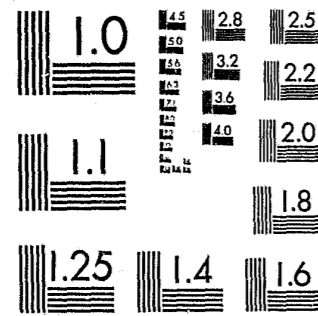


National Criminal Justice Reference Service



This microfiche was produced from documents received for inclusion in the NCJRS data base. Since NCJRS cannot exercise control over the physical condition of the documents submitted, the individual frame quality will vary. The resolution chart on this frame may be used to evaluate the document quality.



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

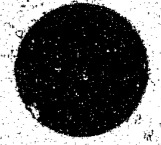
Microfilming procedures used to create this fiche comply with the standards set forth in 41CFR 101-11.504.

Points of view or opinions stated in this document are those of the author(s) and do not represent the official position or policies of the U. S. Department of Justice.

National Institute of Justice  
United States Department of Justice  
Washington, D. C. 20531

7/5/83

MEI



# NATIONAL SYMPOSIUM ON CRIMINAL JUSTICE INFORMATION AND STATISTICS SYSTEMS

NOVEMBER, 1970

83735

PROJECT SEARCH SYSTEM FOR ELECTRONIC ANALYSIS AND RETRIEVAL OF CRIMINAL HISTORIES

NCJRS

SEP 23 1981

ACQUISITIONS

✓  
**PROCEEDINGS OF THE  
NATIONAL SYMPOSIUM ON CRIMINAL JUSTICE  
INFORMATION AND STATISTICS SYSTEMS**

sponsored by **PROJECT SEARCH**

supported by **the LAW ENFORCEMENT  
ASSISTANCE ADMINISTRATION**

November 10-12, 1970

Dallas, Texas

edited by **George A. Buck  
Symposium Coordinator  
California Crime Technological  
Research Foundation**

**U.S. Department of Justice  
National Institute of Justice**

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the National Institute of Justice.

Permission to reproduce this copyrighted material has been granted by  
**U.S. DOJ, LEAA**

to the National Criminal Justice Reference Service (NCJRS).

Further reproduction outside of the NCJRS system requires permission of the copyright owner.



l. to r. Mr. O. J. Hawkins, Deputy Director, California Department of Justice (SEARCH Project Group Chairman)—Mr. Richard W. Velde, Associate Administrator, Law Enforcement Assistance Administration, United States Department of Justice

## SEARCH Policy Committee (Project Group)

Arizona  
**C. J. BEDDOME**  
 Captain  
 Department of Public Safety

California  
**O. J. HAWKINS**  
 Deputy Director  
 Department of Justice

Colorado  
**G. NICHOLAS PIJOAN**  
 Executive Director  
 Council on Crime Control

Connecticut  
**DAVID WEINSTEIN**  
 Director  
 Planning Committee on  
 Criminal Administration

Florida  
**WILLIAM L. REED**  
 Commissioner  
 Department of Law Enforcement

Illinois  
**GARY D. McALVEY**  
 Superintendent  
 Bureau of Identification

Maryland  
**RALPH M. GUTEKUNST**  
 Assistant to the Secretary  
 for Administration  
 Department of Public Safety  
 and Correctional Services

Michigan  
**THOMAS J. TRIMBACH**  
 Research Director  
 Commission on Law Enforcement

Minnesota  
**EMERY BARRETTE**  
 Director  
 Governor's Commission on  
 Crime Prevention and Control

New Jersey  
**JOHN P. MCGANN**  
 Acting Executive Director  
 State Law Enforcement  
 Planning Agency

New York  
**DR. ROBERT R. J. GALLATI**  
 Director  
 New York State Identification  
 and Intelligence System

Ohio  
**DONALD L. DORWARD**  
 Chief, Technical Services  
 Law Enforcement Planning Agency

Pennsylvania  
**MAJOR ALBERT F. KWIA TEK**  
 Director  
 Bureau of Technical Services  
 Pennsylvania State Police

Texas  
**HUGH W. McLELAND**  
 Director  
 Planning Coordination and  
 Grant Administration  
 Criminal Justice Council

Washington  
**JAMES N. O'CONNOR**  
 Administrator  
 Law and Justice Planning Office  
 Planning and Community Affairs Agency

### Project SEARCH Staff (California Crime Technological Research Foundation, DOUGLAS E. ROUDABUSH, Executive Officer):

**PAUL K. WORMELI** ..... Project Coordinator  
**ROBERT L. MARX** ..... Technical Coordinator  
**STEVE E. KOLODNEY** ..... Statistical Coordinator  
**GEORGE A. BUCK** ..... Administrative Coordinator

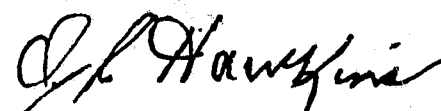
## PREFACE

Project SEARCH is an 18-month multi-state effort designed to develop a prototype computerized criminal justice information system. The project is financed (\$2.5 million) by the Law Enforcement Assistance Administration and the fifteen participating states. It is coordinated by the California Council on Criminal Justice through the California Crime Technological Research Foundation.

The objectives of the project are to:

- Establish and demonstrate the feasibility of an on-line system allowing for the interstate transfer of criminal histories.
- Design and demonstrate a computerized statistics system based on an accounting of individual offenders proceeding through the criminal justice system.

One segment of SEARCH has been devoted to disseminating the results of the project. One means of dissemination selected was to conduct a national symposium. To provide an even more meaningful program for the symposium it was decided to invite speakers representing other progressive criminal justice information and statistics systems—regional, state and local. The reports presented in this document are the papers delivered at this SEARCH Symposium—A National Symposium on Criminal Justice Information and Statistics Systems.



O. J. HAWKINS  
Deputy Director  
California Department of Justice  
(SEARCH Project Group Chairman)

## TABLE OF CONTENTS

	PAGE
KEYNOTE ADDRESS by Richard W. Velde .....	9
<b>SESSION I</b>	
<i>SESSION CHAIRMAN: O. J. HAWKINS</i>	
PROJECT SEARCH—SYSTEM FOR ELECTRONIC ANALYSIS AND RETRIEVAL OF CRIMINAL HISTORIES by Paul K. Wormeli .....	17
SEARCH—SECURITY AND PRIVACY CONSIDERATIONS by Dr. Robert R. J. Gallati .....	27
CRIMINAL HISTORIES—A MANAGEMENT PERSPECTIVE by Commissioner William L. Reed .....	33
LEGISLATIVE IMPLICATIONS OF PROJECT SEARCH by Emery Barrette .....	37
PROJECT SEARCH—CRIMINAL HISTORY EXCHANGE SYSTEM RESULTS by Captain C. J. Beddome .....	43
PROJECT SEARCH CENTRAL INDEX—PHILOSOPHICAL, TECHNICAL AND OPERATIONAL ASPECTS by Captain John R. Plants .....	47
THE ROLE OF FACSIMILE TRANSMISSION IN PROJECT SEARCH by Adam D'Alessandro, James Paley and Ronald Wheeler .....	51
DEVELOPMENT OF INTRASTATE REGIONAL INFORMATION SYSTEMS IN COORDINATION WITH A STATE CRIMINAL JUSTICE INFORMATION SYSTEM by James N. O'Connor .....	69
<b>SESSION II</b>	
<i>SESSION CHAIRMAN: THOMAS J. TRIMBACH</i>	
SURVEY OF STATE CRIMINAL JUSTICE INFORMATION SYSTEMS by Harry Bratt .....	73
PROJECT CLEAR—AN INTEGRATED REGIONAL INFORMATION SYSTEM SERVING GOVERNMENT, LAW AND JUSTICE by Andrews O. Atkinson .....	79
NAME SEARCH TECHNIQUES by Robert L. Taft .....	89
SUBJECT-IN-PROCESS—A DYNAMIC INVENTORY OF A CRIMINAL JUSTICE PROCESS by Dr. James Stevens .....	91
THE DEVELOPMENT OF A LAW ENFORCEMENT COMPUTERIZED SYSTEM FOR TACTICAL INFORMATION CORRELATION AND RETRIEVAL by Sgt. Robert L. Kenney and Captain George Conroy .....	103
THE ALERT SYSTEM FROM CONCEPTUAL DESIGN—PRESENT DAY OPERATIONS—TO FUTURE PLANS by Melvin F. Bockelman .....	118
A COMPARISON OF AN IDEAL CRIMINAL COURT INFORMATION SYSTEM TO THE PHILADELPHIA CRIMINAL COURT INFORMATION SYSTEM by Larry Polansky and Mrs. J. M. White .....	133

## TABLE OF CONTENTS—Cont.

	PAGE
PROGRESS IN COMBINING A NATIONAL DATA BASE WITH DIALOG, A GENERAL PURPOSE ON-LINE RETRIEVAL SYSTEM FOR COMPUTER ASSISTED PAROLE DECISION-MAKING by Ernst A. Wenk, Don M. Gottfredson, Roger K. Summit and Mark S. Radwin.....	171
AN INTEGRATED APPROACH TO CORRECTIONAL INFORMATION SYSTEM DESIGN by Dr. Harland L. Hill .....	183
NEW YORK STATE PAROLE AND PROBATION: INFORMATION NEEDS AND REQUIREMENTS by John F. Burbige .....	195
SPECIALIZED CONSIDERATION OF COURT AND PROSECUTION NEEDS by James R. Donovan .....	209
THE MARYLAND APPROACH TO DATA COLLECTION AND REDUCTION FOR PROJECT SEARCH by Richard Hilton .....	213
<b>SESSION III</b>	
<i>SESSION CHAIRMAN: HUGH W. McLELAND</i>	
EVALUATION—CRIMINAL HISTORY EXCHANGE SYSTEM by Robert L. Marx .....	227
A TECHNICAL ANALYSIS AND REVIEW OF THE SEARCH PROTOTYPE by William R. Nelson.....	233
A CONCEPT FOR A NATIONAL CRIMINAL JUSTICE INFORMATION SYSTEM by Charles E. Robinson.....	239
SOME PROBLEMS ASSOCIATED WITH THE DEVELOPMENT OF A NATIONAL CRIMINAL INFORMATION SYSTEM by Robert P. Shumate .....	249
COMPUTERIZED INFORMATION SERVICES FOR LEAA by Alfred Sansone.....	255
<b>SESSION IV</b>	
<i>SESSION CHAIRMAN: JAMES A. McCAFFERTY</i>	
THE NATIONAL CRIMINAL JUSTICE STATISTICS CENTER—A LONG-RANGE PROGRAM by George Hall .....	261
CRIMINAL STATISTICS—STATE-OF-THE-ART STATISTICAL DEVELOPMENT by Dr. Charles M. Friel.....	265
PROJECT SEARCH STATISTICAL SYSTEM—RESULTS AND EVALUATION OF THE PROTOTYPE by Steve E. Kolodney .....	271
DEVELOPING IN INTEGRATED CRIMINAL RECORDS by Ronald H. Beattie .....	279
PROJECT TRACE—A SYSTEM FOR THE TRACKING, RETRIEVAL AND ANALYSIS OF CRIMINAL EVENTS by Mrs. Joan Jacoby .....	287
DATA MANAGEMENT SYSTEM FOR PROJECT SEARCH by Dr. Val Punga, David Weinstein, Tom Schroeder and Nelson White.....	291

## Remarks before the National Symposium on Criminal Justice Information and Statistics Systems

by Richard W. Velde, Associate Administrator  
Law Enforcement Assistance Administration  
United States Department of Justice

This nation has long prided itself on being able to accomplish things, on being able to achieve whatever it set out to do. The old slogan, "where there's a will, there's a way," has in a sense been a national motto. But that motto failed for decades to produce anything even remotely resembling needed results in at least one area of our national life—the control of crime. There was indeed a will to do something about the growing and awesome problems of crime and the shortcomings of the criminal justice system. But it was not until two years ago that effective programs began to carry out this national impulse to once again fully achieve some of our most basic freedoms—freedom from harm, freedom from fear.

Slightly more than two years ago, no nationwide crime control program existed. Today, it is a reality, in every state from coast to coast, a cooperative undertaking by the federal, state and local governments. The program of the Law Enforcement Assistance Administration is a keystone of this new national effort. I stress that it is a national effort, rather than the effort alone of the federal government, for if we really are to roll back the wave of crime then a major share of the effort must be made by state and local governments.

Your presence here today is heartening, for you are committed—as are we in LEAA—to a safer America. But in a sense something else is even more heartening. As important as your efforts are, they comprise only one of hundreds of efforts, of thousands, to make the new national crime control program a complete success as quickly as possible. If all of the projects and programs are carried out with a dedication to match that of all of those involved in the effort we are meeting about today, the future looks very bright.

It is about that effort, Project SEARCH, that I wish to talk with you today. As you all know, the acronym in Project SEARCH stands for System for Electronic Analysis and Retrieval of Criminal Histories. On one level—and a very important one—Project SEARCH is designed to give criminal justice agencies needed information on offenders in a matter of seconds. But on another level, Project SEARCH has implications far beyond providing information to criminal justice agencies or providing statistics to criminal justice managers.

For some time, people have been asking seriously

whether it is possible to do anything really meaningful to improve and modernize the criminal justice system. Though it is only one example of what is being accomplished under the Law Enforcement Assistance Administration program, Project SEARCH, though in its infancy, has provided an affirmative answer.

SEARCH has shown it is possible to adapt complex modern technology to meet intricate criminal justice needs. It has shown that seemingly insurmountable obstacles can be overcome. Not much more than a year ago, there was substantial doubt among many persons that a SEARCH system could be created. There also was a body of opinion that it would take a number of years to carry out even the testing and demonstration phases.

Today, SEARCH is a reality—so much of a reality that the project states have decided to move beyond the demonstration and make the system operational. The implications of SEARCH are enormous. Though the word frequently is overused, SEARCH represents a breakthrough in criminal justice.

It has shown that a complex project can be conceived and carried out. It has shown that criminal justice does not have to be bound to 19th century techniques and practices. It has shown that long-sought dreams of cooperation among local, state, and federal agencies can be brought to fruition with harmony and meaning rather than with endless bickering and jealousies.

SEARCH has also shown that things can be done speedily. In our criminal justice system today, there is great need for doing things swiftly. Police must apprehend offenders faster. Courts must speed case processing to ensure the rights of both the defendant and society. Corrections must move more swiftly to rehabilitate offenders in its care.

Through the use of computers and related technology, SEARCH has shown it is possible to transmit in seconds information that formerly took days or weeks to obtain—if, indeed, it could be obtained at all. SEARCH also has shown it is possible to conceive of and then develop a revolutionary new system in months instead of years—and overcome the skepticism of some that it could be done at all.

I personally am very proud of the contribution that LEAA has made to SEARCH, as I am proud of the stunning accomplishments of the project states—especially California as the project leader. Support for SEARCH also has been evident in the Federal government. Attorney General John N. Mitchell has voiced his support of SEARCH efforts carried out so

far. My colleague in LEAA, Associate Administrator Clarence M. Coster, fully shares my enthusiasm and support for the SEARCH program.

Today, I would like to outline the development of SEARCH from the LEAA point of view, discuss the practical applications and implications of SEARCH, and make a few observations about the system's future.

SEARCH began shortly after LEAA began. LEAA was created by Congress in June of 1968, with a first-year budget of only \$63 million. Early in calendar 1969, after I joined LEAA, we began receiving a number of grant applications from states seeking funds to develop state criminal justice information systems.

The need for such systems—both from LEAA's viewpoint and that of the states—was great. But there were problems. First, each application or proposal dealt with only one state. If a number of states were given funds, then there could be a number of state systems. But each state might go off in its own direction, leaving us with a bewildering complex of independent and incompatible programs. Then, there was the matter of the amount of money available to support such projects.

In fiscal 1969, out of that \$63 million budget, only \$4 million was available in action funds which LEAA could give at its own discretion. One state wanted \$300,000 for its own criminal justice information project. Other requests were comparably large. It quickly became clear that only one project could be started. It would have to be defined precisely. It would have to embrace a number of states. It also was clear that the system would have to be compatible not only among participating states but would utilize a format into which other states could eventually fit so that a true nationwide system could be developed.

LEAA set to work. We conducted an informal national survey to determine those states which seemed to hold the greatest promise for becoming participants and then invited 24 states to Washington, D.C. for an in-depth meeting to outline our concept and encourage applications. By June of 1969, the first six participants had been selected—Arizona, California, Maryland, Michigan, Minnesota and New York. Four other states were chosen to take part as observers—Connecticut, Florida, Texas, and Washington. As you know, participants now total 15. By June 30, 1969, a \$600,000 discretionary grant had been given to the participant states to launch SEARCH. That June 30 date, by the way, represented the end of the first year of LEAA operations. The program had been devised quickly but carefully.

The speed at which SEARCH would proceed subsequently also was a matter of urgent concern to me. In discussions with federal agencies and others, we were told that the demonstration phase alone would take at least three years. Those experts based

their estimates on the length of the start-up time required for other similar computerized systems.

I am frank when I tell you that I took those estimates seriously. I also will be frank and tell you that I believed the estimates could be proven wrong. I had two urgent concerns. First, the services that could be provided by SEARCH were critically needed by the criminal justice system. In our efforts to reduce crime and help fashion a safer society, we simply could not afford three years for the demonstration alone and then uncounted years more to make the system operational. Every delay in bringing criminal justice improvements makes it harder to break the trend of increasing crime.

My second concern involved the need for a system that truly was nationwide, one in which all the states could eventually take part. I feared that if the demonstration alone would take three years, many states and cities during that period would go off on their own. That could have meant, for instance, that even if SEARCH was found to work after a three-year demonstration, many states would already have developed different systems. They probably would have been systems incompatible with each other. Some states might have been reluctant to ever change, meaning that no nationwide system could be created. For those states willing to change, untold amounts of vitally-needed funds would perhaps have in large part been wasted and funds needed elsewhere would then have to be used for conversion.

The decision which was made may not have been a popular one, but it was the correct one. My view was that the demonstration of SEARCH could be—had to be—carried out within 14 months instead of three years. We were prepared for the eventuality that it might take longer. But we set, as conditions of our grant, the 14-month time schedule. That schedule, I am pleased to say, was met. The funds were given at the end of fiscal 1969—June 30. Twelve months later, in July of 1970, the project states began their demonstration and ended the initial phase by the end of August. The preliminary evaluation indicates that every goal of the demonstration was either met or was exceeded. The demonstration period has been extended to continue through December of this year, and an additional demonstration may be held in the spring of 1971.

In addition, and this is of critical importance, the project states themselves have now made the decision to make the SEARCH system operational in the summer of 1971. I am confident that schedule will be met, and that by the end of 1971 at least two-thirds of the nation's serious criminal transactions will be recorded by the SEARCH system.

The undertaking of SEARCH was not without its difficulties. Could the necessary levels of cooperation be attained, not only between the states and the federal government but among the states themselves?

Could the proper administrative structure be created? Could we resolve the problem of a proper format for criminal histories? Could we find means to convert paper histories to a machine-readable format? Could we resolve the problems related to transmitting data across the country and feasibility of leased lines? Could we devise a proper format for the central index? Could we resolve—and this was of great importance—the delicate questions of security and privacy?

As I indicated earlier, we were fortunate to have states involved which devoted every ounce of their energies to making SEARCH work. California, as the project leader, deserves a special commendation, as does Mr. O. J. Hawkins, Chairman of the SEARCH Project Group, and Mr. Paul K. Wormeli, the project coordinator. For the Project Group staff, there was no such thing as a 40-hour week.

The basic problems facing SEARCH in the demonstration period have been solved. A common format for criminal histories was developed, and in machine-readable form thanks in no small part to the pioneering work of the FBI. Each active participant converted at least 10,000 felony records to the SEARCH system for the demonstration. As the test period showed, a state making an inquiry of the central index with perhaps no more information than a driver's license number, could find out if that person was in the index, and then be switched to the state holding the complete criminal history. It takes merely seconds to do all of that and receive the information.

SEARCH created an administrative structure that works well. Levels of cooperation are higher than anyone could reasonably expect. Problems of distance and lines of communication were resolved. The design of a workable central index was perfected. And the security and privacy questions were so thoroughly researched and developed that SEARCH will from this point on be the standard for any computerized system which contains records of individuals.

A number of tough questions must still be faced and resolved. They include: Should there be uniform state laws, based on a model, concerning file content and access? What public agencies should be involved in the system? Should there be federal legislation to govern interstate exchange of criminal history information? Should criminal and civil remedies be available to the individual who claims his privacy has been invaded?

As I mentioned earlier, SEARCH is indebted to the contributions made by the Federal Bureau of Investigation. The FBI gave substantial help in development of a record format, and much of the progress of SEARCH springs from the pioneering work of the Bureau's National Crime Information Center. I might add here another example of the benefits of

cooperation, for LEAA and its predecessor agency have given the FBI nearly \$1.1 million for support of NCIC. In addition, the Department of Transportation, through its highway safety program, has given great assistance in the area of computerized criminal justice information systems. In the past three fiscal years, the Department awarded some \$37 million to state and local governments for traffic records projects—nearly all of them computerized. This has enabled police, for instance, to not only become familiar with such computerized programs and their benefits, but to also purchase needed computer hardware and software that can be used for other aspects of their work. In a sense, police have a leg-up on other components of the criminal justice system in computerized systems, and generally a much higher degree of expertise and sophistication than courts or corrections agencies. I anticipate that this gap won't exist for long. LEAA block grant funds will be utilized by the states to help automate court and corrections systems.

We should consider for a few moments the implications when Project SEARCH becomes a national system. The benefits that would flow from SEARCH fall into two major categories. First, there would be the benefits to operational criminal justice agencies. The number of inquiries would be greatest for police, since police comprise the bulk of the criminal justice system. Police need information on suspects and persons taken into custody—need it not only quickly but in massive volume. Prior to SEARCH, only one or two states had statewide computerized criminal justice information systems that could produce information on suspects or defendants.

There was simply no fast way to ask every state whether or not they had an individual in their files. A nationwide SEARCH system would make such an inquiry possible—indeed, it would be routine. A query to the central index would discover whether a file existed on the individual, give a brief summary, and tell what state in which the full record was kept. A second inquiry, to the state of record, would produce the detailed material. Such information is valuable to police—when they have detained a suspect, when they are trying to determine whether there is probable cause to arrest, after they have made an arrest.

To cite only one illustration, police might find a man loitering near a school, or in the vicinity of where a sex crime has been reported. A check through the SEARCH system might disclose the information that he has a record of arrests and convictions in another state that would give police probable cause to hold him for a crime they are investigating.

SEARCH will be a very valuable tool for operation of the courts. Quick access to an individual's complete criminal history would help a judge or magistrate, for instance, to reach the best possible determi-

nation on whether to grant bail or whether to sentence a person to prison or place him on probation. A prosecutor might, for instance, query SEARCH to obtain the criminal history, if any, of a surprise defense witness, and perhaps use that information to discredit the testimony.

Corrections agencies could use SEARCH to great advantage as well. In trying to determine the best methods of treatment for incoming prisoners, judgments could be made on the basis of complete criminal histories that would show all encounters with all phases of criminal justice—police, courts, and corrections. Such decisions are inadequate if records are incomplete. Full criminal histories also are important in reaching the best possible decisions in parole and in work release programs.

The second major benefit to flow from a nationwide SEARCH system would not be in operations—though it certainly will have a great impact on operations. This benefit would be in using SEARCH data to help compile complete, meaningful statistics on every aspect of the criminal justice system—both within every state and nationally.

Why are national statistics important? The answer is simple: So we can find out exactly what is happening within the criminal justice system. Until we have reliable data, we cannot move precisely in all areas that need attention. When I say we, I mean not only the federal government—but more importantly, state and local governments and their criminal justice agencies.

Today, information does not exist on a nationwide basis on what happens to an individual at every step of the way through the criminal justice system—from arrest to trial to imprisonment, to release. Such information is vitally needed by criminal justice administrators and planners as they seek to develop new and more effective programs and improve and modernize ones already in existence.

The effectiveness of the police cannot be gauged accurately if we do not know, in every state as well as throughout the nation, precisely how many people are arrested, and for what. The reporting must be complete, but many jurisdictions do not report at all. The reporting must be uniform, and many jurisdictions now compile crime statistics in varying ways. But we must know more than how many persons are arrested. We must know what then happens to them after arrest if criminal justice agencies are to improve. We must know how many of those taken into custody are formally charged. How many of those who are formally charged obtain dismissals for one reason or another. How many of those tried are convicted? How many plead guilty? Of those convicted, how many go to jail or prison? How long did they wait to go on trial? How many received probation? Were sentences uniform? How long do persons in prison serve before being released? What is the rate

of recidivism?

Until we know all of those things, cities and states cannot begin to assess whether criminal justice agencies are functioning at full effectiveness. But today, on a national scale, we don't know any of those things. Reliable statistics would not only help fashion new programs, but would enable proper evaluation of existing ones. If one state has a very low rate of recidivism among its former inmates, then it must be doing something right, and perhaps something that other states can copy. But in the field of corrections, for instance, there is no precise idea today of the extent of recidivism.

A particular state may keep good records on the re-arrests within the state of its former inmates. But it probably will have little or no idea of whether those inmates are re-arrested in other states. SEARCH would provide such information—for the criminal histories would be complete, and masses of such important data could be retrieved to determine national patterns.

As one observer has put it, there now is a national sea of ignorance concerning criminal justice. That must be ended.

What of the future of Project SEARCH? The project states have made the decision to go operational next summer, and have indicated they will ask for further funds from LEAA. No one can predict with any accuracy at this point precisely how much money LEAA might award for SEARCH over an extended period of time—the next five or 10 years. That will depend in large measure on the full results of the entire demonstration and a full evaluation plus the efforts of the states themselves.

I am pleased to be able to announce to you today that the Law Enforcement Assistance Administration has decided to support the SEARCH system going operational. Today LEAA is awarding \$1,500,000 to the SEARCH project to support the work of the 15 SEARCH states during the 12 month period beginning next January 1. In addition, the SEARCH states themselves will provide \$1,000,000 in matching funds next year, making the total SEARCH Budget in 1971 a total of over \$2,500,000.

But it certainly is no secret that LEAA has been most enthusiastic about SEARCH and supported it to the limit of our ability. LEAA discretionary funds to SEARCH so far have totaled some \$1.6 million.

LEAA awarded a \$600,000 grant in fiscal 1969 to initiate the SEARCH project. That grant represented 15 percent of our total discretionary action funds for that year. In fiscal 1970, LEAA awarded an additional \$1 million to support SEARCH. It is clear that our commitment has been substantial, as has been the case with the states. The participating states have added another \$1 million of their own funds.

I personally have had no doubts that SEARCH could develop into an operational, nationwide sys-

tem. Some problems remain, of course, to be worked out. To cite only one, a method must be found to update criminal histories that is both efficient and fully takes into account the privacy considerations. But all of the problems can be resolved—just as I thought more than a year ago that a successful demonstration could be mounted in 14 months.

The key, however, to SEARCH becoming a nationwide successful system lies where it always has—not with LEAA and the federal government but with the states themselves. They will have to continue to do the bulk of the work. They will have to expend the bulk of the funds.

This is what I meant earlier when I said that SEARCH is a good illustration of what the entire LEAA program seeks to do. We can provide some of the money. We can provide some of the ideas. We can provide some of the experts. But when it comes down to doing the work, criminal justice programs will be successful only if state and local governments themselves make them successful.

Law enforcement is primarily a local and state responsibility. It must continue to be. SEARCH, like any other project in which we are involved, can work only if the states make it work. Their commitment must not only be intense but it must be lasting.

I am proud to have been a part of this project and of the role LEAA is playing—to be a catalyst in the improvement of law enforcement so that this country can really be made safer for all of its citizens—much faster than any of us dare now dream.

The great urgency of the need to overcome crime was stressed very strongly by President Nixon in his State of the Union Message when he said, and I quote: "We have heard a great deal of over-blown rhetoric during the sixties in which the word "war" has perhaps too often been used—the war on poverty, the war on misery, the war on disease, the war on hunger. But if there is one area where the word "war" is appropriate it is in the fight against crime. We must declare and win the war against the criminal elements which increasingly threaten our cities, our homes and our lives."

SESSION I  
SEARCH—APPROACH AND RESULTS

SESSION CHAIRMAN:

O. J. Hawkins  
Deputy Director  
California Department of Justice

## PROJECT SEARCH—SYSTEM FOR ELECTRONIC ANALYSIS AND RETRIEVAL OF CRIMINAL HISTORIES

by Paul K. Wormell, Vice President  
Public Systems Incorporated

### 1. PROJECT SUMMARY

Project SEARCH—System for Electronic Analysis and Retrieval of Criminal Histories—is designed to develop a prototype computerized criminal justice information system. The project is a multi-state effort to demonstrate the value and feasibility of a criminal justice data file and statistics system which is based on automated files created and maintained by individual states and providing for interstate transfer of data.

Fifteen states are participating in the project: Arizona, California, Colorado, Connecticut, Florida, Illinois, Maryland, Michigan, Minnesota, New Jersey, New York, Ohio, Pennsylvania, Texas, and Washington. The California Council on Criminal Justice is coordinating the project through the California Crime Technological Research Foundation.

The long-term goal of the SEARCH project is to expand the usefulness and scope of computerized law enforcement information systems composed of state entities which enjoy a capability of interstate inquiry and an inventory of available criminal justice statistics.

The immediate goal of this project is to establish and demonstrate a multi-state prototype system and capability which will:

- (a) Establish and demonstrate the feasibility of an on-line system allowing for the interstate exchange of offender files in the states based on a compatible "criminal justice offender record", integrating police, prosecution, court and correctional offender data.
- (b) Design and demonstrate a computerized criminal justice statistics system (e.g., offense and arrest statistics, court statistics, probation and parole statistics, etc.) which would permit access by LEAA and by police, court, correctional, and planning agencies.

For the exchange of criminal history data, each state is developing its own internal system meeting minimum requirements developed by a Standardization Task Force which was responsible for standardizing interstate terminology, definitions, data elements, etc.

The statistical system concept consists of the creation of a set of transaction-based statistical data, the analysis of the data and the generation of illustrative reports. A Statistical Methods Task Force has developed guidelines for the individual states, indicating the specific data to be included and the output formats for the presentation of statistics.

A 15-man Project Group, consisting of one representative from each participating state, is responsible for the conduct of the project.

The project is scheduled to run from July 1, 1969, to December 31, 1970. The total project budget exceeds \$2.5 million.

### 2. PROJECT OBJECTIVES

There are two major objectives of this cooperative project:

**Objective 1:** Evaluation of the technical feasibility and operational utility of a cooperative interstate transference of criminal history data.

In meeting this first project objective, three subsidiary project objectives will be attained:

- (a) A standardized minimum set of data elements with standardized definitions for each data element will be provided in the areas of offender identification, offenses, and dispositions.
- (b) A prototype centralized index accessible by a state requesting information on a properly identified offender and providing the names of states holding offender data will be developed.
- (c) The capacity for interstate transference of criminal histories and response to requests for criminal histories will be demonstrated and evaluated.

**Objective 2:** Demonstration of a capability to generate transaction-based criminal statistics. In carrying out this project objective, three subsidiary objectives will be attained:

- (a) The requirements of various classes of users for criminal justice statistics will be reviewed and recommendations for a standardized set of criminal justice statistics will be developed.
- (b) Presently available statistics which are compatible among the participating states and which can be provided in computerized form will be delineated.
- (c) A demonstration of automated generation of criminal justice statistics will be conducted, and appropriate reports will be prepared.

In addition to these primary objectives, a number of supporting objectives will be achieved by the special projects conducted by the various states, as described in a later section.

### 3. PARTICIPANTS

A large number of federal and state agencies are participating in Project SEARCH. Figure 1 shows the relatively simple project organization that was established at the beginning of the project. A Project Group, consisting of one representative from each of the 15 project states, is the primary policy board governing the work performed in the project. The



Project Coordinator, supplied by the California Council on Criminal Justice, using the offices of the California Crime Technological Research Foundation, is responsible for insuring that the various policies laid down by the Project Group are carried out in the various states through the State Project Coordinator in each state. Two task forces were created at the beginning of the project. The Statistical Methods Task Force had the responsibility of determining the data elements to be collected which would produce a criminal justice statistical system. The task force members reviewed the available statistics in the various project states, and considered the long-range requirements for criminal justice statistics as expressed by the various possible users. The Standardization Task Force was responsible for the development of the specific data elements and output formats to be used in the SEARCH states in generating their state files and responding to requests from other states. The State Project Coordinator in each state is responsible for the execution of Project SEARCH within his state.

Although the primary effort has been concentrated in the 15 project states, various federal and other state agencies have been involved in the project. Table 1 shows the participation by all state and federal agencies.

Table 1  
PARTICIPANT ROLES

Project Group Member	Standard-ization Task Force Member	Statistical Methods Task Force Member	State project Funded	SEARCH Project Coordination	Observer Only
LEAA .....	X	X			
FBI .....	X	X			
Bureau of Census .....					X
Bureau of Prisons .....					X
Arizona .....	X	X	X		
California .....	X	X	X	X	
Colorado .....	X				
Connecticut ..	X	X	X		
Florida .....	X	X	X		
Illinois .....	X				
Maryland .....	X	X	X		
Michigan .....	X	X	X		
Minnesota .....	X	X	X		
New Jersey ..	X				
New York .....	X	X	X		
Ohio .....	X				
Pennsylvania ..	X				
Texas .....	X	X	X		
Washington ..	X	X	X		

#### 4. PROTOTYPE OFFENDER HISTORY EXCHANGE SYSTEM

The system concept is based on the maintenance of individually state-held files and the existence of a central index, directly accessible by each state and containing summary data on each state-held file. The central index will respond to an inquiring state by providing personal descriptors and identifying num-

bers (shown in Table 2), an abbreviated criminal profile and the name of the state or agency holding the full criminal history record (Agency of Record). The requesting state may then directly access the desired file from the Agency of Record.

Table 2  
IDENTIFICATION DATA ELEMENTS FOR SEARCH FILES  
STATE FILES AND CENTRAL INDEX

*Name	Visible Scars, Marks, Tattoos, Amputations or Deformities
*Sex	Miscellaneous Identifying Numbers
*Race	*State Identification Number
Place of Birth	*FBI Number
*Date of Birth	Social Security Number
*Height	Operator's License Number
Weight	Fingerprint Classification
Hair Color	Skin Tone

STATE FILES ONLY

Address
Occupation

\*Elements indicated by an asterisk are the minimum required for the entry of a record in the central index.

When a transaction takes place between an offender and an agency in a state other than the Agency of Record, that state becomes the Agency of Record, the criminal history file is transferred from the previous Agency of Record, the file is updated, and the central index is updated to reflect these changes.

The central index has the capability of conducting a file search based on (1) FBI number, or (2) operators license number, or (3) social security number, or (4) miscellaneous identification numbers, or (5) name, sex, and date of birth.

There are several reasons behind the choice of this system concept for the prototype system. One of the critical elements of this concept is the approach of using criminal history files created, maintained, and controlled by the individual states. The central index then becomes actually more of a directory of where to obtain additional information on a subject. This approach is an alternative to a national data base containing complete information on all offenders. There are many trade-offs to be considered in choosing between a single national data base and an integrated and coordinated set of state systems. Although economic considerations and the difficulty of updating support a national file, the project participants believed that the desirability of state-held files was sufficient to warrant testing this more difficult approach in the prototype system. The project has conducted a study of felon mobility in an effort to estimate the extent of record exchange which would be required beyond adjacent states. The study showed that a relatively small percentage of offenders are really mobile in a national sense. This fact argues for regional systems interfaced between states rather than a national data bank.

The full criminal history files maintained by the

Agency of Record will include a set of required data plus other optional data required for internal state use. The recorded data includes a minimum set of personal descriptors and identifying numbers (shown in Table 2) and a record of each criminal justice transaction between the offender and the involved criminal justice agencies. These transactions for felonies or gross misdemeanors will include information on, and outcomes of arrest, pre-trial hearing, trial, sentencing, correction (including probation/parole) and postconviction.

Offense terms to be included in the files will be based on NCIC's Uniform Offense Classifications.

In developing the file design, the most difficult decisions were associated with the type of criminal history summaries that were to be included in the central index and state files. Many alternatives were possible, and the actual operational requirements of all the various users are still rather poorly defined. The joint decision of the project participants was based on an intuitive understanding of user requirements.

The central index, containing a count of arrests and convictions by major offense category was considered to be sufficient for answering inquiries by officers in the field needing a quick response as to whether or not a person was in the system (has a prior record) and some brief indication of prior offenses. The index "points" to a state file which is designed primarily to allow investigative and other less immediate needs to be satisfied. The state file indicates dates and agencies where the subject has had prior involvement with the criminal justice system, allowing a more refined "pointer" for obtaining further information.

There was a general belief that the criminal summary contained in the central index would satisfy over half of the inquiries, avoiding the second inquiry to the state. The state inquiry should then satisfy a major portion of the remaining needs, minimizing the effort required in contacting numerous local agencies for more detail on the offender.

The results of our efforts can be shown by the illustrative set of inquiries and responses shown in Table 3.

The system was tested and evaluated during a period of system demonstration in July and August. The evaluation will continue during the remainder of this year. The demonstration included an on-line operational system test. The State of Michigan, through the Michigan State Police, provided the central index for the period of the demonstration and also provided message switching capabilities to handle the state-to-state inquiries as shown in Figure 2. A single low-speed (110 baud) line connected each state to the Burroughs B-5500 computer in Michigan. The computer-to-computer interface allowed each state to set up as many demonstration terminals as it

chose to show the system to users in each SEARCH state. Seven of the states (Arizona, California, Florida, Maryland, Michigan, Minnesota, and New York) were on-line in July and August. Connecticut was on-line for inquiry only via a terminal to the New York computer.

One of the primary purposes of the evaluation is to involve a large number of actual potential system users in determining the extent to which this system concept meets operational needs.

During the period of the demonstration, the central index contained close to 75,000 offender records. Each state was committed to entering at least 10,000 offender records. This was obviously not a sufficient data base to expect a large number of actual hits during the period of this demonstration. However, since the states were concentrating on the records of relatively active offenders, a number of hits actually occurred.

Table 3  
INQUIRIES AND RESPONSES

Inquiry to Central Index  
[INQUIRY CODE] NAM/BIGLOW, CHARLES.SEX/M. DOB/081624.

Response From Central Index  
NAM/BIGLOW,CHARLES, RAC/WHITE, SEX/MALE, DOB/071624  
HGT/600, WGT/192, HAI/BROWN, OLN/CA/HO721460  
SOC/531-82-6201, FBI/0602141E

OFF/	
HOMICIDE	02 ARR, 01 CONV
KIDNAPPING	02 ARR, 01 CONV
SEXUAL ASSAULT	01 ARR, 00 CONV
ASSAULT	01 ARR, 00 CONV
STOLEN VEHICLE	01 ARR, 00 CONV
DANGEROUS DRUGS	01 ARR, 00 CONV
SEX OFFENSE	01 ARR, 00 CONV
TRAFFIC OFFENSE	01 ARR, 00 CONV

SIN/CA/CA09123463  
CAUTION IDENTIFICATION NOT BASED ON FINGERPRINT COMPARISON.  
END

Inquiry to State File  
[INQUIRY CODE] CA/CA09123463.

Response From State File  
SIN/CA/CA09123463.PAG/01.  
CA OFFENDER RECORD. FBI/0602141E.  
NAM/BIGLOW, CHARLES. SEX/M. RAC/W. POB/CA.  
DOB/071624. HGT/600. WGT/192. HAI/BR. EYE/BR. SOC/531826201.  
FPC/6 L 1 UA-T OIL 6.OLN/CAH 721460.  
L 3 U OIO 10.

\*\*\*\*\* CHARGE AND DISPOSITION \*\*\*\*\*

CYC CT	DATE	AGENCY-FILE NO.	CHARGE	DISPOSITION
01	1	061062	CA03801-721430 SEXUAL ASSAULT	ACQUITTED
01	2	061062	CA03801-721430 KIDNAPPING	CONV KIDNAPPING
01	3	061062	CA03801-721430 SEX OFFENSE	ACQUITTED
01	4	061062	CA03801-721430 MURDER	CONV MURDER-HOMICIDE
02	1	061770	CA01942-882916 MURDER-HOMICIDE	RELEASED
02	2	061770	CA01942-882916 ASSAULT	RELEASED
02	3	061770	CA01942-882916 KIDNAPPING	RELEASED
02	4	061770	CA01942-882916 STOLEN VEHICLE	RELEASED
02	5	061770	CA01942-882916 DANGEROUS DRUGS	RELEASED
03	1	062070	CA01942-882916 UNKNWN	CONV REDUCD CHG

\*\*\*\*\* CUSTODY AND SUPERVISION \*\*\*\*\*

AGENCY-FILE NO.	DATE—ACTION	DATE—ACTION
01 2 CA00095-A4216Z	092362—CONFINED	
01 2 CA00095-A4216Z	092362—1Y-20Y	
01 4 CA00095-A4216Z	092362—CONFINED	
01 4 CA00095-A4216Z	092362—5Y-LIFE CC	
01 0 CA00095-A4216Z	101369—PAROLED	040770—DSCHG FRM PAROLE
03 1 CA01942-B82916	062270—FINE 35	

CAUTION IDENTIFICATION NOT BASED ON FINGERPRINT COMPARISON.  
END.

The Law Enforcement Assistance Administration also had access to a terminal for demonstrations to legislative and other federal officials. The records accessible by the terminal in the Law Enforcement Assistance Administration were entirely simulated, in that artificial records were generated solely for demonstration purposes to officials not directly involved in the criminal justice system.

The demonstration period in July and August really began a six-month evaluation period with the purpose of determining the changes which should be made in the system before it can become a national operational reality. One of the major concerns during this period will be to design an adequate updating procedure for all of the states. Also during this period, the states which were unable to be on-line in July and August will complete the conversion of at least 10,000 records so that by December 1970, all 10 of the funded states will have prepared a basic file of offender records for loading into a subsequent national system.

The final products of Project SEARCH to be delivered in December 1970, include the converted records, the central index loading, and a detailed plan for a national system.

One of the primary considerations in developing the system concept will continue to be a comprehensive concern regarding the protection of individual rights in developing the data files and the security precautions in providing access to the files. The project participants are well aware of the implications of creating this national data base, and are taking strong steps toward insuring that individual rights are protected in the final system design. The Project Group in SEARCH has established a special committee chaired by Dr. Robert Gallati of NYSIIS to concern itself exclusively with the security and privacy issues related to the development of this system. The committee has already drafted a Code of Ethics adopted by the project participants, and has issued a special report on the issues of privacy and security.

##### 5. PROTOTYPE CRIMINAL JUSTICE STATISTICS SYSTEM

The system concept is based on the collection, analysis, and report generation of transaction-based statistics—transactions between individual offenders

and the criminal justice agencies with whom they come in contact. The system concept adopted for project utilization is as follows:

**Need.** The facts that describe each state's administration of criminal justice and the processes used against adult criminal defendants are scattered throughout the files of local police, county prosecutors, different levels of courts, and various state and local correctional agencies.

It will not be possible to describe how effectively the criminal justice system is working unless the presently dispersed facts on individuals exposed to prosecution can be brought together to portray the justice system in each state.

**Objective.** The recommended reporting scheme will permit developing information that will join the segmented bodies of information now kept by the separate criminal justice agencies. The facts developed will provide an example of how each participating state, if properly financed, could routinely describe its separate system of criminal justice.

**Approach.** Each participating state will trace a select group of adult felony defendants from entry into the criminal justice system at the point of arrest to their point of departure. Each administrative agency, its procedures and decisions affecting the defendant's progress through the justice framework will be identified. Certain data will be abstracted from the information gathered and processed for analysis of the system.

**Criteria.** The individual at the point of arrest, not the number of charges, is the accepted unit of count for the purpose of building the statistical model. Each of several multiple charges lodged against single defendants at the time of arrest is to be traced through the system and identified with the responsible defendant. Multiple defendants involved in single events are to be counted separately.

In applying this concept a minimum of 250 adult defendants (in each state) arrested on felony charges during the past several years were traced from the point of arrest to the point of departure from the system.

The major focus of the analysis was on the "fall out"—defendants leaving the system. The analytical plan identified departure points and time intervals for each state by the characteristics of the criminal offenders.

A data collection format was developed and consisted of the data elements shown in Table 4. Figure 3 shows the responsibilities of the participants in completing this effort.

Table 4  
STATISTICAL SYSTEM DATA ELEMENTS  
OFFENDER CHARACTERISTICS

State  
State ID Number  
Age at Time of Arrest  
Sex  
Race  
Number of Arrests  
Number of Convictions  
Number of Jail <90 Days  
Number of Jail >90 Days  
Number of Prison (State Institution)  
Status at Time of Arrest  
Status of Supervision (If Status Not = 0)

##### LEVEL 1—POLICE ACTION

Date of Arrest (Mo/Day/Yr)  
Arresting Agency  
Type of Arrest  
Apparent Intended Offense  
Primary Charged Offense (Most Serious)  
Police Disposition

##### LEVEL 2—PRE-FELONY TRIAL

Pre-Trial Cycle Number  
Proceeding Type  
Offense Charged  
Date of Initiation  
Date of Completion  
Disposition  
Release Actions  
Offense Charge at Disposition  
Plea  
Length of Jail Term in Days  
Length of Probation in Months  
Amount of Fine in \$

##### LEVEL 3—FELONY TRIAL

Date Filed  
Offense Charged  
Initial Plea  
Final Plea  
Type of Trial  
Release Action  
Disposition  
Date of Disposition  
Reason for Dismissal  
Convicted Offense  
Pre-Sentence Report Available  
Length of Prison  
Length of Probation in Months  
Length of Jail in Days  
Amount of Fine in \$  
Length of Work Furlough  
Type of Defense Counsel  
Non-Supervisory Sentence

##### LEVEL 4—CORRECTIONS

Corrections Cycle Number  
Receiving Agency  
Date of Receipt  
Date of Termination  
Reason for Termination

#### 6. SPECIAL PROJECTS

In addition to those specific project objectives which are directly related to the construction, demonstration, and evaluation of the prototype system, a number of specialized efforts are being undertaken by individual grantee states to address certain

critical problems which will be encountered in the future development of a full-scale (50-state) system:

**Integrated Record Development.** A special project is being carried out (by California) in an effort to link information concerning individual offenses, the offenders involved, and the criminal justice processes through which the offenders proceed. Feasibility of construction of such integrated records in a form capable of producing complete criminal justice system statistics is being tested by means of a pilot project involving approximately 10,000 record entries from 12 counties of the state.

**Specialized Consideration of Court and Prosecution Needs.** A detailed study of the requirements of courts and prosecuting attorneys for individual offense and offender records as well as statistical data is being performed (by Maryland). In addition to the data requirements analysis, an analysis of the court and prosecuting subsystem is being performed to allow determination of the most effective and efficient locations within that subsystem from which to collect criminal justice information for other users.

**Specialized Probation and Parole Requirements.** A detailed study of the requirements for statistical information is being conducted (by New York) and will lead to a statement of the statistical data required for effective planning, management, and program evaluation in the area of probation and parole.

**Simultaneous Statistics/History Generation.** Connecticut's unique contribution to Project SEARCH is an attempt to design a file and establish a system of offender-based data collection which will permit nearly automatic and simultaneous generation of statistical data and criminal history files. They will closely document and monitor their efforts so that the feasibility of programmatically generating statistical data from offender records can be determined.

**Transaction Utility in Status File Maintenance.** Texas is concentrating on a "subject-in-process" approach. They are establishing an offender-based file that will reflect the dynamic composition and characteristics of a criminal justice system. Each record in the data base reflects the history of each arrest and the current status of an offender while he is in the criminal justice process. Each record is updated as an offender moves through the process, and when the record of his arrest has proceeded to a point of exit from the system a summary of that record is created to update a criminal history file.

**Feasibility of Intra-State Indexing—Regional Files.** Washington is testing the feasibility of establishing a computerized offender history file in a metropolitan region. It is anticipated that Washington will ultimately be served by approximately four regional information centers, each of which will have the capacity of making automatic inquiry of the oth-

ers through a combined index maintained at the state crime information center. An inquiry from outside the state to the center will likewise automatically query the regional centers.

**Facsimile Equipment Demonstration.** A demonstration of facsimile fingerprint transmission between the States of Maryland, Michigan, Minnesota, and New York is being conducted.

#### 7. FUTURE DEVELOPMENTS

One very important aspect of SEARCH is keeping all states informed of the details of SEARCH development and progress to provide for their eventual interface to the system. This is being handled on a general basis through this symposium, of course, correspondence, a monthly newsletter, a brochure, news releases, and possibly a film will be made available nationally. The most important requirement, however, of other states is the detailed content of the system. To meet this requirement, technical reports are being prepared for general distribution. These reports will concern such things as standardized data elements for criminal history files, long-term statistical requirements, security/privacy considerations, results of special projects, etc. These reports will go into considerable detail to provide the basis for work to be accomplished in all states.

It is fairly clear that SEARCH is producing more than a prototype. The demand for a national system will not, I believe, allow us to abandon this effort when the project is concluded in December. The developmental work in progress, not only by the SEARCH states but also by other states, counties, and cities will require a continued effort leading to a na-

tional system.

There are serious problems yet to be solved. In addition to the technical problems of system interfacing, file updating and purging, etc., there are organizational problems related to choosing a "home" for the central index and establishing a hierarchy of controls and responsibilities.

The communication load, with all of this data being exchanged, requires a lot of telephone line capability. We are discussing with NASA the feasibility of using a satellite for this purpose and we may conduct an experiment using an existing satellite to determine the optimum configuration of such a system. A second problem yet to be solved is to provide an equally fast way of verifying the identity of an individual about whom an inquiry is made. With fingerprints as the only positive means of identification, we need to develop high-speed methods of fingerprint transmission and classification or verification. We are investigating the use of satellites with wide band-width transmission capabilities and the use of laser-based holography for high-speed fingerprint comparison.

The project group has set July, 1971, as a target date for starting an operational system. The present states will be asked to convert a minimum of 300,000 records to provide the initial file. After July, we expect that these states will continue to provide input data, and that other states will be invited to participate.

FIGURE I

### PROJECT ORGANIZATION

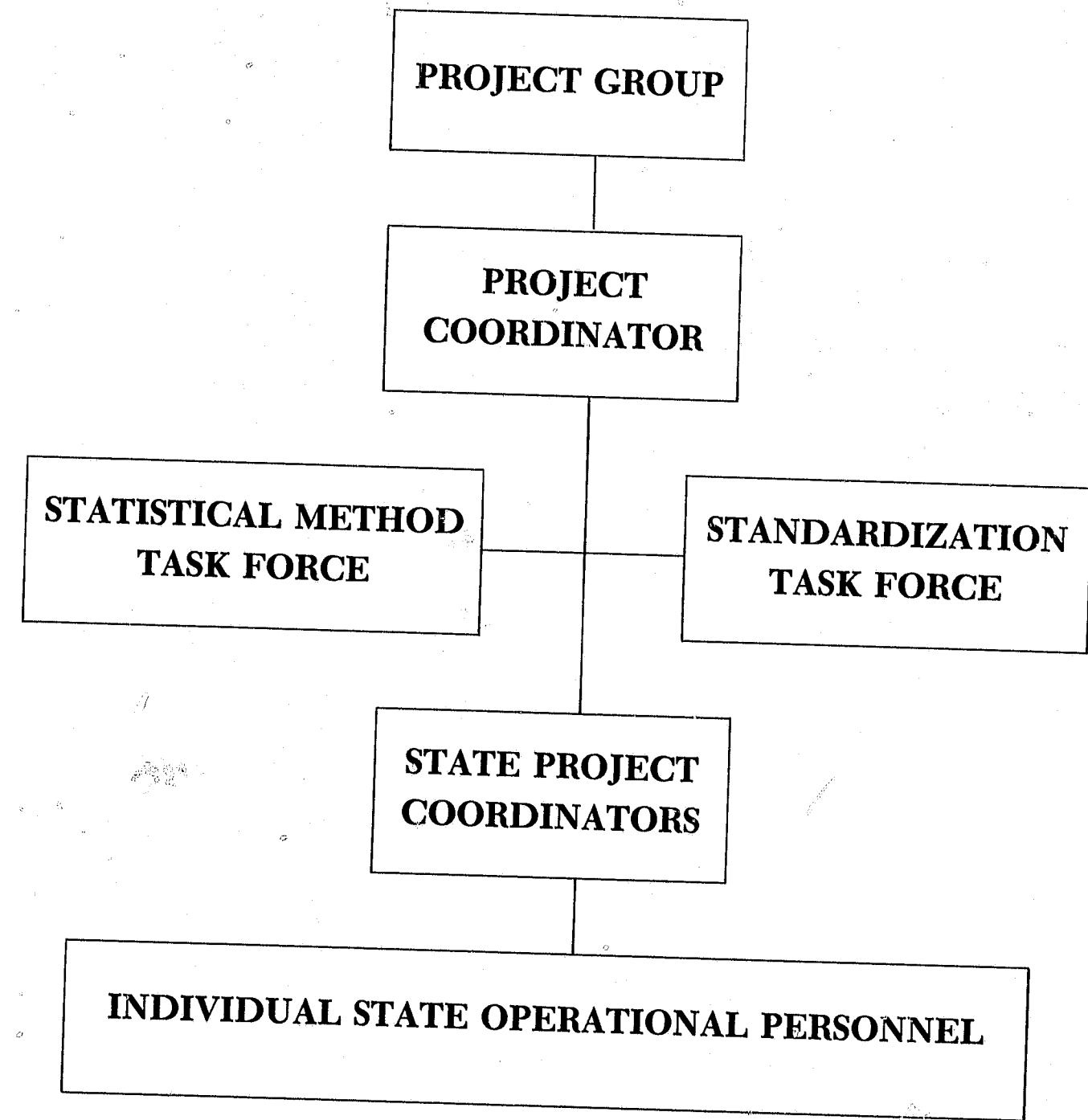
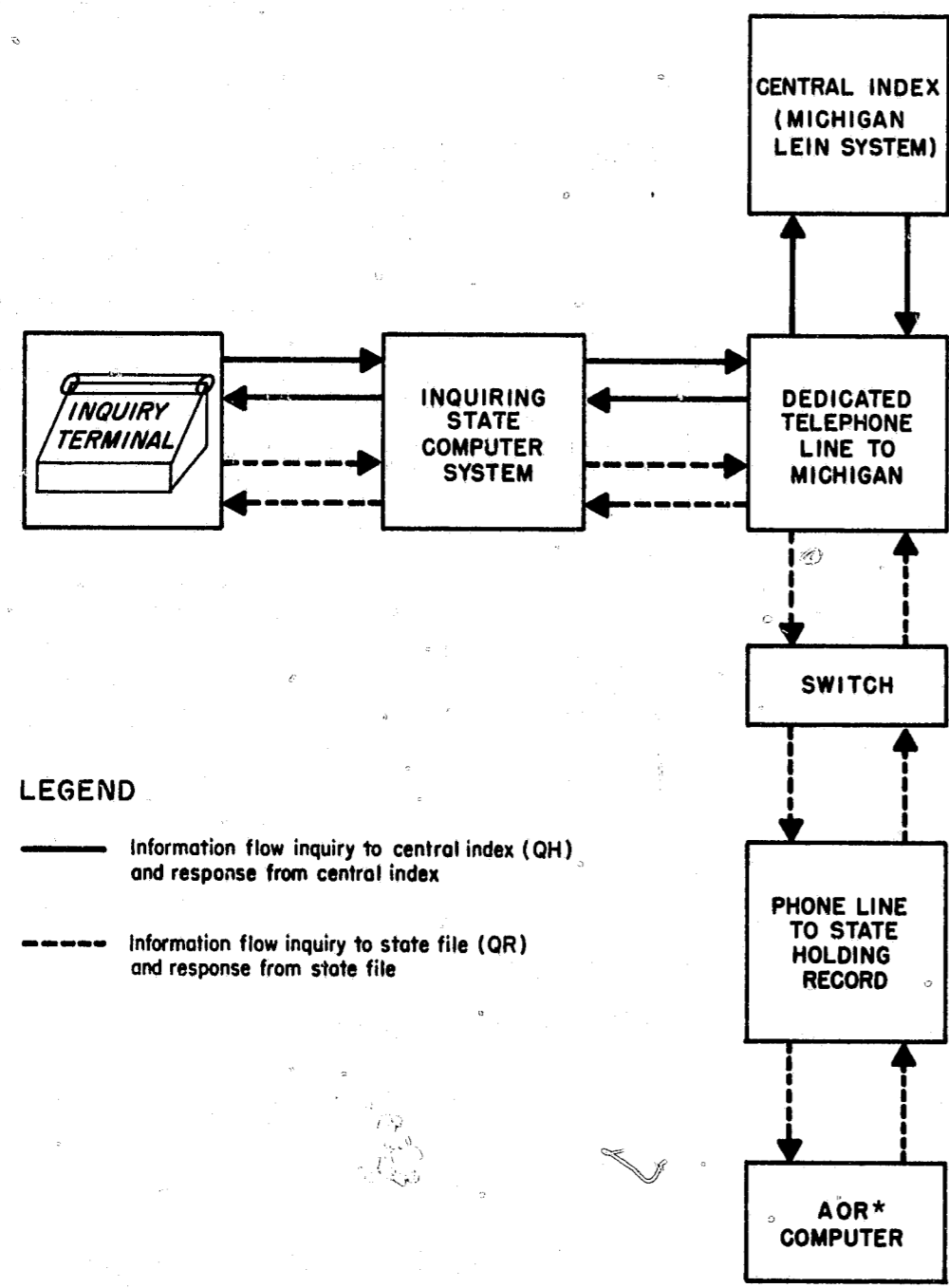


FIGURE 2

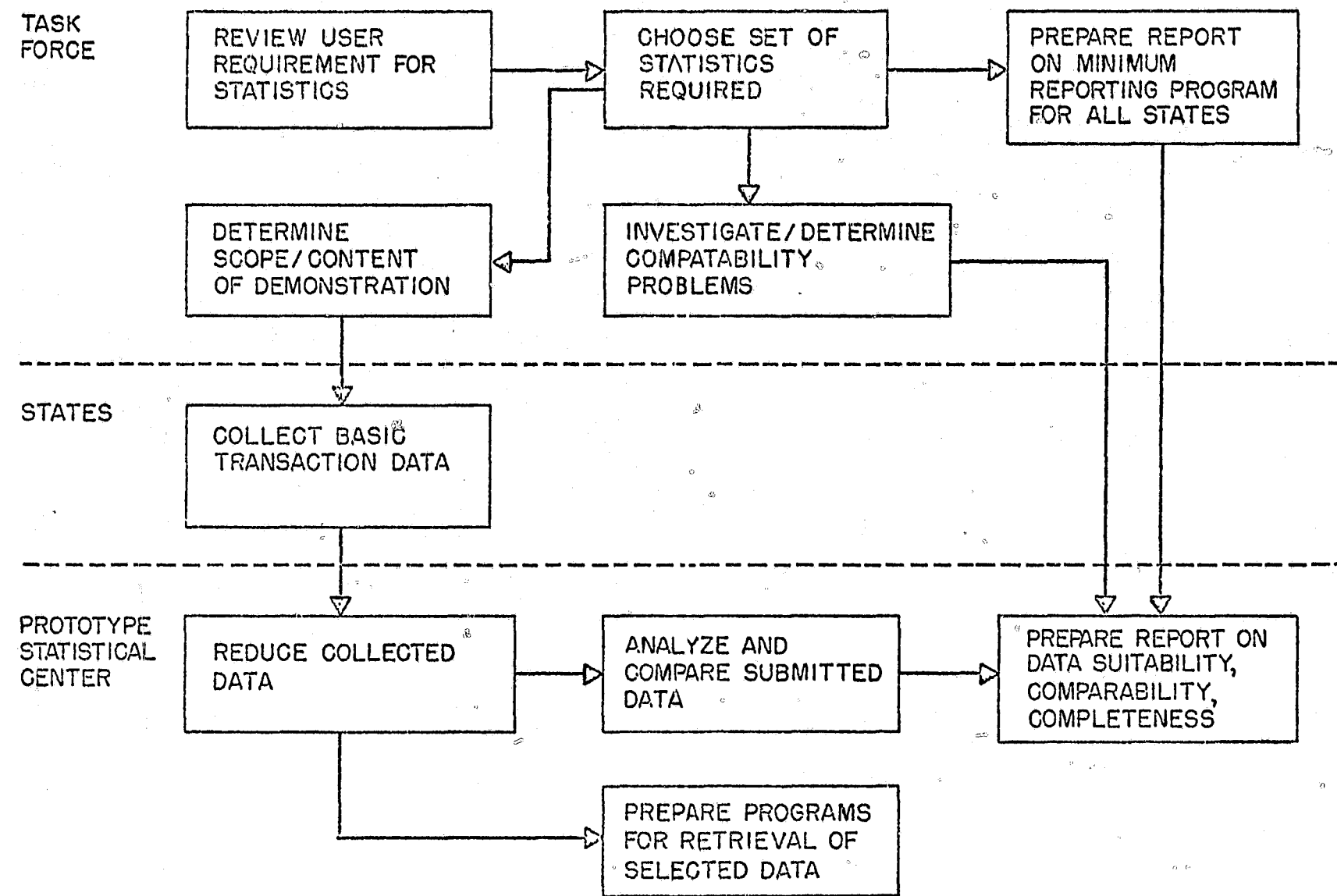


LEGEND

- Information flow inquiry to central index (QH) and response from central index
- - - Information flow inquiry to state file (QR) and response from state file

\*Agency of Record for the Offender

FIGURE 3



# DATA SYSTEMS NEWS

August-September 1970



## PRIVACY AND THE COMPUTER

1970 DATA SERVICE CENTER DIRECTORY

## SEARCH—Security and Privacy Considerations

by Dr. Robert R. J. Gallati, Director  
New York State Identification  
and Intelligence System (NYSIIS)

The most difficult problem involved in presenting a paper on security and privacy these days is deciding upon the parameters of the discussion. So much is being written in this area, and so many people are expressing viewpoints concerning an entire array of various aspects of the subject, that the preparation of these materials requires careful focus lest we become overwhelmed. It was not always thus; indeed, security and privacy was a back-burner item until very recently.

At a conference last month on criminal justice information systems one of the speakers, a state legislator, whose first name is Pete, stated his position on privacy very precisely. He told how one of his fellow assemblymen had for several years talked up the need to purify our rivers and lakes. Somewhat derisively he came to be known as "Clean Water Klein" around the State Capitol. The legislator said: "Today Klein is heading up a federal conservation agency with a salary of almost \$50,000 a year, and I'm still making \$9,000 a year in the Assembly—from now on I'm going to be known as 'Personal Privacy Pete'—I'm getting in on the ground floor of this thing like 'Clean Water Klein' latched onto conservation."

Yes, today security and privacy is rapidly becoming the "in" thing, and a lot of "johnny-come-late-lies" are jumping on the bandwagon. I'm happy to report that the interest of SEARCH and its policy makers in this subject is NOT an instant phenomenon. Long before security and privacy became a red-hot public issue, it was already a burning concern within the policy-making Project Group of SEARCH.

You may wonder why security and privacy are always linked together as though they were two sides of the same coin. They are, of course, closely inter-related. However, we could have ultimate security in a system and still violate privacy; but it is impossible to preserve the individual right to privacy without security. Indeed, the ultimate criterion by which we may judge any system's security and privacy is whether or not it optimizes privacy considerations, for, if privacy is properly protected, adequate security is the essential condition precedent.

Assuming that some kind of national system such as SEARCH is essential, what are the anticipated threats to security and privacy in an operational system? Let us look first at the most obvious kinds of hazards—those that relate to security.

During a recent 15-month period, there was a total of 4,330 bombings in the United States. There were also another 1,475 attempted bombings and 35,129

bomb threats. As I am sure you are aware, police facilities and computers are the favorite targets of the terrorists—we combine both features and SEARCH is, therefore, doubly attractive. But let us not assume that anything so traumatic as a bomb is required to create havoc in so finely tuned a system as SEARCH. More subtle sabotage may be even more devastating than incendiaries and explosives, according to the scholar W. H. Ferry, formerly with the Center for Democratic Institutions, presently a Fellow of the Research Institute for the Study of Man. I quote from an underground handout authored by Mr. Ferry:

"Most important of all to the modern revolutionary is a searching understanding of the computer which is more and more becoming the nerve center of all activity public and private. The vulnerability of the computer proceeds in direct ratio to its expanding use in centralizing information and giving orders whether to lathes or to groups of men. It is not nearly enough to know where the computer is connected to the power line—this is the least important kind of knowledge to a modern revolutionary. He needs to know rather the workings of the computer itself, its premises and procedures. From such technical knowledge flows an understanding of its vulnerabilities. With this kind of information he can readily bring temporary disruptions of the system and, if he plans long and systematically enough, he can bring the apparatus of the establishment to a trembling halt. Security for the system in sense of walls and bars appears surely to be equally unavailing—if only because the vulnerable spots are so numerous and in so many places and because each new contribution to the efficiency of the system brings with it a horde of fresh possibilities for slowing, stopping or merely gumming up the system. When systems become intricately connected and interdependent they inevitably make themselves into a series of revolutionary targets and invite consideration as the possible focus of all revolutionary activities."

Lest we draw the conclusion that security threats may be anticipated from terrorists and revolutionaries only, I hasten to assure you that computer systems and particularly crime fighting systems such as SEARCH, have many potential enemies, perhaps more dangerous than those we already know. Ralph Salerno, one of the nation's leading authorities on organized crime has said that compromising the security of criminal justice information systems is a top priority of the Confederation. Less spectacular, but none-the-less a continuing threat, are those unorganized individuals and groups who will suffer from the system; either like Luddites in the loss of their jobs, or as subjects of SEARCH frustrated by the relentless efficiency of the system. Destruction, sabotage, compromise, alteration of data, unauthorized access and dissemination, all can be achieved without bombing the computer, and by persons who appear far less threatening than terrorists and revolutionaries.

Threats to security are perhaps more readily un-

derstood, and, therefore, more likely to be attended to than threats to individual privacy. Yet in a system such as SEARCH there are privacy problems of a unique and most sensitive nature which many civil libertarians and other concerned citizens view with alarm. Some fear that SEARCH will degenerate into a National Data Bank and they conjure up visions of Big Brother as they warn that 1984, is but 14 years away. Data security is generally regarded as an expenditure to be borne by public administration, whereas losses in privacy are paid for by the affected citizen, so there may be an unbalanced state of motivation in the absence of express dedication on the part of system operators to preserve American liberties. It is this need for just such a high order of dedication which appears to cause so many people to perceive possible peril in vast, nation-wide offender record systems. In the last few weeks I have noted media articles entitled: *Big Brother Is Watching You; Electronic Stool Pigeon; Data Banks, etc. Are on to Something; You; Federal Computers Amass Files on Suspect Citizens; 'Big Brother' Computers Worry British;* etc. There seems to be a growing tendency to sensationalize the perceived threat.

The threat to systems like SEARCH lie—not so much in Congressional hearings such as those conducted by Congressman Gallagher and Senator Long and the announced hearings on *Federal Data Banks and the Systems and the Bill of Rights* to be conducted by Senator Ervin as Chairman of the Constitutional Rights Subcommittee, but rather in a rising crescendo of public revulsion against potential violations of personal privacy by data banks and systems which have not recognized the problem of privacy and have no plans for safeguards.

Examples of the reaction of articulate segments of public opinion are these excerpts from a proposal passed by the American Civil Liberties Union (ACLU) at its Biennial Conference held in New York City last June:

"Whenever a government amasses files about its citizens an inherent threat to liberties exists. The ACLU—should work towards statutes setting forth rigorous tests of compelling need. When personal information is transferred between agencies—special protection must be established. The National Data Bank proposals exemplify such use; the seeming insensitivity of its proponents for safeguards underscores the need for legislative protections. The ACLU should oppose establishment of centralized dossier-type data collections. The ACLU believes that the process of converting manual records to computer processing poses a great risk to privacy and due process.—The ACLU shall act as a public spokesman in the defense of personal privacy and civil liberty in this area."

It is to the credit of Chairman Hawkins and the members of the Project SEARCH policy group that

matters of security and privacy were addressed from the very beginning. It was recognized that the consequences of even unintentional errors may be substantially amplified by the accessibility of the data and the speed of the system—a speed which may exceed the error detection and correction speed.

Likewise, it was foreseen that the possibility of misusing data may increase substantially over a manual system, also because of the increase in users and the easy access, unless controls are implemented. The computer itself introduces more opportunities for misuse. For example, a computerized file can be quickly searched by whatever data elements it contains, so that compilations of subjects can be prepared with respect to certain characteristics contained in the file.

Also, it was anticipated that the opportunity for intentional modification or destruction of records would be increased in proportion to the file centralization of the system. A disc or tape file is much more vulnerable to undetectable modifications by programming or other means than the more inefficient dispersed paper file.

In response to this perceived significance of a new technological approach to the criminal history file, a program was undertaken to address the security and privacy issues. During the initial organization of the project, a *Security of Records Subcommittee* was formed under a Standardization Task Force to deal specifically with this issue. This subcommittee was chaired by Chief H. W. McFarling of the Data Processing Division of the Texas Department of Public Safety. Other members included Inspector Jerome Daunt of the Federal Bureau of Investigation, and Mr. Philip Tannian of the Wayne County Prosecuting Attorney's Office in Detroit, Michigan.

The subcommittee was responsible for providing initial research and a general analysis of the security and privacy implications on the project. Their recommendations for a future course of action were presented to the Project Group (the policy-making body of the project).

This group created a *Security and Privacy Committee* to review and carry forward the recommendations of the subcommittee. Dr. Robert Gallati, Director of the New York State Identification and Intelligence System, was appointed Committee Chairman. Other members included Emery Barrette, Executive Director of the Minnesota Governor's Commission on Crime Prevention and Control; George Hall, Director, National Criminal Justice Statistics Center, LEAA; Captain C. J. Beddome of the Arizona Department of Public Safety; Chief H. W. McFarling; and David Weinstein, Executive Director of the Connecticut Planning Committee on Criminal Administration.

The committee immediately began to explore the specific issues related to the development of a com-

puterized criminal history system and to identify the problems that should be addressed.

The initial review of the problem areas which the committee would have to investigate brought forth a number of recommendations which were implemented. Among these were:

- The decision to draft a Code of Ethics.
- A recommendation that consultants be hired.
- A resolution to limit the information content of the central index.
- Acceptance of the principle of post-auditing.
- Identification of specific questions that required policy decisions.

The Project Group authorized the committee to select appropriate consultants to assist the members in their studies and the preparation of a report. The selected consultants were: Professor Charles Lister of Yale University Law School, and Mr. Jerome Lobel of Ernst & Ernst, Phoenix, Arizona.

The most fundamental philosophical problem underlying the challenge of providing adequate security and privacy for SEARCH is one of a balancing of values. The need for an informed, effective criminal justice system must be balanced against the need for an individual to keep information about himself and his life private. The committee concluded that there need not be a conflict between the safeguarding of reasonable rights to privacy and the construction of a shared information system such as SEARCH, if the following potential problem areas are given adequate consideration:

1. The types of data that will be contained in the computerized files.
2. The persons who will receive the data.
3. The purposes for which the data will be used.
4. The relationship between the system and the people whose criminal history records comprise the data bank.
5. The organizational and administrative aspects of the system.

The committee dedicated itself to the enhancement of both individual freedom and effective criminal justice. One need not be sacrificed for the other. As new levels of progress are achieved, the delicate balance so essential to a just society will find equilibrium.

It is in this spirit, based on an understanding of the dynamics of both society and technology, that the Security and Privacy Committee, over a period of several months, developed a frame of reference for a correspondingly dynamic concept of security and privacy policy with respect to criminal history information systems. Statements of recommended policy were drawn up and officially approved by the Project Group. Some of the major policy recommendations include the following:

- Data included in the system must be limited to that with the characteristics of *public record*.
- Participants shall adopt a careful and permanent program of data verification including systematic audits.

- Purge procedures shall be developed.
- A model state statute for protecting and controlling data should be drafted and its adoption encouraged. (This is the major task in which the Security and Privacy Committee is currently engaged.)
- Direct access to the system should be restricted to public agencies which perform, as their principal function, crime prevention, apprehension, adjudication, or rehabilitation of offenders.
- Each participating state should build its data system around a central computer, through which each inquiry must pass for screening and verification.
- Various state "public record" and "freedom of information" doctrines should be studied with a view to obtaining appropriate exemptions for the system's data. (This is the very next item on the agenda for the Security and Privacy Committee.)
- The use of system data for research shall involve stringent restrictions to preserve privacy.
- Users should be cautioned that reliance upon unverified data is hazardous and that positive verification of identity should be obtained as quickly as possible.
- The citizen's right to access and challenge the contents of his records should form an integral part of the system consistent with state law.
- Civil remedies should be provided for those injured by misuse of the system where not provided for by state law.
- The system participants should elect a board of directors (governing body) to establish policies and procedures governing the central index operation.
- The system should remain fully independent of noncriminal justice data systems and shall be exclusively dedicated to the service of the criminal justice community.
- A systems audit should be made periodically by an outside agency.
- A permanent committee or staff should be established to consider problems of security and privacy and conduct studies in that area.

(The full list of 23 major policy recommendations with detailed references is contained in SEARCH Technical Report No. 2, July, 1970.)

These policy recommendations were formulated after considerable study of the emergence of the constitutionally protected right to privacy. The implications of this newly defined constitutional guarantee are as broad and sweeping as life itself. While it will ultimately affect every aspect of law enforcement and criminal justice, it *here and now* has an immediate impact upon computerized offender systems. It is well that the Project Group members were aware of its nature, scope and applicability to the system. It is also to the everlasting credit of the Project Group that it announced its dedication to the preservation of American liberties and declared its intention to pursue system development in a manner that provides all reasonable safeguards for the protection of individual privacy. Indeed, we may anticipate that

the public will look upon the Project Group's record in this regard as the ultimate criterion of its professionalism. That record is additionally embellished by the adoption of a Code of Ethics, the observance of which the participants pledged themselves. This public acknowledgment of proper intentions and sound values is particularly critical at this time as we develop nationwide offender data systems such as SEARCH.

In this spirit of dedication to the preservation of civil liberties and public attestation thereto, the Project Group adopted the value system articulated in the canons of the Code of Ethics to serve as a basic source of understanding, inspiration, motivation and witness for all participants.

The Code of Ethics in Article I sets out the limitations of the system which serves a limited area of government and a limited category of users, which contains limited amounts of information, and, at the national level, is limited to a Central Index which serves a directory role only. Article II addresses itself to the integrity of information spelling out assurances that every step of the system will optimize the protection of individual privacy; detailing proscriptions concerning the collection, maintenance, and dissemination of data; and providing for the establishment of an advisory committee for policy direction and to entertain complaints about alleged intrusions on individual privacy. Article III constrains the use of the system's data base for research emphasizing the necessity for safeguarding anonymity and an abiding commitment to privacy.

(The complete Code of Ethics as approved by the Project Group is contained in Appendix A of SEARCH Technical Report No. 2, July, 1970.)

There are still many very difficult and controversial matters relating to privacy which must be reckoned with. It is not the position of the Project Group or of the Security and Privacy Committee that all the answers are to be found in Technical Report No. 2. Indeed, there is every intent to encourage further progress in the development of these concepts in conjunction with progress in the development of improved aids for criminal justice agencies. Some of the more controversial issues that must be resolved are:

1. Purging of the files to eliminate information that, because of its age, is thought to be an unreliable guide to the subject's present attitudes or behavior and purging based upon the concept that society ought to encourage the rehabilitation of offenders by ignoring, or permitting them to ignore, relatively ancient wrongdoing. An important part of the opposition to large-scale information systems is the fear that individuals would no longer be permitted to outlive their mistakes, that isolated or immature errors would follow an offender through a lifetime.

2. The development of a sensitivity classification system. The mere fact that the system deals exclusively with public record data does not eliminate the need for attention to security and privacy protection, since the data itself becomes fused with system characteristics and cannot be evaluated as to sensitivity

as something separate and apart from the system itself.

Thus, the least sensitive data in the substantive sense become highly sensitive by virtue of the system procedures enveloping it. It is not alone the information that is in the data base that determines sensitivity. Amount and quality of content, where the data is located, who has access, how it is stored, speed and format of retrieval, how and to whom it is disseminated, etc., all are relevant and impact the sensitivity of a system, while the individual capsules of data as such do not in themselves change their character as particular unit items of public record information.

Arguments have been advanced that a statewide data bank of criminal offender records is inherently more sensitive than a local file and that a computerization of the statewide file increases the sensitivity. Carrying such arguments to their logical extreme, a nationwide file, computerized or otherwise, would be more sensitive than a statewide file and a name file would be more sensitive than a fingerprint file. While these questions are subject to debate, if we assume the accuracy of this premise, the security problems increase with the sensitivity.

As an information file progresses from a small, uncoordinated manual file maintained on a local basis through an extensive, real-time, on-line nationwide computerized file of the same material, the very possibility for more rapid access and greater correlative activities leads to the probability that a constantly increasing security and privacy protection must also be provided even though the basic unit of information has remained constant. Thus, we must evaluate the data in terms of classification, not necessarily from inherent sensitivity, but rather from a standpoint of available combinations, as they exist in the system.

A minimal classification system would determine the security pattern of processing, storage and transmission, the individuals to whom the data may be disseminated, the manner in which the data must be protected by the recipient thereof and procedures for classification and/or destruction. Such a classification system should be applicable to all data in the system. An even more comprehensive classification system may be desirable for any future system. This classification system might extend to the data, the various parts of the physical system that processes or stores the data, and all the documentation describing system components and functions. System access and design criteria should also be included in the sensitivity classification.

3. Elimination or limitation of use of system for applicant/licensee record checks. A wide variety of demands for Project SEARCH data can be anticipated from outside the immediate criminal justice community. For reasons, both good and bad, legislators and other state and local officials have increasingly required a criminal records check as a prerequisite for various licenses, occupations, and professions. In many states, applicants for civil service employment, private detectives, taxi drivers, boxing, wrestling and racing personnel, pistol permit applicants, liquor distributors and licensees, applicants for admission to the bar, and many others must have criminal records checks. State and local criminal justice agencies are often required by law to conduct or at least to permit these checks. In addition, the military services, and other federal agencies very frequently request access to local criminal records, sometimes for purposes with little direct connection to the criminal justice process.

The comprehensive system of governmental and industrial security clearances depends heavily upon local records. Criminal justice agencies, like the schools, the military service, and the credit bureaus, have become depositories of data upon which an impressive variety of agencies, public and private, seek to draw. It must be expected that such requests would markedly increase if a future system, with all its attendant conveniences, were established.

The Security and Privacy Committee believes that all such collateral uses of system data should, so far as reasonably possi-

ble, be prohibited. It fears the widespread use of system data for purposes unconnected with criminal justice will stimulate substantial pressures to collect and disseminate categories of data irrelevant for the criminal justice process.

4. Maintaining system independence by housing system data banks in existing criminal justice agencies capable of properly managing the system within the system's defined guidelines or in computers under the operational control of agencies specially created for such purpose and, in either case, independent of any noncriminal justice agency or data file.

It must be recognized that there are strong pressures to combine and consolidate all state and local data processing into major integrated systems. There are very persuasive and compelling arguments in favor of such integration of data, since, it is argued, that same data elements may be of value to a number of different types of agencies, including law enforcement and criminal justice agencies within a given jurisdiction.

5. Provision of internal and external controls. The Security and Privacy Committee has recommended that there should be a permanent council of state representatives, supplemented by representatives of the relevant federal agencies and the general public. The public representatives should consist of a small number of distinguished private citizens, selected for their known interest in civil liberties and criminal justice.

This governing board should be given wide powers over the system including authority to:

- Monitor the activities of the participating state agencies.
- Adopt administrative rules and regulations for the system.
- Exercise sanctions over all agencies connected with the system.

The council should also have authority to delegate any and all of its powers to an executive committee. In addition, it should be supplemented by a small permanent staff, including a suitably qualified director, and such advisors and consultants as it finds necessary or appropriate.

Among its other activities, the council should conduct periodic investigations of the methods adopted by the participating states for the protection of privacy and security. It should, from time to time, formulate its findings into administrative standards for the entire system. It should exercise particular control over any proposed programs of research.

It should be clear that the committee envisions two layers of internal administrative controls for the system.

First, the individual agencies should be generally responsible for the conduct of the system within their own jurisdictions.

Second, the national governing board and staff should monitor the activities of the several state agencies to insure proper cooperation and the full observance of national standards.

Both levels should be empowered to conduct investigatory hearings in which evidence would be taken, argument heard, and findings made. Both levels of administrative control should be empowered to impose prompt and appropriate sanctions upon any agency that has abused the system or its data.

The sanctions at both levels could involve suspension or expulsion of agencies from the system. However, at the state level, in cases of individual offenders, there should be a whole range of employment sanctions, including discharge.

Further, the committee believes that administrative sanctions should be supplemented by the imposition of criminal penalties upon those who willfully misuse the system or its data. These penalties ought to include the possibility of terms of imprisonment as well as fines.

It should be clear that the system will win the confidence of the general public only if it first provides tangible evidence of genuine concern for the rights of those about whom it will collect information. A meaningful system of judicial remedies would provide such evidence. Two sets of remedies should be considered: First, the administrative rights of notice, access, challenge, and review should be made judicially enforceable by

statutory authorization of a prerogative writ, on the order of mandamus and habeas corpus. This in itself will add nothing to the burdens or inconveniences placed upon the data system by these rights. It merely provides persuasive testimony that these rights are seriously intended and that they may, if necessary, be guaranteed by the courts.

Second, statutory authorization should be given for broadened civil rights of action in cases in which inaccurate, incomplete, or misused data cause injury to the data's subjects.

As the situation now stands, private citizens in most states are given civil causes of action in cases of defamation, invasions of privacy, and breaches of confidentiality. These rights of action are, however, often of little practical value because of various exceptions and limitations. The pressures and situations that shaped these restrictions have little relevance to the issues that now concern us.

The committee, therefore, recommends inclusion in the model state statute of supplementary civil rights of action, under which individuals could recover actual damages suffered as a consequence of negligent or willful misconduct by the data system or its employees.

As I stated in my opening remarks, privacy is of vital concern to a system such as SEARCH, but we cannot have privacy if we lack security—just as we cannot have justice if law and order fail. Adequate security is the essential condition precedent.

The Security and Privacy Committee recommended hardware, software, personnel, communications and physical security measures to protect the system itself and its operations. These detailed recommendations may be summed up in a series of Policy Statements approved by the Project Group:

1. The input, modification, cancellation, or retrieval of information from the system will be limited to authorized agency terminals.
2. Disclosure of information from the system through terminals will be limited to authorized final users.
3. Information in the system will be protected against unauthorized access in the computer center.
4. Information in the system will be protected against unauthorized alteration.
5. Information in the system will be protected against loss.
6. Information in the system will be protected against unauthorized use.
7. System security is a line responsibility equal in importance to system performance.

I would like to conclude this paper by speaking to the nagging problem of the perceived threat posed by a National Data Bank.

It seems to me that a very reasonable solution to the problem of possible compromise of American freedoms because of "instant dossiers" is to keep comprehensive criminal justice computerized data banks containing sensitive information about individuals at the state level. This would allow the federal government to perform the role of supervising and controlling the state-based data manipulators to



insure that they do not violate the liberties of the people. If such data banks are all at the national level, or, if a single National Data Bank develops, we would not have any superior level of government to police possible excesses. Or, as some people would put it, the people would have no appeal except to God.

I am confident that the efficiency and functional effectiveness that are implicit in large scale computerized information systems can be achieved without trampling upon personal privacy. Indeed, I firmly believe that such systems, properly designed for optimum security and dedicated to human liberties, can enhance the very rights and freedoms that some fear may be endangered.

The emergence of comprehensive state criminal justice information systems is strongly supportive of the concept of keeping such computerized systems at the level of the sovereign states. The system designed by the Project Group with the Central Index serving as a pointer to the state of record combines the advantages of a national criminal justice registry while the comprehensive data banks themselves remain at the state level.

The essence of this commitment is to avoid the creation of a computerized National Data Bank containing comprehensive criminal justice dossiers on tens of millions of persons who at some time in their lives were arrested and fingerprinted, but at the same time, to provide a nationwide record for criminal justice purposes in a way that avoids jeopardizing personal liberties.

In a word, the Project Group through its establishment of the Security and Privacy Committee and its approval for publication of SEARCH Technical Report No. 2, has cut Big Brother down to size. We feel that there are great things ahead for the system and if we in the Security and Privacy Committee have helped a little to keep the trolley on the track and headed in the right direction, we are well pleased.

There are many matters still to be studied and reported on but the pattern has been established. The committee is alive and well and eager for a rematch with Big Brother—we think we can knock him all the way from here to 1984.

## CRIMINAL HISTORIES—A MANAGEMENT PERSPECTIVE

by William L. Reed, Commissioner  
Florida Department of Law Enforcement

Never before in the history of the United States has the problem of crime and the general subject of law enforcement received such widespread attention and intensive study. Crime, violence, civil disorder, and the entire subject of the criminal justice process is a primary national concern. Law Enforcement is a major theme of all political parties—only the approach differs.

In 1969, the President's Advisory Commission on Inter-Governmental Relations made the following statement about "Law and Order—Whose Responsibility?":

"In the 1968 Presidential campaign, 'law and order' was the most talked about domestic issue. A great deal of the campaign oratory revolved around the extent to which the National Government had failed to 'insure domestic tranquility', or indeed, by other action had unleashed and encouraged forces of crime and violence. Conversely, concern was expressed lest law enforcement come to be a wholly national, rather than primarily a state-local function. The candidates gave much less attention to a critically important phase of law enforcement and administration of justice—namely the division of responsibilities in this field between the states on the one hand, and local governments on the other. A variety of key questions regarding the role of the state government in this area vis-à-vis that of county, city and other units of general local government have not been answered—or even adequately explored—in recent law enforcement surveys."

In response to the widespread concern, monies are now provided by Congress through the Law Enforcement Assistance Administration. Hopefully, these monies will be used wisely to identify and solve many of the traditional problems that plague criminal justice. Certainly the collection, evaluation, and dissemination of information on crimes, criminals and criminal activity are primary and traditional problems. Those of us who have management responsibilities throughout the criminal justice process for collecting, evaluating and disseminating crime related information, *must* recognize that there are some basic decisions that must be made before we can address the problems, let alone hope for solution.

Certainly, if as the Inter-Governmental Relations Commission states, we have not even defined the "role" of the various agencies at the different levels of government, how can we begin to define the information requirements of these agencies much less present a coordinated effort? The resulting duplication is not only wasteful in the monetary sense, but it creates serious conflicts between the agencies at the different levels of government with regards to *who* is responsible and lessens the opportunity for solution.

Perhaps before we start "computerizing" traditional crime and criminal identification information and records, we had better define the "role" of the agencies involved. We had better seek answers to some questions that are inseparable from the definition of "role". For example, in the area of criminal histories, we need to answer such questions as:

1. *What* information is needed?
2. *Why* is the information needed?
3. *Who* has a need for the information?
4. *When and how* should this information be provided?
5. In *what* form is the information needed?
6. *How* will the information be used?
7. *Will* the information improve or enhance the criminal justice process?
8. Does the utility of the information justify the cost of collecting and disseminating it? Not just resource cost but considerations of security and privacy and the possibility of *losing* the right to collect the information if abused.
9. What agencies should maintain this information, at what level of government, in what branch of government?
10. Is it possible to attach responsibility to any single level or branch of government for the collection and sole dissemination of criminal history information?
11. How would the fixing of sole responsibility affect the traditional separation of powers between the Executive, Legislative and Judicial branches?
12. How much "social" information should be included in criminal history records?
13. Can we justify the cost of computerizing and transmitting interstate the traditional criminal history (rap sheet) information? Project SEARCH proved we could do it technically, but is our statement of the need strong enough to justify the enormous cost?
14. And, inherent to all questions, have we ever even reached an agreement on a common definition for criminal histories?

I submit to you these questions, not to imply that the answers are readily available, but rather to suggest that *if* we hope to receive the necessary resources to develop and expand criminal history records and information, we *must* subject ourselves to systematic analysis to determine what is being done, by whom, and why. We must determine the value of criminal history information in relation to the cost. We must determine to what extent criminal history information contributes to the accomplishment of criminal justice objectives in the states and in the United States.

Project SEARCH *assumed* that criminal history information had utility across state lines. I do not think that anyone in the criminal justice community would debate this assumption at this point in time. *Yet*, I am *not* sure that we are in a position to justify the cost involved to implement SEARCH on an operational basis. This is not a fault of the concept, or the efforts, or the hopes. The failure lies—and rightfully so—with those of us with criminal justice management

and leadership responsibilities—to look within, before we demand of others.

Experience has shown that many criminal justice agencies, including the courts and corrections, have repeatedly refused to generate the primary criminal history source document—the fingerprint card.

We must give credit to the FBI for their leadership in the area of criminal fingerprint identification and the associated criminal history records. But, in spite of the FBI's encouragement and pleading, in spite of the urging of state and local leadership and even in spite of legislation requiring such criminal fingerprint submissions, many law enforcement agencies repeatedly refuse to generate a fingerprint card at the time of arrest. Thus, in spite of all this, the Criminal Justice Community has still not developed the recognition or basic understanding of the importance of fingerprints and criminal history information.

I can assure you from my own experience as a law enforcement manager charged with the state responsibility of providing fingerprint identification and criminal history records services, that the Executive and Legislative branches, charged with allocating the resources for continuing and expanding these functions, will demand considerable justification before providing funds. Particular attention is always given to the cost-utility relationship of our current and proposed systems. The elaborate computerized information systems for processing and disseminating criminal history information requires major funding commitments on the part of governments at all levels. Remember too, we are making our request in an atmosphere of intense competition with other governmental services for the tax dollar—and the tax dollar appears to be more illusive each year.

We need only refer to the President's Crime Commission's comment in the "Task Force Report: The Police", and I quote:

"Clearly law enforcement is competing for tax dollars with a large number of other social services provided by all levels of government, for police agencies over the past 65 years have received a declining percentage of increasing total government expenditures . . . the percentage of government allotments to law enforcement continues to decline even though the cost of enforcing the law has risen."

I submit to you that we, the managers in law enforcement—criminal justice—must be ever mindful of the fact that L.E.A.A. monies are primarily designed by Congress as seed money—"start up" funds. Once the priorities change or the funds are withdrawn, the programs started must either be discontinued or continually funded at the city, county or state level. We must be prepared to defend the programs we initiate including their relative value to other programs. If we develop a crime and criminal records and information system, then we must be prepared to justify the cost, for we are competing with other government services and programs.

Let me assure you again that I am not challenging the SEARCH concept; quite the contrary, I am very much a proponent of increasing our crime and criminal records and information services. But we have a *tremendous* amount of work yet to do, at all levels—in all branches of government, to define our criminal records and information problems. The SEARCH demonstration has proven beyond a shadow of a doubt that we have the technical knowledge. If given the resources, we can maintain criminal history information in computers and exchange it from state to state. But the question is and has been can we develop the *capability* in the police, courts and correction agencies at the city, county and state levels for a meaningful criminal history information system? Perhaps, it is academic to over-emphasize the unavailability of courts and correctional data in the "traditional" criminal history or "rap sheet" until law enforcement agencies fingerprint every person arrested.

Since one of the objectives of Project SEARCH has been the design of an "offender based criminal justice information system" and the only practical method of identifying and tracking the offender at this time is his fingerprints, we must focus on the actual comparison of fingerprints for positive identification. Unfortunately, this is one area that has escaped computerization. Even if we are successful in getting all arrested persons fingerprinted, we are then faced with the availability of enough manpower to process the data for input into the system. This manual process tends to be the Achilles' heel of the computerization and rapid transmission of criminal history information. Needless to say, the computer can only be as fast as our manual capability of preparing the source document and/or information for inclusion in the system.

This once again returns us to the problem of defining "roles" and fixing responsibility for criminal history information. This is not to say that the various levels of government—local, state and federal would lose any of their status in this records area, but rather that by defining the "role" and responsibility of each level, a considerable amount of duplication could be avoided and even more importantly, the expenditure of unnecessary resources could be prevented. If we can answer these questions, a plan can be developed that will be compatible with our needs and capabilities. A primary responsibility must be at the state level where central fingerprints and criminal history depositories are maintained. Perhaps some states would provide a total information service, other states might depend on one or more large urban areas having needs precluding the additional or duplicate expenditure at the state level. The key is that a SEARCH "type" system must be flexible. With an operational SEARCH system, and assuming the FBI's National Crime Information Center as the

index, we could then consider substantial modification of the necessity for each city or county police agency to continue to maintain their own identification and criminal history records capability. Consider too, the tested ability of transmitting fingerprints by facsimile. Could not the cities and counties better utilize the resources committed to this type of records keeping for line functions?

The point is that criminal justice agencies at all levels of government maintain duplicative records and information. Some are necessary but many of these records are bulky, outdated, inaccurate and not related to any meaningful utility. The process of checking for criminal history information on a single offender usually takes an exorbitant amount of time, and often results in information that may not be capable of substantiation by positive identification—even on a known offender.

But enough of the problem. I now respectfully submit for your consideration, a solution—perhaps I should say *attempt* towards solution. I propose there are several important and meaningful activities that should be commenced. *First*, let us candidly admit that a great portion of our crime and criminal records are inadequate and, have very little measurable utility in improving the efficiency and effectiveness of the criminal justice process.

*Second*, that the *National Institute of Law Enforcement and Criminal Justice* of the Law Enforcement Assistance Administration begin immediately a priority level project using the collective experience and expertise of both public and private sectors to:

Develop a detailed issue paper or "white paper" on crime and criminal records and information needs—an issue paper encompassing the needs for *all levels* of criminal justice, that ties the Executive, Legislative, and Judicial requirements into a meaningful package. This issue paper must serve as the first phase of an in-depth cost-utility analysis of the *total* crime and criminal records and information area and specifically address the following:

1. What is the problem?
2. What are the objectives and evaluation criteria?
3. What are the current activities and who is involved?
4. What are the *political* and other significant factors?  
*Political or practical if you prefer—I submit the choice is one of candor.*
5. What are the alternatives?
6. What are the recommendations for followup and/or implementation?

Most of you will recognize that this is basically a standard outline for any issue paper. At first glance there appears some duplication of the questions that I posed earlier. The important departure from the earlier questions is the consideration that there are *political* ramifications and that there presently exist *alternatives*. For example: The State of Florida recently considered as one alternative—complete withdrawal from operation of a fingerprint and criminal records depository. Not doing something is always an alternative. If followed through, the issue paper could be a valuable aid in gaining improved

understanding and insight into this problem area as well as provide the impetus for the Executive, Legislative and Judicial Branches to determine needs. As most of you recognize, determination of needs is only the first step; and there must follow a detailed plan of action. Where the issue paper would begin to provide a meaningful input for consideration of certain statutory changes and/or revenue that would be required of the Legislative Branch, the plan of action would follow up with the detailed specific data necessary for finalizing a plan acceptable to the Executive, Legislative and Judicial Branches. It would also give management an opportunity to gear up for a meaningful systematic implementation.

There are, of course, severe limitations on undertaking meaningful, in-depth, cost-utility or cost-benefit analyses in the area of crime and criminal records and information. These limitations should be recognized from the beginning so that they will not unnecessarily detain or divert the finalization of the analyses. They include:

1. Problems in defining the real objectives—removing the "traditional emotionalism" associated with federal, state and local government and the separation of government powers.
2. The presence of multiple benefits—some of which may apply to "social service" areas other than criminal justice, such as welfare or education.
3. Problems in obtaining accurate information pertinent to the development of a plan including information as to what effect each alternative will have on the total objectives of criminal justice versus the individual objectives of each subsystem.
4. Difficulties in considering continuing future costs and benefits for the criminal justice system as a whole rather than simple evaluation of costs and benefits for a single subsystem at any single point in time.
5. The political value of popular and unpopular issues relative to the allocation of government resources for government services. Perhaps better stated, the emotional and political value of "big brother" type attacks and other philosophical security and privacy considerations.

In summary, I would like to reiterate the urgent need for comprehensive definition and analysis in the *total* area of crime and criminal records and information; with primary emphasis on the identity of offenders and the collection and dissemination of criminal history records. For too long we have studied this problem area much like the well-known version of the famous Indian legend, titled "The Blind Men and the Elephant". Just as each blind man was certain what the elephant was like, so we are certain that each of us know what criminal history information is, and who needs it. I propose to you that the closing verse of the legend is just as applicable to us as it was to the blind man:

"And so these men of Indostan  
Disputed loud and long,  
Each in his own opinion  
Exceeding stiff and strong  
Though each was partly in the right,  
And all were in the wrong".

## LEGISLATIVE IMPLICATIONS OF PROJECT SEARCH

by Emery Barrette, Executive Director  
Governor's Commission on Crime Prevention and Control  
State of Minnesota

### INTRODUCTION

"There is much crime in America, more than ever is reported, far more than ever is solved, far too much for the health of the Nation. . . . Violence and theft have not only injured . . . hundreds of thousands of citizens, but have directly affected everyone. . . ."

"The most understandable mood into which many Americans have been plunged by crime is one of frustration and bewilderment. For 'crime' is not a single simple phenomenon that can be examined, analyzed and described in one piece. It occurs in every part of the country and in every stratum of society. Its practitioners and its victims are people of all ages, incomes and backgrounds. Its trends are difficult to ascertain. Its causes are legion. Its cures are speculative and controversial. An examination of any single kind of crime, let alone 'crime in America,' raises a myriad of issues of the utmost complexity."<sup>1</sup> So begins the President's Commission on Law Enforcement and Administration of Justice Report.

The scientific and technological revolution that has radically changed American society has had surprisingly little impact upon the prevention and control of crime. Thousands of scientists and engineers have been engaged in helping solve problems in the military and in the exploration of space, yet few have been engaged to assist in the war against crime.<sup>2</sup>

The Commission Task Force on Science and Technology gave considerable attention to computer technology, information systems, communications engineering and systems analysis, "since these appeared to offer the greatest unrealized potentials for systemwide improvement."<sup>3</sup>

Since the Commission Report in 1967, there has been evidence that the tools and skills of science and technology are beginning to be utilized to fight crime. At the International Association of Chiefs of Police Convention in Atlantic City last month, Attorney General John Mitchell told the nation's police chiefs that electronic surveillance was the most valuable tool in the federal arsenal in the war against organized crime. General Mitchell said, "Court-authorized wiretapping is a key factor in our plans and it has amply demonstrated its effectiveness. . . . It has won an appropriate place in the American legal structure. But we believe it is our duty to be just as diligent in halting illegal uses of wiretap as we are in using it against the criminal syndicates."<sup>4</sup>

### PROJECT SEARCH

Some sixteen months ago, under a grant by the Law Enforcement Assistance Administration, a major step was taken to utilize the expertise of the computer industry in preventing and controlling crime. Project SEARCH, an acronym for "System for Electronic Analysis and Retrieval of Criminal Histories" had two primary goals:

- 1) to evaluate the technical feasibility and operational utility of a cooperative interstate transference of criminal history data, and
- 2) to demonstrate the capability to automate state-collected criminal statistics for retrieval by selected state and federal agencies.

Initial evaluation of the demonstrations held in July and August of this year clearly indicated that Project SEARCH has not only been a resounding success, but promises to be a major technological advance in fighting crime.

If the SEARCH concept is to be accepted by the fifty states as a prototype of an on-going, permanent system of information gathering, storage and dissemination, then it becomes clear that each state must have, or develop, an organizational structure through which this task can be achieved.

Conversely, the citizens of each state must have a method of controlling such a system.<sup>5</sup> Developing a method to control such a system becomes extremely important because we are dealing with critical information which can, and is properly intended, to restrict or abolish the freedom of some citizens. Appropriate administrative regulations and controls may require legislative authority.

It is anticipated that this criminal history information system will span the entire criminal justice system, from apprehension to prosecution to adjudication to rehabilitation. The "people data" gathered in this system should have "people control."<sup>6</sup> Appropriate citizen authority and control may also require legislation.

We must not fail to secure each citizen against unwarranted misuse of data in the system. This can most effectively be done by providing criminal penalties for those persons who deliberately misuse this information, and by providing civil recovery to any such aggrieved person.

### CRITERIA OF A CRIMINAL JUSTICE INFORMATION SYSTEM

Let us explore some criteria of such a system:

FIRST of all, the information necessary includes the identification of each arrested subject, together with the dates, times, places and agencies of arrest. It includes the original charge, the arraignment process, the trial process, the

sentence given if guilty and the entire correctional process. At each step in this process, dates, places and identification of each adjudication agency, as well as action, is needed. Information concerning offenses reported must also be available to provide a yardstick measuring device for evaluation processes.

SECONDLY, we need an organization capable of collecting all of this information. The organization will undoubtedly be a state level agency and it is most apparent that it will need a broad, mandatory reporting requirement if it is to be effective. Having this requirement, the agency must then develop a system of reporting which is simple, complete, efficient and readily converted to coding.

THIRDLY, the information gathered must be converted to standard codes in order to have interstate capability and inter-changeability.

FOURTHLY, the data must be stored in a dedicated computer system, in a high speed on-line environment; with software capability of interfacing with a central index and the capability of manipulating the data in any desired manner.

FIFTHLY, an intrastate telecommunication network is needed, linking all of the police, courts, and correctional agencies to the state computer. Radio communications and/or mobile telecommunications are obviously needed for law enforcement units, in order that the inquiry and response moves from the officer on the street, to the data storage system, and back to the officer with the greatest possible speed.

SIXTHLY, a clear definition of all qualified users of the system must be developed.

SEVENTHLY, a means of reviewing the data, correction of errors and purging of data by official action must be provided for the public sector as well as the private citizen.

#### BASIC IMPLICATIONS OF A CRIMINAL INFORMATION SYSTEM

The basic implications of such an information system are twofold:

- 1) there is a clearly established need to develop a structure or organization capable of providing on-line information for upgrading the criminal justice system and the maintenance of law and order, and
- 2) there is a clearly established need to develop a program of security and privacy as it relates to the preservation of individual rights.

#### PUBLIC AND PRIVATE CONCERN—TO MAINTAIN A BALANCE BETWEEN THE NEED TO MAINTAIN LAW AND ORDER AND THE NEED TO PRESERVE INDIVIDUAL RIGHTS

A recent editorial in the New York Times reflected upon these basic implications. "There is nothing wrong with the use of the computer to help make efficient and effective the legitimate work of law enforcement and other agencies. A modern society must use modern techniques to help enforce and administer its laws and to protect itself from those who would do violence to its leaders and institutions. . . ." The editorial goes on to say that federal agencies have been employing the new technology to gather information that has "little or no" direct relation to criminal or other activities of legitimate federal concern.

It has been said that such files are data rich, and the individuals to whom they referred are privacy poor. Professor Arthur Miller recently said, "I don't oppose the communication of data. It would be ostrich-like to ban the use of technology just because it might be abused. An increasingly urbanized society cannot survive too many years without planning. We live in an increasingly, information-based society. Everyone wants more data. We must strike a balance," he declared. "To date, the information system's planners have been impervious to questions of privacy. The current system has no controls and no regulations on the collection, use and exchange of data. The federal government can collect any damn thing it wants. There is no limit."<sup>8</sup>

In discussing the nationwide study of data banks and personal privacy being conducted by the National Academy of Sciences and the Russell Sage Foundation, Professor Alan Westin indicated that it will address the question of whether civil liberties can function amid the proliferation of personal data. He said, "The purpose is to make it eminently clear that ethical curbs must be placed over the currently unregulated and unsupervised data banks, or individual privacy and due process will become virtually meaningless in the electronic age." He said further, "Civil liberties safeguards must be established during the next five years or it will be too late. There are no laws or court decisions in the country supporting the individual's right to see, contest, change or eliminate any of the information about him in a data bank."<sup>9</sup>

Senator Edward Long of Missouri observed in Senate hearings, that in the area of invasion of privacy, "We are both in a legal desert and a legal jungle—a legal desert because of the sparsity of law, a legal jungle because of the conflicting nature of the law that exists."<sup>10</sup>

Congressman Cornelius Gallagher referred to a recent Washington Star editorial as a provocative addition to the continuing debate over whether the "Age of Aquarius will actually be the Age of Aquariums in which we live most of our lives in a fishbowl."<sup>11</sup>

Honeywell Vice President, Robert Henderson, said recently, "If we cannot stop this relentless flow of information into central files, we can control it . . . Frankly, I think we will need some new legislation in this area. . . . Such new legislation might make personal information a property right, with all of the traditional protections and guarantees of due process. . . ."<sup>12</sup>

Stanley Rothman feels that "with laws, research in technology of protection and new governmental institutions, a redesigned federal statistical system would be better protected than the existing one."<sup>13</sup>

In his book, *Privacy and Freedom*, Alan Westin said, "It will be apparent that the shifting equilibrium among privacy disclosure and surveillance can-

not be captured by legislation alone, nor is legislation necessarily the best first step to achieve control over surveillance techniques. . . . There are areas in which the stimulation of private authorities to protect rights of privacy will have far more real impact . . . areas in which there is no real need for legislation, and where hastily enacted statutes might prevent the development of a wise accommodation by private and judicial forces. Legislation may be needed to control some 'outlaw' behavior. . . . or to stimulate the non-legislative forces, and give them the broad moral authority with which to operate."<sup>14</sup>

Professor Westin then outlines what he feels to be the role of private forces (moral consciousness, scientific counter measures, intra-organizational restraints, private agreements, and professional standards) and the role of public governmental forces (legislative, executive and judicial).<sup>15</sup> This discussion deserves extensive attention by all interested in and concerned with this issue.

Project SEARCH has from the outset illustrated its major concern for appropriate balance between the need to maintain law and order and the need to preserve individual rights. The Project group adopted a "Code of Ethics" for purposes of the demonstration and operation of any future system.<sup>16</sup> It was adopted with the recognition that there are a variety of methods which could be utilized in relating to this concern i.e.—Constitutional Amendment, Statutes, Rulings and Judicial Decisions.

#### A LEGISLATIVE PROGRAM

Even though the SEARCH Security and Privacy Committee is in the process of drafting a model statute, it is still appropriate to discuss needed elements in a legislative program. I therefore recommend consideration of the following:

- 1) Creation of an agency, or designation of an existing agency, as the central agency to collect broad based, detailed data from the State's criminal justice agencies.

The Wickersham Commission of 1931 reported: "A proper system of gathering, compiling and reporting statistics of crime, of criminals, of criminal justice and of penal treatment is one of the first steps in the direction of improvement . . . if the States would enact a uniform state law governing the gathering of such statistics and sending them to such a (Federal) bureau while retaining such local provisions for local use, as local needs may indicate, an adequate nationwide system could be brought about."<sup>17</sup>

The statutes of the States of California and Minnesota are cited as examples of models of the recommended enactment. A recent study conducted by LEAA indicates that 48 states have a present agency with some criminal records. Thirty-five states have some statutory basis for collecting fingerprints, and twenty-two states have some statutory authority for collecting offender histories, but only eight states indicated that their offender histories were more than 90 per cent complete.<sup>18</sup>

These statistics tell us that most of the states have an agency with some informational data on hand. They also tell us that no state has adequate systems, records, or information gathering functions.

The National Crime Information Center (NCIC), a com-

puterized information system established to improve the effectiveness of law enforcement through the more efficient handling and exchange of documented police information, recently issued a statement that "The states need to centralize crime information for management, operational and research purposes."<sup>19</sup>

- 2) Establishment of a mandatory reporting system incorporating all criminal justice agencies. Failure to comply with this provision would carry a civil penalty.

The present national system is voluntary. The lack of mandatory reporting limits file completeness. The State of Minnesota has a mandatory reporting statute dating back to 1934. If an agency fails to comply, the salary of the responsible official can be withheld.<sup>20</sup> Such a statute has enabled the State to have a most complete data base.

- 3) Establishment of a criminal justice computer system with a unit of state government assigned full responsibility for its operation. The agency should have authority to establish a telecommunications network linking all segments of police, courts and corrections to the criminal justice computer. Inclusion in the network should be mandatory for all contributors and users.

In his preliminary Report to the New York State Identification and Intelligence System (NYSIIS), Alan Westin states that there are five major types of computerized information systems being developed by public agencies:

- a) Autonomous Data Banks for Statistical Studies
- b) Independent Data Banks for Information Coordination in a Field
- c) Interagency Data Bank
- d) Single-Agency Data Bank
- e) Mixed Public-Private Data Banks<sup>21</sup>

In the Spring of 1965, Governor Rockefeller recommended to the New York Legislature the creation of the New York State Identification and Intelligence System (NYSIIS). NYSIIS was empowered to establish a central electronic data facility and a communications network to serve qualified agencies concerned with the administration of criminal justice throughout the State.

The NYSIIS concept is founded upon six principles:

- 1) Unitary concept of criminal justice
- 2) Information sharing
- 3) Voluntary participation
- 4) Separation from administrative action
- 5) Research and technology
- 6) Security and Privacy<sup>22</sup>

The computer agency should be required to provide for the security of the system and give extreme care in the selection and training of all personnel.

Graduate students of computer science at Harvard recently offered a cash prize for the most effective plan for destroying computerized information. The contest was designed to bring various computer security problems to light.<sup>23</sup>

- 4) Enactment of a statute defining the classes of public agencies which may have direct terminal access to the system. The statute should also cite those classes of agencies and individuals that would be excluded from direct terminal access to the system. It is strongly recommended that there be criminal penalties<sup>24</sup> for misuse of information. For user agencies misusing their privilege of access, partial or complete exclusion should be provided.

- 5) Enactment of an agency review process which includes public audit. It should include the mandatory correction of errors and allow for the purging of records, either as a result of official court action, or as a result of a conclusion reached that retaining the data would hinder or prevent desired rehabilitation.

Project SEARCH presently provides that records will be purged when the agency of record indicates either (1) that the offender is not under correctional supervision and that

no additions have been made to the offender's criminal history for a period of time beyond which the likelihood of recidivism is remote, or (2) that a purging of every entry on the history has been ordered by a competent court or executive authority.<sup>25</sup>

These requirements are supplemented by provisions in the Code of Ethics, Article II, Section 2, which endorses purging, particularly in cases of first offender.<sup>26</sup>

- 6) Enactment of a statute providing for guaranteed rights of access, notice and challenge.<sup>27</sup> Provisions should include specified legal procedures to be followed when a point of dispute cannot be resolved through administrative procedures.<sup>28</sup>

Various other vehicles have been suggested including "Ombudsman,"<sup>29</sup> "Privacy Administrator,"<sup>30</sup> "National Information Utility for Individuals,"<sup>31</sup> and a "State Data Availability Office."<sup>32</sup>

In a statement prepared for presentation before the Senate Subcommittee on Constitutional Rights, Professor Charles Lister said, "Every federal agency that proposes to commence or significantly to extend its data collection activities, or to consolidate its data facilities, should be compelled to obtain prior approval of the new regulatory agency. A variety of standards and guidelines will be required but, in general, I would have the regulatory agency adhere for this purpose to the following principle: absent, (if there is not) clear and convincing evidence of public benefit, the collection, consolidation or dissemination of personal information should be impermissible without the prior, informed and written consent of the individual involved. . . . The burden of proof should be placed upon the intended collector."<sup>33</sup>

Earlier this year at Johns Hopkins University, Alan Westin told a computer symposium that a new "writ of habeas data" is required to insure individual rights in the computer age. He equated the "writ of habeas data" to the "writ of habeas corpus" (the command of the Courts to the Crown to produce the body of a person being held, and to justify his imprisonment). "The 'writ of habeas data' would mean commanding government and powerful private organizations to produce the data they have collected and are using to make judgments about an individual, and to justify their using it."<sup>34</sup>

On October 8, 1970, the Senate passed the Judiciary Committee's bill (HR 17825) to extend and modify the Omnibus Crime Control and Safe Streets Act of 1968. A significant amendment was made to Sec. 519(b) "Not later than February 1, 1971, the Administration (LEAA) shall submit to the President and to the Congress recommendations for legislation to promote the integrity and accuracy of criminal justice data collection, processing and dissemination systems funded in whole or in part by the Federal Government, and to protect the constitutional rights of all persons covered or affected by such systems."<sup>35</sup>

- 7) Enactment of provisions for civil recovery of injury due to misuse of information. This might well be included in a victim of crime compensation law which would include all victims of injury from a criminal act.

The SEARCH Security-Privacy Committee recommended the creation by statute of supplementary civil rights of action, under which individuals could recover actual damages suffered as a consequence of negligent or willful misconduct by the data system or its employees.<sup>36</sup>

- 8) Appropriation of funds to establish and operate the agency system, to provide for review procedures and to provide for an appropriate program of victim compensation.

The State Legislatures of Texas and Florida recently appropriated sizeable funds for information system programs.

It is very clear that those states with the most advanced information systems are those states which have made significant financial commitments. In the State of Minnesota were it not for the total commitment on the part of the Governor, Attorney General and State Legislature in 1967, their system

could not be so far advanced.

It is therefore critical that the State legislative and executive leadership be involved in the total program planning. Churchman reminds us that "planners are notoriously very poor politicians." This discussion of politics in systems planning is worthy of consideration. "It would be nice for planners if there were something called 'applied political science' which would tell them how to act in order to overcome political opposition."<sup>37</sup>

The legislative program of eight areas should receive consideration by state and federal legislative bodies. Whether they are enacted as separate pieces of legislation or incorporated in the blanket approach like that being considered by Senator Ervin of North Carolina<sup>38</sup> is not important. It is important that positive ACTION be provided soon or we will be forced to REACT to a most serious national crisis.

### CONCLUSION

We could take the position of total opposition to the creation of information systems—we could assume that existing administrative and legal safeguards are adequate, or we could assume that neither total opposition nor existing safeguards represent acceptable alternatives. "What is called for is a new legal approach to the processing of personal information by authorities in a free society and a new set of legal, administrative and system protections to accomplish this objective. The fact is that American society wants both better information analysis and privacy."<sup>39</sup>

Henry Steel Commager said, "Animated by impatience, anger and fear, we are giving up essential liberties, not for safety, but for the appearance of safety. We are corroding due process and the rule of law not for Order, but for the semblance of order. We will find that when we have given up liberty, we will not have safety, and that when we have given up justice, we will not have order."

I sincerely believe that we can and will provide a sensible balance between the need to maintain law and order and the need to preserve individual rights. Creative legislation will greatly assist us to this end.

### FOOTNOTES

<sup>1</sup> *The Challenge of Crime in a Free Society*. A Report by the President's Commission on Law Enforcement and Administration of Justice, United States Government Printing Office, Washington, D.C., February, 1967 p. 1

<sup>2</sup> *Ibid.* p. 245

<sup>3</sup> *Ibid.* p. 245

<sup>4</sup> Speech by Attorney General John Mitchell at International Association of Chiefs of Police Convention at Atlantic City on October 5, 1970

<sup>5</sup> "We Must Insure Privacy," *The Honeywell World*, July 13, 1970

<sup>6</sup> "Personal Privacy v the Print-out," *Time Magazine*, February 16, 1970

<sup>7</sup> "Our Alienated Rights," *New York Times*, July 4, 1970

<sup>8</sup> "Scientists Debate Need for Regulation of Data Banks," *Computerworld*, January 14, 1970

<sup>9</sup> *New York Times*, March 15, 1970

<sup>10</sup> Senate Hearing

<sup>11</sup> *Congressional Record*, August 14, 1970

<sup>12</sup> "We Must Insure Privacy," a speech by Robert Henderson to the National Symposium of the National Archives and Record Service in Washington, D.C., published in *The World*, July 13, 1970

<sup>13</sup> "Privacy and Government Information Systems," an address to the 1967 Spring Joint Computer Conference, Atlantic City, April 18, 1967

<sup>14</sup> Alan F. Westin, *Privacy and Freedom*, Atheneum, New York, 1967, p. 377

<sup>15</sup> Westin, pps. 378-399

<sup>16</sup> *Security and Privacy Considerations in Criminal History Information Systems*, Technical Report No. 2, Project SEARCH, Committee on Security and Privacy, July, 1970

<sup>17</sup> "Uniform Criminal Statistics Act" drafted by the National Conference of Commissioners on Uniform State Laws, and by it approved and recommended for enactment in all the states, Philadelphia, October 21-26, 1946

<sup>18</sup> Survey by the Law Enforcement Assistance Administration, United States Department of Justice, "Survey of State Central Record and Identification Units," 1970

<sup>19</sup> National Crime Information Center, May 2, 1970

<sup>20</sup> Minnesota Statutes 626.51

<sup>21</sup> Alan F. Westin, "Civil Liberties Issues in the Large Scale Criminal Justice Information System," a survey and report to the New York State Identification and Intelligence System (NYSIIS) pps. 27-35

<sup>22</sup> NYSIIS Against Crime, April 1967

<sup>23</sup> *Computerworld*, October 7, 1970

<sup>24</sup> *The World*, July 13, 1970

<sup>25</sup> Project SEARCH "Operating Manual" January 1970, p. 8

<sup>26</sup> Project SEARCH "Code of Ethics" Article II, Section 2

<sup>27</sup> Charles Lister, statement on behalf of the American Civil Liberties Union

on "Privacy and Government Data Banks" before the Senate Subcommittee on Constitutional Rights, October 7, 1970

<sup>28</sup> *The World*, July 13, 1970

<sup>29</sup> *Computerworld*, August 27, 1969 and March 4, 1970

<sup>30</sup> William S. Holmes, *Research Trends* Summer, 1970, pps. 31-32

<sup>31</sup> Richard Sprague, "The Invasion of Privacy and a National Information Utility for Individuals," *Computers and Automation*, January, 1970, pps. 48-49

<sup>32</sup> Lance Hoffman, "Laws to Protect Against Computer Data Abuse," *Los Angeles Times*, September 23, 1969

<sup>33</sup> Lister (see #27)

<sup>34</sup> Alan F. Westin, a speech before a Computer Symposium at John's Hopkins University, *Computerworld*, January 21, 1970, p. 4

<sup>35</sup> 91st Congress, 2nd Session, HR 17825, In the Senate of the United States, Sec. 519(b)

<sup>36</sup> Project SEARCH "Security and Privacy Considerations in Criminal Justice Information Systems" p. 37

<sup>37</sup> C. West Churchman, *The Systems Approach*, Dell Publishing Co., Inc., New York, 1968 pps. 159-160

<sup>38</sup> *Computerworld*, January 14, 1970, p. 4

<sup>39</sup> Alan F. Westin, *Business & Automation*, January, 1970, p. 62-63

## PROJECT SEARCH—CRIMINAL HISTORY EXCHANGE SYSTEM RESULTS

by CAPTAIN C. J. BEDDOME  
Arizona Department of Public Safety

I'm really proud to be a participant at this Symposium. This gathering together today is tribute to the fantastic relationships that have developed in the past year and a half between the personalities involved directly and remotely in Project SEARCH and related enterprises. Lasting friendships have been launched and older friendships have been strengthened. We have used each other as sounding boards to try out ideas, some good and some not so practical. Project SEARCH meetings brought together groups of some of the finest talent from diverse disciplines and backgrounds. We had rough task masters who made the meetings working sessions and not social affairs. I've never worked so hard or put in such hours as were necessary to accomplish the task set out for us in Project SEARCH.

That includes trying to get ready for this Symposium. You know—just when we thought the worst of SEARCH was behind us and we could get back to the primary chores at home a decision was made to hold this Symposium. From the beginning SEARCH has been one challenge after another.

I told Chairman Hawkins one time that my boss wondered if I had decided to make SEARCH a career project. He is still patiently wondering.

Meanwhile I'd like to present, quite subjectively, a number of non-statistical aspects concerning Project SEARCH. Non-statistical in the sense that I don't want to talk about the number of "hits" made, the hours the system was functional, etc.

Those topics will, I'm sure, be presented to your complete satisfaction by knowledgeable speakers who share this podium with me.

At this point, I'd like to make a direct quote from a report by the President's Commission on Law Enforcement and Administration of Justice:

"Criminal records and communications systems together provide the mechanisms by which the police should be able, swiftly and efficiently, to learn about crimes; to store and retrieve pertinent information, and to deploy personnel effectively. The establishment of an areawide records center is fundamental to successful police operations, particularly in metropolitan areas comprising several jurisdictions, each with its own force. The integration at an areawide records center of basic information collected by many law enforcement agencies would enable inquiring police departments to check only one source rather than several. This would eliminate duplication of effort and physical facilities, reduce the possibility of error, and reduce significantly the time needed to conduct an inquiry or search."

The quoted section of this report continues and projects re-emphasis on centralization through unification of police communications facilities and resources.

We are all well aware that this quote presents a philosophy for all elements of the criminal justice community and not just the police to claim as their own.

There are six functional groupings of official autonomous agencies that are concerned with the administration of criminal justice—police, prosecution, criminal courts, probation, correctional institutions and parole. Despite their autonomy, they are charged with supporting what is in fact a continuous process. Because of their autonomy, they do not have regular systems by which they share and coordinate operational information. Yet, sharing and coordination of information are vital to intelligent action. When addressed to the problems created by a mobile criminal society it is more evident than not that the solid law abiding citizens of this country deserve and desire a unified national criminal justice information system.

This, however, requires prior consideration of the proper relationship between such basically separate units of public administration as are the police, belonging to the executive, and the criminal courts, belonging to the judicial, when speaking in the traditional concept of separation of power. Is it possible to establish an organized information function which does not interfere with this concept?

Fortunately the administrators of LEAA had the foresight and initiative to propose using some of the remnants of their discretionary funds a year ago last summer to attempt the creation of such a system or Project SEARCH might not now be at the stage it is today. This was a pretty gutsy decision that we applaud.

The problem solving necessary to make this a roaring success is not done by a long shot. However, this paper is to deal with results of the prototype system.

I take nothing away from the valuable utility of the present system in the area of "hits"—These go on even to this late date. Our Criminal Identification Officer says he is utilizing the system daily to service Arizona justice agencies with considerable effect.

What I have reference to in the way of great results are the almost insurmountable number of problems resolved by the various agencies and individuals that were brought together or localized, if you will, for the purpose of creating a system like this.

We created, for the first time in the history of our country, a place, a climate and a system whereby large groups of inter-related disciplines from several states and federal agencies worked without discord—certainly not harmony at all times—but no serious, irreconcilable arguments on the legal aspects, philosophies and myriad systems and components necessary in this project.

I have talked publicly and privately on this matter at some length before. It has been a tremendous experience to attend the Project Group meetings, to take part in the discussions and negotiations which have taken place trying to resolve the innumerable differences that exist.

As difficult as this problem is it has been made even more difficult by the time constraints that were established. By July 1st of this year, each of the six original States plus Florida was expected to have 10,000 records converted, systems designed and programmed, and to have the telecommunications capability to automatically exchange records among the computers in the several States. A very formidable objective.

When we started talking about storage, retrieval and dissemination of criminal history information it meant we needed to give considerable thought to the systems involved in this matter. They couldn't be left to develop in and of themselves like some of our early roadways that followed the paths laid out by hungry cows. Following the lines of least resistance were temptations that we were careful to avoid.

An example of this is the serious work undertaken by the SEARCH Project Group in the establishment of a Code of Ethics and rules and goals in the area of Security and Privacy. Another example was the putting together of a national communications network in the time allotted and have it functioning as well as it did even with the assistance of numerous skillful technicians in the employ of vendors and agency shops.

Lots of people said it couldn't be done—at least not in the year that was given to use to kick off the start of on-line operations.

We use the term History in our project name. History is the recording of incidents with details about the persons and places and times involved in the incidents. The Social Scientist can take large quantities of these data and make analyses that will in all likelihood lead us in the direction of some elusive truths—why persons act the way they do towards the rights of others—what are the proper corrective measures needed to heal this sickness that is consuming our land.

We also need to gather data to preserve ourselves from organized crime. I'm not one of those who believes all organized criminals are bound by secret loyalty oaths to national or international gangs. But nevertheless we all recognize that there are thou-

sands of criminal conspiracies going on all over the place at any given time. The very term "organized", implies they are as well off as we are in our systems. Perhaps even better off financially.

It may be a tossup as to which concern the American public addresses itself the most—the Viet Nam War or the crime problem in this country—Remember the 1968 Presidential Election—or the more recent election of a few days ago? We know some of the candidates won't forget—nor those of us that had candidates fail to make the grade after we cast our valuable ballots for them.

The crime rate in this country is rising five times faster than our rate of population. A Harris Survey taken late last year indicated that 81 percent of the Americans surveyed feel that our system of law and order has broken down. According to reports published by the FBI, crime in the United States is costing the American taxpayers over sixty billion dollars a year.

We could really have a lot of fun with that much money—or ease a lot of pain and suffering.

All this depressing news has not gone unnoticed—many boards, commissions and agencies have come to the conclusion that the criminal justice community had better develop some more sophisticated operational methods and take full advantage of the latest technological developments and forget the cost. Maybe the time has come to take Admiral David Farragut's approach to serious problem solving—you history buffs remember his classic statement, "Damn the torpedos—full speed ahead." It all boils down to our paying sixty-plus billion per year versus paying some several millions of dollars to develop proper police, court and correctional systems. The results of this work should be the isolation from society of the uncorrectible and the rehabilitation of those who can and should contribute as first rate citizens.

The communications media and the public periodically get extremely critical of the court system because of unpopular bail decisions or other court adjudications. Perhaps the courts have been remiss on occasion but if current, unbiased criminal history information was instantly available to the judges they would be in a better position to make their judgments.

Centralization of criminal history records is technically feasible now that data can be managed efficiently at some central point where security and confidentiality can be closely monitored and controlled.

We already talked about the various units in the system with operative tasks. There is or should be considerable data traffic between these units. It seems desirable to centralize records to try and support the underlying unity of those associated functions when so many elements of the records that they all need are common.

All this commentary leads us to the computer. It

will have great power if properly programmed and tied to all the agencies involved in the justice process. We have demonstrated this past summer what an enthusiastic, hardworking group can do toward these ends when given a green light and some funds to pioneer with.

I started this brief talk with an excerpt from the President's Commission Report regarding consolidation of records and communications in metropolitan areas. We worked in concert to go one step further in Project SEARCH by creating the vehicle for states to exchange data necessary for the criminal justice processes.

Those who said we couldn't bring off the recently concluded SEARCH demonstration may now feel

that we can do the impossible. They may feel like the next step is just to go forward and complete the file conversions that are already started, hook-up other agencies, etc., over the next twelve months once again. I, born an optimist, say, "Hold on there pardner".

I'd like to make a "Dave Farragut saying" but my past experiences tell me to go slow, be methodical, clean up old files, purge bad data and systematically build up our communications systems so that we stay orderly at every step of the way.

Ladies and gentlemen the time to start these tasks is now—we do need these systems. Shall we get on about the task?

## Project SEARCH Central Index—Philosophical, Technical and Operational Aspects

by Captain John R. Plants  
Michigan State Police

Any discussion concerning the philosophical, technical or operational aspects of a central index must be prefaced with some comment as to why this type of operation was chosen. The Project Group had at least three alternatives to seriously consider when defining the operational aspects of Project SEARCH. These alternatives were: (1) A central agency, probably at the federal level which could hold complete records or histories on individuals which would be updated by any state participating in the system. This national data base would greatly reduce the need for individual states to maintain records of their own. (2) The states could individually maintain their own complete record systems and inquiries could be bounced around from state to state to determine where an individual's total criminal history was kept. The limitations to this system are very obvious. (3) The states could individually maintain their own records while a central index to those records was established to provide a response to a single inquiry which listed the location of the criminal history anywhere in the country.

Alternatives (1) and (3) were the two given most serious consideration by the Project Group. The latter was finally chosen because it clearly presented fewer technical problems associated with huge data bases and multiple inquiry generation, but most importantly because of the inherent privacy and security dangers present in a large national data base. The Project Group also felt that the states would be better able to control their own records with this type of arrangement since they could determine what went out of their state and in what form.

Once the decision was made to create a central index with pointers back to individual records in state files, other less serious questions had to be answered. These evolved principally around what was to be in the index, how much information was to be given to inquiring terminals, what format was to be used in responses and who was to have access to the information. Clearly, one of the most important decisions was the physical location and control of the index.

Because of its vast experience operating the National Crime Information Center, the Federal Bureau of Investigation was asked early in the project to assume the responsibility for the central index. The Bureau, however, because of their extremely heavy workload, could not participate in the demon-

stration or let the SEARCH project use their facilities for the central index. The Michigan Law Enforcement Information Network, operated by the Michigan State Police, was selected by the Project Group to house and operate the central index during the demonstration period.

There are several possibilities to consider in deciding where the permanent central index would go for an operating system. The following organizations have been considered as a permanent home for the index: (1) the Federal Bureau of Investigation, (2) the Law Enforcement Assistance Administration, (3) another federal agency such as the Census Bureau, (4) a specific state operating under a consortium of states. A recommendation has been made to the United States Attorney General, and a decision is expected from him, and indeed may already have been made, as to the location of the central index. Regardless of where the index is housed, the Project Group thinks it imperative that the states retain significant control of central index policy and operation because of the inherent dangers to what is essentially state information, and they have communicated this concern to the Attorney General.

Once the decision was made that the full records would be kept in state files, it logically followed that the central index would contain only identifiers, a brief synopsis of the record and pointers indicating where the complete file could be located. This synopsis and other common data elements required a standardization of items such as charge codes, disposition codes and correction codes. Since the National Crime Information Center advisory group had already drafted a manual of standardized codes, the Project Group accepted that document for use in Project SEARCH.

The Project Group also decided that access to the central index would be through state computers only so that each state would have precise control over their users in the system. Each state, by its own software, limited the participation within its state and formatted whatever information it wished to release from its records.

Two 2400 baud high speed lines connected Florida and Maryland to the central index while 150 baud lines connected New York, Minnesota, Arizona and California. The computers involved were IBM, UNIVAC, RCA, EMR and Burroughs. The system used essentially the software developed for the Michigan Law Enforcement Information Network.

The software provided a sound alike name search that was sophisticated, reliable and selective. The



communications code used in the project was the 1967 version of USASCII with minor variations. The line discipline required some hardware changes in one or two state computers and some major software changes in others. A hybrid bid-contention system was used on low speed lines which required the initiating computer to send a bid to the switch and the switch then polled the inquiring computer. This procedure allowed the switch to be in complete control of the network at all times while providing most of the advantages of both a polled and a contention system. In the absence of traffic on the line, the switch did poll the computers every five minutes to insure that the lines were still up and functioning.

The following information is the minimum necessary for entry of a record into the central index: name, sex, race, date of birth, height, State Identification Number, FBI number and the synopsis of arrests and convictions under major categories. Optional elements which could be included are: social security number, operators license number, miscellaneous identification numbers, NCIC fingerprint classification, skin tone, hair color, place of birth, weight, and visible scars, marks, tattoos, amputations or deformities. By July 1, there were 76,000 batch loaded records in the index.

An inquiry into the central index requires one of the following minimum formats: (A) FBI number, or (B) Operators license number, or (C) Social security number, or (D) Name plus sex plus date of birth, or (E) Miscellaneous number which normally is the state identification number. If more than the minimum required data is provided in the inquiry, the index search is made on all of the data provided.

Inquiry messages to the central index allow a fifteen character header which is returned to the state computer for routing back to the initiating terminal. NCIC addresses and field codes were used wherever possible because most of the users in the field were familiar with them.

Operationally there are two types of messages which the switch receives from the initiating computers. The first is a query into the central index and this message is preceded by the initials "QH." This header rolls in the program for searching the central index based on the elements contained in the inquiry. There are three possible responses to a "QH" inquiry. The first possibility would be an error message which could take any of the following forms: (1) "Text Format or Content Error." This response indicated that the message field code and the data being entered are not compatible within the parameters established by the program. An example would be trying to enter hair color with a date of birth field code. (2) "Line Security Violation—No Response Allowed." This error message indicates that there was an attempt to access a restricted file. During the demonstration period, certain terminals are allowed

access to demonstration information only and not live records. If one of these demonstration terminals attempted to access a live record, this error message was sent to them. (3) "Invalid Header." This response indicates that the message key code did not contain a valid NCIC address. (4) "Invalid Data Line Designator." This response indicates that a message field code was used that was not acceptable to the program. An example would be using the designator BD instead of DOB to indicate date of birth. (5) "Insufficient data to QH." This response indicates that an inquiry message has been received which does not include some of the essential data elements for acceptance by the switch.

The second possibility would be a negative response or "no record", followed by the search descriptors which were submitted in the inquiry.

The third possible response to a "QH" would be a "hit" or positive response which contains first the name or other criteria which was submitted. It then gives back the central index record including all identifiers that have been entered by the state of record. In addition, it gives a brief synopsis of the subject's record and a state identification number. The positive response always ends with the phrase "Caution—Identification Not Based on Fingerprint Comparison."

Upon receipt of a positive response, the inquiring terminal is able to access the record from the state of record by using the state identification number. This is done by initiating a second inquiry with the code "QR." The only information acceptable in a QR inquiry is the state identification number. The QR inquiry comes into the switch and is sent on to the state holding the record. That state's computer searches their file by state identification number and returns the record through the switch to the state of inquiry and on to the originating terminal. The only other possible response from the state of record would be a "no record" which indicates that either an improper state identification number was used or an improper state identification number was submitted to the central index.

The following restrictions were placed on states of records in formatting their responses to a QR. (1) All information on the response must be in interpretable form. This means that unique coding could not be used. English language was stressed wherever possible. (2) Each of the elements must be preceded by a standardized field code. (3) The description of the offense and the disposition must be taken from the list of standard terms provided by the project. (4) Entries not supported by fingerprints must be indicated by some means. Within these parameters, the state of record was free to format their response any way they wished.

The technical problems connected with tying the computer net together were impressive but not

unexpected. As in the case of most computer-to-computer hookups, we tackled them one at a time and in a logical order until the lines and the two systems became operational. There were, however, some problems that we were not able to overcome.

The 150 baud lines, transmitting at ten characters per second, were not fast enough to handle the QR responses from the state computers. As an example, if New York was accessing a record from Arizona and it was a 3,000 character record, it would take 300 seconds or five minutes for that record to come down the line from Arizona to the switch and another 300 seconds from the switch to New York making a total of ten minutes line time for the transmission of that one criminal history. I think the demonstration proved without question that high speed lines are necessary and the desirability of a printer at the receiving end capable of 30 characters per second or more.

Another serious procedural problem was also anticipated but not completely overcome. This is the question of positively identifying the man held by New York as the same man with a record in Arizona. We all know that this can only be done conclusively by fingerprints. You will hear later from Adam D'Alessandro concerning a four state fingerprint facsimile hookup which was conducted in connection

with the identification problem. As those of you know who have been in the fingerprint facsimile business, the existing state of the art is slow and procedures and equipment are being considered to speed it up.

Another technical problem was created because the project was a demonstration one and we in Michigan did not want to fully integrate the central index software into our operating LEIN system because we knew we would take it out after a relatively short period of time. Because of this, we developed the programs as an adjunct to the LEIN system and this was inefficient and sometimes time consuming. There is no question that in a fully operational system, the central index software could be refined and speeded up from that which was used during the demonstration period.

To briefly sum up, the system did work and it worked well. I think it indicated conclusively that an operating network is a necessity for the law enforcement community, but I think it pointed to some specific problems which must be tackled before a fully operational program is implemented. We in Michigan look forward to participating in this operational system and if we can be of any assistance to any state, please let us know.

# THE ROLE OF FACSIMILE TRANSMISSION in the PROJECT SEARCH DEMONSTRATION

by Adam D'Alessandro, James Paley, Ronald Wheeler  
New York State Identification and Intelligence System

Acknowledgment—The material in this paper has been derived from the efforts of the staff members of the four states participating in the Project SEARCH Facsimile Demonstration and most particularly the following committee representatives of the states involved:

Glenn Dofoe ..... Michigan  
James R. Donovan ..... Maryland  
Edward T. Mattson ..... Minnesota  
Ronald Wheeler ..... New York

I would like to talk to you today about facsimile transmission and its relationship to Project SEARCH. It might be helpful if I gave a short description of how facsimile transmission works and some of the specifications necessary for effective transmission of fingerprints.

Facsimile might be defined as a process for transmitting printed matter or graphic information, e.g. still photographs, via wire or radio for the purpose of obtaining an exact reproduction at a remote location. Basically then, a facsimile system consists of a transmitter, communication link and a receiver or recorder.

Figure 1 depicts a very simplified facsimile system. Its operation might be summarized as follows:

The copy to be transmitted is attached to a drum on the transmitter. At the same time at the receiving end, a clean sheet of recording medium is attached to the drum on the receiver. When transmission begins, the copy to be reproduced is "scanned" by the optical system of the transmitter. As shown on the diagram, the optical system consists of a light source for illuminating the surface of the copy as the drum rotates, and a photo cell. As the copy passes under the photo-cell, it senses the amount of light which is reflected from a very small finite area passing directly beneath it. If the area is totally dark the photo-cell doesn't pass any significant current; if the area is white the photo-cell passes maximum current since white will reflect maximum light. For tones between white and black the photo-cell passes current proportionate to the amount of reflected light it detects.

The electronic signal from the photo-cell is amplified, modulated and transmitted over a telephone grade wire to the receiver. At this point it is appropriate to mention the fact that before transmission can begin, the receiver is electronically "locked in" or synchronized to the transmitter. Very simply what this means is that the drum on both pieces of hardware start at exactly the same time and rotate at the

same speed. The "scanner" of the transmitter and the recording device of the receiver also start horizontal traversing at exactly the same time and continue at the same rate. This gives a one-to-one point relationship between the copy being scanned and the reproduction copy being generated by the receiver.

When the scanning signal from the transmitter arrives at the receiving end, it is demodulated and fed directly to the recording device on the receiver. There are several methods of recording; some methods employ direct contact stylus and others utilize a photographic process with a lamp-type device whose light intensity is varied in proportion to the signal being sent from the transmitter. This method of recording is shown in Figure 1, and labelled "Crater Lamp." The Crater Lamp emits a very small diameter, sharply focused beam of light which impinges on the recording medium (photographic paper) surface. Depending on the amount of signal current received from the transmitter, the intensity of the beam varies from maximum for black to some minimum for a signal associated with a white area on the copy being scanned.

The specifications for each of the three components of the system are determined by the application. Probably the three most important considerations of any facsimile system are its speed of transmission, resolution and contrast of reproduction.

Resolution, very simply, is the ability of the system to discern between discrete details of the material being transmitted, and the ability of the hardware at the receiving end to reproduce this detail. Resolution is generally spoken of in terms of lines per inch. For example, a good reproduction of a fingerprint card requires a resolution of 200 lines per inch. A good reproduction of a typical business letter requires a resolution of only 99 lines per inch. If one were to examine a copy of each of the respective reproductions, he would observe in the case of the fingerprint card a string of microscopic black dots, numbering 200 per lineal inch. For the business letter he would observe a packing of 99 per lineal inch.

Contrast relates to the degree of blackness (or gray scale) a copy might exhibit. In the case of the business letter everything is essentially black or white. For photographs or fingerprint records tone is crucial; hence the ability of a transmitter and receiver to

sense and reproduce tonal variation is an important consideration, but dependent on the application.

The communications link is dictated by the application requirement of resolution and scan rate. These two parameters taken together result in the bandwidth of frequencies the communication link must accommodate. For a given resolution, increasing the scan rate yields a shorter transmission time, at a higher signal frequency.

For NYSIIS purposes, we have effected an economic trade off. We require higher resolution for the fingerprint card at the sacrifice of transmission time. A standard 8" x 8" fingerprint card normally requires a 15-minute transmission time. However, this allows the use of single, conditioned (4KC) telephone voice grade lines. Any shorter transmission time would force the utilization of group channels with a commensurate increase in cost.

On the message-type transmissions with the much lower resolution requirement, transmission time can be reduced to 5 minutes for an 8½" x 11" document, still employing the voice grade telephone circuit.

Facsimile transmission, sometimes called "Graphic Communications," is by no means new. As early as 1842 a Scottish physicist, Alexander Bain, developed an electrochemical recording telegraph. In the 1920's A.T.&T. inaugurated a facsimile communication by cable which was used as a wirephoto service for newspapers. In the 1930's Speedfoto equipment was used to transmit photographs and fingerprints among police agencies. This technique fell into disuse primarily because it required that the fingerprints be magnified at least double the original size in order to receive a classifiable image at the other end of the transmission. This proved impractical and caused the equipment to fall into disuse. Technical advances have continued to be made and have resulted in the increased reliability required for operating systems. This increased reliability has resulted in a limited resurgence in the utilization of facsimile by criminal justice agencies.

The Chicago Police Department has been transmitting fingerprints via facsimile on an intra-departmental basis since 1964. We in New York State have been doing the same thing on an intra-state basis since 1967. At the present time we have 105 pieces of equipment servicing 41 different locations—police, courts and probation—throughout the state. For a short period of time in 1968 we tested the selective transmission of fingerprints between NYSIIS and the Federal Bureau of Investigation in Washington, D.C. For the past year or so the Detroit Police Department has been sending fingerprints via facsimile to the FBI in Washington on a selective basis. The Los Angeles Police Department has initiated the use of facsimile within its own department just recently. Although the concept is not new, the utilization of

facsimile for fingerprint transmission is fairly limited. One of the reasons for the apparent reluctance of criminal justice agencies to use facsimile extensively is the relatively slow transmission rate of existing equipment—about fifteen minutes for fingerprints and about five minutes for each page of a criminal history. Of course, when you consider that the alternative method for transmitting fingerprints from one location to another is the U.S. Mail which takes an average of several days, 15 minutes appears to be a rather significant improvement. However, in today's environment when data can be transmitted in seconds, facsimile transmission time is considered inadequate. One of the other problems with today's equipment is that in order to insure the high quality resolution required for fingerprint transmission, dedicated telephone lines must be used and they must be conditioned (specially treated). In New York State each remote station is connected to NYSIIS by dedicated, conditioned lines. The cost of this approach for a nation-wide network would obviously be prohibitive and except for possibly a few states could not be fiscally justified.

The Detroit-FBI linkup uses a dial-up technique over nondedicated unconditioned lines which is quite different from the usual method. The dial-up method requires that you pay for the use of the communications lines only when you use them, as you would for any telephone call. It was decided, therefore, that for a low-volume operation such as the Project SEARCH Demonstration the dial-up method would be economically preferable.

While the dial-up system is less expensive to operate, it has not in the past provided the quality of image resolution that is usually required of fingerprint transmissions to permit fingerprint technicians to classify fingerprints for identification. However, as conceived for Project SEARCH, fingerprints are intended to be used for verification rather than identification. That is, the resolution needed must be sufficient to permit comparison of the transmitted fingerprint with a file fingerprint. Although the resolution had proven adequate when used for this purpose between two locations, the use of the dial-up technique among a number of stations had never been attempted for facsimile transmission. It was felt that the Demonstration would present an opportunity to test more thoroughly the concept.

Project SEARCH, as originally described, had two primary objectives:

1. To develop and demonstrate that a computerized criminal offender file, containing data from all segments of criminal justice, can be standardized and exchanged between states on a timely basis; and
2. To explore the feasibility of developing various statistical series and meaningful research data directly from computerized offender files.

This paper will deal only with the first of these

objectives.

The original concept envisioned a name inquiry system bolstered by personal descriptors to increase the reliability of the search. The intent apparently was to utilize information from the files for field and investigative situations. Although the criteria established for creating the Project SEARCH files provided that at least one record entered into the system must be based on fingerprints, no provision was made in the operating system for the use of fingerprints for verification purposes in connection with records which would be transferred from one state to another.

Several months after the start of the project, it became apparent to some of the participants that the system being designed lacked a very important ingredient. The missing ingredient was the use of fingerprints to verify, whenever possible, that the individual about whom an inquiry was made was in fact the same individual concerning whom the transmitted record was compiled.

Historically the criminal justice community has relied on fingerprint comparison to verify the identity of persons entering the criminal justice system. The lack of this element in Project SEARCH raised doubts in the minds of some of the project participants. It was felt that the widespread dissemination of individuals' criminal records based only on name and personal descriptors could lead to criticism both from within and without the criminal justice community. It seemed that the addition of this other dimension—the use of fingerprints as verification—could forestall this criticism. More importantly, it could provide a much more valuable capability—that of permitting the collection in a timely manner of a nationwide criminal record concerning an individual which would be acceptable in a court of law. This is a rather significant accomplishment when one considers that historically it has taken ten days to two weeks to obtain such a record from most identification bureaus. In almost every case this record is received by appropriate local authorities far too late to be considered at the time of a defendant's initial arraignment.

In January, 1970, therefore, a suggestion was made by New York State to add another dimension to the scope of Project SEARCH. The proposal provided for the transmission of fingerprints and photographs, when appropriate, simultaneously with the related summary criminal history of the individual. It was recognized that in many cases it was not practical to have a set of fingerprints or a photograph of the person about whom an inquiry was made against the central index. However, identification bureaus at the state level would have that capability and it was for such situations that the proposal was introduced.

It was proposed that the Demonstration be carried out in the following manner: (see Figure 2)

1. The state making the inquiry receives a set of fingerprints from a local jurisdiction (by mail or by electronic transmission).
2. The central state agency makes a search of its files to determine if the individual has a prior criminal record.
  - a. If an identification is made and an FBI number is obtained, an inquiry is made against the SEARCH Central Index by FBI number;
  - b. If no identification is made, or if an identification is made and no FBI number is available, an inquiry is made against the SEARCH Central Index by name and one or more descriptors.
3. In either case, if a match is made at the Central Index, the inquiring state would then request the summary criminal history from the state of record.
4. The state of record would respond with the summary criminal history. It would also, when requested, transmit a copy of that individual's fingerprint record to the state of inquiry. In special cases the photograph of the individual could simultaneously be transmitted.
5. The inquiring state would compare the electronically transmitted fingerprints with the fingerprint record received from the local jurisdiction to insure that the criminal history received does in fact belong to the individual about whom the inquiry was made.

Another proposal that had been previously approved in conjunction with the Project SEARCH Demonstration was the creation of 10 "simulated" records by each of the seven actively participating states. The proposal also provided that each of the states would have a listing of all 70 "simulated" records contained in the Central Index. This listing would be utilized for testing, for demonstrations to visitors, and to alleviate the boredom of continuing negative responses which could be reasonably anticipated from the rather limited files of the SEARCH project.

While the criminal histories, fingerprint cards and photographs of actual records in the system would be readily available for real-life situations, such would not be the case for any "simulated" records that might be used during the Demonstration. To make the facsimile phase more realistic and to obtain a broader-based experience on the use of facsimile, it was proposed that the following be done by each of the states:

In addition to loading "simulated" records both in the Central Index and in each participating state's computer, it was essential if we were to demonstrate effectively the facsimile portion of the system that a "simulated" fingerprint record and photograph also be prepared. It was proposed, therefore, that each of the states involved prepare sets of fingerprint records and photographs for each of the ten "simulated" criminal histories which would be used in the demonstration. The fingerprint records would be prepared in the normal manner with all the data elements on the card corresponding to the data elements in the criminal history record. To avoid any possible misuse of these "simulated" records, the criminal histories, fingerprint cards and photographs

were to be clearly marked. For example, "Project SEARCH Demonstration Record—Not For Official Use."

Each state would receive ten fingerprint records from each of the other participating states. This would provide each of the states with a fingerprint file of "simulated" fingerprint and photograph records. The procedure for using these records was the same as delineated above for actual inquiries; one of the facsimile states would make an inquiry against a "simulated" criminal history in another facsimile state. The response from the state of record would include a summary criminal history, a fingerprint record and photograph.

It was intended that this approach would provide each of the states with valuable experience concerning the utility, the speed, and the resolution of the facsimile transmission. Also important would be the data gathered to show the practical problems which would be created because of the anticipated disparity in transmission times between the criminal history and the fingerprint record.

Because the project was so far along and because no money had been provided for this new task, only four states—Maryland, Michigan, Minnesota and New York—agreed to participate. A prerequisite for participation was agreement by the states concerned to divert to the facsimile demonstration funds that had already been earmarked for other project tasks. It was estimated that the total costs for participation in the demonstration would not exceed \$3,000 per state. Approval was granted by the Project Group for the diversion of the necessary funds. (See Figure 3)

Arrangements were made with Litcom Company to provide us with the facsimile equipment and the Western Union Company to provide us with its broad-band communications lines. This was the same system being utilized in the Detroit-FBI test.

We had a litany of complaints concerning the equipment which was used during the demonstration. We had hoped to begin testing the equipment on June 15, to provide the operators with some valuable experience before the start of the demonstration. New York, however, was unable to make any transmissions until July 2 because Western Union made a two-wire connection instead of a four-wire connection. The situations in the other states were worse. Western Union failed to provide 600 ohm impedance matching for the terminals in Michigan, Maryland and Minnesota. As a result these states received poor copy or no copy at all until the condition was corrected. New York, meanwhile, was getting good copy from the other terminals. The Maryland problem was cleared in several weeks. The condition in the other two states was not cleared until the end of July.

Both vendors apparently failed to train operators adequately in the other states, resulting in inquiries to New York as to how to correct operating prob-

lems. Minnesota had a data set failure lasting about two weeks during the middle of the Demonstration and was inoperative from August 24 until the end of the test period on August 31.

The results of the facsimile demonstration, which frankly were somewhat disappointing although not discouraging, showed the following:

A total of 125 transmissions were made during the demonstration. Of these 95 were considered of good quality—seventy-six percent (see Figure 4). This was considerably below what I had expected and certainly not adequate for an operating system. Much of this relatively low rate can be attributed to lack of operator experience and equipment problems. These are factors which can be overcome by proper training of operators and more efficient equipment maintenance by vendors.

It is interesting to note that of the fifty-five transmissions received at NYSIIS, fifty were good enough for classification (identification) purposes, while four of the remainder were adequate for comparison (verification)—ninety-one percent. This represents more closely what we had anticipated when we introduced the idea for the test. It demonstrates, in my opinion, what can be achieved if everyone involved devotes sufficient dedication to the operation.

In New York State we had a fingerprint technician review all of the fingerprint transmissions which were received in order to classify properly the quality of the print. In at least one of the other states this was not done, so that it was possible that some of the "poor" prints could have been utilized for comparison purposes and should therefore have been rated as "good".

The test demonstrated very vividly that one recorder (receiver) per state is not adequate for an inter-state operating system even for one as limited in scope as this one was. We encountered this difficulty early in the test and tried to overcome it by rigidly scheduling transmissions for each state. While this eased the problem it did not solve it. The difficulties that could ensue from a national network make this problem infinitely more complex and is one that requires much attention.

Since the system as conceived is intended to be used only for verification purposes it is not necessary to transmit an entire fingerprint card (see Figure 5). What we have done in New York State in appropriate cases is to send only part of the card (see Figure 6). This is sufficient to permit verification of the identity of the individual in question. This approach reduces the transmission time by about forty percent, so that even without equipment upgrading, the time required can be significantly improved.

If this concept is to work effectively, each state must have a central repository for all the criminal fingerprints in that state. This was demonstrated very vividly during the test when New York made a

"live hit" on a fingerprint inquiry against the Central Index. When we attempted to obtain the related fingerprints from the state of record we were unable to get the prints for several days because the state of record does not have a state identification bureau.

A very important benefit that can be derived from a system such as Project SEARCH is a substantial reduction in the FBI Identification workload. Since more than half of the criminals arrested are recidivists (repeaters) and are identified at the state level, there is no need for such fingerprints to be sent to the FBI for processing. Once he has been identified at the state level, inquiry can be made against the Central Index to ascertain whether the individual has an arrest record anywhere else in the country. If the response from the index is positive, the individual's out-of-state record can be added to the inquiring state's record and a nationwide criminal record can be quickly compiled (see Figures 7, 8 & 9). With this very substantial reduction in workload, it is conceivable that the FBI could then process the remaining arrest fingerprints on an on-line basis and provide a national criminal history in a matter of several hours instead of the substantially longer turn-around time now required.

The approach used for this demonstration project is certainly not the only one that can be used for this purpose. It is widely recognized that other types of equipment and communications can be employed for the transmission of both textual and graphic data. Our experience with and our study of facsimile techniques indicate to us that current research will significantly impact facsimile transmission and that within the next five years the most likely developments will occur in one or more of the following approaches:

1. **Video-Transmission**—The use of video transmission offers an immediate solution to the rapid transmission of fingerprint and rap sheet data. The New York City Police Department conducted a federally funded research project to test the feasibility of transmitting fingerprints intra-departmentally via coaxial cable and remotely displaying such images on television consoles. The results of that project affirmed the rapid transmission aspects, in addition to demonstrating that the quality of the images was sufficient for classification and identification purposes. Hard copy images were also obtainable at the receiving end of the system.

This means of communications is extremely valuable for fingerprint record transmission where there is high volume over a relatively short distance. The wide spread employment of this medium is currently impeded by costs. A leased coaxial cable nominally costs approximately \$80/mile/month. This can be compared with a cost of about \$3.50 per mile, per month on the NYSIIS system. The concept of time sharing a coaxial communications link could significantly influence the accelerated utilization of this communications mode for criminal justice purposes.

2. **Fibre-Optic Scanners**—In the area of improved facsimile hardware there is considerable interest in a new technique for document scanning. You will recall earlier I mentioned that the conventional facsimile document scanner consists of a photo-cell detector and an illuminating source which completely traverses the document in the vertical and hori-

zontal directions. The new technique for scanning consists of three parallel rows of very small diameter fibre-optic glass fibers positioned side by side extending for a length of nominally 8½ inches. This forms a transmitter scanning bar. The middle fibre transmits light from an external source to the copy surface and the two adjacent fibers detect the reflected light and transmit it to a remote photo-cell. The transmitter scanning bar is rigidly mounted and the copy is made to pass beneath it at a distance of three thousandths of an inch. The copy is essentially scanned one full (8½ inches long) row simultaneously.

The advantage to this new technique is high resolution, and fewer moving parts which will yield improved quality, reliability and less expensive equipment.

NYSIIS has had technical discussions with the developers of this technique. They are very willing to make this technology available for criminal justice purposes. Additional development and modification would be required, however.

3. **Bandwidth Compression**—Very simply, bandwidth compression is an electronic technique that achieves more rapid facsimile transmission over voice grade circuits by more efficient utilization of the circuit. This is accomplished by first scanning and transmitting only the intelligence portion of a document and ignoring the white or space areas. Secondly, the intelligence that is to be transmitted is converted to digital information that facilitates other electronic techniques (modulation schemes) which permit the transmission of data at the maximum frequency capability of the voice grade line with a minimum of distortion.

A typical business letter (8½" x 11") can be transmitted in approximately 60 seconds over an unconditioned telephone line. One immediate application for equipment of this type might be the transmission of rap sheets.

Various tests by NYSIIS of transmitting fingerprint records using this technique have not been too successful. The half tone requirement of the fingerprint documents mandates modification of most currently available commercial equipment. The problems are not insurmountable and we expect this technique can be employed for fingerprint transmission in the foreseeable future.

4. **Satellite Transmission**—As was pointed out in the discussion of video transmission, the monthly rental charge for coaxial cable or a microwave link is very expensive, particularly for inter-city or inter-state communications. Even inter-state voice grade telephone line service is relatively expensive.

The increased utilization of "stationary" or synchronous satellites such as "Early Bird" and INTELSAT II will eventually drastically reduce the cost of long distance data transmission that would be required by a system such as SEARCH.

Such a satellite would allow the inquirer in Albany, N.Y. to contact Sacramento, California by "bouncing" or relaying his transmission off the satellite anchored some twenty thousand miles above the earth. The inquirer could just as easily and for the same price query INTERPOL, Scotland Yard or the Hong Kong Police Department. In other words, a single transmission to the satellite relay station can be directed to any part of the world (with the exception of the region close to the poles). The transmissions can be voice, facsimile, video, etc.

5. **Computer-Facsimile Interface**—Another new facsimile development which will be useful to SEARCH communications is an On-Line Facsimile Printer. This device will allow the computer to transmit formatted rap sheet data directly via voice grade lines to a printer at a remote site at a rate well in excess of 100 lines (of 132 characters) per minute. This is considerably faster than teletype, and the cost is only ¼ that of a conventional on-line impact printer.

6. **Color Facsimile Transmission**—(Equipment now being

marketed by the Japanese). The system uses digital transmission over conditioned telephone lines and would be useful for the transmission of photographs.

7. *Direct Dial Message Transceivers*—There is equipment on the market which can transmit data over ordinary telephone lines by means of a coupling device attached to a telephone. This equipment currently is being widely used for the transmission of textual data. The manufacturers claim that they can obtain the resolution required for fingerprint transmissions. This remains to be demonstrated. We had hoped to test this equipment during the Project SEARCH Demonstration but were unable to complete satisfactory arrangements with the vendor.

There are two important problems not presently being given serious consideration which must be addressed before any future interstate network of facsimile transmission can be expected to operate as effectively as it should. The first of these is the lack of compatibility among the facsimile equipment of different manufacturers. If this incompatibility continues it means that one vendor would have to supply the equipment for all stations on such a network. Thus, if the equipment were to prove unsatisfactory, the entire system would have to be replaced simultaneously. This would be catastrophic. The monopolistic climate which a one vendor system would generate would be undesirable. It is imperative therefore that criminal justice representatives impress upon facsimile equipment vendors the necessity for providing compatibility among equipment of the various manufacturers.

The second issue that should be recognized is that we in criminal justice are trying to improve the identification process by repairing or patching different parts of the process instead of starting at the front end of the system. This is analogous to trying to repair or replace the upper floors of an existing build-

ing which has a weak foundation. The weak foundation in this case is the present method for recording fingerprints which historically has consisted of rolling a finger on a thin layer of black ink and then rolling the finger on a card form to create an inked impression. This method has resulted in fingerprint records lacking uniform quality because of over-inking, under-inking, smudging and distortions. This lack of uniformity has hampered the effectiveness of the identification process because it slows the system and leads to errors. A fingerprint recording method which results in uniformly good fingerprint impressions is sorely needed not only to improve the existing manual method but even more for any automated fingerprint classification system that may be developed. It will also increase the reliability of facsimile transmission systems and automated image retrieval systems. It is strongly urged that every effort be made to encourage necessary research in this very vital area.

While everyone agrees that existing capabilities fall short of meeting all the specifications of an operating criminal justice system, the possibilities that are implied by the work that is being carried on make the future very promising indeed. We look forward to being a part of that very promising future.

# BASIC FACSIMILE SYSTEM

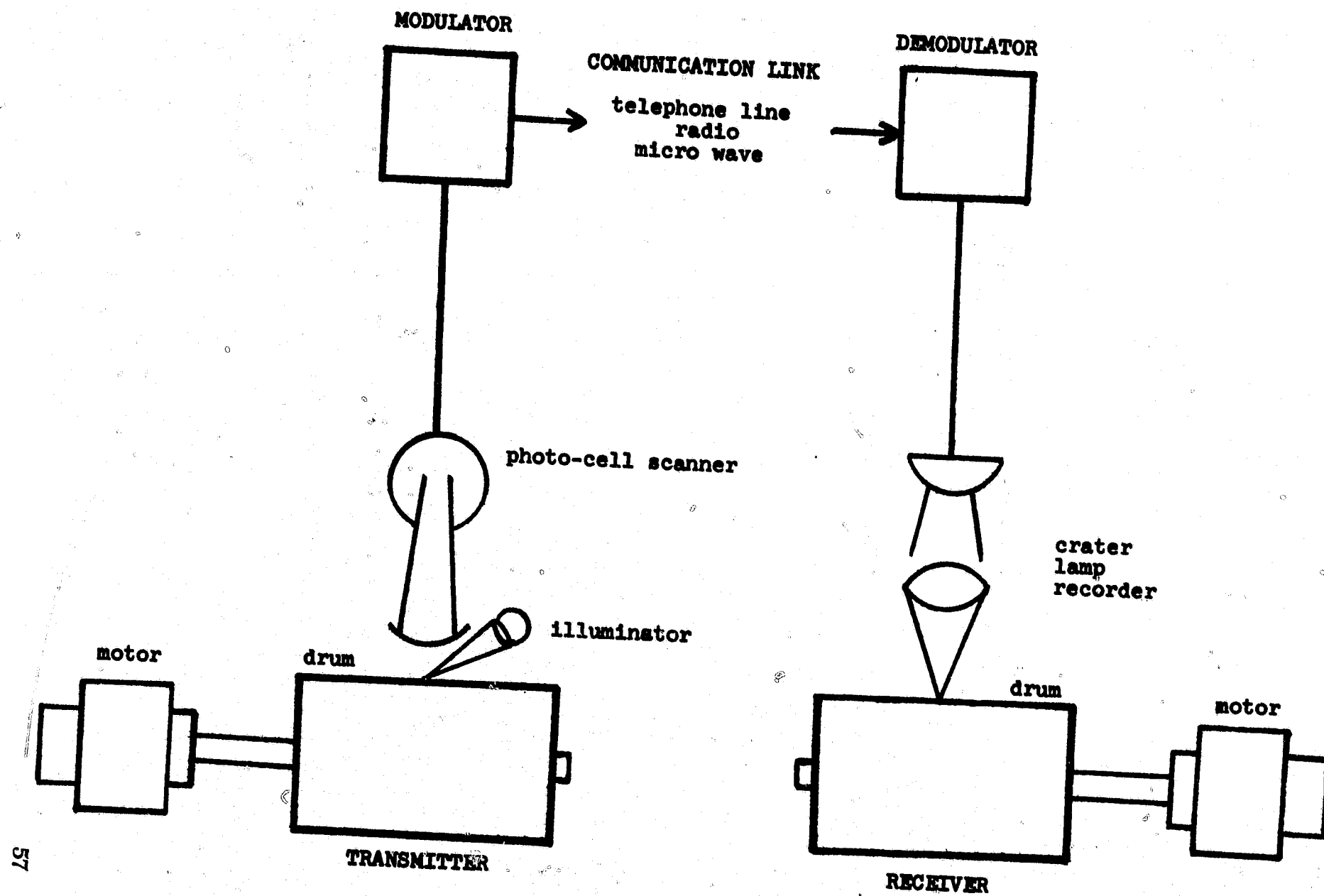


Figure 1

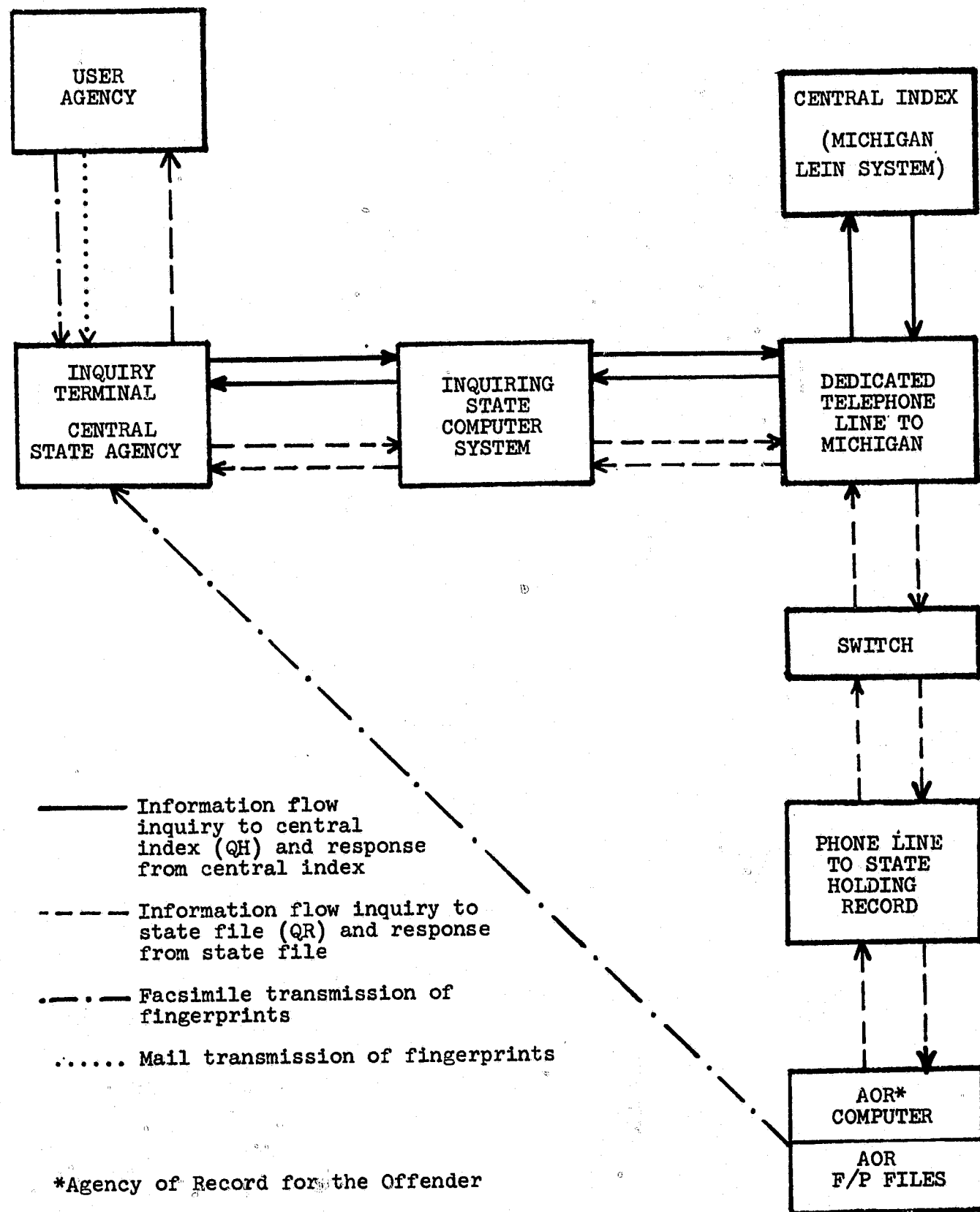


Figure 2

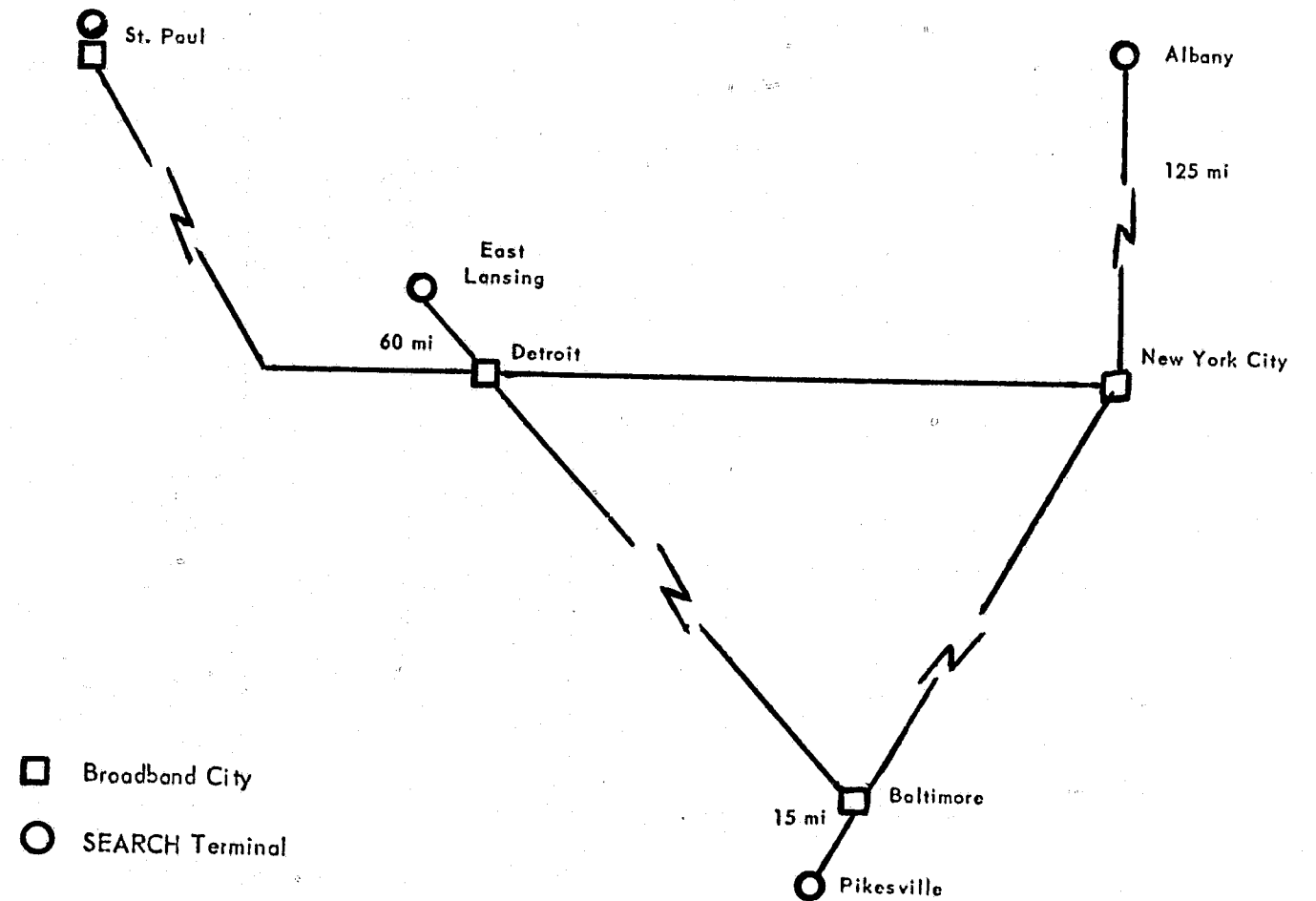


Figure 3

THIS STATION	RECEIVED FROM THIS STATION				TOTALS	
	MD.	MICH.	MINN.	N.Y.	Rec. By Individual Stations	
					Good	Poor
<u>MD.</u>						
Good		1	0	4	5	
Poor		5 (5)	0	8 (8)		13
<u>MICH.</u>						
Good	11		0	18	29	
Poor	2 (2)		1 (1)	9 (9)		12
<u>MINN.</u>						
Good	0	5		5	10	
Poor	0	1 (1)		0 (0)		1
<u>N.Y.</u>						
Good	13	28	10		51	
Poor	2 (2)	1 (1)	1 (1)			4
Total Good & Poor Tx. by Stations	28	41	12	44	(Total For Network)	
Poor Copy Tx. by Individual Stations	(4)	(7)	(2)	(17)	95	30

Figure 4

1. NYSIS Number 03001780		2. Name of Person Fingerprinted (Last-First-Middle) Adams, Sandro F.			3. Classification (Leave blank)	
4. Address of Person Fingerprinted 27 Swish St. N.Y.C.				5. Nickname Sneaky		
7. Alias and/or Maiden Name			8. Sex M <input type="checkbox"/> F <input checked="" type="checkbox"/>	9. Racial Appearance White <input type="checkbox"/> Negroid <input type="checkbox"/> Mongoloid <input type="checkbox"/>		
10. Light Medium Dark Skin Tone x	11. Height in. (month-day-year) 5 9	12. Date of Birth (month-day-year) 02-02-22		13. Place of Birth (City and State) Oswego, N.Y.		
16. Agency Ident. Number B-12345X		17. FBI Number 999008Z		18. Social Security No. 124-37-5698		19. Date Fingerprinted 5/22/70
21. Date of Arrest 7-9-70		22. Place of Arrest (City and State) East Ring, N.Y.		24. Signature of Person Fingerprinted <i>Sandro Adams</i>		
25. Date of Crime 7-9-70		26. Place of Crime (City and State) East Ring, N.Y.		28. Fac. Con. No. ER-5		29. Arresting Agency East Ring PD
30. Law PL	Section No. 140.3001	Sub. Sec. B	Class. F	Name of Offense Burglary		Degree 1
				31. Contributor East Ring PD		31a Prec. Arrest No. 2 5
				32. Court of Arraignment East Ring Police Ct.		

1. Right Thumb	2. Right Index	3. Right Middle	4. Right Ring	5. Right Little
6. Left Thumb	7. Left Index	8. Left Middle	9. Left Ring	10. Left Little
Left Four Fingers Taken Simultaneously		Left Thumb	Right Thumb	Right Four Fingers Taken Simultaneously

Project SEARCH Demonstration Record - Not for Official Use  
Figure 5



NYSIS-2 (1/68)  
(Arrest)

STATE OF NEW YORK - EXECUTIVE DEPARTMENT  
IDENTIFICATION AND INTELLIGENCE SYSTEM  
ALBANY, NEW YORK 12225

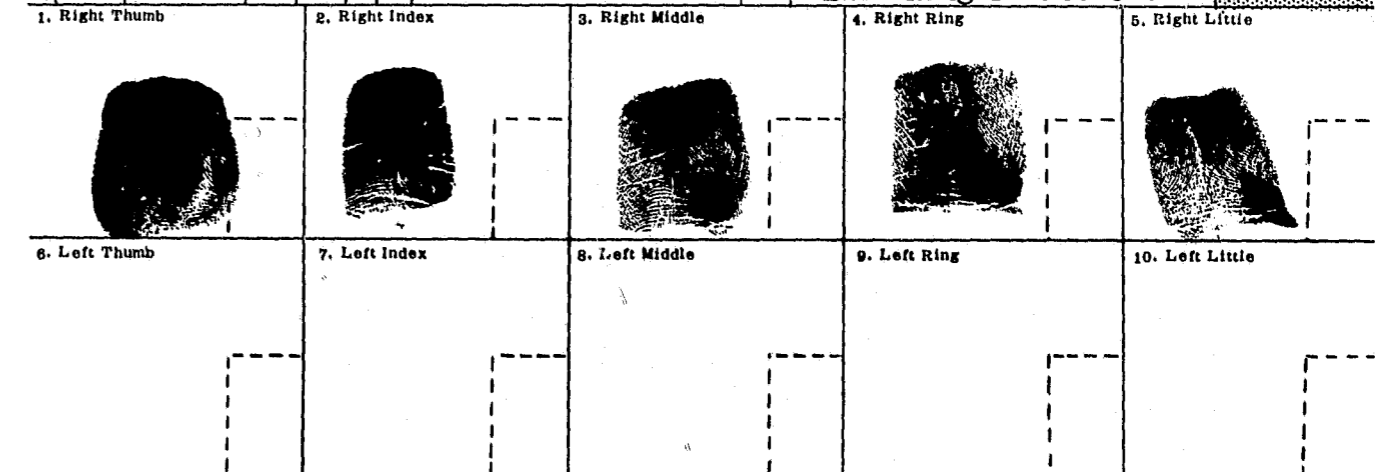
34. Name(s) and ID Number(s) of Associates			
35. Description of Crime		36. Occupation	37. Wt.
39. Physical Marks & Oddities		40. Additional Information	

INSTRUCTIONS

Leave all shaded areas blank.  
Enter dates as month/day/year, e.g. 12-27-67.  
When rolling fingerprints, disregard the dotted box in lower right corner.

- NYSIS No. - Formerly DCI Number.
- Nickname - Enter any identifier, except versions of person's name, usually descriptive, e.g., Baldy, Shorty, Butch, Fatso.
- Alias and/or Maiden Name - Enter any alias. An alias is a complete name in which the given and/or surname is different than those entered above.
- Racial Appearance - Check the racial category which best describes the person's appearance: White if Caucasoid, Negroid if Negro, and Mongoloid if Oriental or American Indian. Classify as White persons those of mixed ancestry who are definitely not Negroid or Mongoloid.
- Skin Tone - Check the skin tone category which best describes the individual's complexion in relation to his racial appearance. For example, classify white persons with olive or swarthy complexion as Dark Skin Tone, and classify light-colored Negroes in the Negroid Category as Light Skin Tone.
- Place of Birth - If not U.S.A., enter city and country.
- Agency Ident. Number - Enter your identification number assigned to this individual.
- Date of Crime - If more than one, use space in Item 40.
- Place of Crime - If more than one, use space in Item 40.
- Facsimile Control Number - Enter when facsimile transmission is used.
- Charge(s) - Enter all charges with most serious first, as set forth in the NYSIS Charge Code Manuals. If more space is necessary, enter in Item 40.  
Law - Enter law abbreviation. For example:  
PL - Penal Law      CCP - Code of Crim. Proc.  
PHL - Public Health Law      VTL - Vehicle & Traffic Law  
Section Number - Enter Section Number of Law.
- Subsection Number - Enter number found after dash in Section Number.
- Class - Enter class of crime, A, B, C, D, E, or U - Unclassified.
- Offense Category - Enter letter as follows:  
F - Felony      V - Violation  
M - Misdemeanor      I - Infraction  
Attempted Code - Enter letter as follows:  
A - Attempted Crime      O - Actual Crime
- Name of Offense - Enter name of crime for which individual is charged, such as Fraud, Assault or Larceny.
- Degree - Enter degree of crime, if applicable.
- Contributor - Enter name of agency if different than Arresting Agency.
- Court of Arraignment - Enter Court name and City, Town or Village. Enter name of Justice of Peace or Police Justice and mailing address in Item 40.  
NYC - Enter court name including part of court and borough. For example, Criminal Court, Part 1A, Queens.
- Name(s) and ID Number(s) of Associates - Enter name(s) and ID Number(s) if known, of persons arrested with or involved with the arrestee in the commission of the offense for which the fingerprint card is submitted.
- Description of Crime - Describe the criminal act for which this individual was arrested.
- Physical Marks & Oddities - Enter any amputations, deformities, visible scars, marks or tattoos.
- Additional Information - Enter any miscellaneous information which may be helpful.  
Refer to the original entry whenever an item is carried over to Item 40, e.g., Item 25, Date of Crime -12-27-67.

1. NYSIS Number 0300178Q		2. Name of Person Fingerprinted (Last-First-Middle) Adams, Sandro F.			3. Classification (Leave blank)	
4. Address of Person Fingerprinted 27 Swish St., N.Y.C.				5. Nickname Sneaky		
7. Alias and/or Maiden Name		8. Sex M <input checked="" type="checkbox"/> F <input type="checkbox"/>	9. Racial Appearance White <input type="checkbox"/> Negroid <input type="checkbox"/> Mongoloid <input checked="" type="checkbox"/>			
10. Light Skin Tone x	11. Medium Dark 5 19	12. Height in. 5 19	13. Date of Birth (month-day-year) 02-02-22		13. Place of Birth (City and State) Oswego, N.Y.	
16. Agency Ident. Number B-12345X		17. FBI Number 999008Z		18. Social Security No. 124-37-5698	19. Date Fingerprinted 5/22/70	
21. Date of Arrest 7-9-70		22. Place of Arrest (City and State) East Ring, N.Y.		24. Signature of Person Fingerprinted		
25. Date of Crime 7-9-70		26. Place of Crime (City and State) East Ring, N.Y.		28. Fac. Con. No. ER-5	29. Arresting Agency East Ring P.D.	
30. U C H A R G E (S)	Law Section No. PL 140.30	Sub. Sec. 01	Class B	Off. Code F	Name of Offense Burglary	
31. Contributor East Ring P.D.		31a Proc. Arrest No. 2 5		32. Court of Arraignment East Ring Police Ct.		



Left Four Fingers Taken Simultaneously      Left Thumb      Right Thumb      Right Four Fingers Taken Simultaneously

Project SEARCH Demonstration Record - Not For Official Use  
Figure 6

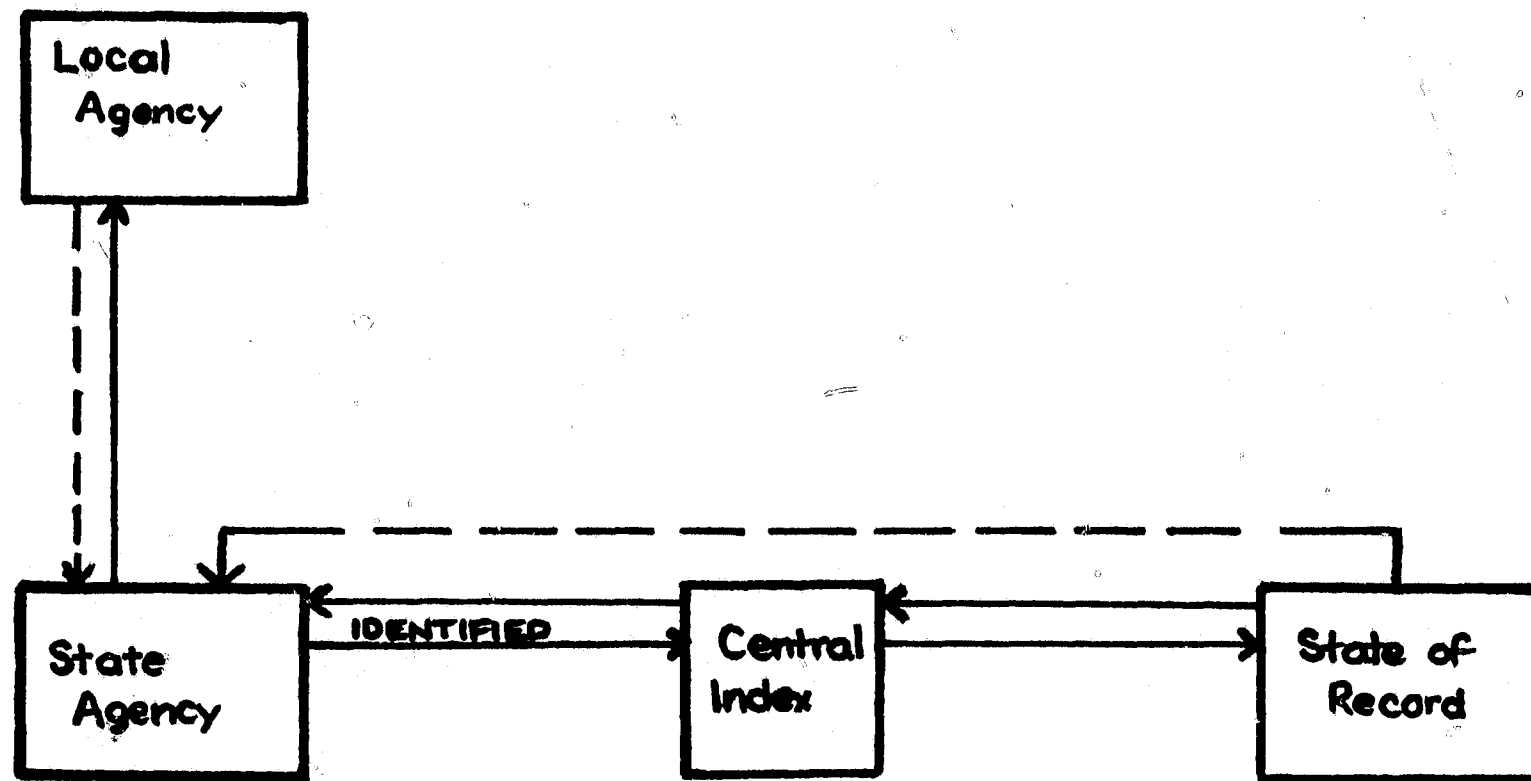
STATE OF NEW YORK - EXECUTIVE DEPARTMENT  
IDENTIFICATION AND INTELLIGENCE SYSTEM  
ALBANY, NEW YORK 12225

34. Name(s) and ID Number(s) of Associates			
35. Description of Crime		36. Occupation	37. Wt.
39. Physical Marks & Oddities		40. Additional Information	

INSTRUCTIONS

Leave all shaded areas blank.  
Enter dates as month/day/year, e.g. 12-27-67.  
When rolling fingerprints, disregard the dotted box in lower right corner.

- NYSIIS No. - Formerly DCI Number.
- Nickname - Enter any identifier, except versions of person's name, usually descriptive, e.g., Baldy, Shorty, Butch, Fatso.
- Alias and/or Maiden Name - Enter any alias. An alias is a complete name in which the given and/or surname is different than those entered above.
- Racial Appearance - Check the racial category which best describes the person's appearance: White if Caucasoid, Negroid if Negro, and Mongoloid if Oriental or American Indian. Classify as White persons those of mixed ancestry who are definitely not Negroid or Mongoloid.
- Skin Tone - Check the skin tone category which best describes the individual's complexion in relation to his racial appearance. For example, classify white persons with olive or swarthy complexion as Dark Skin Tone, and classify light-colored Negroes in the Negroid Category as Light Skin Tone.
- Place of Birth - If not U.S.A., enter city and country.
- Agency Ident. Number - Enter your identification number assigned to this individual.
- Date of Crime - If more than one, use space in Item 40.
- Place of Crime - If more than one, use space in Item 40.
- Facsimile Control Number - Enter when facsimile transmission is used.
- Charge(s) - Enter all charges with most serious first, as set forth in the NYSIIS Charge Code Manuals. If more space is necessary, enter in Item 40.  
Law - Enter law abbreviation. For example:  
PL - Penal Law CCP - Code of Crim. Proced.  
PHL - Public Health Law VTL - Vehicle & Traffic Law  
Section Number - Enter Section Number of Law.
- Subsection Number - Enter number found after dash in Section Number.
- Class - Enter class of crime, A, B, C, D, E, or U - Unclassified.
- Offense Category - Enter letter as follows:  
F - Felony Y - Violation  
M - Misdemeanor I - Infraction
- Attempted Code - Enter letter as follows:  
A - Attempted Crime O - Actual Crime
- Name of Offense - Enter name of crime for which individual is charged, such as Fraud, Assault or Larceny.
- Degree - Enter degree of crime, if applicable.
- Contributor - Enter name of agency if different than Arresting Agency.
- Court of Arraignment - Enter Court name and City, Town or Village. Enter name of Justice of Peace or Police Justice and mailing address in Item 40.  
NYC - Enter court name including part of court and borough. For example, Criminal Court, Part 1A, Queens.
- Name(s) and ID Number(s) of Associates - Enter name(s) and ID Number(s) if known, of persons arrested with or involved with the arrestee in the commission of the offense for which the fingerprint card is submitted.
- Description of Crime - Describe the criminal act for which this individual was arrested.
- Physical Marks & Oddities - Enter any amputations, deformities, visible scars, marks or tattoos.
- Additional Information - Enter any miscellaneous information which may be helpful.  
Refer to the original entry whenever an item is carried over to Item 40, e.g., Item 25, Date of Crime -12-27-67.



**LEGEND**

- - - - fingerprint facsimile transmission
- data transmission

Figure 7

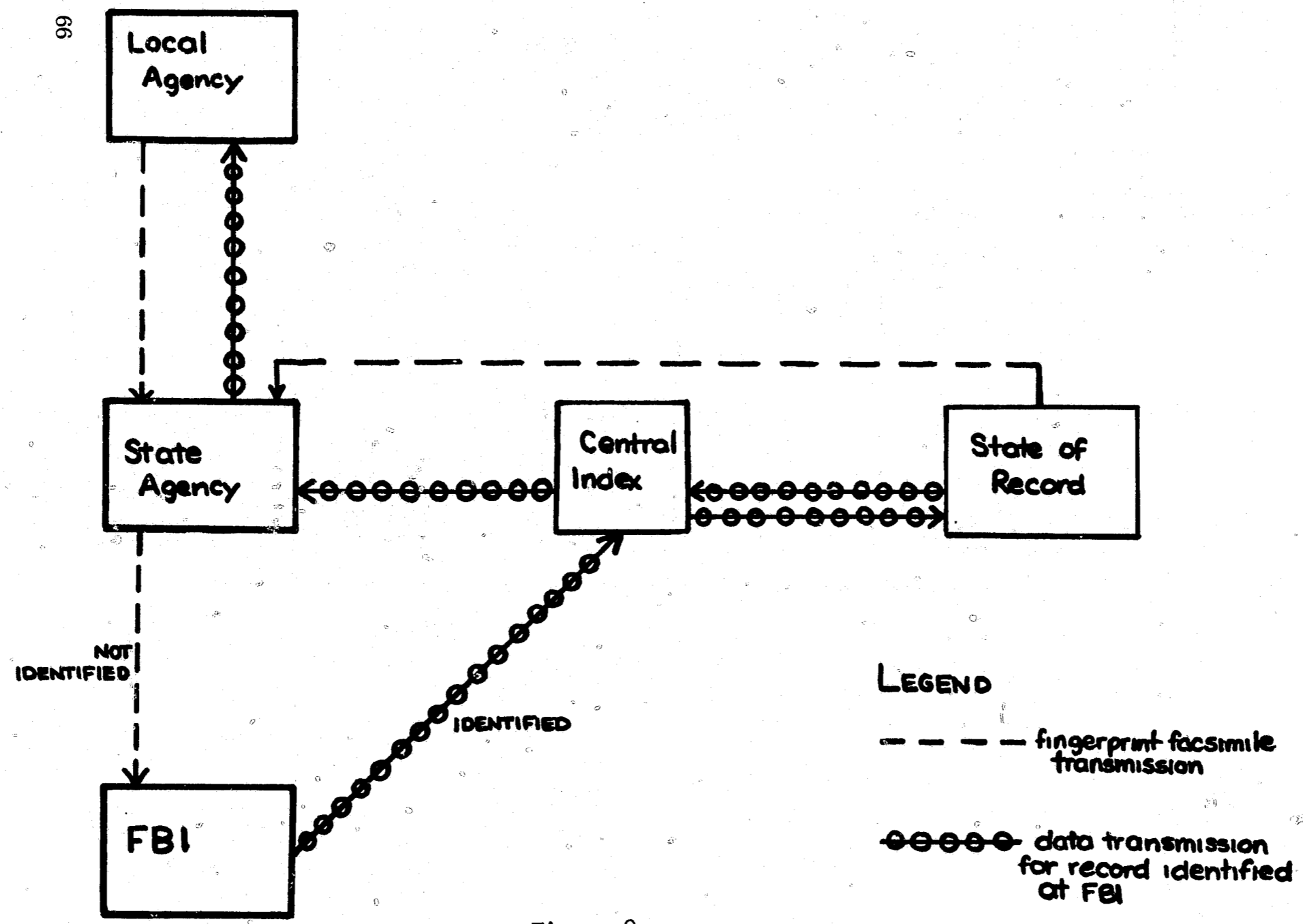


Figure 8

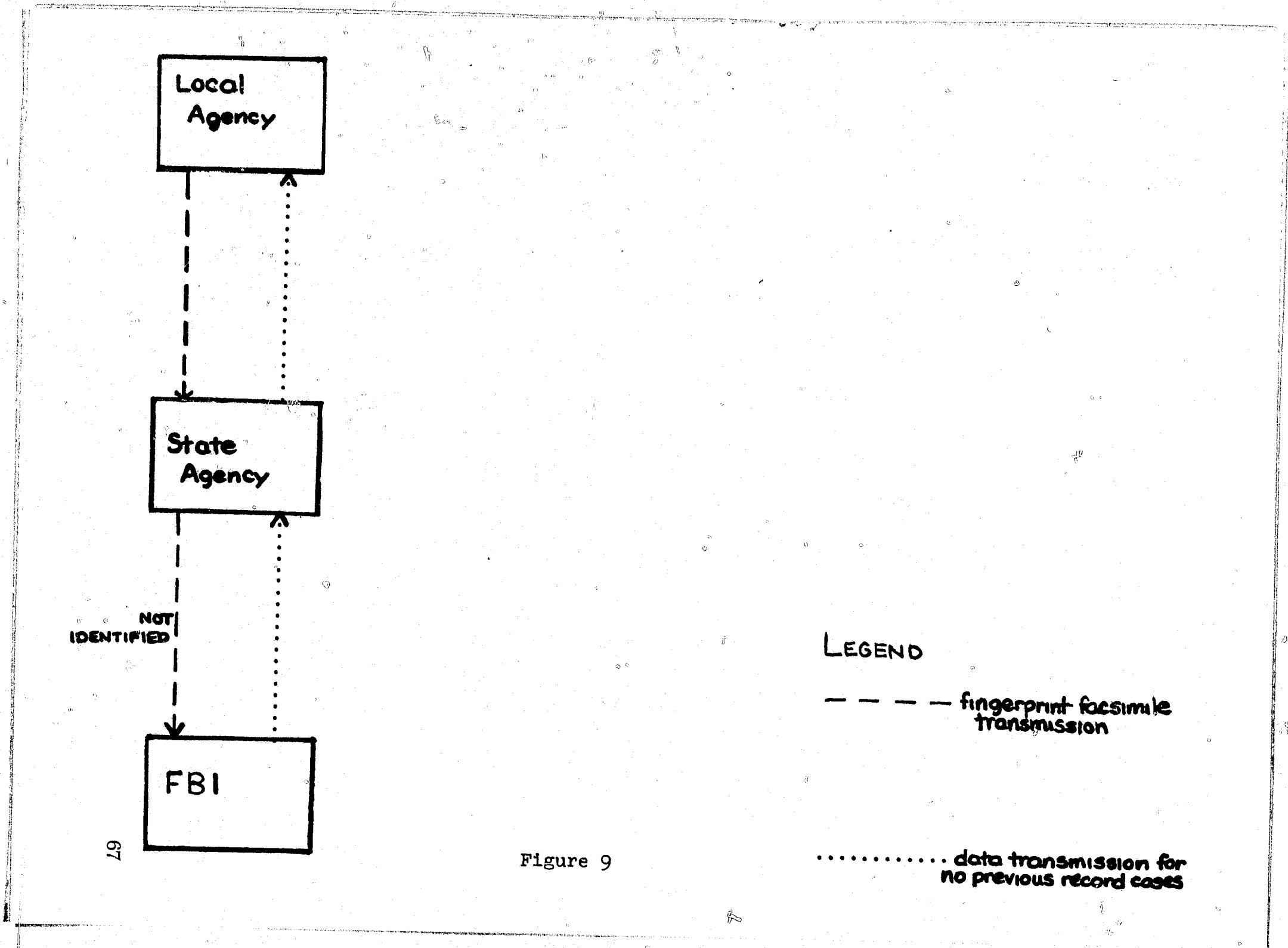


Figure 9

67

## DEVELOPMENT OF INTRASTATE REGIONAL INFORMATION SYSTEMS IN COORDINATION WITH A STATE CRIMINAL JUSTICE INFORMATION SYSTEM

by James N. O'Connor, Administrator  
Law and Justice Planning Office  
Planning and Community Affairs Agency  
State of Washington

Among the persons present today from the State of Washington are DeWitt Whitman, Director of the Washington Crime Information Center, and Dale Douglass, Project Director for Sea-King Alert. These men have been the principal movers in the development of Washington's state and regional information systems, and would be most pleased to discuss in detail any facets of our system which might be of interest to you.

My presentation this afternoon is not intended to be a technical one. I intend to describe some of the conditions and factors which led to the design of the intrastate regionalized criminal history information system which we are presently undertaking to develop. I must emphasize at the outset that the criminal history segment of our information system is still under development, and it is not at all clear today that regional files, with a central state index and switch, will prove to be more efficient and economical than the single state file that a number of larger states are implementing.

Washington's decision to develop a regionalized information system was made prior to the availability of substantial federal financial assistance for such systems. It was hypothesized by the state Central Budget Agency (even before it had a very good idea of the information needs of prosecutors and courts) that the computer capacity necessary to store, process and communicate all law enforcement information which would be useful on a real-time basis would not be available in the state's Data Processing Service Center, but would exist in county and city systems in various locations throughout the state, some of which then had under-utilized CPU capacity. In addition, the state communications network would need substantial upgrading to handle a real-time offender history file. The Law Enforcement Teletype System was the principal mode for communication with the Washington Crime Information Center, which utilized the "torn tape" method of taking an inquiry from the teletypewriter, using a terminal in the records division of the Washington State Patrol (which has responsibility for operation of the Crime Information Center) to access the computer, and carrying the computer response back to the teletypewriter to send to the inquiring agency. It was obvious that this method would break down entirely when volume

and length of messages reflected the servicing of an operating offender history file, as well as the other files which were to be held by WACIC.

This leads into another very important factor: an offender history file was the last item on WACIC's list of programming priorities. Without going into the rationale, which was entirely supportable so long as only police needs were thoroughly considered, WACIC's first file priority was vehicles, second guns, third stolen and recovered articles, and fourth wanted persons. Only the last file would be capable of being expanded or linking into a criminal history file.

For local police agencies and sheriffs, as well as the courts which were beginning to become interested in computerized information, the priorities were quite different. Real-time access to outstanding warrants, and information about offenders, was a primary need. This need was reinforced by the fact that local police records were built around persons, and the sheer bulk of the existing paper and manila folders was an important factor which motivated the larger cities to act.

The development of our regional information systems, therefore, was the result of a conscious determination by the state and principal local agencies to build regional files, as well as a state information system; but only very general notions were initially held as to what file content would ultimately be maintained at each level with respect to offender history information. There was also a lurking problem, which I will return to later, which was to arise subsequently as a result of two different "understandings" of the configuration of the communications network which would be developed to access the system data.

The establishment of a state law enforcement planning agency, and the availability of LEAA funds for the development of law enforcement information systems, caused a new look at the overall plan to be taken in the spring of 1969. It was decided then to re-affirm the original decision as to the system concept. In effect, a miniSEARCH system would be created in the state for the maintenance of criminal history files. The Washington Crime Information Center would hold an index; at least two geographic regions (perhaps as many as six ultimately) would hold offender files, as would the state correctional agency, the Division of Institutions. Terminals accessing these files would have capability to make authorized inquiries of any of the files in the system. This concept would not only significantly reduce the

storage capacity necessary at the state center, but if a large proportion of the "hits" by system users should prove to be against the data base held for the users' own region, the communications load and expense would be much less than if all inquiries and all responses on hits had to go to, and be returned from, the state CPU.

Another important consideration in designing the system is the extent to which the data base in the offender history file is composed of elements which are common to the management information system utilized by the local agency to improve its operational efficiency. On the other side of the coin is commonality with the data elements that are reported to a state records bureau. In Washington, the former consideration far outweighed the latter. Local interest in using information about offenders and their status, for the purpose of improving efficiency of operation, is very high; on the other hand, no state records bureau was or is operational.

Once the system design has been settled upon, the precise content of the state index is one of the most critical considerations for developing the intrastate SEARCH. Our present anticipation, barring a radical change, is to use the SEARCH index format of identifiers and offense "box score" of arrests and convictions for our state index.

Another question which was of concern to the SEARCH Project Group, and which must also be addressed in developing an intra-state system which utilizes regional files and an index, is the determination as to what files ought to be indexed. That is, should the misdemeanant, the traffic offender, or other minor offenders be listed so as to cause transmission of their records in response to a subsequent inquiry from outside that region. (I assume that the record will be automatically available within the region because all or almost all record keeping will be done on the region's computer. However, programming could be accomplished to restrict availability of the record even within the region.)

To return to the subject of communications, the configuration of the network must not be overlooked while considering matters relating to file content and format. The regional concept, quite naturally, was assumed by the personnel developing the regional files, to call for lines from terminals in the field and operating agencies directly to the CPU holding the regional data base. A switch at the regional CPU would automatically transfer inquiries and responses, when appropriate, to and from the state center, other regions within the state, NCIC and SEARCH. Development at the Washington Crime Information Center, however, assumed direct lines to its central processing unit from all field agencies. Resolution of this difference obviously has a significant bearing on the capacity and design, as well as software and programming, for both the state and

regional switches.

In developing a system such as ours, as well as SEARCH, there is value in re-examining assumptions which one might make almost automatically with respect to which agency might most appropriately maintain the index for the state. Although the Washington Crime Information Center came first to mind when the concept for the system was discussed, there is no intrinsic reason why the index function could not be performed within one of the regional centers, or even by contract with a private vendor. At the moment, we are hopeful that the State Crime Information Center will maintain the index, but workload factors may preclude it.

I have avoided going into a detailed description of either of the two regional files within the state, since they are largely pirated from systems which will be described later in the program of the Symposium. To conclude, no technological roadblocks to a successful intra-state regional system have yet appeared. The cost/effectiveness of such a system cannot be determined until patterns of use develop.

The development of such a system is far more difficult than having a single state agency undertake the design and implementation of an information and records bureau; however, there is a widely held belief that a state agency may not be as responsive to local agency needs in system design and operation. The key to making our approach work is a very high degree of cooperation among the agencies involved, and an active, continuous effort at coordination. We have been fortunate in having seen outstanding cooperation among the developers of the information centers, state and local, and among the users. We are also presently obtaining the benefit of active coordination, which for a period had lapsed because of the pressures upon the time of the persons involved. That lapse was long enough to show what a disaster in terms of lost efficiency, could have occurred, but was not of such duration as to seriously set back the development of the system.

For any state which may choose to undertake development of a similar system, be sure to include in your budgeting for staff the time necessary to maintain continuous and effective liaison among agencies. That activity is far too important to be treated as an afterthought or the twelfth item in the project director's job description.

If we in Washington can assist you in any way by sharing our experiences, please call on us.

## SESSION II

### STATE-OF-THE-ART INFORMATION SYSTEMS

#### SESSION CHAIRMAN:

Thomas J. Trimbach  
Research Director  
Michigan Commission on Law Enforcement

# SURVEY OF STATE CRIMINAL JUSTICE INFORMATION SYSTEMS

by Harry Bratt  
Law Enforcement Assistance Administration  
United States Department of Justice

During the first half of 1970, LEAA conducted a field survey of criminal justice information systems. The development of information systems is probably the most dynamic area in law enforcement and criminal justice. Almost all states are engaged in planning, implementing or operating a criminal justice information system. City and regional systems are springing up throughout the country. All components of the criminal justice community—police, corrections, courts, parole, probation, and prosecution—have become increasingly involved.

## BACKGROUND

All of this development has occurred during the past decade. The Air Force SAGE system, and the American Airlines SABRE system, in the civilian sector, ushered in the era of large, real-time computer systems in the late 1950's and early 1960's. The early computerized law enforcement systems also attracted considerable attention in various computer and law enforcement journals and at professional meetings. These systems include the Alameda County PIN system, which became operational in 1963, the California Highway Patrol AUTO-STATIS system in 1965, and the New York NYSIIS system. The FBI's National Crime Information Center (NCIC) system had a tremendous impact. The Law Enforcement Assistance Act of 1965 and the Highway Safety Act of 1966 provided federal funds for the development of information systems.

## SAFE STREETS ACT OF 1968

In 1968, only about 10 states had computerized information systems under development. Most of these systems were in the design or early implementation stage. Among the most advanced were those of California, Michigan, Ohio and New York. At the present time, virtually every state and countless cities and counties are planning, implementing and operating law enforcement systems. There has been a tremendous surge in the development of these systems during the past few years. This may be attributed to a large extent to funds made available under the Omnibus Crime Control and Safe Streets Act of 1968. Project SEARCH has been a catalyst in this development.

The states and units of local government have placed high priorities on statistics and information systems. This is best illustrated by examining the

1970 block grants and the discretionary fund grants. According to the FY1970 state plans, \$16.0 million of the \$182.0 million, or 9% of the block grant funds were devoted to this area. In addition, more than \$2.5 million of the \$32.0 million of the discretionary grants were for statistics and information systems. Most projected funding requests in the 1970 state plans show sizable increases. One of the reasons for this is that many systems now in the design stage will require substantial funds for implementation.

## NATIONAL SURVEY

The survey of state criminal justice information systems was undertaken by the National Criminal Justice Information and Statistics Service during the first half of 1970. Computerized law enforcement information systems in most of the nation's largest cities were also reviewed. The survey covered computerized law enforcement and criminal justice systems, central criminal records, correctional and court records and information systems, police communication systems, and criminal justice statistics.

There were several major goals in conducting this survey. One of the prime objectives was to establish a base from which to measure future progress in information and statistical systems. Another was to collect data to aid in determining the level of funding and technical assistance required to establish nationwide systems for criminal justice information and statistics. A third objective was to gather data and establish contacts which will assist in organizing a clearinghouse for information on law enforcement and criminal justice systems. During the course of the survey, it became apparent that there would be several other benefits. These included the identification of potential research and development requirements, the opportunity to exchange information and ideas on LEAA programs with state and local criminal justice personnel, and the knowledge gained by LEAA staff conducting the survey.

Field visits were made to all states except Alaska, Arizona and Hawaii which were surveyed by state personnel. The time spent in each state ranged from one to four days. Dozens of individuals and organizations were contacted. For example, in California more than twenty-five state law enforcement and criminal justice agencies were visited. A wealth of information was obtained from the survey. We will shortly issue a publication containing general comments and capsule descriptions of each state system. Much of the information gathered has provided excellent background data for technical assistance to



the states and units of local government. In view of the dynamic nature of this area, tentative plans have been made to update the data on a periodic basis.

#### CENTRAL BUREAUS

A key factor in any statewide information system is the state's central record-keeping system for criminal offenders. Central bureaus maintain three basic files: fingerprint, name index to prints and criminal histories. The differences between states in this regard is extreme, ranging from non-existence of a bureau to a very complex record system.

Forty-eight states and the District of Columbia have a state bureau serving as a central depository for criminal fingerprints and offender history data. The two states lacking central bureaus, Washington and Nevada, have built systems around criminal records of major localities. A few of the state bureaus are not authorized by statute, several have limited operations, e.g., serving only state police, and a few are just starting operations.

The oldest bureau is the California Bureau of Criminal Identification and Investigation which was established in 1918. The most recently established are those in Arizona (1968), Colorado (1967), Virginia (1966), and Wisconsin (1969). The organizational location of these state bureaus has often changed. Several were initially established under a Department of Corrections. At the present time, almost all are either under a state Department of Justice or the state police, with the latter in the majority.

There are more than 2,000 persons employed in state central bureaus. The numbers of employees in the various state bureaus cannot be validly compared because of the differences in functions of the organizations, the nature of the crime problem in a particular state, and other factors. However, some of the bureaus are definitely undermanned with substantial backlogs in classifying fingerprints and rather chaotic file conditions. The largest bureaus in terms of number of employees are those in California, New York and New Jersey.

The various state bureaus have nearly 50,000,000 fingerprint charts, approximately 29,000,000 of which are criminal prints. The largest number are in the California bureau which has 8,000,000 including 5,500,000 criminal prints. New York has 6,700,000 including 3,500,000 criminal prints. The aggregate annual growth is approximately 4,000,000. In most states, the rate of growth is 5-10% annually.

One of the critical factors affecting the completeness of fingerprint operations is whether there is a statutory requirement for arrest fingerprinting and transmission of arrest prints to the state bureau. Thirty-five states have such a statute. This is further complicated by the actual content of the legislation. For example, in some instances the legislation calls for mandatory reporting only by certain law enforce-

ment agencies, i.e., county sheriffs and not local police departments. Only 11 states report that arrest print reporting is substantially complete and this is probably an optimistic evaluation.

The name index to prints is another key file. The records contain name, aliases, print classification, date of birth, physical characteristics, and a variety of other information.

Some states will include index cards on offenders even if they have no prints, as long as some other information or evidence is submitted. Criminal and non-criminal (e.g., applicants) index cards are often lumped in the same file. Purging of files is a problem in most central bureaus.

The state bureaus have about 75,000,000 name index cards, about one-half of which are criminal. These are very active files as there are numerous requests to check name-card files to see if a person has a record or has prints on file. Consequently, several states are putting name index cards on-line for inquiry purposes.

Criminal history files show the greatest variance among the states. Some of the state files are rather complete with FBI and state RAP sheets, repeater prints, mug shots, correctional information, probation and parole reports, court dispositions, etc. Criminal history files in other states are limited to FBI RAP sheets. One of the most important aspects of criminal history files is whether they contain court dispositions. Twenty-two of the states had statutory or administrative regulations requiring the reporting of dispositions. However, only six of these stated that reporting is substantially (more than 90%) complete.

The various state bureaus have more than 18,000,000 criminal history jackets. The annual rate of increase is about 7%. New York and California each have approximately 4,000,000 criminal histories. Prior to Project SEARCH, only a few states including New York (NYSIS) were developing criminal histories as a computer application. At the present time, in addition to the states participating in SEARCH, many others plan to include criminal histories in their state criminal justice information systems.

#### STATE OF STATE CRIMINAL JUSTICE INFORMATION SYSTEMS

There are several ways of trying to indicate the state or status of state criminal justice information systems and none are entirely satisfactory. One reason for this difficulty is the dynamic nature of the field as has been continuously stressed. Even if the data were collected in a short span of time, by the time they are analyzed and evaluated, the information is often out of date.

Another problem is the difficulty in defining a criminal justice information system. By any definition, there are extreme differences in the various state systems. One approach was to use the following

stages of systems development: pre-design, design in progress, design completed, design implementation started but system not yet operational, system operational with implementation substantially completed. However, many systems do not follow this pattern. Some systems have no overall design; their development has been evolutionary. Others have very comprehensive designs. This can be illustrated by the fact that design costs ranged from a few thousand dollars to \$750,000. Additional design will often be underway while the original design is being implemented. By this approach alone, a state with a limited police information system would appear to be further along than a state with a comprehensive design of a criminal justice information system. Therefore, the stage of development must be considered along with what is encompassed by the system design. The following is a discussion of the principal components of the present state systems.

#### COMPONENTS OF CRIMINAL JUSTICE INFORMATION SYSTEMS

One of the primary requirements for state criminal justice information systems is a computerized message switching capability and a computer interface with the FBI's National Crime Information Center (NCIC). The states have had a rapidly increasing amount of traffic on their telecommunications systems. This has resulted in frequent delays in sending and receiving messages. The use of a computer for message switching has alleviated this situation in many states.

One of the foremost achievements in law enforcement has been the development of NCIC. The NCIC provides law enforcement officials with on-line information on wanted persons, stolen vehicles, stolen license plates, stolen articles, stolen guns, stolen securities, and stolen boats. All states except Alaska have at least one terminal on the NCIC system. As of April 1970, fourteen state systems and the District of Columbia system had computer interfaces with the NCIC system which allows terminal users to have on-line access to the NCIC.

In four other states, information systems in one or more cities had a computer interface with the NCIC system.

#### DRIVER AND VEHICLE REGISTRATIONS

Another important component or module of state criminal justice information systems provides immediate or real-time access to motor vehicle registrations and driver records. This data is often available through a computer interface with a Department of Motor Vehicles system. The Highway Safety Act of 1966 has resulted in major contributions in this area which are beneficial not only to improved highway safety, but also to law enforcement. One of the priority functional program areas under this Act is a traffic

records program. The purpose of the program is to assure that appropriate data on traffic accidents, drivers, motor vehicles and roadways are available for planning and implementing safety improvements in the motor vehicle transportation system of the State and its local jurisdiction. An illustrative example follows:

An Ohio Traffic Records project was originally started in April 1967 by a feasibility study funded by the Office of Law Enforcement Assistance, the predecessor of the Law Enforcement Assistance Administration. Federal funds in excess of \$2 million were obligated to implement this traffic records system identified as a Law Enforcement Automated Data System (LEADS). This resulted in the development of an on-line computer system involving driver licenses, motor vehicle registrations, conviction records and other items essential to a total traffic records system. The system was interfaced with the NCIC and the Law Enforcement Telecommunications System (LETS) and has teletype terminals throughout the state. Law enforcement users, through the teletype terminals, receive answers to inquiries into traffic record computer files within seconds, and are able to exchange messages with all other terminals in the system. In 1970, a want/warrant file is being added to the system with funds awarded to Ohio under the Omnibus Crime Control and Safe Streets Act of 1968. Thus, through the available grant-in-aid funds from two Federal Departments, Ohio and its local communities can now obtain instantaneous identifying data on vehicles and drivers, which are essential elements for both highway safety and law enforcement.

About one-half of the states had this capability definitely planned, under development or operational. This included 9 states where police agencies had direct file access from terminals on police networks via a computer interface between the law enforcement system and the motor vehicle system. In some states, police can communicate by teletype or phone to the Motor Vehicle Department, which has direct file access by in-house terminals. Several other states have driver registrations and vehicle registrations on a computer with batch processing.

#### STATE NCIC-TYPE FILES

Another component of a state criminal justice data base consists of NCIC-type files, i.e., wanted persons, vehicles, license plates, articles, guns, securities, and boats. Almost all states with criminal justice information systems maintain certain of these files to complement the NCIC.

One of the main reasons for this is to alleviate the burden on the NCIC system. For example, if all stolen vehicles bearing a state's registration are included in the state's stolen vehicle file, inquiries within that state can be handled by its system. Another reason

for state NCIC-type files is that they serve as a backup to the NCIC. Many states also include additional records to those maintained in the NCIC files. For example, a wanted persons file at the state level might include missing persons, misdemeanor warrants and other entries not eligible for entry in the NCIC. In a vehicle file, the state file might include impounded vehicles, vehicles involved in accidents, etc., in addition to stolen vehicles. Some NCIC-type files, especially wanted persons, are also maintained in city and regional systems for the same general reasons as indicated for state files. Thus, there is a hierarchy of information composed of national, state, and local NCIC-type files.

#### CRIMINAL HISTORIES

One of the newest and most important components of state criminal justice information systems consists of criminal histories. The previously discussed components were primarily involved with the police function and could be described as the essential elements of "police information systems." Criminal histories are not only vital to the police function but are important to all functions of the criminal justice system—police, courts, corrections, probation, parole and prosecution. The details on Project SEARCH are well covered in other papers. The only point to be reiterated is that 7 states (Arizona, California, Florida, Maryland, Michigan, Minnesota, and New York) are presently on-line, 8 other states (Connecticut, Texas, Washington, Colorado, Illinois, New Jersey, Ohio and Pennsylvania) are also participating in Project SEARCH; and most other states have plans to include criminal histories in their state information system.

#### Computers

A vast array of computers and communications facilities are involved in state criminal justice information systems. Computer facilities are continually being upgraded to handle new and expanding systems. Most of these systems have, or will have, duplexed or backup computers to allow uninterrupted operation. Many computers are on order to supplement or replace existing hardware. Additional storage and peripheral devices are also being acquired. Almost all manufacturers of computers and peripheral equipment are represented in state law enforcement systems. These include: IBM in Arizona, Illinois, Maryland, Ohio, and other states; Burroughs in Florida, Massachusetts, Michigan and New York (NYSIS); UNIVAC in Louisiana, Minnesota and Pennsylvania; RCA in the Law Enforcement Telecommunications System (CLETS) in California; and Honeywell in Georgia.

#### Communications

Communications facilities and networks are a vital

part of criminal justice information systems. Forty-six states have some type of law enforcement telecommunications system. However, many of these systems are grossly inadequate. Some of the state systems have developed in a haphazard manner and are a conglomeration of equipment, lines and terminals. Many networks have a limited number of lines and terminals. Some of the communications centers often have huge backlogs of messages and are characterized by streamers of torn tape awaiting transmission. Most state telecommunications systems require some improvement especially with the increased demands resulting from emerging criminal justice information systems. Consequently, many states have placed a high priority on their telecommunications systems either prior to or as an integral part of the development of a criminal justice information system.

The computer has proved a boon to telecommunications systems. Data communications programs can audit, switch, number and queue messages. This "message switching" capability was included in one of the previously discussed requisites of criminal justice information systems. The capacity and number of telecommunication lines is being increased in most states. In several states, including Colorado and Indiana, microwave systems are planned or under development.

Another aspect of communications systems is the number and type of terminal devices. There are more than 4600 terminals on the various state systems not including those on city and regional systems. The California Law Enforcement Telecommunications System (CLETS) has more than 1,000 terminals serving 414 local law enforcement agencies, 80 state law enforcement agencies, 4 Federal agencies, 6 correctional agencies; and others. Some of the smaller states have law enforcement systems with less than 10 terminals. There are also wide varieties in the types and models of terminals. The type of teletype terminals include receive only, non-buffered send-receive, and buffered send-receive. There has been a general continual upgrading of these terminals with send-receive replacing receive-only, buffered replacing non-buffered, and automatic replacing manual equipment. There is also increasing emphasis on video display terminals.

#### New Developments

There are many new developments in criminal justice information systems occurring throughout the country. Several of these are being discussed at this symposium. Some involve well-established systems such as the Cincinnati/Hamilton County CLEAR and the Kansas City ALERT systems. Others are prototype systems such as Project TRACE, Washington, D.C., which will serve the prosecutor's needs, and the California Correctional Decisions Informa-

tion Project (CDIP). The coordination of intrastate regional information systems with a state system is of growing interest.

Other interesting developments include the trend toward the adaptation of existing systems and computer programs by other states and other units of local government. The Massachusetts LEAP system is an adaptation of the Michigan LEIN system. The Nebraska NCIS is based on the Arizona ACIC system. Seattle is adapting the Kansas City ALERT system. There are obvious advantages to this but it is often more difficult than it initially appears.

A feasibility study has just been completed for a regional criminal justice information system for the New England states. There have also been preliminary discussions regarding a regional system by another group of states. A number of states are con-

sidering linking their systems with that of neighboring states such as the present link between the Ohio LEADS and the Michigan LEIN system. In addition to Project SEARCH, LEAA is developing an automated grants management information system, a technical reference service and a statistical data base to serve the criminal justice community.

The development of criminal justice information systems offers a tremendous challenge for the 70's. Although there has been substantial progress, and the development has gained considerable momentum, there is still a vast amount of work to be done. There are formidable problems to overcome. It will require the combined efforts of local, state and federal governments and the private sector to strive toward the goal of a national network of criminal justice information systems.

## PROJECT CLEAR

### AN INTEGRATED REGIONAL INFORMATION SYSTEM SERVING GOVERNMENT, LAW AND JUSTICE

by Andrews O. Atkinson  
Superintendent  
Regional Computer Center  
Cincinnati/Hamilton County, Ohio

We are on the threshold of a new decade. The 60's were full of frustrations and disillusion. The American people entered the decade with a search and dream of peace and prosperity; but they could not find leadership equal to the task.

We witnessed man walk on the moon—but we could not assure our citizens a safe walk on our city streets. The 60's brought additions to our vocabulary—such terms as walk-in, sit-in, moratoriums and love-ins.

Lost in the shuffle was the simple term "faith-in". Our citizens lost their "faith-in" leadership.

Allow me to dramatize the situation in Hamilton County, Ohio. The City of Cincinnati passed on the May ballot, a .7% income tax increase. Also passed on the May ballot was a Cincinnati School Board renewal of an 8 mill operating property tax levy. They will follow in November with an increase of an 8 mill operating tax levy. Hamilton County has just instituted a .5% sales tax increase to relieve its financial crisis.

The City of Cincinnati settled an illegal 6-week strike by agreeing to wage increases which helped necessitate the .7% income tax increase. At times during the strike things were so desperate that it was necessary to dump raw sewage into the Ohio River.

Recently a Cincinnati Patrolman, Edwin Schindler, was shot and critically wounded while sitting in a patrol car at the corner of Reading and Rockdale—the focal point of the civil disturbances which rocked Cincinnati in 1967. A few weeks later, in the same area, two firemen were wounded while on duty inside a fire station. Both incidents were totally unprovoked and have significantly increased tension in the entire community.

Governments, local to federal, desperately need to develop a new awareness and responsiveness in every phase of government. As Richard Krabach, City Manager for the City of Cincinnati has stated, "People will pay well for good services, but will not stand still for inferior products".

Present governments, whose organizational concepts are more than 100 years old (an example is our electoral college), are inferior products of a long-past era.

A better informed and continually aware public is demanding better, more responsive, faster acting, and most importantly, management-oriented government bodies. This is the challenge to government in the 70's. Can we meet the challenge? I would like to discuss with you the manner in which one group of metropolitan governments has approached the 70's.

#### THE "CLEAR" CHALLENGE TO AMERICAN GOVERNMENT IN THE 70'S

"We must cut costs." "We have to increase services." Conflicting statements like these constantly confront today's urban administrators. How can we, these men ask, hope to accomplish both tasks?

Cincinnati and Hamilton County, Ohio, have found one solution in a Regional Computer Center. Through wide-spread cooperation on the part of many local jurisdictions, associations, and key individuals, the Center came into existence in 1968. It serves 38 police departments, the City of Cincinnati and Hamilton County. Future plans call for the extension of the Center's service into three states and eight more counties.

At present, the Center provides a computer-based communications and information network for the area's police departments. In addition, it provides a wide range of data processing for the City and separate, but equally-varied applications, for the County. Most important, it does this at a saving to all users.

#### OUT OF COOPERATION—THE DECISION WAS CLEAR

Law enforcement agencies in Hamilton County are most effective today because in late 1966 they all agreed, "Yes, our problems are in many ways similar". This agreement eventually led to development of Project CLEAR (County Law Enforcement Applied Regionally), linking the thirty-eight otherwise autonomous law enforcement agencies in a single computerized information and communications system. CLEAR became fully operational in March, 1969.

More importantly, the unique cooperative effort of law enforcement had a catalytic effect on all local government and brought about one of the most unique government commitments in American history.

At the same time that the police association began to develop ideas about the feasibility of Project CLEAR, the City of Cincinnati's Department of Finance was developing a program to computerize routine City functions. Hamilton County also enthusiastically joined the pioneering cooperative effort. The three projects were merged and the concept evolved to establish a single computer center that could serve not only the law enforcement function, but the many other tasks as well. It was determined that in practice, much the same information that would be stored in the computer's memory bank for use in crime prevention also would have application in the routine functions. For instance, land and occupancy data is appropriate both for police work and for water and tax billings, etc.

Project CLEAR joined Projects CINSY (Cincinnati Information SYstem, the acronym for the system's team effort associated with the design and implementation of programs for the City of Cincinnati) and HAMCO (HAMilton County information system which denotes the system's effort of the team responsible for studying and implementing projects for the County), all three organizations contributing to and benefitting from the information resources of the Management Information System.

The system's prime intent is to provide a more accurate, more efficient and more usable record-keeping system that eliminates duplications, yet is able to make available needed information to all the using law enforcement agencies.

Thus CLEAR has developed as a multi-jurisdictional facility to serve all urban and rural governments and law enforcement agencies, regardless of size or political boundaries, represented in the Hamilton County Police Association.

A Law Enforcement Assistance Grant from the U. S. Department of Justice, secured in March, 1967, made possible much of the groundwork and preliminary investigation necessary to set up CLEAR. Then in the fall of that year, the voters of Hamilton County passed a special .3 mill tax levy, giving their support to the law enforcement program. *This act involved every citizen in the nation's only special tax-supported system for law enforcement.*

Within thirty days after the election, data processing equipment began to arrive at the Center's headquarters in downtown Cincinnati. Installation was completed by September 1, 1968.

#### CLEAR IN ACTION

To illustrate Project CLEAR in operation: A police officer in a patrol car radios his dispatcher the license number of a suspicious vehicle he is trailing. The license number is keyed into a video data terminal and immediately the terminal displays all information on file at the Regional Computer Center and at the state and federal levels pertaining to the license,

vehicle and its owner, plus his address and any past criminal record. In turn, the dispatcher radios the information to the patrol officer.

The simplicity of the system today veils the complexity of planning that went into the development of Project CLEAR.

In order to define the requirements for CLEAR, a detailed analysis was made of the then existing teletype networks, record centers, and radio communication centers in the police departments in Cincinnati and Hamilton County. This investigation and meetings with local law enforcement officers and officials of the Ohio Highway Patrol and the National Crime Information Center led to the decision to set up the CLEAR system to provide information storage and retrieval on a real-time basis.

The system provides message switching capabilities on a point-to-point, point-to-multiple-points or on a broadcast basis, giving the various police agencies the ability to exchange administrative information and to distribute critical data quickly.

Approximately eighty percent of the activity with CLEAR regards such information as wanted persons; stolen, wanted, towed or repossessed vehicles; stolen auto parts; stolen articles, and stolen guns. This information is stored on disc units which are quickly accessible.

The Criminal History File is on mass storage and consists of arrest records, offense records, traffic accident records, gun registrations and applications, field interrogation reports, aided cases and general conditions reports. Mass storage units are slower than discs, but the volume and nature of the data is easily adaptable to such systems. The Criminal History File, the first operating in the United States, formed the backbone for Ohio Project SEARCH and is a testimonial to the modularity of the file design concepts built into Project CLEAR.

The CLEAR communications network consists of eighty terminals for the thirty-eight police agencies, plus computer interface linkage to the LEADS system of the Ohio Highway Patrol and the National Crime Information Center of the FBI in Washington, D.C. The terminal units are teletype terminals or video data terminals, depending upon the needs of the using agencies. The teletype devices are two types—RO (Receive Only) and ASR (Automatic Send Receive).

The terminal configuration can be changed easily to adjust to needs as they arise or to accommodate agencies that may come into the system. The computer center maintains traffic flow statistics in order that the need for any modification might be easily detected.

Message traffic within the CLEAR system can be categorized into three groups—(1) inquiries, (2) new entries or cancellations, and (3) message switching transactions. Inquiries and message switching is an

around-the-clock activity, while adjustments to the memory bank's information in the form of additions, changes and deletions are handled, for the most part, on an eight-hour-per-day basis.

Henry Sandman, Cincinnati Safety Director, has stated that: "The CLEAR intelligence and communications network is the most advanced police tool since the introduction of police radios in the 1920's".

#### CLEAR: HARDWARE AND SOFTWARE CAPABILITIES

##### Hardware Specifications

The CLEAR system consists of a fully duplexed RCA Spectra 70/45 system. Data files are maintained on both disc and mass storage units. The communications capability will facilitate forty-eight (48) common carrier lines with the following terminal devices:

18—RCA 70/752 Video Data Terminals—1200 Baud  
35—ASR MOD 35 Teletype Terminals—150 Baud  
30—RO MOD 28 Teletype Terminals—75 Baud  
2—IBM 360-40 Computers—150 Baud.

##### Software Specifications

The software criterion for CLEAR was established to permit the design of a system with a modular approach to both the communications and data file environments for ease in expansion into other law enforcement areas and to be able to use any software developed in non-police applications. To accomplish this interaction programs were developed and integrated with vendor software. The primary parts of the executive system are:

1. A *communications executive routine* which controls the computer and line program environment beyond that which the vendor supplies.
2. A *file executive routine* which facilitates all searches and updates while maintaining file security in a multi-programming mode.
3. A *scheduler routine* which controls the CLEAR processing environment outside the confines of the vendor supplied software.
4. *User or application programs* to interface with the communications, file and scheduler to perform all necessary background tasks.

The CLEAR software was carefully designed to incorporate the following characteristics:

1. Own multi-programming capability.
2. Re-entrant program capability.
3. Dynamic queueing for all aspects of the system.
4. Macro capability.
5. Facilitate a wide range of terminal equipment as needed.
6. Modular file concept for the addition of both data bases and indices as needed.
7. Full back-up restart capability with both the communication and file environments.

#### Operating Specifications

Project CLEAR's operating requirements were ultimately defined as:

1. To provide a message switching capability within the CLEAR system for instant communication between terminals. The destination of a message may be routed to single or multiple terminals at the operator's discretion. This includes area and all terminals broadcasts.
2. To provide a comprehensive central repository of information which can be updated and searched in a real-time environment. The data files now available on the CLEAR system are defined in the CLEAR File Content Chart.
3. To provide computer-to-computer communications to interface with the Law Enforcement Automated Data System (LEADS) which is a computer based police information system maintained by the State of Ohio. Access to this system provides CLEAR terminals with the following capabilities:
  - a. Message switching to all terminals on the LEADS Law Enforcement Teletype Service (LETS) and the Michigan Law Enforcement Information Network (LEIN) systems by means of the LEADS computer.
  - b. Access to the data bases maintained by the LEADS system (See CLEAR File Content—Ohio Highway Patrol).
  - c. All searches and updates in the CLEAR system that meet the criteria for search or update in the LEADS system are handled automatically by the CLEAR system.
4. To provide a computer-to-computer communications interface with the National Crime Information Center (NCIC) which is a computer based police information system maintained by the FBI. Access to this system provides CLEAR terminals with the following capabilities:
  - a. Switching of messages to the NCIC system for the purpose of performing any update to NCIC files not within the CLEAR system such as the locate function, updates to the securities and boat files, etc.
  - b. Access to all data bases maintained by the NCIC system.
  - c. All searches and updates in the CLEAR system that meet the criteria for search and update in the NCIC system are handled automatically by the CLEAR system.
5. Provide a data collection and processing capability to enhance the following areas:
  - a. Management information to assist in administrative decision-making by providing a wide variety of accurate and timely reports at all levels.
  - b. Resource allocation.
  - c. Command and control capability.

## CLEAR FILE CONTENT

### File Name and Contents

Article File—5 thousand

- A. Stolen Property
- B. Weapons—stolen, lost, etc.
- C. Weapons recovered in connection with unsolved crime.

Warrant/Wanted File—25 thousand

- A. Warrants
- B. Temporary felon wants
- C. Wanted persons for which a warrant has not been issued, run-aways, AWOL, etc.
- D. Suspended, revoked and denied drivers licenses
- E. Known police characters such as gang members, parolees, sex and narcotic offenders.

Vehicle File—10 thousand

- A. Stolen Vehicles
- B. Stolen or missing plates
- C. Vehicles belonging to known police characters
- D. Wanted vehicles
- E. Stolen auto parts with serial number
- F. Repossessed vehicles
- G. Towed or impounded vehicles.

Name History File—2 million plus

- A. Arrest and Convictions
- B. Traffic Accident Reports
- C. Field Interrogation Reports
- D. Offense Reports
- E. Gun File
- F. Minor Accident or Aided Cases
- G. General Conditions Report
- H. Vehicle Inspection Lane Data.

Ohio Highway Patrol Files—Statewide

- A. Registration File
- B. Drivers License File (Drivers record)
- C. Vehicle File.

### Real-Time Search and Access By:

- A. Serial number
- B. Unserially numbered stolen property will be listed and distributed on a background basis.

- A. Name and additional data such as date of birth, sex and physical description
- B. License plate number
- C. Drivers license number
- D. Social Security number
- E. Vehicle Identification number.

- A. License plate number
- B. Vehicle identification number
- C. Serial number.

- A. Name and additional data such as date of birth, sex and physical description
- B. License plate number
- C. Drivers license number
- D. Social Security number
- E. Vehicle identification number
- F. Seal number.

- A. License plate number
- B. Vehicle identification number
- C. Operator's license number
- D. Social Security number.

## CLEAR: A FUTURE NECESSITY FOR COMMAND/CONTROL

The need for improved methods for dispatching and assigning mobile personnel in the field has been obvious to police administrators for some time. Under normal circumstances, police departments spend more than sixty percent of their budgets to maintain mobile forces in the field for call-answering service and crime prevention activities. The CLEAR system will significantly improve the control and use of these mobile resources.

In addition to providing assistance to the dispatch function within the police departments, the system through its remote terminals at the dispatch locations will serve as an on-line data collection device for the entry of performance information relating to the use of patrol forces which, in turn, may support the command and control function and long-range planning for allocation of resources.

A recent file package enhancement designated by the acronym SIAM (Street Intersection Access Method) will provide the complex file handler and data base for the Command/Control system. The capabilities and flexibility of this software package are overpowering.

Much information stored in a Management Information System is accessed by premise address. This information must be entered into a computer storage location on the basis of the premise address. The computer storage locations may pertain to individual addresses, city blocks, census sub-tracts, or other groupings. The desired groupings may be different for different sets of computer records within the system. For example, one file of records may divide a geographic area into blocks, while another file of records divides the area into school districts.

The process of converting premise addresses to other geographic areas has traditionally been performed by use of maps, directories, and other aids to an essentially manual process. Street and Intersection Access Method (SIAM) provides a fully automated alternative to this process. It provides the ability to define, access and update data files on the basis of premise address.

Records are accessed by specifying a street name and address. A record may be accessed by only one premise address or by many different premise addresses.

Some data may be identified by an intersection, rather than premise address. These data may be grouped with premise address data, or may be placed in separate records. Records may also be retrieved by references to intersections. The intersection is described by the names of the streets which cross.

Although premise address is the basic descriptor for access of data files generated by SIAM, other descriptors of a record may be used for retrieval. These

descriptors of a record are called secondary identifiers. Each secondary identifier forms a secondary index. An index refers to a single data file. It can be either a one-to-one index, or a one-to-many index, depending on the characteristics of its identifier. A one-to-one index contains a unique value of the identifier for each record in the data file. Such an index might reference census sub-tract numbers for a data file containing one record for each census sub-tract. A one-to-many secondary index identifies several records to be accessed, on the basis of a single value of the secondary identifier which describes all the records. Such a one-to-many secondary value might be census tract number for a system in which there is a record for each census sub-tract. In such a case, the tract number would identify records for all sub-tracts within the census tract. SIAM would present all records for the tract sequentially to the user processing program.

SIAM can serve as the base of a large number of police applications. Computer-based command and control systems rely on the capability to return promptly the location of a given premise address. In addition, SIAM may be used to maintain auxiliary data such as intelligence information, which may be required by a command and control system.

A manpower resource allocation system requires SIAM's abilities to maintain a geographically distributed data base of patrol activity. Such a system is of value in the study of many problems such as beat design.

Geographically differentiated data are of value in many areas of police investigation. Systems which record the incidence of crime, are valuable in determining enforcement and patrol policies. Data bases incorporating field interrogations and detailed crime records are a valuable enforcement tool.

SIAM is actually a set of macro subroutines which have built-in flexibility to establish, on instruction, secondary indexes for special statistical reporting or analysis of the primary data base and a multitude of sub files appended to it.

SIAM retrieval programs may be used by programs written in either assembly language or high level languages. From assembly language programs, SIAM is accessed in the same manner as other system I/O support routines. The same macro instructions will be used when system structure allows. From high level languages, subroutine linkages will be used for each SIAM retrieval function.

## CLEAR: CRIMINAL JUSTICE

With the powerful CLEAR information resource as the foundation, the tremendous benefits of a complex Criminal Justice Information System can now be made available to the tri-state region. Systems designs are now underway.

A Criminal Justice Information System is basically

an information retrieval system encompassing three separately organized parts—the police, courts, and correctional institutions. Although each has a distinct task, the parts are by no means independent of one another. The actions of each have a direct effect upon the activities and responsibilities of the others. The courts must deal, and can only deal, with those whom the police arrest. The business of correction is with those delivered by the courts. How successfully corrections reforms convicts determines whether they once again become police business and influences the sentences which permit reforming and reorganizing any part of procedures within the system and also affects all other parts of the procedures. Furthermore, the criminal processor method by which the system deals with individual cases, is not a dissimilar mixture of random actions. It is rather an orderly progression of events, some of which, like arrest and trial, are highly visible and some of which, though of great importance, occur out of public view.

The Criminal Justice Information System will encompass all of Hamilton County and can easily be expanded to a tri-state region. It will have the capability of communicating data of this nature with any system at the state or national levels, both automatically and upon request.

The major functions of this Criminal Justice Information System are to:

1. Increase significantly the amount of comprehensive information available to decision-making elements within the system.
2. Perform record keeping and clerical tasks to free personnel for more important duties, and
3. Collect, store, and disseminate these data as required by the system.

Full development should permit the Regional Computer Center to provide both the courts and corrections with a comprehensive management information system.

Any data processing system is governed and controlled by data, used as *input*, and reports and action which are *output*. In a CJIS these two ingredients are better described as arrest and release. The system will track individuals through the entire criminal justice system from the time an individual enters the system, by being held for investigation or arrested, until eventual release. Each step along the system flow will be recorded by either the:

—*Police*, which would include investigation, arrest and booking. This information would then be fed into the police and court MIS and correlated with other inputs to produce the UCR reports, patrol beat workload and performance, crime occurrence by beat, precinct, etc., and begin scheduling court and prosecution workloads.

—*Prosecution*, which would provide input such as initial appearance, delays, and preliminary hear-

ing. This information, along with that put in by the police, would then become active in assignment of judges and courtrooms, scheduling of preliminary hearings, pre-trial conferences, and trials, and the monitoring of attorney workloads and schedules.

—*Courts*, which would provide input concerning hearing, grand juries, arraignments, trials, guilty and not guilty pleas, and sentencing and fines. This information would be used for extensive case monitoring and history, and be made a part of the court MIS.

—*Corrections*, which would provide input relating to probation and subsequent revocations, confinements, parole and subsequent violations, jail populations and scheduling for possible parole and eventual release.

The purpose of gathering and maintaining these data is to prepare statistics and attempt to smooth the flow of persons through the system and reduce the costs by eliminating delays and permitting better utilization of personnel.

#### FROM DATA PROCESSING TO DATA MANAGEMENT

While the CLEAR system is the most highly advanced activity of the Regional Computer Center, it is not the unit's only task. The fundamental design concept of *Time-Sharing* gives the Center the capability to perform for all government agencies in Cincinnati and Hamilton County. Further, a dramatic projection of data management has been introduced by the Center called *Data-Sharing*. An extension of the data bank approach, this concept represents a "new dimension" in data processing utilization and effectiveness.

Through employment of *Time-Sharing* techniques and by establishing common data banks, the Regional Computer Center gains maximum effectiveness and utilization for all possible using agencies.

*Time-Sharing* considers that users normally take from ten to thirty seconds to think before entering commands on a terminal and with the command taking but a fraction of a second to execute, it is possible for the Center to service a number of users simultaneously. Internally, of course, the requests are taken serially; but due to the actual short execution time, responses occurring within seconds give each user the impression that he has exclusive access to the processor.

*Data-Sharing* is designed around the concept that at least half of all records of the City of Cincinnati and other county governments are the same. These include such data as property records, payroll and accounting procedures, and legal records. Therefore, when this information is available at a central computerized source, massive duplication and maintenance effort is eliminated. Elimination of this du-

plication more than pays for the Center itself.

*With the Regional Computer Center as an information utility for data management, many government agencies share computer power and software technology without sacrifice to individual autonomy. The most direct benefit is realized by the citizens served by the Center both in Cincinnati and Hamilton County.*

As further progress is made in data management through computers, it becomes more and more evident that the key to success is in software.

The auxiliary services of the Regional Computer Center operate within the Management Information System, providing each manager at every level of government data to assist him in decision-making. Through this system numerous projects of benefit to the community have been or presently are being developed which take advantage of all the social, environmental and economic information available in the computer's memory bank.

#### WHAT IS A MANAGEMENT INFORMATION SYSTEM?

A Management Information System, simply, is an organized method of providing each manager, at every level of government, with all the data and only that data which he needs for decision, when he needs it and in a form which aids his understanding and stimulates his action. A MIS System:

1. Considers the full effect of a decision in advance by supplying complete, accurate and timely data for use in the planning and decision-making processes.
2. Eliminates from the planning and decision-making processes the problems associated with the use of inconsistent and incomplete data by providing a means for preparing and presenting information in a uniform manner.
3. Uses common data and methods in the preparation of long-range and short-term plans.
4. Identifies, structures and quantifies significant past relationships through the use of advanced mathematical techniques in analyzing data.
5. Merges financial and operational data to produce significant measures of performance to facilitate control of present costs and to facilitate planning decisions with minimum processing of data.
6. Recognizes the needs of all agencies so that the requirements of each are met with a minimum of duplication while serving the Regional Governments as a whole.
7. Reduces the time and volume of information required to make decisions by reporting to each level of management only necessary degrees of detail and usually only the exception from the standard or norm.
8. Utilizes personnel and data processing equipment effectively so that the optimum in speed and accuracy is achieved at the lowest cost.
9. Requires that the data be presented to those responsible for the decision-making and planning processes in a form which minimizes the need for analysis and interpretation.
10. Provides flexibility and adaptability to change.

The concept of management information is one that would be equally valid if the organization were small or large or if the data were obtained and proc-

essed through the most simple manual means or through the most sophisticated computer.

*The level of intelligence made available by the correlation, quantification and mathematical analyses of data extracted from the many significant information sources, drawn together in a time-sharing environment, establishes an awesome responsibility for the Regional Computer Center to effectively and accurately apply this power to the best advantage of the community. In order to handle this responsibility, the Regional Computer Center Management Information System has been designed to permit the implementation of six subsystems, each with an individual responsibility for a segment of the total Management Information System.*

I would like to now discuss the organizational concept of the Regional Computer Center Management Information System. *The Control Board, which is the governing body of the Regional Computer Center, is responsible for determining the fiscal policy with the Regional Computer Center. By enactment of a City Ordinance and a County Resolution, the following members participate on the Control Board for the Regional Computer Center: the City Manager, County Administrator, City Finance Director, County Auditor, County Sheriff, and the Safety Director of the City. The organizational concept of the Regional Computer Center is that autonomous government agencies share a management information system. It is the only center of its type in the United States—a political milestone.*

A Priorities Committee is responsible for the coordination and interrelation of the many projects associated with the Management Information System. The members of this committee are selected because of their responsibility for development of the long-range policy and plans of local government. The primary responsibility of the Priorities Committee is to control, organize, guide, plan, direct and evaluate all information subsystems with relation to each other and the long-range goals of regional management.

Each of the six information subsystems is served by an Advisory Committee made up of men in local government, industry and commerce selected because of their basic relation or interest, as an individual or a company, to the respective subsystems. In this manner, the Regional Computer Center is able to command the advice and experience of outstanding citizens of the region in formulating the development and implementation of the framework of the Management Information System.

The basic goal and purpose of the Management Information System for the Regional Computer Center is, therefore, to advise and promote the development of a decision-oriented Management Information model which will permit evaluation and analysis of the resources of Cincinnati/Hamilton County, and the tri-state region.

**MANAGEMENT INFORMATION SYSTEM  
INFORMATION SYSTEMS DETAIL**

**ECONOMIC  
INFORMATION  
SYSTEMS**

Accounting  
Budgeting  
Cash Flow  
Investments  
Purchasing  
Inventory Control  
Federal Grants  
Industrial Level  
Research Capacity  
Community Profile  
Capital Improvements  
Fiscal P.P.B.S.  
Payroll Personnel  
Pension Systems  
Treasury Management  
Revenue Management

**ENVIRONMENT  
INFORMATION  
SYSTEMS**

Water Distribution  
Transportation  
Highway—Expressway  
Traffic Engineering  
Public Utilities  
Water, Air Pollution  
Recreation, Parks  
Library  
Government  
Solid Waste Treatment  
Fire Prevention Protection

**LAND  
INFORMATION  
SYSTEM**

Culdata  
Land Use  
Buildings  
OKI Trans. Study  
County Auditor  
County Recorder  
Regional Planning  
Inspections  
Real Estate Appraisal  
Real Estate Tax

**HEALTH  
INFORMATION  
SYSTEM**

Public Health  
General Hospital  
Drake Hospital  
Dunham Hospital  
Inspection Licensing  
Patient Care  
Vital Statistics

**POLICE  
INFORMATION  
SYSTEMS**

Law Enforcement  
Courts  
Records  
Vehicle Inspection  
Ohio Highway Patrol  
Bureau Motor Vehicles  
NCIC  
S.P.C.A.  
Command Control  
Corrections  
Ohio Dist. 13  
Crime Commission  
Kentucky State Police  
Northern Kentucky Crime  
Commission  
Louisville-Jefferson County  
Kentucky Crime Commission

**PEOPLE  
INFORMATION  
SYSTEM**

Income Tax  
Board of Education  
Manpower/Employment  
Census  
Relocation Rehabilitation  
Welfare  
Population Projection  
Civil Defense  
CAI

All systems objectives and information sets are categorized for the Management Information Subsystems described on the Information Systems Detail Chart describing the six subsystems which are:

1. The Economic Information System
2. The Environment Information System
3. The Land Information System
4. The Health Information System
5. The Police Information System
6. The People Information System.

Through the use of the talent, equipment and information available through the Regional Computer Center, the Management Information System seeks to optimize the resources of this area through mathematical modeling, review, evaluation and refinement of data, and by stimulating and cultivating information sources. *From this powerful base, City and County management can evaluate the growth by potential of every parcel, block, tract or segment of this region and guide individuals, industries and management to the optimum investments within Hamilton County for locating businesses, establishing parks, developing transportation, promoting water, power and, in general, optimizing the development of the most economically sound and culturally balanced community through computer analyses of its total environment and capacity.*

The value and accomplishments of the Management Information System to the Regional Computer Center and to the region will be totally dependent upon the sensitivity, awareness and responsiveness of Advisory Committee members charged with the long-range planning and policy for the region. In order to achieve complete effectiveness, both sides of this two-way street must be completely considered. That is, regional management must be continually aware of the social, environmental and economic information available in the decision-oriented Management Information System and either apply or adjust these long-range goals to coincide with the long-range plans of the government and prepare to maximize the utility of the power available to the region.

The value of the data base and information resources available to support Project CLEAR, through the Management Information System concept, is unlimited. Instantaneous availability of data such as this is a fundamental by-product of the information base and can only be made possible in a concept such as a Management Information System. *Data processing, dedicated only to a police information system such as the many others being implemented throughout the country, cannot take advantage of these tremendous information resources which also provide significant savings to all!*

**CONCLUSION**

The judicial system is the backbone of our democratic process. All government resources must be

marshalled, dedicated and committed to the development of advanced technological procedures paralleling the scope and complexity of our accomplishments in space.

We must upgrade our judicial process to a level current with space-age technology. At the present time, this antiquated system is a haven for those who wish to undermine our judicial system—our democratic process. *A national system for criminal justice must be developed to strengthen and stabilize democracy.*

Too much of the system is physically inadequate, antiquated or dilapidated. This condition goes beyond the obvious obsolescence of many correctional institutions and the squalor and congestion of many urban lower courts, which make it difficult to treat defendants or convicts humanely. The system's personnel often must work with poor facilities: record-keeping systems that are clumsy and inefficient, communications equipment that makes speedy action difficult, and an absence of all kinds of scientific and technological aids. Furthermore, in few States is there the variety of correctional facilities that could make a variety of correctional programs possible. Most institutions are almost entirely custodial in a physical sense—with high walls, locked gates, and barred windows. New kinds of institutions, less forbidding in character and situated within reach of the community, are an immediate and pressing need.

Probably the single greatest technical limitation on the system's ability to make its decisions wisely and fairly is that the people in the system are often required to decide issues without enough information. A policeman who has just set out in pursuit of a speeding and suspicious looking car should be able to get immediate information as to whether or not the car is wanted; a judge about to sentence a criminal should know everything about him that the police know; and the correctional authorities to whom the criminal is delivered should know everything about him that the judge knows. When they make dispositional decisions, judges and corrections officials should be able to draw on the experience of the system in dealing with different offenders in different ways. Existing procedures must be made more efficient and new procedures must be devised, so that information can flow more fully and swiftly among the system's many parts.

The Regional Computer Center of Hamilton County and the City of Cincinnati has made a significant thrust forward in developing a computerized criminal justice information system as an integral part of a total community management concept.

Overlooking political and geographical differences, the men who helped establish the center and who cooperate in its operation truly have shown their concern for their own jurisdictions by cooperat-

ing with others.

The establishment of the Regional Computer Center—Project CLEAR—represents a milestone in local government cooperation. But that is just the beginning. It is now apparent that the potential for use of the center is almost unlimited.

As Mr. Anderegg, the Hamilton County Administrator, put it: "The precedent established by many communities working together for a common goal may in the long run prove to be the greatest dividend derived from the Regional Computer Center."

Gentlemen, the challenge to Government in the 70's which our people now demand is "CLEAR".

## NAME SEARCH TECHNIQUES

by Robert L. Taft, Principal Analyst  
Computer Usage Company  
New York, New York

This presentation outlined the results of an extensive study of names and name searching techniques recently completed at the New York State Identification and Intelligence System.

The initial phases of the study developed frequency distributions of the population contained in the computerized criminal history files at NYSIS. Four basic distributions were developed. These were—

1. Frequency distribution of surnames
2. Frequency distribution of given names
3. Frequency distribution of variations in surnames
4. Frequency distribution of variations in given names

Using these files, an analysis of the nature and causes of variations in names was made. Following this, twenty-three known methods of coding names (SOUNDEX, Consonant Coding, etc.) were evaluated. The coding procedures and statistical results for each of the methods are included in the report.

During the study, a new method of name coding was developed (the NYSIS Method). This method offers significantly higher reliability than any previously known method while retaining desirable grouping characteristics.

The study also resulted in the development of a weighting scheme which permits direct evaluation of the probability that a file entry is a true match to a search argument. This permits the selection of the most probable match from a file.

The full report is available from Project SEARCH under the title—"Name Search Techniques"—Special Report #1.



**CONTINUED**

**1 OF 4**

## SUBJECT-IN-PROCESS: A DYNAMIC INVENTORY OF A CRIMINAL JUSTICE PROCESS

by James W. Stevens  
Assistant Director  
The Institute of Urban Studies  
The University of Texas at Arlington  
Arlington, Texas

The fact that very little central coordination exists for a subject's progress through the criminal justice system from arrest to final release is well documented. In few instances are all agencies involved with the process able to locate the same individual or able to produce identical information concerning previous steps in the process. Many officials have argued long and hard for some type of central index which could provide operating officials with the data they need for managing each individual and, yet, a system which would produce information on the total criminal justice process to allow informed management decisions.

A step in this direction was taken with the proposal to develop and implement a "subject-in-process" tracking system in Tarrant County, Texas, as the state's part in Project SEARCH. The project will achieve the following:

1. It will demonstrate that the subject-in-process concept is technically possible and will show the utility and value of such a system to the criminal justice community. An integrated information system will make vitally needed information on events occurring within one agency available almost immediately to officials responsible for the administration of justice.
2. Having a record of each accused felon's movement through the various criminal justice agencies will provide data for the systematic evaluation of the over-all system and the efficacy of the various programs and policies of the individual agencies.
3. This project will provide a vehicle for the gathering of knowledge and the training of personnel, thus allowing the expansion of such a system to a larger area or to other jurisdictions.
4. The subject-in-process system will also provide data which will assist in agency decision-making with regard to such management matters as the allocation of agency resources (personnel, equipment, and so forth).

Basically, the project will result in the development of a tracking system which will establish a data file on each adult charged with committing a felony in Tarrant County. This data file will be updated as the individual moves through the criminal justice system toward his eventual exit, thus providing a record, current at any given time, of the individual's status within the system and automatically creating a complete criminal history of this transaction upon the subject's exit from the system.

Addressing itself to the subject-in-process concept

the Assessment of Crime Task Force of the President's Commission on Law Enforcement stated:

... there is ... an urgent need for information concerning the criminal justice system as a whole. The delay involved in the criminal justice process, for example, may look quite reasonable from the viewpoint of each separate agency but wholly unreasonable from the viewpoint of the individual person forced to run through the whole system. There are, in addition, various points in the system where similar functions are performed by different agencies, parole and probation, for example. Only through knowledge of the whole system can performance regarding these kinds of functions be evaluated. (p. 127)

An effective subject-in-process system will require the cooperation and interest of criminal justice agencies of all types—police, courts, corrections, parole, probation—and at all levels—local, state, and federal. The persons covered will be limited to those accused or convicted of committing felonies within this geographical jurisdiction and will be further limited to adults.

The resulting computerized system for tracking subjects of the criminal justice process should be distinguished from the National Crime Information Center since these two systems will be very different. The National Crime Information Center (NCIC) contains information on *wanted* persons and objects and can provide immediate information for operational uses. However, whenever an object or person is located, the NCIC does not maintain data which could tell an official what progress the accused felon has made through the criminal justice system. The subject-in-process tracking system would provide such information.

The NCIC regional connections are being handled by the North Central Texas Crime Information Center (NCT/CIC) Advisory Committee which will be kept informed of the progress made in the project. It is expected that the system developed in Tarrant County will eventually become a regional system and that it will supplement the coverage already provided by the NCT/CIC. Eventually, both systems could be merged at the regional level and connections made to the Texas Crime Information Center (TCIC) which is presently in the planning stages.

### TEXAS PARTICIPATION IN PROJECT SEARCH

Texas became a Project SEARCH participant state on January 1, 1970, after six months as an observer state. The Texas Criminal Justice Council (CJC) was designated state SEARCH coordinator; Mr. Hugh McLeland, Program Director for Research and De-

velopment, Texas Criminal Justice Council is Texas' representative on the National Project Group.

Responsibility for the criminal justice statistical system component of Texas' participation in SEARCH rests with the Criminal Justice Council and Mr. Peter B. Kleck, Program Director for Science and Technology. This component requires the development of 250 complete criminal history records for a demonstration of the capability of states to generate transaction-based criminal justice statistics.

The North Central Texas Council of Governments was designated by the Texas Criminal Justice Council to direct the special project proposed for completion in Texas. After extensive discussion and negotiation with the Texas Criminal Justice Council staff, development and testing of a prototype subject-in-process tracking system was proposed. This coverage of the criminal justice process has been proposed as a subsystem of the Texas Crime Information Center; the Tarrant County project will serve as a test of the feasibility of this subsystem and also as the developmental grounds for working out difficulties in the original conceptualization.

#### PROJECT COMMITTEES

The North Central Texas Council of Governments (NCTCOG) has appointed two committees to advise and assist during the project. The Regional Criminal Justice Information System Committee will function in an advisory and observer capacity. The Project Committee will be a working group which will participate in project decision-making, evaluation, and implementation.

**Regional Criminal Justice Information System Committee.** This committee is composed of representatives of communities within NCTCOG's ten-county region. The general responsibility of the Committee is to observe the progress and results of the demonstration project from a regional perspective. Because of the possible statewide implications of the research, the regional committee includes representatives from cities and counties in other parts of the state; they were asked to join in the committee's observer role and to offer advice and assistance wherever possible.

The tasks of the regional committee will be determined by the committee itself as the project progresses; initially the following are suggested as guidelines for committee activity:

1. Examine the possible applications of the system in the North Central Texas region as well as in other metropolitan areas in the state.
2. Anticipate problems which could arise in developing the system on a region-wide basis. Suggest alternatives and solutions.
3. Meet periodically during the course of the project with NCTCOG representatives and members of the project staff to discuss the progress of the project. Offer advice and assistance as appropriate.

**Tarrant County Project Committee.** This committee will be composed of representatives from Tarrant County criminal justice and related agencies which will cooperate with NCTCOG in the project. The committee will be a working group which will provide detailed as well as general directions to project staff members. A primary function of the group will be to represent the needs and interests of Tarrant County criminal justice agencies to NCTCOG and the project staff. In carrying out this responsibility, it is anticipated that the committee will perform the following tasks:

1. Provide recommendations concerning system security.
2. Examine the reporting forms and procedures recommended by the project staff from the viewpoint of the reporting agencies.
3. Review system design and suggest modifications.
4. Provide liaison with criminal justice agencies throughout Tarrant County.
5. Promote interagency coordination and cooperation.
6. Meet regularly with representatives of NCTCOG and members of the project staff to review project status.

In general, both committees will participate as much as possible in all phases of project development. Since cooperation and coordination of project activities are of the utmost importance in achieving a testable system within the time allotted, much can be gained by early committee evaluation and participation in system design and implementation. In addition, since committee members are representative of operating agencies, it is expected that all interests can be effectively considered in initial system structuring and that problem areas will be readily apparent prior to an extensive investment of resources.

#### STATE COMMITTEES

In 1970, a Task Force on Criminal Justice Reports and Records was created from the membership of the Texas Criminal Justice Council. The prescribed purpose of the Task Force was to study criminal justice reporting procedures in Texas and to make recommendations for a mandatory reporting system that would be essential for operation of the Texas Crime Information Center (TCIC). The work of the Task Force is supervised and directed by an Executive Committee, which also appointed the group's Technical (working) Committee. The Technical Committee, chaired by Peter Kleck of the Criminal Justice Council Staff, is made up of personnel from representative state and local criminal justice agencies.

As set forth by the Criminal Justice Council, the objectives of the Technical Committee are as follows:

1. Analyze present reporting procedures.
2. Recommend reporting statutes to the state legislature.
3. Design a model system for uniform reporting—data needed, types of reports, forms design and instruction manuals.
4. Demonstrate recommendations under Project SEARCH in Tarrant County.

Functionally the Technical Committee is divided into three subcommittees assigned to the areas of Law Enforcement, Prosecution and Courts, and Corrections. The ad hoc Committee for Criminal Justice Reporting Law has been given the task of preparing a model uniform mandatory reporting statute to provide the data input for TCIC.

The Task Force objectives and the project goals overlap to a great degree. The work of analyzing present reporting procedures in Tarrant County, determining data needs, and designing model forms clearly coincides with the statewide objectives established by the Criminal Justice Council for the Technical Committee. For this reason the local project will utilize the recommendations made by the Technical Committee. At the same time the Tarrant County participant agencies are in a unique position to influence state criminal justice reporting decisions. The research and analysis for the Project will be used in the design of a model mandatory reporting statute and a model system for uniform reporting.

If duplication and wasteful overlap are to be avoided, it is essential that there be close contact and coordination between the State Task Force and the Tarrant County Project. Dr. James Stevens, a member of the project staff, is a member of the Technical Committee and Chairman of the Implementation subcommittee. He will provide liaison between the two groups. In turn, the Technical Committee will provide project personnel with copies of its reports and recommendations. Peter Kleck, Chairman of the Technical Committee and Criminal Justice Council Director for Science and Technology, will serve as an ex-officio member of the local committees.

#### RESEARCH AND DEVELOPMENT ACTIVITIES

As indicated above, the North Central Texas Council of Governments was the grantee under the Project SEARCH involvement of the State of Texas. Mr. Fred Keithley, Director of Criminal Justice, NCTCOG, is the regional project director and is responsible for ensuring coordination and implementation of the project as outlined in the grant proposal. Mr. Keithley's role is one of supervision and direction, thus allowing the degree of objectivity and detachment essential for regional monitoring and evaluation of the project.

#### INSTITUTE OF URBAN STUDIES

Specific research and developmental activities were contracted to The Institute of Urban Studies at The University of Texas at Arlington and to the City of Fort Worth. The scope of services listed for the Institute of Urban Studies includes the following:

1. Prepare and publish a detailed study design and explanatory material for dissemination to organizations involved with the design, development and implementation of this

project. This will include statements of objectives, methodology, time schedules, and final products to be expected.

2. Provide supervision for the project.
3. Coordinate and refine current systems analyses to specify reporting variables.
4. Design and guide the implementation of reporting and data gathering methods for file creation and maintenance.
5. Supervise the collection of data on offenses and offenders within Tarrant County for a six-month period.
6. Participate with the City of Fort Worth to that extent possible in the development of the software package for the subject-in-process subsystem of the Texas Criminal Justice Information and Communications system.
7. Supervise the creation of a communications system for the purpose of providing a data base for inquiry and statistical analyses of a criminal justice system.
8. Provide on a demonstration basis statistical and management information on offenders from the tracking system to agencies involved in the development of the system to determine uses of data and to test system structure.
9. Document methods and procedures of the project.
10. Coordinate with the Planning Agency Staff and any committees it may specify in the performance of all the foregoing work and submit monthly reports on progress.
11. Provide 500 copies of a final report describing project development and explaining successes and failures. This report will include information on organizations involved, procedures developed for project implementation, forms designed for data input, instruction manuals prepared for system implementation, and an evaluation of system functioning.

Dr. James W. Stevens is the Institute's project director and is project manager for the North Central Texas Council of Governments. Dr. Allan K. Butcher of the Institute staff is charged with responsibility for coordinating the criminal justice field research and implementation insofar as operating agencies are concerned. Mr. Gerald S. Tyson is responsible for the information systems and data processing tasks required under the Institute's portion of the project.

#### CITY OF FORT WORTH

The scope of services contractually specified for the City of Fort Worth includes the following:

1. Edit and keypunch all data used in the criminal justice tracking system.
2. Provide data processing systems design and programming of the data used in the criminal justice tracking system.
3. Provide such computer processing as may be required to develop and test the criminal justice tracking system.
4. Provide such data, reports, and records as are existing and in possession specified by the Grantee as being necessary for the carrying out of the criminal justice tracking system.
5. Submit monthly progress reports to the Grantee at the end of each calendar month during the course of this project.
6. Submit quarterly accounting of expenditures, fully documented, to the Grantee in order to provide a basis for auditing and accounting of expenditures.

Mr. Charles Binford, Assistant City Manager, is the project director for the City of Fort Worth. Mr. Don Harwell, Director of Data Processing, is in charge of data processing coordination and Mr. James England

is supervising systems design, data processing, and programming for Fort Worth.

#### RESEARCH AND METHODS

Two types of research were conducted before final design and development of the system. The first type of research consisted of an in-depth examination of presently operable or planned information systems of a similar nature. A survey of such systems has been completed. The second type of research consisted of field investigation which began during the month of August. Field research concentrated on unique characteristics of operating agencies in Tarrant County.

The general areas for initial study included the following:

1. What forms or reports are used within your agency to record or control the processing of a subject?
2. What is the internal flow of these forms or reports?
3. What periodic internal reports or summaries are made and with what frequency?
4. What periodic reports are made to other agencies or officials?
5. How much and what type (formal or informal) communication takes place between your organization and other criminal justice agencies?
6. What information from other agencies would be useful to the functioning of your agency? In what form or how often would this information be desirable?
7. How do you see the type of information to be contained in the subject-in-process system as being of assistance to your office?

This phase of the research required the collection of all reporting forms used in the various agencies, a charting of information exchange across organizational boundaries, a linking of agencies for subject processing, and other matters that bear on the subject's movement through the system.

Information solely relevant to a subject's movement *within* an agency was not sought since the emphasis was on the total system and the interrelation of agencies rather than the internal operation of the individual agencies.

#### DATA ELEMENTS

In order to provide a starting point for discussion of the kinds of data to be contained in the master file of the subject as he progresses through the criminal justice system, a tentative list of data elements was constructed. Some of the elements, such as those identifying the subject (name, sex, race, etc.) were determined by the requirements of the NCIC and SEARCH. Likewise, since it is imperative that this system be compatible with that of the TCIC, where possible the codes and data elements designated by the State of Texas were used.

Having the codes and forms of the data elements for this system compatible with those of NCIC and TCIC should facilitate handling of the data by agencies in the field and should reduce duplication. It is also expected that if the subject-in-process system is

fully implemented, any entry into the system would contain the requisite information for an automatic check of the NCIC and TCIC files also.

In addition to the data elements to be used for the simple tracking of the subject as he progresses through the system, other information, such as social characteristics, was included in the final data file to facilitate long-range research on recidivism, rehabilitation, and other subjects of interest to criminal justice agencies.

The listing in Appendix III indicates the basic framework used in structuring the final master file. Efforts were made during the field research to solicit reactions to these items and their value in the final file for retrieval and management purposes. Other data items will be included in future systems if needed, and it is expected that suggestions from criminal justice officials will result in the expansion of the master list to provide system capabilities not anticipated at present.

#### THE SUBJECT-IN-PROCESS CONCEPT System Overview

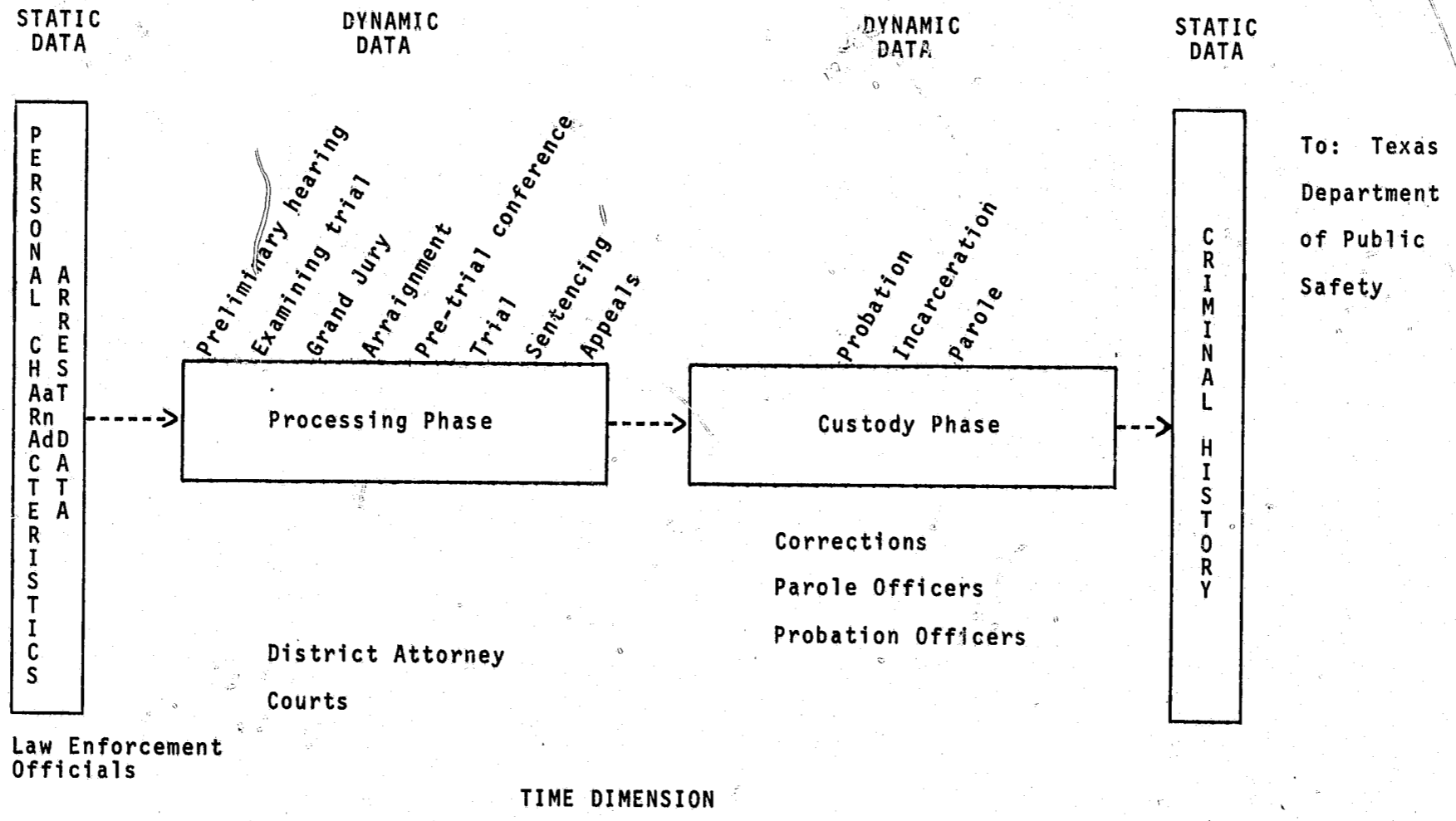
An overview of the system to be covered and the basic segments of the process are presented in the following flow chart. The chart indicates the three basic segments which will provide data input for the system. These include (1) arrest and booking records from law enforcement agencies for the initial file of personal data and event description, (2) processing phase data from prosecuting attorneys and courts, and (3) data on the custody phase from corrections, parole officers, and probation officers.

The first phase data are static in the sense that they do not change during the course of the process nor are they generated by the operation of the agencies involved. These data are recorded as initially reported and only corrections will result in changes after the first file is created. The second two phases provide data created by the agencies that process the individual. These data change as the individual moves from agency to agency or as the individual is processed by a single agency. In this sense, they are dynamic.

The final disposition of the process master file results when the individual is released from the criminal justice system. At this point, a criminal history file is forwarded to the Texas Department of Public Safety for inclusion in the State criminal history file.

In its preliminary draft of the project proposal, the staff of the Criminal Justice Council summarized the subject-in-process system as a "demonstration project to establish an offender-based file that will reflect the dynamic composition and characteristics of a criminal justice system. Each record in the data base will reflect the history of each arrest and the current status of an offender while he is in the criminal justice process. Each record will be updated as an

SYSTEM FLOWCHART



TIME DIMENSION



Subject-in-Process Data Coverage and Institutional Participation

offender moves through the process, and when the record of his arrest has proceeded to a point of exit from the system a summary of that record will be created to update a criminal history file.

"In aggregate, the file will reflect, at any time, a dynamic inventory of a criminal justice system. This file will be used to extract information relating to a particular offender for his current status, for analysis of a group of offenders having common characteristics, for research to study any aspect of a criminal justice system for management information to evaluate the effectiveness of system components, and other applications that relate to specific or summary information of an operational or management nature."

In the same preliminary draft, the council enumerated the specific objectives of the subject-in-process tracking system project to be the following:

1. Create a substantial data base of complete transaction-based offender records to provide a means of evaluating and measuring a criminal justice process.
2. Provide an available base of comprehensive information on crime and criminals for research, diagnostic and management purposes.
3. Establish on-going data requirements, collection, reduction, and dissemination procedures to gain experience for implementing a state-wide criminal justice reporting system.
4. Provide a basis for utilizing operations research techniques, such as input/output simulation models as a means of testing new approaches or concepts of systems alternatives.
5. Prepare for the integration of this sub-system into the State's Criminal Justice Information and Communications System.
6. Provide experience and documented methodology for establishing and maintaining a model system for other states or jurisdictions.

#### THE SUBJECT-IN-PROCESS IN PERSPECTIVE

While the subject-in-process system is being developed, every effort is being made to organize the system to achieve maximum compatibility with other existing or proposed information systems. One of the most important of these is the Texas Crime Information Center. Basically, the TCIC will provide two types of information to support law enforcement agencies; these are *management* and *operational* information, with the assumption that information and data for *research* will be subsumed and utilized under management. While it may be difficult to distinguish the function of data in various contexts based on these categories, some examples may suffice for purposes of definition. The *TCIC Final Report* offered the following:

*Operational information*—services related to information about persons, property, vehicles, etc.

*Management information*—related to that information required by those who manage criminal justice agencies, such as statistical information.<sup>1</sup>

Examples of uses of information offered by the 1970 *Criminal Justice Plan for Texas* include:

A law enforcement officer can radio in for information on a license plate or suspicious subject and receive an answer regarding a stolen car or dangerous criminal within a few seconds.

A prosecutor can easily and quickly obtain complete criminal records on subjects he must prosecute.

A judge can quickly determine bail risk by viewing a summary of a subject's criminal history, and/or the status of other arrests should he already be on bail in another jurisdiction.

Prison and jail authorities can more efficiently process the inmates coming into their jurisdiction by obtaining more complete information.

Parole and probation officers can be automatically notified when one of their subjects is arrested either locally or in another jurisdiction.

These examples illustrate what may be generally defined as "operational information," since the information received is expected to affect the process in which particular individuals are involved. The information will, supposedly, change the course of events in a manner that should ensure more comprehensive understanding of the circumstances and provide for a more rational decision on the part of the official involved.

Management information aids in the general decision-making process and supports planning and allocation of organizational resources. Types of reports suggested by the *TCIC Final Report* include:

Activity summary reports for each agency  
Communication lines traffic reports  
NCIC traffic reports  
NDRS traffic reports  
LETS traffic reports  
Rejected messages reports  
Arrest reports  
Dispositions reports  
Rap sheet printouts  
Fingerprint lookup routine for DPS  
Vehicle file content reports by make, model, contributing agency, etc.  
Property file content reports by make, model, contributing agency, etc.  
Person sub-file content reports by age, sex, race, contributing agency, etc.

While these items suggest the types of statistical reports possible with the system, the *TCIC Final Report* did not attempt "to specify exact data elements and format requirements because this is generally late in the system implementation phase and usually continues as new requirements arise from the various Criminal Justice agencies."

Management-related studies exemplified by the following will be possible from the subject-in-process information:

1. Studies of groups categorized by age, race, crime specialty, geographical region, disposition, treatment, etc.
2. Reports which display subject processing times, bottlenecks in the criminal justice process, work loads, reporting deficiencies, etc.
3. Studies of criminal careers of selected individuals.
4. Detailed studies of recidivists which should contribute to crime prevention and rehabilitation.
5. Simulation of the Criminal Justice Process.

An additional operational use of the subject-in-process data involves the use of information for "alerting." This use results when a subject is arrested or detained by one jurisdiction and is being processed or carried on probation or parole by another jurisdiction. The first jurisdiction can notify the second jurisdiction of the violation and the action taken in the second incident, and thus provide officials with data about the individual which may be relevant to his treatment or control.

The alerting capability is not identical to that provided for wanted persons although the concepts are similar. The information that a person is wanted would result in an arresting jurisdiction holding the subject until the agency "wanting" the individual has had the opportunity to evaluate the situation and possibly initiate extradition proceedings. In the alerting process, the concerned jurisdiction is simply notified of new developments and should take whatever action is warranted in the light of the individual's status.

Analysis of the "subject-in-process" thus facilitates "operational" control of subjects, since progress can be monitored and subsequent action taken to affect movement. The provision of this type of data supports research studies and operations analysis for general decision making and management and, in addition, provides the operational basis for more effective movement and control of specific individuals.<sup>2</sup>

#### BENEFITS TO CRIMINAL JUSTICE AGENCIES

Getting accurate, current information to the proper individuals and agencies when they need it and in the form they need it is the goal of the subject-in-process system. Many obvious benefits will accrue to the individual agencies and the criminal justice system as a whole from such an interagency information system. While some of the more apparent of these are listed below, it can be expected that many others will be realized once the system is in operation. Basically, these benefits can be divided into those relating to a specific individual in the system and those involving management reports derived from the total or aggregate data.

##### k. Immediate Retrieval of Specific Information.

- A. By means of an automatic alert, interested agencies such as the District Attorney's Office or parole offices will be notified of the arrest of any person who is already in the criminal justice system on a previous charge. This timely information will allow the agencies to take appropriate action based on the knowledge of the new situation or events.
- B. Provide a unified information source for the District Attorney's Office to use in presenting the charges to the grand jury.
- C. Provide a unified information source for presentence report purposes.
- D. Provide a unified information source for use by the Board of Pardons and Parole in considering action.
- E. Provide information for law enforcement agencies in

the scheduling of personnel so as to have the necessary officers available for trial at the proper time.

- F. Provide information for probation or parole officers to facilitate record keeping, identification, and other activities.
  - G. Provide time controls to monitor the system to ensure a continuous flow of current information on the status of each individual in the system. For example, the District Attorney's Office might want a print-out each week alerting it of individuals whose progress in the system has been interrupted or delayed for an unusual amount of time.
  - H. Provide a complete criminal history of each transaction which can be filed locally and by the state agencies upon the subject's exit from the system.
- II. *Benefits Derived from Aggregate Data*
- A. Provide statistics for management decisions such as the optimum allocation of agency resources (e.g. personnel, equipment, etc.).
  - B. Provide data for the scheduling and balancing of the work load within each agency.
  - C. Provide data for the systematic evaluation of programs, policies, and personnel.
  - D. Provide data for long-range research into areas such as recidivism, rehabilitation, and other areas of vital importance to criminal justice agencies.
  - E. Provide data to support requests by the agencies for additional personnel, equipment, funding or other resources.

Numerous other benefits to participating agencies will undoubtedly become evident as the system is put into operation and tested. It is the intention and objective of the project staff to observe and monitor the agencies' uses of the system in order to illuminate those areas of operation in which further system benefits can be enhanced.

#### CONCLUSION

Several ideas which were touched on in this paper, and several others that were not emphasized, should be summarized at this point. First, extensive cooperation among criminal justice agencies will be required. Heretofore these agencies have not been inclined to give up any institutional autonomy that might be required by participation in such a system. Extensive education and strong emphasis on total system benefits will have to be used to break the traditional sense of sovereignty that has characterized organizations involved in the criminal justice process.

Secondly, the system advocated will eventually allow control over the entire criminal justice process (in addition to benefiting each participating agency). The disruptions caused by lack of interagency communication should be minimized—at least insofar as data about the subjects of operations are concerned. Accurate measurement of processing times and quantity of persons moved should be achieved. Automatic, programmed reports on criminal justice system operation will be possible.

Thirdly, the research and development project will concentrate on problems involved in establish-

ing regional, metropolitan, or inter-jurisdictional information systems. The project in Tarrant County will involve a regional council of governments as the project control agency and will attempt to design, develop, and implement a system that requires participation, not only from all agencies at each level, but from different jurisdictions (with all agencies). Thus county, municipal, state, and federal agencies will be involved in the system when it becomes operational. A major objective of this project is to determine what problems are involved in implementing such a system and the strategies required for stimulating cooperation.

Finally, the subject-in-process tracking system involves the type of system that will today receive public support because of the emphasis on law enforcement. The system should provide a concrete product

that will stimulate long-run financial support after its capabilities are demonstrated. However, the operations and benefits will not be as dramatic or as visible as those of immediate response systems such as the NCIC. The advantage of total criminal justice process coverage must still be demonstrated and use of the system stimulated. In the long run, it is expected that system payoffs will become evident.

<sup>1</sup> Systems Science Development Corporation, *Texas Crime Information Center: Final Report* (St. Louis, Missouri: SSDC, July 1969), Section 3, p.1.  
<sup>2</sup> Much of this material is taken verbatim from James W. Stevens, *State and Regional Information Systems: The Criminal Justice Component*, (Arlington: The Institute of Urban Studies, The University of Texas at Arlington, 1970), pp. 42-47.

NATIONAL

SEARCH PROJECT GROUP  
Hugh McLeland,  
Texas Representative

STATE

Texas Criminal Justice Council  
Peter Kleck, State SEARCH  
Coordinator

Task Force on  
Criminal Justice  
Reports and Records

REGIONAL

NCTCOG  
Fred Keithley, Director of  
Criminal Justice, Project  
Director

North Central Texas  
Criminal Justice  
Policy Development Committee  
T. J. Vandergriff, Chairman

PROJECT

City of Fort Worth  
C. Binford, Ft. Worth  
Project Coordinator  
D. Harwell  
J. England

Institute of Urban  
Studies  
J. Stevens,  
Project Manager  
A. Butcher  
G. Tyson

Tarrant County  
Project Committee

Regional Criminal  
Justice Information  
System Committee

Project SEARCH Administration and Committee Structure

Appendix I



GENERAL TIME SCHEDULE  
SUBJECT-IN-PROCESS TRACKING SYSTEM

	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
PREPARATION OF WORK STUDY PLAN	██████████											
SYSTEMS ANALYSIS	██████████											
SYSTEMS DESIGN		██████████										
PROGRAMMING		██████████										
TESTING AND DEBUGGING					██████████							
INSTRUCTIONS TO USER AGENCIES				██████████		██████████		██████████				
DATA INPUT				██████████								
SYSTEMS USE AND TESTING						██████████	██████████	██████████	██████████	██████████	██████████	██████████
EVALUATION							██████████	██████████	██████████	██████████	██████████	██████████
DOCUMENTATION											██████████	██████████

Appendix II

Appendix III

<i>Description</i>	<i>Length</i>	<i>Description</i>	<i>Length</i>
1. Name.....	30	51. Date Subject Transferred to County Jail ..	5
2. Sex .....	1	52. Amount Bond Set.....	4
3. Race.....	1	53. Date Bond Posted .....	5
4. Date of birth .....	6	54. Type of Bond.....	1
5. Place of Birth .....	3	55. Place Held When Bond Posted .....	7
6. Height.....	3	56. Name of Bondsman .....	30
7. Weight .....	3	57. Date of Grand Jury Indictment.....	5
8. Eyes, color .....	1	58. Indictment Number.....	6
9. Hair, color .....	2	59. Indictment Charge A.....	4
10. Visible marks.....	49	60. Indictment Charge B.....	4
11. Address, residence .....	30	61. Indictment Charge C.....	4
12. Census Tract and Block .....	9	62. Date of Formal Arraignment.....	5
13. Occupation.....	6	63. Court Arraigned (Judge) .....	2
14. Driver's License Number .....	8	64. Plea Entered .....	1
15. Driver's License State .....	3	65. Amount Bond Set .....	4
16. Social Security Number.....	9	66. Date Bond Posted .....	5
17. Miscellaneous Numbers.....	15	67. Type of Bond.....	1
18. First Offense, Code .....	4	68. Place Held .....	7
19. Offense Location, Address .....	30	69. Name of Bondsman .....	30
20. Census Tract and Block .....	9	70. Date Applied for Counsel.....	5
21. Offense Date .....	5	71. Date Counsel Assigned .....	5
22. Offense Time.....	4	72. Name of Counsel .....	29
23. Offense Day of Week .....	1	73. Name of Prosecuting Attorney .....	29
24. Type of Place of Offense .....	2	74. Date of Pretrial Conference.....	5
25. Second Offense, Code .....	4	75. First Pretrial Motion .....	2
26. Third Offense, Code .....	4	76. Date.....	5
27. Arrest Date .....	5	77. Outcome.....	1
28. Arresting Agency Code.....	7	78. Second Pretrial Motion .....	2
29. Arrest Number .....	6	79. Date.....	5
30. Offense Number .....	7	80. Outcome.....	1
31. Arrest Agency File Number.....	8	81. Third Pretrial Motion .....	2
32. Fingerprint Classification .....	20	82. Date.....	5
33. Previous Offense Code, No. 1 .....	4	83. Outcome.....	1
34. Date.....	5	84. Fourth Pretrial Motion .....	2
35. Conviction .....	1	85. Date.....	5
36. Previous Offense Code, No. 2 .....	4	86. Outcome.....	1
37. Date.....	5	87. Fifth Pretrial Motion .....	2
38. Conviction .....	1	88. Date.....	5
39. Previous Offense Code, No. 3 .....	4	89. Outcome.....	1
40. Date.....	5	90. Sixth Pretrial Motion .....	2
41. Conviction .....	1	91. Date.....	5
42. Alias.....	30	92. Outcome.....	1
43. Skin Tone.....	1	93. Seventh Pretrial Motion .....	2
44. Trademark .....	30	94. Date.....	5
45. Driver's License, Year Expires .....	2	95. Outcome.....	1
46. FBI Number .....	8	96. Eighth Pretrial Motion .....	2
47. DPS Number .....	10	97. Date.....	5
48. Preliminary Hearing Date .....	5	98. Outcome.....	1
49. Preliminary Hearing Magistrate .....	2	99. Trial Judge .....	2
50. Date Charges Filed in J.P. Court .....	5	100. Date Trial Called .....	5

Description	Length
101. Trial Disposition Date .....	5
102. Disposition .....	4
103. Type of Sentence .....	4
104. Type of Length of Sentence .....	4
105. Duration of Sentence (in months) .....	5
106. Amount of Fine (in 00's) .....	4
107. Date of Appeal to Texas Court of Criminal Appeal .....	5
108. Disposition .....	1
109. Date Appeal to Federal Court of Criminal Appeal .....	5
110. Disposition .....	1
111. Date Appeal to U.S. Supreme Court .....	5
112. Disposition .....	1
113. Date Entered Probation .....	5
114. Probation Officer Assigned .....	1
115. Date of Motion for Probation Revocation .....	5
116. Reason .....	4
117. Date Revoked .....	5
118. Disposition From Revocation or Attempt to Revoke .....	4
119. Date Entered Correctional Institution .....	5
120. TDC Number .....	6

Description	Length
121. Institution Held .....	2
122. Institution Rehabilitation Program Participation .....	2
123. Date Re-entered .....	5
124. Unit Re-entered .....	2
125. Date Parole Granted .....	5
126. DPO Assigned .....	3
127. Date Parole Revoked .....	5
128. Reason .....	4
129. Date Exited From System .....	5
130. Reason .....	4
131. Charges Reduced to Misdemeanor .....	4
132. Extradicted to — (State) .....	3
133. Education .....	2
134. IQ .....	3
135. Narcotics Use (Yes or No) .....	1
Previous Arrests Not Listed Before	
136. Offense Code .....	4
137. Date .....	5
138. Offense Code .....	4
139. Date .....	5
140. Offense Code .....	4
141. Date .....	5

## THE DEVELOPMENT OF A LAW ENFORCEMENT COMPUTERIZED SYSTEM FOR TACTICAL INFORMATION CORRELATION AND RETRIEVAL

by Sergeant R. L. Kenney and  
Captain George E. Conroy  
Los Angeles Police Department

### INTRODUCTION

Since the early 1960's the Los Angeles Police Department's research and development of automated information systems has burgeoned. Today a family of such systems exist within LAPD; the Automated Want/Warrant System provides real-time access to 300,000 records; Law Enforcement Manpower Resources Allocation System (LEMNAS) provides watch commanders with predictions of work load; the Traffic Information System ferrets out traffic accident/citation correlations; and the Automated Arrest/Booking system expedites arrestee processing. An Automated Record Management System (ARMS) is on the drawing board as is an Emergency Command Control Communications System (ECCCS). These systems cover the basic logistical and functional demands of a large metropolitan police department, but a void still exists as to *modus operandi* and crime prediction considerations. This last member of the automation family will be the Law Enforcement Computerized System for Tactical Information Correlation and Retrieval, also known as the PATRIC System (Pattern Recognition and Information Correlation), and future reference to this system will be under that acronym.

PATRIC represents an MO system concept different in kind, not degree. Boiled down to its essentials, the PATRIC Project is concerned with devising an effective man/machine interface which simulates specialized investigative reasoning. The difficulties involved are familiar to anyone who has worked with *modus operandi* considerations. In the absence of hard data such as named suspects, license numbers, or fingerprints, MO searches become almost a ghost hunt when the investigator considers all of the possible combinations/permutations involved in such analysis.

This paper has four basic sections. The first is a description of the basic PATRIC functions and their relation to the operations of a police department. The second part describes an experiment conducted by LAPD and Systems Development Corporation (SDC) of Santa Monica, California (contractor for the forthcoming PATRIC experiment); this experiment consisted of taking a small amount of LAPD MO data and placing it in an automated environment and con-

ducting various tests to examine the feasibility of an automated MO system. The third section describes the PATRIC operational test-bed which will be a one-year effort consisting of a real-time information system with crime and crime-related report files accessible to 5 of the 17 geographic police divisions of Los Angeles. The fourth section deals with the technical characteristics to be determined during the one-year effort. Because technical characteristics will determine costs involved in building the ultimate PATRIC System, this section is prefaced by statements on methodology of acquiring cost effectiveness.

It is anticipated that the PATRIC operational test-bed will commence January 1, 1971.

### PATRIC: ITS BASIC FUNCTION

Three basic areas for operational research will be conducted during the PATRIC test-bed period. Of these three areas, two are rather straightforward. First there is the detection of crime patterns in order to supply patrol personnel with detailed deployment plans for problems indigenous to their assigned area. The second is the correlation of suspect, *modus operandi*, and property information to supply investigators with filtered and distilled data from existing records within the police department. The basic difference between these two functions is that the former, patrol deployment, is not so much concerned with following up on a specific crime in order to arrest the perpetrator and recover any property outstanding, as it is to take a group of crimes and extract that information which would be of use to the patrol officer. For example, if a rash of burglaries are occurring, it is the patrol function to deploy in such a fashion as to be in the right place at the right time to stop the burglar whoever he may be.

This is opposed to the detective function wherein a specific burglary is assigned to an investigator and he is charged with the follow-up on that crime for the express purpose of apprehending the perpetrator and recovering any stolen property. If information is available concerning the specific perpetrator of the crime, then the investigator will follow up and solve the problem in that matter. Oftentimes, however, a series of burglaries has no information other than basic MO. The PATRIC function will be to analyze burglaries, for example, and pull out that information which will be most useful to the patrolman. This

would include the type of premise most often attacked. It would also include the prime time during which the burglars are committing the crimes. And would give other information such as the type of property most often attacked, the method of entry, especially if specialized burglary tools were used, etc. Thus each radio car in a division would be supplied with a tailor-made deployment plan which would provide the officer a blueprint for intelligently deploying on that problem. Currently techniques such as pin maps are employed, but they are of limited utility because the officer more than likely does not have unlimited time to deploy. Given his basic duties of responding to calls, serving warrants, handling traffic problems, etc., he normally has only limited time for deploying on special problems. PATRIC would thus provide him with information that would go something like this: between 10:00 and 11:00 there is a high probability that a burglar will be in a certain area, and that he will be attacking two-story apartment buildings using a jimmy, and taking electronic sound equipment. By 11:00 the crime patterns might show that burglaries drop dramatically but that a robbery pattern develops near midnight. In this way a more effective and efficient use of patrol personnel can be effected.

The research conducted during the test phase will be geared toward isolating those descriptors from incoming crime reports which best serve patrol officers and deployment techniques. Another question to be addressed in the PATRIC research is the periodicity of such deployment reports. Would it be necessary to supply such reports daily, weekly, or monthly? This becomes exceedingly important in costing out a system such as PATRIC.

The second area of PATRIC function is the correlation of data for the investigator. Here the emphasis is on specific suspects being identified with specific crimes. In this case each incoming crime report is examined to see what other possible files could be of use in the correlation strategies. For example, a burglary report might have a sketchy physical description and vehicle description, along with the basic MO information and stolen property description. In this case several passes would be made at the files. The investigator would be provided a listing of all other crimes with the same MO, a listing of possible suspect descriptions from the field interview and Investigator's Final Report File, and a listing of property from pawnshop records which matched the property stolen in the burglary. This entire package would be presented to an investigator; he would evaluate it and follow-up on that which he deemed appropriate. At this point his evaluation would be fed back to the research team.

The third area of the PATRIC function is perhaps one of the most interesting. It is termed the detection of multiple occurrence. This function was the

result of an observation stumbled upon. During the 1968-69 tests at SDC, project personnel were scanning a data base profile wherein all of the data elements were displayed on a cathode ray tube along with their occurrence count in the data base. While examining a field interview file, there was an occurrence of one license number appearing six times in the data base. Since this could possibly have been a loading error or an instance of six duplications of one record, the entry was investigated. It seemed that there were six different field interviews entered at different times on the same vehicle, and they were all in a given location of the city except one, which was in an area frequented by narcotic addicts. All of the instances were in the early morning hours, and none of the persons listed as being in the vehicle lived in that area. The hard copies of the interview cards were obtained and the concerned investigators interviewed. All of the persons in the car were known to the detectives and all of the persons had records of burglary. Thus it was obvious that there was a high potential for a burglary ring existing, and this would be a natural for surveillance deployment in the affected area. From this incident the PATRIC researchers built a hypothesis that this sort of multiple occurrence could be applied to other areas of the data base and become a monitoring function.

One of the initial determinations which will have to be made during the project period will be to establish levels of significance in multiple occurrence. Another example of a multiple occurrence monitoring function would be in the pawnshop records. Taking, for example, the pawning of typewriters of a given type or even of all typewriters, the researcher would have to know what is the normal level of such transactions. From there certain parameters must be established wherein a level of significance occurs. If the average daily pawnshop transactions in typewriters is 100, then some number above 100 becomes significant. If during a given period, one week for instance, 160 typewriters were pawned and all of them were IBM Selectrics, there is a probability that these articles were taken in a burglary or theft. The important point is that an investigator be notified to check out the situation; conceivably a theft would not be discovered for some weeks to come. If the detective were to go to the pawnshops and examine the merchandise and question the pawnshop dealer, it is quite possible that the theft could be detected earlier and the follow-up work done at a more advantageous time. The danger here is in eliciting data not necessarily of significance and thus defeating the purpose of the system by misdirecting investigators.

The three functional areas outlined above will be closely controlled and constantly monitored and evaluated. As correlation strategies, deployment techniques, and multiple occurrence parameters are arrived at there will be intensive evaluation of their

effectiveness. Feedback loops will be established to the system operators so as to cross-pollinate the system in the various divisions in order to capitalize upon better techniques as they evolve. This is not to say that the system operators at the test divisions will be stringently controlled in all that they do. In fact, some amounts of experimentation will be encouraged as the operators and the investigators confer in the best approach to solving problems. If unique or unorthodox methods seem appropriate, they will be tried and their results will be monitored by the research staff in the laboratory, and if it should seem appropriate these techniques will be fed back to other systems operators.

The overriding objective during the operational test-bed period will be to derive as much information regarding the tactical effectiveness of police data as possible, and any and all techniques will be examined.

#### A LABORATORY EXPERIMENT

Between June 1968 and January 1969, LAPD and Systems Development Corporation conducted a computer-based laboratory experiment to test MO correlation feasibility.<sup>1</sup> A data base consisting of ten-weeks' worth of crime and field interview data was constructed, utilizing SDC's Q32 computer complex with the lucid programs. This system is highly user-oriented, employing simple English instructions. The data source was punched cards produced by the Los Angeles Police Department; these cards contain 80 columns of data per crime incident.

PATRIC Project personnel were in-house at SDC during the seven months of this study. In order to validate correlation hits, three investigators were detached from their divisional assignments and phased into the PATRIC laboratory test environment. Using daily listings of crime and suspect descriptions, project staff could make queries of the system based on crime characteristics. For example, a male, Caucasian, 25 to 30 years, 5'10" to 6', 180 to 200 lbs., commits a robbery and uses a German Luger, binds the victim and forces him to the back room, takes cash only and departs in an old green sedan. This crime extract would be run against other robberies in the data base. And the very construction of the query highlights a central problem still facing PATRIC research, a problem which must be resolved during the forthcoming operational test-bed experiment.

If the suspect description, his MO actions, and his vehicle are entered into the system exactly as listed on the crime extract, any retrieved robbery correlation would, on the face of it, have high probability of being a crime perpetrated by the same individual. Some interesting questions arise as each descriptor is considered.

Male

This information is virtually assured as correct.

Caucasian

This information has a high probability of being correct.

25-30 years of age

At this point we become involved in a gray area potentially creating problems for the automated system. For example, the suspect may well be described elsewhere with an age range outside of the one given on this extract. For example, if on another report the suspect is described as 22 to 24, that correlation indicator would be lost to this inquiry.

5' 10" to 6'

The same problem arises here.

180 to 200 lbs.

Again, we are faced with the same problem of how reliable is that piece of information.

German Luger weapon

The suspect may well have two or three weapons which he uses on different occasions.

Binds the victim and forces him to the back room

The suspect may on occasion deviate from this MO not necessarily because he would not follow it, but perhaps because the physical layout of the premise being robbed does not lend itself to such action. At any rate, there are many considerations as to how much reliability can be based on this MO trait.

And so it goes. If the search parameters are too loose (as in retrieving age on five-year parameters surrounding victim's description of suspects, which means 20 to 35 years) then "hits" too voluminous may be retrieved, making it unfeasible to have investigators check out all of the possibilities. If the parameters are too tight, good "hits" may be lost. Thus a problem in probabilities stands squarely before the researcher.

This area of research, however, was deferred from first priority as a twofold basic problem emerged as a result of the laboratory testing. The time lag (four weeks) between capture of initial data (e.g., crime reports) and the time that the pertinent crime data was in machine processable form is intolerable from a tactical point of view. Second, the data itself was losing something in the informational preprocessing procedures; its reliability was suspect.

Traditionally, the data preprocessing procedure consists of an officer completing a source document which is sent to a coding unit where a clerk analyzes the narrative content. From that analysis the clerk selects sets of MO descriptor codes from a catalog. The codes are then punched into a Hollerith card, and the input data media is available. It was this procedure which was to be the villain.

While the upshot of the 1968-69 experiment pointed toward feasibility of an automated MO correlation system, investigators, to a man, said that the system must be capable of rapid input of data and the data must be more reliable. If information is never more than a month old, too much potential was lost. Thus a queuing problem appeared to be needing solution.

Speeding up of data preparations seemed relatively simple, but data reliability was another ball game. The PATRIC Project Team conducted an analysis of the Department's information processing, and the resulting document was "An Analysis of the Capture, Flow and Processing of Selected Los Angeles Police Department Crime and Crime-Related Reports". Every step, procedure, and policy was examined. And a problem definition, almost an hypothesis emerged. Police officers were recording a crime event or personal contact which was oftentimes an interpretation of an event gleaned from composite statements of victims and witnesses. The officer's expertise in interviewing techniques usually guided the quality of the report. The report was then sent to clerical personnel with the officer's interpretation, and the clerks had to then perform their own interpretation based on that narrative. The data became twice removed from the occurrence.

As the coding clerks reached conclusions as to the MO involved, they had to find an appropriate descriptor from a book of MO codes. Unfortunately, MOs are not always cut and dried; close decisions sometimes had to be made. And if further information was required, it was unfeasible to go back to the original source because the volume and work load level were prohibitive—not to mention the logistics involved.

Yet to make each officer a coding clerk would not be cost effective. The solution appeared to be a compromise, and the first step was to evaluate the coding charts of MO data, to perform frequency runs, and to conduct interviews of investigators well-versed in MO techniques. This effort resulted in massive revisions to MO tables. Deadwood was cut away, updating of descriptors was made, and terms revised. When the dust cleared, a drastically reduced set of MO descriptors emerged. Lo and behold it appeared feasible to place the MO descriptors on field crime reports. (See Figure I.)

Not only did this crime report format appear to solve the interpretation problem, it pointed toward the speed-of-input problem. Codes still had to be given to the descriptors, but subjective evaluations became the sole responsibility of the officer making the initial investigation of the crime event. Also, optical character recognition became a distinct possibility, permitting a truly real-time information system to emerge and reducing possible error to only the investigating officer (OCR would eliminate transposed code numbers, mistaking during the keying of data to magnetic tape, etc.). Even though OCR application may be some time in the future, owing to costs involved presently, the preprocessing of the new reports would be drastically reduced in time because the clerical process would no longer require reading of narrative and time-consuming searches through coding books for the appropriate MO code.

At present the Los Angeles Police Department is preparing phaseover to its new crime report format processing procedure during the first quarter of 1971.

The present target is to have crime information in machine processable form within a 24-hour turnaround time.

With the new reports and the streamlined preprocessing methodology, the PATRIC Project is ready to conduct further tests geared to obtaining a real-time MO processing information system.

#### **PATRIC: AN OPERATIONAL TEST-BED SYSTEM**

The California Council on Criminal Justice has awarded grant funds to the Los Angeles Police Department to develop an operational test-bed in order to perform basic research and development in furtherance of the PATRIC System.

An operational test-bed environment has been decided as the method of approach because to-date there have been extensive "paper" studies and laboratory experiments; it now appears feasible and proper to conduct an experiment using operational personnel and operational situations to test the validity of the PATRIC hypothesis. The operational test-bed will have a data base consisting of tactical information from reports on robbery, burglary, theft from person, burglary/theft from motor vehicle, theft by trick and device, auto theft, homicide, aggravated assault, rape, child molesting, indecent exposure, kidnap, and prowler. In addition to these records the field interview file, the pawnshop transaction file, registered sex offender file, and the Investigator's Final Report will all be included in the system. All relevant tactical information from these reports and records will be entered into the system. All of the crime information will be taken from reports similar to the robbery report shown in Figure I. Figure II is an exemplar of the Investigator's Final Report which was revised as a result of the studies conducted during the past year. Of note is the formatting on the back of the Investigator's Final Report and the attached MO sheet. (See Figure III.) The terms employed on the Investigator's Final Report and its attendant MO sheet are identical with those appearing on the revised crime reports. The significance of this is that all operational personnel, both patrol officers and detective investigators, are employing the same terminology while preparing reports which will be input to the PATRIC System. Also of note is that the Investigator's Final Report allows the investigator to determine whether or not the report will be entered into the PATRIC data base. It is felt that the investigator, who conducts the follow-up investigation, is in the best position to judge whether or not the individual in question is indeed someone capable of perpetrating other crimes when released from the

criminal justice system or whether it is an arrest wherein the perpetrator will probably not again come in contact with law enforcement.

The operational test-bed sites will be six geographic police divisions with 2741 terminals installed in the squad rooms or the analytical offices. In this way the terminal operators will be in daily contact with operations personnel and will have firsthand contact with them and will be privy to a free flow of information from investigative or patrol personnel. The significance of this is addressed by Mr. Earl E. Hall of Dikewood Corporation and Captain Jack F. Chappell, Albuquerque Police Department, in their paper, "Man/Machine Systems to Aid in the Apprehension of Career Criminals", which was presented at the proceedings of the Second National Symposium on Law Enforcement Science and Technology in Chicago, Illinois, during 1968.

"With great respect for the substantial knowledge and skills typically developed out of experience by good police officers, we nevertheless suggest that some changes be made. In doing so we in no way wish to lose their experienced-based individual skills or to change those aspects of the system that allow them to develop. What we do suggest is that the organized nature of much crime, the natures of rules of evidence in court (which take little account of the police officer's judgments and educated intuition) and the availability of this new tool—the computer—indicate the great value of a team approach over highly individualized approach.

"The team approach asks that the patrol officer report accurately on each offense he investigates and that he provide to the systems analyst any auxiliary information about the city and about crime that becomes available to him. The system depends heavily upon identification crime site teams and other auxiliary investigators reporting accurately and in great detail on their investigations. All reporting must be done so as to facilitate compiling of the several sources of information on each single crime."

Further on in their paper, Dikewood and Chappell comment:

"The cooperative sharing of information and participating in planning officer assignments is not limited to systems analysts and patrol officers. The systems analysts should work closely with the detective division. A case can be made for including systems analysis as a part of the detective division. It is also possible to make a case for a separate section, or even for having systems analysis under patrol. In most cases, systems analysis will probably be part of the records division. The important point is not where this function is headquartered and managed. The important point is that a good free flow of information among all divisions to and from the systems analysis operation is crucial to its success."

Through decentralizing the PATRIC operational test-bed experiment into the detective squad rooms and the patrol division's analytical offices, it is hoped that the free flow of information will reinforce the experimentation conducted using the PATRIC data base. Through this type of operation, the full potential for retrieving tactical information from a police information data base can be realized. Full documentation of all uses made of the system in assisting inves-

tigators and patrol officers will be made and analyzed by the PATRIC research team. In this way feedback will be given to system operators as to the most effective method of searching the data base.

One of the objectives of the PATRIC test period is to derive correlation strategies for individual crime occurrences. During the operational test-bed phase, the entire operation will be through on-line interactive access to the computer. The volume of crime in a large metropolitan area such as Los Angeles, however, would probably prohibit a full interactive mode for an MO system. What is envisioned as results from the experiment would be automatic correlation strategies. If, for example, a strategy could be devised to handle an incoming robbery report, then the search would be made automatically and any resulting hits from any of the appropriate files would be transmitted to the investigator. It is also foreseen that there would be some amount of real-time interactive capability available, but this would have to be reduced to that which would be cost-effective. Thus the majority of incoming crime reports would be automatically correlated; automatic correlation could be overridden, and interactive correlation conducted in instances of severe crimes.

The kind of information that will be derived from the PATRIC experiment will be along these lines: The height of a described suspect should be expanded to a two-inch parameter outside of the given height description from the crime report; the weight descriptor should be expanded to 20 pounds of the given crime report descriptor. Certain MO characteristics would be flagged so as to indicate that their absence in a correlation search would not call for a rejection of other correlating reports which did not contain that particular descriptor. In other words, all points of information from a given record in the data base will be evaluated as to their intrinsic value in a correlation search. In this way an hierarchy of descriptors can be established in rank order of their probabilistic value. Again, the need to establish such hierarchies regarding the data concerned with *modus operandi* is central to the PATRIC research. The thrust behind the operational test-bed technique to be used on PATRIC is exemplified in Ward Edwards and Robert M. Gagne's *Psychological Principles in System Development*.

"One reason why men are good at tolerating and exploiting ambiguity is that they can effectively translate uncertainty into probability—another task in which men far excel computers. . . . Computers, on the other hand, are far superior to men in taking probabilities and payoffs and computing from them the best course of action. These considerations suggest that a military information processing system which must cope with relatively unreliable data . . . might profitably use human operators as transducers for probabilities. These probabilities could be entered into a computer, which would then compute the optimal course of action in the light of them."

The principle involved is pertinent to PATRIC research. During the 1968-69 experiments at SDC, certain tables were established which have guided the thinking behind the present operational test-bed concept. For example, on robberies the resulting correlations which the investigators indicated were worthy of follow-up were analyzed by descriptor type. The sets of correlating reports were divided into such categories as time of day, day of week, height, weight, age of suspect, means used, property involved, and trademarks exhibited by suspect, etc. The resulting tables showed that the match on time of day was within one hour in 15% of the instances; 15.7% was within 2 hours, etc. The height of the suspect was on an exact match in 34.7% of the correlating reports, one interval away (an interval being 3 inches) in 23.7% of the correlating reports. On the trademarks exhibited by suspect, the trademark match was good in 1.6%, fair on 36.4%, within possibility on 50% and dissimilar in 12%. The subjective nature of the evaluation of trademarks was necessary because of the very nature of trademarks which are a reflection of behavior. The investigators arbitrarily ranked them into the four categories. It is this sort of information analysis which will be continued and expanded during the upcoming PATRIC Project period.

This leads to evaluation. Two forms of evaluation will be conducted. First will be the classical measurements of police effectiveness: arrest rates, crime rates, property recovery rate, and crime clearance rate. As an adjunct to this objective evaluation, there will be subjective evaluation by a cadre of investigative specialists. This cadre would consist of specialists from robbery investigation, burglary, sex crimes, etc. The reason for supplementing the crime statistics with the subjective opinion of police experts is justified because there could be successful correlations which would not necessarily result in a dramatic decrease in a given crime rate. To abandon such correlations, especially when the system itself is on a limited geographic basis, would be unfair to the total system development.

Along with the establishment of value tables for the various *modus operandi* descriptors, a second hierarchy of information will be necessarily derived. This might be termed data age utility tables, or the establishment of utility of data as a function of its age. Because of the extremely large volumes of data involved, it becomes essential that some knowledge be derived regarding the length of time that the data should be retained, especially in a high speed storage environment. Data utility curves will be established wherein each correlation hit will be plotted so as to reflect the time between an incoming report and any reports which positively correlate against that incoming report. In this way information will be derived as to how long a given file should be kept

established until purging begins.

Along with the operational evaluation of PATRIC correlations, statistical research scientists will be using certain classical statistical techniques to derive meaningful patterns from sets of correlation hits. Of particular interest will be instances where an arrestee admits to perpetrating a series of crimes, a burglar, for example, admitting a series of 20 to 30 burglaries. These reports would be isolated in the data base and such techniques as regression analysis, discriminant analysis, and cluster analysis would be applied to these events to discover the various relationships existing therein. Also available will be a statistical technique developed by Systems Development Corporation and entitled *IDEA* (Inductive Data Exploration and Analysis).

"By use of teletype console and, when available, a cathode ray tube display with a light pen, *IDEA* enables the scientist to participate interactively in a data analysis process which involves the creation of a decision tree to represent important relationships in the data. As each potential branching point in an evolving decision tree is considered, *IDEA* displays the alternatives evaluated by the program, a measure of the value (desirability) of each, and a recommended course of action. The scientist may then decide: (a) to accept the program's solutions; (b) select one of the other alternatives; (c) request statistical evaluation of alternatives not considered by the program; (d) impose his own choice of action. In this way the scientist collaborates with the program in an inductive search for an underlying tree structure in his data."

The justification for using *IDEA* as well as other classical statistical methods is described.

"Classical induction algorithms such as regression analysis, discriminant analysis, and cluster analysis are often used by an investigator to help him discover, understand, summarize, and represent various relationships that exist among many measurements and observations. Whenever these interrelationships become very complex—containing non-linearity and interaction—the usefulness of the classical approaches is limited. In many cases the emergent structure is not obvious to the researcher; nor is he solely interested in testing an *a priori* hypothesis. Under these conditions his knowledge of the field from which the data come, and his experience, intuition, and pattern recognition skills—if these could be used—would enable him to improve on the results of classical methods or perhaps to succeed where the classical techniques fail."

Thus the preceding paragraphs describe the methodology involved in the operational test-bed approach. It is designed to wed the best of an operations approach using automated MO information in a real-life situation with classical statistical techniques in a laboratory environment. The desired result of this approach will be an understanding of the usefulness of complex *modus operandi* information in an automated environment as well as the interrelations of the various files resident in that system.

## PATRIC: TECHNICAL CHARACTERISTICS AND REQUIREMENTS

Thus far this discussion has centered around the tactical utility of a police information system and the methods to be employed in arriving at decisions regarding that information. Evaluations can be made concerning the utility of such a system, but to equate those capabilities to cost effectiveness is a delicate issue. To attempt to put a price on the apprehension of a burglar or to put a price tag on the recovery of contraband is questionable at best and impossible at worst. Yet some measure of cost effectiveness must be developed during the PATRIC research period. The considerations which will be used will include the increased effectiveness of police personnel. Presently an investigator on the Los Angeles Police Department devotes 40% of his time to pure investigative procedures; the remainder of the time deals with administrative processes such as the making of certain reports, the arraignment of suspects, and interviews with the district attorney's personnel in seeking complaints. If presently investigators can handle a case load of, say, five reports per day, then increasing that case load to ten per day as a result of functions of the PATRIC System can show a definite cost effectiveness. The same principle applies to deployed uniformed personnel. Another area is that of duplication; in a city such as Los Angeles the criminal element possesses high mobility within the 460 odd square miles of the city. During the experiments at SDC in 1968-69, there were several instances wherein crimes were correlated and it was found that investigators in different geographic divisions were working on the same problem unbeknownst to the individual investigators. Through a pooling of information there could be a much faster resolution of the case as well as an avoidance of duplication of effort. These sorts of considerations will constitute the basis for cost effectiveness evaluation.

The determination of the tactical system functions as described above is only one half of the PATRIC evaluation. The second half will comprise the technical requirements needed to produce the tactical results desired. This consideration will be handled through the assigning of a Senior Data Processing Analyst and a Software Systems Specialist to the PATRIC work group during the test-bed operation.

The objectives and the configuration of the operational test-bed are such that the anticipated test-bed system characteristics are felt to be justified. They include on-line interactive mode, time sharing, multiple remote terminal access, general purpose data manipulation, report generation capability, orientation to nonprogrammer use, English-like language, explanation of error message and command, system guidance on-line for inexperienced users, off-line

batch processing initiated either off-line or by on-line interactive command, and disc/drum/tape orientation. The system is capable of handling massive volumes of data (445,000 records per six months). All of these features would have to be justified in the eventual PATRIC System, and that evaluation as to their justification will be the province of the technical personnel described above. Another area of evaluation will be the input/output devices. The proliferation of IO devices today will require careful evaluation as to the most appropriate types necessary as well as the number of devices necessary to provide proper support for a PATRIC System.

Also, technical research will necessarily have to be conducted into the retrieval logic which the system would have to use to ultimately display information to the user.

These and numerous other questions must be answered by appropriate technical personnel because they will significantly impact upon the ultimate configuration of the system. Both technical considerations and cost tradeoffs must be taken into account in this feasibility evaluation since a major objective of the program is to provide an optimum system of maximum utility at the least total cost.

The operational test-bed period will, at its conclusion, provide three documented areas of concern: (1) a tactical requirements analysis, (2) a technical requirements analysis (those requirements necessary to support the tactical considerations), (3) a systems design document to guide the building of the ultimate PATRIC configuration.

## SUMMARY

The Los Angeles Police Department has, for the past several years, experienced an increase in work load not commensurate with the increase in police personnel. The increased work load results in a proliferation of reports which traditional manual procedures can no longer efficiently nor effectively accommodate. The need for automation is now well established within the police service, especially in large metropolitan areas. Wholesale numbers of automated police information systems are springing up throughout the nation, but most of these systems are based on retrieval of discrete elements. These systems call for a name, a license number, or some other hard fact, and such systems might be termed, "pure retrieval". The PATRIC System calls for a somewhat different system concept based on the blanket term, *modus operandi* evaluation.

Various studies and tests conducted over the past several years have indicated that the prerequisites to an effective MO system are accuracy and speed of data input. In furtherance of these two ends, the PATRIC Project over the past two years has radically revised crime report forms and has called for the magnetic tape encoding of *all* MO data available.

With these two objectives met, the PATRIC research team is now preparing to conduct an operational test-bed experiment to span one year using one of the more powerful hardware/software configurations available in private industry. The results and subsequent evaluation of this forthcoming year's effort will determine the configuration of the ultimate PATRIC Project, and will be available through the offices of the California Council on Criminal Justice for dissemination to interested agencies which may care to study the techniques, the results and the evaluation of this effort.

The operational test-bed environment will consist of six geographic police divisions, five of which will have on-line interactive access to the full data base and will have trained operators to work directly with investigative and patrol deployment personnel in furtherance of the police function. The data base will consist of crime reports, Investigator's Final Reports (these reports are based on interviews of arrestees), pawnshop records, field interviews, and registered sex offender reports. Correlation techniques will be derived that will point out the most efficient method to isolate other appropriate records which may bear on the case at hand and to supply the concerned investigator with that data. The three basic functions to be developed in the PATRIC research will be the correlation of appropriate records to provide the investigator with data in furtherance of his investigations. Feedback from the field personnel will be one of the methods of evaluating the effectiveness of all correlation techniques. A second will be the development of individual deployment plans for each radio car in a given division based upon specific problems indigenous to that radio car area. And a third will be the so-called multiple occurrence detection wherein significant patterns, which arise within the data base and reflect an identical value appearing more than once, will be evaluated for possible tactical signifi-

cance.

The evaluation of the PATRIC experiments will be divided between the opinion of police experts in their respective fields and the monitoring of classic police indicators such as crime and arrest rates as well as crime clearance and property recovery rates. Along with the operational testing in real-life situations, there will be laboratory experimentation on the data using classical statistical approaches to deriving significant patterns in the data.

Of particular interest is the utility of the data, which means assigning relative weights to all MO descriptors as to their value in an MO correlation search; also the data age utility is of extreme importance, meaning that at some point in time after an event is placed in a data base, that information decays because it has outlived its usefulness and should be purged from the system. As the answers to these questions are derived, a second area of concern comes into focus.

With the isolation of the full tactical usefulness of police information, the question arises as to what technical considerations must be taken into account to support those tactical functions. And this consideration leads to cost effectiveness evaluation. Specific personnel will be attached to the PATRIC Project to make just such evaluations; they will perform exhaustive analyses of the system functions and begin the process of a systems requirements analysis which will serve as a blueprint for the PATRIC Project.

<sup>1</sup> "Results and Evaluation of the LAPD/SDC Project, June 1968-January 1969". System Development Corporation, Santa Monica, California. 1969.  
<sup>2</sup> Hall, Earl E., and Chappell, J. F. "Man-Machine Systems to Aid in the Apprehension of Career Criminals". *Law Enforcement Science and Technology II*. Ed. Cohn, S. I. (USA, Port City Press, Inc.) P477.  
<sup>3</sup> Edwards, Ward. "Men and Computers". *Psychological Principles in System Development*. Ed. Gagne, Robert M. (New York: Holt, Rinehart and Winston). 1962. P95.  
<sup>4</sup> Laurence I. Press, et al. "An Interactive Technique for the Analysis of Multivariate Data". *Behavior Science*. Vol. 14, No. 5, September, 1969. P364.

Los Angeles Police Department  
**ROBBERY REPORT** Attempt  FIGURE I

PAGE      of     

PREMISES	<input type="checkbox"/> Store <input type="checkbox"/> CANDY <input type="checkbox"/> CLOTHING, SHOE <input type="checkbox"/> DRUG <input type="checkbox"/> JEWELRY <input type="checkbox"/> LIQUOR <input type="checkbox"/> MARKET <input type="checkbox"/> SMALL NEIGHBORHOOD <input type="checkbox"/> OTHER:	<input type="checkbox"/> Business <input type="checkbox"/> BANK, SAVINGS & LOAN <input type="checkbox"/> FED. INSURED <input type="checkbox"/> BAR <input type="checkbox"/> CAR LOT-NEW, USED <input type="checkbox"/> FINANCE CO. <input type="checkbox"/> CREDIT UNION <input type="checkbox"/> FED. INSURED <input type="checkbox"/> FOOD STAND <input type="checkbox"/> HOSPITAL <input type="checkbox"/> MEDICAL OFFICE <input type="checkbox"/> PUBLIC DEPOT <input type="checkbox"/> RESTAURANT <input type="checkbox"/> SERVICE STAT. <input type="checkbox"/> THEATRE <input type="checkbox"/> OTHER:	<input type="checkbox"/> Residence <input type="checkbox"/> APARTMENT <input type="checkbox"/> HOTEL <input type="checkbox"/> MOTEL <input type="checkbox"/> SINGLE FAMILY <input type="checkbox"/> OTHER:	<input type="checkbox"/> Miscellaneous <input type="checkbox"/> ALLEY <input type="checkbox"/> CARPORT <input type="checkbox"/> DRIVEWAY <input type="checkbox"/> GARAGE <input type="checkbox"/> PARK <input type="checkbox"/> PEDESTRIAN <input type="checkbox"/> TUNNEL <input type="checkbox"/> STREET <input type="checkbox"/> YARD <input type="checkbox"/> OTHER:	VICTIM'S NAME (Last, first, middle-First Name if Bus.) DR													
	LOCATION OF OCCURRENCE R.D.				VICT'S ADDRESS CITY PHONE													
	RES.				BUS.													
	VICT'S OCCUPATION SEX: DESCENT: AGE: VEHICLE DESCRIPTION NO. OF SUSPS: ON BACK: <input type="checkbox"/> YES <input type="checkbox"/> NO				OCURRED: MONTH DAY YEAR DAY OF WK TIME RPTD: MONTH DAY YEAR TIME													
INVEST. DIV(S) & PERSON NOTIFIED				CONNECTED REPORT(S) (Type & DR No.)														
ALSO CHECK IF APPROPRIATE: <input type="checkbox"/> DEPARTMENT WITHIN STORE <input type="checkbox"/> SHOPPING CENTER				<input type="checkbox"/> OFFICE <input type="checkbox"/> PARKING LOT														
Type of Property Taken <input type="checkbox"/> MONEY <input type="checkbox"/> JEWELRY <input type="checkbox"/> FURS <input type="checkbox"/> CLOTHING <input type="checkbox"/> OTHER				TOTAL VALUE TAKEN--RECOVERED \$ \$														
SEX: DESCENT: HAIR: EYES: HEIGHT: WEIGHT: AGE: CLOTHING: NAME & ADDRESS IF KNOWN; OR NAME, BKG.# & CHARGE IF ARRESTED																		
S-1																		
S-2																		
S-3																		
PERSONAL ODDITIES	SUSP.#	1 2 3	Amputations <input type="checkbox"/> LEG <input type="checkbox"/> ARM <input type="checkbox"/> FOOT <input type="checkbox"/> HAND <input type="checkbox"/> EAR <input type="checkbox"/> FINGERS <input type="checkbox"/> Deformities <input type="checkbox"/> CRIPPLED LEG <input type="checkbox"/> CRIPPLED ARM <input type="checkbox"/> CRIPPLED HAND <input type="checkbox"/> LIMPS <input type="checkbox"/> CRIPPLED FINGERS <input type="checkbox"/> BOWLEGGED <input type="checkbox"/> Tattoo <input type="checkbox"/> ARM <input type="checkbox"/> HAND <input type="checkbox"/> FINGERS <input type="checkbox"/> CHEST/NECK <input type="checkbox"/> Type of Tattoo <input type="checkbox"/> PICTURES <input type="checkbox"/> DESIGNS <input type="checkbox"/> NAMES <input type="checkbox"/> WORDS, PHRASES	SUSP.#	1 2 3	Type of Tattoo (cont.) <input type="checkbox"/> INITIALS <input type="checkbox"/> PACHUCO <input type="checkbox"/> Facial Scars <input type="checkbox"/> CHEEK <input type="checkbox"/> CHIN <input type="checkbox"/> FOREHEAD <input type="checkbox"/> LIP <input type="checkbox"/> NOSE <input type="checkbox"/> EAR <input type="checkbox"/> EYEBROW <input type="checkbox"/> Oddities-Face <input type="checkbox"/> BIRTHMARKS <input type="checkbox"/> POCKMARKS <input type="checkbox"/> MOLES <input type="checkbox"/> FRECKLES <input type="checkbox"/> PIMPLES <input type="checkbox"/> LIPS-THICK <input type="checkbox"/> LIPS-THIN <input type="checkbox"/> CHIN-PROTRUDES <input type="checkbox"/> CHIN-RECEDES <input type="checkbox"/> HOLLOW CHEEK	SUSP.#	1 2 3	Teeth <input type="checkbox"/> MISSING <input type="checkbox"/> GOLD <input type="checkbox"/> BROKEN <input type="checkbox"/> FALSE <input type="checkbox"/> STAINED/DECAYED <input type="checkbox"/> PROTRUDING <input type="checkbox"/> IRREGULAR <input type="checkbox"/> Body Scars <input type="checkbox"/> ARM <input type="checkbox"/> HAND <input type="checkbox"/> WRIST <input type="checkbox"/> NECK <input type="checkbox"/> BURN <input type="checkbox"/> CHEST <input type="checkbox"/> Speech <input type="checkbox"/> IMPEDIMENT <input type="checkbox"/> ACCENT (FOREIGN) <input type="checkbox"/> ACCENT (U.S.) <input type="checkbox"/> LIPS <input type="checkbox"/> STUTTERS <input type="checkbox"/> HARE LIP <input type="checkbox"/> MUMBLES <input type="checkbox"/> RAPID	SUSP.#	1 2 3	Speech (cont.) <input type="checkbox"/> SOFT/LOW <input type="checkbox"/> REFINED <input type="checkbox"/> Eyes <input type="checkbox"/> MISSING <input type="checkbox"/> CROSS-EYED <input type="checkbox"/> PRESCRIPTION <input type="checkbox"/> GLASSES <input type="checkbox"/> SUNGLASSES <input type="checkbox"/> UNSHAVEN <input type="checkbox"/> Bulging <input type="checkbox"/> SQUINTS/BLINKS <input type="checkbox"/> SLANTED <input type="checkbox"/> Hair Type <input type="checkbox"/> DYED <input type="checkbox"/> PROCESSED <input type="checkbox"/> WIG/TOUPEE <input type="checkbox"/> BALD <input type="checkbox"/> NATURAL (NEGRO) <input type="checkbox"/> LONG <input type="checkbox"/> THIN/RECEDING <input type="checkbox"/> STRAIGHT <input type="checkbox"/> WAVY <input type="checkbox"/> BUSHY	SUSP.#	1 2 3	Mustache/Beard <input type="checkbox"/> MUSTACHE-CHINESE <input type="checkbox"/> GOATEE <input type="checkbox"/> BEARD-FULL <input type="checkbox"/> MUSTACHE-HEAVY <input type="checkbox"/> MUSTACHE-THIN <input type="checkbox"/> MUSTACHE-MEDIUM <input type="checkbox"/> EYEBROWS-HEAVY <input type="checkbox"/> UNSHAVEN <input type="checkbox"/> Ears <input type="checkbox"/> CAULIFLOWER <input type="checkbox"/> PIERCED LOBES <input type="checkbox"/> PROTRUDING <input type="checkbox"/> CLOSE TO HEAD <input type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> NOSE <input type="checkbox"/> CROOKED <input type="checkbox"/> HOOKED <input type="checkbox"/> UPTURNED <input type="checkbox"/> LONG <input type="checkbox"/> BROAD <input type="checkbox"/> FLAT <input type="checkbox"/> SMALL <input type="checkbox"/> THIN	SUSP.#	1 2 3	Face <input type="checkbox"/> NEGRO WITH CAUC. FEATURES <input type="checkbox"/> HIGH CHEEK BONE <input type="checkbox"/> LONG <input type="checkbox"/> BROAD <input type="checkbox"/> THIN <input type="checkbox"/> ROUND <input type="checkbox"/> Complexion <input type="checkbox"/> DARK/SWARTHY <input type="checkbox"/> SALLOW <input type="checkbox"/> RUDDY <input type="checkbox"/> LIGHT/FAIR <input type="checkbox"/> MEDIUM <input type="checkbox"/> Other <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
	WEAPONS																	
	<input type="checkbox"/> BODILY FORCE (ONLY) <input type="checkbox"/> GUN <input type="checkbox"/> REVOLVER <input type="checkbox"/> AUTOMATIC Caliber <u>    </u> <u>    </u> <u>    </u>																	
	Barrel length <input type="checkbox"/> 2 INCHES <input type="checkbox"/> 4 INCHES <input type="checkbox"/> 6 INCH, OR MORE																	
<input type="checkbox"/> BLUE STEEL <input type="checkbox"/> NICKEL PLATED <input type="checkbox"/> UNUSUAL GRIPS <input type="checkbox"/> RIFLE <input type="checkbox"/> SHOTGUN <input type="checkbox"/> SAWED OFF																		
<input type="checkbox"/> SIMULATED GUN <input type="checkbox"/> RUSTY, DEFECTIVE <input type="checkbox"/> MACHINE GUN <input type="checkbox"/> RARE TYPE GUN <input type="checkbox"/> TOY GUN <input type="checkbox"/> OTHER GUN																		
<input type="checkbox"/> KNIFE <input type="checkbox"/> SWITCH BLADE <input type="checkbox"/> BLADE LONGER 6" <input type="checkbox"/> BLUDGEON, CLUB <input type="checkbox"/> BLACKJACK, SAP <input type="checkbox"/> LIQUOR, DRUGS																		
<input type="checkbox"/> CAUSTIC CHEM. POISON <input type="checkbox"/> VERBAL THREATS <input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> RAZOR <input type="checkbox"/> OTHER:																		
TRADE MARKS	Misc. Sex Acts <input type="checkbox"/> RAPED OR ATTEMPT <input type="checkbox"/> OTHER:		Pretended to be (cont.) <input type="checkbox"/> REPAIRMAN <input type="checkbox"/> DELIVERYMAN <input type="checkbox"/> CUSTOMER <input type="checkbox"/> OTHER:		Solicited (cont.) <input type="checkbox"/> PACK CIGARETTES-BRAND: <input type="checkbox"/> NARCOTICS <input type="checkbox"/> IMMORAL ACT <input type="checkbox"/> USE OF PHONE, TOILET <input type="checkbox"/> INFORMATION <input type="checkbox"/> A CIGARETTE <input type="checkbox"/> OTHER:													
	Suspect Wore <input type="checkbox"/> MASK, FACE COVERING <input type="checkbox"/> BAG, CLOTH, ETC., W/HOLES FOR EYES <input type="checkbox"/> HALLOWEEN <input type="checkbox"/> HANDKERCHIEF, SCARF OVER FACE <input type="checkbox"/> SKI <input type="checkbox"/> STOCKING <input type="checkbox"/> OTHER TYPE MASK <input type="checkbox"/> DISGUISED AS <input type="checkbox"/> OPPOSITE SEX <input type="checkbox"/> MAKE UP (MALES ONLY) <input type="checkbox"/> GLOVES <input type="checkbox"/> EXTREMELY UNUSUAL CLOTHING <input type="checkbox"/> CAP/HAT <input type="checkbox"/> Pretended to be POLICE <input type="checkbox"/> AIDING VICTIM <input type="checkbox"/> BLIND, CRIPPLED, INFIRM, ETC. <input type="checkbox"/> SEEKING SOMEONE		Suspect's Actions <input type="checkbox"/> USED A NOTE <input type="checkbox"/> HID IN BUILDING <input type="checkbox"/> DEMANDED MONEY FROM SAFE <input type="checkbox"/> JUMPED COUNTER <input type="checkbox"/> ASKED FOR JEWELRY <input type="checkbox"/> USED LOOKOUT <input type="checkbox"/> USED DRIVER <input type="checkbox"/> OTHER:		Telephone <input type="checkbox"/> CONTACTED BY <input type="checkbox"/> PHONE WIRES PULLED, CUT, DISCONNECTED <input type="checkbox"/> OTHER:													
	<input type="checkbox"/> Solicited, or Offered <input type="checkbox"/> AID FOR VEHICLE <input type="checkbox"/> RIDE <input type="checkbox"/> LIQUOR-BRAND:		Evidence <input type="checkbox"/> LEFT NOTE <input type="checkbox"/> FINGERPRINTS-AVOIDED/REMOVED <input type="checkbox"/> FINGERPRINTS <input type="checkbox"/> OTHER:		Force/Threats <input type="checkbox"/> THREATENED VICT'S FAMILY <input type="checkbox"/> SEARCHED													
	Shots Fired AT VICTIM <input type="checkbox"/> WARNING <input type="checkbox"/> AT OFFICERS <input type="checkbox"/> ACCIDENTAL <input type="checkbox"/> OTHER:		Vehicle Involved <input type="checkbox"/> HID IN REAR SEAT OF PARKED VEH. <input type="checkbox"/> V.FORCED INTO VEH. V'S. VEH. TAKEN <input type="checkbox"/> VICT. PUTTING VEH. INTO GARAGE, PKG. PLACE, OR LEAVING SAME <input type="checkbox"/> FORCED VICT'S VEH. TO CURB <input type="checkbox"/> DISABLED V'S. VEH. <input type="checkbox"/> COVER, BEND, ALTER LICENSE PLATES <input type="checkbox"/> STOPPED V'S. VEH. BY FLAGGING, STEP- PING IN FRONT OF, PLACING OBJECT IN ROAD <input type="checkbox"/> OTHER:		Force/Threats (cont.) <input type="checkbox"/> HIT WITH WEAPON <input type="checkbox"/> BIT <input type="checkbox"/> CUT/STABBED <input type="checkbox"/> CHOKED <input type="checkbox"/> KICKED <input type="checkbox"/> HIT (OTHER) <input type="checkbox"/> ROLLED <input type="checkbox"/> THREATENED W/DEATH <input type="checkbox"/> OTHER:													
Victim Forced to <input type="checkbox"/> DISROBE <input type="checkbox"/> ENTER VEH. TRUNK <input type="checkbox"/> ENTER REFRIGERATOR <input type="checkbox"/> REFR. OR INTO TOILET <input type="checkbox"/> OPEN SAFE <input type="checkbox"/> LIE ON FLOOR <input type="checkbox"/> OPEN REGISTER <input type="checkbox"/> OTHER:		Initial Contact <input type="checkbox"/> AMBUSHED <input type="checkbox"/> ATTACKED FROM BEHIND <input type="checkbox"/> RANG DOORBELL, KNOCKED <input type="checkbox"/> OTHER:		Speech <input type="checkbox"/> APOLOGIZED <input type="checkbox"/> UNUSUAL, EXTRA- ORDINARY STATEMENT <input type="checkbox"/> Carried Gun in <input type="checkbox"/> SHOULDER HOLSTER <input type="checkbox"/> BAG, BRIEFCASE <input type="checkbox"/> BELT, WAISTBAND <input type="checkbox"/> NEWSPAPER <input type="checkbox"/> POCKET <input type="checkbox"/> OTHER:  Type <input type="checkbox"/> HIJACK <input type="checkbox"/> HOMOSEXUAL <input type="checkbox"/> PAYROLL HOLDUP <input type="checkbox"/> SNATCHED <input type="checkbox"/> STRONGARM <input type="checkbox"/> OTHER:  Victim Was <input type="checkbox"/> CLOSING, OPENING <input type="checkbox"/> AGED, BLIND, DEAF, CRIPPLED, ETC. <input type="checkbox"/> OTHER:														

03.02.016-701 ROBBERY REPORT CHECKED







<input type="checkbox"/> PLAIN <input type="checkbox"/> BUNCO <input type="checkbox"/> BFV <input type="checkbox"/> TFV <input type="checkbox"/> TILLTAP <input type="checkbox"/> S/L <input type="checkbox"/> FROM PERSON <input type="checkbox"/> DRUNK ROLL <input type="checkbox"/> PURSES/NATCH <input type="checkbox"/> PICKPOCKET <input type="checkbox"/> OTHER:					
<b>T H E F T</b> <input type="checkbox"/> BADGER GAME <input type="checkbox"/> BANK EXAMINER <input type="checkbox"/> COIN SMACK <input type="checkbox"/> FOUNTAIN-PAIN, REMODEL, BUTL <input type="checkbox"/> CREEPERS <input type="checkbox"/> FRUIT HUSTLE <input type="checkbox"/> GOLD SWINDLE <input type="checkbox"/> GYPSY INVOLVED <input type="checkbox"/> HOMOSEXUAL <input type="checkbox"/> INSURANCE FRAUD <input type="checkbox"/> JAMAICAN SWITCH <input type="checkbox"/> LATIN CHARITY SWITCH <input type="checkbox"/> MARRIAGE BUNCO <input type="checkbox"/> MINING FRAUD <input type="checkbox"/> PADDY HUSTLE <input type="checkbox"/> PIGEON DROP <input type="checkbox"/> Activity/Objects involved <input type="checkbox"/> BGGUS <input type="checkbox"/> BOND <input type="checkbox"/> BUSINESS <input type="checkbox"/> CHARITY <input type="checkbox"/> CONSIGNMENT <input type="checkbox"/> CONTEST <input type="checkbox"/> COUPONS <input type="checkbox"/> CREDIT <input type="checkbox"/> DEPOSIT	<b>Activity/Objects Involved(cont.)</b> <input type="checkbox"/> EMPLOYMENT <input type="checkbox"/> EQUIPMENT <input type="checkbox"/> FRANCHISE <input type="checkbox"/> FURS <input type="checkbox"/> GOLD, SILVER <input type="checkbox"/> HOT MERCHANDISE <input type="checkbox"/> IMMORAL ACT <input type="checkbox"/> INSURANCE <input type="checkbox"/> INTEREST IN NON-EXISTENT ENTERPRISE <input type="checkbox"/> JEWELRY <input type="checkbox"/> LEASE <input type="checkbox"/> LICENSE <input type="checkbox"/> MAGAZINE <input type="checkbox"/> MERCHANDISE, GOODS <input type="checkbox"/> MINING <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> PHOTOGRAPHIC ORDER <input type="checkbox"/> PREVIOUSLY MORTGAGED PROPERTY <input type="checkbox"/> REAL ESTATE <input type="checkbox"/> STOCKS, BONDS <input type="checkbox"/> SUBSCRIPTION <input type="checkbox"/> TUITION <input type="checkbox"/> OTHER:	<b>Initial Contact</b> <input type="checkbox"/> BY TELEPHONE <input type="checkbox"/> THROUGH ADVERTISEMENT <input type="checkbox"/> BY MAIL <input type="checkbox"/> AT HOME/DOOR (TO DOOR) <input type="checkbox"/> AT SUSP'S BUSINESS <input type="checkbox"/> AT VICT'S BUSINESS <input type="checkbox"/> OTHER PERSONAL CONTACT <input type="checkbox"/> Pretended to be <input type="checkbox"/> POLICE <input type="checkbox"/> INVOLVED IN ACCIDENT <input type="checkbox"/> AIDING VICTIM <input type="checkbox"/> BLIND, CRIPPLED, INFIRM, ETC. <input type="checkbox"/> REPAIRMAN, DELIVERYMAN <input type="checkbox"/> SALESMAN <input type="checkbox"/> CUSTOMER <input type="checkbox"/> SENT BY OWNER <input type="checkbox"/> SEEKING SOMEONE <input type="checkbox"/> DOCTOR <input type="checkbox"/> INSPECTOR (FIRE, HEALTH, ETC.) <input type="checkbox"/> SOCIAL SECURITY, MEDICARE REP. <input type="checkbox"/> OTHER:	<b>Suspect Offers</b> <input type="checkbox"/> FREE GIFT <input type="checkbox"/> TO BLESS <input type="checkbox"/> TO GIVE AUDITION <input type="checkbox"/> TO APPRAISE <input type="checkbox"/> TO HOLD FOR SAFEKEEPING <input type="checkbox"/> TO REPAIR <input type="checkbox"/> TO TEACH, TRAIN <input type="checkbox"/> TO FIND EMPLOYMENT FOR VICT. <input type="checkbox"/> OTHER:	<b>Action</b> <input type="checkbox"/> EXTORTING <input type="checkbox"/> FACTORING <input type="checkbox"/> SOLICITING <input type="checkbox"/> SWITCHING <input type="checkbox"/> FORTUNE TELLING <input type="checkbox"/> TEACHING <input type="checkbox"/> BUYING <input type="checkbox"/> CALLING FOR <input type="checkbox"/> COLLECTING <input type="checkbox"/> EMPLOYING <input type="checkbox"/> TRANSPORTING <input type="checkbox"/> SELLING <input type="checkbox"/> SHORT CHANGING <input type="checkbox"/> RENTING <input type="checkbox"/> OBTAINING <input type="checkbox"/> FAIL TO DELIVER <input type="checkbox"/> BORROWING <input type="checkbox"/> FAIL TO RETURN <input type="checkbox"/> BUILDING, RENOVATING, PAINTING <input type="checkbox"/> OTHER:	<b>Gambling</b> <input type="checkbox"/> CARD GAME <input type="checkbox"/> DICE <input type="checkbox"/> HORSE RACE <input type="checkbox"/> MATCHING COINS <input type="checkbox"/> PUNCHBOARD, PUZZLE <input type="checkbox"/> 3 CARD MONTE <input type="checkbox"/> SHELL GAME <input type="checkbox"/> OTHER:

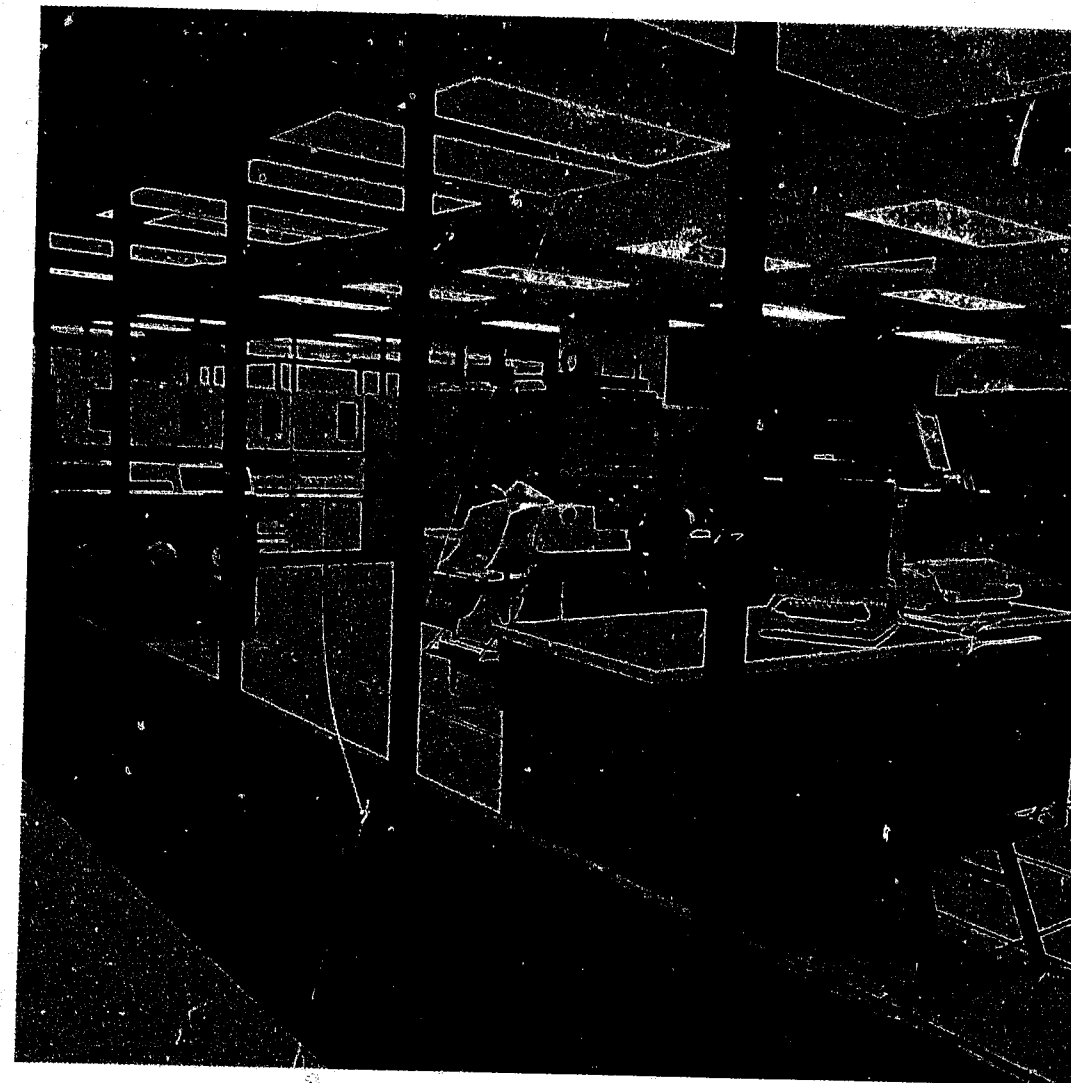
<b>S E X C R I M E</b> <input type="checkbox"/> Aberrant Sex Acts <input type="checkbox"/> URINATION INVOLVED <input type="checkbox"/> DEFECATION, EXCREMENT INVOLVED <input type="checkbox"/> SADISM INVOLVED <input type="checkbox"/> INSERTED OBJECT INTO VAGINA <input type="checkbox"/> INCENDIARISM INVOLVED <input type="checkbox"/> MASOCHISM INVOLVED <input type="checkbox"/> TOOK PICTURES OF VICTIM(S) <input type="checkbox"/> SODOMY INVOLVED <input type="checkbox"/> FETISHISM INVOLVED <input type="checkbox"/> PORNOGRAPHIC MATERIAL USED <input type="checkbox"/> APPLIED TONGUE OR MOUTH TO ANUS <input type="checkbox"/> SUGGESTED VICTIM COMMIT LEWD, PERVERTED ACT <input type="checkbox"/> INSERTED HAND INTO VAGINA <input type="checkbox"/> EXHIBITIONISM INVOLVED <input type="checkbox"/> TALKED ABOUT BODY FUNCTION (SEMEN, ETC.) <input type="checkbox"/> MULTIPLE VICTIMS <input type="checkbox"/> OTHER UNUSUAL ACT <input type="checkbox"/> 288A Requested or Forced <input type="checkbox"/> SUSPECT 288A ON VICTIM <input type="checkbox"/> VICTIM 288A ON SUSPECT <input type="checkbox"/> Type <input type="checkbox"/> CULT, RITUAL <input type="checkbox"/> OTHER: <input type="checkbox"/> Pretended To Be <input type="checkbox"/> GOD, SATAN, ETC. <input type="checkbox"/> POLICE <input type="checkbox"/> SEEKING SOMEONE <input type="checkbox"/> OTHER:	<b>TYPE CRIME:</b> <input type="checkbox"/> BAR <input type="checkbox"/> INVITATION	<b>INITIAL CONTACT</b> <input type="checkbox"/> PLACE OF ENTERTAINMENT <input type="checkbox"/> RESIDENCE <input type="checkbox"/> FORCED ENTRY	<input type="checkbox"/> SUSP. A PED. <input type="checkbox"/> SUSP. A RELATIVE <input type="checkbox"/> SUSP. IN VEHICLE	<input type="checkbox"/> SUSP. KNOWN TO VICT <input type="checkbox"/> VICT. A PEDESTRIAN <input type="checkbox"/> VICT. IN VEHICLE
	<b>Speech</b> <input type="checkbox"/> REMORSEFUL <input type="checkbox"/> UNUSUAL EXTRAORDINARY STATEMENT <input type="checkbox"/> OBSCENE, PROFANE <b>Telephone</b> <input type="checkbox"/> TORE FROM WALL <input type="checkbox"/> PHONE WIRES PULLED, CUT, DISCONNECTED <input type="checkbox"/> OTHER: <b>Suspect Wore</b> <input type="checkbox"/> DISGUISED AS OPPOSITE SEX <input type="checkbox"/> MASK, FACE COVERING <input type="checkbox"/> EXTREMELY UNUSUAL CLOTHING <input type="checkbox"/> NUDE <input type="checkbox"/> PARTIALLY NUDE <b>Clothing Involved</b> <input type="checkbox"/> CUT OR TORN <input type="checkbox"/> LINGERIE <input type="checkbox"/> USED FOR MASTURBATION <input type="checkbox"/> OTHER: <input type="checkbox"/> Solicited, or Offered <input type="checkbox"/> FOOD, DRINK (NOT LIQUOR), CANDY <input type="checkbox"/> RIDE <input type="checkbox"/> AMUSEMENT, GAME <input type="checkbox"/> ASSISTANCE <input type="checkbox"/> DIRECTIONS <input type="checkbox"/> MONEY <input type="checkbox"/> OTHER:	<b>Force/Threats</b> <input type="checkbox"/> HANDCUFFED <input type="checkbox"/> BOUND VICT. TO OBJECT (BED, ETC.) <input type="checkbox"/> BOUND <input type="checkbox"/> BURNED VICTIM <input type="checkbox"/> COVERED VICT'S FACE <input type="checkbox"/> BIT <input type="checkbox"/> GAGGED <input type="checkbox"/> CUT, STABBED <input type="checkbox"/> WHIPPED W/OTHER THAN HANDS <input type="checkbox"/> AGGRAVATED ASSAULT <input type="checkbox"/> COVERED MOUTH W/HANDS <input type="checkbox"/> THREATENED V'S FAMILY <input type="checkbox"/> CHOKED <input type="checkbox"/> HIT AFTER ACT <input type="checkbox"/> HIT DURING ACT <input type="checkbox"/> HIT PRIOR TO ACT <input type="checkbox"/> KIDNAPED <input type="checkbox"/> PULLED VICTIM'S HAIR <input type="checkbox"/> TWISTED ARM <input type="checkbox"/> OTHER: <b>Vehicle Involved</b> <input type="checkbox"/> EXHIBITED SELF FROM VEH. <input type="checkbox"/> V. PUTTING VEH. INTO GARAGE <input type="checkbox"/> PRG. PLACE, OR LEAVING SAME <input type="checkbox"/> OTHER: <b>Masturbation</b> <input type="checkbox"/> COMPELLED V. TO MASTURBATE <input type="checkbox"/> COMPELLED VICT. TO MASTURBATE SUSPECT <input type="checkbox"/> MASTURBATED SELF OR VICT.	<b>Miscellaneous Sex Acts</b> <input type="checkbox"/> OBSCENE, PROFANE-WRITING, DRAWING <input type="checkbox"/> RAPED OR ATTEMPT <input type="checkbox"/> SIMULATED INTERCOURSE <input type="checkbox"/> UNABLE TO ACHIEVE ERECTION <input type="checkbox"/> DESIRED TO OBSERVE VICT'S GENITALS <input type="checkbox"/> REACHED CLIMAX <input type="checkbox"/> CAUSED VICT. TO TOUCH, FONDLE OWN GENITALS (CHILD MOLEST) <input type="checkbox"/> CAUSED VICT. TO TOUCH, FONDLE SUSP'S GENITALS (CHILD MOLEST) <input type="checkbox"/> REMOVED OBJECT COVERING GENITALS (INDECENT EXPOSURE) <input type="checkbox"/> INSERTED FINGER IN VAGINA <input type="checkbox"/> MUGGED, PRESSED VICT (CHILD MOLEST) <input type="checkbox"/> KISSED VICT'S BODY <input type="checkbox"/> KISSED VICT'S FACE <input type="checkbox"/> TOUCHED, FONDLED V'S BODY (CHILD MOLEST) <input type="checkbox"/> TOUCHED, FONDLED V'S GENITALS (CHILD MOLEST) <input type="checkbox"/> OTHER: <b>Victim Forced To.</b> <input type="checkbox"/> DISROBE <input type="checkbox"/> OTHER: <b>Voyeurism Occurred</b> <input type="checkbox"/> IN DRESSING ROOM <input type="checkbox"/> IN PUBLIC TOILET <input type="checkbox"/> MIRROR WAS USED <input type="checkbox"/> PEEPHOLE(S) USED <input type="checkbox"/> OBSCENE GESTURES <input type="checkbox"/> OTHER: <b>Theft Involved</b> <input type="checkbox"/> AGED, BLIND, CRIPPLED, ETC.	

<b>M I S C E L L A N E O U S C R I M E</b> <input type="checkbox"/> Aberrant Sex Acts <input type="checkbox"/> URINATION INVOLVED <input type="checkbox"/> DEFECATION, EXCREMENT INVOLVED <input type="checkbox"/> TOOK PICTURES OF VICT. <input type="checkbox"/> INCENDIARISM INVOLVED <input type="checkbox"/> INSERTED OBJECT INTO VAGINA <input type="checkbox"/> SADISM INVOLVED <input type="checkbox"/> SODOMY INVOLVED <input type="checkbox"/> FETISHISM INVOLVED <input type="checkbox"/> OTHER UNUSUAL ACT <input type="checkbox"/> Victim Was <input type="checkbox"/> POLICEMAN <input type="checkbox"/> FIREMAN <input type="checkbox"/> LAPD/FD <input type="checkbox"/> Reason <input type="checkbox"/> SEX <input type="checkbox"/> ROBBERY <input type="checkbox"/> BURGLARY <input type="checkbox"/> RACIAL HOSTILITY <input type="checkbox"/> STRIKE LABOR TROUBLE <input type="checkbox"/> SUSPECT INSANE <input type="checkbox"/> UNKNOWN <input type="checkbox"/> OTHER:	<b>TYPE CRIME:</b> <input type="checkbox"/> POLICE <input type="checkbox"/> OTHER:	<input type="checkbox"/> Pretended To Be <input type="checkbox"/> POLICE <input type="checkbox"/> OTHER:	<input type="checkbox"/> Solicited/ Offered <input type="checkbox"/> RIDE <input type="checkbox"/> ASSISTANCE <input type="checkbox"/> MONEY <input type="checkbox"/> NARCOTICS <input type="checkbox"/> OTHER:	<input type="checkbox"/> Type <input type="checkbox"/> HOMOSEXUAL <input type="checkbox"/> RIOT <input type="checkbox"/> CULT, RITUAL <input type="checkbox"/> ORGANIZED GANG <input type="checkbox"/> DISRUPTIVE PRESENCE - SCHOOL, COLLEGE <input type="checkbox"/> CAUSED HOSTILE CROWD TO GATHER <input type="checkbox"/> TRAIN WRECK, TAMPER <input type="checkbox"/> MAIL, MAILBOX TAMPER <input type="checkbox"/> CHILD STEALING <input type="checkbox"/> CHILD BEATING <input type="checkbox"/> WIFE BEATING <input type="checkbox"/> OTHER:	<b>Quarrel</b> <input type="checkbox"/> REVENGE <input type="checkbox"/> TRAFFIC ACCIDENT <input type="checkbox"/> JUVENILE PARTY <input type="checkbox"/> BUSINESS <input type="checkbox"/> DRUNKEN <input type="checkbox"/> GAMBLING <input type="checkbox"/> JEALOUS <input type="checkbox"/> FAMILY <input type="checkbox"/> LANDLORD, NEIGHBOR <input type="checkbox"/> COMMON-LAW <input type="checkbox"/> OTHER: <b>Suspect Wore</b> <input type="checkbox"/> DISGUISED AS OPPOSITE SEX <input type="checkbox"/> MASK, FACE COVERING <input type="checkbox"/> EXTREMELY UNUSUAL CLOTHING <input type="checkbox"/> CUT OR TORN <input type="checkbox"/> LINGERIE <input type="checkbox"/> OTHER: <b>Shots Fired</b> <input type="checkbox"/> AT VICTIM <input type="checkbox"/> AT INHABITED DWELLING <input type="checkbox"/> AT MOVING VEHICLE <input type="checkbox"/> OTHER:	<b>Telephone</b> <input type="checkbox"/> TORE FROM WALL <input type="checkbox"/> PHONE WIRES PULLED, CUT, DISCONNECTED <input type="checkbox"/> OTHER: <b>Force/Threats</b> <input type="checkbox"/> HANDCUFFED <input type="checkbox"/> COVERED VICT'S FACE <input type="checkbox"/> BOUND VICT TO OBJECT (BED, ETC.) <input type="checkbox"/> BURNED <input type="checkbox"/> GAGGED <input type="checkbox"/> BIT <input type="checkbox"/> BOUND <input type="checkbox"/> CUT, STABBED <input type="checkbox"/> AGGRAVATED ASSAULT <input type="checkbox"/> CHOKED <input type="checkbox"/> BOMB THREATS, SCARES - NO BOMB FOUND <input type="checkbox"/> OTHER: <b>Bombings</b> <input type="checkbox"/> PRIOR WARNING <input type="checkbox"/> FAILED TO EXPLODE <input type="checkbox"/> EXPLODED <input type="checkbox"/> CAUSED FIRE	<b>Initial Contact</b> <input type="checkbox"/> SUSPECT IN VEHICLE <input type="checkbox"/> VICTIM IN VEHICLE <input type="checkbox"/> SUSPECT A PEDESTRIAN <input type="checkbox"/> VICTIM A PEDESTRIAN <input type="checkbox"/> BY TELEPHONE <input type="checkbox"/> BAR <input type="checkbox"/> INVITATION <input type="checkbox"/> PLACE OF ENTERTAINMENT <input type="checkbox"/> RESIDENCE <input type="checkbox"/> SUSPECT A RELATIVE <input type="checkbox"/> SUSPECT KNOWN TO VICT. <b>Vehicle Involved</b> <input type="checkbox"/> CAUSED DAMAGE TO VEH. <input type="checkbox"/> OTHER: <b>Suspect's Actions</b> <input type="checkbox"/> DAMAGED BUILDING <input type="checkbox"/> DAMAGED PUBLIC PROPERTY <input type="checkbox"/> DAMAGED VEHICLE <input type="checkbox"/> COMMITTED SEX ACT IN PRESENCE OF VICTIM <input type="checkbox"/> HARBORED A RUNAWAY <input type="checkbox"/> OTHER:
---	--	--	--	--	---	---	--

# KANSAS CITY MISSOURI POLICE DEPARTMENT

## ALERT

(AUTOMATED LAW ENFORCEMENT RESPONSE TEAM)



**CLARENCE M. KELLEY**  
Chief of Police

PREPARED BY  
DATA SYSTEMS DIVISION

SERVING LAW ENFORCEMENT AGENCIES WITHIN 3,000 SQUARE MILES OF  
EASTERN KANSAS AND WESTERN MISSOURI

## THE ALERT SYSTEM FROM CONCEPTUAL DESIGN— PRESENT DAY OPERATIONS—TO FUTURE PLANS

by Melvin Bockelman  
Manager, Data Systems Division  
Kansas City Missouri, Police Department

The City of Kansas City, Missouri, like other large metropolitan communities, has been faced with a rapid increase in population and a rising crime index. The city, with nearly 500,000 citizens, ranks 26th in the national population class; however, in area, Kansas City is the fifth largest city of the United States. Geographically, the city covers 316 square miles, in which 9,000 city blocks and 15,000 street intersections are divided into 174 patrol beats.

The police force of only 950 uniformed personnel has been hard pressed to process the rising yearly workload of 146,350 arrests, investigate 57,574 reported offenses, respond to and record 26,905 vehicle accidents and answer 285,540 "calls for service." The Communications Center, operating on seven radio frequencies, responds to nine million radio transmissions annually. Warrants issued by municipal and county magistrates and filed with the Police Department continued to be received in almost unmanageable numbers. The law enforcement officer, as a result, could not in many instances obtain needed information without a 30-minute delay.

Citizens of the Kansas City metropolitan area are victims of crime at a ratio of 2.9 for every 100 citizens as compared to 2 citizens in 100 for the national average. Crime indices reflect the fact that one vehicle is stolen approximately every hour; one woman is criminally assaulted and seven robberies, 44 burglaries and seven aggravated assault cases are committed every day.

The Police Force has 1.5 officers assigned per 1,000 population as compared with the national average of 2.2 per 1,000 population. Area-wise, the force has 3.3 officers assigned per square mile as compared with 7.3 officers per square mile as the national average. With this workload, the Kansas City Missouri Police Department decided to seriously consider introducing electronic data processing as a technological means of improving the efficiency of its law enforcement operation. By late 1966, it became evident that only a "real time" police computer system could be responsive to the needs of law enforcement. The Board of Police Commissioners approved of the program and an order was placed for an advanced telecommunications-oriented, third-generation computer.

Chief of Police Clarence Kelley's instructions to the computer technicians, who were about to begin systems design and programming of the computer-

ized teleprocessing system, were to "Build me a Police Information System which will provide a quick response to the informational needs of the law enforcement officer on duty on the streets."

Police Department administrators and technicians of the Data Systems Division entered into a series of studies and discussions in an effort to determine the informational needs of the district officer and the volume of requests for information which would be forthcoming during a five-to-seven year period.

Department philosophy and policy were established around the following thirteen points:

- (1) The computer system will be a slave to the needs of the officer in the field, rather than regimenting the officer to become a slave to computer systems.
- (2) The computer must function in a law enforcement environment, rather than attempting to orientate police operations into a computerized environment.
- (3) Computer technicians and hardware engineers will adjust their working hours to the needs of law enforcement operations.
- (4) A law enforcement officer is an extremely busy individual. Besides performing his basic duties of enforcing the law and fighting crime, he has many documented reports to prepare (some are required by law). Whatever the system, it must first assist the officer in the more efficient performance of his duties and, second, it must provide for his ease in its use.
- (5) At a time when society was restricting the powers of the law enforcement officer, it became necessary to develop the technological means by which the law enforcement officer could receive an immediate response to his informational needs; thus reducing or eliminating unnecessary periods in which the citizen is held, pending the outcome of investigation checks. The System must, therefore, be designed to furnish responses within 10 seconds to inquiries initiated by the field forces.
- (6) The first basic category of information to be computerized to which the law enforcement officer needed immediate access was outstanding warrants and police pickup orders.
- (7) The second category of information needed by the field force was abstract data related to criminal convictions, parole status, penitentiary releases, and other information relative to criminal records.
- (8) The third category of information needed was that which would forewarn the officer of impending danger, such as persons known to have been armed, considered dangerous or those who have resisted arrest.
- (9) The data bank stored in the police computer system must be afforded security and protection from access by unauthorized persons or agencies, as required by law enforcement ethics and state law.
- (10) The system must be validated as absolutely accurate, since the citizen's freedom or detention may be at stake. Every safeguard must be built in to permit the system to approach 100 percent reliability on the 'grounds for arrest' information.
- (11) Every category of information entered into the police computer's memory banks must be backed up by a legal document which, by law, authorizes police access to such information and empowers them to investigate and, where warranted, to arrest the citizen when the circumstances clearly indicate a violation of the law.

(12) The system must employ the capability of transmitting "all points bulletin" and other administrative messages through a message switching system to any of the on-line Data Communication terminal devices. As a result of the expected high volume of inquiring traffic, the terminals must be buffered to provide for minimum line transmission time. It was determined that we could assign up to 10 terminals per line with each terminal transmitting on the line for a maximum of 8 seconds per transmission. The system would be designed for automatic numbering of messages thus reducing the administrative control of station clerks.

(13) The hardware and software must be capable of operating in a multi-programming environment, with law enforcement telecommunications functioning in one partition and administrative report programs functioning simultaneously in a second partition.

The conceptual systems study clearly showed that it was essential that the Police Department have an advanced communications system to support the computerized teleprocessing system being planned for the Department. A new communications system which would support seven broadcast channels through various areas of Kansas City was recently placed in operation. It possesses the capacity to handle in excess of one million radio transmissions per year.

The police teleprocessing system originally was built around six major files, each of which could be accessed separately, but which could also access the remaining five files through the Cross Reference Index. The parameters of inquiry were established by name, license number, vehicle identification number, and complaint number.

Provisions were made to 'log' every action occurring in the teleprocessing network operations since this capability would be vital in determining teleprocessing problems, and retrieving on-line transactions should the need arise.

A technical manual was prepared which covered on-line teleprocessing operations. An 80-question test was prepared and given to all police communications personnel since it was felt that they were the heart of the operation. If these personnel failed to understand the new police information system effectively, it could not succeed however successful the computer operations might be. The test stimulated police communications personnel to become familiar with the new system, and their conversion to the use of the video and printer terminals was accomplished with relative ease.

During the month of May, 1968, the hardware equipment was delivered and installed on the fourth floor of the Police Department and the display terminals were installed in the Police Communications Center, Warrant Service Center and Message Center. Action was then initiated to build the operating system in early June and action was initiated to establish the real-time files. Limited teleprocessing service was made available for police operations beginning July 1, 1968. This joint venture in law enforcement utilizing the electronic computer

became known as 'ALERT' or Automated Law Enforcement Response Team.

An extensive checkout of the reliability of the system was conducted during the summer months. All precautions were taken to insure that arrests resulting from information supplied by the teleprocessing system were authentic. To assure that this important phase was accurately and promptly accomplished, the Records Unit of the Police Department was originally assigned one terminal device from which warrants served or recalled could be cancelled immediately into the real-time files. The Message Center of the Communications Division was made responsible for cancellation of recovered stolen vehicles and pickup orders as soon as disposition was completed. One terminal was installed in the Kansas City, Missouri Municipal Court to provide immediate on-line cancellation and recall of warrants, an essential ingredient in maintaining the integrity of real-time files. Program 'locks' were developed which prevented non-law enforcement agencies from gaining access to restricted intelligence information.

On-line teleprocessing demonstrations were conducted for the orientation of police field commanders, which stimulated the commanders to encourage their field personnel to use the system. Field Sergeants were also scheduled for the orientation. It was noted that utilization of the police computer teleprocessing system increased considerably immediately after the orientation. All law enforcement field officers were scheduled in groups of 25 per day and given an extensive indoctrination concerning the potential of the system. The capabilities of the new on-line police teleprocessing system clearly demonstrated to police officials that the department would have the ability to operate in a 21st Century urbanized environment.

Programs were developed which would extract and print from the log file those records on which specific incidents transpired and at the approximate time the incident occurred, as may be requested. The log proved an invaluable aid in recovery problems, was extremely useful in extracting statistics for the patrol commanders regarding use by subordinate personnel, and provided the ability to look at specific events occurring in the police environment.

Procedures were implemented to provide frequent backup of all on-line files. The capability was developed by which transactions could be extracted from the log files if recovery so required. One theory soon was verified—the moment the teleprocessing system became inoperative, the integrity of the system was seriously affected. Programs were developed to produce listings of "hot files" for use when the system was inoperative. Experience showed that inquiries from the field were greatly reduced when field personnel knew they did not have access to the police teleprocessing system.

It was determined that data collection and processing of information into on-line files were highly important elements of real-time telecommunications systems and the mission was assigned to the Data Control Unit. In order to establish firm and rigid control over this function, a special job description was established for Data Control Clerks, with prerequisites similar to Computer Operators. It was felt these persons must necessarily understand the function of the system if they were to be capable of managing and controlling the quality of the ALERT Data Bank. All data entry for the Kansas City Missouri Police Department was assigned to this unit which must man the on-line terminals on a 24-hour basis. Punch card actions were eliminated from the Real-Time system by July, 1969.

One of the major problems confronting Police Administrators was developing a system which would provide district officers with a compact, but meaningful, listing of subjects wanted, who reside within the officer's district. A program was developed which contained an inventory of all wanted persons in street name and residence sequence within district. The system proved extremely helpful in assisting the district officer in apprehending wanted subjects.

The Telecommunications System, while being responsive to the needs of law enforcement operations when requested, still lacked the capability of providing information to officers prior to arrival at a scene or incident. It was decided that the system must be cross-indexed by street name and residence number, with capability of inquiry by street name and residence number for all persons wanted and those with active criminal records. An additional feature was added so that if no one lived at a specific address, the computer would supply names of those individuals who live on the street name within a two-block radius of the residence number. The Address Inquiry routine is generally used when police officers are called to a specific address on a disturbance call and the computer response is given by radio so that officer may be forewarned of wanted subjects or persons who live there and are known to be armed, dangerous or resist arrest. Names and addresses of citizens with no criminal records were specifically excluded and the local chapter of the Civil Liberties Union was advised of that fact.

Kansas City, Missouri provides approximately one-third of the metropolitan area population where 31 jurisdictions exist. It was decided to invite all agencies involved in the criminal justice process to join the ALERT Telecommunications Network System. Those agencies wishing to join would be subject to the following policy:

- (1) Procure the Data Communications Terminal and accept a prorated share of the communications line cost.
- (2) Abide by all system disciplines required of the computerized telecommunications system.

- (3) Safeguard all information obtained from the Data Bank.
- (4) Maintain appropriate source documents which are the authority for entry into the Criminal Data Bank.
- (5) Accept full responsibility for accurate entry of information into the Criminal Data Bank and timely cancellation when the want no longer exists.

At this time, law enforcement agencies representing 3,000 square miles of eastern Kansas and western Missouri are interfaced into the system. These agencies utilize 68 terminals, represent two state highway patrols, four county sheriffs, 19 police departments, one municipal court, county prosecuting attorney and county juvenile court. Since many of the active criminal elements are involved with multi-police agencies, it was decided to establish a master name-index within the ALERT Data Bank. Each criminal record entry would be identified with the ORI of the agency which entered the record, thus multi entries by various law enforcement agencies would be associated with one Master Name Record.

The ALERT System was further extended to interface with the National Crime Information Center. Because of our policy of providing response within 10 seconds to the officer in the street, it was decided to interface NCIC on a Binary-Synchronous (2400 Baud) line. Programming was initiated to relieve the dispatcher of the additional burden of making two inquiries (into the ALERT Data Bank and the NCIC Data Bank). Local inquiry codes requiring only half as many keystrokes as NCIC formats were devised, thereby relieving the dispatcher of the additional time required. The on-line system is now programmed so the inquiry searches the ALERT Data Bank and gives the response back to the dispatcher, converts the local inquiry into NCIC formats and automatically searches NCIC files, giving the second response to the dispatcher.

Organized crime activity is fairly well concentrated in the Kansas City Metropolitan Area and, as such, is of concern to law enforcement. The intelligence officer, previously hampered by being unaware of other law enforcement contacts with Organized Crime (Intelligence Subjects), began to give serious consideration to automating his files. The intelligence officer is vested with complete responsibility in data collection of information pertaining to Organized Crime, Militants and Activist activity and all information related to this category of data must be released by the intelligence officer before it can be entered into on-line files. On-line programs were modified so that any time an Organized Crime subject or vehicle known to be used by a member of Organized Crime was checked by law enforcement agencies, the computer, once it had determined the relationship with Organized Crime subjects would relay 'confirmation of the contact with Organized Crime subjects', together with the time, date, and law enforcement agency of contact, to the Data Communications Terminal operated by the intelli-

gence officer. This feature provides the first step in coordinating contacts with Organized Crime subjects for all regional law enforcement agencies in the Telecommunications Network System.

Parole Officers in this region have always been hampered by a lack of information as to the conduct and activity of persons on parole status. It was decided to record, in the ALERT Data Bank, all persons on parole status. Law enforcement officers contacting parolees are required to prepare a report concerning the circumstances which surround the contact with parolees. This proved to be a valuable source of information to Parole Officers. In some instances, this new source of information proved to be of sufficient value to warrant cancellation of parole and the subject's return to jail.

The ALERT System Data Bank presently consists of the following categories of information:

Outstanding Warrants.....	36,000
Stop/Pickup Orders.....	11,200
Organized Crime Subjects (local).....	480
Organized Crime Subjects (national).....	2,000

On Parole Status .....	4,700
Penitentiary Releases .....	520
Adult Arrest/Conviction Record.....	31,000
Juvenile Arrest/Conviction Record .....	8,100
Fingerprint Classification Numbers .....	18,000
Assault Against Police .....	200
Narcotic Users.....	425
Narcotic Dealers.....	50
Militants * .....	660
Activists .....	35
Shoplifting Subjects .....	250
Robbery Subjects .....	445
Burglary Subjects .....	750
Auto Theft Subjects.....	450
Molestation Subjects .....	37

\* Includes all nationally known militants associated with Black Panthers.

These files may be accessed by name, alias, moniker, license number, vehicle identification number, address and complaint number.

The following pages contain examples of inquiry and retrieval of information from the ALERT Data Bank.

A.TEST.114.200 (Address inquiry at 114 East 200 street)

A.TEST.114.200  
UNABLE TO FIND EXACT ADDRESS  
FOUND THESE POSSIBLES  
ZXAMPLE BARBARA WF 061154 KS 503 130 BN BL  
MOKPD00 110 E 200 ST KANS CITY MO  
MOKPD00 09945670 JA W PROSTITUTION 010168  
XM .TEST.0000020

ZXAMPLE BARRY X WF 121248 KS 502 120 BR BK SUICIDAL  
MOKPD00 111 E 200 ST KANS CITY MO  
MOKPD00 01020304 JA W MURDER 1 051670 01000  
XM .TEST.0000018

ZXAMPLE BENJAMIN D J NM 010240 KS 600 140 GY MN SUICIDAL  
MOKPD00 112 W 200 ST KANS CITY MO  
MOKPD00 01111345 KC W NON-APPEARANCE 092368 00035 2121  
XM .TEST.0000004 HAS MORE WANTS

ZXAMPLE BARON A J WM 010530 MO 408 140 GY BL SUICIDAL  
ARMED DANGEROUS MENTAL RESIST ARREST  
MOKPD00 115 E 200 ST KANS CITY MO  
KS10502 88889999 W LARCENY 072870 00100 9823  
XM .TEST.0000008 HAS MORE WANTS

ZXAMPLE BARRY D WM 070444 UN UN  
ARMED DANGEROUS RESIST ARREST  
MOKPD00 116 E 200 ST KANS CITY MO  
MOKPD00 00006998 JA W SFTY RSPNS FNCL 061070  
XM .TEST.0125084 HAS MORE WANTS

(A search by the computer reveals no one resides at 114 E 200 with a criminal record or wants however within a 2 block radius on 200 St 5 persons live who have criminal records or outstanding warrants).

A.TEST.112.200 (Address inquiry)

A.TEST.112.200  
ZXAMPLE BENJAMIN D J NM 010240 KS 600 140 GY MN SUICIDAL  
MOKPD00 112 W 200 ST KANS CITY MO  
MOKPD00 01111345 KC W NON-APPEARANCE 092368 00035 2121  
MOKPD00 00111654 KC W RECKLESS DRIV 092368 00100 2121  
MOKPD00 00114460 REL 060566 JACKSON CTY JAIL (FORGERY)  
MOKPD00 00999922 MENTALLY DISTURBED INDIVIDUAL  
MOKPD00 00114460 REL 072264 MO STATE PEN (BURGLARY)  
MOKPD00 CRN = \*0000044 TA-020 TC-020 MA-015 MC-008 FA-010 FC-010  
NATIONAL INTELL SUBJECT—PREPARE FIC  
SHOPLIFTING SUBJECT—PREPARE FIC  
BURGLARY SUBJECT—PREPARE FIC  
ROBBERY SUBJECT—PREPARE FIC  
AUTO THEFT SUBJECT—PREPARE FIC  
MOLESTATION SUBJECT—PREPARE FIC  
MENTAL SUBJECT  
ALERT/0000004  
ALIAS ZXAMPLE BOB

NL.TEST.SPARKPLUG. (Nickname inquiry)

NL.TEST.SPARKPLUG.  
XXAMPLE BARDVARK X NM 071915 KS 600 180 BR BR  
MOKPD00 FBI = SOC = 593628741 OLN = NIC = W027896547  
MOKPD00 109 W 200 ST KANS CITY MO  
MOKPD00 ZZZZ99 MO 1 66 FORD MUS 2D RED 987654322  
MOKPD00 9090AOAO KC W MURDER 1 120469  
MOKPD00 12345679 AB S ESCAPE 100968  
MOKPD00 88889999 CC W PARKING VIOLATN 121569  
MOKPD00 9090BOBO JA W PARKING VIOLATN 120469  
MOKPD00 9090COCO KC W PARKING VIOLATN 120469  
MOKPD00 00000CCC ON PAROLE MO STATE PAROLE O EXP 010172  
MOKPD00 09999999 REL 010170 MO STATE PEN (ROBBERY)  
ALERT/0066450 100%  
MONIKER SPARKPLUG  
MOKPD00 ZZZZ90 MO 1 65 FORD FAL 2D CRM 1234567890

(The nickname inquiry reveals the computer found the subject's true name and outstanding warrants.)

N.TEST.SNYDER.HARVEY.E.W.M.010530 (Name Inquiry)

N.TEST.SNYDER.HARVEY.E.W.M.010530  
ZXAMPLE BARON A J WM 010530 MO 408 140 GY BL SUICIDAL  
ARMED DANGEROUS MENTAL RESIST ARREST  
MOKPD00 FBI = SOC = 125146184 OLN = Z314511422  
MOKPD00 115 E 200 ST KANS CITY MO  
MOKPD00 ZZZ882 NB 0 68 CHEV BIS BLK V6789012345  
KS10502 88889999 W LARCENY 072870 00100 9823  
MOKPD00 TEST9990 CC S AUTO THEFT 072470  
MOKPD00 09911340 CP S HIT AND RUN 030468  
MOKPD00 88889999 CC S PARKING VIOLATN 073170  
KS04600 00009999 ON PAROLE JOHNSON CTY PAR O EXP 072374  
MOKPD00 JKT = XX123432 TA-000 TC-000 MA-170 MC-168 FA-003 FC-002  
LOCAL INTELLIGENCE SUBJECT—PREPARE FIC  
NATIONAL INTELL SUBJECT—PREPARE FIC  
ASSAULT AGAINST POLICE OFFICER  
SHOPLIFTING SUBJECT—PREPARE FIC  
BURGLARY SUBJECT—PREPARE FIC  
ROBBERY SUBJECT—PREPARE FIC  
AUTO THEFT SUBJECT—PREPARE FIC  
MOLESTATION SUBJECT—PREPARE FIC  
KNOWN NARCOTICS USER—PREPARE FIC  
KNOWN NARCOTICS DEALER—PREPARE FIC  
KNOWN ACTIVIST—PREPARE FIC  
KNOWN MILITANT—PREPARE FIC  
MENTAL SUBJECT  
MO04800 CRN = \*0000008 TA-000 TC-000 MA-002 MC-001 FA-000 FC-000  
KS04600 CRN = 99999999 TA-000 TC-000 MA-004 MC-003 FA-000 FC-000  
ALERT/0000008 100%  
ALIAS SNYDER HARVEY

TEST MOKPD00

NO RECORD DOB/010530 NAM/SNYDER, HARVEY E SEX/M RAC/W (NCIC Response)

(Response from ALERT Data Bank reflects the fact that the subject Harvey Snyder is an Alias name and the computer has identified his true name as Baron Zxample. The abstract of criminal records shows entries from various law enforcement agencies, reference the ORI)

N.TEST.ZXAMPLE.BENJAMIN.D.W.M.010240 (Name Inquiry)

N.TEST.ZXAMPLE.BENJAMIN.D.W.M.010240 (Response ALERT Data Bank)  
ZXAMPLE BENJAMIN D J NM 010240 KS 600 140 GY MN SUICIDAL  
MOKPD00 112 W 200 ST KANS CITY MO  
MOKPD00 01111345 KC W NON-APPEARANCE 092368 00035 2121  
MOKPD00 00111654 KC W RECKLESS DRIV 092368 00100 2121  
MOKPD00 00114460 REL 060566 JACKSON CTY JAIL (FORGERY)  
MOKPD00 00999922 MENTALLY DISTURBED INDIVIDUAL  
MOKPD00 00114460 REL 072264 MO STATE PEN (BURGLARY)  
MOKPD00 CRN = \*0000044 TA-020 TC-020 MA-015 MC-008 FA-010 FC-010  
NATIONAL INTELL SUBJECT—PREPARE FIC  
SHOPLIFTING SUBJECT—PREPARE FIC  
BURGLARY SUBJECT—PREPARE FIC  
ROBBERY SUBJECT—PREPARE FIC  
AUTO THEFT SUBJECT—PREPARE FIC  
MOLESTATION SUBJECT—PREPARE FIC  
MENTAL SUBJECT  
ALERT/0000004 093%  
ALIAS ZXAMPLE BOB

TEST MOKPD00

(Response from NCIC Data Bank)  
NO RECORD DOB/010240 NAM/ZXAMPLE, BENJAMIN D SEX/M RAC/W

N.TEST.ZXAMPLE.BOBBY..W.M.010240 (Name Inquiry)  
N.TEST.ZXAMPLE.BOBBY..W.M.010240 NM 010240 KS 153 GY MN  
ZXAMPLE BOB ST KANS CITY MO  
MOKPD00 112 W 200  
MOKPD00 01111345 KC W NON-APPEARANCE 092368 00035 2121  
XM .TEST.0000004 HAS MORE WANTS 071%

ZXAMPLE BENJAMIN D J NM 010240 KS 600 140 GY MN  
MOKPD00 112 W 200 ST KANS CITY MO  
MOKPD00 01111345 KC W NON-APPEARANCE 092368 00035 2121  
XM .TEST.0000004 HAS MORE WANTS 064%

ZXAMPLE BILL WM MO 409 160 BK BK  
ARMED DANGEROUS RESIST ARREST  
MOKPD00 198 E 200 ST KANS CITY MO  
NO WARRANTS OR PICKUPS FOUND  
XM .TEST.0000012 058%

ZXAMPLE BIFF WM MO 500 148 BK BK  
MOKPD00 199 E 200 ST KANS CITY MO  
NO WARRANTS OR PICKUPS FOUND  
XM .TEST.0000019 058%

TEST MOKPD00  
NO RECORD DOB/010240 NAM/ZXAMPLE, BOBBY SEX/M RAC/W

(The response from the ALERT Data Bank reflects the fact that the computer was unable to find a record on the subject but found similar names and has given a brief description together with the per cent of match. The NCIC response shows a negative search in NCIC files.)

L.TEST.ZZZZ90.MO (License Inquiry)  
L.TEST.ZZZZ90.MO (Response Alert Data Bank)  
ZXAMPLE BARDVARK X NM 071915 KS 600 180 BR BR NIC = W027896547  
MOKPD00 FBI = SOC = 593628741 OLN =  
MOKPD00 109 W 200 ST KANS CITY MO  
MOKPD00 ZZZZ99 MO 1 66 FORD MUS 2D RED 987654322  
MOKPD00 9090AOAO KC W MURDER 1 120469  
MOKPD00 12345679 AB S ESCAPE 100968  
MOKPD00 88889999 CC W PARKING VIOLATN 121569  
MOKPD00 9090BOBO JA W PARKING VIOLATN 120469  
MOKPD00 9090COCO KC W PARKING VIOLATN 120469  
MOKPD00 00000CCC ON PAROLE MO STATE PAROLE O EXP 010172  
MOKPD00 09999999 REL 010170 MO STATE PEN (ROBBERY)  
ALERT/0066450  
MONIKER SPARKPLUG  
MOKPD00 ZZZZ90 MO 1 65 FORD FAL 2D CRM 1234567890

TEST MOKPD00  
NO RECORD LIC/ ZZZZ90 LIS/MO (Ncic Response)

A.TEST.111.200 (address inquiry made on 111 W 200 St)  
A.TEST.111.200  
ZXAMPLE BARRY X WF 121248 KS 502 120 BR BK SUICIDAL NIC = W026263912  
MOKPD00 FBI = 12345678 SOC = 111111111 OLN =  
MOKPD00 112 E 200 ST  
MOKPD00 ZZZZ95 MO 1 67 CADI CON WHI VIN12345678  
MOKPD00 01020304 JA W MURDER 1 051670 01000  
MOKPD00 09898989 ON PAROLE MO STATE PAROLE O EXP 051775  
MOKPD00 09797979 REL MO STATE PEN 051770 (ROBBERY)  
MOKPD00 JKT = 00113513 TA-002 TC-000 MA-000 MC-000 FA-010 FC-000  
LOCAL INTELLIGENCE SUBJECT-PREPARE FIC  
ROBBERY SUBJECT-PREPARE FIC  
ALERT/0000018  
MOKPD00 1122 E 200 ST  
MOKPD00 111 E 200 ST KC MO

Successful automated information systems require a great deal of thought, foresight and design effort. Equally important is the need for 'user-participation' in the design of the system since, ultimately, the 'user' must participate and utilize the system. Failing to fully involve the 'user' and consider his operational requirements can only result in resentment, non-cooperation, and lack of harmony in implementation of the operational system. The Command Staff decided that a Procedural Instruction should be published which contained Departmental Policy, Doctrine and Procedures with respect to 'Automated Information Systems.' The document contained a list of terminology and definitions, many of which were new in the police environment, but which must be learned by law enforcement personnel involved in automated systems. Responsibilities applicable to various echelons of command were specifically outlined with respect to use and control of information systems within the police environment.

The Command Staff of the Police Department decided that as a second priority, administrative programs should be developed for the following systems:

- (1) Finance/Payroll
- (2) Traffic Violation Analysis
- (3) FBI Uniform Crime Reporting System
- (4) National Safety Council
- (5) Detective Workload System
- (6) Municipal Court Docket
- (7) Police Budget System
- (8) Computer Utilization System
- (9) Position Control
- (10) Patrol Workload Factors
- (11) Offense Reporting
- (12) Modus Operandi ID System
- (13) Resource Allocation and Forces Workload Prediction

Utilizing the 'Computerized Law Enforcement Resource Allocation System', the Kansas City Missouri Police Department hopes to improve the effectiveness of current police resources by concentrating the available forces of some 1,000 men throughout the 316 square miles of Kansas City, based on the greatest need of 'Calls for Service'. The police force structure changes three times in each 24-hour period which results in the law enforcement officer's area of patrol for the 'high crime area' being changed from 49 patrol areas during the period midnight to 8:00 a.m. to a reduced geographical area in which the additional beats are established to 65 beats during the period of 4:00 p.m. to midnight and 60 beats during the day shift. Studies made from the Police Computer Resource Allocation System have shown that metropolitan police solve two-thirds of the crimes they respond to within two minutes; however, less than one crime in five is solved if the response is delayed more than five minutes. Using the resource allocation system, the Kansas City Missouri Police Department hopes to increase the number of two-minute responses. Studies of 'predicted' calls for

service compared against actual events reveal the computerized resource allocation system is effective in that the predicted statistics are about 95 percent accurate.

It is generally felt that the efficiency and productivity of the police force have been increased by 15 percent as a result of automation practices which have been implemented within the Police Department. The following specific instances are cited as examples where automation is improving the efficiency of law enforcement operations:

- (1) The reduction from between 10-30 minutes to an average of 10 seconds, 90 percent of the operational time, in obtaining information as to 'want' status on the subject being checked by the officer in the field, and providing information which would 'forewarn' the officer of contact with the subjects known to be armed, dangerous or resist arrest. Approximately 16,000 outstanding warrants/want cases have been resolved since the computer has been in operation.
- (2) The provision of instantaneous information to district officers and intelligence officers on movements of organized crime subjects.
- (3) The capability by law enforcement to be appraised of persons identified on parole status, with follow up information submitted to the Parole Officers.
- (4) Developed the capability to provide statistical data related to vehicle accidents and enforcement by location, date and time of occurrence.
- (5) The provision of lists of wanted persons by residence within beat to reduce the amount of time for the law enforcement officer to get to each residence.
- (6) The provision of abstract criminal records for the district officer's informational and investigative purposes.
- (7) The provision of summaries of investigators' work by case, by category of work within case, etc.
- (8) To provide police administrators with current information and projected cost of specific projects.
- (9) The preparation each day of listings of all outstanding wanted persons and stolen vehicles in the metropolitan area, which are disseminated to metropolitan area police operations.
- (10) The development of the capability to search computerized files by "method of operation" or "method of commission of a crime incident" in an effort to identify likely suspects based upon previously established criminal patterns.
- (11) The ability to fulfill special requests for data on a timely basis from any of the real time criminal files or from the offense, arrest, vehicle accident or traffic arrest files.
- (12) Preparation of uniform crime reports and National Safety Council reports for terminal users in the ALERT system.
- (13) Preparation of the Municipal Traffic Court dockets.
- (14) Traffic ticket accountability from initial issue from the Municipal Court to the Police Department, through final disposition of the case.
- (15) On-line traffic arrest conviction information for two years from date of final disposition.
- (16) Assignment of patrol personnel to handle calls for service on the basis of resource allocation statistics.
- (17) Analysis of on duty patrol time spent in non-patrol functions, i.e., vehicle and radio repair, administrative activities, and on duty court appearances.
- (18) Analysis of effectiveness of foot patrol beats in areas previously covered by motorized patrol only.

The entire automation function of the Police Department represents about five percent of the police budget or, in practical terms, it costs the Police Department \$84.00 an hour to operate the Police Com-

puter System.

### FUTURE PLANS

The Kansas City Missouri Police Department has developed tentative plans for building a "Command and Control System." This System, when implemented, will result in a further integration of the computer with police operations as follows:

- (1) Implementing a Phase I Mobile Terminal Operations System in vehicles of law enforcement agencies within the region. This Mobile Terminal System will eliminate 75 percent of police dispatcher operations by eliminating the manual effort of dispatchers.
- (2) Introduction of an automated system whereby the computer will record, on a real time basis, all police vehicles 'in service' and 'out of service'.
- (3) Designing a Phase II Mobile Terminal System in which Cathode-Ray terminals will be available for officers to enter selected items of data with respect to field operations for on-line files.

Other programs in the planning stage include:

- (1) The development of a Personnel Package containing a complete personal profile on each police officer. This file will be used to provide the police administrator with statistical data relative to career progression training and job assignments.
- (2) Development of a long range planning model that will enable the Chief Administrator to simulate cost factors and their relationship to desirable programs. As an example, what is the total direct and indirect cost involved in implementing a program of hiring 100 additional police officers.
- (3) Design of an Automated Police Vehicle Maintenance Profile.

In January, 1970, it was decided that this system must be expanded to meet the additional requirements of law enforcement administrators. The extended system will be required to provide the capability to capture, process, store and retrieve every category of information in which the citizen becomes involved with law enforcement operations.

The system is to be designed around a master name index which will provide an abstract history of the citizen's record from on-line files. It is also proposed that the system will provide an abstract summary of crime index figures to field officers, with retrieval capability of crime by time, location and crime index code.

In an effort to increase the 'throughput' of input data, we are converting the mechanical process of capturing data from keypunch to data entry from Cathode-Ray tube devices.

In addition to serving regional Police and Sheriffs' Departments, the 'ALERT' System will serve those other areas of the law enforcement triangle, the courts' and the Prosecuting Attorney's offices, with data that is of interest to them.

Following is a description of the various sub-systems contained in the expanded 'ALERT' System:

- (1) A Criminal Information System that will contain warrants, wants, warning information and selected items of criminal history.
- (2) An Offense Reporting System that will record names of

victims and witnesses, as well as statistical and historical data in the files about each incident.

(3) A Traffic Ticket System that will record the names of traffic violators, as well as statistical and historical data about each incident.

(4) A Court Docket System that will contain the data needed to print the court dockets, as well as officer notifications.

(5) An Arrest System that will record arrest information for statistical and historical purposes. Information will be available by individual arrest.

(6) A Vehicular Accident Reporting System which will have statistical and historical data available about accident reports.

(7) An Applicant System which will contain information about those persons who have applied for a license in a number of fields requiring a permit from the Police Department.

(8) A Serialized Stolen Property System which will contain statistical and historical information about serialized stolen property. This system will also contain recovered property for which we have no stolen report.

(9) A Civil Index System whereby any incident for which a case number was issued will be indexed by name for every person involved in the incident.

The files are designed so that there will be three physical files, a name index, a general purpose index and a master data file. The general index file will, by nature of the key, be subdivided into logical sub-files.

#### Name Index File

Purpose—to provide an alphabetic grouping of all names involved in any way with system participants. This file will contain true names, alias names, moniker names and those business names that have reason to be in our files.

#### General Purpose Index File

Purpose—to maintain one central index file where a check can be made for any numeric identifier which may be associated with a person, address, automobile, offense or ticket, vehicle accident and arrest. Also included will be index entries for Court System purposes which will have court date and time as the key and Offense System entries which will be used for the Daily Intelligence Report (Part I Offenses committed within the past 24 hours), and Injury Accidents occurring within the past 24 hours.

The types of data included in this file will be as follows:

- (1) License number
- (2) VIN number
- (3) Address
- (4) Warrant number
- (5) Free format information numbers
- (6) Traffic ticket numbers
- (7) Court date and time
- (8) CRN for arrest system/Civil Index
- (9) Four formats of an offense cross-index record
- (10) CRN for Vehicle Accident
- (11) Arrest number index

#### Master File

Purpose—to provide one central file where all data concerning an individual or an automobile can be stored together. One seek by the 2314 can pick up all

associated data.

The data in this file will be grouped together by an ALN (Alert Number). Within an ALN, several different suffixes will cause the data to be grouped and displayed in the sequence desired. The sequence of a complement of records will be as follows:

- (1) Name records
- (2) Numeric identifier records
- (3) Address records
- (4) License records
- (5) Warrants or Wants (In seriousness sequence)
- (6) Informational records
- (7) Arrest information (abstract)
- (8) Traffic Arrest
- (9) Vehicle accidents
- (10) Offense Records
- (11) Civil Index

## ALERT 'ON-LINE' SYSTEMS

LAW ENFORCEMENT WARRANTS/PICKUP ORDERS	COURT DOCKET SYSTEM
OFFENSE SYSTEM	VEHICULAR ACCIDENT
SERIALIZED STOLEN PROPERTY SYSTEM	APPLICANT PERMIT RECORD SYSTEM
TRAFFIC TICKET	CRIMINAL HISTORY
CIVIL INDEX	

In order to best use the record space available in our files, we will split some of our records into two parts. For example, the name record has certain data missing a large percentage of the time. Our solution to this was to divide the name record into one segment of data that is present most of the time, and another segment that is missing frequently. The second segment is called the numbers record and contains all numeric identification an individual normally uses. Another example of segmenting records is in the offense and traffic systems. These systems collect two types of data, statistical and historic. The historic data has to be retained for inquiry purposes for a period of one and two years respectively. Statistical data is necessary only long enough to run statistical reports. These records have been segmented on that basis and the statistical records will be dumped onto tape and purged from the Teleprocessing System, as soon as the reports have been run.

One of the major problems confronting the computer technicians was developing a highly accurate

technique by which the computer could search out and retrieve accurate information on a given person from other records with similar common names. The following explanation reflects the technique used by the ALERT System in the identification of correct names by the computer.

When the computer receives the name inquiry, the name is compacted to be used as the search key. The computer will retrieve all of the records with the same key as the search key. Comparison of the fields in the inquiry are then made against the equivalent fields in the records found. If the field in the inquiry and the equivalent field in the record are not blank, a positive value designated for that field is added to a total weight counter. If these fields contain matching information, the positive value is also added to the weight counter. When one or both fields are blank, no values are added to either counter. After all the fields have been compared, the weight counter is divided by the total weight counter giving a percent of hit. The records are then sorted so that the record with the highest percent will be displayed first. To be displayed, the record must match at a minimum of 40 percent. The following example portrays how the weighting table is used.

Example: An inquiry made on the name 'Less Johnson, white, male, DOB 11094'

WEIGHTING TABLE		INQUIRY		RECORD INTERROGATION	
Match	No Match	Name	Total Points Added	Points Accumulated	
+ 90	- 10	Name, Last JOHNSON	+ 90	JOHNSON	+ 90
+ 40	- 15	Name, First L (First Char)	+ 40	L	+ 40
+ 0	- 15	Name, First E (Second Char)	0	E	
+ 40	- 10	Name, First SS (Last 9 Positions)	+ 40	Onard	- 10
+ 10	- 40	Name (MI)			
+ 5	- 10	Race W	+ 5	W	+ 5
+ 0	- 80	Sex M	0	M	-
+ 10	- 40	DOB (Month) 11	+ 10	11	+ 10
+ 15	- 20	DOB (Day) 09	+ 15	24	- 20
+ 25	- 10	DOB (Year) 41	+ 25	38	- 10
Total Points Accumulated			225	Interrogation Points	105
					Result—47% Hit

The nearest match found was on the name Leonard Johnson. The person making the inquiry would have to evaluate the response. A 47% match when full name, race, sex & D.O.B. as given is normally not considered a good hit. However, an evaluation and decision should be made on the merits of each case when a possible match is indicated. Such things as physical description, present and previous address and numeric identification should be compared with what is recorded in the files to assist in positive identification or elimination of the subject.

A new system philosophy is proposed in which 'multi-threading' and a priority of processing actions must be implemented in order to guarantee the volume of 'throughput' and processing of quantities of data proposed in this document.

To achieve this goal, the Real-Time Teleprocessing Program will consist of a main task and six sub-tasks,

operating concurrently under control of the Disk Operating System.

The six sub-tasks are:

- (1) Line Control Program
- (2) Output Queue Routine
- (3) Input Queue Routine
- (4) FASTER Transaction Processor
- (5) Source Data Collection Processor
- (6) NCIC/Message Switch/Error Handler Processor

These tasks are attached, in that priority. That is, if two tasks require CPU Control, the task with the highest priority gets control and performs its function. When it no longer requires CPU Control, the other task takes over and performs its function. Under this arrangement, a task can interrupt a lower

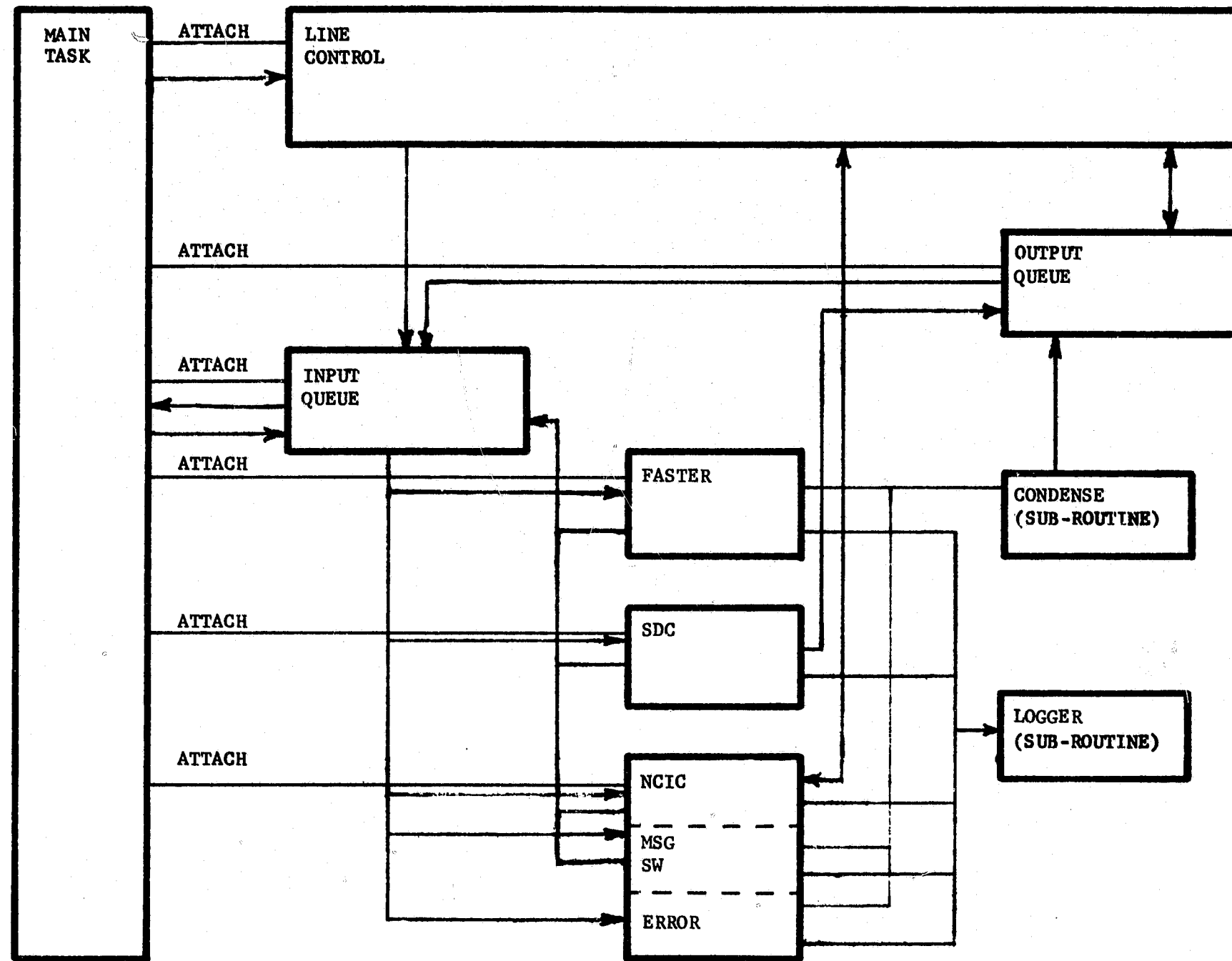
priority task or can be interrupted by a higher priority task.

Line Control, Input Queueing, and Output Queueing are *low volume* processing service routines that require priority control in order to perform their services and keep the whole system running effectively.

The transaction processing routines contain the bulk of the logic processing and are the most time consuming routines. When these routines are busy and a request for Line Control, Input Queueing, or Output Queueing is recognized, the processing program is only temporarily interrupted and then continues once the interrupting routine completes service.



TELECOMMUNICATIONS SYSTEM CONTROL



CORE ALLOCATION

Main Task .....	3½ K
Line Control (Task) .....	29 K
NCIC MSG & Error Handler (Task)	12 K
Faster (Task) .....	76 K
Output Que (Task) .....	10 K
Input Que (Task) .....	7 K
SEP Sub-Routines	
LOGGER 2 K	
USRM 32 K	
CONDS ½ K.....	34½ K
Source Data Collection (Task).....	4 K
Administrative Programs (Batch)	64 K
Supervisor .....	16 K

TRANSACTION PROCESSING FLOW  
From Input through Output

The line control program reads a transaction from the terminal. It then determines that it is a data transaction and passes the transaction to the input queue routine.

The input queue routine checks to see that the transaction is valid for the system and the terminal and is active. It then queues the transaction, (either in core or on disk), in the appropriate queue.

The transaction processing routine that processes the above queue requests the transaction from the input queue routine. The input queue routine then de-queues the transaction and passes it to the transaction processing routine.

The transaction processing routine then processes the transaction and generates some output. The processing routine then requests that the output queue routine queue the output data.

The output queue routine starts building the output message queue, and waits for further requests from the transaction processing routine.

The transaction processing routine continues processing the transaction, and may generate some more output and result in the above sequence between the output queue routine and the transaction processing routine being continued.

However, when the transaction processing routine has completed the transaction (before requesting another transaction), it notifies the output queue routine that output is complete.

The output queue routine then terminates the message and releases the pages used by the message to the common page pool. The terminal status is readjusted and some other control tables are updated.

All the while this transaction was being processed, other transactions could be at any of the stages of its flow.

The output queue routine then places the output in the proper terminal queue, ready to be sent to the terminal.

The line control program checks to see if there is any output available, and when there is, requests output data from the output queue routine. The output queue routine gets the output from disk, resets terminal status conditions, and passes the data to the line control program.

The line control program then transmits the output data to the terminal and upon successful transmission (or paging command, depending on terminal discipline) the line control program notifies the output queue to reset the terminal status. The line control program again checks for output and the above sequence is executed until the last page has been transmitted (or a termination command has been issued).

FG

BG

LINE CONTROL

The line control task is responsible for performing the input/output operations for the terminals, as well as passing and getting data and control commands to and from the input queue and output queue routines.

Basically the processing of the line control program is as follows:

- Read data from terminal
- Determine if it is a data transaction or a terminal control function request
- Call the input queue routine to handle data transaction requests
- Call the output queue routine to handle terminal control function requests
- Check for output availability and request output data from the output queue routine
- Upon notification from the output queue routine that output data has been transferred, write to the terminal.

When not actually performing any of these functions, the line control program will stand by in a wait state so that lower priority tasks can perform their functions.

INPUT QUEUE ROUTINE

The input queue routine is responsible for maintaining queues of transactions for the transaction processing routines. This ability to stack transactions for processing regardless of whether the transaction processing routine is busy allows the line control program to maintain maximum communication with the terminals.

Queue maintenance includes stacking of transaction requests, and unstacking the transaction and passing it to a transaction processing routine. The queueing may be done in core, on disk, or a combination of core and disk.

Since the transaction processing routines each perform only specific transactions, the input queue routine must determine which transaction processing routine will perform the processing and stack the transaction request in the proper queue for that processor. At the same time, the input queue routine will check the validity and status of the transaction request. If the transaction request does not pass all tests, an error transaction request is generated and queued for the error handling processing routine.

Requests to stack transactions may be made by any other task in the real-time program. Line control will request stacking of terminal requests, transaction processing programs will request stacking of secondary transactions, and any task can request stacking of error transactions.

The unstacking of transaction requests is performed only for transaction processing routines.

Briefly, the transaction processing routine will check to determine if any transaction is queued for it. If there are none, the transaction processing routine waits until there is a request stacked. If there is

a transaction stacked, the processing routine requests a transaction from the input queue routine. The input queue routine then unstacks the request and passes it to the transaction processing routine for processing.

GENERAL CONCEPTION OF  
TRANSACTION PROCESSING ROUTINE

The transaction processing routine will wait until something is queued up for it to do. As soon as a transaction is queued, the processing routine will request a transaction from the Input Queue routine. After the input queue routine has passed the transaction to the processing routine, the processing routine performs its functions and may generate some terminal output. If there is some terminal output, the transaction processing routine will request the output queue routine to take the output and queue it on disk.

The transaction processing routine may make multiple requests to the output queue routine for a single transaction. (Multiple terminal output is an example of a situation requiring a multiple output queue routine request.) At the end of processing, the processing routine will notify the output queue routine of completion of processing for this transaction; then the process will begin all over.

FASTER

This processing routine will update and maintain the real-time police data base files. All inquiries from field officers and all updates and additions to these files will be performed by this task.

This task will have three input queues for stacking its transactions. These queues will permit priority processing of transactions.

- (1) Chained transactions
- (2) Operational inquiries.
- (3) Updates, adds, investigative inquiries

The programming for this task will be done using the FASTER programming package.

SEPARATE SUB-ROUTINES

This transaction processing routine will perform the following three functions:

- (1) NCIC message handling
- (2) Error message handling
- (3) Message switching

NCIC message handling:

Transaction processor #1 processes a transaction and determines that this transaction should also be routed to NCIC, so it queues a transaction for the NCIC message handler via the input queue routine. This transaction indicates the kind of NCIC request and includes the data.

The NCIC message handling routine then takes

the data and re-formats it to be consistent with NCIC format requirements and queues it via the output queue routine.

Responses from NCIC come back through the line control program to the input queue routine to the NCIC message handler. The NCIC message handler relays the response to the initial originating terminal and if necessary, stacks a request (via the input queue routine), to transaction processing routine #1 to notify it of NCIC's handling (update responses contain FBI record information, to be stored on real-time police data base files).

#### ERROR MESSAGE HANDLING

Any task in the system may stack an error transaction via the input queue routine. The error message handler will use the information in the error transaction to generate the correct error message and establish the message routing. The error messages and their particular handling requirement may be disk resident or core resident.

Any catastrophe errors or errors that cannot be handled using this approach, will be handled immediately by the task recognizing the error condition and will be outputted on the system console.

#### MESSAGE SWITCHING

All administrative traffic will be sent to this routine. The message switching routine will handle input and output message numbering and will take care of routing the messages to the proper terminals.

#### OUTPUT QUEUE ROUTINE

The output queue routine is responsible for disk queuing all output data, retrieving output data upon request of the line control program, and maintaining terminal output status.

The output queue routine will insure that the messages from the transaction processing routines are kept intact and separate from messages created by another transaction processing routine.

In addition, the output queue routine will provide

for four levels of priority for output. (NCIC inquiries must be in a higher priority and separate queue than updates, this will allow updates to be blocked and still handle inquiries). This degree of priority output queuing is not needed immediately but it does provide for future developments.

The output queue routine also provides the paging and termination functions as well as a wide range of terminal output queue manipulation and control functions.

The output queue routine will provide a common page pool to be shared by all terminals, and it maintains queue pointers to keep track of the messages for each terminal.

#### SOURCE DATA COLLECTION

The Source Data Task provides the means for entering large batches of data directly from the source document into the ALERT files. Because of the greater efficiencies which result to Data Processing (greater accuracy and 20 percent more data throughput), this technique in source data collection is being implemented as a replacement to Key punch Operations.

Data is entered on the 2260 visual display devices using formatted masks. The source data task provides the masks in a predetermined sequence unless otherwise specified by the operator. Data that is entered is processed through a series of edits referred to as 'Primary edits'. Any field that does not pass the primary edits will cause the transaction to be redisplayed on the 2260 device with the field or fields with errors displayed as asterisks. After errors have been corrected and the transaction has passed the primary edits the next sequential mask is displayed on the 2260 device.

When this transaction passes the primary edits, the Source Data Task changes the inquiry code that is used on the mask to an inquiry code that is recognized by FASTER and passes the data to input queue. Input queue passes the data, to FASTER, where 'Secondary edits' are performed and the files are updated.

## A COMPARISON OF AN IDEAL CRIMINAL COURT INFORMATION SYSTEM TO THE PHILADELPHIA CRIMINAL COURT INFORMATION SYSTEM

by Mr. Larry P. Polansky  
Chief Deputy Court Administrator  
Data Processing  
Common Pleas Court of Philadelphia  
and

Mrs. Jean M. White  
Administrative Assistant to Court Administrator  
Common Pleas Court of Philadelphia

#### INTRODUCTION

Although we recognize the need and are working towards the goal of a Total Criminal Justice Information System, we will limit this paper to a comparison of an ideal criminal court information system to the operating Philadelphia criminal court information system.

Certainly the criminal courts are inextricably interrelated with the agencies of law enforcement, criminal prosecution, and criminal reform. The courts cannot function without these other agencies, and any serious attempt to solve the problems of crime and criminality must necessarily involve commitment to the study of the total criminal justice process, of which the courts are only a part.

On the other hand, the criminal courts do perform very special and specific functions. The criminal court is the one stage of the criminal justice process where facts must be presented and weighed, where a judgment must be made concerning the law-breaking act itself, where the dangerousness and reliability of the defendant must be ascertained, and where the future of the law-breaker must be determined. In a large metropolitan area, such as Philadelphia, which has at least 12,000 active criminal cases, an information system which is accurate and easily accessed is vital to supporting the important decisions to be made by the Court.

The first part of this paper, then, is a discussion of an ideal court information system, beginning with definitions, and followed by a description of the special functions (ideal operating sub-systems) of the court, which require certain types of information in order to do their jobs. The second part of the paper is devoted to the Philadelphia court information system—how it supports certain of the ideal operating sub-systems, and how it anticipates to expand its scope in the future.

#### PART I

In this era of systems planning, systems analysis, and systems design for the criminal justice system,

the court system, and the system of information for the systems aforementioned, it would seem basic to define what a "system" is. The most erudite definition we could find calls a "system" a "set or arrangement of things such that any part ultimately has some effect on every other part."<sup>1</sup> We like this definition for it indicates that the human race has raised itself to such a state of civilization that we are becoming increasingly cognizant that everything is relative and that most things are interrelated.

Using this definition of "system" seriously, we are able to define an "information system" as bits of data which are collected and combined in a systematic way, such that use of that data can be made in making decisions of far-reaching value. From our definition, the data collected for an information system must be data *useful in making decisions*, and it must have *ultimate influence on more than one individual or operation*.

If we take our definition one step further, we are able to postulate what a "court information system" is. It is a *system of collected bits of data of significance to those who are in a position to make decisions about the operation and policy of the criminal court*. In other words, a court information system serves all attorneys and court personnel—including the Court Administrator, the District Attorney, the Judges—who make decisions about the functioning and effective operation of the Courts. The court information system, then, is a supportive system, and system, then, is a supportive system, and the other court systems it supports or serves are the operating, functioning systems which determine what the court does.

The next logical question is, what are these operating systems (or what does the court do). Speaking of the ideal criminal court, we have identified five operating sub-systems which we feel every court should have, all of which would function best if decisions were made based on accurate data from a complete court information system. The systems we identified are:

- I. Trial-stream, case-flow system (including the control of facilities and resources)
- II. People system
- III. Statistical Reporting System
- IV. Research and Planning System
- V. Statute and case law searching system

We will discuss each of these court sub-systems (1)

describing what is included in the particular system by means of listing some of the decisions to be made within that system, (2) hypothesizing what the ideal goal of each system might be, and (3) presenting what information or bits of data would have to be collected and systematized in order to attain the ideal goal for each system. In the second part of this paper, we will outline how the five ideal court sub-systems function in Philadelphia; we will present some samples of how the Philadelphia court information system supports these sub-systems; and we will indicate the future direction and priorities of our Philadelphia court information system.

### I. Trial-stream, case-flow system

The criminal court has the obligation to try a case as quickly as it can without impairing the rights of the defendant to "due process" and equitable, humane treatment. The scheduling of the legally required steps in the trial process and the docketing or recording of the outcome of each of those steps have been the means of assuring speedy, just trials. The kinds of decisions the court faces in weighing speed against "fairness" include the following:

- Will cases pass through the trial stream more quickly if we give the attorneys more advance notice that the case is coming up?
- Can we continue cases on a day to day basis where the officer was unavailable, or no service was made on the defendant, or witnesses failed to appear?
- Should we assign a voluntary defender for the defendant for the course of a proceeding whenever private defense counsel fails to appear?
- Will the trial process be expedited by incorporating the hearing of pre-trial motions at the time of trial?
- Can we force consolidation of minor cases?
- Should we acknowledge and use the fact to our advantage that certain Judges are "waiver" Judges, and that others are not?

The ideal goal of the trial-stream, case-flow system then, might be the *setting of one time, date, and courtroom for each legally required action of a case, and the assurance that that portion of the case will be dealt with and decided fairly at that designated time.*

In order to achieve this goal, a conflict free time and date would have to be worked out for each case at each stage of the processing of that case. The ideal court information system would have to have an accurate, unchanging schedule for the prepared defense attorney, the prepared District Attorney, the witnesses, the arresting officer, and the defendant. These schedules would then have to be matched to Judge, room, and court staff availabilities. Information could also be gathered regarding reasons for continuances, and Judges before whom cases will be heard and disposed of at first trial listing.

Logistics of facilities and resources refers to the physical operation of the courtroom—assigning a Judge, court clerks, court reporters, and court officers to the available courtrooms. The kinds of deci-

sions which must be made include—

- How many Judges are needed to maximize use of space?
- How many cases should be listed per day in order to insure that each Judge has enough cases ready to try to keep him busy for the extent of the court day?
- What stenographers are behind in their work?
- How many jury rooms and jurors need to be available on a particular day?
- Should Judges conduct sentence imposition in their chambers?

The ideal goal of the logistics system might be to *maximize use of limited, good personnel and adequate facilities.* A complete information system, in order to contribute to this goal, would have to be equipped to provide an inventory of personnel, their schedules, and a ranking of their abilities; an inventory of courtrooms, chambers, and conference rooms; and an indication of how many of what type of facility is needed and when. Judges, clerks, reporters, and juries would be scheduled in such a way that at any time in the entire court day, every room would be filled and functioning with the required number of personnel with the required degree of skill.

### II. People System

There are many actors in the criminal justice process, the most important of which should be the defendant. All actors (attorneys, bonding companies, witnesses, and Judges, as well as the defendant) must be contacted from time to time. We need to know where to find these actors. We also need to know many social characteristics about the defendant in order to guess his reliability, dangerousness to the public, and special keys to reforming his behavior. Within the people system, then, questions to be answered or decisions to be made include:

- Who are the parties involved, where are they located, and how shall we contact them?
- When is the best time to get information about a defendant's background, character, and special problems?
- Can pre-sentence investigations be eliminated if the Judge has defendant information as a result of the bail-setting procedure?
- How can the court be certain that a defendant will be brought or will come to each stage of the trial process?
- How far in advance of a court appearance must notice be given to bonding companies, the defendant, the Sheriff, and the witnesses that the defendant's appearance is required?
- Who's responsibility is it to assure that witnesses are not inconvenienced?

The ideal goal of the people system would be to *be able to successfully and rapidly communicate with each actor in a particular case, and to have so much of the right information about each actor that the court would always treat the defendant successfully.* A complete court information system would need to accumulate and organize by case the exact names and location of all the participants in a case, with the

capacity of rapidly changing that information when required. Social characteristics of the defendant should be gathered and stored and updated by the ideal court information system, the "rightness" or "usefulness" of that information being determined over time.

### III. Statistical Reporting System

By statistical reporting we mean that the court has the obligation to provide the public with periodic reports on the number of cases in the court, the number of dispositions, the type of dispositions, etc. Decisions to be made include:

- How much information about dispositions of cases should the Public be made aware of?
- Should we tell Judges how they are sentencing compared to the other Judges?
- Can we aid or hinder the speed of trials by publishing facts about delinquent lawyers?
- Who should write the reports?
- How can we assure that the statistics will not be misconstrued or used for political gain?

Ideally, the goal of the statistical reporting system would be to *inform every participant and nonparticipant in the criminal justice process with what he needs to know about court operations in order for him to help improve that process.* The complete court information system should provide the data for the various reports.

### IV. Research and Planning System

We feel that research and planning is an important system in the ideal court. It is here that questions about the other operating sub-systems such as those listed in each description above are articulated, organized, and, hopefully, answered. Other questions and decisions to be made within this particular sub-system include:

- How long should the average criminal case take from arrest through sentencing in Philadelphia?
- Should we speed the process of trial by eliminating the Grand Jury?
- Can the court aid the flow of cases by assuming functions of indictment now done by the under-staffed District Attorney's Office?
- Would we be able to handle a situation in which every defendant demanded a jury trial?
- How many Judges would we need to clear up our criminal court backlog completely?

The ideal goal for a research and planning system might be to *be able to evaluate quickly (perhaps by simulation) what effect a change of policy or procedure in one aspect of the court's operation would have on all other aspects and court systems.* It becomes most evident here that the court information system must provide complete and accurate bits of data to the research and planning effort of the court.

### V. Statute and Case-Law Searching System

This system, according to some, is the most impor-

tant of the operations—i.e. to hear the facts surrounding a particular act and to decide, based on a history of interpretations of similar acts, whether or not the act is a criminal violation of the Law. Decisions to be made within this system include:

- What cases are applicable in determining Justice on the present particular case?
- Can we correct the statutes or laws which are working against the effectiveness and efficaciousness of Justice?
- Can we improve our case decision-making by knowing the results of appeals made on similar cases from our own court?

The ideal goal of the statute and case-law searching system would be to *automate the retrieval and cross-referencing of cases and statutes, so that histories of interpretations would be complete and available upon command.* In order for the court information system to respond to the goal, all statutes and laws and cases would have to be collected, indexed, and cross-referenced by a large number of topics, phrases, and words.

### SUMMARY

The approach we have used in discussing our vision of the ideal court information system was first, to define what we mean by "system", "information system", and "court information system." We then indicated that the *ideal* court information system would be one which supplied all the informational needs to the *ideal operating* sub-systems of the court. We outlined five ideal sub-systems, and we attempted to show how an ideal court information system would collect, compile, and distribute the bits of data needed to make both operating and overall policy decisions in the criminal court.

### PART II THE PHILADELPHIA SYSTEM

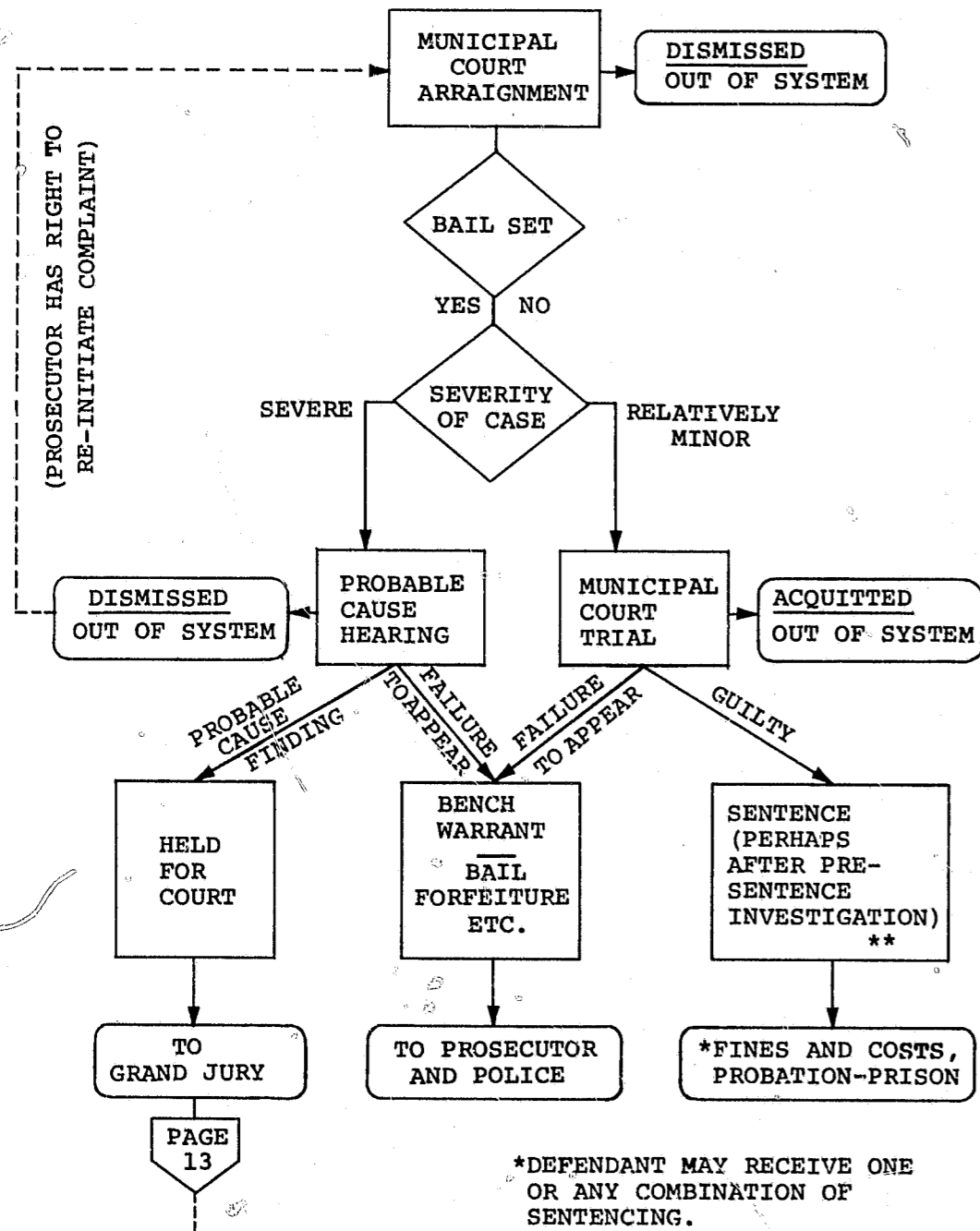
The Philadelphia computer oriented system has attempted to approach the ideal court information system primarily by expending all initial efforts toward the first three subsystems described in the ideal. We have implemented many practical parts of subsystems I, II, and III, but even in these areas we have a great distance to go before we are complete. We have just barely begun to touch upon subsystem IV (research capabilities) and have done no more than the barest initial research into the possibilities of subsystem V (statute and case law citation, i.e. legal searching).

In this part of the paper we shall briefly indicate, primarily by samples, just what Philadelphia has done in subsystems I through III.

To assist in the understanding of our system we have prepared a general flow diagram of the basic Philadelphia system and we will attempt to relate the following descriptions and some samples, reports, etc. to the portion of the system at which it interrelates.

Basic Court Flow

THE BASIC COURT CASE FLOW  
OF THE PHILADELPHIA CRIMINAL JUSTICE SYSTEM



RELATIVE EXHIBIT

EXHIBIT A

EXHIBIT B  
EXHIBIT D

EXHIBIT C

EXHIBIT E

\*DEFENDANT MAY RECEIVE ONE OR ANY COMBINATION OF SENTENCING.  
\*\*DEFENDANT HAS TOTAL RIGHT TO NEW TRIAL IN COMMON PLEAS COURT ON APPEAL WITHIN 30 DAYS.

Grand Jury Indictment

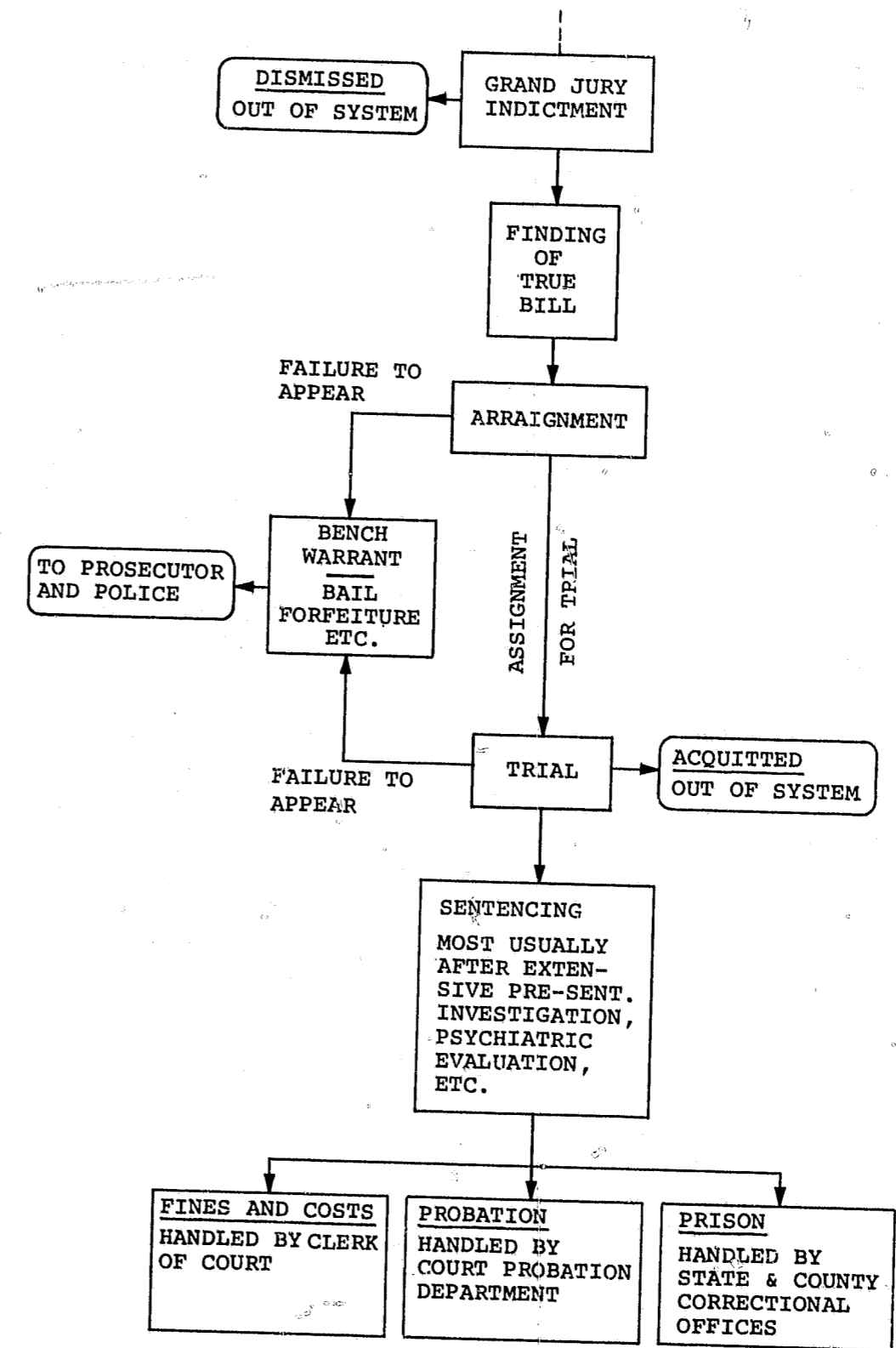


EXHIBIT F

EXHIBIT G  
EXHIBIT H  
EXHIBIT N

EXHIBIT I  
EXHIBIT J  
EXHIBIT K  
EXHIBIT M  
EXHIBIT N  
EXHIBIT L

EXHIBIT Q

### Subsystem I—The Trial System

Scheduling, Docketing, Room Control, etc.

All cases (and therefore all defendants) enter our system at the *conclusion* of the preliminary arraignment, which is held within 24 hours of arrest. Exhibit A indicates the data which we collect from preliminary arraignment ([a] officer complaint, [b] criminal record sheet, [c] Municipal Court transcript) and which we use to form the basic computer file for the case as it travels through the Municipal Court Process.

Scheduling of further court actions at the Municipal Court level is done directly from the preliminary arraignment and is done in a manner to satisfy both police officers' schedules, and to accommodate work load parameters set up by the administrative office. Exhibit B represents the computer work sheet made available to preliminary arraignment court personnel to insure balanced work loads.

All Municipal Court actions subsequent to preliminary arraignment are tracked by the computer system and all calendars required for hearings or trials are prepared, on a timely basis, prior to the action date (Exhibit C).

Although defendants are personally instructed at preliminary arraignment as to the need for counsel at subsequent court appearances, and are told of the possibility of procuring assigned counsel in case of indigency, we additionally prepare, automatically, computer letters reminding defendants of the dates of their next action and of their responsibility to engage counsel (Exhibit D).

As you might guess, a great deal of additional information flows to our computer department concerning every bit of paper filed and every action which takes place relative to each case, i.e., bail transactions, attorney data, hearing and trial results, etc. Each of these items is posted carefully to our machine files and painstakingly verified to insure accuracy.

At the conclusion of the Municipal Court case, the computer file is transferred to either disposed files ([a] Minor Case Municipal Court trial dispositions and [b] Dismissals from probable cause hearings) or to the Held for Court file, which is used to retain control over cases turned over to the prosecutor for presentment to the Grand Jury. Many reports are prepared at this stage but one sample is the Daily Master List of Municipal Cases Held for Grand Jury, (Exhibit E), which indicates the current status of all cases recently held for Grand Jury.

Upon indictment by the Grand Jury the case enters the Common Pleas Court case stream (and Computer File). Exhibit F represents typical data entered which is checked by computer against Held for Court file and manually against the bills of indictment to insure accuracy. Cases are scheduled for arraignment based on available slots in accordance

with minimum and maximum limits prescribed by the Court Administrator; if a defendant is on bail a subpoena is prepared mechanically (Exhibit G). Arraignment calendars (Exhibit H) are prepared and are used in the arraignment rooms for calling the list, as well as for file pulling, case preparation, etc. by the affected agencies. Perhaps unique to Philadelphia is the process of arraigning detained defendants *at the prison* in order to minimize the need for transportation and to maximize the security provisions. (Our detention facilities are 15 miles from the Court House, and our Court House is ill-equipped to handle the volume of defendants requiring security procedure.)

Among the purposes of our arraignment procedure is the setting of a trial date. If the arraignment concludes successfully (i.e. attorney engaged for the case and trial date set), our system is notified of the results of the actions; subpoenas are prepared for civilian witnesses, and police witness lists are prepared for the police department (Exhibits I & J). If arraignment (or trial) is not successfully concluded, the system is programmed to bring to the attention of court personnel all cases which have gone past their "action date" without successful action and/or without having been continued to a specific future date. Exhibit K represents such a weekly list, which is reviewed, along with the case files to determine what action is next required. Trial Calendars (Exhibit L) are prepared by the system on a timely basis, as well as prison bring-up lists (Exhibit M) and attorney letters (Exhibit N) when required.

Subsequent to all case actions, the files are routed through data processing clerical staff to insure the greatest accuracy possible in the status of our computer files and records. All transactions are posted with great emphasis on accuracy and verification.

The adjudication of cases, in many instances, does not mean the case is closed. Sentencing must normally await pre-sentence investigations, psychiatric evaluations, notes of testimony, disposition of post trial motions, etc. To assist in this area, our system prepares judicial orders relative to post trial activities, to assist the judge in prompting the various parties to perform their required tasks toward the total disposition of cases (Exhibit O).

Upon final disposition of the case, the computer record is transferred from our disk files to historic tape files, and court records are microfilmed, and the microfilm numbers are cross-referenced in our computer for easy retrieval.

### Subsystem II—People Information

During the entire process from preliminary arraignment through final disposition, the court records are completely indexed by various cross-reference methods.

Exhibit P is an alphabetic defendant report which

is made available at many locations through the court house to provide information on cases by defendant.

Many additional reports are run relative to individuals, whether they be defense counsel, defendant, Judge, etc. Some examples are Exhibit Q—alphabetical open warrant file; Exhibit R—case lists by attorney; Exhibit S—101 day case report; Exhibit T—Multiple case Bail Defendants (recidivist report).

In addition to the "paper-based" information capability we also have had installed and operating for about a year (at this date) nine (9) computer-based display terminals. These are located at seven (7) spots through our court house, at our detention center (15 miles from the court house), and at the police central booking facility (about one [1] mile from the court house). These terminals make all cross-reference files available as well as giving each unit access to the complete data base for all active cases. For disposed cases, the cross-reference file gives the microfilm number so that one can quickly reach the disposed case file in the clerk's micro-film system. Exhibits U through Y represent a few of the visual displays that are available on our terminal system. For example, Exhibit U-1 represents a search by name for a suspect, John Jones. Noticing several John Joneses with the same Philadelphia Police photo number, we then searched by that number (Exhibit U-2) and discovered that the suspect apparently had previously used several names, and had four open cases in our system, as well as one disposed case (indicated on the first line of display U-1 by the presence of a microfilm number).

Exhibit V-1 presents the current status of the active case under the name of John Jones. Apparently John Jones is a fugitive and a bench warrant for his arrest is outstanding. Exhibits V-2 and V-3 are the results of looking further into this case, determining that the most serious charge is larceny, and that John Jones' attorney is the Voluntary Defender.

Following Mr. Jones (P) into our Municipal Court record (Exhibit W-1) we discover that he is apparently a fugitive in this case also, and, incidentally we are informed of several of his aliases. Exhibits W-2, W-3, and W-4 reflect further searching of this Municipal Court case and show the name and address of the defendant's bonding company, the name of the Judge who issued the bench warrant, and the charge.

Exhibit X-1 is another John Jones, but it is put in here to indicate that we maintain control over our cases while in the stage between "probable cause finding" and Grand Jury indictment. Notice that the bottom of the display indicates Grand Jury indictment information. Exhibit X-2 represents a case as it appears after Grand Jury indictment.

Exhibit Y-1 and Y-2 reflect attorney searching possibilities.

These are but a representative few of the displays available. We hope that we have shown that various

searching techniques, developed by experienced terminal operators, can produce more comprehensive dossiers for criminal suspects and defendants. Current plans call for some two dozen additional terminals to be installed in various areas over the next year. At this writing, two (2) terminals are scheduled for installation by November 1, 1970, allowing us to service the following areas with display terminals:

#### Local Terminals (In City Hall)

1. Computer Room Monitor Unit
2. Criminal Clerk's Office
3. Data Processing Posting Unit
4. Arraignment Courtroom (installation due 11/1/70)
5. Prosecutor's Office
6. Municipal Clerk's Office
7. Criminal Listings Office
8. Civil Listings Office

#### Remote Terminals (Outside of City Hall)

9. Police Administration Building
10. Detention Center
11. Public Defender's Office (installation due 11/1/70)

### Subsystem III—Statistical Reporting

Various statistical reports and management tools have evolved from or have been prime objectives of this system.

Exhibit AA represents a typical monthly report on court disposition activity required for state reporting. Exhibits BB and CC, on the other hand, are analyses done to help evaluate the relationship between bail amounts, criminal charge, and the propensity of defendants to appear or fail to appear for court action.

Exhibit DD is used by management to plot our progress (or retrogression) in the area of case backlog, whereas another report (not shown) analyzes the average time spans between court processing stages. Many other reports are run to analyze attorney work-loads, Judge disposition rates, sociological breakdown of active and disposed cases, etc. Exhibit EE is a management tool to control the number of cases listed in each room, the number of judges and facilities required, and to plot the "lead time" required for next court action. The only limits to the statistical analyses possible, once you have built a large data base, are the limits of the imagination of the management requesting information.

### Subsystem IV—Research and Planning

We have begun to work on the utilization of our data base, along with simulation techniques, to assist management in efficient planning for the future. We are currently studying IBM's G. P. S. S. (General Purpose Simulation System) to see if it will offer us the tool (in conjunction with our data base) to intelligently evaluate future alternatives.

There appears to be great promise in this area but, frankly, we are far too busily engaged in furthering real projects in the trial stream area to afford to

spend much time in this area at present.

#### Subsystem V—Statute and Case Law Searching

We have done nothing in this area other than to keep ourselves alert to projects such as the automated Law Searching Project which had its start at the University of Pittsburgh. We feel that by the time we are in the position to utilize this type of program, the state of the art will have advanced far enough to make it relatively easy for us to purchase the necessary software and to make it available to our Judges and Law Clerks via our existing hardware.

#### CONCLUSION

In retrospect, we feel we have come a long way, since our initial entry into data processing in 1968, in a relatively short period of time; but, more importantly, we are discovering that there is so much more that can be done, and, in fact must be done. The three segments or subsystems of the ideal court infor-

mation system that we have attacked are still being improved, as we learn how to collect more and different kinds of data, and as we discover how to make this data more useful. The final two segments are completely untouched and they are truly important parts of our ideal—i.e. a "Total Court Information System" geared to supply information to service the operation of all of our justice units—from the policeman at the beginning of his day to the probation or correctional official at the moment of final release of the defendant. The Ideal Justice Information System includes, of course, the connection of our data base to that of our state, and from there to SEARCH and NCIC. When we look at our progress in light of this ultimate goal we realize we have only started our vehicle onto a road which will require quite a few years of driving effort to even begin to obtain the early fruits of a "Total Information System."

<sup>1</sup> Fundamentals of Operations Research, Ackoff and Sasieni, etc.

CRIMINAL COURTS OF PHILADELPHIA - COURT ADMINISTRATION  
MUNICIPAL NEW BILL EDIT  
SEPTEMBER TERM  
09/14/70

RUN DATE 09/15/70 PAGE 12

REC.CTL.# 7009-0537 1/1

DEFENDANT TERRY NELSON  
2900 ELLSWORTH ST.  
PHILA. PA 19100

ALIAS.... NDNE

CRIM. ACT 09/12/70  
ARREST... 09/14/70  
COMPLAINT 70-17-50983  
SEX..... MALE  
RACE..... NEGRO  
RELIGION.  
BIRTHDATE 08/18/52  
AGE..... 18

POLICE # 443214  
STATUS... PRISON  
PRE.ARRGN 09/14/70  
NX HR DATE 09/22/70  
ROOM 007  
TIME 08.30 A.M.  
FINE  
SENT

JUDGE 204 COX  
ATTY. EDWARD S  
BAIL AMT.  
BAIL TYPE  
BAIL DATE 09/14/70  
SURETY.

CHARGE CODE	DESCRIPTION
200-03	ROBBERY
400-00	BURGLARY
500-00	LARCENY
580-00	RECEIVING STOLEN PROPERTIES-GOODS
360-00	AGGRAVATED ASSAULT AND BATTERY
370-00	ASSAULT AND BATTERY
390-01	A&B ON POLICE OFFICER
391-00	RESISTING ARREST
940-00	CONSPIRACY TO DO UNLAWFUL ACT

MOST SEVERE 200-03 ROBBERY

EDIT TABLE ANALYSIS

INVALID SEX, RACE AND/OR RELIGION CODE

Report Utilization:  
Internally for checking and  
verification of data

141

EXHIBIT A



MUNICIPAL COURTS OF PHILADELPHIA  
COURT ADMINISTRATION  
SUMMARY OF ROOM ASSIGNMENT BY DATE

RUN DATE 09/16/70 PAGE 001

DATE	001	002	003	004	005	006	007	008	009	010	011	012	013	195	196	296	TOTALS
9/16/70	44		16	1		22	25	30	24	1			23	20	25	23	254
9/17/70	1	36	3	16	53	7	18	4	3	4	22			20	23	7	227
9/18/70	29		11	1		25	24	10	15					25	20	5	165
9/21/70	20	1	13			23	16	30	15					25	22	1	166
9/22/70		26	6	8	25	1	8		2	11	3			29	24		143
9/23/70	14	1	7			14	14	11	18					6	27	35	147
9/24/70		6	3	2	8	6	13			2	4			33	26		103
9/25/70	3		7			7	1	4	4				1	34	28		89
9/28/70	11		2			4	3	4	4				1	37	43		109
9/29/70	1			4	12		6							33	31		87
9/30/70	1		1				2	5	13				1	7	38	35	103

TOTAL MONTH 1,593

NOTE--ROOM 013 - 1801 VINE ST.

## Report utilized by:

1. Municipal Court Judges
2. Prosecutors Office
3. Police Department
4. Court Administration

EXHIBIT B

HEARING DATE 9/17/70 TIME 08.30

MUNICIPAL COURT OF PHILADELPHIA  
COURT ADMINISTRATION  
DIST. NO. 2 - 61ST & THOMPSON

RUN DATE 09/16/70 PAGE 6

DEFENDANT INFORMATION

COUNSEL SURETY  
INFORMATION

RECORD CONTROL INFORMATION  
TERM BILL CHARGE

DISPOSITION

\* 16\*

HARGETT CHRISTINE  
836 S 58TH ST.  
PHILA. PA 19100

REC. CNTRL MC7008-3001 1/1

A&B ON POLICE OFFICER 39001  
AGGRAVATED A&B 36000  
RESISTING ARREST 39100  
DISORDERLY CONDUCT 85000  
BREACH OF PEACE 85400  
CONSPIRACY 94000

SURETY-62 \$300  
SOUTHERN GENERAL INS. CO.  
T- 9/08/70 9/08/70 20 13 S MJLE ST  
CRIM 8/30/70 PHILA. PA 19107  
BAIL F N 19 COMP. NO 701637105

CONTINUANCE REQUESTED BY DA ----- ATTY ----- CRT -----

\* 17\*

STEPHENSON JOHNNY  
4925 HODPES ST.  
PHILA. PA 19100

REC. CNTRL MC7008-3362 1/1

BURGLARY-MOTOR VEHICLE 42001  
RECEIV STOLEN GOODS 58000  
CONSPIRACY 94000  
POSSESS BURG TOOLS 43000

SURETY-24 \$500  
ALLEGHENY MUTUAL CAS. CO.  
T- 9/10/70 9/10/70 20 5501 PINE ST  
CRIM 9/02/70 PHILA. PA 19143  
BAIL M N 21 COMP. NO 701961355

CONTINUANCE REQUESTED BY DA ----- ATTY ----- CRT -----

\* 18\*

MILBURN BARRY E  
1530 N ALLISON ST.  
PHILA. PA 19100

REC. CNTRL MC7008-3429 1/1

POSSESSION OF NARC DRUGS 80104

SURETY-03 \$1  
BARRY E MILBURN  
T- 9/10/70 9/10/70 20 1530 N ALLISON ST.  
CRIM 9/03/70 PHILA. PA 19100  
BAIL M N 23 COMP. NO 701961561

Report utilized by:  
1. Court Administration  
2. Prosecutor  
3. Municipal Court Judges  
4. Municipal Court Clerk  
5. Public Defender  
6. Police Department

EXHIBIT C

CONTINUANCE REQUESTED BY DA ----- ATTY ----- CRT -----

EXHIBIT D

MUNICIPAL COURT OF PHILADELPHIA

**\*\* NOTICE \*\***

09/16/70

TO THE DEFENDANT,

RE. COURT TERM AND NUMBER

MC 70-07-2043 1/1

WILLIAM MAPLES  
248 N 9TH ST.  
PHILA. PA. 19100

TRIAL DATE ROOM TIME  
10/05/70 296 9.00

YOUR CASE IS LISTED FOR TRIAL IN THE MUNICIPAL COURT AT THE TIME AND PLACE LISTED ABOVE. YOU HAVE AN OBLIGATION TO EMPLOY AN ATTORNEY TO REPRESENT YOU. IF YOU CANNOT AFFORD TO HIRE A PRIVATE ATTORNEY OF YOUR OWN CHOICE, YOU MUST MAKE AN APPLICATION TO THE COURT AND IT WILL DETERMINE WHETHER OR NOT YOU ARE ELIGIBLE TO HAVE THE SERVICES OF THE VOLUNTARY DEFENDER IN THIS CASE.

IF YOU BELIEVE THAT YOU CANNOT AFFORD A PRIVATE ATTORNEY. YOUR APPLICATION TO THE COURT MUST BE MADE THROUGH THE DEPUTY COURT ADMINISTRATOR FOR THE MUNICIPAL COURT IN ROOM 269 CITY HALL ON AT 10.00 A.M. .

YOU MUST BRING WITH YOU ALL PAPERS AND DOCUMENTS PERTAINING TO YOUR CASE.

YOUR CASE WILL BE TRIED ON THE SCHEDULED DATE AND YOU MUST APPEAR FOR THE TRIAL. FAILURE TO APPEAR MAY RESULT IN A WARRANT BEING ISSUED FOR YOUR ARREST.

VERY TRULY YOURS,

EDWARD J BLAKE  
COURT ADMINISTRATOR

CRIMINAL COURTS OF PHILADELPHIA  
MASTER LIST OF MUNICIPAL CASES  
HELD FOR GRAND JURY

MC-REC.CTL.NO.	**** NAME OF DEFENDANT ****	LAST TRIAL DATE	D.C.F. STAT	BAIL CODE-AMT.	POLICE NUMBER	* DATE OF INDICTMENT *	DATE OF ARRAIGNMENT	CP-REC.CTL.NO
MC7008-1015	1/1 ABBRUZZI ANGELO	8/18/70	B	62 1000	390464	***	9/22/70	
MC7008-0764	1/1 ACKRIDGE MILDRED	8/12/70	B	3 1	999999	***	9/16/70	
MC7008-0022	1/1 ADAMES ESTEBEN E	8/10/70	B	24 300	441754	9/03/70	9/03/70	7008-2364 1/1
MC7007-0248	1/1 ADAMS JOHN W	7/31/70	B	62 1500	333902	8/26/70	9/04/70	7008-1394 1/1
MC7008-0718	1/1 ADAMS THEODORE	8/17/70	B	24 500	441072	9/02/70	9/21/70	7008-2044 2/2
MC7006-1710	1/1 ADAMS WAYNE	7/08/70	P		420048	***	***	
MC7007-2760	1/1 ADAMS WAYNE	8/06/70	B	47 1000	420048	***	9/10/70*	
MC7007-2759	1/1 ADAMS WAYNE	8/06/70	B	47 1000	420048	***	9/10/70*	
MC7007-2763	1/1 ADAMS WAYNE	8/06/70	B	47 1000	420048	***	9/10/70*	
MC7007-2758	1/1 ADAMS WAYNE	8/06/70	B	47 1000	420048	***	9/10/70*	
MC7007-2761	1/1 ADAMS WAYNE	8/06/70	B	47 1000	420048	***	9/10/70*	
MC7007-2762	1/1 ADAMS WAYNE	8/06/70	B	47 1000	420048	***	9/10/70*	
MC7006-0811	1/1 AGRONT RAYMOND	8/19/70	B	96 1500	413335	***	9/23/70	
MC7007-2198	1/1 AKRIDGE BENJAMIN	8/24/70	B	62 300	441541	***	9/28/70	
MC7008-1939	1/1 ALBRECHT JONATHAN	8/26/70	B	3 1	442359	***	9/30/70	
MC7008-1208	1/1 ALKINSON STEPHEN P	9/09/70	P		438205	***	10/14/70	
MC7004-2586	1/1 ALLEN RAYMOND C	9/04/70	B	24 300	438473	***	10/09/70	
MC7007-2756	1/1 ALLEN SAMUEL	8/07/70	B	24 300	243201	***	9/11/70*	
MC7008-1231	1/1 ALLEN WILLIE	8/18/70	B	62 300	314927	***	9/22/70	
MC7008-0828	1/1 ALPIANO RONALD	8/14/70	B	24 500	438746	9/03/70	9/18/70	7008-2406 1/1
MC7008-0395	1/1 ALSBROOKS EUGENE	8/13/70	B	24 300	430794	***	9/17/70	
MC7007-2637	1/1 ALSTON FRANK	8/07/70	P		405302	9/03/70	9/11/70	7008-2410 1/2
MC7008-0774	1/1 ALSTON, JR. EDWARD L	8/17/70	B	62 500	253664	***	9/21/70	
MC7008-1263	1/1 AMARO JUSTINE	8/20/70	B	24 300	436402	***	9/24/70	
MC7008-0083	1/1 AMBROSE WAYNE	8/10/70	P		302717	8/27/70	9/14/70	7008-1678 1/1
MC7006-2262	1/1 ANDERSON CALVIN B	8/26/70	B	62 1000	418515	***	9/29/70	
MC7008-1864	1/1 ANDERSON SHIRLEY	8/27/70	B	62 1000	310334	***	10/01/70	
MC7007-0696	1/1 ANDERSON WALTER	8/26/70	B	62 300	441058	***	9/30/70	
MC7008-2649	1/1 APONTE JOSE C	9/04/70	B	61 500	430089	***	10/09/70	
MC7008-1446	1/1 ARNDT HARRY J	8/20/70	B	62 800	388565	***	9/24/70	
MC7008-3194	1/1 ARNOLD LESTER	9/08/70	P	1000	398985	***	10/13/70	
MC7008-0358	1/1 ARRINGTON CONRAD	8/28/70	P		423393	***	10/05/70	
MC7008-0359	1/1 ARRINGTON CONRAD	8/28/70	P		423393	***	10/05/70	
MC7008-0357	1/1 ARRINGTON CONRAD	8/28/70	P		423393	***	10/05/70	
MC7008-0360	1/1 ARRINGTON CONRAD	8/28/70	P		423393	***	10/05/70	
MC7008-3169	1/1 ARROYD JOSE L	9/09/70	P	500	430944	***	10/14/70	
MC7008-1613	1/1 ATKINS RICHARD	8/27/70	B	62 300	418772	***	10/05/70	
MC7008-2447	1/1 AUGBORN ALLEN	9/04/70	B	24 1000	333645	***	10/09/70	
MC7007-2040	1/1 AUSTIN HOSEA	8/31/70	P		440390	***	10/05/70	
MC7008-1080	1/1 BACKUS ROBERT	8/19/70	P		318629	***	9/23/70	
MC7008-0291	1/1 BAINES AUBREY C	8/14/70	B	3 1	309505	9/03/70	9/18/70	7008-2368 1/1
MC7008-2373	1/1 BAKER ALLEN M	9/08/70	B	62 300	320561	***	10/13/70	
MC7007-2542	1/1 BAKER GORDON	8/07/70	B	3 1	999999	***	9/11/70*	
MC7008-1121	1/1 BALDWIN STEPHAN	8/21/70	B	3 1	442095	***	9/25/70	
MC7008-0119	1/1 BALLARD ERVIN	8/10/70	B	28 300	441803	***	9/14/70*	
MC7008-0674	1/1 BANKS HERBERT	8/10/70	B	62 300	292956	***	9/22/70	
MC7008-2260	1/1 BANKS SIMON	9/01/70	P		379979	***	10/06/70	
MC7008-1397	1/1 BARBOUR CLARENCE	8/20/70	B	24 300	442206	***	9/29/70	

Report utilized by:  
 1. Court Administration  
 2. Grand Jury Unit  
 3. Prosecutor's Office

EXHIBIT 2

146

DY1103

CRIMINAL COURTS OF PHILADELPHIA - COURT ADMINISTRATION  
GRAND JURY NEW BILL LIST  
SEPTEMBER TERM  
09/10/70

RUN DATE 09/16/70 PAGE 2

REC.CTL.# 7009-0127 1/1

DEFENDANT LE GRANDE JAMES  
1623 N 60TH ST.  
PHILA. PA 19100

CRIM. ACT 04/15/70  
ARREST... 08/01/70  
COMPLAINT 70-18-21322  
SEX..... MALE  
RACE..... NEGRO  
RELIGION. UNKNOWN  
BIRTHDATE 09/07/48  
AGE..... 22

POLICE #. 400402

M.C.# 7008-0080 1/1

ALIAS.... NONE

BAIL AMT.  
BAIL TYPE NONE  
BAIL DATE NONE  
STATUS... PRISON  
SCHED. ARRG. 09/22/70

ATTY.#1 NONE  
M.D.... NONE  
SURETY. NONE

ERRORS OR OMISSIONS-MC FILE DATA

DEFENDANT NAME NOT EQUAL

INDICTMENT BILL NO.	CHARGE CODE	DESCRIPTION	DISPOSITION
7009-0127	400-02	BURGLARY W/I TO COMMIT FELONY	TRUE BILL
	815-00	VIOLATIONS UNIFORM FIREARMS ACT-VUFA	
0128	200-00	AGGRAVATED ROBBERY	TRUE BILL
	815-00	VIOLATIONS UNIFORM FIREARMS ACT-VUFA	
0129	810-00	CARRYING CONCEALED DEADLY WEAPON	TRUE BILL
	810-02	CARRYING FIREARMS WITHOUT LICENSE	
0130	812-00	PLAYFULLY OR WANTONLY POINTING/DISCHARGING D W	TRUE BILL

MOST SEVERE 200-00 AGGRAVATED ROBBERY

EDIT TABLE ANALYSIS

INVALID SEX, RACE AND/OR RELIGION CODE

MAJOR ERRORS MUST BE CORRECTED

Report utilized for:  
Internally for checking  
and verification of data.

EXHIBIT F

**DEFENDANT SUBPOENA**

EXHIBIT G

COURT OF COMMON PLEAS OF PHILADELPHIA  
TRIAL DIVISION, CRIMINAL SECTION

TO (Bondsman)

SOUTHERN GENERAL INS. CO                      13 S MOLE                      ST

You are the bail for this defendant and you are required to have the defendant appear at the precise time and place indicated.

COURT OF COMMON PLEAS  
CITY HALL, BROAD & MARKET STREETS  
ON                      IN                      AT  
MO. DAY YR. COURTROOM                      TIME  
10 06 70                      NO. 625                      12.15PM

Trial                       Arraignment                      2

COMMONWEALTH VS.                      MICHAEL                      6855 UPLAND                      ST. PHILA.                      PA  
MARCHINA                      Last Name                      First                      Address - City and State

CHARGED WITH                      TERM                      NUMBER TO  
ASSAULT & BATTERY                      70 05                      1554 1555

You are responsible for service of defendant's copy.

THIS  
MO. DAY YEAR  
09 16 70

Bail will be forfeited if you fail to produce the defendant in court.

- 30-86                      1 - BONDING COMPANY
- 30-86                      2 - DEFENDANT
- 30-86                      3 - DISTRICT ATTORNEY
- 30-86                      4 - DISTRICT ATTORNEY DETECTIVES

*Vincent Conner*  
President Judge  
COURT OF COMMON PLEAS OF PHILADELPHIA

*President Judge*  
COURT OF COMMON PLEAS OF PHILADELPHIA

*President Judge*  
COURT OF COMMON PLEAS OF PHILADELPHIA

*President Judge*  
COURT OF COMMON PLEAS OF PHILADELPHIA

ARRAIGNMENT DATE 10/06/70  
ROOM NO 625

CRIMINAL COURTS PHILADELPHIA  
COURT ADMINISTRATION  
BAIL ARRAIGNMENT

RUN DATE 09/16/70 PAGE 3

DEFENDANT INFORMATION	COUNSEL SURETY INFORMATION	RECORD CONTROL INFORMATION TERM BILL CHARGE	ARRAIGNMENT ROOM DATE	PLEA	REMARKS
-----------------------	----------------------------	--	--------------------------	------	---------

PERKINS 2167 N 9TH PHILA. PA 19100	RONALD ST. COUNSEL	REC. CNTRL 7008-1175 1/3 1175 AGGRAVATED ROBBERY	20000	6	
INST #					
ARST 6/22/70	SURETY-62 \$300	A D A			
A- 9/02/70	SOUTHERN GENERAL INS. CO.				
T-	13 S MJLE ST				
CRIM 6/22/70	PHILA. PA 19107				
BAIL M N 18					

CFN ----- DA ----- ATTY ----- CRT -----

\*\*\*\*\*

BUSH 2136 N 9TH PHILA. PA 19100	GEORGE ST. COUNSEL	REC. CNTRL 7008-1175 3/3 1177 AGGRAVATED ROBBERY	20000		
INST #					
ARST 6/22/70	SURETY-62 \$800	A D A			
A- 9/02/70	SOUTHERN GENERAL INS. CO.				
T-	13 S MJLE ST				
CRIM 6/22/70	PHILA. PA 19107				
BAIL M N 19					

CFN ----- DA ----- ATTY ----- CRT -----

MCIVER 5059 STENTON PHILA. PA 19100	EDWARD AVE COUNSEL	REC. CNTRL 7008-1551 1/1 1551 CHEAT-FRAUD PRETENSES	56000	7	
INST #					
ARST 6/09/70	SURETY-24 \$1500	1552 ASSAULT & BATTERY	37000		
A- 7/28/70	ALLEGHENY MUTUAL CAS. CO.	1553 POSSESSION OF DANG DRUGS 80107			
T-	5501 PINE ST				
CRIM 6/09/70	PHILA. PA 19143				
BAIL M N 26					

CFN ----- DA ----- ATTY ----- CRT -----

Report utilized by:

1. Clerk of Court	6. Sheriff
2. Prosecutor	7. Corrections
3. Public Defender	8. Courtroom staff
4. Court Administration	9. Judge
5. Legal Newspaper	

EXHIBIT

THE CITY AND COUNTY OF PHILADELPHIA,  
THE COMMONWEALTH OF PENNSYLVANIA ss.

**WITNESS  
SUBPOENA**

**EXHIBIT I**  
74  
COURT OF COMMON PLEAS OF PHILADELPHIA  
TRIAL DIVISION CRIMINAL SECTION  
CITY HALL, BROAD AND MARKET STREETS

TERM	NUMBER TO	COMMONWEALTH vs.	ET AL	INTERNAL USE ONLY	ON MO. DAY YR.	APPEAR IN COURTROOM	AT TIME
7004	1829	1829	SAMUEL JACKSON	7004	0411	9 21 70 <sup>No.</sup> 296	9:00 AM

03 ROBERT JACKSON  
6051 HAZEL  
PHILADELPHIA PA.

You are commanded, by the Honorable Vincent A. Carroll, President Judge at Philadelphia, to appear as a Witness in this case, at the precise time and place indicated above.

TRIAL  GRAND JURY

THIS MO. DAY YR.  
09/16/70<sup>AD</sup>  
*Vincent Carroll*  
President Judge, Court of Common Pleas

30-88 BRING THIS SUBPOENA WITH YOU COPY 1 - WITNESS

THE CITY AND COUNTY OF PHILADELPHIA,  
THE COMMONWEALTH OF PENNSYLVANIA ss.

**WITNESS  
SUBPOENA**

**EXHIBIT I**  
74  
COURT OF COMMON PLEAS OF PHILADELPHIA  
TRIAL DIVISION CRIMINAL SECTION  
CITY HALL, BROAD AND MARKET STREETS

TERM	NUMBER TO	COMMONWEALTH vs.	ET AL	INTERNAL USE ONLY	ON MO. DAY YR.	APPEAR IN COURTROOM	AT TIME
7004	1829	1829	SAMUEL JACKSON	7004	0411	9 21 70 <sup>No.</sup> 296	9:00 AM

04 JERRY BROOKS  
5805 MCMAHON  
PHILADELPHIA PA.

You are commanded, by the Honorable Vincent A. Carroll, President Judge at Philadelphia, to appear as a Witness in this case, at the precise time and place indicated above.

TRIAL  GRAND JURY

THIS MO. DAY YR.  
09/16/70<sup>AD</sup>  
*Vincent Carroll*  
President Judge, Court of Common Pleas

30-88 BRING THIS SUBPOENA WITH YOU COPY 1 - WITNESS

THE CITY AND COUNTY OF PHILADELPHIA,  
THE COMMONWEALTH OF PENNSYLVANIA ss.

**WITNESS  
SUBPOENA**

**EXHIBIT I**  
74  
COURT OF COMMON PLEAS OF PHILADELPHIA  
TRIAL DIVISION CRIMINAL SECTION  
CITY HALL, BROAD AND MARKET STREETS

TERM	NUMBER TO	COMMONWEALTH vs.	ET AL	INTERNAL USE ONLY	ON MO. DAY YR.	APPEAR IN COURTROOM	AT TIME
7004	1829	1829	SAMUEL JACKSON	7004	0411	9 21 70 <sup>No.</sup> 296	9:00 AM

05 ROBERT MARTIN  
1104 KATER  
PHILADELPHIA PA.

You are commanded, by the Honorable Vincent A. Carroll, President Judge at Philadelphia, to appear as a Witness in this case, at the precise time and place indicated above.

TRIAL  GRAND JURY

THIS MO. DAY YR.  
09/16/70<sup>AD</sup>  
*Vincent Carroll*  
President Judge, Court of Common Pleas

30-88 BRING THIS SUBPOENA WITH YOU COPY 1 - WITNESS

PRINTED BY THE STANDARD REGISTER COMPANY U.S.A.

PRINTED BY THE STANDARD REGISTER COMPANY U.S.A.

PRINTED BY THE STANDARD REGISTER COMPANY U.S.A.



150

COURT OF QUARTER SESSIONS  
POLICE WITNESS SUBPOENAS  
(AND CANCELLATIONS)

THE FOLLOWING OFFICERS ARE SUBPOENAED TO APPEAR  
ON IN AT  
MO. DAY YR. COURT NO. TIME  
09 24 70 676 9:00 AM

DATE ORDERED  
MO. DAY YR.  
09/16/70

SUBPOENA DATE ORDERED  
NO. DAY YR. COURT NO. DAY  
09 24 0 676 09/16

CAN-CEL	DISTRICT	FOR PRIOR CONV. FI	OFFICER'S NAME	BADGE NO. - OR - ANALYSIS NO.	DEFENDANT	ETAL	CHARGE	TERM			CAN-CEL	WITNESS			FILE CONTROL			
								YR.	MO.	NO.		TO	FILE NO.	YR.	MO.	NUMBER		
			DET SCURRY FULLAM BASKERVILLE IANNAcone SMITH	990 7405 7531 6716 3157	MARGARET ADAMS	*	BURG LARC RSG	6912	0285	285		2	01	6911	0758			
			DET SCURRY FULLAM BASKERVILLE IANNAcone SMITH	990 7405 7531 6716 3157	GERTRUDE LEWIS		BURG LARC RSG CONSP.	6912	0285	285		2	01	6911	0759			
			PAGLIAPELLA ZOOG CHEM DEGLIN	2658 7346 35666	GILBERT MARTIN		POSS NARC MARI	7003	1492	1493		2	01	7003	0259			
			MITOS MESSARIS BOSTON	7294 6358 1732	THEODORE TURNER		POSS NARC	7004	1244	1244		2	01	7004	0331			
												2	02	6911	0758			
												2	03	6911	0758			
												2	04	6911	0758			
												2	05	6911	0758			
												2	02	6911	0759			
												2	03	6911	0759			
												2	04	6911	0759			
												2	05	6911	0759			
												2	02	7003	0259			
												2	03	7003	0259			
												2	01	7004	0331			
												2	02	7004	0331			
												2	03	7004	0331			

PAGE  
1 OF

TOTAL NUMBER OF POLICE WITNESSES ON THIS PAGE 16

RECEIVED (POL. SIGNATURE & DATE)  
PAGE  
1\*

11-191

COPY 1 - POLICE COURT ATTENDANCE

1 - INDICT/RIALS DIV.

EXHIBIT J

WY1215

CRIMINAL COURTS OF PHILADELPHIA  
 COURT ADMINISTRATION  
 WEEKLY REASSIGNMENT SELECTION RUN

RUN DATE 09/09/70 PAGE 4

RECORD CONTROL NUMBER	SEV. CODE	MAJOR CHARGE	DEFENDANT NAME LAST NAME	FIRST NAME I	STATUS	TYPE TRIAL REQUESTED	PREVIOUS TRIAL ROOM	TRIAL INFORMATION DATE	DISPOSITION	ATTY CODE	TRIAL TYPE ASSIGNED	CASE STA.
7003-1791	2/3 M	0 42001	MAYS	JOHN	BAIL		676	08/20/70	94-FUGTIV		NO ASSIGNMT	001
7003-1791	3/3 M	0 42001	YOUNG	WILLIAM	BAIL		** 254	06/08/70	54-TR LIST		NO ASSIGNMT	001
7004-1296	1/1	0 20000	GOODMAN	FREDERICK	PRISON		** 682	08/21/70	82-INC DIS	00001	NO ASSIGNMT	001
7004-1608	4/5	0 85800	GONZALES	JOSE	BAIL		** 682	08/11/70	82-INC DIS	00001	NO ASSIGNMT	001
7004-1897	1/1	0 40002	WISE	CLAYTON	BAIL		** 675	08/26/70	75-DEF SEN	00001	NO ASSIGNMT	001
7004-2095	1/1	0 40002	SATTERWHITE	GERALD	BAIL		** 513	08/21/70	13-CFV	54105	NO ASSIGNMT	001
7005-0560	1/1	0 80104	HARRIS	CHARLES	PRISON		675	08/11/70	94-FUGTIV		NO ASSIGNMT	001
7006-0288	1/2	0 56100	BRAVMAN	JEFFREY	BAIL		676	09/04/70	04-CFV		NO ASSIGNMT	001
7006-0717	1/2 M	0 20000	DAVIS	DAVID	PRISON		** 625	07/28/70	25-CFV	00001	NO ASSIGNMT	001
7006-0717	2/2 M	0 20000	TATE	RAYMOND	PRISON		** 625	07/28/70	25-CFV	00001	NO ASSIGNMT	001
7006-0798	1/1	0 58000	THOMPSON	BETTIE	BAIL		** 675	08/24/70	75-DEF SEN	00001	NO ASSIGNMT	001
7006-0990	1/2	0 80104	BENSON	KENNETH	PRISON		** 653	08/25/70	53-TR LIST	00001	NO ASSIGNMT	001
7006-1585	1/1	0 20000	THOMPSON	LAWRENCE	PRISON		** 625	08/24/70	25-CFV	00001	NO ASSIGNMT	001
7006-1955	1/1	0 84300	HELLER	JOHN	BAIL	C	**	04/04/04	04-CFV		NO ASSIGNMT	001

Report utilized by:

1. Court Administration
2. Court Clerk
3. Prosecutor

151

EXHIBIT X

DEFENDANT INFORMATION COUNSEL SURETY INFORMATION RECORD CONTROL INFORMATION DISPOSITION TERM BILL CHARGE

JACKSON HARRY COUNSEL REC. CNTRL 7006-1340 1/2 TR 9/23/70
4048 LANCASTER AVE 20925 EISMAN DENNIS 1340 BURGLARY 40000
PHILA. PA 19100 LARCENY 50000
RECEIV STOLEN GOODS 58000
INST #
ARST 4/29/70 SURETY-61 \$1500
A-02 7/28/70 8/24/70 50 SOUTHERN GENERAL INS. CO.
T- 9/23/70 6102 HAVERFORD AVE
CRIM 4/29/70 PHILA. PA 19151
BAIL M N 35

CONTINUANCE REQUESTED BY DA ----- ATTY ----- CRT -----

\*\*\*\*\*

THOMAS LOUIE COUNSEL REC. CNTRL 7006-1340 2/2 TR 9/23/70
912 S 51ST ST. 20925 EISMAN DENNIS 1341 BURGLARY 40000
PHILA. PA 19100 LARCENY 50000
RECEIV STOLEN GOODS 58000
INST #
ARST 4/29/70 SURETY-61 \$1500
A-02 7/28/70 8/24/70 50 SOUTHERN GENERAL INS. CO.
T- 9/23/70 6102 HAVERFORD AVE
CRIM 4/29/70 PHILA. PA 19151
BAIL M N 41

CONTINUANCE REQUESTED BY DA ----- ATTY ----- CRT -----

JOHNSON WILLIAM H COUNSEL REC. CNTRL 7007-0754 1/2 TR 9/23/70
2208 N 5TH ST. 00001 VOL. DEFENDER 0754 LARCENY 50000
PHILA. PA 19100 RECEIV STOLEN GOODS 58000
INST #
ARST 6/02/70 SURETY-24 \$300 0755 LARCENY 50000
A-01 7/22/70 8/25/70 50 ALLEGHENY MUTUAL CAS. CO. RECEIV STOLEN GOODS 58000
T-01 9/23/70 5501 PINE ST
CRIM 6/02/70 PHILA. PA 19143
BAIL M N 19

Report utilized by:
1. Clerk of Court 5. Legal Newspaper 8. Courtroom staff
2. Prosecutor 6. Sheriff 9. Judge
3. Public Defender 7. Corrections
4. Court Administration

CONTINUANCE REQUESTED BY DA ----- ATTY ----- CRT -----

EXHIBIT 1

PRISONERS BRING - UP

EXHIBIT M  
PAGE 1

DATE 09/01/70

TO- SUPERINTENDANT, PHILADELPHIA PRISONS

SEND THE FOLLOWING PRISONERS FOR TRIAL IN COURTROOM 625, CITY HALL  
ON 9/14/70.

NAME ADDRESS	SEX	PRISON NO. TERM & NUMBERS	POLICE PHOTO NO. OFFENSE DESCRIPTION
BAILEY CRAIG 1435 FRAZIER ST	M	68/07 477 - 480	417109 AGGRAVATED ROBBERY
FORTUNE DARREL 20 N 57TH ST	M	68/07 477 - 480	390732 AGGRAVATED ROBBERY
UNIVERSAL AGENC INC 4211 CHESTNUT ST.	M	69/01 964 - 1008	999999 CHEAT-FRAUD PRETENSES
BORIS JEROME 408 FAIRVIEW RD	M	69/01 1009 - 1053	241330 CHEAT-FRAUD PRETENSES
DENNIS LAMONT 8201 TORRESDALE AVE	M	69/07 8 - 9	396729 ASSAULT & BATTERY
WOODARD EUGENE 1112 SOUTH ST.	M	69/09 1752 - 1752	999999 ASSAULT & BATTERY
CORBETT WILLIAM 2433 N 27TH ST.	M	70/01 676 - 681	383946 PLAYFUL POINTING FIREARM
BORIS JAMES 408 FAIRVIEW RD.	M	70/01 1480 - 1480	241330 LARCENY BY EMPLOYEE
MCQUEEN MELVIN 3922 FOLSOM ST.	G M	70/06 1493 - 1496	431002 AGGRAVATED ROBBERY
SMITH LEWIS 3812 PARRISH ST.	C M	70/06 1497 - 1500	427241 AGGRAVATED ROBBERY
ROSEBERE SAMUEL 1100 SPRUCE ST.	M	70/07 334 - 334	299957 BURGLARY

TOTAL DEFENDANTS 11

COURT CLERK ----- DATE -----

RECEIVED BY ----- PHILA. PRISON DATE -----

RECEIVED BY ----- SHERIFFS OFFICE DATE -----

EXHIBIT N

OFFICE OF COURT ADMINISTRATION

CRIMINAL LISTINGS  
ROOM 621 CITY HALL  
PHILADELPHIA, PA. 19107

EDWARD REIF ESQ. 09/16/70  
3240 P.S.F.S. BLDG.  
PHILADELPHIA, PA. 19107

TO COUNSEL-

THE DEFENDANT NAMED BELOW WILL BE ARRAIGNED ON THE 5TH  
DAY OF OCTOBER, 1970, AT 12 15 P.M. IN ROOM 625, CITY HALL,  
PHILADELPHIA.

COMMONWEALTH	VS	CASE	TERM	NUMBER
		SQ		FROM TO
WILKINS	, BARBARA	164	68/07	2070 2074

KINDLY ARRANGE TO BE PRESENT AS THE TRIAL DATE WILL  
ALSO BE FIXED AT THAT TIME.

YOURS TRULY,

EDWARD J. BLAKE, ESQ.  
COURT ADMINISTRATOR

NOTE--ALL INQUIRIES SHOULD BE DIRECTED TO THE CRIMINAL  
LISTINGS OFFICE--TELEPHONE MU6-2535.

EXHIBIT O  
09/16/70

COMMONWEALTH OF PENNSYLVANIA □  
VS  
PATRICK FIDLER □ CP 7002-1268 3/3  
PP# 397159 □ POST TRIAL ACTION

JUDICIAL COURT ORDER

THE ABOVE CAPTIONED CASE IS LISTED FOR DISPOSITION OF POST TRIAL MOTIONS AND/OR  
IMPOSITION OF SENTENCE IN COURTROOM 621, CITY HALL 9/29/70 AT 4.00 PM.

ACCORDINGLY, IT IS ORDERED THAT THE SUPERINTENDENT OF PHILADELPHIA COUNTY PRISON  
RELEASE SAID DEFENDANT, IF HE OR SHE BE IN HIS CUSTODY, TO THE SHERIFF OF PHILADEL-  
PHIA COUNTY FOR TRANSPORTATION TO CITY HALL, PHILADELPHIA ON THE DATE SET FORTH.

IT IS ORDERED THAT THE SUPERINTENDENT OF THE PHILADELPHIA COUNTY PRISON NOTIFY THE  
SHERIFF OF PHILADELPHIA COUNTY IF SAID DEFENDANT IS NOT WITHIN HIS CUSTODY, AND IF  
SAID DEFENDANT WAS EVER IN HIS CUSTODY FURNISH TO THE SHERIFF ALL INFORMATION  
PERTAINING TO THE RELEASE OF THE DEFENDANT ON BAIL OR TRANSFER TO THE CUSTODY OF  
STATE CORRECTIONAL AUTHORITIES, INCLUDING THE PRESENT PLACE OF CONFINEMENT OF THE  
DEFENDANT. IN THE EVENT THE DEFENDANT HAS BEEN ADMITTED TO BAIL AND RELEASED FROM  
THE COUNTY PRISON AFTER A DATE HAS BEEN SCHEDULED, PURSUANT TO THIS ORDER, THE  
SUPERINTENDANT OF THE COUNTY PRISON SHALL INFORM THE SURETY OF HIS OBLIGATION TO  
PRODUCE THE DEFENDANT AT THE TIME AND PLACE STATED IN THIS ORDER.

IT IS ORDERED THAT THE SHERIFF OF PHILADELPHIA COUNTY TRANSPORT THE ABOVE CAPTIONED  
DEFENDANT TO THE INDICATED COURTROOM IN CITY HALL, PHILADELPHIA AT THE TIME AND  
DATE SET FORTH. ALL NECESSARY ARRANGEMENTS FOR SAID TRANSFER TO BE MADE BY THE  
SHERIFF OF PHILADELPHIA COUNTY, INCLUDING PREPARATION OF THE PROPER WRIT, IF THE  
INDIVIDUAL IS IN THE CUSTODY OF STATE CORRECTIONAL AUTHORITIES, FOR EXECUTION BY  
THE CRIMINAL CALENDAR JUDGE.

IT IS ORDERED THAT THE SURETY, HEREIN NAMED- ALLEGHENY MUTUAL CAS. CO  
113 NINTH ST PHILA. PA 19103

PRODUCE SAID DEFENDANT AT THE TIME AND PLACE ABOVE MENTIONED UNDER PENALTY OF  
FORFEITURE OF BAIL ENTERED ON BEHALF OF THE DEFENDANT.

IT IS ORDERED THAT THE DISTRICT ATTORNEY BE PREPARED TO PROCEED WITH THIS CASE ON  
THE DATE AND AT THE TIME SET FORTH ABOVE.

IT IS ORDERED THAT THE COUNSEL FOR THE DEFENDANT BE PREPARED TO PROCEED WITH THIS  
CASE ON THE DATE AND AT THE TIME SET FORTH. IN THE EVENT, THE INDICATED COUNSEL FOR  
THE DEFENDANT DOES NOT REPRESENT THIS DEFENDANT, THE COURT ADMINISTRATOR SHALL BE  
NOTIFIED OF THIS MATTER IN WRITING WITHIN FORTY-EIGHT HOURS.

BY THE COURT,

VINCENT A. CARROLL  
PRESIDENT JUDGE

TRIAL JUDGE HONORABLE WILLIAM A DWYER, JR.  
ATTORNEY FOR DEFENDANT JOSEPH P MCCABE, JR. 2  
DISTRICT ATTORNEY PAUL MICHEL

1/ HONORABLE WILLIAM A DWYER, JR. HONORABLE WILLIAM A DWYER, JR. T/J  
2/ COURT REPORTER--TRIAL JUDGE TO FORWARD, IF NOTES OF TESTIMONY REQUIRED.

3/ PROBATION DEPARTMENT  
4/ DEFENSE ATTORNEY JOSEPH P MCCABE, JR.

5/ SUPERINTENDENT OF PRISON  
6/ SHERIFF

7/ DISTRICT ATTORNEY  
8/ CLERK OF QUARTER SESSIONS

9/ CRIMINAL LISTINGS  
10/ FILE COPY

11/ SURETY, ALLEGHENY MUTUAL CAS. CO  
12/ RECEIPT COPY FOR DISTRICT ATTORNEY, PROOF OF SERVICE

CRIMINAL COURTS OF PHILADELPHIA  
DEFENDANT CROSS REFERENCE LISTING

DEFENDANT NAME LAST NAME FIRST NAME I	RECORD CONTROL NUMBER	MAJOR CHGE.	ATTY. #1	S R R A S E A E G T CD	*SURETY* AMNT.	POLICE PHOTO#	INSTIT. NUMBER	LAST ACTN. T DATE DC T DATE RM.	NEXT ACTION T DATE DC T DATE RM.	ADDRESS INFORMAT.
AARON LUCIUS	7002-1022	1/1	D	31000	69946	M N	P	999999	T 07100	T 07100 414 1315S 5TH
ABBOTT JAMES	C 7005-0225	1/1	D	12000	26715	M N	21 P	383115	T 08100	2 T 09300 613 423N PRESTON
ABBOTT THOMAS	W 6804-1725	1/1	D	84000			F 3	9 414531		A 08268 296 800 BORBECK AVE
ABRUZZESE PATRICK	6711-1019	1/1	D	12000	59955		B 62	9 333475	T 09040	2 T 09210 443 939 S 10TH ST
ABRUZZESE SALVATORE	681C-0213	1/1	D	80102	67865	M C	26 B 96	3000 362503	T 07020	1 A 09210 625 932KIMBALL
ALIAS ABRUZZESE SALVATORE										
ABRUZZESE SALVATORE	6907-0194	1/1	D	40003	67865	M C	26 B 28	800 362503	T 07020	1 A 09210 625 932KIMBALL
ABRUZZESE SALVATORE	7004-1998	1/1	D	80105	67865	M C	26 B 62	800 362503	T 07020	1 A 09210 625 932KIMBALL
ABRUZZESE SALVATORE	7007-0433	1/1	D	80104		M C	25 H	500 362503		A 09210 625 932KIMBLE
ABRUZZESE SALVATORE	6910-1837	2/2	D	40000	67865	M C	26 B 28	2500 362503	T 07020	1 T 09160 676 923KIMBALL
ABRUZZI ANTHONY	7003-0545	1/1	D	50000	67865	M C	26 B 28	300 362503	T 08130	1 T 09230 625 932KIMBALL
ABRUZZI FRANK	7004-0319	3/3	D	40003	67865	M C	24 B 61	1000 381948	T 09110	1 T 09110 676 1150S 11TH
ABRUZZI SALVATORE	6810-0213	1/1	D	80102	67865	M C	26 B 96	3000 362503	T 07020	1 A 09210 625 932KIMBALL
ALIAS ABRUZZESE SALVATORE										
ABRUZZI SALVATORE	6810-0213	1/1	D	80102	67865	M C	26 B 96	3000 362503	T 07020	1 A 09210 625 932KIMBALL
ALIAS ABRUZZESE SALVATORE										
ABNFY FRANCIS	6911-0417	1/1	D	31101		M N	29 F 24	300 426551		A 03300 625 1619ST PAUL
ABNFY JOEL	R 7004-0091	1/1	D	40002	00001	M N	20 F	500 434239	T 06180	9 T 06180 254 2324N DOVER
ABRAHAM DONALD	7006-0938	1/1	D	80104	72050	M N	29 B 62	800 397795		4 T 09300 296 368CHURCH
ABRAMS ANTHONY	7001-0367	1/1	D	12000	62970		P	999999	T 08260	2 T 09220 613 2242N 17TH
ABRAMS IRENE	5908-0707	1/1	D	50600	37700		B 39	9 267268	T 02061	9 3143 DIAMOND ST
ABRAMS IRFNF	6805-1285	1/1	D	80100			F 24	800 267268		A 03039 625 3116 W DIAMOND ST
ABRAMS LARRY	7007-0578	1/1	D	31102	46495	M N	36 B 24	2500 356927		T 10150 296 3324N 15TH
ABRAMS WILFRED	6507-1088	1/1	D	81000			F 47	9 359600	T 02146	9 2415 W INDIANA AV
ABRAMSON JAY	6903-1681	1/2	D	40000	63780	M C	20 B 47	1500 424391		A 09239 625 1732KENDRICK
ACKENRIDGE REGINAL	6709-1589	2/2	D	40500	00001		F 11	9 409222	T 12178	T 12178 196 1921N ORIANNA
ACKES JOSEPH	R 6712-0610	1/1	D	32000			F 11	9 370129	T 01238	9 3505 HAVERFORD AV
ACKES RDMAN	6711-1097	1/1	D	84000			F 62	9 370129	T 01048	9 3911 HAVERFORD AV
ACOSTA WANDA	7008-1447	1/1	D	80104		F N	27 B 62	1500 367981		A 10050 625 3122W CLIFFORD
ACOSTA WANDA	M 7008-0306	1/1	D	50000		F N	27 B 62	1000 367981		A 10150 682 1705N 21ST
ADAM WILLIAM	7006-0403	1/1	D	12000	72740	M C	32 B 62	1000 436704	T 07170	8 P 09220 613 2902ROBBINS
ADAMES ESTEREN	7008-2364	1/1	D	81500		M O	23 B 24	300 441754		A 10140 682 2013GERMANTOWN
ADAMOLI CARL	J 7007-1087	1/1	D	37000	87790	M C	36 P	1500 344542		T 09170 296 5119GREENE
ADAMS ALBERT	6810-0037	1/1	D	84001		M N	48 F 11	9 201713		A 05239 625 2104S LLOYD
ADAMS ALBERT	6810-1904	1/1	D	84001		M N	F 5	9 201713		A 05139 625 2104S LLOYD
ADAMS BARRY	6601-0999	1/1	D	20000			F 26	9 393546	T 08060	2 T 09210 625 2822 W CAMBRIDGE
ADAMS BERNARD	R 6703-0426	1/1	D	81000			F 3	9 402966	T 04287	9 668 N PARK AVE
ADAMS BOOKER	T 7008-0430	1/3	D	50000		M N	23 B 62	800 386593		A 09160 682 5550ARDLEIGH
ADAMS FRANKLIN	7001-0713	1/1	D	70500	48225	M N	35 B 26	1000 354475	T 09030	T 09030 625 3229N 26TH
ADAMS FRED	6905-1082	2/2	D	20000	23305	M C	24 P	369349	T 08050	2 T 10080 625 6025IRVING
ADAMS HORACE	6807-1051	1/1	D	81000			F 3	9 332829		A 10088 296 4438SANSOM
ADAMS JAMES	6706-0449	1/1	D	50600	00001		F 11	9 353884	T 07038	9 1835 N 12TH ST
ADAMS JAMES	6911-0018	1/1	D	31102	00001	M N	44 B 91	800 209907	T 04130	T 04130 646 1844N 18TH
ADAMS JESSE	6909-1814	1/1	D	94000	62970		B 28	1000 430762	T 09110	1 T 09110 676 1241CATHARINE
ADAMS JOE	6806-0344	1/1	D	37000			F 3	9		A 08198 296 4553 N 5TH ST
ADAMS JOHN	W 7008-1394	1/1	D	81500		M C	28 B 62	1500 333902		A 09040 682 760N CROSKY
ADAMS MARGARET	6912-0285	2/2	D	40000	44350	F N	47 B 47	1000 330817	T 09100	2 T 09240 676 1964N 19TH
ALIAS BONNER MARGARET MARGARET										
ADAMS MARGARET	6912-0285	2/2	D	40000	44350	F N	47 B 47	1000 330817	T 09100	2 T 09240 676 1964N 19TH

Report utilized by:  
 All agencies requiring information  
 about defendant's status, attorney,  
 bail bondsman, etc.

EXHIBIT P

MY1314

CRIMINAL COURT OF PHILADELPHIA  
ALPHABETICAL LIST OF DEFERRED INDICTMENTS FOR WEEK ENDING 09/09/70

RUN DATE 09/17/70  
PAGE 1

REC. CONTROL	F/BILL	L/BILL	LAST	DEFENDANT NAME	FIRST	CHGE IN CODE	POLICE#	TYPE	LAST SCHED ACTION DATE	REASON	DEFENDANT DATA	DATE DEF.
68/04	1725	1/1	1725	ABBOTT	THOMAS	W 84000	414531	ARRIG	8/26/68	94 DEF FUGITIVE	H.W. ISSUE	
69/11	0417	1/1	417	ABNEY	FRANCIS	31101	426551	ARRIG	3/30/70	94 DEF FUGITIVE	B.W. ISSUE	
70/04	0091	1/1	91	ARNEY	JOEL	R 40002	434239	TRIAL	6/18/70	95 DEF AT LARGE	NO B.W.	6/18/70
68/05	1285	1/1	1285	ABRAMS	IRENE	80100	267268	ARRIG	3/03/69	94 DEF FUGITIVE	B.W. ISSUE	
65/07	1088	1/1	1088	ABRAMS	WILFRED	81000	359600	TRIAL		94 DEF FUGITIVE	B.W. ISSUE	2/14/66
67/09	1589	2/2	1589	ACKENRIDGE	REGINAL	40500	409222	TRIAL	12/17/68	94 DEF FUGITIVE	B.W. ISSUE	12/17/68
67/12	0810	1/1	810	ACKES	JOSEPH	R 32000	370129	TRIAL		94 DEF FUGITIVE	B.W. ISSUE	1/23/68
67/11	1097	1/1	1097	ACKES	ROMAN	84000	370129	TRIAL		94 DEF FUGITIVE	B.W. ISSUE	1/04/68
68/10	1904	1/1	1904	ADAMS	ALBERT	84001	201713	ARRIG	5/13/69	94 DEF FUGITIVE	B.W. ISSUE	
68/10	0037	1/1	37	ADAMS	ALBERT	84001	201713	ARRIG	5/23/69	94 DEF FUGITIVE	B.W. ISSUE	
66/01	0999	1/1	999	ADAMS	BARRY	20000	393546	TRIAL	9/21/70	94 DEF FUGITIVE	B.W. ISSUE	8/06/70
67/03	0426	1/1	426	ADAMS	BERNARD	R 81000	402966	TRIAL		94 DEF FUGITIVE	B.W. ISSUE	4/28/67
68/07	1051	1/1	1051	ADAMS	HORACE	41000	332829	ARRIG	10/08/68	94 DEF FUGITIVE	B.W. ISSUE	
67/06	0449	1/1	449	ADAMS	JAMES	50600	353884	TRIAL		94 DEF FUGITIVE	B.W. ISSUE	7/03/68
68/06	0344	1/1	344	ADAMS	JOE	37000		ARRIG	8/19/68	94 DEF FUGITIVE	B.W. ISSUE	
70/06	2054	1/1	2054	ADAMS	ROYCE	43000	424303	ARRIG	8/14/70	95 DEF AT LARGE	NO B.W.	
68/10	0840	1/1	840	ADAMS	STEVEN	H 20000	322751	TRIAL	6/12/69	94 DEF FUGITIVE	B.W. ISSUE	6/12/69
60/04	1080	1/1	1080	ADAMS	TRACEY	50600	326718	ARRIG	7/10/70	94 DEF FUGITIVE	B.W. ISSUE	10/27/61
69/12	0671	1/1	671	ADDERLY	JEROME	71002	417964	ARRIG	3/03/70	94 DEF FUGITIVE	B.W. ISSUE	
62/12	2152	1/1	2152	ADDERLY	NATHANIEL	43000	346702	TRIAL		94 DEF FUGITIVE	B.W. ISSUE	3/04/64
57/08	0110	1/1	110	ADKINS	ALFRED	31000	66820	ARRIG	7/10/70	94 DEF FUGITIVE	B.W. ISSUE	7/24/62
70/01	0534	1/1	534	ADKINS	JOSEPH	20000	377247	TRIAL	5/06/70	94 DEF FUGITIVE	B.W. ISSUE	5/06/70
68/11	1661	1/1	1661	AIKEN	FRANK	B 84001	398419	ARRIG	5/14/69	94 DEF FUGITIVE	B.W. ISSUE	
69/12	1198	1/1	1198	AIKENS	LARRY	A 84600	416657	ARRIG	3/09/70	94 DEF FUGITIVE	B.W. ISSUE	
68/12	0717	1/1	717	AKINS	JOSEPH	40000	224377	ARRIG	8/04/69	94 DEF FUGITIVE	B.W. ISSUE	

Report utilized by  
Police department, to supplement  
the court terminal system

157

EXHIBIT 6

ATTY. NO.	LAST NAME	F I	M I	LATEST DATE	T Y	RM.	DC	A S YR N PL	TT RECORD NUMBER	CONTROL	MAJOR CHGE.	SUS. CODE	MAJOR CASE#	DEFENDANT NAME LAST NAME	POLICE F I	S PHOTO NO.	T ARR	TIMES LST	OTHER MESSAGES ATTY. NO.	
04285	BECKER	E	R	09/21/70	T	625	24	E MA	6909-1494	1/1	0	75100	1	2949 SMITH	K G	407284	B	3	4	
04285	BECKER	E	R	09/30/70	T	676	23	E BA	7004-2064	1/2	0	56000	1	CUTLER	T	436681	B	1	2	
04285	BECKER	E	R	09/30/70	A	682	20	R	7008-1114	1/1	0	80104	1	STEWART	R G	441415	B	2		
04285	BECKER	E	R	10/05/70	T	625	25	E MA	6901-0850	1/1	0	55600	1	2590 LAURIELLO	J	421881	B	3	4	
04285	BECKER	E	R	10/05/70	T	625	25	E BA	6909-0542	2/2	0	55600	1	2902 LAURIELLO	J	421881	B	1	3	
04285	BECKER	E	R	10/05/70	T	625	25	E BA	6912-1833	2/2	0	55600	1	LAURIELLO	J	421881	B	1	3	
04285	BECKER	E	R	10/19/70	T	675		B	7008-0357	1/1	0	80104	1	MISTALSKI	S	439839	B	1		
04510	BEGIER, JR.	H	P	09/23/70	T	625	24	E PA	6911-0442	3/3	0	70500	1	7759 PAGE	L	418610	P	8	1	
04720	BELLO	A	J	09/16/70	T	675		B BA	7006-1614	1/1	0	85300	1	DAVENPORT	R	439027	B	1		*OLDDATE
04720	BELLO	A	J	09/28/70	T	625	25	E MA	7001-1283	1/1	0	84900	1	4029 DIPILLA	M	433114	B	2	3	
04720	BELLO	A	J	10/05/70	T	675		R BA	7007-0645	1/1	0	80104	1	HOPKINS	B	439537	B	1		
04720	BELLO	A	J	10/06/70	T	625	25	E BA	7001-0029	1/2	0	20000	1	4210 MCELWEE	J	433412	B	2	4	
04720	BELLO	A	J	10/14/70	T	296		B BA	7007-1569	1/1	0	40000	1	MICELI	J B	360394	B	2		
04720	BELLO	A	J	10/14/70	T	675		B BA	7007-1023	1/1	0	80107	1	CURRY	A	042899	B	2		
04885	BENNETT	R	L	09/15/70	T	625	20	E MA	6807-1223	1/1	0	93000	1	2281 LUCCI	F	417408	B	9	5	46150*OLDDATE
04885	BENNETT	R	L	09/23/70	T	675		B BA	7006-2341	1/1	0	58000	1	SANTORA	J	409857	B	1		
04885	BENNETT	R	L	09/28/70	T	675		B BA	7006-0284	1/1	0	81000	1	BRUNN	P	417718	B	1		
04885	BENNETT	R	L	09/28/70	T	675		B BA	7006-2191	1/1	0	39101	1	JOYCE	J	439152	B	1		
04885	BENNETT	R	L	10/01/70	T	675	20	E BA	7006-0808	1/1	0	51600	1	QUINN	F	393530	B	1	1	
04885	BENNETT	R	L	10/05/70	T	296		B BA	7007-1551	1/1	0	80104	1	TRIGGS	H	434153	B	1		
04885	BENNETT	R	L	10/06/70	T	296		B BA	7006-1545	1/1	0	78100	1	PELZER	F	429765	B	2		
04915	BERNOFF	E		09/09/70	T	676	94	E MA	6905-1571	1/2	0	71003	1	9999 KING	J	331147	P	16	3	*OLDDATE
04975	BERENS	P	E	09/16/70	T	613	24	E PA	7003-1414	1/1	0	12000	1	1413 GASKINS	J	249534	P	3	2	11510*OLDDATE
04990	BERENSON	J	N	10/15/70	T	621	48	E BA	7002-0141	1/2	0	02100	1	4037 LUCCI	F	203886	B	1	3	
04990	BERENSON	J	N	10/15/70	T	621	48	E BA	7002-0141	2/2	0	02100	1	4037 TERRELL	K	434466	B	1	3	
05140	BERKOWITZ	A		10/01/70	T	676	24	E PA	6911-0834	1/1	0	50000	1	THOMAS	A	395260	P	2	3	
05140	BERKOWITZ	A		10/08/70	T	613	20	E PA	6906-0172	1/3	0	12000	1	6199 TAYLOR	J	999999	P	12	5	71570
05155	BERKOWITZ	M	W	09/14/70	T	650	24	E BA	7001-0549	2/4	0	20000	1	MCCLELLAND	J	384768	B	1	2	*OLDDATE
05155	BERKOWITZ	M	W	09/14/70	T	676	25	E BA	7006-0665	1/1	0	80104	1	IACHINO	A C	438260	B	2	3	*OLDDATE
05155	BERKOWITZ	M	W	09/15/70	T	675		B BA	7004-1782	1/5	0	80104	1	DILLARD	J M	413629	B	6		*OLDDATE
05155	BERKOWITZ	M	W	09/16/70	A	682	20	B	7008-0417	1/1	0	40000	1	WORMLEY	P	413056	B	2		*OLDDATE
05155	BERKOWITZ	M	W	09/17/70	T	275	20	E MA	6811-1703	1/1	0	12000	1	6086 HINSON	W	259758	B	8	2	
05155	BERKOWITZ	M	W	09/17/70	T	675		B BA	7006-1049	1/1	0	80104	1	SPURILL	J	430535	B	2		
05155	BERKOWITZ	M	W	09/22/70	T	625	24	E BA	7002-0440	1/2	0	81000	1	BROWN	R	411070	B	1	2	
05155	BERKOWITZ	M	W	09/22/70	T	625	24	E BA	7002-0440	2/2	0	81000	1	KOCHER	P	411077	B	1	2	
05155	BERKOWITZ	M	W	09/28/70	T	625	20	E PA	6911-0125	1/1	0	70100	1	7756 LEH	C	999999	P	3		
05155	BERKOWITZ	M	W	09/30/70	T	675		B BA	7006-0076	1/1	0	81000	1	STEINMETZ	J	383481	B	2		
05155	BERKOWITZ	M	W	10/08/70	T	675		B BA	7007-0407	1/1	0	80104	1	DICKERSON	J P	419339	B	1		
05155	BERKOWITZ	M	W	10/19/70	T	625	25	E	6308-1284	1/1	0	31100	1	31 GRADY	I	285348	P	7	5	
05155	BERKOWITZ	M	W	10/19/70	T	625	25	E MA	6310-0487	1/1	0	81200	1	31 GRADY	I	285348	P	7	3	
05155	BERKOWITZ	M	W	10/19/70	T	625	25	E PA	6401-0913	3/3	0	20000	1	GRADY	I	285348	P	1	3	
05155	BERKOWITZ	M	W	10/19/70	T	625	25	E BR	6808-0378	1/1	0	31001	1	GRADY	I	285348	P	5	5	
05155	BERKOWITZ	M	W	10/19/70	T	625	25	E PA	6912-0080	1/1	0	37000	1	GRADY	I	285348	P	21	2	
05155	BERKOWITZ	M	W	10/27/70	T	625	25	E BA	6902-1443	1/1	0	55500	1	385 WALDRON	M	129228	B	9	2	
05200	BERLANT	N		09/16/70	A	682			7008-1716	2/2	0	81000	1	WHITFIELD	A	440849	B			*OLDDATE
05200	BERLANT	N		09/17/70	P	625	85	A PA	6909-1100	2/2	0	71500	1	2944 CAMPBELL	H	303675	P	4	1	
05200	BERLANT	N		10/07/70	T	296			7006-1519	1/1	0	40000	1	QUATTLEBAUM	S E	375956	B	1	1	03820
05200	BERLANT	N		10/19/70	T	625	25	E BA	6401-0913	1/3	0	20000	1	RORBERSON	W	205527	B	2	2	

Report utilized by:  
 1. Court Administration  
 2. Board of Judges  
 3. Court Listing Unit

EXHIBIT R



MY1322

CRIMINAL COURTS OF PHILADELPHIA  
LIST OF SENTENCE DEFERRED CASES  
OVER 101 DAYS OLD FOR WEEK ENDING 09/09/70

RUN DATE 09/16/70  
PAGE 1

HON. JOSEPH R GLANCEY CODE 201

REC CONTROL	F/BILL	L/BILL	LAST	DEFENDANT NAME	FIRST	CHGE I	DEF STA	J O	NEXT SCHEDULED ACTION DATE	POLICE CODE	NO	ATTY1	ATTY2	DATE DEF.
69/10 0150	1/1	150	151	HORTON	HARRY	71500	PR	N	9/23/70	70	276467	16155		6/03/70
69/12 0591	1/1	591	591	HICKS	MACARTHUR	31000	PR	Y	9/15/70	78	429636	1		5/08/70
70/02 0961	1/1	961	961	MCKETHAN	ARRIE	20000	BA	N	9/22/70	70	428666	32715		6/02/70
70/02 1237	1/1	1237	1237	SMITH	ERATH	A 81000	BA	Y	9/10/70	70	434172	36886		5/14/70
70/03 1379	1/1	1379	1381	BALLARD	WILLIAM	40002	PR	Y	9/15/70	70	329650	1		6/02/70
70/03 1789	1/2	1789	1789	DRAKES	ALAN	20000	BA	Y	9/15/70	78	432120	17970		6/04/70

Report utilized by:

1. Sentencing Schedule Unit
2. Court Administration
3. Judge
4. State Supreme Court

159

EXHIBIT 5

**CONTINUED**

**2 OF 4**

CRIMINAL COURTS OF PHILADELPHIA  
 COURT ADMINISTRATION  
 MULTIPLE BAIL DEFENDANTS

 RUN DATE 09/16/70  
 PAGE NO. 8

DEFENDANT NAME	COURT TERM-NO.	SER-CHG	COMPLAINT#	STATUS	POLICE#	CHARGE DESCRIPTION	ACTION DT.	ROOM	TYPE
JENKINS EARL	CP69-10-0614 1/3	80104	690627769	B-070	0323924	POSSESSION OF NARC DRUGS	8-18-70	676	T
JENKINS EARL	CP70-08-1988 1/1	43000	700600640	B-001	0323924	POSSESS BURG TOOLS	9-18-70	682	A
FORD EUGENE	CP70-03-0509 1/1	37001	701403619	B-001	0323946	A&B W/I TO RAVISH	9-24-70	676	T
FORD EUGENE	CP70-03-0512 1/1	93000	701403619	B-001	0323946	CORRUPT MORALS OF MINOR	9-24-70	676	T
THOMAS CHARLES	MC70-08-3522 1/1	50000	703510253	B-001	0324805	LARCENY	9-11-70	9	T
THOMAS CHARLES	MC70-08-3523 1/1	37000	703549439	B-001	0324805	ASSAULT & BATTERY	9-11-70	9	T
BROWN LEROY	CP65-08-0873 3/4	85200		B-098	0325507	OFFENSES AGAINST FLAG			
BROWN LEROY	MC70-09-0596 1/1	37000	700001237	B-001	0325507	ASSAULT & BATTERY	10-07-70	195	T
THOMAS RAYFIELD	CP65-03-0809 1/1	42500		B-091	0326287	BURG-MV LARC RSG			
THOMAS RAYFIELD	CP67-03-0206 1/1	31000		B-091	0326287	A&B W/I TO MURDER			
CRDPPER EDWARD	CP68-11-0163 1/1	12000	681615835	B-070	0326928	MURDER	6-29-70	225	T
CROPPER EDWARD	CP69-08-0106 1/1	80104	691608035	F-094	0326928	POSSESSION OF NARC DRUGS	7-20-70	625	A
CROPPER EDWARD	CP70-04-1356 1/1	20000	701411642	B-098	0326928	AGGRAVATED ROBBERY	7-30-70	625	T
CROPPER EDWARD	MC70-03-2634 1/1	31500	700708940	F-094	0326928	ASSAULT BY PRISONER	6-16-70	11	T
HANDS HAROLD	CP69-10-1850 1/1	31000	691959452	B-098	0329696	A&B W/I TO MURDER	6-22-70	246	T
STANFORD HAROLD	CP70-04-0645 1/1	81000	701812064	B-070	0329696	CARRY CONC DEADLY WEAPON	8-28-70	675	T
WELSH JOHN	CP70-07-0844 1/1	31000	691739371	B-001	0329787	A&B W/I TO MURDER	9-15-70	625	A
WELSH JOHN	MC69-09-1865 1/1	58000	691750353	F-094	0329787	RECEIV STOLEN GOODS	11-14-69	4	T
WILLIAMS LYNN	CP68-01-0733 1/1	31100		F-094	0330084	ATTEMP W/I TO KILL	11-12-68	225	T
CLARK WILLIAM	MC70-08-0640 1/1	40000	702421389	B-001	0330084	BURGLARY	9-24-70	11	T
ROBINSON CHARLES	CP70-08-0347 1/2	80104	702240996	B-001	0330276	POSSESSION OF NARC DRUGS	9-15-70	625	A
ROBINSON CHARLES	MC69-08-0618 1/1	40001	690639685	B-001	0330276	ATTEMPTED BURGLARY	9-27-69	5	T
CHESTNUT JAMES	CP70-07-1036 1/3	37000	702533053	B-001	0331191	ASSAULT & BATTERY	9-21-70	625	A
CHESTNUT JAMES	MC70-05-2985 1/1	39001	702533853	B-001	0331191	A&B ON POLICE OFFICER	6-10-70	8	T
ANDERSON HARRY	CP69-11-0551 1/2	40000	692550226	B-070	0333347	BURGLARY	5-27-70	246	T
ANDERSON HARRY	CP70-06-0647 1/1	81000	702323377	B-001	0333347	CARRY CONC DEADLY WEAPON	10-14-70	675	T
MENYWEATHER MILTON	CP69-10-0449 1/1	31102		P-070	0333771	AGGRAV A&B W/I TO KILL			
MENYWEATHER MILTON	MC69-09-0732 1/1	31101	692669343	B-001	0333771	ASSAULT W/I TO KILL	9-30-69	8	T
DAVIS JAMES	CP60-08-0447 2/2	40500		B-098	0334212	BURGLARY-LARCENY-RSG			
DAVIS JAMES	CP61-05-0566 1/1	81500		P-098	0334212	VIOL UNIF FIREARMS ACT			
ARGONDIZZA GERRANO	CP69-05-0061 1/2	42000	690616037	F-094	0335267	BURGLARY-ANY VEHICLE	11-28-69	254	T
ARGONDIZZA GENNARO	CP70-04-0319 2/3	40003	700607342	B-001	0335267	ATT BURG W/I COM FELONY	9-11-70	676	T
JACKSON JOSEPH	CP70-06-0262 1/2	37000	700620008	P-001	0335640	ASSAULT & BATTERY	10-01-70	676	T
JACKSON JOSEPH	CP70-08-2146 1/1	43000	700915094	B-001	0335640	POSSESS BURG TOOLS	9-16-70	1	A

Report utilized by:  
 1. Prosecutor  
 2. Court Listing Unit  
 3. Police Department

EXHIBIT H

DP01DEF1001 JONES

DEFENDANT NAME	JOHN	COURT TERM-NO.	POLICE#	MICP-FIM#	SER-CH
JONES	JOHN	D CP69-03-0820-1-1	420988	69002704	
JONES	JOHN	D CP69-08-1104-1-1	359828	69007213	
JONES	JOHN	D CP70-04-0435-1-1	420988		50000
JAMES	JIM	D MC70-02-0564-1-1	420988		53501
JAMES	JIM	E MC70-06-0515-1-1	396031		39100
JONES	JOHN	E MC70-07-0775-1-1	396031		50000
JONES	JOHN	H CP68-07-1330-2-2	360066	70001521	
JONES	JOHN	H CP70-06-1966-1-2	360066		20000
JONES	JOHN	H HC70-07-2326-1-1	352331		81000
JONES	JOHN	H MC69-03-1873-1-1	259311		400001

EXHIBIT U-1

DP01PP010420988

TERM + NO.	LAST NAME	FIRST	IN.	SER-CHG	BDS-CD	SOURCE
69-01-0529 1/1	MORRISON	ERNEST		535-02	24	CRIMINAL
70-04-0435 1/1	JONES	JOHN		500-00		CRIMINAL
70-07-0381 1/1	ONEY	MICHAEL		500-00		CRIMINAL
70-02-0564 1/1	ONEY	MICHAEL		535-01	28	MUNICIPAL

RESULT OF SEARCH BY PHILADELPHIA POLICE PHOTO NUMBER!

EXHIBIT U-2

DP01CR017004043511  
 DEFENDANT NAME ADDRESS CITY STATE STAT SEV  
 JONES JOHN D 00635N 13TH ST. PHILA. PA 19100 F

BDS-CD ATTY1 ATTY2 ADA MD SUSP POLICE# INST# SER/CHG DT. APREST DT. INDICT  
 0001 95 0420988 50000 2-22-70 4-13-70

ARRAIGNMENT DATA				TRIAL LISTING DATA				NEXT COURT ACTION			
NO.	FIRST/DT	LAST/DT	DISP	NO.	JUD	FIRST/DT	LAST/DT	DISP	TYP	ROOM	DATE
1	4-22-70	4-22-70	50	2		5-18-70	7-03-70	95	T	254	7-03-70
ARR. DISP.-- NOT GUILTY PLEA- WAIVED				TRIAL DISP.-- DEF AT LARGE NO B.M.!							

DP01OF0150000

SHORT OFFENSE DESCRIPTION	LONG OFFENSE DESCRIPTION
LARCENY	LARCENY

TYPE	FBI/POI	TERM TO DATE CHARGES	YEAR TO DATE CHARGES
CHARGE	CLASS	DRAWN MOST/SER. BILL--REC.	DRAWN MOST/SER. BILL--REC.
NONE			

TERMINALS ARE NOT CURRENTLY BEING USED TO DISPLAY STATISTICAL INFORMATION!

DP01AT0100001

LAST NAME	FIRST	IN	PHONE NO		
VOI. DEFENDER			1083100		
FIRST ADDRESS LINE	SECOND ADDRESS LINE	THIRD ADDRESS LINE	ZPCD		
1 N. 13TH STREET	PHILADELPHIA, PA.		19107		

EXHIBIT V-1

EXHIBIT V-2

EXHIBIT V-3

DP01MC017002056411  
 LAST NAME FIRST IN STREET ADDRESS STAT  
 ONEY MICHAEL IN 00635N 15TH ST. PHILA. PA 19100 (F)  
 TRIAL LISTING DATA TRIAL DISP. DATA ACTION CONTROL DATA  
 NO. FIRST DT LAST DT. DISP JUDGE SENT. DT. FINE SP-CD HEAR. DT RM. TYP  
 1 2-11-70 2-11-70 94 202 94 2-11-70 13 T  
 FIRST BAIL AMT. OF DT. OF POLICE SERIOUS DT. CRIM. DT. OF ACTION  
 ATTY. CODE BAIL BAIL NUMR CHRG. ACT ARREST DATE  
 28 300 2-07-70 0420988 53501 2-07-70 2-07-70

FOR ALIAS NAMES--KEY P/M!

THE FOLLOWING ARE ALIAS NAMES FOR DEFENDANT ONEY MICHAEL  
 JONES JOHN D MORRISON ERNEST!

DP01MISCUR028  
 ALLEGHENY MUTUAL CAS. CO. 1009 S BROAD ST PHILA. PA 19148

DP01MISCJUD202  
 CLARKE ANNE M MUN. COURT!

DP010E0153501

TYPE CHARGE	FBI/POL CLASS	TERM TO DATE CHARGES DRAWN MOST/SER. BILL--REC.	YEAR TO DATE CHARGES DRAWN MOST/SER. BILL--REC.
NONE!			

168

EXHIBIT W-1

EXHIBIT W-2

EXHIBIT W-3

EXHIBIT W-4

164

DP01UC017007232611

LAST NAME		FIRST		IN.	STREET ADDRESS			ST. PHILA.		PA	19100
JONES		JOHN		H	03108N 7TH			ST. PHILA.		PA	19100
TRIAL LISTING DATA				TRIAL DISP. DATA				ACTION CONTROL DATA			
NO.	FIRST DT	LAST DT.	DISP	JUDGE	SENT. DT.	FINE	SP-CD	HEAR. DT	RM.	TYP	
1	8-04-70	8-04-70		202	8-04-70		60	04-04-04	682	T	
FIRST	RAIL	AMT. OF	DT. OF	POLICE	SERIOUS	DT. CRIM.	DT. OF	ACTION			
ATTY.	CODE	RAIL	RAIL	NUMB.	CHRG.	ACT	ARREST	DATE			
	62	300	7-28-70	0352331	81000	7-28-70		7-28-70			

APPRN. DATE 10/07/70      INDICT. DATE 9/14/70      CP. NUMB. 7009-0327 1/1!

EXHIBIT X-1

DP01CP017009032711

DEFENDANT NAME		ADDRESS		CITY	STATE	STAT	SEV			
JONES		JOHN		H	03108N 7TH		ST. PHILA. PA 19100 P			
PDS-CD	ATTY1	ATTY2	ADA	MD	SUSP	POLICE#	INSTIT#	SEP/CHG	DT. ARREST	DT. INDICT
62					1	0352331		81000	7-28-70	9-14-70

ARRAIGNMENT DATA				TRIAL LISTING DATA				NEXT COURT ACTION	
NO.	FIRST/DT	LAST/DT	DISP	NO.	JUD	FIRST/DT	LAST/DT	DISP	TYP ROOM DATE
	10-07-70								A 682 10-07-70!

EXHIBIT X-2

DP01ATAID	LAST NAME	FIRST		STREET ADDRESS	PHONE#	ARR	ASG
04607	BELLIS	ARTHUR	D	1420 WALNUT ST.	PE58800		
06246	BLAZEK	DOUGLAS	R	SUITE 550	WA54222	A	
06587	BLYWEISS	DANIEL		2840 P.S.E.S. BLDG.	WA26073		
06040	BLAKE	EDWARD	J	1135 LAND TITLE BLDG.	1071154		
02755	BALICK	HELEN	S	709 N PROOM ST.		A	
02785	BALKA	HENRY	W	1342 FIDELITY TRUST BLDG.	K163750	A	
02770	BALIS	HARRY		612-14 ONE E. PENN SQ. BLDG	L039344		
04705	BELLIS	ISADORE	H	1420 WALNUT ST. ROOM 500	PE58800	A	
06325	BLOCK	J.	S	4501 ARAMINGO AVE.	P136800		
02800	BALKA	JEROME	R	1342 FIDELITY TRUST BLDG.	K163750	AI	

EXHIBIT Y-1

DP01AT0106040	LAST NAME	FIRST	IN	PHONE NO			
	BLAKE	EDWARD	J	1071154			
	FIRST ADDRESS LINE	SECOND ADDRESS LINE	THIRD ADDRESS LINE	ZPCD			
	1135 LAND TITLE BLDG.	PHILADELPHIA, PA.		19110			

EXHIBIT Y-2



MY1328

CRIMINAL COURTS OF PHILADELPHIA  
 DEFENDANT DISPOSITIONS  
 YEAR-TO-DATE THROUGH AUGUST TERM 1970

RUN DATE 09/04/70 PAGE

CHARGE CODE	CATEGORY DESCRIPTION	TOTAL DEF. DISP.	TOTAL DEF. ACQUIT	TOTAL GLTY. AS CHGED	TOTAL GLTY. LESS. OFF.	** ACQUITTED **			** CONVICTED **			***** SENTENCE *****		***** FINES & UNK. COSTS *****			
						DISM. W/O TRIAL	BY WAIV. TRIAL	BY JURY TRIAL	GLTY. PLEA	WAIV. TRIAL	JURY TRIAL	DEATH OFF.	STATE PRISM	CNTY. PRISM	PROB.	SUSP. SENT.	FINES & UNK. COSTS
800-809	NARCOTIC DRUG LAWS	1799	858	802	139	426	432		386	554	1	4	172	661	94	10	
810-819	WEAPONS OFFENSES	688	326	335	27	128	197	1	131	230	1		69	191	66	36	
820-829	OFFENSES VS. FAMILY & CHILD	16	15	1		14	1			1						1	
830-839	LIQUOR LAWS	78	46	30	2	24	22		8	24			2	4	12	14	
840-840	DRIVING WHILE INTOXICATED	225	80	132	13	29	51		55	89	1		7	57	23	48	
841-849	OTHER MOTOR VEH. OFFENSES	77	37	38	2	15	22		20	20			8	16	10	6	
850-859	DISORDERLY CONDUCT / VAG.	56	42	14		19	23		4	10			4	8	1	1	
860-899	GAMBLING	169	103	66		35	68		10	48				30	6	30	
900-909	ARSON	33	13	19	1	5	6	2	9	11		2	3	12	3		
910-919	ABORTION	4	3	1		3				1			1				
920-929	BIGAMY														3	5	1
930-939	CONTRIBUTING TO DELINQUENCY	45	36	8	1	21	15		4	5				7	8	5	1
940-949	OFFENSES VS. PUBLIC JUSTICE	89	68	21		40	26	2	5	15	1		7	8	5	1	
950-959	PRISON BREACH, ETC	14		14					10	4			7	7			
960-969	BLACKMAIL / EXTORTION	6	4	2		4			1	1				2			
970-979	KIDNAPPING	1	1				1										
980-989	MALICIOUS MISCHIEF	26	21	4	1	16	5						1	2	1	1	
990-998	TRESPASSING														1		
999-999	UNCLASSIFIED	8	7	1		7				1							
TOTALS		10508	4454	4623	1431	2096	2300	58	2521	3443	90	1	71	1956	3177	535	314

Report utilized by:  
 1. Court Administration  
 2. Statistical Reporting Unit  
 3. State Court Administrator

EXHIBIT A

CRIMINAL COURTS OF PHILADELPHIA - COURT ADMINISTRATION  
ANALYSIS OF BAIL AMOUNTS PER CHARGE

RUN DATE 09/17/70 PAGE 02

ACTIVE CASES

MOST SERIOUS CHARGE	NOMINAL	LESS-100	100-199	200-299	300-399	400-499	500-799	800-999	1000-1999	2000 + OVER	TOTAL
425-00											2
430-00	7	5			7		9	1	2	4	35
500-00	58	12		1	165		113	30	40	14	433
500-01	2	1			7		1				11
503-00	1						1				4
506-00		7					1		1	1	8
515-00	1				3		3		1	2	10
516-00	3				3		2			3	11
533-00							2				2
535-00		3									3
535-01					1						1
535-02					2						2
540-00	3	3			1		2	1	2		12
550-00									2		2
555-00	1	1									2
556-00	6				6		6		3	3	24
560-00	10	1			2		8		7		28
561-00								1	1	1	3
564-00										1	1
565-00	2	3			1						6
565-03									1		1
565-05	1				2				2		5
568-01										2	2
580-00	21	2			23		22	7	22	20	117
587-00	2				4		2		1		9
600-00	4	1			6		2		3	2	18
600-01	1				3		2		4		10
660-00										1	1
700-00		1								1	2
701-00										1	1
705-00		2			1		2	3	12	5	25
710-02	2	2			1		3		12	10	30
710-03	1						3			1	5
711-00							1		1		2
713-00	1	4			2		2		6	8	23
715-00	3				6		5	1	4	1	20
730-00	9				2		6		1		18
744-00									1		1
746-00	1				2				1		3
750-00	3	1					1		3	5	14
751-00	2	2			6		3		2	2	17
755-00										1	1
781-00					5		5	1	1	1	13

167

EXHIBIT B

CRIMINAL COURTS OF PHILADELPHIA - COURT ADMINISTRATION  
ANALYSIS OF BAIL AMOUNTS PER CHARGE

RUN DATE 09/17/70 PAGE 02

DEFERRED STATUS

MOST SERIOUS CHARGE	NOMINAL	LESS-100	100-199	200-299	300-399	400-499	500-799	800-999	1000-1999	2000 + OVER	TOTAL
390-01	6	3			7				1	1	18
391-00		59			3			1	1		64
391-01	25	3			12		9	1		1	51
400-00	16	69			16		35	7	55	20	218
400-01									1		1
400-02	4	10			7		13	6	15	3	58
400-03	2	1			8		6	2	7	1	27
405-00	3	91			2		4		6	4	110
420-00							1		1		2
420-01	2	2			7		14	5	6	4	40
420-02	2	3			3		4	2	2		16
425-00		23					2		2		27
430-00	4	8			8		3	2	5		30
500-00	78	27			82	1	72	17	25	5	307
500-01	1				6		2				9
503-00	1	7			2			1	2	1	14
506-00	3	153			3		3	2	3		167
515-00	4	5			2		3		2		16
516-00	2	7			3		3				15
533-00					2						2
535-00		71			1		1				73
535-01	4	2			13		3				22
535-02		2			5		5	1			13
540-00	1	10			3		1				15
555-00		9									9
556-00	9	32			2		1		1		45
560-00	2	18			3		1	1	1	1	27
561-00		3									3
562-00		2									2
563-00		5			1						6
564-00		1									1
565-00		7									8
565-05	1				5				1		6
568-00		6									6
570-00	1						1		1		3
570-01					1						1
570-02	1				1						2
580-00	11	28			13		17	4	14	3	90
587-00	4	2									6
588-00		3					2				5
600-00	4	5			1		2		2		14
600-01	4				6		5		2		17
605-00		11									11

EXHIBIT CC

MY1378

CRIMINAL COURTS OF PHILADELPHIA  
RELOAD MASTER DOCKET FILE

RUN DATE 09/04/70

01

	TOTAL RECORDS ON FILE *	SCHEDULED FOR ARRAIGNMENT *	PRE-TRIAL CONFERENCE	SCHEDULED FOR TRIAL	DEFERRED SENTENCE	DEFERRED INDICTMENT	UNSCHEDULED	OTHER
GRAND TOTAL	12,167 *	1,518	175	3,120	517	6,426	411	
MAJOR/HOMICIDE	707	68	45	192	103	285	14	
MAJOR/OTHER	1,421	205	130	462	83	497	44	
N-MAJ/1ST LIST	1,061	1		824	75	133	28	
N-MAJ/OTHER	8,978	1,244		1,642	256	5,511	325	
PRISON TOTAL	2,256 *	204	77	966	300	559	150	
MAJOR/HOMICIDE	484	27	31	161	80	175	10	
MAJOR/OTHER	430	43	46	164	51	101	25	
N-MAJ/1ST LIST	216	1		146	37	18	14	
N-MAJ/OTHER	1,126	133		495	132	265	101	
BAIL TOTAL	5,225 *	1,314	98	2,154	203	1,195	261	
MAJOR/HOMICIDE	142	41	14	31	23	29	4	
MAJOR/OTHER	768	162	84	298	30	175	19	
N-MAJ/1ST LIST	741			678	35	14	14	
N-MAJ/OTHER	3,574	1,111		1,147	115	977	224	
FUGITIVE TOTAL	4,686 *				14	4,672		
MAJOR/HOMICIDE	81					81		
MAJOR/OTHER	223				2	221		
N-MAJ/1ST LIST	104				3	101		
N-MAJ/OTHER	4,278				9	4,269		
OTHER TOTAL	*							
MAJOR/HOMICIDE								
MAJOR/OTHER								
N-MAJ/1ST LIST								
N-MAJ/OTHER								
DEF. SENT. 98		64						
DEF. SENT. 01		5						

END OF JOB-RELOAD MASTER DOCKET FROM TAPE

CRIMINAL COURTS OF PHILADELPHIA  
COURT ADMINISTRATION  
SUMMARY OF ROOM ASSIGNMENTS BY DATE

RUN DATE 09/18/70 PAGE 001

DATE	091A	296	513	602	613	625A	625	653	675	676	682A	682	696	MISC	TOTALS
9/21/70		31	2	3	10	108	26	12	21	47	15			5	279
9/22/70		19	1	1	12	95	24	14	27	42	4			1	235
9/23/70	77	25	2		9		19	11	21	34	70			1	269
9/24/70		13			9		19	16	20	45	10			3	135
9/25/70		20			5		14	6	22	30	41				138
9/28/70		24	3		9	92	21	4	20	60	5			3	241
9/29/70		17			7	91	20	4	24	40				1	204
9/30/70		25			6		23	16	19	48	44			1	182
9/31/70											1				1
MONTH TOTALS	77	173	8	4	67	386	166	83	169	346	190			15	1,684

## Report utilized by:

1. Court Administration
2. Trial Listing Commissioners
3. Prosecutors
4. Chief Court Officer
5. President Judge

EXHIBIT 12

# PROGRESS IN COMBINING A NATIONAL DATA BASE WITH *DIALOGUE*, A GENERAL PURPOSE ON-LINE RETRIEVAL SYSTEM FOR COMPUTER ASSISTED PAROLE DECISION-MAKING<sup>1</sup>

by Ernst A. Wenk  
National Council on Crime and Delinquency  
Research Center  
Davis, California

Don M. Gottfredson  
National Council on Crime and Delinquency  
Research Center  
Davis, California

Roger K. Summit  
Information Sciences Laboratory  
Lockheed Palo Alto Research Laboratory  
Palo Alto, California

Mark S. Radwin  
Information Sciences Laboratory  
Lockheed Palo Alto Research Laboratory  
Palo Alto, California

It is a rare occurrence when two independently developed information projects can converge during advanced phases of development and satisfy even the most sophisticated data-retrieval requirements without extensive and costly adaptations. The collaboration between Uniform Parole Reports, a national uniform data base<sup>2</sup>, and *DIALOG*, a general purpose system for on-line interactive information retrieval and data analysis, represents such a rare opportunity.

## Background of Uniform Parole Reports

The Uniform Parole Reports idea was formulated during a series of seminars conducted for parole authorities from across the nation under the auspices of the National Parole Institutes. While the primary focus of these seminars was the complexities of parole decision-making, it soon became clear that a general lack of parole information based on common definitions made meaningful comparison between agencies impossible. The idea to develop uniform parole statistics gained great support among participants of the National Parole Institutes since they believed that knowledge of individual parolee characteristics and information on individual parole outcome would provide means to assess effectiveness of parole agencies within a comparative frame of reference. A comparative quality was felt to be essential if self-evaluation was to be meaningful nationally.

This group, composed of Parole Board Members, parole administrators, staff of the National Parole Institutes, and research specialists, formulated a pro-

posal for action which led to the selection and definition of the items to be reported. A feasibility study<sup>3</sup> was initiated, and when the feasibility was established the group submitted a proposal for a pilot study to the National Institute of Mental Health. In January 1966 the project received a three-year grant from NIMH to conduct a pilot project. In January 1969 another three-year grant was awarded to further develop the system and study the feasibility of turning it over to some central information repository by the end of the grant period in 1971.

The pilot study was originally designed with an expected membership of twenty paroling agencies. During the four years of its development it grew to a formidable information system. The participants include 55 agencies in fifty States, the Federal Government, the Commonwealth of Puerto Rico, and collaboration of the National Parole Board and Dominion Bureau of Statistics in Canada. Uniform Parole Reports provides information on parolees and their experience during the first twenty-four months following parole. The computerized UPR data files contain close to 100,000 individual records. The ongoing monthly contributions are in excess of 2,000 records.

The following items are reported<sup>4</sup> or computed:

### Identification Data:

- Name
- Identification number
- Birth date
- Agency releasing
- Sex
- Agency receiving

### Historical Data:

- Effective date of sentence
- Date of admission to confinement from which paroled
- Type of admission (new commitment; probation violation or parole violation)
- Commitment Offense
- Prior prison sentences
- Prior sentences other than prison
- Age at admission
- Age at time of release on parole
- Time served in prison
- History of drug misuse
- History of alcohol misuse

### Parole Outcome Data:

- Date of release to parole supervision
- Length of time under parole supervision
- Outcome of first year and second year on parole:

- a. no difficulties and no discharge or death during this period
  - b. if applicable: Types of difficulty and date of earliest difficulty
- New offense  
Date of discharge or death

It is important to note that the items, definitions, and reporting procedures were developed in cooperation with representatives of the states' paroling authorities, with the present data-reporting capabilities of the various state agencies in mind. The requirements for data recording are within the reach of all states, making it possible for most states to report on all persons released to parole supervision.

The development of a highly useful design calls for operational experience and a systematic program of ongoing systems development based on such experience. Reliability studies were completed and demonstrated confidence in the data collection program.<sup>5,6</sup> The design of a system such as Uniform Parole Reports must be influenced by the anticipated forms of information feedback or reporting that are to be generated for the consumer. The common form of information feedback provided to users of information systems is what we call standard feedback. When dealing with a relatively large user community, as in the case of the Uniform Parole Reports system, there are common areas of interest that call for periodic reports. Standard reports usually have a format that facilitates the reporting and provides a basis for some inter-agency comparisons. A systematic information feedback program has been established for the participants in the Uniform Parole Reports system, providing regular reports on parole outcomes as related to various offender attributes. A set of seven standard tables is made for those persons paroled during the prior year. Separate tables are compiled for men and women for each of the participating agencies and for the combined data.

This kind of standard reporting is deficient in several ways. The time lapse from the formulation of the information request to the availability of the results of the computations diminishes the relevancy of the information considerably. This method of information retrieval lacks the capability of providing interactive participation of the information user in the process of information retrieval. Standard feedback services are not responsive to immediate research or information needs. There clearly exists a need for a more adaptive technique for fulfilling user requirements of a spontaneous nature. Such immediate information retrieval is especially critical when the information is used to aid the decision-making process, as encountered in the parole decision-making setting.

#### Development of DIALOG

While Uniform Parole Reports was developing

with great emphasis on agency participation and contribution and the main efforts were directed toward uniform coding from existing files, a group of scientists at the Information Sciences Laboratory of the Lockheed Palo Alto Research Laboratory were working on a general-purpose system for on-line interactive information retrieval and analysis. The latter efforts were unrelated to Criminal Justice concerns. Their primary concern was the problem of immediate accessibility to knowledge accumulated in space technology.

The DIALOG system, which is in wide use in the National Aeronautics and Space Administration, the Office of Education, the Atomic Energy Commission, and the European Space Research Organization, accepts basic data in the format it has been collected. The file load programs process the data to produce special indexes which identify the location or locations of each data item. The retrieval programs search these indexes—not the records themselves—to determine records containing desired combinations of data items.

This means that search time is largely independent of file size, and that many files of data—even of differing formats and content—can be simultaneously searched under the system.

For purposes of efficiency, DIALOG has been programmed in assembly language for the IBM 360 Series computer systems. It operates on 360 computer models 30 and larger. Several versions exist that will operate under the standard IBM operating systems BOS, DOS (foreground and background), and OS PCP, MFT I and II, and MVT. DIALOG provides for the time-shared operation of a large number of local and remote terminals of varied manufacture and configuration. Terminals manufactured by such firms as IBM, Bunker-Ramo, Computer Communications Incorporated, Teletype Corporation and others may be used in any combination. DIALOG can be interfaced with any existing file, regardless of size or record complexity, in a timely and efficient fashion through use of generalized file generation and maintenance software.

The user input to DIALOG consists of a series of several succinctly defined commands and associated operants that each call for the performance of one of the basic data processing operations. Extensive use is made of the full hierarchies of storage available to the system so as to take best advantage of their relative speeds and capacities. DIALOG output may be directed by the user to display, typewriter, lineprinter, magnetic tape, or photocomposition devices. Formats may be pre-specified and called by number or user specified at the time of use.

#### Combining Uniform Parole Reports with DIALOG

In early 1968 the NCCD Research Center initiated meetings with the Lockheed Research Laboratory in

order to discuss collaboration of the two research groups.

Several unique features of DIALOG provided the base for an increasingly close collaboration:

- 1) The generality of the on-line retrieval system DIALOG made it possible to make use of the system without paying large amounts for system programming. This was an important factor since limited funds were available to the Uniform Parole Reports. The DIALOG system allowed us to maintain our files as originally designed and continue our routine data collection, data editing, and standard reporting.
- 2) Combining UPR with DIALOG opened up possibilities of conducting interactive statistical data analysis on-line by interfacing with the University of California at Los Angeles Biomedical Computer Programs (BMD) package.
- 3) Access to the Parole Information and its statistical implications in real-time provided the base for future research into the parole decision-making process by utilizing associations and relationships in parole outcome data for parole decision-making in simulated and real decision-making situations.

Let us briefly review the state of development reached. The utility of on-line information retrieval for the information user can be very dramatic. The DIALOG on-line retrieval system allows the user to display, print out, or perform further processing on subsets of records within a file, where the subsets are based on combinations of characteristics specified by the user as to be present in the retrieved records. If we are dealing with a file containing vehicle registration records, for example, we can identify the owner(s) of all grey or cream colored Chryslers of model year 1960-1965, which have a license number the last two digits of which are 38. Such a retrieval program on a file of several million vehicles would require less than two minutes. Incidentally, a similar vehicle description was recently available in connection with the shooting of an Oakland police officer. Had a system such as DIALOG been available in this case, it is possible that officers could have been waiting at the residence of the subject vehicle owner on his return home following the shooting incident.

While the application of on-line retrieval may not be so dramatic in parole work, it nevertheless contains a similar note of relevance. In dealing with a parole data file, all manner of analysis questions can be asked of the file such as: What is the comparative incidence of narcotics used among women in the California Youth Authority with that of all women offenders? Another on-line analysis question can produce a table showing incidence of commission of rape by parolees by age, and by time since release on parole. (It turns out that if a parolee has not committed rape by the fifth month of his release he is not likely to at all.) Such information helps the parole official to know what to expect of a particular parolee based on the analysis of actual experience with other parolees. This is similar to the preventative medicine approach of the medical profession. If the doctor knows there is a strong tendency toward diabetes in a certain patient, for example, he can help that per-

son avoid foods and situations which might tend to provoke that disease. In the medical profession, knowledge has grown up over many generations; we are just beginning to collect the basic data necessary for a "preventative medicine" approach to parole supervision. We are, however, assisted by a tool which heretofore has not existed—computer based on-line retrieval and analysis.

We demonstrated this information retrieval technique to a large audience during the National Institute on Crime and Delinquency in June 1969, in Boston, and during the American Congress of Corrections in August 1969, in Minneapolis, using Uniform Parole Reports data on persons released in 1965, 1966, and 1967<sup>7,8</sup> containing 56,741<sup>9</sup> case files.

Examples of applications described in the above papers are presented here in an adapted version.

DIALOG provides the user ten commands such as BEGIN, EXPAND, SELECT, COMBINE, DISPLAY, PRINT with which to examine desired files. When a command is sent to the computer, a reply is sent back on the TV-like display screen. Based on this feedback from the computer, the user can browse through files containing thousands of records in a matter of minutes.

The immediate response allows the user to selectively browse the file to examine simple or quite complex relationships within the data and thus a close rapport of "interaction with the data." The interactive nature of the system is well illustrated by the beginning of a search. When the user presses the BEGIN SEARCH key, the screen displays the request:

PLEASE ENTER THE FOLLOWING INFORMATION  
PRESS ENTER FOLLOWING EACH ENTRY  
SEARCH TITLE:

When the user has typed the search title, he presses the ENTER key to signal the completion of the item, and the computer asks, one at a time, for the user's name, the person for whom the search is being done (if different), the address, and the data file to be searched (available files are listed). Then the information is typed on the console typewriter as follows:

SEARCH TITLE	DEMONSTRATION OF DIALOG/NCCD		
DATE/FILE	11-18-69/UPR		
SEARCH BY	CONAL McHUGH		
REQUESTOR	E. A. WENK		
ADDRESS	NCCD RESEARCH CENTER DAVIS, CALIFORNIA		
SET NO.	NO. IN SET	DESCRIPTION OF SET (+ = OR, * = AND, — = NOT)	

The file selected is composed of UPR data from the years 1965-67. In actual use of the system, a command called LIMIT could be used to restrict the search to specific portions of the file, such as male, 1967 parolees. The last two lines typed are column

headings for the search record to follow. They will be discussed later.

In our example, the user wishes to explore the relationship of recidivism to the original offense. He would probably wish to select groups according to the original offense, so he displays the possible choices. The command used is EXPAND, which causes a display of descriptors that are alphabetically close to the entered term. The user presses the EXPAND key and types "OF = 11." "OF" is the DIALOG prefix for commitment offense, and "11" is a UPR offense code. The resulting display is shown in Figure 1.

Figure 1  
DISPLAY RESPONSE TO EXPAND OF = 11 COMMAND

EXPAND OF = 11					
REF	DESCRIPTOR	CIT	REF	DESCRIPTOR	CIT
E01	OF = 01	4248	E10	OF = 61	513
E02	OF = 02	882	E11	OF = 70	1071
E03	OF = 03	5737	E12	OF = 71	551
E04	OF = 11	2247	E13	OF = 72	1072
E05	OF = 20	2827	E14	OF = 73	68
E06	OF = 30	15512	E15	OF = 74	448
E07	OF = 40	5256	E16	OF = 80	2682
E08	OF = 50	2953	E17	OF = 81	306
E09	OF = 60	6904	E18	OF = 90	3463

The index descriptions used in the present experimental application are formed from the UPR codes. An alternative would be to use the English language descriptions, e.g., 01 could be displayed as Willful Homicide, 02 as Negligent Manslaughter, 10 as Armed Robbery, etc., as described in the *Uniform Parole Reporting Coding Manual*.

The column headed "REF" is a reference number provided to make it easy to select one or several of the groups described for further study. The column headed DESCRIPTOR defines the group represented by each line, and the column CIT gives the number of citations (in this case, UPR individual parole records) in the file containing the descriptor. For instance, there are 4,248 records in the file with the descriptor OF = 01 (originally committed for Willful Homicide). To select this group, the SELECT key is pressed, followed by E01. If E06 and E09 (Burglary and Check Fraud) are also selected, the console typewriter will type out the following search record as a permanent reference:

SET NO.	NO. IN SET	DESCRIPTION OF SET
1	4248	OF = 01
2	15512	OF = 30
3	6904	OF = 60

The SET NO. is used for reference in the same manner as the REF (E number in Figure 1) in an expansion, and the NO. IN SET corresponds to the entry in the CIT column of the original expansion. In our example SET NO. 1 tells us that 4,248 parolee records are in our 1965-67 UPR files committed originally for Willful Homicide, 15,512 for Burglary,

and 6,904 for Check Fraud.

After selecting a few representative offense classifications with sufficiently large frequencies, the relation of these offenses to the commission of offenses while on parole will be investigated. First, the sets of all parolees who committed a particular offense in the first year of parole are selected. An expansion of the term NO (for New Offense), followed by the selection of REF numbers should achieve this, but since the new offense and commitment offense codes are the same, it is simpler to use the SELECT key followed by NO = 01, then SELECT NO = 30 and SELECT NO = 60, producing sets 4, 5, and 6, as shown in Figure 2.

Figure 2  
RECORD OF A SAMPLE SEARCH

SET NO.	NO. IN SET	DESCRIPTION OF SET
1	4248	OF = 01
2	15512	OF = 30
3	6904	OF = 60
4	74	NO = 01
5	1336	NO = 30
6	628	NO = 60
7	9	1 * 4
8	6	1 * 5
9	24	2 * 4
10	794	2 * 5

SET NO. 4 shows us that from all parolees in the file, 74 committed Willful Homicide as a new offense during the 12 months follow-up period, 1,336 had a new offense of Burglary, and 628 a new offense of Check Fraud. SETS 7, 8, 9, and 10 will be described in the following paragraphs.

We decide now to study two groups of parolees, one originally committed for Willful Homicide and the other originally committed for Burglary, in terms of their tendency to repeat their crimes. In order to get this information, the sets of records defined by both original offense (OF) and the new offense (NO) must be selected.

For instance, homicide offenders who committed homicide on parole are in both set 1 and set 4 (OF = 01 and NO = 01). The description of the new set (7) is the combination of set 1 with set 4. The user selects this set using the COMBINE key and the combination description 1 \* 4.

As seen in the Search Record, \* means AND. The resulting set is number 7, with nine repeat homicide cases. Similarly, set 8 consists of all records which are in sets 1 and 5 (OF = 01, NO = 30).

The nine repeat homicides in set 7 are 0.21 percent of the 4,248 persons in the file paroled from a Willful Homicide sentence SET NO. 1). Set 8 represents 0.14 percent of homicide parolees with Burglary offenses on parole. In the same manner, sets 9 and 10 were created for Burglary parolees, of which they represent 0.15 percent and 5.12 percent, that is, of all parolees originally committed for Burglary,

0.15 percent committed murder on parole, while 5.12 percent committed a new Burglary offense.

Several methods are available by which the investigation can be carried out further. For instance, individual records can be examined. DISPLAY, followed by the SET NO., displays the first record in the set, and the ENTER key advances the display to the next record each time it is pressed. For example, DISPLAY 7 would cause Figure 3 to appear on the screen. The content of the records might suggest new approaches, such as defining sets by history of alcohol misuse, drug misuse, or any other items:

Figure 3  
UNIFORM PAROLE RECORD OF A REPEAT MURDERER

Admission Data					
Date of Birth	Date Sentenced	Date Admitted			
BY = 30	BM = 05	SD = 59	SM = 10	AY = 59	AM = 10
Type of Sentence	Prior Sentences	Type of Admission			
TS = 0	Prison Non-Prison	TA = 0			
	PS = 1	PN = 1			
Type of Offense	Age When Admitted	Drug Use	Alcohol Use	Sex	
OF = 01	AG = 29	DU = 0	AU = 1	SX = 1	
Release Data					
Date Released	Paroled by Agency	Area	Released to Agency	Area	
RY = 67	RM = 04	PA = 62	AP = 6	RA = 62	AR = 6
Years in Prison	Identification Number				
YP = 07	ID = 00078123				
Parole Performance Report					
Parole Performance	Date of Difficulty	Type of New Offense			
PP = 7	TY = 67	TM = 10	NO = 01		
Months Under Supervision	Date of Discharge/Death	Death			
MS = 06	DY = 00	DM = 00	DE = 0		

Assume as another example that the user is interested in the number of years served in prison by murderers. Entering the command EXPAND YP = 04 provides a display response from the computer showing a frequency distribution of terms served, irrespective of crime. The first group is shown in Figure 4.

Figure 4  
FREQUENCY DISTRIBUTION OF PRISON TERMS SERVED FOR ALL CRIMES

Years in Prison	No. of Occurrences	Years in Prison	No. of Occurrences
YP = 00	5179	YP = 11	246
YP = 01	23921	YP = 12	208
YP = 02	12095	YP = 13	162
YP = 03	5662	YP = 14	127
YP = 04	2984	YP = 15	116
YP = 05	1881	YP = 16	93
YP = 06	1319	YP = 17	75
YP = 07	960	YP = 18	66
YP = 08	588	YP = 19	70
YP = 09	407	YP = 20	68
YP = 10	377		

YP is a retrieval code which stands for years served in prison (Appendix B), and 04 is entered because the EXPAND callout automatically provides items which are located near to the entered item in the index. Selecting OF = 01 (Appendix B) and combining it (using the COMBINE command) with each of the prison term categories provides data for the distribution shown in Figure 5.

Figure 5  
FREQUENCY DISTRIBUTION OF YEARS SERVED BY MURDERERS

Years in Prison	Number of Occurrences		Percent Willful Homicide
	All Crimes	Willful Homicide	
0-5	51722	2470	4.8
6-10	3551	1006	28.3
11-15	859	420	48.9
16-20	372	219	58.9
over 20	237	133	56.1
	56741	4248	7.5

It might be of interest to examine some of the individual parole records of the group YP = 00 (indicating that less than one year was served). Entering the DISPLAY command together with the reference number of this group displays successive members of this set as described above.

Assume that the first case file display indicates that the parolee in this case was a female. By selecting SX = 1 (male), SX = 2 (female), and combining these categories with those shown in Figure 5 (murderers' prison terms), we get data for the distribution shown in Figure 6.

Figure 6  
DISTRIBUTION OF YEARS SERVED BY MALE AND FEMALE MURDERERS<sup>10</sup>

Years in Prison	Total No. Murders	Male		Female	
		Number	%	Number	%
0-5	2401	1990	54.4	411	80.0
6-10	1026	944	25.7	82	16.0
11-15	423	411	11.2	12	2.5
16-20	204	199	5.3	5	1.1
20+	123	121	3.3	2	0.4
	4177	3665	100.0	512	100.0

If desired, these categories could be further broken down by state, number of previous sentences, or any of the other categories shown in Figure 3.

On-line techniques also allow analysis to be performed at the time information is needed. Assume, for example, that an administrator in State A wants to see a comparison between his and other states regarding years in prison before parole for Willful Homicide. Obtaining these data, as shown in Figure 7, could be accomplished in a matter of minutes:



Figure 7  
YEARS IN PRISON FOR WILLFUL HOMICIDE BEFORE PAROLE

Years in Prison	Number	%	Number	%	Number	%	Number	%
0-5	76	65.5	33	55.0	156	36.3	51	32.0
6-10	26	22.3	12	20.0	136	31.6	67	42.0
11-15	10	8.7	5	8.3	77	17.9	20	12.5
16-20	3	2.6	4	6.7	35	8.1	19	11.8
over 20	1	0.9	6	10.0	26	6.1	3	1.7
Total	115	100.0	60	100.0	430	100.0	160	100.0

The administrator of State A then wonders what the parole performance for murders in his and the other states has been. Figure 8 indicates the immediate results of his inquiry.

Figure 8  
PAROLE PERFORMANCE OF MURDERERS FROM FOUR STATES

State	% Success
A	78.5
B	96.7
C	92.6
D	93.2

The significance of progress in information retrieval for the field of parole lies in the manner in which the results were achieved. The information on parole outcomes as collected and computerized by the Uniform Parole Reports system was for the first time accessible in real-time through the use of a remote terminal. The computer responded immediately to the inquiry and interaction between the user of the information and the data base was achieved. For description of retrieval codes see Appendices A and B.

#### Data Analysis as an Extension of Information Retrieval

The process of information retrieval, as described above, is the identification of subsets of records from a file that satisfy a pattern of requirements posed by the user. The end product of the computer retrieval process is usually a display or print of the identified records. The interest is in the retrieved individual item. Citations of an item in the literature in a library retrieval application would be a case in point. In the case of the Uniform Parole Reports file, it could be a record that describes the paroling and parole outcome of an individual.

This is in contrast to the results desired of an analysis of a subset of the same file. Here the user is interested in properties or characteristics of groups. He may simply request a tabulation of the years spent in prison before parole. This would represent what could be called a one-dimensional analysis since only a single variable is involved. He may wish to see a cross tabulation of parole outcome categories vs. the years spent in prison. This would be an example of a two-dimensional analysis since it involves two variables. In these simple forms of analysis, as well as

in the more complex statistical forms (such as multiple-regression and configural analysis), we are dealing with and manipulating data elements pertaining to the group.

By applying DIALOG and examining the indexes created for on-line information retrieval, it is possible to perform simple preliminary analyses of the data. The addition of a few tools to the information retrieval system can create an impressive on-line data analysis system since it appears that the same techniques that are used in on-line information retrieval are useful for the preliminary analysis of data.

Such capability is of great importance as working with the uniform Parole Reports data base clearly shows the desirability to perform simple data analyses and generate statistical tables and reports on-line in addition to classical information retrieval, such as identification, acquisition, and examination of sub-collections of individual records.

The immediate feedback of results provided by an interactive system, combined with the facility for exploration and strategy revision, will not only result in substantially faster generation of results but is also expected to help increase insights into the data being studied. It appears that the same significant advantages an on-line retrieval system provides to reference retrieval apply to conducting analysis and research in an on-line environment. Indeed, the preliminary experience obtained in combining the Uniform Parole Reports file with DIALOG bears this out. An investigator utilizing this system is in a position to perform "on-line hypothesis testing."

It is reasonable to expect that the development and utilization of these computer tools will lead to unprecedented advances in research and significantly increase both the degree and variety of its utilization. Many problems in criminal justice systems research require extensive analyses of large collections of data. It is clearly desirable to make the data handling processes as automatic and rapid as possible. The researcher should be provided with as complete a set of tools as his research requires. For this purpose DIALOG has been interfaced to a substantial collection of statistical analysis and reporting programs as well as being provided with commands for elementary statistical operations.

The DIALOG user can currently generate at his terminal one or two dimensional analyses and cross tables with a single command. For example, he can request the one-dimensional (single variable) distribution of admission ages of wards paroled by the California Youth Authority. By entering another command he can request the cross table of CYA ward admission ages against their incarceration offenses. The responses to these commands appear almost instantly on the user's video screen. By making use of the system's fast response and interactive nature he is able to explore a variety of questions, rapidly con-

verging on the ones of greatest interest to him.

Much more extensive and sophisticated tools for statistical analysis are available to the DIALOG user through the interface created to the University of California at Los Angeles Biomedical Computer Programs (BMD) package. This "package" consists of over forty programs that perform:

- Data description and tabulation
- Multivariate analysis
- Regression analysis
- Variance analysis
- Cohort, contingency table, probit, and Guttman scale analyses

To use any of these programs, the user creates the subset(s) of the Uniform Parole Report records he wants to analyze during a DIALOG terminal session, using any combination of the record attributes. The identified records are retrieved by DIALOG and a tape containing these records is automatically generated in a format suited to the BMD programs. The researcher is, through this method, able to use the combination of DIALOG's interactive capabilities with rigorous statistical analyses of the chosen record subsets.

Current efforts are extending the DIALOG interface to other useful program analysis packages such as the University of Michigan Institute for Social Research's Automatic Interaction Detection (AID) program and the IBM Scientific Subroutine Package.

#### Toward the Utilization of Experience in Parole Decision-Making

Beginning in early 1970 a three year study was funded by LEAA which will see members of the United States Parole Board collaborate closely with staff of the NCCD Research Center. The aim of this project is the development and demonstration of model programs for provision of information to paroling authorities in such a way that parole decisions may be improved by an increased utilization of experience. Building upon the Uniform Parole Reports system, an information development program in collaboration with the United States Parole Board is underway.

Parole decision objectives, alternatives, and information needs will be defined. Relationships between offender information and parole objectives will be measured, and "experience tables" will be developed and tested. Models for rapid retrieval of relevant objective information will be developed and demonstrated, and the utility of these models will be assessed.

A large sample of case decisions, representative of all made by the United States Parole Board, will be studied each year. Parolees, mandatory releasees, and discharges from Federal prisons will be followed after release so far as possible to determine later criminal records.

The project can contribute to the study of rational decision-making in the criminal justice system, to knowledge of the offender and of the impact of criminal justice operations upon his subsequent behavior, to methodology concerning improvement of information for decisions (especially parole "experience tables") and to the study of parole as a method of prison release.

National seminars for parole officials, and a final report, will make the results of the three-year study available to paroling authorities across the country.

The convergence of (1) the paroling authorities' concern for improvement of the parole decision process with (2) the needs for discovery of methods for identification, measurement, and assessment of information needed for improvement of decisions, and with (3) the needs for technological development to permit ready access to relevant information, provides the background and motivation of the project. The objective of the study is the development and demonstration of model programs providing information to paroling authorities in such a way that parole decisions may be improved through the appropriate utilization of experience.

Two kinds of decisions are made by paroling authorities. They make individual *case* decisions. They also make paroling *policy* decisions which set a broad framework within which the individual case decisions are made. Both will be studied. The different types of decisions require different (but overlapping) sets of information relevant to the decision problems. The major problems of both individual decisions and general policy decisions involve the identification and definition of (1) objectives, of (2) information items demonstrably relevant to the decision (i.e., to the decision outcomes), of (3) the available decision alternatives, and of (4) the consequences of the decision alternatives (in terms of the objectives). For both general purposes, the relevant information for decision-making should meet certain requirements of availability, of reliability and validity, and of acceptability and practical utility.

If information utilization is to be increased, the information should be immediately available. The usual research course of events is to raise a question, collect relevant information, then seek to answer the question. With questions anticipated in advance (through careful planning by research staff and decision-makers jointly), with data collection completed, and with the availability of modern on-line systems for retrieval and analysis, the answers to recurrent questions should be available within minutes, rather than weeks.

One of the first tasks in developing models pertinent to *individual case decisions* is the precise definition of parole decision objectives, of available alternatives, and constraints of relevant information, and of decision consequences to be included within the

scope of the study. This task is being carried out through a series of planning meetings with members and staff of the United States Parole Board.

A second task is the measurement of relationships among the information elements presumed relevant, the decision outcomes, and the decision consequences (as these are defined in the collaborative effort with the Parole Board). This task includes, but is not limited to, the development and validation of base expectancy "experience tables."

The pursuit of this objective requires collection of considerable information concerning the population of offenders with which the United States Parole Board deals. The following items are presently coded in addition to the Uniform Parole Reports items on a random sample of 50 percent of the persons heard by the United States Parole Board<sup>11</sup>:

#### CARD 1

Identification Number  
F.B.I. Number  
Judicial District  
Birthdate  
Sex and Ethnic Group  
Citizenship  
Effective Date of Sentence  
Date of Admission  
How Committed  
Sentence Procedure  
Expires Full Term  
Mandatory Release Expected with Good Time  
Minimum Parole Eligibility Date  
Number of Parole Hearings  
Grade Claimed  
Marital Status at Admission  
Homosexuality  
Escape History  
Beta I.Q.  
Age at First Arrest  
Age at First Commitment  
Codefendants  
Longest Time Free Since First Commitment  
Longest Time Served on any Commitment  
Custody Classification Prior to Parole Hearing  
Assaultive Infractions  
On-the-Job Training  
Education Program  
Aliases  
Dependents

#### CARD 2

Identification Number  
Offense  
Weapon in Offense  
Type of Sentence  
Type of Admission  
Offense Rating  
Reason for First Arrest  
Age at First Sentence  
Prior Prison Commitments  
Other Prior Sentences  
Assault (Commitment Offense)  
Sentences with Probation  
Prior Incarcerations  
Probation or Parole Revocations  
Mental Hospital Confinement  
Family Criminal Record  
Living Arrangement Before Commitment

Living Arrangement Plan  
Alcohol  
Drugs  
Prior Arrests and Convictions  
Total Arrests  
Military Discharge  
Longest Job in Free Community  
Employment in Last Two Years of Civilian Life  
Prison Adjustment Indicated in First Classification Report  
Custody Level Reduced During Imprisonment  
Letters and Visits from Family  
Prison Punishment  
Parole Advisor Obtained (YCA only)  
Date of Decision  
Type of Decision  
Decision Outcome  
Members  
Examiners  
Case Analyst

#### Generated Variables

The following additional items will be derived from the coding for Cards 1 and 2 above:

Age at Admission  
Age at Release  
Months Served Before Hearing  
Months Served Before Release  
Sentence Length to Full Term  
Sentence Length to Fixed Term  
Years Between First Arrest and Admission  
Years Between First Commitment and Admission  
Commitment Offense a Repeated Offense  
Number of Prior Sentences  
Prior Sentences to Jail and/or Fine  
Number of Convictions  
Number of Prior Prison Convictions  
Number of Prior Property Convictions  
Months to be Served under Community Supervision  
Glaser's Configural Classifications—Adult  
Glaser's Configural Classifications—Youth  
Gottfredson's Base Expectancy 61A (modified)  
Gottfredson's Base Expectancy 61B (modified)  
Uniform Parole Reports Association Analysis sub-groups  
Uniform Parole Reports Cluster Analysis sub-groups

A third task will be the development of procedures for rapid retrieval of both numerical data and case history abstract information pertinent to individual decisions. Such procedures will be developed and demonstrated on the basis of a limited random sample of offenders.

A fourth task will be the development of procedures for assessing the degree to which the information provided by the models is utilized in individual case decisions. The objective of a correlative effort will be the estimation of the consequences of the use of the model versus its nonuse; one question is whether or not the information is used, and another is whether or not it should be used. An aspect of the latter study will include the estimated cost of full use of the model for all parole decisions, permitting an assessment of the estimated costs and utility of the procedures developed.

#### Summary of Data Sources for the Parole Decision-Making Project

Five major sources of data could provide the information needed to attain the above objectives. These are:

1. The Uniform Parole Reports data file, containing limited information on a large sample of paroled offenders.
2. The necessary information concerning background characteristics of Federal offenders coded from materials available in the offices of the United States Parole Board (i.e., the case records) and augmented so far as possible by data recorded by the United States Bureau of Prisons.
3. Information coded from arrest records of persons released by parole, mandatory release, and discharge, so far as available from the Federal Bureau of Investigation.
4. Information from follow-up study of offenders paroled by the United States Parole Board so far as available from the computer system at the Administrative Office of the United States Courts.
5. Case file abstracts taken from samples of case files available in the offices of the United States Parole Board.

A particularly exciting aspect of the Parole Decision-Making Project will be the proposed development of a Parole Simulation Model. This project involves an analysis of information used by parole boards for making decisions, and then synthesis of this information, together with outcome information into a parole simulation model. This model will be used to further determine information useful in parole decision-making, to train parole board members, and to make predictions of parole outcomes in certain cases.

Using the DIALOG analysis functions relationships between various environmental and background circumstances will be related to parole outcome. These relationships will be built into a computer simulation model. Decision makers, representing parole board members, will be presented with specific case histories and asked to make a parole decision. The computer will "predict" the outcome and inform the board members.

Such a model allows time to be compressed such that many parole cases can be "gamed" in a short period of time, and also acquaints parole board mem-

<sup>1</sup> Paper presented at the SEARCH Symposium in Dallas, Texas, November 10-12, 1970.

This research was in part supported by Public Health Service Grant Number MH 14798 from the National Institute of Mental Health and Grant NI 70-014 from the National Institute, LEAA.

<sup>2</sup> The National Probation and Parole Institutes, and the Uniform Parole Reports Project, are administered by the NCCD and sponsored by the Advisory Council on Parole of the NCCD, the Association of Paroling Authorities, the Interstate Probation and Parole Compact Administrators Association, and the United States Board of Parole.

<sup>3</sup> Gottfredson, Don M., et al., "Uniform Parole Reports: A Feasibility Study," *Journal of Research in Crime and Delinquency*, Vol. 3, No. 2, July 1966.

<sup>4</sup> Research Center, National Council on Crime and Delinquency, *Uniform Parole Reporting Coding Manual*, Davis, California, 1966.

<sup>5</sup> Venezia, Peter S., et al., *The Uniform Parole Reports: Intra-Agency Reliability*, New York, National Council on Crime and Delinquency, December, 1967.

bers with various statistical tools which can be used as aids to decision-making. Observation of board members in the simulated situation allows the determination of what information was pertinent to the decision-making process. Such a determination guides us in selecting additional information for inclusion in our data base. As the model becomes more detailed, it will be possible to suggest situations and tendencies for the parole officer to watch closely for particular parole cases.

It is our hope that through such a data base, retrieval system, and simulation model we will be able to learn and benefit from our parole experience on a cumulative basis.

#### The Terminal Network for the Parole Decision-Making Project

Beginning production operation of the parole information system will involve two terminals initially. The terminals will consist of video screens with keyboards and a teletypewriter for local hard copy output. The terminals will be located at the NCCD Research Center in Davis, California, and the United States Parole Board offices in Washington, D.C. The data base and computer system will be in the Lockheed Missiles & Space Company's Information Sciences Laboratory in Palo Alto, California. The remote telecommunications will be performed by extending an existing 2400 Baud full duplex conditioned line that has been installed by the Atomic Energy Commission. The AEC network connects Lockheed's Palo Alto computer to the Oakridge National Laboratory in Oakridge, Tennessee, the Bettis Laboratory in Pittsburgh, Pennsylvania, the Lawrence Radiation Laboratories in Berkeley, California, and the AEC Headquarters in Washington, D.C. The AEC is currently using DIALOG at these locations to perform retrieval on its Nuclear Science Abstracts document collection. Through extension of this existing communications network, optimum facilities are used while providing substantial cost savings to both agencies involved. A scheduled period of operation will make the parole data files available on-line for approximately six hours each week starting in December 1970.

<sup>6</sup> Venezia, Peter S., et al., *The Uniform Parole Reports: Inter-State Reliability*, New York, National Council on Crime and Delinquency, January, 1969.

<sup>7</sup> Wenk, Ernst A., Summit, Roger K., Radwin, Mark S., and McHugh, Conal, "New Developments in On-Line Information Retrieval Techniques in the United States as applied to the Uniform Parole Reports," *Abstracts on Criminology and Penology*, University of Leiden, The Netherlands, January-February, 1970.

<sup>8</sup> Wenk, Ernst A., Gottfredson, Don M., and Radwin, Mark S., "A Modern Information System for Uniform Parole Reports Data," *Journal of Research in Crime and Delinquency*, Vol. 7, No. 1, January, 1970.

<sup>9</sup> The following frequencies may differ slightly from the figures presented in the above-mentioned papers due to further editing and correcting of Uniform Parole Reports data.

<sup>10</sup> The following examples are hypothetical and only approximate UPR files.

<sup>11</sup> Research Center, National Council on Crime and Delinquency, *Manual for Coding, Parole Decision Information Sheet*, Davis, California, 1970.

## APPENDIX A

### DIALOG Retrieval Codes for UNIFORM PAROLE REPORTS File

RETRIEVAL CODE	DESCRIPTION	RETRIEVAL CODE	DESCRIPTION
PS	NUMBER OF PRIOR PRISON SENTENCES	BD	BIRTH DATE
PN	NUMBER OF PRIOR NON-PRISON SENTENCES	BY	BIRTH YEAR
TA	TYPE ADMISSION	BM	BIRTH MONTH
OF	ORIGINAL OFFENSE	SD	SENTENCE DATE
NO	NEW OFFENSE	SY	SENTENCE YEAR
AG	AGE WHEN ADMITTED	SM	SENTENCE MONTH
DU	DRUG USAGE	AD	ADMISSION DATE
AU	ALCOHOL USAGE	AY	ADMISSION YEAR
SX	SEX	AM	ADMISSION MONTH
PA	PAROLING AGENCY	RD	RELEASE DATE
AP	PAROLING AGENCY AREA	RY	RELEASE YEAR
RA	RECEIVING AGENCY	RM	RELEASE MONTH
AR	RECEIVING AGENCY AREA	DD	DIFFICULTY DATE
YP	YEARS IN PRISON	TY	DIFFICULTY YEAR
PP	PAROLE PERFORMANCE	TM	DIFFICULTY MONTH
MS	MONTHS SUPERVISION ON PAROLE	DT	DISCHARGE/DEATH DATE
DE	DEATH	DY	DISCHARGE/DEATH YEAR
ID	IDENTIFICATION NUMBER	DM	DISCHARGE/DEATH MONTH
		TS	TYPE SENTENCE

RETRIEVAL CODE	DESCRIPTION
ON	ORIGINAL OFFENSE/NEW OFFENSE
OP	ORIGINAL OFFENSE/PAROLE PERFORMANCE
OY	ORIGINAL OFFENSE/YEARS IN PRISON
OS	ORIGINAL OFFENSE/MONTHS SUPERVISED
NS	NEW OFFENSE/MONTHS SUPERVISED
PT	PAROLE PERFORMANCE/TYPE ADMISSION
SP	PAROLE PERFORMANCE/PRIOR NON-PRISON SENTENCES
TP	PAROLE PERFORMANCE/PRIOR PRISON SENTENCES
SI	PAROLING AGENCY/STATE INSTITUTION

## APPENDIX B

### Offense Codes from the UNIFORM PAROLE REPORTS Coding Manual

OF CODE	DESCRIPTION
00	NO NEW MAJOR CONVICTIONS AND NO MAJOR OFFENSE ALLEGED WITH GUILT ADMITTED
01	WILLFUL HOMICIDE
02	NEGLIGENT MANSLAUGHTER
10	ARMED ROBBERY
11	UNARMED ROBBERY
20	AGGRAVATED ASSAULT
30	BURGLARY
40	THEFT OR LARCENY, EXCEPT VEHICLE
50	VEHICLE THEFT
60	FORGERY, FRAUD, OR LARCENY BY CHECK
61	OTHER FRAUD
70	RAPE, FORCIBLE
71	RAPE, STATUTORY
72	SEX OFFENSES AGAINST JUVENILES (EXCLUDING RAPE)
73	PROSTITUTION AND PANDERING
74	ALL OTHER SEX OFFENSES NOT AGAINST JUVENILES
80	VIOLATIONS OF NARCOTIC DRUG LAWS
81	VIOLATIONS OF ALCOHOL LAWS
90	ALL OTHERS

## AN INTEGRATED APPROACH TO CORRECTIONAL INFORMATION SYSTEM DESIGN

by Dr. Harland L. Hill  
American Justice Institute

The purpose of this presentation is to acquaint you with the objectives and results to date of the Correctional Decisions Information Project conducted by the American Justice Institute and funded by the National Institute of Mental Health Grant #5 R11 MH02092.

The project's original title indicated its purpose: the Improvement of Correctional Decisions Through the Utilization of Electronic Data Processing. Those responsible for the conduct of the project constantly have considered the overall objective of this particular project to design an information system that will enable the agency which it is to serve to operate effectively and efficiently. A broad view of the latter statement means consideration of all forms of advanced information systems technology, some of which is computer based and some of which is not. This posture was taken in order not to limit the conceptualization of the information system for the Youth and Adult Corrections Agency of the State of California in which the project was embedded. This Agency consisted of the two main correctional departments of the state—the California Youth Authority and the California Department of Corrections—and the four releasing Boards—the Narcotic Addict Evaluation Authority, the Adult Authority, the Youth Authority, and the Women's Board of Terms and Parole.

At the time this project was initiated this Agency had over 150 organizational units including 23 institutions. They served approximately 63,000 offenders, 32,000 of which were housed in institutions; the remainder were parolees. There were 10,000 employees and the combined budget exceeded 140 million dollars. With a staff of three professionals the project might well have adopted the policy of searching this huge agency to see where the volume of activities would justify the utilization of electronic data processing, and then proceed to design specific applications to satisfy those specific instances where a high volume and other factors pointed toward the early adaptation of EDP applications. This was not the approach that was taken. As the title of this presentation indicates the broadest perspective possible was retained and the design was approached with a total systems perspective.

A number of constraints necessarily limited the scope of the project. The time constraint was 18 months for the development of the conceptual de-

sign of the system. In order to develop a conceptual design, as most of you know, it is necessary to specify the requirements to be met by that design. Although, as indicated, interest was in the total information requirements of the California Youth and Adult Correctional Agency the limitations of staff precluded attempting to define all these requirements. It was necessary to draw some boundaries around the systems areas to be studied in order to define the requirements. The primary parameter at the start was the emphasis on case decision-making rather than management information. This was due to the interest area of the Agency and the funding source. Next, to further delimit the design, internal operations of certain subsystems were eliminated, retaining concern only for the interfaces between those subsystems and the larger case-decision system. For example, there was no attempt to analyze all the education subsystems requirements for instruction or management of the education process. Neither was the development of a hospital information system within the institutional organization considered. Still, there was resolve to define the necessary outputs from those subsystems—in terms of diagnoses or results of educational program or vocational training program exposures—for use in the larger system of making decisions about the offender as he proceeded through the correctional process. In other words, computer-aided instruction was defined out of the system but inmate or ward progress in an educational program was included so that the program results could be made available for other decisions about programs in which the offender would be involved.

The approach was to develop an existing system description to serve as a basis for extraction of existing requirements and, at the same time, to attempt to develop future requirements that may be impinging on the system at the time the system is implemented. Thus, we set about on a study of a sample of the organizational entities of the two major departments and of the activities of some of the releasing Boards. Our objective was to define 1) the mission and objectives of these organizational entities, 2) the decisions and actions necessary to achieve their goals and objectives, 3) the information stated to be necessary to facilitate their processes/decisions and objectives, and 4) some of the system performance requirements. Included in the latter were the direction and flow of data and the processing, response timing, formats, tolerances for accuracy, peak and normal volumes, interface requirements with external or-

organizations as well as between subsystems of the same organization, information retrieval and display requirements, the need for analytical or predictive techniques, and those requirements imposed by the legislative bodies.

In so doing we are constantly cognizant of the expectations of our funding agency, the National Institute of Mental Health, which sought a design that may be adaptable by other than California jurisdictions. In addition, we were cognizant of the probability of organizational change and the necessity for any design to be able to adapt to that change. Consequently, it was not our intent to design a correctional system which would only fit the organizational pattern of the California system. Rather, it was our intent to extract from our study of the organizational structure of California and its operations, a functional definition of what takes place in the correctional process and the information requirements necessary to serve those functions.

During this process the basic functions of the case decision subsystem were defined. The case decisions that took place in the two departments were identified. For each decision there was specified a general statement of the alternatives that were available to the identified decision-makers and the data those making the decision stated they felt necessary to enable them to make each of those decisions. In addition, the volume of the decisions that took place in each of the major organizational entities were set forth along with the number of decision-makers responsible for making those decisions simultaneously or independently. In addition, the basic functions of the management subsystem were defined and a preliminary statement of the management subsystem requirements were specified.

The preliminary statement of the system requirements was geared to an operational system beginning some time in the early part of the 1970 decade. The specification of these requirements provided a basis for the generation of a preliminary system design for a California Correctional Information System.

This preliminary design statement was simply set forth. This design called for an integrated information system replicated in two locations to avoid the idleness of a large standby duplex backup. An overview of this system is presented in Figure 1. One location was in Northern and one in Southern California. Each location called for a computer complex with peripheral equipment to handle the needs of that organizational subset attached to it. In addition, the plan called for each of the locations to serve as a backup for the other, with the appropriate exchanges of information to permit failsafe operation. Roughly half of the operational organizations were attached to each. Functions carried on at the reception centers, institutions, and the field services would

be supported in each of the two major areas. The central management was primarily to be handled by the one in the Northern area. The Northern configuration serving central management also contained a Management Display Center for the use of graphic displays involving management decisions. The conceptual design would have provided both the Youth Authority and Department of Corrections systems with unique data as appropriate for each.

A number of environmental constraints have precluded the development and implementation of that design. Dominating these has been the constraint on dollars available for implementation of large computer-based systems in the California environment. In addition, the State of California has been developing an EDP Master Plan which impacts the Correctional Information System considerably. For example, correctional departments apparently will not have their own dedicated equipment as the original plan specified, rather they will be required to consolidate their information system development with other ongoing California State information system operations. At the present time this may result in the Department of Correction being consolidated with the Departments of Mental Hygiene or Social Welfare or the Department of Justice. This decision has not yet been made. In the meanwhile, the Correctional Decisions Information Project has been proceeding to further define the requirements and the design of a correctional information system.

It is my intention today to share with you some of the conceptual thinking that has occurred in terms of this more detailed design and the informational objectives it will serve. During these additional efforts, the CDIP Project has directed its efforts more toward the development of a model information system rather than a California Correctional Information System. This has developed in part because of the fact that the Youth and Adult Corrections Agency, for which we originally intended to design a system, was desolved by the State Legislature and the two major departments and the Boards were consolidated into a much larger agency, the Human Relations Agency. Thus, rather than designing a single information system for that original agency the two departments will be developing individual information systems. Any product of the CDIP Project should be adaptable to each of these two departments as well as to other correctional departments around the nation. In so doing, we have changed some of the words and data element definitions to be more general in nature, rather than being specifically California oriented. For example, in California there are several levels of supervision in parole, called work unit and conventional. In CDIP we provided for six levels of parole supervision which in fact can be designated by the adapting unit.

Another major change, which occurred after the

completion of the conceptual design in the first phase of the CDIP project, was the change in emphasis from the case decision process to that of the management information system. This change was made for a number of reasons. First, the chances of implementing a management information subsystem of a total correctional information system was deemed much greater than that of starting off with a case decision information system. This conclusion was reached because it was obvious that there would be less risk with the gradual implementation process due to the smaller number of operational personnel involved and the less outlay in dollars for the initial equipment configuration. The latter is true particularly with respect to the display equipment for decision-makers. The smaller system, it was concluded, would lend itself to better control in the initial stages. Then, it was believed that the data to support management would be similar to that data needed for case decisions although smaller in quantity. Therefore, it would provide an empirical data base for the case event system design. The research on the worth of different kinds of data for case decisions could take place during the management subsystem era and the results be available for the selection of the data to be included in the case event subsystem design. Likewise, by developing the management information subsystem data base the conversion problem would be greatly eased later when changing over to the case decision subsystem. Finally, it was thought that operational stages could be reached earlier if the system started with a management system rather than a case event system. This conclusion was due, in part, to the belief that the management information system could begin while the related developments in the EDP Master Plan area were taking place.

For all these reasons the developments since the earlier conceptual design have largely been concerned with the management information subsystem rather than the case decision subsystem. There have been some preliminary efforts, however, to develop the methodology for assessing the value of specific data elements for specific types of case decision-making. This methodology was explored in a preliminary study of decisions concerning releases on parole, classification of inmates into various levels of custody, and the parole revocation recommendation decisions. Aside from that, however, most of our efforts have been concentrated on the management information area.

The case decision, or case event, subsystem, and the management information subsystem and their functions were derived from an extensive analysis of the existing operational system. Since we desired to have a system adaptable to different organizational structures it was necessary to derive those functions which are performed regardless of the organization structure in which they are embedded. Resulting

from this process were six functions within the case event subsystem. Represented in Figure 2, they are:

1. Acceptance
2. Intake/Receiving
3. Diagnosis
4. Program Decisions/Implementation
5. Program Monitoring/Evaluation
6. Offender Departure

Briefly, the acceptance function constitutes the granting of permission for a person to enter an organizational unit. In California, for example, it is necessary for the Youth Authority to accept all cases prior to entering it, including those which are there on a court commitment. In the adult system it is necessary for the Department Director to accept cases referred by court for pre-sentence diagnostic work-ups. In addition, this acceptance function takes place in other organizational units of the system. For example, the pre-parole acceptance by the parole unit before a person is released to it. Another is when a person is being transferred from one organizational unit to another; oftentimes there is a requirement that the receiving unit accept the case for transfer before official transfer is made. Thus, this function takes place in many parts of the organizational structure—at headquarters, at parole units, the reception centers, and sometimes in institutions; it is not peculiar to one organizational unit; it is a common function across many organizational units.

The intake-receiving function is primarily one of receiving the person into the organizational structure. This may take place at the reception center, at an institution, or in a parole unit. It usually follows acceptance. The third function, that of diagnosis, most generally takes place at a reception center or clinic. However, it may also take place at an institution upon initial receipt or transfer, or sometimes when the diagnosis was not completed in a reception center. It is the process of assessing the present status of the offender or his environment in terms of assets, constraints, or deficiencies with a view toward planning for a more adequate social adjustment. It is a prognosis of his needs for individual rehabilitation or environmental change while he is institutionalized or under the jurisdiction of the correctional agency.

The fourth function, that of program decision and implementation is a key function that is performed in all organizational units. Basically, it consists of those decisions related to placement of the offender in all kinds of programs, be they vocational, educational, medical, psychiatric, counseling, or other resource programs available to the decision-maker. Since a re-cycling through the program decisions oftentimes may be required if it is not possible to implement the chosen program, the implementation procedure is included in this basic function. Once a person has entered the program decided upon, this function gives way to the next function, that of pro-

gram monitoring/evaluation. The objective of this program is to track the progress of the offender as he engages in the programs decided upon in the previous function. As his progress performance indicates the need for a change through the evaluation process, he is re-cycled into the program decision functions for additional programming or a decision is made to permit him to exit the system.

The last remaining case event function is that of departure. This consists of the offender leaving any organizational unit for any reason, be it a discharge from the system, a transfer, escape, absence without permission, or death. In Figure 2 progress from left to right depicts these case event system functions in their normal process; however, offenders oftentimes do not go directly through the process. As the upper arrows on Figure 2 indicate they may loop back and forth, cycling and recycling through the system or skip certain of these basic functions. Many times the information outputs or requests from one function feed into another function as depicted by the lower arrows in the same figure. Program evaluations become inputs into the program decision function and program decisions develop referrals for diagnosis or for acceptance requests. Associated with each of these functions is a complete set of flows or procedures which have been documented. Figure 3 illustrates the detailed functional flow for the program decision and implementation function. There are similar flow charts for the other case event functions.

Within each of these functional flows is embedded a series of events. Thus, there are events related to acceptance, intake/receiving, diagnosis, program decisions/implementation, program monitoring/evaluation, and offender departure. A list of these events at the macro-level are as follows:

- 1.0 Acceptance
  - .1 Request for Acceptance
  - .2 Acceptance Request Withdrawn
  - .3 Employment Plan Investigation/Development
  - .4 Housing/Living Plan Invest./Development
  - .5 Academic/Vocational Training Plan Invest./Development
  - .6 Disposition of Request for Acceptance
- 2.0 Intake-Receiving
  - .1 Admissions
  - .2 Revocation Return
  - .3 Temporary Return
  - .4 Temporary Release
  - .5 Transfer
  - .6 Release
  - .7 Absconder Arrivals
- 3.0 Diagnosis
  - .1 Clinical Diagnosis (Work-up)
  - .2 Clinical Staff Rx's for Offender Treatment
- 4.0 Program Decisions/Implementation Events
  - .1 Term Setting
  - .2 Control Level Decisions
  - .3 Temporary Release/Return Decisions
  - .4 Parole/Outpatient Release/Revocation Decisions
  - .5 Special Release Condition Decisions
  - .6 Rehabilitation Program Decisions
  - .7 Incident Decisions

- .8 Implementation Decisions
- .9 Program Entry (Implementation)
- 5.0 Program Operations, Monitoring, and Evaluation
  - .1 Rehabilitation Program Participation Monitoring
  - .2 Voluntary/Leisure Time Activities Participation/Monitoring
  - .3 Special Correctional Status Monitoring
  - .4 Socio-Economic Environmental Monitoring
  - .5 Offender Control/Compliance Monitoring
  - .6 Evaluations
  - .7 Recommendations
- 6.0 Offender Departure
  - .1 Discharges
  - .2 Revocations
  - .3 Temporary Returns
  - .4 Temporary Releases
  - .5 Transfers
  - .6 Releases
  - .7 Absconders

For each of these gross events there are a number of sub-events. For example, the gross event numbered 1.1.00, Request for Acceptance, has been detailed as follows:

- 1.1.00 Request for Acceptance
  - 1.1.10 From California Courts
    - .11 Diagnostic from Court
    - .12 Pre-Arrival from Outside
  - 1.1.20 Within Department (Paroles)
    - .21 Pre-Release from Institution
    - .22 Pre-Transfer from Parole
    - .23 Post-Arrival Transfer from Parole
  - 1.1.30 Within Department (Outpatients)
    - .31 Pre-Release from Institution
    - .32 Pre-Transfer from Parole
    - .33 Post-Arrival Transfer from Parole
  - 1.1.40 External (Other State)
    - .41 Courtesy Diagnostic from Other State
    - .42 Interstate Institution (Contract)
    - .43 Interstate Parole

It is necessary to track these events at this level of detail for each gross event because each sub-event may require a different kind of processing or a different data set to be collected at the time it occurs. In total, there are 393 unique sub-event types presently defined.

Any system design necessarily must provide for that subset of these events which the correctional managers designate as important to their system. This is one statement of the universe of events from which the correctional managers may select as he sets forth the requirements for his system. As the system design becomes formulated the provision must be made for data with which each decision-maker can complete each of the events selected.

In a program budget sense there are ten programs which must be supported by the management information system. In the CDIP design conceptualization, the six case event functions form six of the ten major programs of the correctional system. The other four major programs are those related to 1) the control or supervision of the offender, 2) the support of the offender, for example, food, clothing, shelter,

medical care, etc., 3) community relations and services, and 4) management. The latter includes such things as accounting, budgeting, personnel, etc. To a large extent the support for this system rests on the capture and handling of data generated in the case event subsystem process.

One might distinguish between a management subsystem and case event subsystem by stating that the system furnishing the data supporting the case events, i.e., case decisions, would be considered the case event subsystem and the data supporting the management needs—the management information system. Thus, there could be a manual case event system as the data are provided manually and displayed manually. However, the data captured as a result of the events would be entered into the electronically supported information system for managers. When an adequate data base became established for the management information system, conversion necessary for the case event system would be extremely limited. The primary problem would be developing a delivery system for the display of the system data to the case event decision-makers.

You may be interested in the methodology by which a number of the managers information requirements were extracted. Some come from having the managers role-play certain problem situations and define the data they would require to satisfy their needs as they attempted to solve those problems. Other methods included seminars amongst managers in which they would state their understanding about expectations of their managers for data and, likewise, their expectations for receiving data from their subordinates, or from interfacing units at similar levels or outside systems. From these efforts the following management functions have been derived:

- 1. Policy formations
- 2. Planning
- 3. Operational Implementation/Control
- 4. Achievement Assessment
- 5. Effectiveness Evaluation

These basic management functions, policy formulation, planning, operations control, achievement assessment and evaluation effectiveness assessment must be performed for each of the ten major programs. Figure 4 shows the interrelationships between these management functions and the ten programs.

The information system must be designed to support these management functions to enable efficient and effective management decisions in each management functional area. Decisions must be efficient in the sense that they enable achievement of objectives with the least expenditure of resources including time and money. The objective is to provide more programs for the same cost or same programs for less cost. The term effective means that decisions

will result in actual goal achievement, that is more effective correction program results. Thus, the ability to support managers in making cost-effectiveness decisions in each of the major correctional program areas is one major objective of the CDIP design. Needless to say, feedback on those decisions is a necessary corollary.

A Gestalt of the data necessary for such a system is presented in three dimensional Figure 5. There are many other dimensions within each of those shown but those depicted are the major ones.

When first considering the outputs required to support the management functions numerous report formats containing various combinations of these data were prepared. Quickly it was realized that an infinite number of report formats could be developed and that a more appropriate statement of output requirements would be in terms of capabilities rather than specific formats.

These capabilities have been categorized into two groups as follows:

#### A. POINT-IN-TIME STATUS

- 1) Population Characteristics by Organization Unit
- 2) Characteristics by Characteristics Within Org. Unit
- 3) Program by Organization Unit
- 4) Population Characteristics by Program Within Org. Unit
- 5) Characteristics by Characteristics Within Program Within Organization Unit
- 6) Fiscal Data by Program Within Organization Unit
- 7) Personnel Data by Program Within Organization Unit
- 8) Facilities/Equipment Data by Program Within Org. Unit

#### B. PERIOD-IN-TIME REPORTS

- 1) Offender Non-Program Event Summaries by Org. Unit (Including results of events—Movements, Board Actions, Disciplinary Actions)
- 2) Offender Program Event by Organization Unit
- 3) Personnel Event Summary by Program Within Org. Unit
- 4) Fiscal Event Summary by Program
- 5) Event Summaries by Population Characteristics
- 6) Event Summaries by Personnel Characteristics
- 7) Facilities/Equipment Expended by Program Within Organization Unit

The detailed design of the necessary data bases to support these output requirements, the specification of the events with their concomitant data sets, and the related flow and processing logic has been of major concern since completing the original conceptual design. Priority has been given to the development of the offender data file and those events related to the case-events functions. The offender data file has been conceptually organized into seventeen logical blocks containing approximately 300 data elements defined to the character level. Specification of the data sets associated with the 393 sub-events related to the case-events is nearly complete. The Program Data File content has been specified and codes developed for the major programs of academic and vocational education, work assignments, and leisure

time activities. The fiscal ledgers have been conceptualized and preliminary work completed on the fiscal event specifications. An integrated code for the organizational structure has been completed. A Management Display Center for the presentation of management data in a group mode has been designed and operated as a prototype.

All of these activities are pointed toward the designation of the universe of system contents of value to managers. It is not expected that any jurisdiction will implement the total system—at first thrust. Based on their own priorities each correctional unit will select that module highest on its priority list. Some of the early potential modules from which to select either one for a combination of modules as the first implementation objective are:

1. Population accounting and on-line location index
2. Static population characteristics
3. Program Accounting
4. Program Performance Monitoring (Individuals)
5. Effectiveness Evaluation
6. Process Status Monitoring (Mgm't by Exception Reporting)

7. Dynamic Population Characteristics
8. Employment/Placement
9. Automated Computations (Base Expectancy or Time)

The implementation may be tried department-wide or tested in a sub-unit before department-wide implementation, depending on the module selected. Depending on the priorities chosen the configuration of data elements and events associated therewith can be selected for inclusion in a specific system for the specific needs of a specific jurisdiction and a preliminary assessment of volumes extant in the system. Thus, in conclusion, one of the CDIP planned products at its completion is a series of design modules, each carrying a predetermined general assessment of basic system requirements. Then, each set of basic requirements would be extended by the volumes, etc., unique to the jurisdiction desiring the system. Hopefully, this will eliminate duplication of much system analysis activity in other correctional systems desiring to initiate information systems and facilitate implementation of correctional information systems across the nation.

FIGURE 1  
SUBSYSTEMS OF THE  
TOTAL INFORMATION SYSTEM

NCC - NORTHERN COMPUTER COMPLEX  
SCC - SOUTHERN COMPUTER COMPLEX  
CMSS - CENTRAL MANAGEMENT SUBSYSTEM  
RCSS - RECEPTION CENTER SUBSYSTEM  
FSSS - FIELD SERVICES SUBSYSTEM  
ISS - INSTITUTION SUBSYSTEM

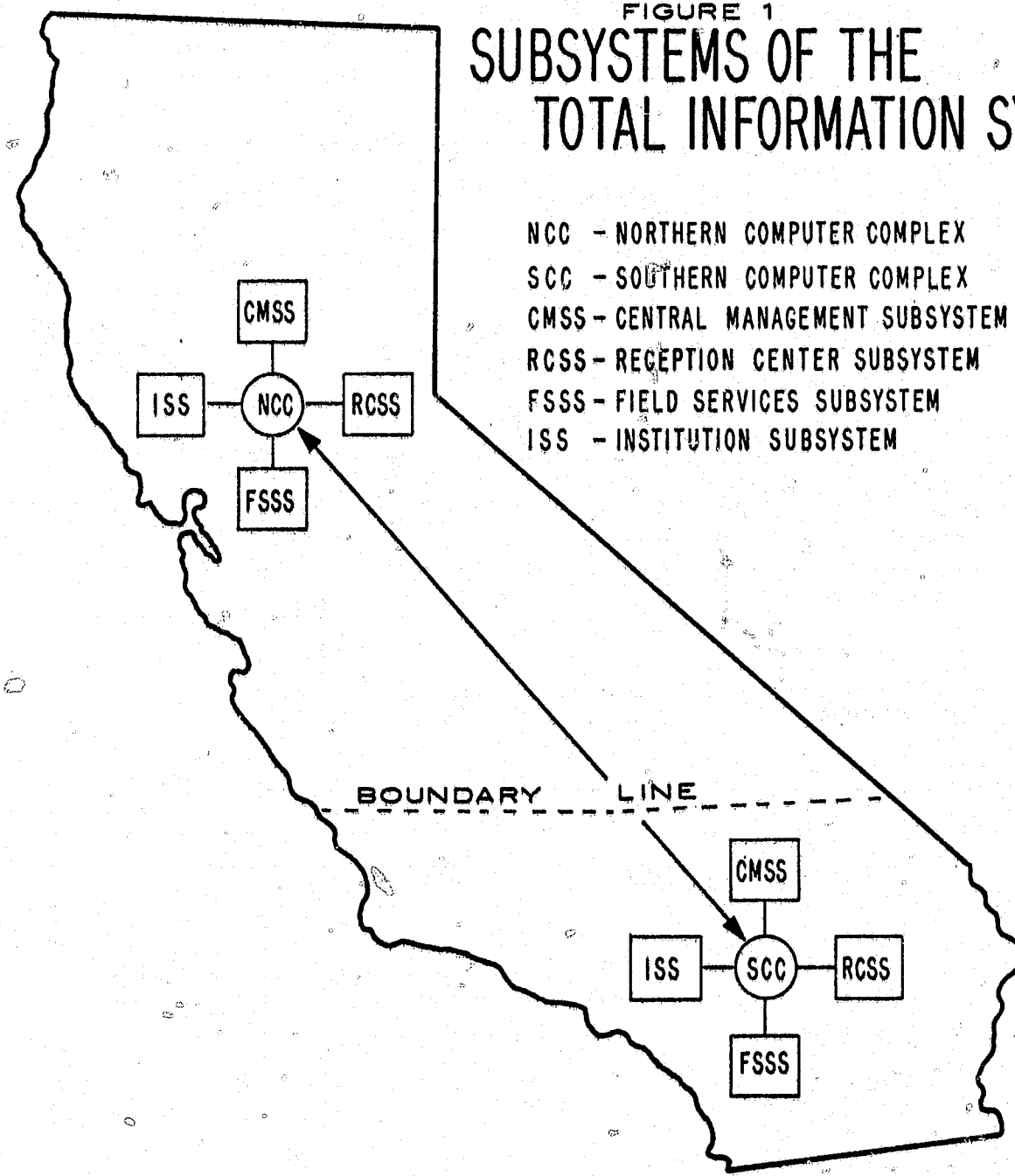




FIGURE 2  
CASE EVENT SYSTEM FUNCTIONS

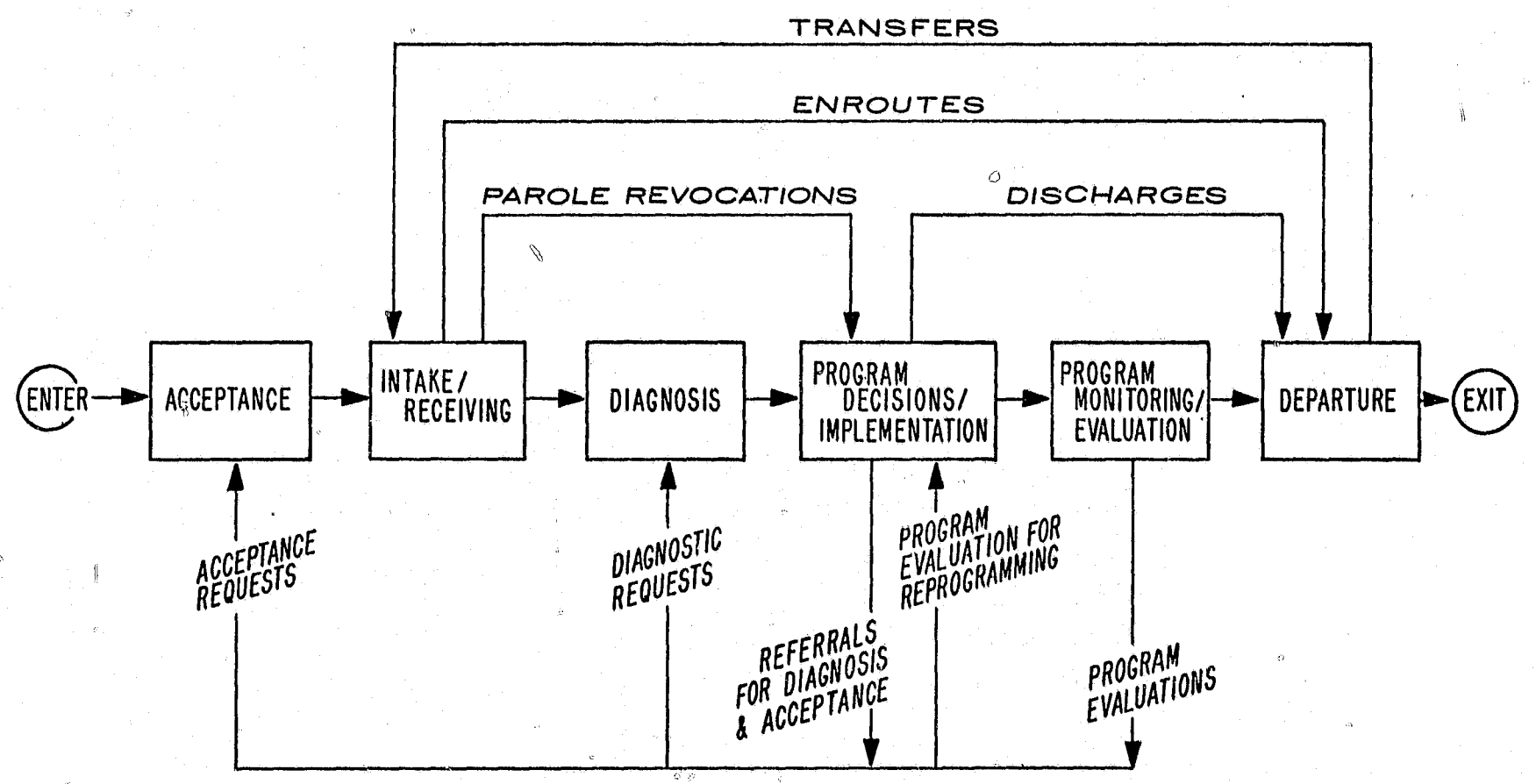


FIGURE 3

PROGRAM DECISIONS AND IMPLEMENTATION FUNCTIONAL SUBSYSTEM

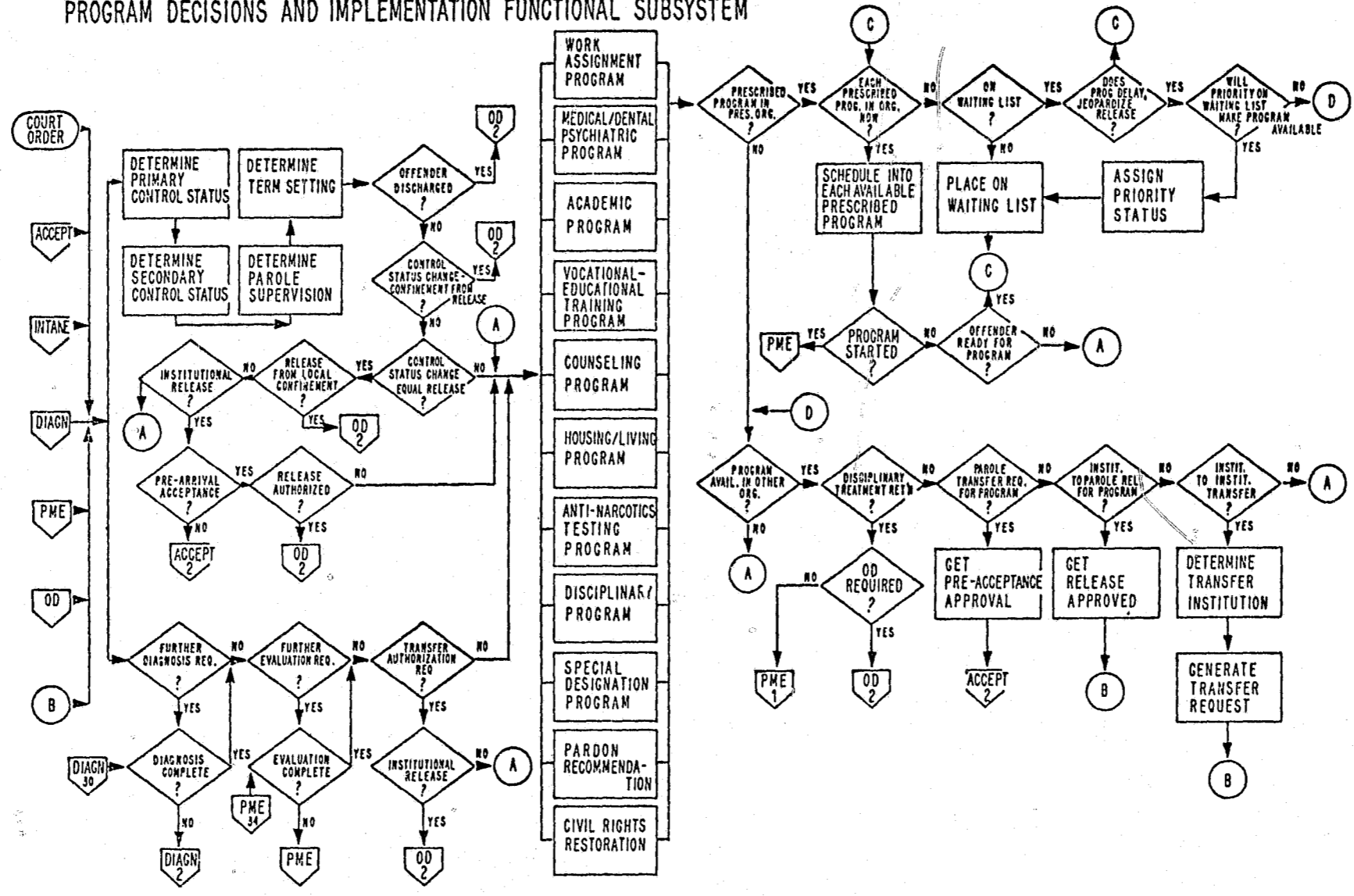


FIGURE 4

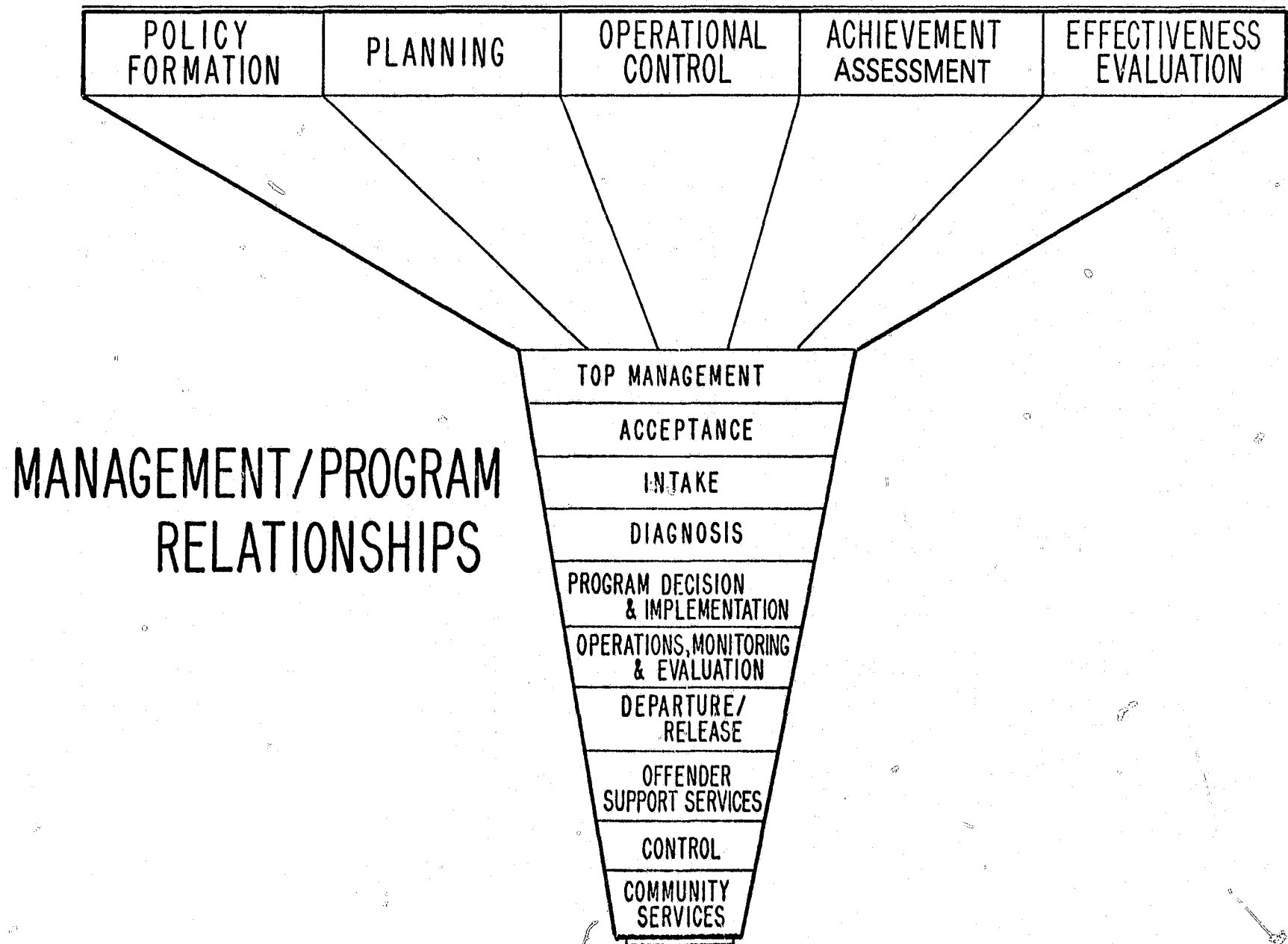
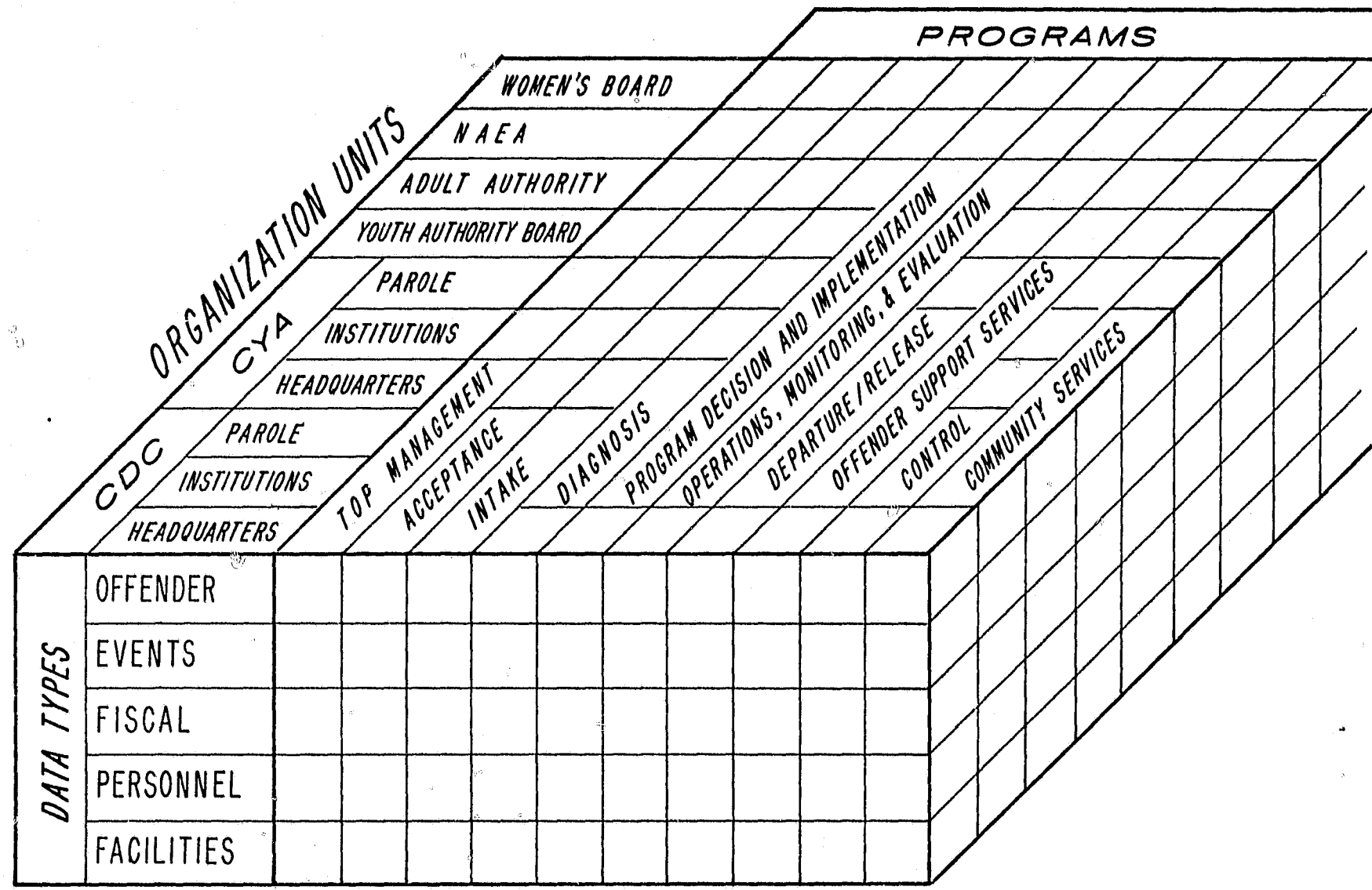


FIGURE 5



# NEW YORK STATE PAROLE AND PROBATION: INFORMATION NEEDS AND REQUIREMENTS

by John F. Burbige  
Associate Computer Programmer  
New York State Identification  
And Intelligence System

## INTRODUCTION

In November of 1969, the NEW YORK STATE IDENTIFICATION AND INTELLIGENCE SYSTEM (NYSIIS), as part of its overall contribution to Project SEARCH, initiated a series of field interviews with a representative sample of New York State criminal justice agencies. These interviews, when concluded in early 1970, totaled over thirty in number and included visits to probation offices, central parole headquarters, courts, prosecutors, state and local correction administrators, a correction facility and police and sheriffs organizations. These interviews were primarily concerned with investigating the feasibility of expanding the NYSIIS computerized information file to include parole and probation information, which would provide added benefits to the inter and intra-state users of the NYSIIS system.

In order to facilitate the acquisition of information which would fulfill the objectives of this survey the team approached its investigation via an analysis of the informational needs and requirements of the parole and probation agencies of this state and an analysis of the informational needs and requirements of the remaining component agencies of the criminal justice system in New York for parole and probation information. This analysis was performed by examining the operations of each type agency through its major decision-making points within the criminal justice process. Within this decision point context, NYSIIS was able to further isolate the major areas of information needs and requirements on the part of the New York State parole and probation agencies by relating these needs to their three primary functions: investigation, supervision and research.

If any function of the probation process may be considered as the cornerstone of that process, or perhaps the criminal justice system, it would seem to be the probation investigative function. The importance of performing a proper investigation cannot be overemphasized due to the heavy impact the investigation results will have on the subsequent phases of the offender's system involvement. There are several types of probation investigations, however, all are performed in the context of satisfying two basic criteria:

—acquiring all available and pertinent information concerning the individual in order to provide the ingredients necessary for proper evaluation of prior socio-criminal experience and

to facilitate the prudent application of various judicial alternatives (e.g. bail, ROR, sentence of probation or incarceration); and

—to provide the basis for planning institutional or community based supervisory programs which seem to offer the maximum benefits to both society and the offender upon his exiting the system.

In the examination of the probation investigative process the survey concentrated its attention on the requirements of this process for data at the bail-ROR decision level and the pre-sentence decision level. There are admittedly other areas of probation investigation concern, however, both of the aforementioned levels seem to be indicative of most probation needs. The bail-recognizance investigation is performed in order to provide the court with information which will permit an insight into the prior history of the offender. These investigations must be performed expeditiously without sacrificing any information or accuracy requirements. The present procedure requires that a probation officer interview the offender to acquire data relating to prior criminal activity and present justice system status, employment and educational experience, residence information and so forth. The officer then attempts to validate, mainly through telephone calls, as much of the information as possible. Based on the results of the interview and the validation procedure the officer recommends, to the presiding judicial officer, the procedure deemed appropriate (i.e. bail or recognizance release, detention). The performance of this investigation, however, is restricted in varying degrees, due primarily to the severe time limitation often imposed on the investigator. In addition, much of the required information is scattered throughout the files and records of various criminal and non-criminal agencies. Many times a probation officer will have no awareness of prior criminal activities outside his own area and unless this information is offered by the offender, it will not be included in the probation report.

In order to assist this investigation, NYSIIS would transmit to the investigating officer an abbreviated criminal history indicating all known prior in and out of state judicial information. In addition, and when available, this response would include data such as previous employment experience and residence information. By providing this type of data in an expeditious manner, NYSIIS will significantly reduce the time presently required to locate and retrieve pertinent data, thereby permitting the officer to expend more time in the interview and data verifica-

tion processes. An additional benefit of this central agency involvement is that the timely acquisition of accurate background information will permit the officer to allocate more of his time to supervisory functions.

The pre-sentence investigation is performed in order to provide the court with detailed information concerning the defendant's prior record and the current offense. In basic format the investigation is similar to the previously discussed bail-ROR investigation, however, the preparation and presentation of this report dictates that the investigating officer expend a considerable amount of time in the development of the background of the individual via a detailed explanation of the prior and current social climate of the individual and an analysis of the ways, if any, these conditions have precipitated the present situation.

In gathering this type of information the probation officer has a number of resources upon which he will call to complete the investigation. He may have prior probation reports on the individual, and he should have all the support documents which permitted the completion of these reports. In addition, the officer will augment and verify these prior reports by visiting the family and area of residence of the defendant, visiting relatives, clergymen and social and business associates; finally he will interview individuals who have known the defendant in areas such as education and employment.

A central agency reporting system would render significant assistance to the investigator by supplying him with a complete background history of the individual. The history released at this point would differ from that released at the bail-recognizance level in that it will supply information such as the location, type and availability of previously performed probation investigations. This criminal history entry will greatly facilitate the investigation, by providing the officer with an awareness of the existence of prior probation investigative data and thereby reduce the time expended on performing what often amounts to repetitive background investigations. This reduction in investigative time will also permit increased utilization of officer time in the supervisory function.

This brief examination of the investigative probation function has indicated its use by the courts (in bail-sentence proceedings) and by subsequent probation operations (supervision, other probation reports). However, the utilization of the results of these investigations extends far beyond the aforementioned and affects the eventual operation of the correction function and the parole function. In the correction area the results and evaluations contained in the pre-sentence report will provide the basis necessary for proper classification of the offender at the reception facility and should provide assistance in

the proper placement of the offender in the type of correctional program which offers him the best opportunity for improvement. The probation reports play an important role in the parole function. Initial parole contact with the probation report occurs in the classification process where it is used as a training basis for the assignment of the offender to a type of training and will be used in the planning of and preparation for an eventual parole supervision program for the individual.

The supervision phase of the probation function is designed to provide the probationer with the opportunities which will offer the maximum potential for positive social readjustment. In the performance of his duties, the supervisory probation officer is dependent upon a number of various factors. The success or failure of the supervisory function depends a great deal on the recommendations set forth in the prior investigative process, for it was here that the probationer's background, motivations and aspirations were first uncovered and evaluated, and based on these findings a supervisory program was suggested. The function also depends on the attitude of the probationer; his capacity and his willingness to conform to regulatory procedures and the degree to which he applies himself to the self-improvement process. A third factor in the supervision period is the attitude of the community, especially the attitude of those with whom the probationer is most likely to associate. And further, it is recognized that in the final analysis, the success or failure of the supervisory function is largely proportional to the amount of time a probation officer has available to provide guidance and counsel for the probationer.

One of the basic requirements of the supervisory function is the need of the officer to maintain a current awareness of the status of each probationer under his supervision. This awareness encompasses areas of responsibility ranging from new arrest information pertinent to the probationer to keeping up-to-date on newly acquired or reinstated associative relationships which may precipitate an adverse probation result.

The central agency can assist in satisfying these needs by forwarding upon request any background information in the file on newly acquired associates, and could supply the rapid notification required in the identification of new arrestees as probationers. Such a response would immediately be transmitted to the probation office listed as the supervising office and to the arrest agency currently holding the individual. While this notification is deemed necessary for all probationer arrests, it becomes a matter of particular concern when the arrest is based on a relatively minor infraction of law and the entire system process (arrest-arraignment-trial-sentence- or probation or fine) may be completed before any agency becomes aware of the individual's current status.

Since the investigative process continues throughout the probation period, the officer must allocate portions of his available supervisory time to this investigative process. Here, as before, the central agency can assist by rendering informational services thereby permitting more time to be expended in a purely supervisory environment.

The utilization of sound research techniques has long been recognized by probation authorities as necessary if effective probation procedures are to be realized. However, the survey results indicated that research programs in the probation function have not been developed to any large degree on a state-wide basis and it is submitted that the underlying causes for this lack of development seem to be the result of:

- the autonomy of the New York State Probation agencies;
- the diverse levels and types of supervisory control;
- the number of agencies composing the probation function;
- the demand for operational services (investigation-supervision) of probation which precludes the participation of agencies in research and research related studies.

While these factors hinder, in varying degrees, the refinement of data evaluation and research techniques on the state level, the survey team did find some efforts relating to individual agency operations in some of the agencies surveyed.

For example, on one of its visits, the team had occasion to meet with and discuss the operations of an agency's Division of Research. This Division is actively engaged in ongoing research projects on a county basis, and has initiated among others, a study relating to the evaluation of probation and its effects on recidivism. This study entitled "AN EVALUATIVE RESEARCH STUDY OF PROBATION IN NASSAU COUNTY AND ITS EFFECT ON RECIDIVISM" is an undertaking of the Division of Research of the Nassau County Probation Department, and it is anticipated that the study when completed will provide this agency with information required to evaluate present and planned probation programs and the relationships these programs have to the rate of recidivism. In carrying out this study, the research team anticipates the assistance of NYSIIS in gathering research data concerning a sample number of individuals who have been under the jurisdiction of this agency. In recent years this agency has also published the results of studies relating to the effects of its Parole and Recognizance program and an analysis of all individuals arrested on drug related crimes.

The New York City Office of Probation has undertaken a number of studies relating to the evaluation of its operation. Many of these studies have been in conjunction with the VERA Institute of Justice and one of the most recent analyses published, entitled *THE PROBLEM OF OVERCROWDING IN THE DETENTION INSTITUTIONS OF NEW YORK CITY—AN ANALYSIS OF CAUSES AND RECOMMENDATIONS FOR ALLEVIATION*—ANDREW

SCHAFFER, VERA INSTITUTE OF JUSTICE, January, 1969, was a comprehensive examination of and recommendation for the increased use of the Release on Own Recognizance program in the New York City criminal courts.

There are undoubtedly other research projects underway locally throughout the state, and the impression perceived by the survey team indicated the growing awareness on the part of the surveyed agencies of the benefits which would accrue to those agencies which vigorously pursued this research and evaluative method. In addition, the assurance that NYSIIS is prepared to offer systems assistance in the pursuit of agency research goals is recognized as a valuable asset in the formulation of such programs.

In a similar manner NYSIIS is prepared to offer assistance to the New York State Division of Probation in their state-wide research projects. Discussions directed toward this end have been initiated, however, the type assistance desired has not been fully defined due primarily to the upcoming Division of Probation organizational change. This change, effective January 1, 1971, removes the Division of Probation from the State Department of Correction and establishes it as a division within the Executive Department of New York State.

NYSIIS anticipates that the discussions already begun will continue throughout this re-organization phase and will provide direction on the types of research assistance desired by the State Division of Probation.

In New York State, the application of the parole process has, by law, been vested in a Board of Parole in the Division of Parole of the State's Executive Department. This organizational structure, however, has recently been modified. On May 8, 1970, Governor Rockefeller signed into law a bill which, when it goes into effect on January 1, 1971, will remove both the State Board and Division of Parole from the Executive Department and consolidate it with the New York State Department of Correction into a single Department of Correctional Services. This legislation is the latest in a series of revisions relative to modifications of the operational and organizational characteristics on New York State agencies charged with the rehabilitation and supervision of pre- and post-adjudicated offenders.

While it is not intended to herein detail other major modifications to the system, this presentation will make note of one recent modification which due to its wide ranging impact, does significantly affect the overall responsibilities of the New York State parole function.

Effective September 1, 1967, by legislative enactment, the New York State Division of Parole assumed the state-wide responsibility for providing parole services to all individuals sentenced to a term of imprisonment in any institution in the State of

New York. Prior to this date there had been two independent parole authorities in the State, the New York City Parole Commission responsible for the parole of all individuals incarcerated in institutions under the control of the New York City Department of Correction, and the New York State Board of Parole whose responsibility covered all inmates incarcerated in State Penal institutions.

The results of this agency consolidation, while not as yet completely known, will provide a high yield of positive benefits in the area of parole practice and operation. One of the most immediate gains is the emergence of a unified state-wide parole operation, supervised by a single Board of Parole. Additionally, the consolidation permits state-wide parole standards and procedures to be implemented and uniformly applied to all qualified inmates.

Perhaps the single most notable benefit, from an information reporting system viewpoint, is the formation of a central records section which contains the parole files of all New York State parolees and parolees supervised by New York State for other states. This centralized filing system substantially assists both the "record keeping" process of the Division and the interagency reporting system recently initiated between the Division of Parole and NYSIIS.

The parole investigative function represents a continuing process which commences with the receipt of a sentenced individual at a classification center, continues throughout his incarceration and supervision period and in most cases terminates upon release from legal custody. (In some cases the investigation process may continue into the research function.)

Upon receipt of a sentenced offender at a correctional classification facility the parole officer begins the classification process. This entails a thorough review of the pre-sentence report performed by probation, an interview with the inmate and when necessary requests for further background investigative assistance through a parole area office. The objectives of the classification investigation are basically twofold:

- to initiate the professional casework relationship between inmate and officer; a relationship which will eventually continue between parolee and officer and;
- to gather, analyze and evaluate all available background information on the inmate to help determine the institution and program assignment which seems to offer the inmate the best opportunity for rehabilitation.

In order to accomplish a successful classification investigation, the institutional parole officer must have the facilities to acquire timely and pertinent data on the inmate. While this acquisition process has required considerable effort in the past, it has been of lesser concern recently due to the increase in the number of pre-sentence probation reports transmitted to the classification facility. This increased transmission and use of pre-sentence probation reports

has, in addition to providing significant assistance in the data acquisition process, also assisted parole in its establishment of positive casework relationships by allowing more time for inmate-officer interviews and discussions.

Since one of the most vital ingredients in a successful classification investigation is a pre-sentence probation report, NYSIIS contends that by supplying detailed background information to probation authorities, it can most expeditiously assist Parole in achieving its classification objectives. This process of supplying information to probation authorities at the pre-sentence level has been previously discussed in the probation segment of this report. However, it must be emphasized that if a classification parole officer requires additional assistance from NYSIIS during classification, the assistance will be readily available.

The parole supervision function is primarily concerned with offering guidance, assistance and counsel to the parolee. This supervisory period commences with the arrival of the parolee for his initial interview with his supervising parole officer and officially continues until he satisfactorily completes his parole period or is returned to a facility as a parole violator. Unofficially, parole officers often find themselves rendering assistance to prior parolees far beyond the culmination of the parole period.

In the performance of the daily supervisory process, the parole officer must possess the data necessary to monitor and guide the parolee's progress. Much of the investigative work has already been performed, however, it should be emphasized that the supervisory officer, may, for any number of reasons, require immediate additional information on a wide range of matters. While most of these additional informational needs are not easily predictable or categorized, there do exist areas such as the identification of new potentially dangerous associations and the identification of newly arrested individuals as parolees, where the supervising officer requires information as a matter of routine and a central information agency could offer significant assistance. The manner in which the information relating to associates would be transmitted to the operating agency is similar to the transmission method previously discussed in the probation portion of this presentation. In the area of identification of possible parole violators, the central agency would examine all incoming arrest records received from any area in the state, and by scanning an active parole file, quickly identify the arrestee as a parolee and notify both the central office of parole and arresting authorities as to the arrest and status of the individual. This is current procedure between NYSIIS and the State Division of Parole. Without this procedure, the Division of Parole would have to resort to its previous method of determining whether or not a parolee had been arrested: assign a parole

officer to a daily review of arrest listings at police or sheriff's agencies. This review consumed a considerable number of parole officer man-hours, and affected the total supervisory process by keeping otherwise qualified officers involved in non-supervisory functions. While this process has as yet not been discarded, the foundation for its removal has been laid in the newly implemented reporting system. As this system expands in use and sophistication, it can be assumed that the manual daily review requirements will correspondingly decrease and eventually become unnecessary.

By providing timely and routine assistance to the parole supervisor, a central agency can also benefit parole in two indirect but essential ways, namely, increased utilization of qualified parole officers in the supervisory process and increased value of the supervisory period to the parolee by permitting a close officer-parolee involvement.

The Division of Parole has long acknowledged the need for effective research techniques which would assist them in analyzing and evaluating the application and results of various parole programs. In 1957, the Division of Parole initiated a Bureau of Research and charged it with the responsibility for conducting research projects and operational analyses of various parole activities and operations. This Bureau has undertaken a number of research projects which have contributed to a better understanding of the motivations and personality characteristics of offenders. The studies performed by this unit reflect more than the usual basic "head-count" type of research. Instead, many of these research and statistical studies are analytically oriented and reflect the ways in which the relationships of basic social, economic, and educational advantages, or lack thereof, contribute toward the increase of criminality in society today. It is through research studies such as these that the criminal justice system will be able to evaluate more realistically the effects of its policies and practices on the offender as he passes through the system. For example, once documented and formulated, basic relationship research could be expanded to demonstrate the results of various sentences on certain types of offenders (i.e. where probation is ultimately more valuable to society in regard to certain offender types than a period of confinement); or the effects of varying degrees of counseling aids (intensive-moderate-none) on similar and diverse groups of parolees. It is anticipated that these types of studies would provide the groundwork for the eventual reduction of the unknown factors contributing to initial and persistent criminal behavior.

A central information agency can contribute to this type of research in a variety of ways. First, since it is a central repository for the basic system data, it is in a unique position to supply this data for advanced research studies. It can also assist a research

function by removing the necessity for duplicate data collection, hence permitting it to spend more time on the research-development phases of a project. Another way it may offer assistance is by producing the research studies once they have been fully developed thereby permitting additional research projects to be undertaken. Lastly, through the knowledge and operational experience gained, it would seem feasible for a central agency to produce composite agency statistical reports which would reflect the total offender treatment process.

The preceding portions of this report have indicated the manner in which NYSIIS plans to assist the parole and probation segments of the criminal justice system at their major decision points within the system process. In order to accomplish the previously mentioned areas of assistance and additionally to satisfy the overall needs of all agencies for parole and probation information, NYSIIS plans to introduce a series of modifications and additions to its present computerized criminal history information system. In brief, these revisions will encompass the following points:

1. Revision of output format to more closely provide the information needed by processing agencies throughout their operations;
2. Revision of dissemination procedures to facilitate the transmission of this information in a time frame acceptable to agency needs;
3. Revision of current data collection procedures to permit NYSIIS to acquire more comprehensive information concerning individuals of interest to the system in a more extensive manner.
4. Revision of the basic composite of the criminal history reporting system to provide for a status file and a statistical file in addition to the present criminal history file.

One of the immediate outcomes of the conferences was an examination by NYSIIS of its present computerized output. This examination was performed due to the fact that many of the agencies visited expressed a desire for a background report which would be more in step with their varying information needs at different points of their system involvement. As a result of this request NYSIIS has initiated a study of its present output reports and is currently considering expanding the output types from the present comprehensive summary case history report and no prior record report to include reports such as an abbreviated summary case history and a high priority notification. A brief explanation of each of these report types will be found in the glossary.

The proposed comprehensive summary case history report will be an extension of the present criminal history response containing in addition to the current information those data elements not presently collected by NYSIIS but deemed essential for a full report by the agencies surveyed. This additional data supplied to the system by the agencies is seen as consisting of bail, ROR information; parole/proba-

tion supervision data; supervision transfer information; location, type and availability of prior pre-sentence reports, and so forth. It is anticipated that the system will also permit the future collection of verified information relating to educational and employment experience, military data, birth date and place data and other relevant social characteristics. This type of response will be transmitted to fulfill the two areas of the justice system wherein full background data is deemed necessary: the probation pre-sentence investigation area and the police crime investigation phase. Each of these areas requires extensive background information on an individual, or a list of suspects, if it is to complete successfully its investigative function.

A second type of planned response will be an abbreviated summary case history report and will be composed of a concise tabular recount of the individual's prior history. It contains all the pertinent data displayed on the full report but without the detail found thereon. Briefly the report will be composed of six sections as follows:

#### **SUBJECT IDENTIFICATION SECTION**

Consists of name-State Identification Number; FBI Number (if available); also known as; race; skin tone; sex; date of birth; height; and social security number.

#### **CURRENT STATUS SECTION**

Contains a statement of the current criminal justice status of the individual such as on parole/probation; under sentence of conditional discharge; wanted and either the supervisory agency and charge for which supervised; or the wanting agency.

#### **ARREST AND JUDICIAL DATA SECTION**

Containing arrest date, arrest agency, local agency ID number, arrest charge, latest judicial action date, disposition charge and decision. The arrest and judicial segments of this section will be associated via arrest date.

#### **POST-ADJUDICATORY INFORMATION SECTION**

Reflects sentence information and contains final judicial date, sentence, term or length of supervision and institution or supervision area.

#### **MENTAL HYGIENE INFORMATION SECTION**

Indicates admission date, patient identification number, discharge date and name and location of institution for individuals admitted as a result of a criminal adjudication.

#### **OTHER INFORMATION SECTION**

Contains specific information under subheadings such as, Employment (date, firm, location, position);

Education; Military (date(s), branch, type, discharge, service no.); Addresses (location frequency); Marital Status; Dependents and Associates (names-dates and ID Numbers, if known).

This response will be the type most often produced and distributed by NYSIIS. It will be used for supplying information to: courts and probation agencies in the preliminary stages of judicial action (Bail—ROR—Pre-plea); police agencies who according to law must receive a copy of the criminal record and district attorneys who will require background information in carrying out their duties in these preliminary stages.

Whenever the processing of an arrest record indicates that the subject is presently registered with the system as a parolee, probationer or fugitive, NYSIIS, in addition to producing the normal report will also produce a notice for transmission to the supervising or the wanting agency indicating to that agency that the subject has come under the official jurisdiction of another agency. This notification will contain elements (i.e. name, agency ID, present agency and location, etc.) sufficient to permit identification of the subject.

Occasionally, agencies will have a need for gathering information pertinent to an individual's activity from the date of a last report, such as when a considerable length of time passed between a probation pre-sentence report, (at which point NYSIIS has already replied), and the actual date for sentence. The court may wish to confirm that there has been no further criminal activity in this time period. In processing this request, NYSIIS would scan its files; if no further activity were encountered a response indicating this fact would be released. If activity were encountered, NYSIIS would reply with a subsequent report beginning where the previous report terminated. Another potential user of this type response would be a parole classification officer, under conditions similar to those described previously.

In order to satisfy the diverse obligations of all segments of the criminal justice system, NYSIIS is preparing to disseminate the required information in accordance with the following criteria:

##### **Bail/ROR Proceedings**

—For every arrest, in those areas which possess the facilities for centralized arraignment, NYSIIS will prepare two copies of an abbreviated summary case history and will transmit these copies to the indicated arraignment court and probation agency as required by CPL 530.20.

—For every arrest, NYSIIS will prepare two copies of an abbreviated summary case history and will transmit both copies to the arresting agency. The arrest agency will retain one copy and, as required by CPL 160.40, will forward the second copy to the county district attorney.

The timely distribution of history information, in response to a felony arrest, to New York State areas which do not possess a centralized arraignment court function poses a problem of considerable magnitude

in relation to providing this information to the proper arraignment court and probation agency. Due to the wide diversity of local courts which may be called upon to participate in this type of bail or recognizance proceeding (there are over 2500 justice courts involved) NYSIIS, without further studies of potential transmission possibilities cannot, at this time, concretely describe the best dissemination method. However, when these communication studies are completed NYSIIS will be in a position to determine the best method of satisfying both the needs exhibited by the surveyed agencies and the mandates of the new law. Until such time, NYSIIS will transmit abbreviated summary case history information to the arresting agency and will request that these agencies provide for the prompt dissemination of the information.

If during the processing of any arrest fingerprint, the subject's record indicates that he is Wanted, under post-adjudicatory supervision (parole-probation-conditional discharge) or in a preliminary supervisory status (bail-recognizance), NYSIIS will immediately notify the agency exercising jurisdiction and the arresting agency informing them of his current location and system status through the utilization of the high priority response.

#### **Pre-Sentence Proceedings**

Section 390.10 of the CPL stipulates that the court may not pass sentence on any fingerprintable offense conviction until it has received a pre-sentence report from NYSIIS. This report will contain a comprehensive history of the defendant and will be utilized by the probation agency in the preparation of the pre-sentence report for the court. In transmitting this report NYSIIS will, regardless of the location of the court, forward it directly to the sentencing court or probation agency as indicated on the input request.

In the post-survey evaluation of data needs, it was confirmed that much of the information required was presently being collected by NYSIIS in its normal operations. However, in regard to those elements not presently being collected, NYSIIS will expand its data collection procedures by requesting more active input assistance from the probation and parole agencies. One of the areas of major concern is the receipt, from probation, of notification of prior investigation reports, so that NYSIIS may include this information on its responses with the objective of reducing the investigative work load. Another area of concern for the system is the acquisition of timely results of bail/ROR proceedings so that the system may be continually aware of the status of an offender completely through the process. The collection of this data causes problems which are quite similar to those mentioned previously in relation to the dissemination of data. In order that information such as the above, particularly bail/ROR information, be re-

ported to and processed by NYSIIS within an acceptable time frame, this information must be quickly transmitted to this agency. This transmission requirement cannot, in most instances be satisfied through normal mail deliveries, hence, NYSIIS plans to utilize the same procedure as previously described for output dissemination, for receiving input data. Thus, NYSIIS would request that in areas processing centralized arraignment facilities, the probation agencies input the preliminary disposition data to NYSIIS via these centralized facilities for immediate update of the central files. In other areas, NYSIIS plans to request the assistance of the agency, usually State Police or Sheriff's office, possessing the transmission equipment to forward the necessary data.

The present NYSIIS computerized criminal history reporting system consists of over twenty sub-files making up the NYSIIS data base file. These files contain the total criminal information available on an individual and it is via these files that responses are produced for agency use. At the present time, although much of the data exists, the system does not possess the capability for the production of statistical data or for a unique method of determining the present criminal justice system status of an individual. In order to determine this status at present, NYSIIS must scan the individual's complete file, and produce a comprehensive history report for transmission to the input or inquiring agency. Based on the data in the report the recipient agency then determines the individual's status within the system.

In order to streamline the above procedure, NYSIIS plans to introduce a status file into its present history reporting system. This file will contain pertinent extracts from an individual's complete record which will reflect the current criminal justice status of the individual. These extracts will consist of entries which will chronicle the individual's progress through the system from point of entry (arrest) to point of exiting the jurisdiction of the system (release from legal obligation). At a future date the status file organization will provide for the entry of post-sentence "appeal" events, however, at the present time due to the absence of comprehensive data concerning this area it has not been included. The following in conjunction with Exhibit 1, is submitted as what is anticipated to be representative of the typical operations of the status file.

1. Arrest Notification  
Upon receipt of an arrest fingerprint record and following the data verification process, an update concerning this event will be performed on the status file to indicate entry into the justice system.
2. Preliminary Judicial Results  
Upon the receipt of preliminary data, two processing alternatives are possible. If the data represents a dismissal of charges the system will provide for the purging of the arrest information from the status file, since the individual is no longer a matter of system responsibility. However, should the charges remain, the offender may be admitted to bail or



recognizance release or be remanded to a detention facility to await further judicial action. The individual's status file record will be updated to reflect this condition.

3. Pre-Trial Judicial Results

This stage of the judicial process generally consists of the activities following a grand jury indictment or misdemeanor information. Again, as in the previous instance the individual may qualify for bail or recognizance release or be remanded to custody. The entry at this point will reflect this judicial decision.

4. Trial/Sentencing Results

If, as a result of the trial process, the defendant is either acquitted of all charges or sentenced to a period of imprisonment all prior information relating to this event will be purged from the status file. This purge will be performed, in the case of acquittal, for the same reason as the purge process at the charge dismissal point. In the case of a sentence of imprisonment, the purge will be performed due to the fact that the individual may no longer be considered in an active status. If the offender is convicted and sentenced to a period of probation, this information will be entered onto the status file.

5. Release To Parole Supervision

Upon receipt of notification of a release to parole supervision status, NYSIIS will post this information to the status file.

6. Release From Supervision

Upon an individual's successful completion of a probation or parole supervision period, all information relating to the original event will be purged from the status file. If, during the supervisory period, the individual is returned or sent to a correctional facility, all records pertaining to the original event will be purged from the status file.

The implementation of the status file will provide all criminal justice agencies with the rapid type of notification they require regarding the status of parolees and probationers. It will provide for the identification of new arrestees who are currently in a phase of either post-adjudicatory (Parole-Probation) supervision or pre-adjudicatory (bail-recognizance) supervision. An added benefit to the system through the utilization of this file will be recognized in the assistance it will lend to all those agencies performing investigative operations. For example, in the police crime investigation phase, this file is seen as potentially reducing the number of suspects the agency must concern itself with. In another way this file is seen as lending assistance to parole and probation investigative officers in their offender or offender-associate types of investigations by providing rapid notification of the subject's current justice system status.

The second planned additive to the current criminal history reporting system will be a statistical file. The addition of a statistical capability will provide NYSIIS with the operational potential for providing either comprehensive statistical reports for individual agency evaluation or for providing those data elements which are required by the individual agencies in performing their own evaluation of programs.

The statistical file will contain those data elements concerning offenders which will enable parole and probation agencies to effectively evaluate the effects

their operations and programs and the total justice system have had on the individual passing through the system. In order for this evaluation to be complete, it must collect data at system entry, at various points throughout the system and at systems exit. The input to the system would initially conform to the recommended items in the Data Collection Manual for the SEARCH Statistical Demonstration Project dated March, 1970. Most of this required data is routinely collected by NYSIIS in its current data base updating process and when required it will also be included on the statistical file. The acquisition of certain other required data (e.g. interim judicial determinations) although not presently provided in all cases has, via the survey, been recognized as necessary to a full information system, and procedures are currently being explored to provide for the timely receipt of this information by NYSIIS. Certain other information required by this system (e.g. presence or absence of a pre-sentence report) has never been routinely received by NYSIIS, however, the agencies surveyed have indicated their willingness to provide such information. Once experience has been gained, the system will provide for the acceptance of additional data elements which will assist in providing more detailed statistical analysis. It is anticipated that these additional elements will consist of information relative to types of institutional programs and training enrolled in and the result of such training; similar information relating to planned probation programs and training is also desired. This data would be captured and correlated on the file in a manner which will optimize its utilization by the system's subscribers.

The survey results indicated that the supervisory agencies are actively interested in receiving data and assistance from a central agency which will facilitate their operational evaluative process. Of particular concern to many of these agencies is the acquisition of subsequent information concerning individuals who had previously been under their supervision and discharged. It was indicated that by examining these subsequent criminal activities or lack thereof (in addition to previous criminal behavior) an agency would possess the basic ingredients necessary to initiate research into the effectiveness of present agency procedures. The output of the planned statistical system would be structured, as far as possible, in accordance with basic user agency goals and automated capabilities. Thus, the output of the system is seen as providing either individual or broadly based (by pre-arranged classification) statistical reports, or the basic data necessary for an agency to produce its own reports.

The manner in which NYSIIS will process the documents it receives may, for purposes of discussion, be divided into two segments: the INQUIRY PROCESS segment and the UPDATE PROCESS

segment. A basic system flow chart for each of these segments is included as exhibits 2 and 3.

The inquiry process segment is designed to handle those types of documents which only request information from the files. In processing these requests, NYSIIS will search both the status file and the criminal history file in order to produce one of the types of responses described previously.

The update process segment provides the mechanisms whereby the three primary NYSIIS files, (criminal history; statistical and status) are updated with current information concerning individuals in the justice system. In general, the operations of the segment may be described as follows:

1. If the event is an arrest event and is also the first event for the individual, the system will initiate records for the individual on both the criminal history and the status files and will format a reply for transmission to the appropriate agencies.
2. If the event is an arrest event and is a subsequent event, the system will update the individual's criminal history. Additionally, if the offender is recognized to be in an active status, via the status file, the system will update the status file and notify both the arrest agency and the agency, as

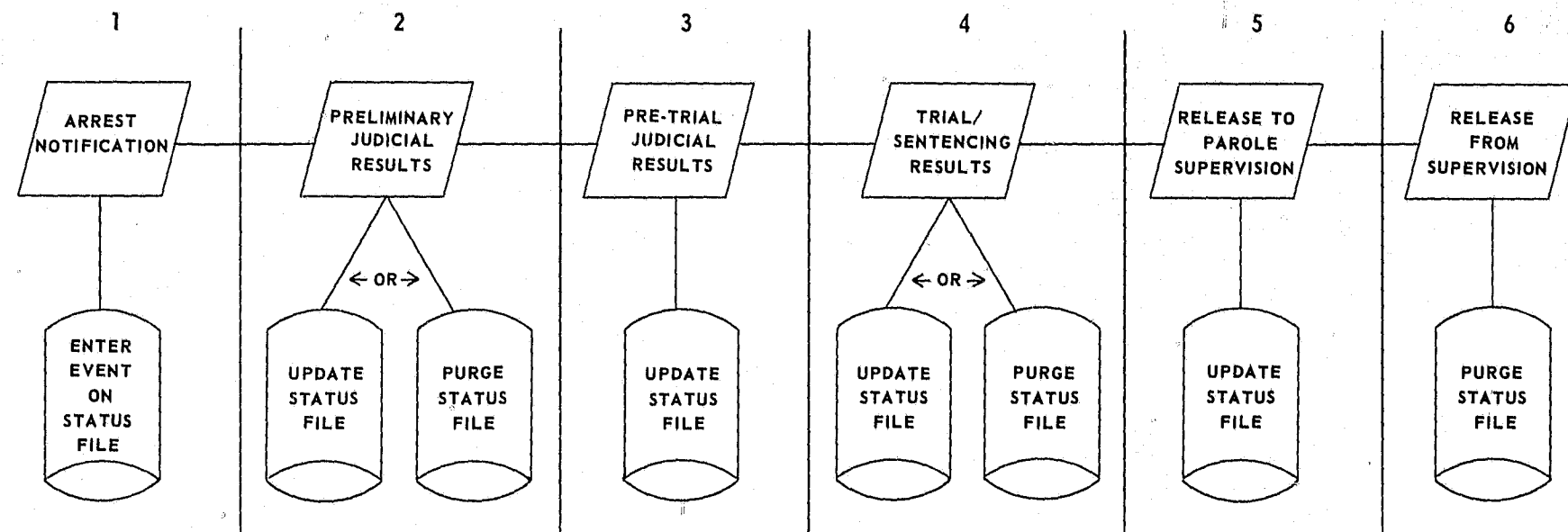
indicated by the status file, exercising interest in the individual. However, if the offender is not found to be in an active status, the system will initiate a record in the status file and format a reply for the appropriate agencies.

3. If the event is other than an arrest event and represents a removal from active system status, the system will purge the status file and update the individual's criminal history file.
4. If the event is other than an arrest event and represents additional system data of an active type (bail-ROR-probation-parole) the process will update the status file and the criminal history file.
5. In all cases, the system will provide for the addition of pertinent data to a statistical file for off-line retrieval.

In conclusion, it seems realistic to state that the implementation of a full-scale parole and probation information system capable of not only supplying pertinent parole and probation data to agencies needing such data but additionally providing it within a time frame compatible to agency operational obligations represents a challenging and formidable assignment. This challenge has been recognized and accepted and through the cooperative efforts of the agencies of the New York State criminal justice system, it will be successfully resolved.

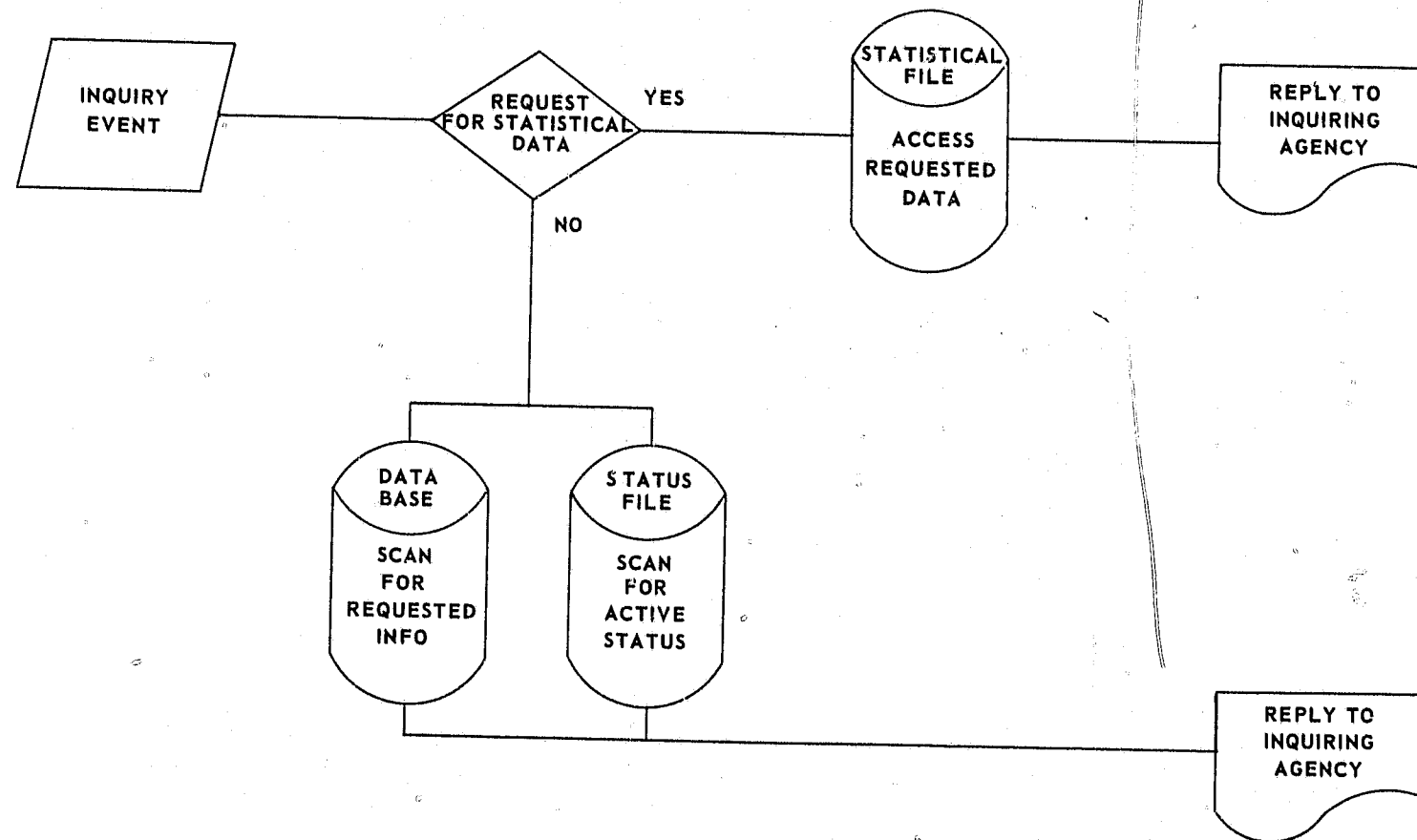
NYSIIS STATUS FILE OPERATIONS BY MAJOR SYSTEM ACTIVITY

EXHIBIT 1

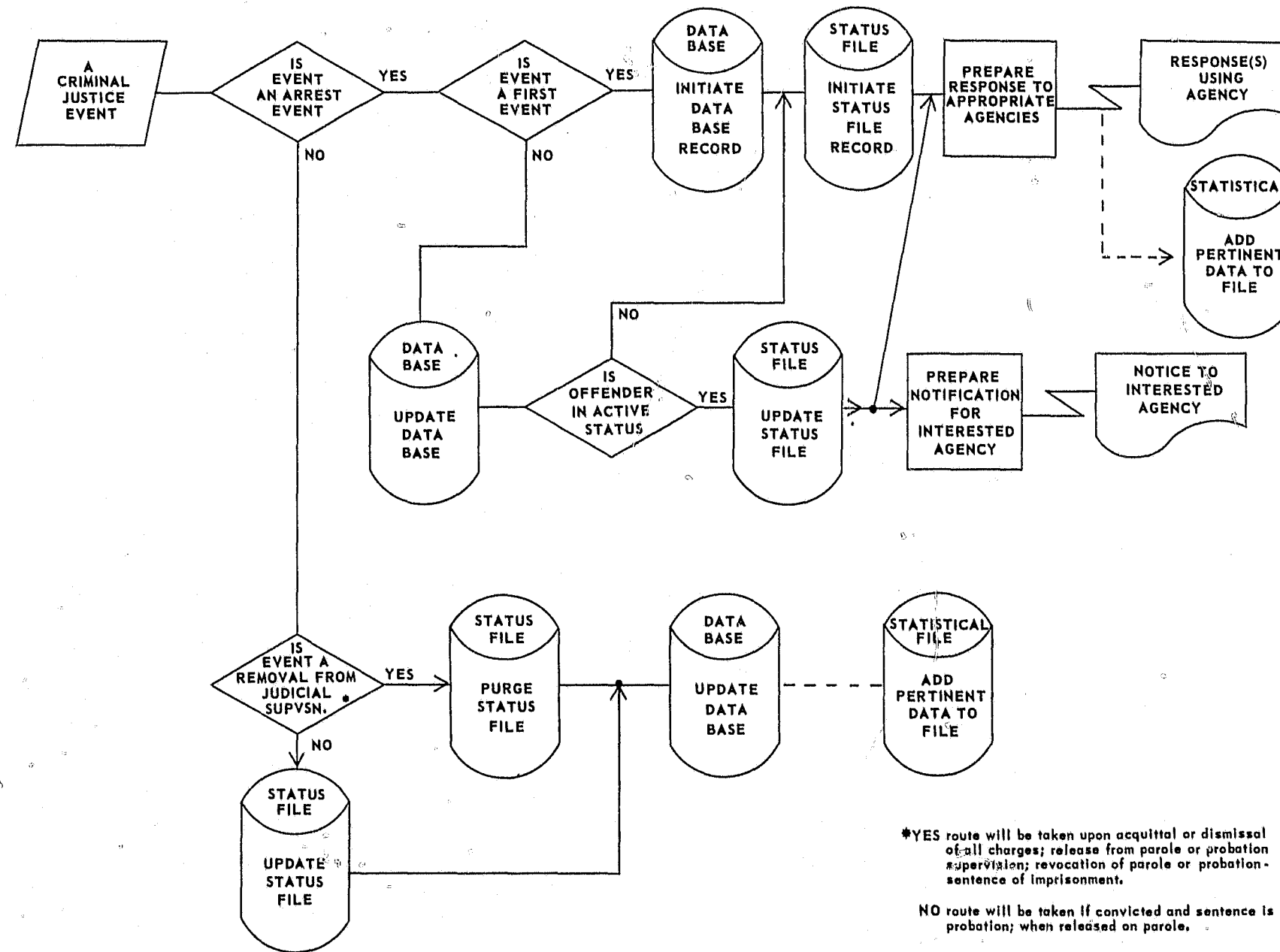


NYSIIS INQUIRY PROCESS

EXHIBIT 2



NYSIIS UPDATE PROCESS



**APPENDIX**  
**SYNOPSIS DEFINITION OF LEGISLATION MENTIONED**  
**THROUGHOUT THE TEXT**

with requirements of CPL 160.10 be forwarded to NYSIS.

**NEW YORK STATE SENATE BILL 9086-A**

—this bill, with an effective date of January 1, 1971, amends both the Correction and Executive laws of New York State and provides for the removal of the State Division of Parole from the Executive Department and consolidates it with the Department of Correction in a newly created Department of Correctional Services.

**NEW YORK STATE SENATE BILL 9097**

—this bill with an effective date of January 1, 1971, amends both the Correction and Executive law of New York State by providing for the removal of the State Division of Probation from the State Department of Correction and re-establishes it as a division within the Executive Department.

**NEW YORK STATE SENATE BILL 7276**

**NEW YORK STATE ASSEMBLY BILL 4561**

—jointly enacted legislation with an effective date of September 1, 1971, providing for the repeal of the New York State Code of Criminal Procedure and establishing in its place a Criminal Procedure Law (CPL). This newly enacted law, contains provisions relative to criminal actions and proceedings throughout the State of New York.

The following is a brief narrative of the major contents of those sections of the CPL mentioned in this presentation.

**CPL 160.10**

—fingerprints are required to be taken in the following instances:  
—arrest for felony  
—arrest for penal law misdemeanor  
—arrest for misdemeanor defined outside the penal law, which would constitute a felony if the individual has a previous judgment of conviction for a crime.  
—loitering, as defined in subdivision three of section 240.35 of the penal law.

**CPL 160.20**

—requires that fingerprints taken in accordance

**CPL 160.30**

—requires NYSIS to classify all fingerprints received, pursuant to CPL 160.20, search its records for pertinent information and transmit such information, or notification of lack thereof, to the forwarding police officer or agency.

**CPL 160.40**

—upon receipt of a fingerprint report from NYSIS, the police officer or agency must promptly transmit such report or a copy thereof to the district attorney of the county.

**CPL 390.10**

—directs that the court may not pronounce sentence in the event of a conviction for any offense specified under CPL 160.10 until it has received a fingerprint report from NYSIS.

**CPL 390.20**

—directs that, if a felony conviction, the court must order a pre-sentence investigation of the defendant and may not pronounce sentence until it has received a written report of such investigation.  
—further directs that, if a misdemeanor conviction, a pre-sentence report is not required but the court may not pronounce any of the following sentences unless it has ordered a pre-sentence investigation of the defendant and has received a written report thereof:

- sentence of probation;
- reformatory or alternative local reformatory sentence;
- sentence of imprisonment for a term in excess of ninety days;
- consecutive sentence of imprisonment for terms aggregating more than ninety days.

**CPL 390.60**

—directs that, when a person is sentenced to any of the terms of imprisonment mentioned in the misdemeanor section of CPL 390.20 or to an indeterminate sentence of imprisonment, a copy of all pre-sentence reports and memoranda be delivered to the person in charge at the correctional facility.

**CPL 530.20**

- directs that, when a defendant is charged with an offense or offenses of less than felony grade, the court must order recognizance or bail.
- further directs that no local criminal court may order recognizance or bail with respect to a defendant charged with a felony unless and until:
  - The district attorney has been heard or has waived his right to appear; and
  - The court has been furnished with a report of NYSIS concerning the defendant's criminal record, if any.

**GLOSSARY**

**1. ABBREVIATED SUMMARY CASE HISTORY**

—a report indicating in a concise manner all available information relating to the individual's prior criminal justice experience.

**2. COMPREHENSIVE SUMMARY CASE HISTORY**

—a detailed report chronicling all available information relating to the individual's prior criminal justice experience.

**3. COURT OF SERVICE**

—the court or courts which a probation agency serves.

**4. CPL**

—Criminal Procedure Law—see Appendix for definition.

**5. HIGH PRIORITY REPORT**

—a report transmitted to supervisory agencies (i.e. parole/probation) notifying them that an individual under their supervision has re-entered the justice system via another event.

**6. NO RECORD RESPONSE**

—a report which indicates to the input agency that the current event represents the individual's initial contact with the system.

## SPECIALIZED CONSIDERATION OF COURT AND PROSECUTION NEEDS

by James R. Donovan  
Director of Systems Development  
Maryland Governor's Commission on Law Enforcement  
and the Administration of Justice

### I. INTRODUCTION

Maryland's special project in relation to SEARCH has been to address problem areas existing in the functioning of Baltimore City criminal courts and the related activity of the Prosecutor's Office. It has been clear for some time, to those who care to observe closely the operations of the judicial system, that the probability of true justice, as related to both the victim and the offender was becoming less likely, as an antiquated court and prosecution structure attempted to cope with a steadily increasing volume of cases.

Fortunately, the aggressive posture and high level of interest of key court officials, the State's Attorney's office, and the Bar Association resulted in joint funding by the Governor's Commission and the Bar Association for hiring a consulting firm to conduct a study of court problems. The firm selected was Court Management Systems, Inc., which is at this moment preparing a final draft of its report of the court management problem. I am, therefore, indebted to Mr. David Saari and his staff at Court Management Systems for much of the information being presented in this paper.

An important point to be made at this juncture is that it was deemed very important by all concerned that the initial efforts to resolve court-related problems should be based not upon a simple assumption that computers would "solve all problems" but that a truly comprehensive examination must be made of all aspects of the courts' operations—with the aim of developing recommendations capable of resolving problems in a systematic and practical fashion. This approach has resulted in a management study with tremendous implications, since the recommendations resulting from the first phase of this problem-solving approach are primarily aimed at resolving organizational, procedural, and legal problems. We are emphasizing this heavily since it is our considered opinion that only through vigorous development of the proper organizational base can the staggering court problems be resolved through the implementation of new systems for dealing with those problems, including the use of computers.

"... We have never come to grips with ... court administration ... We should make bold plans to see that our Courts are properly managed to

do the job the public expects ... We must do everything that modern institutions these days do in order to keep up with growth and changes in the times."<sup>1</sup>

"In this supermarket age we are, with few exceptions, operating our courts with cracker-barrel, corner-grocer methods and equipment, vintage 1900. Our population has increased from 76 million in 1900 to 204 million at the present. Wars and social upheaval and the inventiveness of man have complicated our society. Changes and improvements in our courts are long overdue. . . .

From 1940 to 1970, personal-injury cases multiplied five times. Petitions from state prisoners seeking federal *habeas corpus* release increased from 89 to over 12,000—140 times as many. Congress increased the number of judges by 70 percent—while the total of all cases filed in the *federal* courts nearly doubled. . . .

The actual trial of a criminal case now takes twice as long as it did ten years ago, because of the closer scrutiny we now demand of confessions, identification witnesses and evidence—a deliberate commitment to values which are higher than pure efficiency when we're dealing with human liberty.

It is elementary in the system of courts that the number of judges, prosecutors, bailiffs, clerks, court reporters and courtrooms has been based on the premise that approximately 90 percent of all the defendants will plead guilty, leaving only 10 percent to be tried. But that premise may no longer be valid. Even a small percentage change in the rate of guilty pleas can have a tremendous impact on the courts. A reduction from 90 percent to 80 percent in guilty pleas, for example, requires the assignment of twice as many judges. A reduction to 70 percent trebles that demand. . . .

There is a widespread public complaint that the present system of criminal justice does not deter criminal conduct. . . . If ever the law is to have a genuine deterrent effect on criminal conduct, we must make some changes. The simple and obvious remedy is to give the courts the manpower and the tools, including prosecutors and defense counsel, to try criminal cases within 60 days after indictment and then let us see what happens. I predict that this would sharply reduce the rate of crime.

Some of what is wrong, however, is due to the failure to apply the techniques of modern business to the management of the purely mechanical operation

of the courts—of modern record-keeping and systems-planning for handling the movement of cases. The management of busy courts calls for trained administrator-managers. . . .<sup>2</sup>

Although court management does differ from other kinds of management, it does nevertheless try to handle men, money, materials, and space. Just as all managers must plan, organize, delegate, supervise, coordinate and review, so must the courts work with budgets, personnel problems, space allocations, purchases, research functions and development. And they must make daily contacts with seniors, peers, and subordinates. . . . The task placed upon the judge to manage courtroom personnel and courthouse personnel (probation workers, clerks of court, bankruptcy officers, and so on) requires tools appropriate to the task. . . . How to organize or reorganize departments of the court, projecting program costs, establishing manpower training and development programs, deciding upon computer processing of information, preparing space utilization and building programs appropriate to a public agency, strengthening ties to budget and financial agencies outside the court, building sound relationships with a legislature and with executive departments—all of this departs rather substantially from the activities associated with the judicial adjudicative role carried out on the bench and in the judge's chambers. . . .<sup>3</sup>

## II. SOME RESULTS OF THE STATISTICAL ANALYSIS OF THE BALTIMORE CRIMINAL COURTS

This analysis relies on published official statistics of law enforcement agencies and courts. Each agency keeps its own statistics for its own purposes, and the resulting inconsistencies make it difficult to view the criminal process comprehensively. . . .

It is important to explain the units counted by the various agencies. The Police Department's unit of count is the *Arrest*. An arrest involves one defendant only, but may involve a number of charges against that defendant. . . . The Municipal Court employs the "case" as a unit. This *Municipal Court case*, not to be confused with the Criminal Court case, is one defendant and one specific charge against that defendant. . . . The Criminal Court employs a different definition of "case". In the vocabulary of Criminal Court and State's Attorney's Office personnel, a *Criminal Court case is a docket number*. . . . The principal determinant of criminal court caseload is, of course, arrest activity. Arrest is virtually the sole route into Municipal Court for criminal cases. In 1969, a citywide total of 54,991 arrested defendants were processed in the city's criminal courts. . . . Of the 54,991 total arrested defendants, 21,431 (39%) were in the Non-Serious category, which includes arrests for such offenses as Begging, Vagrancy, License Law Violations, Park Rule Violation, Ticket

Scalping, and the like. The 45,167 arrested defendants not transferred to Criminal Court went on to dismissals, trials, and other dispositions in the Municipal Court. . . . An estimated total of 9830 arrests (18%) resulted in transfer to the jurisdiction of Criminal Court; this includes felony defendants, misdemeanor defendants who pray a jury trial, defendants who have a companion case pending within the jurisdiction of Criminal Court, and defendants as to whom the Municipal Court judge waives jurisdiction. . . .

It is generally believed that 95% or more of the felony preliminary hearings result in the defendant's being held for the Grand Jury. It is impossible to confirm this belief from the Municipal Court records, because no distinction is made between a dismissal after preliminary hearing (for lack of probable cause) and a dismissal on the merits; both types are simply noted as "dismissed". . . . The estimated 9830 defendants in 1969 who were transferred from Municipal Court to Criminal Court were almost without exception presented to the Grand Jury for indictment. Since early 1970, however, the State's Attorney has instituted a pre-presentment screening program, the purpose of which is to scrutinize the evidence against defendants and, where appropriate, to reduce the charge and remand to Municipal Court, or to dispose of the case by *nolle prosequi*. It is too early at this point to judge the effectiveness of this new program. . . . 9423 Criminal Court cases (docket numbers) were presented to the Grand Jury, which dismissed 110 and returned 9313 indictments. . . .

The above Municipal Court and Criminal Court figures support a principal theme of the Report: *A significantly increasing number of cases are coming before criminal court which are not being resolved through the traditional means of trial and acquittal or conviction and criminal sanction; therefore more attention must be paid to screening cases before they enter the formal adjudicatory process, and to diverting cases which primarily involve social or psychiatric problems by referring them to appropriate service agencies.* . . . The Other Than Jury Trial figures are most representative, since jury trials constitute less than 5% of all dispositions. Thus, the average time from filing to disposition is currently about five months. For indictments, which constitute the bulk of the total, the five month figure does not include the time from entry into Criminal Court jurisdiction to actual issuance of the indictment, nor does it include the time from conviction (if any) to sentencing. . . . Based on a sample of 110 cases from the first five months of 1970, there is an estimated average of 26 days from entry into Criminal Court jurisdiction to issuance of indictment (17 days from entry to presentment and 9 days from presentment to issuance of indictment). *This makes the average entry-to-disposition time for indictments about six months. . . . the data showing that total Criminal*

*Court processing time for indictments is presently averaging six months or more support the recommendations in the study concerning judicial review of case intake, reduction in use of formal arraignment, and improvement of Criminal Court calendaring procedures through the new Criminal Assignment Office.* Clearly, drastic changes are needed to reduce delay from an average of six months to a maximum of ninety days, which is the long term goal recommended in the Report. . . . The Criminal Court indictment backlog was on the order of 5816 cases as of July 3, 1970. Six hundred seventy of the defendants involved in the 5816 cases were in non-triable status, which means that for an indefinite period of time they were not involved in regular court processing. Further analysis can be done in the future using the benchmark data to determine how many non-triable defendants can be brought into court and have their cases disposed, and how many are for all practical purposes permanently removed from court processing. . . . the evidence indicates a rapid growth in the backlog in the last two years, and therefore, that the new Criminal Assignment Office is faced with a deteriorating situation. Programs of innovation in calendar management should therefore be implemented. . . .

A selection of some of the recommendations currently developing out of the Baltimore study include:

Because the transfer of the calendar management function to Supreme Bench control has focused the attention of all concerned agencies on the basic understanding that the Criminal calendar management system should form the basic ingredient of any integrated system of criminal justice for Baltimore City, these CAO policies and procedures must be developed as the central essential features of such an integrated system. . . .

### GENERAL POLICY RECOMMENDATIONS:

The Criminal Court of the Supreme Bench should adopt criminal calendar management principles which include the following elements:

A. Judicial responsibility for initially reviewing, as appropriate, the Criminal Court's acquisition of jurisdiction, whether by appeal for a trial de novo, by remand from a higher Appellate Court, by waiver of juvenile court disposition, by independent grand jury presentment without a prior preliminary Committing Magistrate proceeding, or by the recommended increased use of the information with the defendant's consent. This screening process would be made by CAO under supervision of the Assignment Judge. . . .

B. Judicial responsibility for controlling the progress of cases from Supreme Bench Criminal Court acquisition of jurisdiction to disposition.

C. Establishment of court rule and enforcement of definitive time standards governing the calendaring of each judicial process by the CAO, with scheduled case setting, within the time standard, of finite dates for the next process scheduled or for proceedings to determine such fixed dates, particularly in non-triable cases.

D. Use of pre-calendaring negotiations with interested parties for setting dates within the time standard, publication and distribution of calendars, and strict enforcement of a restrictive continuance policy by a single Assignment Judge serving the Criminal Court en banc for this purpose.

E. A case assignment system which selectively assigns to particular Parts of the Criminal Court certain categories of cases

and randomly assigns the large balance of cases to other Parts of the Court, with compensatory adjustments, on a random basis, to adjust caseload imbalance between Parts to consolidate all cases involving the same defendants in the same Part. . . . Another recommendation is the development of procedures for vigorous and continuous judicial surveillance through the CAO of all unexecuted capias and bench warrants, as well as other failures to take into custody material witnesses or evidentiary material. These procedures would employ listings developed from the automated active case or perpetual inventory system, to be produced on a regular basis by the CAO and circulated to the Sheriff, the Police, and other appropriate parties.<sup>4</sup>

## CONCLUSION

It seems obvious to me that those of us connected with the computer profession must pause and seriously consider our posture in the problem area of the courts. It is simply too easy to go into the courts and to streamline and mechanize the existing procedures. Current trends, supported by crushing statistics, indicate that the present system simply cannot survive and yet too often we find computer manufacturers, software firms, and federal, state, or municipally employed systems personnel contributing little or nothing to the necessary reform of the entire system. While such an approach may result in more profit for the commercial firms and greater security or profit for the publicly employed, it is nevertheless a cop-out on the problem. Systematizing a no-good operation is a disservice and the perpetrators of such systems should be scorned by their peers. The true test of the computer systems professionals in this contest will be to see whether or not we are capable of working hand-in-glove with the "court reformers" who are willing to put their necks on the line in face of deeply entrenched adversaries using non-systems, whose only gain is some type of self-profit through perpetuation of the old way, and to propose, instead, sweeping changes which will truly radicalize the courts. We could hardly choose more dignified company than the true philosophers and practitioners of the "new law". (And I include the Burgers, the Warrens, and others of similar stature who would decry our horse-and-buggy methods.) The tide is beginning to turn, but the inertia is very great and the turning of the tide is much too slow. The question we have to come to grips with is—can we apply enough energy, interest, and advanced techniques to truly change the system in time to prevent total disaster in our criminal justice system?

## REFERENCES

<sup>1</sup> Chief Justice Earl Warren: Speech to District of Columbia Judicial conference, June 2, 1969.

<sup>2</sup> Chief Justice Warren E. Burger: Speech to the American Bar Association, August 10, 1970.

<sup>3</sup> David J. Saari: Law and Order Reconsidered: A staff report to the National Commission on the Causes and Prevention of Violence, October, 1969.

<sup>4</sup> Excerpts from preliminary report of the Baltimore Criminal Court Management Study by Court Management Systems, Inc., November, 1970.

## THE MARYLAND APPROACH TO DATA COLLECTION AND REDUCTION FOR PROJECT SEARCH

by RICHARD L. HILTON, Senior Systems Analyst  
Maryland Governor's Commission on Law Enforcement  
and the Administration of Justice

### INTRODUCTION

During the pre-testing stages of this project, it became apparent that the hardware and program requirements were going to be the simplest problem areas to resolve. The most difficult was going to be the data collection and reduction. It was this area that was one of the potentially highest costs per unit and required the most time for completion. It has been apparent in the past few years that techniques of data collection and reduction are still in the unit record age while computer technology is nearing the fourth generation. Within the criminal justice community we are presently capable of applying only simplified versions of scientific investigation. Mathematical modeling and simulation is in its infancy here.

We have the hardware and the theory, if we could find the way of collecting timely and accurate data at a reasonable cost. How do we jump from 18th Century data collection techniques into 20th Century technology? We think of the punched card as a clever method providing a common linkage from the paper and pencil files into electronic files and the computer. There are many superior combinations of techniques available. Training for these techniques takes time and money. I feel this presentation offers one method of increasing the competence of the data collection and reduction process. It develops the in-house expertise necessary for implementation of more advanced techniques.

A superior technique currently available is the use of a terminal which allows a data collection clerk to communicate directly with the computer. This brings data collection and reduction into the 20th Century. Such direct input is costly and many organizations cannot dedicate the required funds. I feel there are two additional problems associated with this technique.

The first is "worker acceptance" of having a "computer" (terminal) in close proximity to his work situation. The computer is still widely resisted even after it has proven its worth. The training required to operate a terminal is specialized and worker resistance is often realized—therefore, labor costs and time delays tend to increase. The second associated problem is one of mechanical design. The installation of a terminal tends to be fixed and they are not highly mobile. While it is costly and difficult to take the

terminal to the work situation, instant feedback in editing and file entry is our ultimate goal.

Most studies designed to improve efficiencies in data processing start with the data collected. Few consider the entire process from source document to computer file as a totally integrated process. Although we did not re-design and implement data collection source documents, we have this under consideration (ticket books, accident forms, booking documents, transmittal forms, admission documents, i.e., a family of forms). Much of our team training involved teaching how to identify errors in the many original source documents used to create a composite criminal history presentation. This treatise also encompasses an integrated approach of training from source document to computer file. This training should be invaluable when attempting to bridge the current techniques to an on-line system.

### FORMS DESIGN

Pre-testing indicated that one area that would cause us the greatest difficulty in collection, but not conversion, would be the data collection form. It must have all the necessary SEARCH elements. It should also provide a point by point check list so that missing or incomplete data would be obvious.

Most people in the computer field have little difficulty in filling out computer oriented and symbolic forms. It is within their nature and training to think symbolically. This is one prime source of frustration to the general clerk. Resistance to the form and frustration in general is quite common when the data collection clerk is forced to PRINT IN BLOCK FORM WITHIN THE BOXES PROVIDED (a  $\frac{1}{4}$  x  $\frac{1}{4}$  inch box is common). The first exhibit in this section is an example of this FILL-IN-THE-BOXES approach. We did not use this form because it was unnecessarily complex. Why force variation in penmanship into little boxes when it is tradition alone that dictates this design? The continuity in layout and thus the ability to complete this form was difficult. Once past the training stage these little boxes are actually of little use in the collection technique—they indicate a space parameter. The same is true in the data reduction stage, so why have them at all? Space requirements can be stated in other ways as shown in the second exhibit.

The second exhibit in this section is our data collection sheet. (The original size is  $8\frac{1}{2}$  x 14 so this form is "short".) This may be considered a "free form" when compared with the traditional "box" type. An area is designated as a collection point on the form





AGENCY \_\_\_\_\_  
 FILE \_\_\_\_\_  
 FILE \_\_\_\_\_

SHEET \_\_\_\_\_ OF \_\_\_\_\_

NAME \* \_\_\_\_\_ .L, FMS  
 FBI # \* \_\_\_\_\_  
 SEX \* \_\_\_\_\_ RACE\* \_\_\_\_\_ HGT\* \_\_\_\_\_ STATE ID# \_\_\_\_\_ WGT \_\_\_\_\_ SKIN TONE \_\_\_\_\_ DOB\* \_\_\_\_\_ HAIR \_\_\_\_\_

MARKS & SCARS

1									
2									
3									
4									
5									

NUMBERS

MISC									
SOC SEC									
OPER LIC									
AGENCY									

BIRTHPLACE

\_\_\_\_\_

ARREST DATE									
AGENCY									
TRIAL DATE									
COURT									
JUDGE									
SENTENCE DATE									
YMD									
CORRECTION DATE									
INSTITUTION									
PAR & PROB DATE									
PAR									
PROB									

	CODE	LITERAL OR REFERENCE
CHARGE		
DISPOS		
OUTCOME		
OUTCOME		
OUTCOME		
TYPE		
LENGTH		
OUTCOME		
OUTCOME		
STATUS		
STATUS		

PRIOR ACTIONS & DATE OF LAST PRIOR ACTION

PRIOR ARRESTS NO.		SENTENCES NO.		COMMITMENTS NO.	
DATE-L.P.		DATE L.P.		DATE L.P.	



**SDA**  
CORPORATION  
6425 LANDOVER ROAD  
CHEVERLY, MARYLAND 20785  
301/772-6400

FORMS DESIGN  
EXHIBIT III

July 29, 1970

Mr. Rick Hilton  
Executive Department  
Governor's Commission on Law Enforcement  
and the Administration of Justice  
Suite 302, Executive Plaza One  
Cockeysville, Maryland 21030

Dear Mr. Hilton:

Now that we have completed the conversion of the law enforcement data for your commission I would like to pass on our views and evaluation of that portion of the project in which we were involved.

As you know, SDA is dedicated to the use of OCR techniques for preparing data for computer input. We have demonstrated on numerous projects that OCR is generally more economical and accurate than other input methods, i.e., Key punching or Key-taping. In some applications the advantages of OCR are more significant than others. Your project fell in this latter case.

In your project the amount of data for each Case was large and completely variable in both the size of individual data elements as well as the number of data elements within records. Because of this variability the keypunch method would have required numerous individual cards for each Case to capture all of the data. In addition, it would have been complex keyboarding to either cards or tape, because of the absence of much of the data within records for a single Case. Using OCR techniques we were able to overcome these problems.

By your decision to use OCR techniques we feel you received accurate data, in a suitable format and media at a significantly lower cost than available if other methods were used. It is our estimate that the cost of data preparation for this project using keypunching would have been about 65% more than our costs using OCR.

The Washington Area's First Independent OCR Service Bureau: Source Data Automation • DP Management & Systems Consulting  
CDC 915 Time Rental • Optical Character Recognition Specialists • Training in Optical Scanning

**SDA**  
CORPORATION  
6425 LANDOVER ROAD  
CHEVERLY, MARYLAND 20785  
301/772-6400

Page 2

One aspect of your project which made the conversion easier and less costly was the excellent form used in collecting the data and from which we extracted information to place on magnetic tape. The form was logical in format, used self coding techniques where feasible, and was designed to permit maximum conversion speed with minimum error. The designer of this form obviously understands the problems of collecting source data and should be complemented the excellent form.

We at SDA appreciated the opportunity to participate in your project. We hope our work was satisfactory and that we have an opportunity to participate in any future projects of this nature.

Sincerely,

*Cecil A. Myatt, Jr.*  
Cecil A. Myatt, Jr.  
Vice President

CAM:jd

The Washington Area's First Independent OCR Service Bureau: Source Data Automation • DP Management & Systems Consulting  
CDC 915 Time Rental • Optical Character Recognition Specialists • Training in Optical Scanning

### Group Dynamics

While we felt that the non-traditional data collection form would successfully increase speed and accuracy, we also found it unrealistic to think we would receive 1,500 man-hours of free in-State keypunching for data reduction. The OCR technique resolved the latter situation at a lower cost than the in-State bid for the keypunching service. We were now ready to extract the criminal history data from source documents. An experimental situation was established. We decided to create data collection teams comprised of persons not employed in the criminal justice system for these reasons:

1. The current staff in the various areas of the CJS would come pre-disposed as to what would be important and what should receive emphasis. It is natural for people to be most concerned with their area of work. They would have two bosses: their "regular" job and this "temporary" job. It was hoped that an impartial data collection team with a single goal would increase the validity of the data.
2. Specialized training would be an absolute necessity due to the complexity and multi-faceted operations required to create a composite criminal history. Learning to correct the errors in source documents through cross-checking was of paramount importance.
3. Higher quality control could be realized because our staff would have total control over all personnel.
4. Generally, the cost would be lower by hiring new short-time personnel than using criminal justice staff that had established longevity, would require overtime pay, and would work at the end of a regular shift.
5. The teams would be more mobile because this would be stipulated as a condition of employment. They would move from one collection site to another and have no home base.

It became apparent that if we were to meet the deadline, a dramatic and effective training approach was needed. I successfully used this approach in group management in the past. Here is a summary of the background to this technique.

In the late 1930's, there was a growing movement to obtain a higher level of production from individual workers. Management felt that as a result of unionization, many of management's prerogatives had been lost. Many of the earlier studies were aimed at understanding the composition of the workers and how to extract this higher level of production. Prior to this movement, the traditional management approach of dictating all conditions and absolute standards was used. Management slowly became aware of the fact that higher levels of production could be realized while many other associated cost factors such as turnover rate and absenteeism could be reduced by applying selected theories and principles generated by human research individuals in the business community. Some of the principles developed by individuals such as Maslow, Argyus, Hawthorne, Kahn, Brayfield, Crockett, McGregor and Hershburg, are studied as classical techniques in the human problems associated with personnel management and motivation. Their first level of research was to take certain principles from the psychological

and sociological world and apply them to the work environment. These were the conditions they thought would be conducive to higher production. Some researchers started at a very basic level and made the workers feel secure by having a clean, warm, and well-lighted work place. The focus here seems to be one of manipulating the individual in his environment and how the individual perceives his environment to increase productivity. This manipulative phenomenon is clearly and simply stated by Douglas McGregor's "X Theory" in his book *The Human Side of Enterprise*.

#### The X Theory

1. The average human being has an inherent dislike of work and will avoid it if he can.
2. Because of the human characteristic of dislike of work, most people must be coerced, controlled, directed, and threatened with punishment to get them to put forth adequate effort toward the achievement of organizational objectives.
3. The average human being prefers to be directed, wishes to avoid responsibility, has relatively little ambition, wants security above all.

As you can see, this theory makes the assumption that there is a great mediocrity of the masses, that the individual must be coerced into working and that he has very little personal integrity.

It is my contention that you will find many "X Theory" managers in practice today. McGregor's "Y Theory" states the opposite extreme.

#### The Y Theory

1. The expenditure of physical and mental effort in work is as natural as play or rest.
2. External control and the threat of punishment are not the only means to bring about an effort toward organizational objectives. Man will exercise self-direction and self-control in the service of objectives to which he is committed.
3. Commitment to objectives is a function of the awards associated with their achievement.
4. The average human being learns, under proper conditions, not only to accept, but to seek responsibility.
5. The capacity to exercise a relative degree of imagination, ingenuity, and creativity in solution of organizational problems is widely, not narrowly, distributed in the population.
6. Under the conditions of modern industrial life, the intellectual potential of the average human being is only partially utilized.

There have been many successful extensions and applications of the "Y Theory". Tannenbaum and Hershburg are leaders in the theory of Participative Management. This theory states that middle and lower management can participate successfully in the decision-making process.

On previous occasions, I successfully hyper-extended these theories to the worker level. The many participants in Project SEARCH (Federal, State, Business) are excellent examples that the individual *is* self-motivating and *will* exercise a high degree of creativity and *does not* have to be coerced. In applying the Participative Management theory combined with "Theory Y", I tried to avoid the phenomena

%21/050466//BPD/AT/BK/SAME/051466//BCM/AT/CN/BLUM/051466/CF/0001//051466/  
54012/HC/PL/091966//EX;

DATA REDUCTION  
EXHIBIT ONE

%31A/HE ASSAULTED HIS GIRLFRIEND BY STRIKING AND CUTTING;

%1/ fbi # ;

%1&&/ name /507/169/043043/MD/M/BK///SC FH///AT0101\*/LA0101;

%21/090065//BPD/AT/BK/SAME/051466//BCM/AT/CN/ARABIAN/9KUJLL/CF/0600//  
051466/54014/HC/EE;

%31A/HE ASSAULTED HIS WIFE BY SLAPPING HER FACE;

%1/ fbi # ;

%1&&/ name /511/166/090622/NK/M/BK/2151#87404////LA0101;

%21/050166/135782/BPD/LA/BK/SAME/050366//BCM/LA/CN/BROCCOLINO/050366/CF/  
0600//051666/54018/HC/EE;

%31X/HE HAS A CRIMINAL RECORD DATING FROM 1940 IN NEW JERSEY AND PENNSYLV/  
ANIA;

%1/ fbi # ;

%1&&/ name /601/170/103140/MD/M/BK/213363572//SC L HND/  
SC L EYE//NS0202;

%21/050666/132840/BPD/NS/BK/SAME/051666/I-2082/BPD/NS/BK/SAME

%21/050666/132840/BPD/NS/BK/SAME/051666/I-2082/BCC/NS/CN/BYRNES/050566/CF/  
1800//051666/54021/HC/RC;

%1/ fbi # ;

%1&&/ name /N/601/201/012214/VA/M/BK/213074982//SC NECK///  
DW0100/AT0101/W00101/RP0100/AI0101;

%21/051566/98192/BPD/DW/BK/SAME/051666//BCM/ATW0/CN/BLUM/051666/CSCF/  
1200//051666/54023/HC/RC;

%1/ fbi # ;

%1&&/ name /W/510/159/081908/VA/L/GY///TAT L ARM/  
TAT R ARM//;

%21/051266/4257/HGP/PE/BK/SAME/051366//WAT/PE/CN/MOYLAN/051366/CF/0400//  
051766/54026/HC/EE;

%31X/HE HAS 44 ARRESTS FOR DRUNKENESS FROM 1952; 3 INCARCERATIONS AT SPRIN/  
GFIELD MARYLAND STATE HOSPITAL FOR ALCOHOLISM;

discussed by Tannenbaum. He states that when the superior subordinate relationship exists and the subordinate is a participant in the management decision-making process, the superior maintains primary control and very little participation takes place. The two basic methods applied here are:

1. Strip away the physical barriers so obvious and cherished by managers such as jacket and tie, and avoidance of rapping with workers. Many such traditions are physically obvious and others are non-verbal and subtle.
2. Involve the workers in ALL aspects of decision-making. This includes all work conditions such as hours of work, coffee breaks, duties, comprehensive time, work standards, pay scale, and even budget requirements and political aspects.

This experiment was run in traditional fashion with a control group to measure the effect. The team members were from as wide a population base as conveniently possible. They ranged in age from 17 to 60 years, male and female, black and white, from ghetto dweller to a curious upper-middle class, 60 year old woman, who had never held a job. The control group leader did not know that this experiment was being conducted. He established a superior/subordinate or teacher/pupil relationship, always wore a white shirt, tie, and jacket and conducted all training sessions in lecture form. Work was given to him to be verified. The work conditions were dictated in total.

I feel that as a result of this approach, the workers could not be highly motivated and became dependent upon the manager for all areas of decision-making. As a result, the production of this control group was quite slow to rise and was dependent upon the ability of the manager to review the work. The error rate without this review was quite high when compared with the "Y" groups.

There were two philosophical goals we sought for the "Y Theory" teams: group cohesiveness and group independence. By having a strong cohesive team the standards and decisions generated by that team would be enforced by the team. It was intended that the teams would have a voice in management decisions equal to or greater than that of the manager. To obtain these goals, the following procedures were followed:

1. Even though a jacket and tie was "required" of the manager, it was removed upon entering the work area except when guests were expected.
2. The lecture procedure was used only in the initial stages for the presentation of the background of the project and to familiarize the teams with the source documents. There were less than 10 hours of lecture per team.
3. The manager did not stand in front of the group, even for the lecture process, but sat at (or on) the work tables with the team members.
4. When an individual could not resolve a particular problem, he was encouraged to direct the question to team members, not the manager. Only if the team could not resolve the problem was the manager called in as a mediator to help solve the problem.
5. Training/Rap sessions ran approximately an hour each day

- throughout the life of the project. On the surface this may seem excessive, but the content of these sessions increased the skill level of the teams. We talked not only about the problems of creating a composite criminal history, but also about Maryland criminal law and various management decisions. It was at these rap sessions that Participative Management decisions were made, such as hours worked (start and stop time), if a break would be taken and how, (as a group, individually, 5, 10, or 15 minutes), and production standards.
6. A status report was made to the teams every second day. This report included such items as: total funds expended in the various functional areas of programming, data collection and reduction, total records captured to date and error rates.
7. The manager ran errands. He would flip a coin with team leaders to see who would go to get cokes or escort the females through the security areas in the institutions.
8. Tardiness would be accepted up to a point, but not compensated.

I should issue a warning that the participating management group realized who they were and what role they were playing in the entire experiment. In other words, everything was revealed to them in this study, so that you probably have an over-run in production and interest, and therefore, the final production might be inflated.

I feel that in our on-going system a team approach in data collection and data reduction will be used. The Participative Management approach will be utilized, especially if management is willing to take the advice of the team members. By and large, the groups made most decisions. This involved a conscious choice between several alternatives and since the alternatives and consequences of each alternative were fully understood and developed by the group, they accepted their decision. Some of the advantages which resulted from this deep participation in management decisions were as follows:

1. The expected rates of data collection (15-20 per person per day) was almost tripled.
2. Half the expected error rate of 3-4% was realized.
3. The personnel turn-over rate was practically non-existent.
4. Absenteeism was slight.
5. There were no grievances.
6. In the area of readiness-to-accept-a-change, the group itself generated most of the innovations, guided by suggestions from the group leader.
7. There was very little overseeing-type management required, due to the fact that the group was self-activating and essentially self-managing.

Random checking revealed that this type of learning technique resulted in an enhanced pride of workmanship and an extremely low error rate. Out of 151.5 data elements collected per individual criminal history, we could expect one or two errors. The exhibit in this section shows the dramatic contrast in these two management techniques.

#### Pay Back

Throughout the experimenting in the three areas of Forms Design, Data Reduction via OCR and Group Dynamics, one question really should be

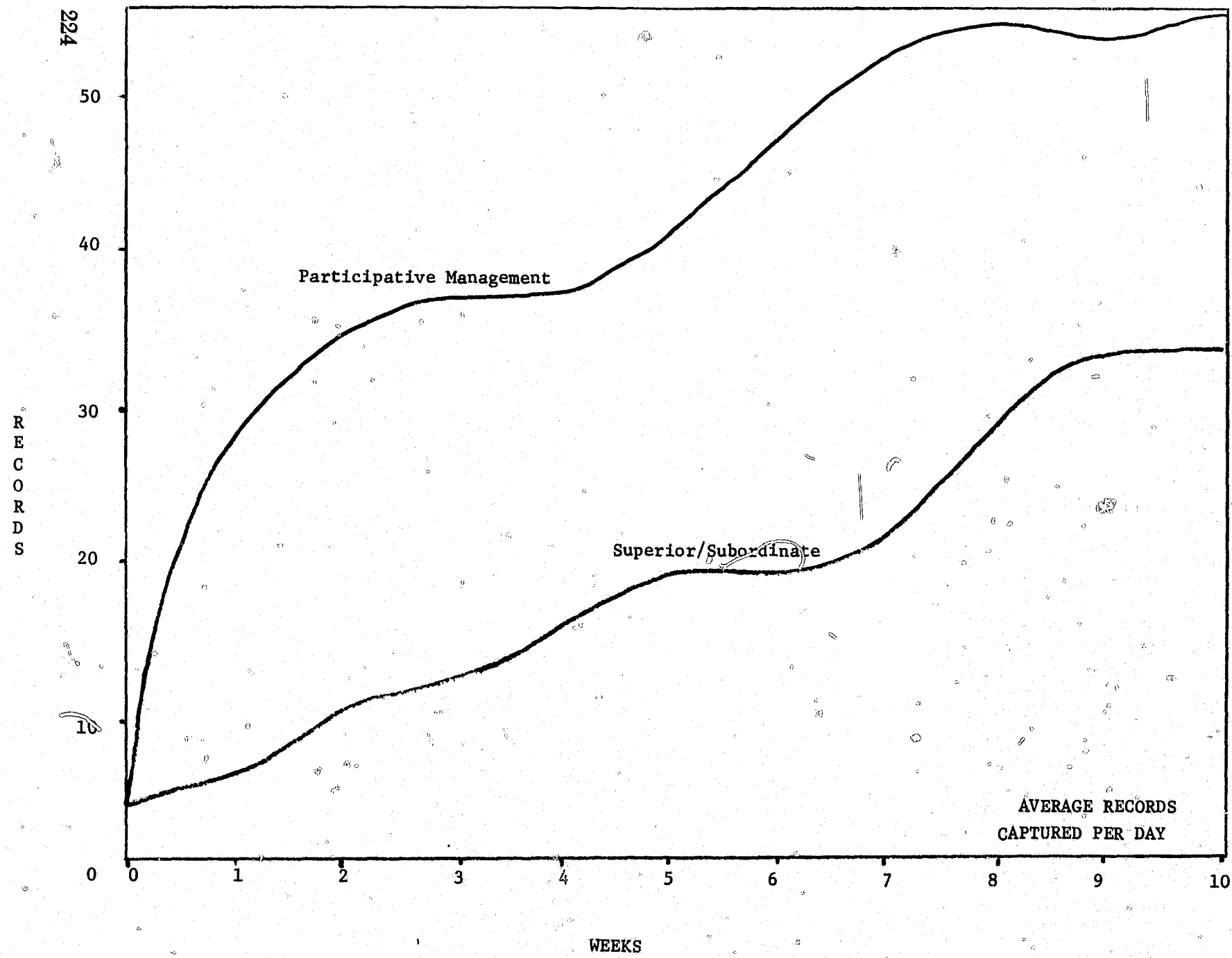
asked over and over again. The question is: Are the results of these experiments applicable to any future use? Since I was deeply involved in the entire conversion technique, it is my feeling that the lessons learned are directly applicable to any data gathering process that could go on within the State. The team concept with Participative Management was highly successful. The exhibit in this section indicates the degree of effectiveness of the Maryland approach to data collection and reduction for Project SEARCH. The OCR reduction technique has been applied in various organizations within the State at the current time. It has been their experience that it has resulted in at least an equal data validity at a lower cost. I can see data collection and reduction teams serving many police departments, thus unburdening them from one of the traditional complaints, that of too much paper work.

In reviewing the unit cost of our conversion, you should keep in mind that this is a combination of three studies run simultaneously.

It is my feeling that any one of these techniques applied separately, would result in higher productivity at a lower cost.

TOTAL COST TO CONVERT 11,400 CRIMINAL HISTORIES FROM PAPER FILES TO MAGNETIC TAPE.....\$25,292.

	UNIT COST	PER RECORD
DATA COLLECTION TEAMS .....	\$1.456	
DATA REDUCTION .....	.293	
OCR TYPING .....		
OCR READING .....		
SPA STAFF.....	.320	
OVERHEAD, PAPER STOCK, SECRETARY, MISCELLANEOUS .....	.149	
	\$2.22	



GROUP DYNAMICS  
EXHIBIT ONE

SESSION III  
FUTURE PROSPECTS

SESSION CHAIRMAN:

Hugh W. McLeland  
Director of Planning Coordination  
and Grant Administration  
Texas Criminal Justice Council

## EVALUATION—CRIMINAL HISTORY EXCHANGE SYSTEM

by Robert L. Marx, Vice-President  
Public Systems Incorporated

The Technical Evaluation Team is one of several committees established by the Project Group of Project SEARCH in order to carry out the technical tasks of the project. Members of the Technical Evaluation Team represent each of the ten states which were active in the conversion of records or which participated in the on-line demonstration directly. In addition, the team has representation from the project coordination staff, the Law Enforcement Assistance Administration, and the FBI.

The Technical Evaluation Team was charged by the Project Group with the responsibility of looking at all aspects of the system concept and the experience gained during the demonstration. The team is to identify problem areas, and provide the Project Group with concrete recommendations for changes in record contents, configuration, and system procedures.

There is another evaluation of SEARCH being conducted at the present time. This second evaluation, being conducted for LEAA through the California Crime Technological Research Foundation, is intended to provide a different "outsider" point of view on the operations of Project SEARCH during the initial demonstration.

The Technical Evaluation Team met for the first time during September, immediately following the scheduled demonstration. The development of specific evaluation goals and collection of data necessary to support the analytical evaluation effort has been completed. The final report of the team, containing the evaluation and recommendations for changes in system design and procedures will be presented to the Project Group during December 1970.

I would like to discuss with you the major areas being addressed by the Technical Evaluation Team, and give you some idea of the way we have approached these problem areas.

The first such area I would like to discuss concerns the coding structure used for recording offenses and dispositions, both in the central index criminal profile, and in the more detailed criminal history statements contained in the state records.

Those of you who are familiar with the form and contents of SEARCH records will recall that the central index, the national directory to the system, contains two basic types of information concerning an offender (Exhibit 1). First, identification information, similar to that contained on the "header" of most rap sheets, is included. These identification elements,

such as name, race, sex, and so forth are relatively standard. Although some problems were encountered in obtaining compatibility with present state identification codes, for the most part the identification section was found to be satisfactory in form for all the participants.

The second type of information available from the central index record is a criminal profile. The criminal profile was intended to be a very brief summary of the criminal history of an offender, in sufficient detail to answer most of the questions to be expected during the pre-arrest portion of the criminal justice process. That is, for field investigation, detective work, establishing probable cause, or narrowing investigative leads, it was felt that a brief statement indicating that a given person had arrests and/or convictions within relatively broad categories of offense types would be satisfactory. In providing for this criminal profile capability at the central index, the offense coding structure used was taken from Draft 7 of the NCIC Uniform Offense Classification Guide. In this offense classification scheme, there are 41 major crime categories in the central index record. An offender was allowed to "claim" up to twelve of these crime categories, and the number of arrests and number of convictions in each such category claimed would be provided as part of the central index response to an inquiry.

In our evaluation we are trying to determine whether twelve categories are sufficient to allow an adequate criminal profile, to what extent various categories were used, and what difficulties were encountered in fitting individual offenders to the coding structure.

In this chart (Exhibit 2) we see the extent to which offenders "claimed" offense categories in the 68,000 records we analyzed in the central index. You will notice that the majority of the offenders, as one might expect, have one or two categories. That is, offenders tend to specialize just like everyone else. Further, it would seem that allowing for twelve offense categories is ample, since over 98% of offenders in the index load could be handled with only eight categories.

As I mentioned a moment ago, the coding structure provided for 41 categories of crime. Next, we would like to look at the extent to which each of these available categories was used in the index load. The 68,000 records entered into the index contained a total of 204,000 category entries. A relatively small number of the 41 possibilities account for most of the entries. As we see on this chart, (Exhibit 3) 55% of all such entries involve only seven of the possible



categories. On the next chart (Exhibit 4) we see what these high popularity crime categories are. As you might expect, they include traffic, burglary and larceny, traffic offenses, and dangerous drugs.

When we consider the offense coding structure used in the state files, another sort of problem emerges. As you know, entries in the computerized criminal history files at the state level also use an offense coding scheme based on the NCIC Draft 7. In this case, however, SEARCH has used the full four digit category descriptor, in which each of the major categories is broken down into several sub-categories. The problem that was encountered in data conversion is one of matching up these offense categories with the information presently available on fingerprint cards, the basic source document for record conversion. At the time of arrest a person is charged with violation of a given state penal code, which can usually be converted into one of the higher order categories, but often cannot be converted into the full four digit offense code provided for in the SEARCH Operating Manual. For example, we see in the next chart (Exhibit 5) the experience in converting 70,000 records, in which 35% of the possible offense codes were not used at all. Providing an offense coding structure much more elaborate than any participating state can use has serious cost implications in terms of computer storage and software to convert the stored record into man readable form. On the other hand, more detailed information could be collected at time of arrest by re-designing the fingerprint card to allow posting of descriptive information in addition to penal code violation. This could require correlation of arrest reports with offense reports, which is not generally being done at this time. In addition, there remains some question as to the arguability of the fact that SEARCH is concerned only with information of public record if offense details more specific than those contained in the penal code description are contained.

The Technical Evaluation Team is considering alternative ways of handling these problems of offense coding based both on record conversion difficulties during the demonstration project, and on an analysis of these technical and political problems associated with higher detail coding.

The second major problem area I would like to discuss concerns the telecommunications requirements of an interstate criminal history exchange project. Compared to prior law enforcement experience, such as warrants and warrants, criminal history files are very long. If one is not careful with transmission formats, telecommunications facilities can very quickly become clogged. As you may know, one of the policy guidelines around which the system concept for Project SEARCH was built required that all output from the system would be in a form easily understood by a person experienced in law enforce-

ment, but not experienced in special requirements of Project SEARCH. This means that words are spelled out, data elements are given names, and the format is designed so that an easily readable form is provided on a teletype printer. The Technical Evaluation Team has started to take a look at message lengths as they were transmitted in order to see what effect this decision would have on telecommunications loading.

On the next chart (Exhibit 6) we see some characteristics of the response messages generated from files contained in the participating states. We see first that, in the form transmitted during the demonstration, which is directly printable by teletype terminals, the average message length was 2020 characters. Several of the interstate connections during the demonstration project were at ten character per second capabilities, so that this would represent over three minutes of transmission time on the interstate network. An analysis of the response messages in the forms transmitted, however, indicates that only 65% of the characters actually transmitted carried information; the remainder of the characters are spaces, to allow development of the desired output format at the receiving terminal. Thus, relatively simple changes in transmission format involving the removal of spaces and reinsertion of spaces at the final computer before delivery to the ultimate user terminal could cut the effective character length to about 1310 representing about 2 minutes of transmission time. Further analysis of the state files indicates that in terms of "hard" information, that is information in the form in which it is stored within the state computer system, the effective record length shrinks to 765 characters. If the information were transmitted interstate in this condensed form and then "blown up" to a fully readable form at the final computer before delivery to the user terminal, interstate transmission time would be shrunk to about one minute.

Similar savings in transmission time can be derived for response messages from the central index, in which the storage form of the data requires 256 characters, as compared to an average 605 characters for the transmission form.

In addition to the obvious saving in transmission time, there are other considerations which point in the direction of changing the interstate transmission format to the condensed version. First, it would allow each state to give its customers response messages in a single format without limiting other states to provide other formats if they so desire. Second, there are some security advantages in having the interstate portion of the transmission in a highly compressed and coded form. Finally, the fact that only computer-to-computer operation would be allowed under such a system concept might act as a useful stimulus to the advancement of state record systems.

At the same time, several arguments can be advanced against interstate transmission in such a com-

pressed form. Increased standardization within state systems would be required in order to allow for such a generalized transmission form. Each state would have to provide coding and decoding software to allow the development of a specialized transmission format and the "blow up" into man readable form at the end. This additional cost might be substantial, possibly considerably higher than simply designing high speed data transmission in the operational system from the outset. Finally, the fact that non-computer users are kept out of the system, while we previously said it could be considered an advantage, it is also obviously a disadvantage in the sense that a full nationwide participation in the system would be several years in coming.

A third major problem area being addressed by the Technical Evaluation Team which I would like to discuss with you is not based on the statistical evaluation of demonstration results. Whereas the first two problem areas I have discussed might lead to relatively minor changes in system configuration or procedures, this third area could potentially result in a major change in system concept.

You recall that Project SEARCH is based on two fundamental premises: first, that state files will normally be held at the state level, and second, that the user desiring a complete criminal history record will be required to make only one inquiry to a state file, even if the offender has had arrests in more than one state. These guidelines led to the concept of "agency of record" in which the latest state to have criminal justice cognizance over an individual would become the single receptacle for all criminal history information concerning that individual, even that portion of his criminal history which occurred in other states. This agency of record, a state identification bureau or a federal agency in the case of federal offenders, would be indicated in the central index response message and would maintain responsibility for the integrity and accessibility of the criminal history record until pre-empted by another agency establishing cognizance over the individual.

During the record conversion portion of the demonstration period the first problem in this system concept became apparent. If Maryland, for example, was converting a record of a man with a previous California history, how would the California penal code number be translated into SEARCH offense code classifications? If the conversion were performed inaccurately or if the offense were "forced" into a category into which it did not properly belong, what agency would accept the responsibility? If a court order were obtained in California to purge a portion of a given record, how could it require the proper action to be taken in Maryland? To what extent would substantial duplication of files be caused by failure to expunge a record after relinquishing the duties of agency of record? If a state

designs an optimal file structure and applications programs for its own criminal justice information system needs, to what extent is this design distorted by the necessity to handle data from other states, arriving in different formats and requiring different conversion software? To what extent is the auditability of the system hampered by the fact that a state loses direct control over the reporting of events which occurred within its borders?

Obviously, within the two criteria stated above for system performance, there are alternatives to the agency of record concept. For example, it should be possible to allow each state to maintain permanent control over those portions of an offender's criminal history which occur within its own borders. The name of each state involved in an offender's history, and an identifying number within each state, would be stored within the central index. Upon receipt of an inquiry for the full criminal history from a user, the central index computer could automatically query each of the states for the criminal history fragments, assemble these fragments into an entire criminal history record, and forward the assembled record to the inquirer. From the point of view of the user, there would be no apparent difference between this system concept and the agency of record concept. The problems of accountability, responsibility, and the power to purge would all be alleviated.

Obviously, this "pointer" system concept has its own set of problems. Total system reliability on any given inquiry is bound to be lower than it is in the agency of record concept, since down time on any one of several computers can cause failure to respond with the complete criminal history. Telecommunications costs and facilities requirements are likely to be somewhat higher than the agency of record concept, depending on detailed characteristics of offender mobility not presently known. The computer capabilities required at the central index installation are substantially larger than those required under any other system concept.

Strong attitudes for and against this alternate system concept can be found within the Technical Evaluation Team. We will develop the pros and cons of the alternative system concept in sufficient detail to allow a reasoned policy decision.

These have been just a few of the several major problem areas being addressed by the Technical Evaluation Team. In addition to these areas, we are attempting to document some of the detailed problems involved in implementation of the demonstration system, including the cost and problems of record conversion, the technical problems associated with linking together seven different models of computers into a single telecommunications network, and problems associated with using a criminal history exchange program during day-to-day operation of criminal justice agencies.

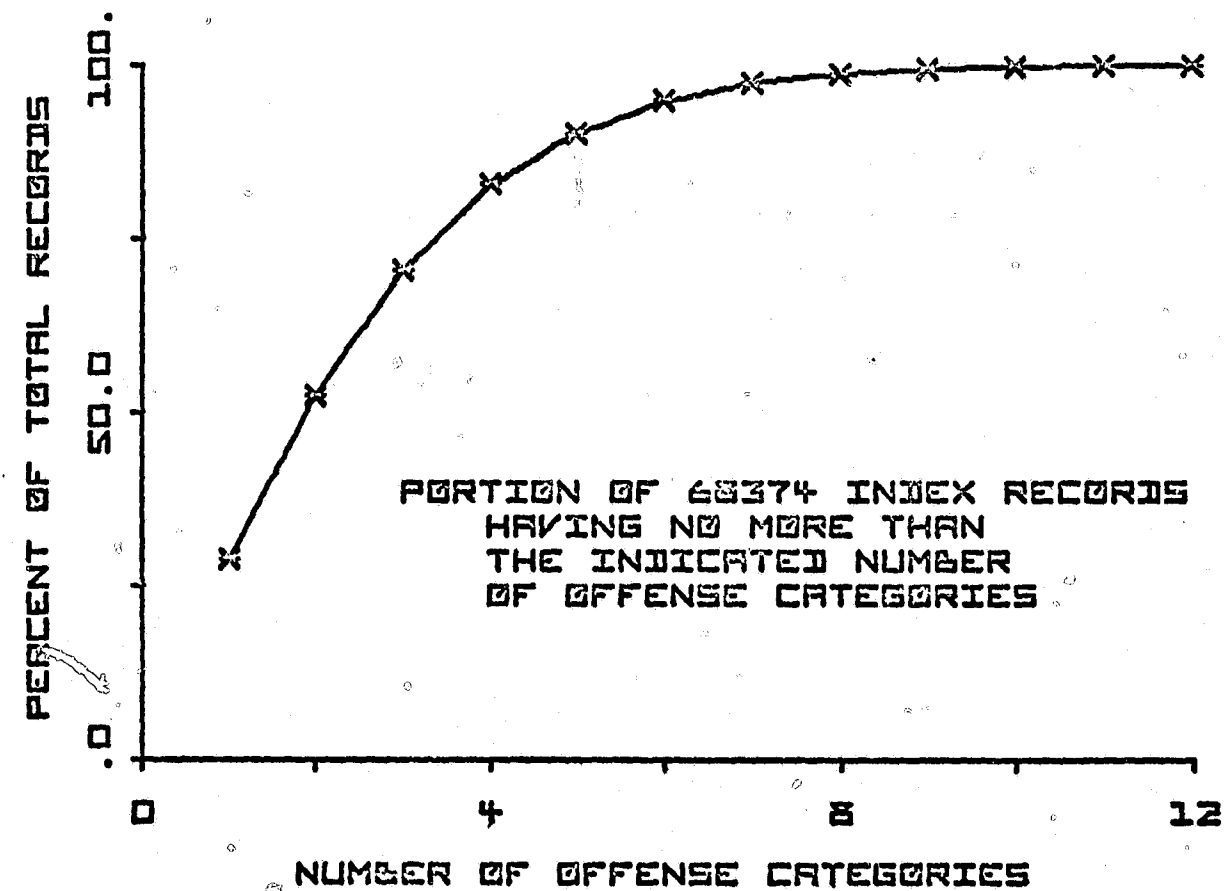
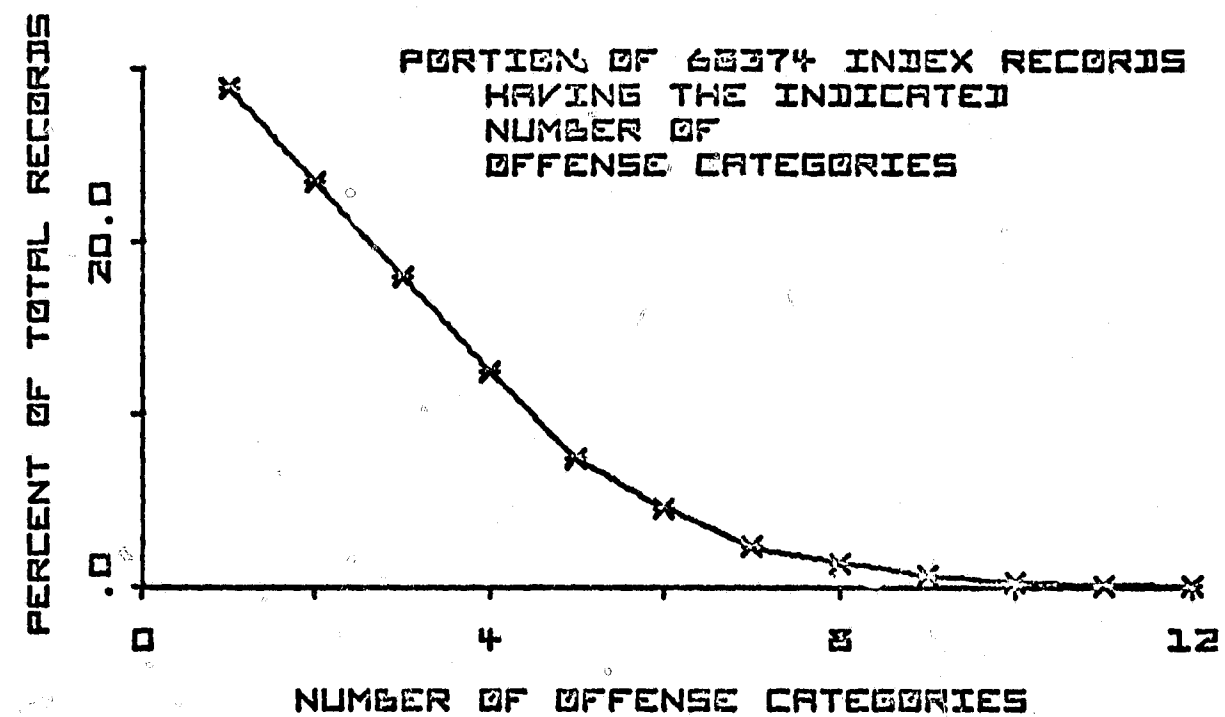
As I said at the beginning of this paper, the report of the Technical Evaluation Team will be presented to the Project SEARCH Project Group during December 1970. I hope and believe that at that time we will have taken an objective look at many of the problems we experienced during this prototype period, and will be able to provide all of you with useful information and insights upon which to base decisions as you move towards similar systems of your own.

**EXHIBIT 1**

NAM/JOHNS, ALVIN LEROY, RAC/NEGRO, SEX/MALE, DOB/110348  
 HGT/601, WGT/210, HAI/BLACK  
 SOC/382-11-5963, FBI/0102938K

OFF/	
ASSAULT	01 ARR, 01 CONV
BURGLARY	01 ARR, 01 CONV
LARCENY	01 ARR, 00 CONV
DANGEROUS DRUGS	02 ARR, 02 CONV
GAMBLING	01 ARR, 00 CONV
SIN/CA/ZZ09934256	

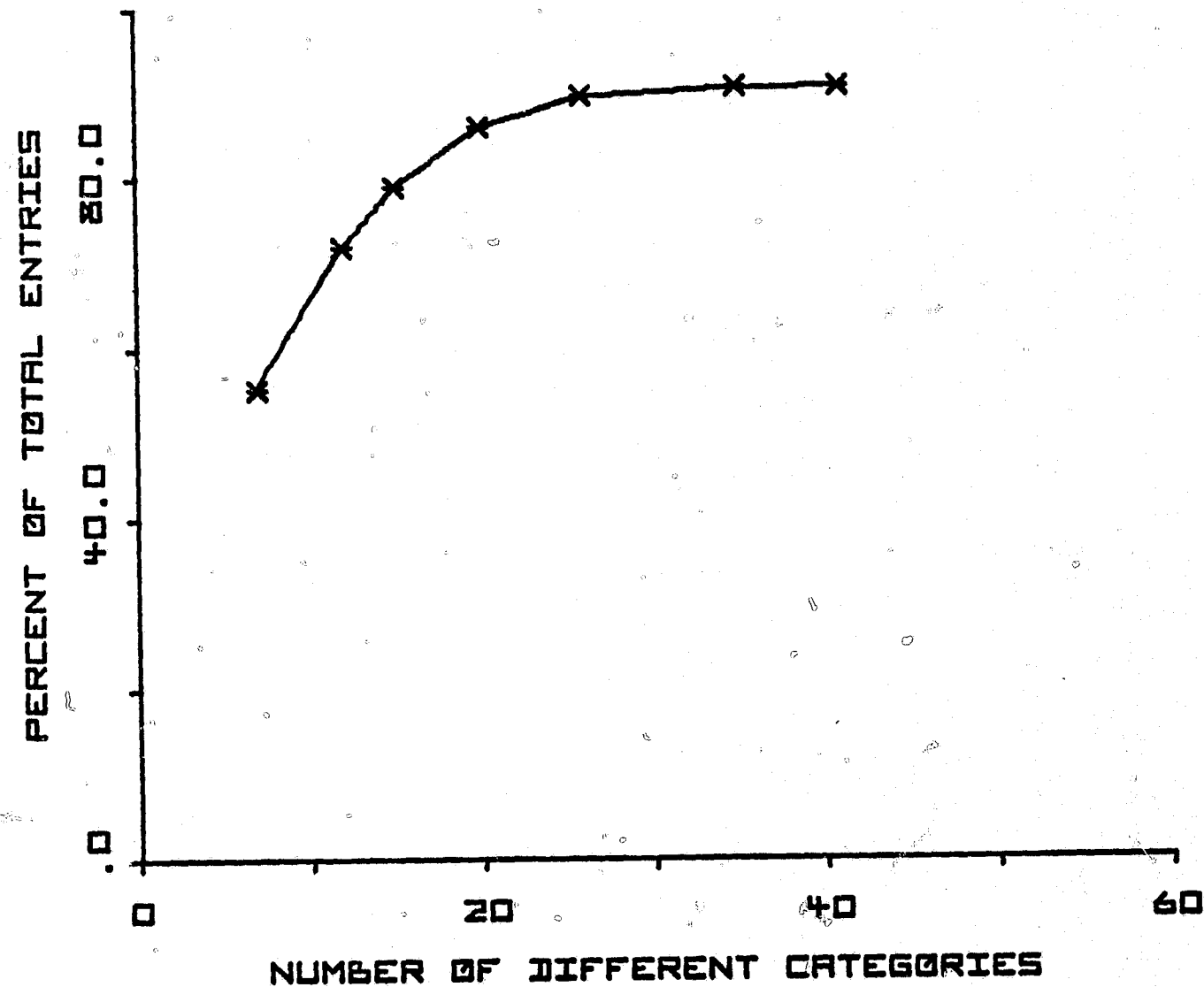
CAUTION: IDENTIFICATION NOT BASED ON FINGERPRINT COMPARISON.  
 END



**CONTINUED**

**3 OF 4**

**PORTION OF 204,203 INDEX ENTRIES  
HANDLED BY MOST USED  
OFFENSE CATEGORIES**



**EXHIBIT 4**

7 Most Frequent Codes Account for 55% of All Occurrences  
BURGLARY LARCENY ASSAULT TRAFFIC DANGEROUS DRUGS STOLEN VEHICLE ROBBERY

7 Least Frequent Codes Account for 0.1% of All Occurrences  
SMUGGLING BRIBERY HEALTH ABORTION ELECTIONS ANTITRUST CIVIL RIGHTS

**EXHIBIT 5**

PROJECT: 7003	AZ	CA	NY	MI	FL	TOTAL BY ALL
NUMBER OF CODES USED	229	39	35	173	69	22
NUMBER OF CODES NOT USED	188	378	382	244	348	147

**EXHIBIT 6**

	AZ	CA	FL	MI	MN	NY	AVE
LINE TIME SECONDS PER RECORD (10 CPS)	150	91	74	196	365	346	202
SAVING BY SPACE REMOVAL	15%	20%	35%	38%	45%	40%	35%
SAVING BY CODING DATA	71%	60%	53%	69%	86%	32%	62%

**A Technical Analysis and Review  
of the SEARCH Prototype**

by William R. Nelson  
Project Director  
Data Dynamics, Inc.

Project SEARCH is an 18 month multi-state effort designed to develop a prototype computerized criminal justice information system. The Law Enforcement Assistance Administration, through the California Crime Technological Research Foundation, established a grant to hire an independent data processing consulting company to conduct a technical review of the project and to propose a system re-design. Data Dynamics, Inc. of Arlington, Virginia was the company selected and I am the director of the review and design proposal project. I also have available to me on this project the law enforcement expertise of the International Association of the Chiefs of Police.

The review phase of our project has been completed and a report has been submitted. I do not intend in this talk to repeat the details of the review but rather discuss what has been accomplished in Project SEARCH and what must be accomplished if we are to have a fully operational system. My comments are based on a review of each SEARCH participant, what they had to do to participate in the project, the interrelationships between SEARCH and the state systems, and the requirements of local systems (police courts, and corrections) for criminal history data. Our analysis went to considerable technical depth, not to dissect the prototype but rather to establish a firm base for the proposed system re-design. From a technical systems point of view it would not be difficult to criticize the prototype system. Almost any system can be the subject of critical review. The actual design of the prototype is not the important issue here. There is a concept behind Project SEARCH that is a significant step in the proposed use of computer assisted information handling techniques to help the law enforcement forces. What the prototype may not have achieved in systems techniques it did achieve in setting up the momentum needed to put a complicated information system into being. Project SEARCH, its prototype and demonstration, had a number of achievements and isolated many problems which must be overcome in the development of the operational system.

With the development of a prototype, a technical demonstration of the feasibility was made to law enforcement personnel, many of whom who had little or no exposure to the use of data processing equipment. The demonstrations held in the participating states brought real-time access to criminal history

data right to the user. In many cases this was the first time staff personnel from the courts or correctional institutions had criminal justice information available by this method. Most of the existing systems have a definite police orientation brought on by the fact that the majority of use in any such system would be by the police. Operational use of the prototype system was quite limited during the demonstration period. However, in cases where the system was used and considering the relatively small number of records in the system a remarkably large access rate was achieved with many of the records coming from out of state files.

The demand for interstate exchange of information has been proven by the NCIC. With files on the material objects of crime and persons who have fled a state to avoid prosecution, the NCIC has grown to more than 50,000 transactions a day. Computer systems have been used in many states and cities to account for the more volatile objects of crime. A moral reservation against having a file on people involved in a crime plus the complex and diverse legal processes involved in recording historical data on people convicted of crimes, has delayed the establishment of a system such as SEARCH. This Project has broken the ice on such a system and established the feasibility for an operational version of SEARCH.

Significant achievements were accomplished relative to the information processing requirements of SEARCH. A set of data elements was selected for the prototype. The selection of the data elements or the determination of system data requirements is not a difficult process except when the variations in state laws must be considered. The development of the SEARCH prototype involved a great deal of state cooperation to overcome differences in state system designs and differences in state laws which are basic to a criminal code. From this spirit of cooperation came the development of standardization essential to the data processing system. These aspects of a system that involves so many people in such diverse environments are far more complicated than the technical aspects of the system design. It is for that reason the achievements of Project SEARCH are so significant.

Another achievement of the Project is the Report on Security and Privacy Considerations. This again is a subject that is over and above the technical design considerations. The report of the Security and Privacy Committee is a significant accomplishment in a very sensitive aspect of the system.

Project SEARCH was not without its problems. I

do not intend to discuss these problems from the viewpoint of condemnation but rather what are the problems, what caused them, and can they be resolved. I have separated the problems of the prototype from what we have projected as problems that must be resolved if we are to develop a reliable and operational system. None of the problems are really new and none of them are insurmountable if we do not lose the momentum and the spirit of cooperation acquired in the Project.

Each state had problems in the creation of records that would meet the minimum criteria for Project SEARCH. Two of the problems were availability of data and availability of resources to convert the data. The information from which criminal history data is to be derived is available in a variety of formats. In most cases the information is adequate for intra-state requirements although these requirements might be restricted to police requirements. FBI numbers were required for all records as the most unique identification number but were not found to be available in most state records. Court disposition data was a major problem for several states. The problem in some cases was complete lack of dispositions and in other cases the time or difficulty involved in correlating these data with the basic offender record. The second problem is directly proportionate to the first problem. The quality and quantity of resources required to create criminal history data files depends on the availability, quantity, and quality of the information. Translating the resources into manpower was not too difficult for 10,000 records but will come up again as a projected problem.

The objective of Project SEARCH was to test the feasibility of a Central Index to state criminal history records. The system design was a matter of compromise and utilization of existing capabilities made available by the participants. The SEARCH Central Index shared a computer with another system. Since the other system was a fully operational support system, it had to have priority over SEARCH. This was not a detrimental problem since the prototype was used primarily for demonstration purposes. The system did not have an update capability. The SEARCH data base was a static data base. Although the records selected for use in SEARCH were in some cases the more prominent criminal history records, little operational use was made of the system. A number of reasons were expressed but a general reluctance to use a potentially non-current record was the principle reason cited for non-operational use. The demonstration provided concept exposure but provided little in the way of operating statistics data.

There were other problems that were existent in the prototype but were not readily apparent under the limited operational use. Low speed communications and technical failures in communications prevented reasonable and reliable access to the data. It

is not difficult or unusual to submit queries at the rate of two per minute per terminal. However, a prototype response comes at the rate of one every two minutes for a low speed line that experiences no communication breakdown. The mathematics is simple. One terminal can generate a 90 minute backlog in 30 minutes and two or three terminals can create a four or five hour backlog, which was the actual experience during operational use. The technical problems added to the backlog. Lack of a technical control system for communications made trying to isolate the problems an unreliable process. A system that is going to be used operationally would require high speed communications and technical controls to isolate the communication failures.

Although we are not making any claims for or against SEARCH as a data processing system, there were technical problems in terms of resources that should be mentioned. As we mentioned, the SEARCH prototype was a matter of compromise and expediency. There was no real reason to do it differently as long as there were capabilities that could be modified to handle the prototype. This conserved data processing resources in law enforcement systems. I think it is fair to say that data processing is a fledgling business within law enforcement. There are a number of good systems but there are few personnel with any real experience. Most of the participating states have very limited staffs and therefore were not capable on a practical basis to take on a new problem such as SEARCH. The technical problems that arose from the composite system were resolved in most cases although they did affect severely some of the participation in the prototype. This problem of lack of data processing capability and shortage of data processing resources is not unique to law enforcement. The problem exists whenever there is competition for limited financial resources. The problem can be solved only by top management decisions.

We have not completed our study of data requirements for SEARCH but we have observed problems in the prototype. In areas where we explored the computerized "RAP" sheet, many users complained about the report. Most complaints concerned lack of readability although many complaints were a matter of a lack of orientation or inherent opposition to computer products. The criminal history report often contained more general information than was desired and not enough specific information. Part of the problem was due to differences in the information requirements of police, courts, and corrections. The most difficult data elements were those concerning the establishment of positive identification. Although the fingerprint provides unique identification there is not a unique fingerprint code that can be processed by a computer. There are no other universal data elements that can be used to establish a

unique record. Other data elements in the system were not adequately classified to be used for selective retrieval.

The last item I would like to mention as a problem area in the prototype is a matter of experience or lack of experience in systems organization and design in law enforcement. Systems experience and data processing experience are not the same, although they must relate when a data processing system is to be designed. Project SEARCH had the benefit of systems experience in police information systems, but had very little systems experience in the courts and corrections functional areas. The shortage of qualified resources resulted in a lack of courts and corrections participation in Project SEARCH. Without practical experience in these areas, the cost of development becomes extremely high. Much of the resources expended to develop the system were used to bring law enforcement up to date with the "state of the art" in information handling.

Looking into the future, our research was able to identify potential or projected problem areas that would affect an operational system. Since we have not completed the system design proposal study, I am sure that we have not identified all problem areas. The problems that I intend to discuss assume that there is to be an operational system for the interstate exchange of criminal history data. The problems are relative to making the operational system the best and most reliable system. Actually, the problems are not really problems but considerations that must be resolved prior to or during the development of the system.

Since SEARCH is to function as a service to all states, there is the problem of a management structure for the system. SEARCH must meet the requirements of all state law enforcement agencies. For that reason policy guidance to the system must originate from state sources. State guidance would establish the system policy but that will not suffice for administrative and operational management. Since it is not within the role of data processing personnel to set policy, an objective management guidance group or steering committee also is required. Regardless of who is assigned management responsibility, an operational project must have positive and dynamic management. With positive guidance and a full-time management staff, the operational system can be developed on a business-like basis.

The first problem the management team must face is the development of an efficient and a reliable system. A complete system design and cost plan would be required. The location of the installation would have to be determined and a site selected and prepared. Finally, an implementation plan and an operational cost plan would have to be prepared. All of these problems are a normal part of setting any system into operation. The problem must be ap-

proached on a cost-effective basis to preclude the wasting of monies that are required in other areas of law enforcement. Assuming that the entire index and communications system is to be funded by the Federal Government, a major portion of the system can be put into operation without burdening the states. Although these problems directly concern the management staff for the national index and communications systems, each state must be aware that there will be costs involved for the state to interface with the national system. The operational SEARCH management team will have to keep all participating states completely informed on all plans and progress.

The development of the operational system must be the result of a detailed analysis of the requirements. The Project Group has resolved that there be an operational system by July 1971. Using existing software and operational hardware, a reliable system can be developed. The initial system would be similar in concept to the prototype. However, it must be designed as a solid basis for future systems requirements. Although there were many requirements stated for sophisticated capabilities, the majority of users need a simple but reliable and accurate indexing system to start out with. Such a system will require the development of file maintenance procedures and use of strict system disciplines and record control procedures. Inaccurate or duplicate records will destroy confidence in the system on the part of the users. From a technical point of view, the discipline we are talking about is readily understood, but the major problem will be the effect this discipline will have on the state systems. When each state connects to the national index, the two systems become one and the discipline of the index must carry into the state system.

The establishment of unique records with standard data elements appears to be the major systems problem. The system will require a policy for an "agency of record" who will provide the data for the index record. This does not mean that only one state will hold a record on an individual, but rather, under specified criteria, one of the states' records becomes the basis for the index record. If the system discipline is such that an offender's criminal history is maintained in more than one state, every effort must be taken to uniquely establish and cross-reference the index record. Based on mobility statistics, forty per cent of the records can appear in more than one state system and thereby cause duplicated entries in the index. A unique, machine-readable fingerprint classification code that can be used for substantiating record uniqueness and for record retrieval is one of the overriding data element problems that must be solved. Other than that the data elements required for the index record are quite simple and standard.

The complete criminal history data is another problem. Few if any standards exist. The identifica-

tion, classification, and standardization of these data will be a long and difficult task. The difference in state laws and penal codes has been mentioned. The review of the court and corrections functions has the prospect of identifying many more data elements. The variations in use of data means that data must be classified for selective retrieval. Although it is not a problem of the national index, the total system must have a capability of retrieving selectively the data required by any function of the system. The operational system will require a standard format for the communication of criminal history data. By doing this, each state will be able to manipulate the data and present it to its users in the same format as if it were a state record. This means that each state must program to receive the data in the standard format, but since there are only a few systems in being, this standard will not be too costly. The one major benefit of there not being many operational systems is that the establishment of standards both in data elements and communications formats will be relatively inexpensive if it can be logically and realistically accomplished.

Unlike the prototype, the operational SEARCH can have a greater degree of technical sophistication built into it since it is a permanent system. The success of the system depends in part on the reliability of the communication. This problem can be resolved by the installation of a communications technical control package to assist in monitoring all system communications. Query modules will be required for the national index with compatibility logic available for each state. The initial query capabilities would be based on the prototype queries. Sophisticated name search and fingerprint search queries would be developed after the system becomes operational. Finally, as the operational system becomes more complete with data, the problem of access to the information may become more pressing. Technical controls may be required to preclude unauthorized access to the information by devious means such as wire-tapping.

The establishment of a complete and accurate data base for SEARCH will be a resource consuming problem. A policy will have to be established on the criteria for placing a record into the system. The criteria must cover both time and criminal activity. Should the key step in the criminal justice process be the arrest for the crime or the conviction of the offender? If a certain degree of seriousness of the crime is established for initial entry into the system, should the system then go back and pick up the offenders previous history? What should the cut-off time be for placing past records in the system or retaining a record in the system? Perhaps an economic consideration will govern how far back a state must go in establishing criminal history files or to what extent the state can go in correlating data from manual records in police, courts, and corrections. Maintenance

of data base is a time consuming process. The difficulty of the process depends on the availability and condition of the data being converted. If the offenders name is the only connecting data element among police, courts, and corrections records, accuracy of the criminal history records may require detailed and costly research. To a lesser degree, the quality and integrity of the data base will depend partly on the human resources used to establish the data base. The use of research personnel or the availability of data conversion personnel is projected to be one of the major problems in full implementation of an operational system. This projection is in no way related to the fact that this is a law enforcement system, but rather, to a problem that has been experienced throughout the data processing industry. The projection is complicated by the requirement to have completely accurate information in the system. One additional problem that should be recognized is the timely and natural capture of data on all new criminal justice cases. Acquisition of data must be made a natural part of the administrative process within law enforcement or the data creation problem will remain forever.

In the background to the effort surrounding the operational system is the recognition that there are two other law enforcement communications systems that network the entire country. The problem of duplication and financial waste becomes obvious if there is any way these systems can share the same communications. Our study effort has taken this into consideration on the basis that a consolidated law enforcement data communications network is technically feasible. There are other questions that must be answered concerning the desirability and practicality of interfacing and/or consolidating the systems. These questions were not addressed as part of our evaluation, but are problems that must be resolved in the operational system design.

None of the problems that I have mentioned are considered to be insurmountable. From a technical point of view, SEARCH requires a reliable and efficient communications system. This problem has been solved many times with systems that are readily adaptable to SEARCH requirements. The data processing problem in SEARCH is actually a rather simple problem that does not require many very sophisticated techniques. The data base problem appears to be the most complicated aspect of the system. The prototype system clearly demonstrated the cooperation that is needed to develop the operational system. The cooperation is among the three major functional areas of law enforcement and among the participating states and territories. To be a successful system, SEARCH must have the full participation and cooperation of all states and territories. A criminal history cannot be complete unless it contains all data from each state file and the data can be identi-

fied from a unique record in the SEARCH index. System standards and disciplines are the answer to most of the data base problems. Hard work, of course, is the only way to create the initial data base. But also, hard work and a very business-like approach is the only way to design a reliable and efficient system. We need a business-like approach free of personal controversy or the system is going to re-

quire funds that are needed in other areas of law enforcement. We need accurate and reliable data because the users cannot do their jobs with any other kind of information. The concept is proven and the technical problem can be solved, but the operational effectiveness rests entirely in the hands of the participants who must supply and use the data.

# A CONCEPT FOR A NATIONAL CRIMINAL JUSTICE INFORMATION SYSTEM

by Charles E. Robinson  
Assistant Deputy Director

New York State Identification and Intelligence System

In writing this paper, it has been assumed that the reader would have sufficient knowledge of the criminal justice process and of Project SEARCH to provide the necessary background for this presentation. Although the intent of the system described herein is similar to that of SEARCH in its desire to fulfill the needs of a national criminal justice information sharing system, the approach, organization, and development of the proposed system are different from those that underlie the present SEARCH System. The SEARCH System is rarely referred to in this text; because, at best the present system was designed only for demonstration purposes.

It is hoped that study work now being performed for the Project Group will lead to a system that supersedes, rather than expands upon, the present SEARCH Demonstration System. It is further hoped that at least some of the features contained in this paper will be incorporated into the successor system.

The essence of the proposed concept for a national criminal justice information exchange system is embodied in the propositions that follow. The majority of these propositions you will have heard before—in one form or another. However, collectively in their present form, they represent to the author the basis for the development of a rational and viable system that will adequately meet the real information needs of the criminal justice community as a whole, without undue emphasis on any one segment.

The propositions are presented under the following topical headings:

- The Federated System
- State-Units: Functional Responsibilities
- State-Units: System Responsibilities
- The Criminal Justice Status Component
- The Criminal History Component
- The Index
- Conversion of Records
- Conclusion

## The Federated System

1. The national criminal justice information exchange system would be a federation of state-units.
2. A state-unit may be a state, a formally organized region of two or more states, or designated federal agencies to act as states with respect to the collection and processing of data related to federal crimes and/or military crimes.

3. The purpose of the Federated System would be to facilitate the exchange—among the state-units—of specific verifiable information of criminal activity about known persons and to develop analytically derived measures of the actions of these persons and the criminal justice system that processes them.

4. The criminal activity portion of the system would actually be comprised of two components. One—called the Criminal Justice Status Component or Status Component—would describe an individual's current status within the criminal justice system: i.e., wanted, on probation or parole. The other—called the Criminal History Component—would describe an individual's historic actions in the system: i.e., criminal history.

(This paper will deal primarily with these two components, both to limit the scope of this paper and because the statistical measures of the criminal justice system will be based—in large part—on the information contained in the criminal history data base.)

5. The exchange of information among state-units would be accomplished through computer-based communications networks: one for the Status Component and one (the Index) for the History Component.

6. The Criminal History Component of the system would contain only records of persons whose identity has been established by fingerprints. At the state and federal level, the "release to bail", probation, and parole conditions of the Criminal Justice Component would also contain only records of persons whose identity has been established by fingerprints. Therefore, a centrally issued number based on fingerprint identification would be required as the basic number used to identify an individual in the system and the records associated with each individual. The most logical number to use for this purpose would be the FBI Number.

7. In order to exchange information in an economic, rapid, and intelligible manner, it would be necessary for the Federated System to develop two sets of common language. The first set would constitute the manner in which data would be represented for transmission among state-units or between the state-units and the Index. The second common language set would be that used to describe the reason for arrest (the arrest charge) and the subsequent actions within the criminal justice process.

8. One of the most difficult and trying problems to solve would be that of crime description or arrest charge, which is a major component of the second common language set mentioned above. Its solution would remedy not only the problem of knowing, for example, whether one state's "Aggravated Assault" is the same as another's "Assault First Degree"; but, perhaps more importantly, would allow truly comparative and accurate aggregated national crime statistics. Despite advances in resolving this problem by the FBI and by SEARCH, it still remains a problem of fundamental importance, for without resolution, arrest charge data collected in a system of national scope would not be directly comparable. Therefore, resolution of this problem should be given the highest priority so that commonality would be incorporated into the data collected for the Federated System at the earliest possible date.

In coping with this problem, it is further suggested that a serious exploration be made of a method to describe crimes in terms of their fundamental elements rather than continue endeavors to achieve commonality of definitions by bending traditional legal terminology. Therefore, instead of trying to mold coincidence of meaning from among terms such as homicide, manslaughter, and murder, call the crime "an act which resulted in the death of one or more persons," or in short—"death". From this point, any number of elemental descriptors—such as method, cause, instrument, perpetrator, victim, location, time, and so forth—could be developed, extended, and/or modified as needed to meet growing and varying informational and statistical needs without changing the fundamental description.

9. Once the common language for defining crimes/arrest charges is developed, it would be possible to specify those crimes/arrest charges to be recorded at each level (local-state-federal) of the component systems in a manner that could be implemented with universal consistency.
10. Given the development of a common language that describes criminal acts in a fundamental and more extensive way, then each arrest charge would be recorded in two ways. One, each charge would be recorded in the prevailing legal terminology of the pertinent state-unit primarily for intra-state use within its criminal justice system, and two, in the fundamental way for reporting to the Federated System. It is quite likely that the descriptive information desired for statistical work would

exceed that required to adequately describe a basic criminal act for the purpose of recording the act on a basic history statement. However, because the smaller set of descriptive information necessary for criminal history statements could be extracted from the larger set desired for statistical work, the larger set is that which should be required by the system. The recording of the larger set of descriptive information would at once satisfy the system's need for commonality and intelligibility of arrest charges or criminal acts for all purposes.

Again, it must be emphasized that the development of a common language to describe arrest charges/crimes, as well as other data items in the system, is of the greatest importance. It deserves the highest priority, not only to provide the basis for a common understanding, but because of the ramifications for design and administration of the System.

11. Name searching of a file representing all of the individuals in the Federated System would not be contemplated, because it would be impractical with the data normally available from an on-site situation against a file of several million names. Future work might make available useful descriptive information sufficiently discriminating and reliable to be used in association with name search under these circumstances.

Name searching, however, would be one of the primary entry modes into the smaller files of the Status Component but not in the Criminal History Component. Operationally, name searching would not be required within the Criminal History Component, because upon arrest a central number—the FBI Number—would be known or assigned based upon fingerprint identification. From this point onward, an individual's record would always be addressable, at a systems level, by FBI Number.

Name searching in connection with investigations would be conducted through state-unit files. When unsatisfactory results are obtained from one's own state-unit name file, then a request for a name search would be channeled to one or more state-units as circumstances warrant. The selection of state-units could, for example, be made from a probability table—developed from an offender movement analysis—that would indicate in rank order the states in which it is most likely that a suspect might previously be known.

12. The national criminal justice information system, being a federation of state-units, would be governed by a body composed of one official representative (and one official alternate)

from each of the participating state-units. It would elect officers and elect or appoint committees or groups as seems fitting to direct itself and its activities.

One of the groups would be a small body of technically knowledgeable persons chosen from each state-unit on a rotating schedule to administer the Federated System. The term of service would be for a relatively short period of time but scheduled so that the terms expire on a staggered basis. No state-unit would be represented by more than one person at any given time, and no state-unit would fill a position again until all state-units have their turn in accordance with a predetermined schedule.

The system (the Index) would be operated by a full-time staff with an executive director. The executive director would report to the administrative body.

13. When a person is dissatisfied with the contents of his record and the problem is not satisfactorily resolved at the state-unit level, he would be allowed a hearing at the federated level through an easily invoked procedure.

#### State-Units: Functional Responsibilities

14. Each of the state-units would be responsible for gathering and processing specified information about known persons in relation to the criminal justice process within its bounds. That is, each state-unit would gather arrest and associated information related only to crimes occurring within its boundaries; a region comprised of two or more states would store and process information provided by its component states; and designated federal units would gather and process such information for crimes committed within their respective jurisdictions. This would apply whether the initial arrest were made by state-unit personnel or by personnel of another state-unit.
15. For each arrest, the state-unit in whose purview the arrest was made would be—and would remain—the *State-Unit of Record*, because this state-unit would always retain the original supporting documentation related to the arrest itself and to subsequent criminal justice actions stemming from the arrest.
16. Upon reporting the original arrest of an individual or upon reporting the latest (most recent) arrest of an individual to the Federated System, the reporting state-unit would become the *Repository State-Unit*.

(When an arrest on a warrant occurs, only the placing agency would report the actual arrest on specific charges through its state-unit system to the Federated System, thereby establishing the proper state-unit as the repository.)

17. Therefore, upon a first arrest, the reporting state-unit would be both the state-unit of record and the repository state-unit. When a second arrest is made, and if it is made in another state-unit, the latter state-unit would become the repository state-unit and would always be the state-unit of record for the second arrest. The first state-unit would remain the state-unit of record for the first arrest.

18. Upon reporting a new arrest, and if there is a prior repository state-unit, the Federated System would notify the prior state-unit that it is no longer the repository state-unit for the person's records in question, write the individual's records to the state-unit of latest arrest, and update the Index with the latest repository state-unit.

19. A state-unit of record, that has been superseded as a repository state, would continue to update the Federated System with transactions of any subsequent events related to individuals for whom it is the state-unit of record.

20. A state-unit of record would be responsible for initiating the transaction to expunge appropriate records from the Federated System when a court within the state-unit has ordered the return of an arrest record and associated fingerprint record. The Federated System would be responsible for performing the expunging and for notifying the affected state-units that it has been accomplished. No account of a record expunged on these grounds would remain in the Federated System.

(When prior arrests exist in other state-units and the expunging of a record by court order causes a state-unit to lose its repository status, the state-unit with the next latest arrest will become the repository state.)

21. A state-unit of record would be responsible for initiating the transaction to expunge arrest records—for arrests made after a state-unit joins the Federated System—for which a court disposition has not been posted within a specified period of time. The time period, variations, and exceptions would be defined by the Federated System.

22. Each state-unit would be responsible for imposing the privacy and security requirements of the Federated System.

23. Each state-unit would provide the facilities necessary to allow a properly identified person to readily review his record as it appears in the Federated System. He would be allowed to cause a legitimate correction to be made to his record. If a period of time is required to confirm the verity of any requested corrections, an appropriate mark should be placed against the data in question during the waiting period.



#### State-Units: System Responsibilities

24. Each state-unit would establish a computerized data base for the maintenance and exchange of information deemed necessary to participate in the Federated System.
25. Each state-unit would provide remote input-output facilities, through an intra/state communications network, linking authorized criminal justice agencies with the state-unit computer system. The state-unit computer system would provide the link, via inter-state communications networks, to the federated data base of the Criminal Justice Status Component and to the federated data base of the Criminal History Component.
26. Because each state-unit would have its own particular requirements, equipment peculiarities, and unique development problems, no effort should be made to impose (or limit) design, content, or format requirements upon these state-unit systems—except those necessary to meet the goals of the Federated System and to permit economic, rapid, and intelligible exchange of information and to insure the security of this information.

#### The Criminal Justice Status Component

27. The primary purpose of this component would be to supply the field officer, during an on-site situation, with a very rapid response as to whether the person in question is wanted or in violation of any restrictions placed upon him by the criminal justice system.
28. The second purpose of this component would be to supply status information to the Criminal History Component, so that upon arrest—the majority of which will not be associated with a field inquiry—the criminal history statement will include this information.
29. The third purpose of this component would be to supply the investigating officer with the means to rapidly determine, by name, the current status of an individual in whom he was interested.
30. The status system would contain as a minimum the following categories: persons wanted on a criminal warrant, wanted as missing, released to probation, and released to parole. The records for each category, as maintained in the system, should be as comprehensive but as succinct as possible. In addition, when possible, all categories except "missing" would contain an abbreviated criminal history in a form similar to that used in the present SEARCH Index. The abbreviated history would be developed and added to the record when it is entered into the status system by the state-unit involved.

31. The most direct course for developing this component would be simply to expand upon the system capabilities and relationships that already exist in the NCIC System and the associated state systems. Therefore, the Status Component would not operate through the Index maintained for the Criminal History Component.

32. Although the definitions of what data within each status category would be maintained at the federal, state-unit, and local levels may vary from time to time in accordance with system needs and changing technical capabilities, it seems likely there would continue to be a division of data among the three levels. For a start, the division might be as follows:

##### Warrants:

NCIC—present definition

States—those not allowed or qualified for NCIC

Local—traffic and others not allowed or qualified for state level

##### Missing Persons:

NCIC—none

States—by state-unit definition

Local—those not allowed or qualified for state level

##### Probation:

NCIC—from federal courts, when FBI Number assigned

States—from state/county/and local courts, when FBI Number assigned

Local—when no FBI Number assigned

Parole:

NCIC—from federal prisons, when FBI Number assigned

States—from state/county/and local institutions, when FBI Number assigned

Local—when no FBI Number assigned

Local—when no FBI Number assigned

Local—when no FBI Number assigned

Local—when no FBI Number assigned

It also seems likely that in some of these categories, contiguous states or local areas (or states and local areas configured by other pattern determinations) may want to share records when they are not allowed at the federal or state level. Development of the common language to describe crimes/arrest charges discussed previously would also help in defining records to be admitted at each level.

33. In operation (see Chart 1), a communications network separate from the Index network would link state-unit computer systems with the NCIC computer system. An inquiry at the local level would cause a concurrent search of the state-unit maintained file while formatting, transmitting, and searching the NCIC file. The state-unit would combine responses and provide a unified response to the inquirer. Where there is a local computer system, it would perform in the same relative manner with the state-unit system as the state-unit system would with the NCIC System.

A "time-out" feature would be incorporated at each system level. This feature would provide for an independent response from any level whenever another level was unable to respond within a specified period of time.

34. The Criminal Justice Status Component would require the facility to perform at least two basic types of searches: e.g., a name search with a variable set of additional qualifiers to support the field officer and the investigating officer, and an FBI Number search in support of the Criminal History Component.

#### The Criminal History Component

35. The principal purpose of this component would be to provide a complete and extensive criminal history statement (with current criminal justice status) to authorized agencies at different points throughout the criminal justice process.
36. The secondary purpose would be to serve as a vehicle for collecting much of the data required by the statistical component.
37. For purposes of this presentation, it has been assumed that the contents of the criminal history statement that would satisfy the needs of the Federated System are fairly well defined and generally known. In any event, they are subject to modification with the advance of the system. Accordingly, no attempt will be made here to define the contents of the criminal history statement.
38. In operation (see Chart 2), each state-unit would collect and process at least the criminal justice information, specified by the Federated System, as it flows from the process triggered by each arrest occurring within its purview. That is, following each arrest, information related to subsequent charges, certain interim court dispositions and final dispositions including probation, and certain institution activities including parole would be entered by the appropriate agencies within the state-unit. Such information stemming from each arrest, together with like information stemming from arrests occurring in other state-units, would in the aggregate permit the generation of a complete criminal history statement. The cumulative combining of history data retained in one repository state-unit would occur through the use of a unique number—the FBI Number—and a communications network linking the several state-units through an Index maintained by the Federated system.  
At arrest time, a positive identification based on fingerprint submissions would be attempted by each state-unit. Only when the process results in a non-identification would a set of fingerprints be passed on to the FBI. The FBI would process fingerprint submissions for a positive identification. If not identified, a new number would be assigned. New and established FBI Numbers would be transmitted to

the Federated Index.

The Index, in addition to other functions, would initiate communications and the transmission of FBI Numbers and available records to the repository state-unit (the state-unit initiating the process with the most current arrest). When the identification is confirmed by a state-unit (assuming an FBI Number is on hand) and the state-unit is not the repository state-unit, it would initiate communications with the Index. The Index would then retrieve any available history and transmit it to the new repository state-unit.

39. The Criminal History Component would interface with the Criminal Justice Status Component. This would permit the inclusion of any status report in the criminal history statement. It would also allow automatic notification of the placing agency that an arrest had occurred by transmitting a copy of the full history statement to the placing agency.
40. History data would be transmitted from one state-unit to another in an encoded form through the Index in a pre-established common language (Section 7, mentioned previously) that would satisfy the need for economy and speed in transmission but would be decodable by the recipient. The recipient state-unit would reconstitute and reformat the data in any way or ways commensurate with its computer system and with the output content and format requirements of its user agencies.

#### The Index

41. The Index is at the same time a concept, a file, a system, and an operational/administrative body.
42. As a concept, it is the focus for a truly national criminal justice information system that would be able to share information without the creation of a centralized national data base under any one organization's control. It would be a system democratically administered by the participating membership—each with an equal voice.
43. As a file, it would contain the data that permits the interchange of criminal history information among state-units. The principal data elements for each individual represented in the file would be his FBI Number, his state-unit identification number, the repository state-unit identification code, and the conversion status of his full record.
44. As a system, it would perform several functions. Chief among them in the initial system would be to: create and maintain the Index; install and maintain a communications network; perform message switching; monitor

system performance in order to balance the system; control repository state-unit status; and process data to produce statistical evaluations of the criminal justice process. Perhaps more importantly, it would provide the base for the addition of future shared capabilities.

45. As an operational/administrative body, it would consist of the people, equipment, and site facilities necessary to perform its system functions.

#### Conversion of Records

46. Each member state-unit would convert that portion of a record pertaining to arrests made within its purview. More specifically, each state or region would convert arrest data and all associated data for crimes committed under its laws; and the FBI would convert arrest data and all associated data for federal crimes.

When any state-unit converts a record containing data emanating from an arrest in a state not currently a member of the Federated System, the FBI would convert such data.

A record composed solely of arrests (and associated information) in states not currently a member of the Federated System would not be converted. As an aside, the money that could be spent on conversion of such records might better be spent on bringing such states into the system so they could perform their own conversion.

47. Criteria for selection of records for conversion prior to the start-up of the Federated System would vary somewhat from one state-unit to another according to the status of each system, availability of funds, and other such considerations. It is also likely that the Federated System would develop some general criteria which would be incorporated into the state-unit criteria. However, whatever record selection criteria a state-unit may adopt, it would be preferable from the point of view of the Federated System that one of the criteria require the FBI Number be a part of the record at the time it is selected.

A temporary procedure would be set up with the FBI to obtain numbers when a state-unit has exhausted its supply of records with assigned FBI Numbers under the conditions presented above. The same temporary procedure would apply when a state-unit, because of an active system, has converted records and is continuing to convert records that do not have an FBI Number assigned.

As the Index data for the converted records are sent to the Index, the Index would obtain Washington Letters for all records not assigned new FBI Numbers during the tempo-

rary procedure mentioned above. Information from the Washington Letters would be used to initiate the record conversion status system.

48. Following initialization of the Index and the start-up of the Federated System, in which state-units' systems would convert records based on new arrests, the following procedure would apply. A state-unit, unable to identify a fingerprint record or the record does not have an assigned FBI Number, would forward it to the FBI.

Following the FBI identification processing, the FBI would transmit to the Index: The FBI Number, new number or existing number code, the identification number issued by the arresting state-unit, and repository state-unit code.

The Index would coordinate and control the conversion effort. When the Index is notified of the assignment of a new number by the FBI (initially this may occur on a first or second arrest), it would add the number and related data to the Index and transmit the required information to the repository state-unit. The repository state-unit, in addition to other actions, would complete any necessary conversion.

When the Index is notified by the FBI of the assignment of an existing FBI Number to a new arrest, it would check for the presence of the number. If the number had been entered previously, the Index would be updated, all converted history would be retrieved, and all information would be transmitted to the new repository state-unit. If further conversion was required, the Index would so notify the affected state-units. If the number had *not* previously been entered, the full Index record would be added, the repository state-unit would be notified, the Washington Letter would be requested from the FBI, and the applicable state-units would be notified to initiate conversion of the record.

When the Index is notified of a new arrest by a state-unit with an FBI Number assigned to a local record, but the arresting state-unit is not the repository state-unit, the Index would operate as described above.

#### Conclusion

This is the first of an intended two parts. The first part has described an underlying philosophy for a true criminal justice information system—which if adopted essentially as presented—would provide the desired operational ingredients of:

- a. Responses that are rapid and complete enough to satisfy the real needs of a modern criminal justice system.
- b. Balancing the workload between the three participating levels of government—local, state, and federal—for more effec-

tive operation.

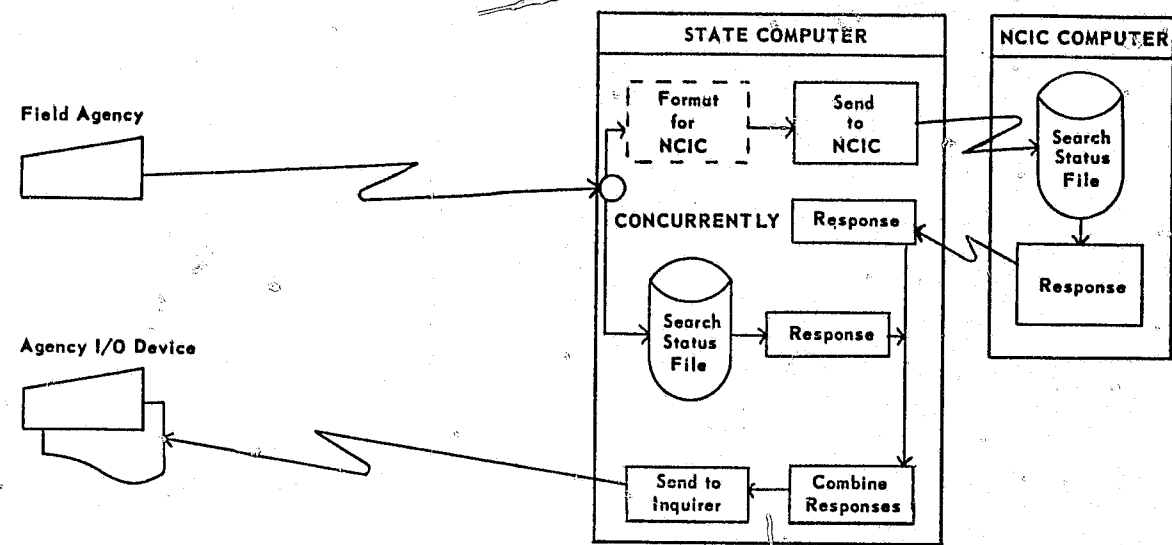
- c. Sharing of information interpretable on a common basis throughout the criminal justice process to better inform and to better evaluate the process.

The second part will deal with how successive evo-

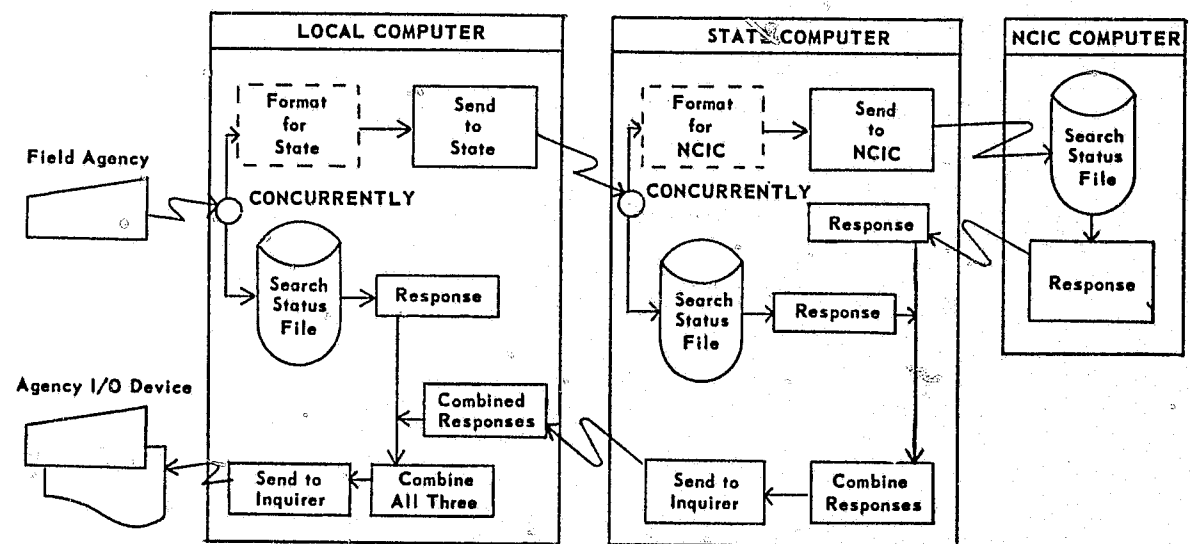
lutionary levels of systems might be developed with which to achieve the system goals embodied in the propositions recommended in Part I. The emphasis will be on state level systems with implications for both federal and local levels.

FEDERATED SYSTEM - CRIMINAL JUSTICE STATUS COMPONENT

CHART 1



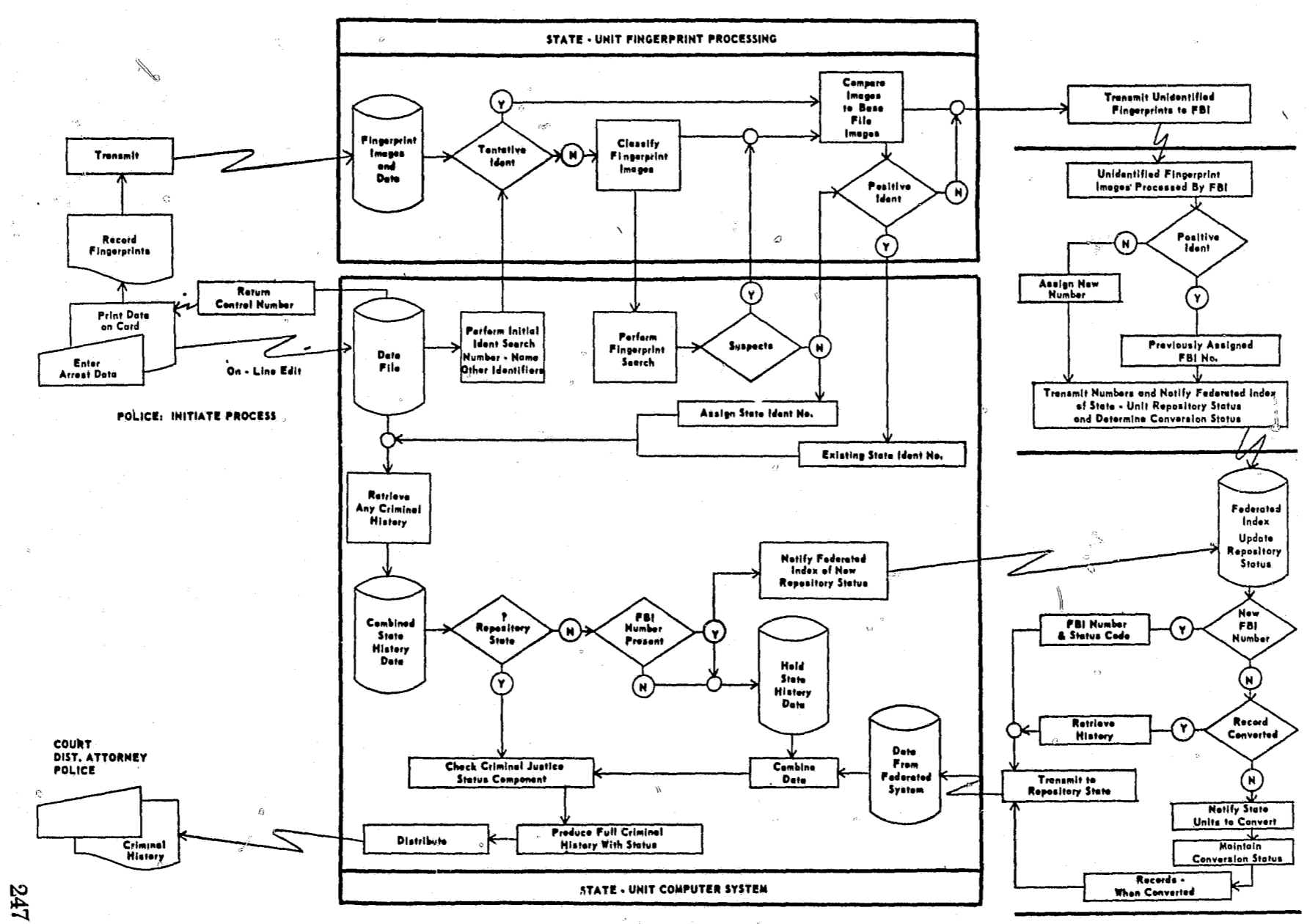
STATUS CHECK CHART 1A



STATUS CHECK CHART 1B

FEDERATED SYSTEM - CRIMINAL HISTORY COMPONENT ( ARREST SITUATION )

CHART 2



247

# SOME PROBLEMS ASSOCIATED with the DEVELOPMENT OF A NATIONAL CRIMINAL HISTORY INFORMATION SYSTEM

by ROBERT P. SHUMATE  
Systems Science Development Corporation.

It is yet too early to judge whether project SEARCH has been an unqualified success. It is also too early to assess fully the lessons learned and to interpret their significance. It is clear, however, that if SEARCH is to lead to a National system of criminal information exchange, attention and effort must be re-directed to a much broader class of problem than has been examined during its present phase.

Since we are examining project SEARCH within its current environment, the purpose and objectives of the present project should be examined briefly. Perhaps as a starting point, two partial quotes taken from the SEARCH project plan, as revised April 1, 1970, will aid in defining the scope in the project planners own words:

"There are two major objectives of this cooperative project: evaluation of the technical feasibility and operational utility of a cooperative interstate transference of criminal history data."

"Demonstration of the capability to automate the state collected criminal statistics for retrieval by LEAA and selected state and Federal agencies."

It is emphasized throughout the project plan that the objective of project SEARCH to date has been the exploration through a limited usage prototype of the technical feasibility of a multi-state computer-based, criminal history storage and retrieval system; and to ascertain to the extent possible the benefits that accrue therein.

It is fair to say that it has been no real surprise that the initial results of the project have demonstrated that technologically it is feasible to store, retrieve and transmit data between a group of computers on at least a limited scale without undue or insoluble problems. That this comes as no great surprise stems from the fact that systems of this general class have been in use on a significant scale both within the criminal justice establishment and in a wide range of military, industrial and general governmental agencies.

The participating agencies in project SEARCH have been introduced to, and have on the whole dealt effectively with the initial technological problems. However, the resolution of initial technological

problems involving a limited sample of the total criminal history population and a limited sub-set of the user population does not necessarily imply that the more complex problems of a full system will be overcome as easily. Further, as of the present, the utility of such a computerized criminal information system has yet to be demonstrated in any quantitative fashion. This is not an unusual situation since demonstration or prototype systems generally focus initial interest upon the technical performance of the system rather than on its benefits in terms of the user objectives.

It is not unreasonable to assume that an objective appraisal of the cost benefits of such a system can be extracted from the data being collected as part of the current project. There is a real danger, however, that the attraction of a new technological innovation may be so overwhelming that the central question of whether the "juice is worth the squeeze" may be overlooked. It is to this danger and its implications that I would like to direct the balance of my remarks.

In a general sense, there is little question that the criminal justice establishment has much to gain through the development of an efficient system of criminal history information interchange. The already significant impact that existing municipal, regional, state and Federal computerized information systems have had on the criminal justice process is apparent.

However, notwithstanding the demonstrable value of such systems in individual instances, it is also apparent that in many cases the fascination with technology (a form of keeping up with the Jones') has resulted in the installation of systems which cannot, by any rational means be justified. I use the term justified in the sense of how the costs of the system and the benefits accruing to the using agencies compare with the alternative methods of reaching the same objectives.

The real danger to the future of Project SEARCH (or its successor) is not that the current project will suggest that the concepts involved are technological-ly unfeasible, but rather that its technological success may result in a loss of perspective. As one moves from a limited prototype to a full system, the complexity of the problems encountered often increase in the form of a geometric progression.

Concern for the future of Project SEARCH stems from the observation that as yet there has been little attention directed toward the underlying structure of the National Criminal Information System. Without detracting from the obvious lessons that are being learned from the present demonstration project, significant, additional advances could have been made had there been a parallel attention directed toward a rigorous assessment of the nature of the criminal information system, the users it serves, the geographic distribution of its users, the size of the data base population, the density of data flow between users and related matters.

It may be contended that the practical lessons to be learned through project SEARCH are a necessary prerequisite to placing the criminal information system into perspective. Yet it would seem that it should be a matter of genuine concern that before further commitments are made to an extension of Project SEARCH that a significant amount of effort be directed toward a careful, systematic examination of the system structure. This examination must go far beyond an evaluation of the success, or failure, of the present phase of Project SEARCH.

I find it difficult to believe that at the conclusion of the present phase of project SEARCH, given its limited objectives, that it will be possible to determine with any degree of certainty whether a computerized national criminal information system is justified. I would even go so far as to question whether a definitive answer will be forthcoming regarding the question of whether the technical approach being utilized is feasible if applied to a full system national in scope.

It is worthwhile to pause and examine the precepts involved in a criminal information system. It is reasonable to accept the premise that a truly useful criminal information system must have a data base that is national in scope. Fragmented data bases do have limited use; but optimum utility requires that the user have access to all information concerning the subject's past criminal activity, irrespective of the geographic source of its origins. Project SEARCH has implicitly recognized this need, and by its nature is directed toward dealing with the problems associated with enlarging the electronically stored data base from a local or regional subset to a National set.

A further significant factor involved is the matter of accessibility. For many years, the FBI has provided a national repository of information pertaining to a major subset of the criminal population. The paramount problem associated with full utilization of this data repository has been the lack of ease and the speed with which this data can be accessed. Routine additions to, and retrievals from, this data repository are handled by mail. The time units associated with the retrieval of data in this repository are measured in days. In our modern society with its mobile popu-

lation an accessibility level measured in such time units is no longer acceptable. This is one major factor that has led to a search for technology that can improve the accessibility of data.

Viewed as a system, the components of the computer and the manual system are identical. The system components consist of:

1. An index module
2. An identity module
3. A text module

The index module is simply a set of locators used as a prime reference point to reduce the population being examined to a group of reasonably sized subclasses. Traditionally index components utilized have included names, fingerprint classifications, and identification numbers.

Identity modules contain data elements that link the physical entity with the abstract record of his past history on a one-for-one basis. Identity modules are usually organized by sub-classes of reasonable size, with each class (such as all Smiths) being located by the index element Smith in the index module. To the extent that the one-for-one match between physical entity and identity module approaches unity, the system reaches its maximum reliability.

The text module consists of entries or notations regarding the individuals' past or present activities. As the system moves through time, the text portion is constantly being extended or modified as new events take place and are recorded.

The major advantages that the computer-based information system has is the speed of data transmission between user and data base. New text notations may be updated practically as they occur and become instantaneously available to other users a continent or half a world away. One can hardly deny the advantages of this increase in accessibility given the defined objectives of the criminal justice system.

However, given the present state of our technology, certain problems associated with electronic data retrieval may overshadow the advantages. You will note that I emphasize the verb "may" because it is questionable whether anyone has as yet examined fully the true extent of the problem and carried out any rigorous analysis.

While the manual system may be lacking in accessibility and response, the level and reliability of its identification function is another matter. By all standards which can be applied today, it is markedly superior simply because the match between physical entity and the identity module can be made on a point-by-point comparison of a set of fingerprints. No comparable methods yet exist for the electronically created and manipulated data base.

The world—which includes the criminal justice community—still lacks a body of solid experience in dealing with truly large name files. Electronic file identification methods employed today are adequate

for limited sized files and particularly for those files in which there is no motivation for identity concealment. Rudimentary identification methods work well for example in an airline reservation system. However, they are much more likely to prove inadequate in a criminal information system of any size, where motivation for concealment is high.

Before Project SEARCH moves from the prototype stage, extensive study of the identification problem must be undertaken. I am not necessarily referring to research and development directed toward remote fingerprint scanners or voice pattern analyzers (although this must inevitably take place) but toward analysis of the nature and extent of the identification problem given existing techniques and hardware technology.

It is disturbing, however, to note that with the millions of dollars which have already been spent in the criminal justice community during the past decade for the development of computerized information systems, that an infinitesimal amount has been applied to the actual study and research into the fundamental problems involved in large, person-oriented files. By way of illustration, I would like to suggest some problem areas in which studies directly related to identification problems associated with a National Criminal History file should be undertaken.

It is questionable whether anyone truly knows the size of the total population of persons with criminal histories. While the size of the population can be controlled to some extent by the establishment of policy guidelines concerning these classes of criminal histories that are to be included in the population, it is still necessary that the population size be identified. The data base population is dynamic with new persons entering the population and others leaving as the system moves through time. The population size, while changing slowly is identifiable and measurable.

I am unaware of any competent studies based upon a statistically defensible sample of the criminal history population that has examined the probability of multiple identification matches when: 1. surname only is used; 2. surname plus given and middle initial are used; 3. date of birth plus (2) above are used; 4. race and sex plus (2) and (3) above are used.

To illustrate why such studies are needed, let us take a look at what happens to the problem of false drops in a name file selected from the general population where the content is increased from a population of 10,000 to 10,000,000 persons. A false drop is defined as multiple identifiers returned from the file that meet exactly the identification criteria submitted. We will assume that the match criteria used is surname, given name, and middle initial, date of birth, race and sex which slightly exceeds the SEARCH minimum inquiry identification criteria. In the file of 10,000 the expected probability of encoun-

tering a false drop is about .001, or once in a thousand inquiries one or more false matches will occur. The interesting thing about a false drop as we have defined it is that additional information must be supplied to make an absolute identity. It has been further calculated that the probability of a true match in a file of 10,000 would be .00005, or one chance in 20,000.

To illustrate what happens as the file size increases let us look at the expected probabilities for a file of 10,000,000 individuals. Using the same identification criteria the expected false drop rate in the larger file is 3.75 per inquiry. This means that on the average there will be approximately four false matches returned for each inquiry that makes any type of match. The expected true hit rate is .05—or one out of 20 inquiries submitted.

Before hasty conclusions are reached concerning the above data it should be pointed out that the estimates given are in all likelihood not applicable to the criminal history file population because they are likely to be grossly understated. The assumptions used in the calculations were that the queries entered to the system represent a true random sample drawn from the general population and that criminals as a group have identification characteristics in the same proportion as that found in the general population. We believe both assumptions to be incorrect. The sample of identities selected for inquiries will be biased toward those already in the file, simply by the nature of the police screening process. Further, there is reason to believe the subset of population in the criminal history file has identity characteristics different from those found in the general population. If either of such assumptions are correct, the true match and false drop rate will be significantly higher than those stated.

This example is intended only to highlight the type of problem that is likely to be encountered as file sizes are increased. The false drop rate in the 10,000 unit file is hardly cause for concern. However, in the larger file the rate is sufficiently high as to make its utility of questionable value.

The possible combinations of commonly used identifiers with electronic data files are extensive and their efficacy needs to be examined. As the population increases in a person-oriented file, the probability of false drops increases rapidly. We need to know the kind of identification problem we will have when a National Criminal History file becomes a working entity. Further, we need to establish from the study of carefully constructed samples drawn from the National Criminal History population the combinations of identifiers that minimize the probability of false drops.

To the best of my knowledge, no well-designed studies have been carried out into such basic factors as the distribution of surnames within the criminal

population to determine whether their distributions conform with known distributions in other large files, such as the Social Security file, utility user files, and military files. This type of information is a necessary prerequisite to the development of the system itself.

The data is available, the sampling techniques are known, the methods of statistical inference exist to determine the reliability and limitations of the identification problem. The planning and implementation of a full scale system should not be undertaken until adequate attention is directed toward this problem. It is conceivable that examination of the identity problem could suggest that until improved technology for identification purposes emerges criminal history files have size limits beyond which they cannot within practical limitations be extended.

It will serve no useful purpose to dwell further on the problems of identification. The problem exists, and prudence dictates that the limitations it will impose on the future growth of person-oriented files be ascertained. There are other areas which present equally important problems and it seems appropriate that we consider their nature and their probable consequences.

Since it appears that a key element in a National Criminal History file is the establishment of a central repository containing as broad a class of the criminal history population as possible, it is of interest to examine alternative approaches which are available in the development of such a system.

There are actually two basic approaches to the problem of establishing a central repository of criminal histories. Briefly, these may be summarized as follows:

1. A truly central repository in which a single computer complex contains all indices, identity modules and text at a single location. Access is by an extensive communications system with terminal points located throughout the geographic area served.
2. A modified central repository in which the indices and identity modules are located physically in a single central computer facility and the text is located in a series of local or regional computer systems. Communications between the central computer and the local or regional computers are by digital communication facilities.

A review of these two approaches will serve to bring into focus some of the problems associated with each.

Project SEARCH has in its initial demonstration period adopted an approach that embodies the decentralized text storage concept. Under this concept the central repository contains indices and identity modules only. It serves to establish identification according to current criteria and provides a reference to where the actual text is stored. In addition the central index computer serves as a mechanism for collecting and assembling text material and for transmitting the assembled information to the requesting

station.

It should be noted that under such a concept, only the identity modules and associated indices are actually physically located in a central repository. Text material may reside in one or several locations. Unfortunately, the extent to which a single person's history is likely to be distributed over multiple locations is presently unknown. Examination of a limited sample of criminal histories suggest that the average number of jurisdictions associated with a single criminal history is over 3. Nothing is known at present concerning the shape of the distribution about the mean, although it is reasonable to assume it is negative exponential.

The advantages of a decentralized text storage approach are several. First, it offers the advantages of a broad data base while providing a high level of local or regional autonomy over criminal histories. Each local region physically possesses its own records and may, if it so desires at any time withdraw from the system or impose restrictions on the access to certain records. Second, such local autonomy has a built-in mechanism for distributing the cost of the system among user agencies in some rough proportion to their use and size of their data base. It has the further effect of distributing the bulk of the data storage (text) among many systems rather than placing the storage burden on a single system.

It may be further argued that since it appears that within the next decade every state and major region will have computer systems dedicated in full, or in part, to the criminal justice function, distributing the storage to local or regional level will create economies of scale. If, for example, an agency already has a computer, the incremental cost of adding storage is not a significant percentage of the whole.

The primary disadvantage of the modified central repository approach is that in terms of systems efficiency it cannot approach that of the true central repository. Since text for any given matched request may be distributed at from one to N locations, the collection, assembly and retransmission of text data is less efficient than a system where all text is in a single location.

A second disadvantage is that as a system embodies more components their combined reliability declines. It generally follows that within any system anything that can happen will eventually happen. The more elements that are contained within a system—the more elements there are that fall within this law. Paradoxically, one of the arguments advanced in favor of the decentralized text storage is that the distribution of the text portion of the data base reduces the possibility of the entire system being inoperable. However, if one or more repositories are unavailable to the system, the system's effectiveness is compromised. Intuitively, one would suspect that a central system would have a reliability

coefficient significantly higher than the decentralized text storage approach.

Finally, the question of whether such an approach is technically feasible within reasonable economic constraints once the system moves beyond the prototype stage is yet to be answered. The decentralized text storage approach involves a network transmission problem of extraordinary complexity. Just how complex this problem is cannot be ascertained until some rigorously constructed studies and simulations are carried out.

Turning to the pure central repository concept, we can examine its more obvious advantages and its more visible disadvantages. The central repository concept involves the location of indices, identity modules and texts in a single central computer complex. It resembles the central index in the sense that the indices and the identity modules are the same. The two approaches differ primarily in the location of the text. In the central system the text is located in a single contiguous record whereas in the decentralized text approach, the text is located in several physically remote locations.

The advantage of a central repository is the relatively higher efficiency with which text can be retrieved on matched identities. Text need not be collected and assembled from physically remote locations before transmission to the requesting agency. Further, the reliability level of equipment can be controlled more stringently. Considering the reduced complexity of the data transmission network problem, it seems likely that greater reliability at equivalent or lower costs can be achieved.

The disadvantages of the centralized text storage system in many respects parallel the advantages enumerated for the decentralized system. First, of course, there is the question of giving up local control of certain classes of records. While on a purely rational basis, this disadvantage may appear to be more illusory than real, in practice attitudes toward this problem run deep.

A more important and more formidable disadvantage lies in the area of technology. Without a full knowledge of the population size, the average text size, traffic volume levels and match frequency, there is no way of being completely sure that a central repository of the size required can be established within any justifiable cost structure.

The final problem is one of cost allocation. This is primarily a matter of policy and there is ample precedent for the Federal Government assuming the financial burden of services that benefit all or a group of the local jurisdictions.

We have been discussing two conceptual approaches, which in a sense are polar. There are many degrees of centralization that lie between. For example, texts could be maintained in four or five regional computer repositories. Alternatively, regional

switching computers could collect and route data requests to a central computer.

The alternatives for how the National System for the Interstate Transference of Criminal History can be approached are numerous. The data and the quantitative techniques for reaching a determination of the optimal feasible approach are available. Yet to date there has been a surprising lack of real effort directed toward studies that will answer these questions.

If we are going to embark on the establishment of a National System for the Transference for Criminal History Information it is imperative that certain steps be taken as part of the next phase in Project SEARCH.

Funding must be provided in ample quantity to undertake a study of the identification problem inherent in a national criminal history file utilizing existing technology and identification elements that can be used within this technology. Such a study should, as a minimum, include drawing statistically derived samples from Federal and selected state criminal history files to, as a minimum, determine the following:

1. A statistically derived estimate of the true population of persons with criminal histories by class of criminal act.
2. A statistically derived model of the frequency with which combinations of common identifiers within the expected population will produce false drops.
3. Utilizing statistically sound sampling techniques, a determination of the distribution of surname, given name and other identifiers within the criminal history population should be made so that subclass size can be determined.

Funded research at significant levels should be encouraged to study in more detail the relative efficacy of various types of identifiers or combinations thereof. Far too little attention has been directed toward the study of such basic factors in the rush to get systems "on the air." If there is to be a significant increase in the quality of identification using present technology, a considerably higher level of emphasis must be given this important activity. It would be short-sighted indeed to embark upon a national system without a better foundation than we currently have regarding identification criteria and techniques.

Furthermore, substantial funding should be made available for encouraging research and development in technological areas, such as remote fingerprint scanning, voice pattern identification and other promising positive identification techniques. Eventually, as file sizes and text availability grow, the ultimate solution must be the development of techniques of absolute personal identification of individuals. If we are to put millions of dollars into a National criminal information system, we cannot neglect the technology that the future welfare of the system must rest upon.

Beyond the problems associated with identifica-

tion methods and techniques, effort should be directed toward determining the optimal feasible conceptual approach to the storage and retrieval of a National criminal history data base. As a minimum, the SEARCH Committee should initiate a study or a series of studies to undertake the following.

A statistically sound sample of records should be drawn from both state and Federal criminal history files. This sample should be used as the basis for a number of analytic studies.

Samples should be analyzed to determine a statistically reliable estimate of the size of the criminal history population. This should include estimates of the number of individuals in the file, the number of text entries, the mean and variance of the number of text entries per person and the total volume of text characters, including their mean length and distribution. This type of basic information will permit sound estimates of the file sizes of selected classes of histories to aid in policy planning to determine those classes of criminal histories that should or can be retained in the file. From such a sample, estimates of the overlap that exists between current state files and Federal files can also be determined.

A statistically derived estimate should be made of the number of different geographic sources of origin that a single identity in the file is likely to have. The distribution of persons who have 1, 2, 3, . . . . . N entries from different locations should be established. Such data is essential in evaluating the type and magnitude of network transmission problems that will be encountered under alternate conceptual

approaches. An analysis of the geographic distribution of such entry sources will also yield valuable information for network planning.

Utilizing existing manual files at the state and local levels a statistically sound sample of user activity should be drawn to permit reliable estimates to be made of the volume levels that a National network will have to handle. The initial experience gained within Project SEARCH should contribute valuable information to such a study. The same data should be used to determine the rate at which requests result in true matches, false matches, and false drops, to further identify the network transmission problems.

This type of effort should lead to the development of a model of the system that will permit a rational approach to be followed in developing the final physical structure of the system. It seems only sensible that alternate models of the system should be simulated, utilizing the parameters derived in the sampling and analysis, to determine the system performance under a range of load factors and different conceptual approaches.

While the foregoing discussion is not intended as a definitive or complete exposition concerning methodology of the extent to which such studies should be carried, it does suggest however, that this class of problem should be studied. It seems inconceivable that a full effort for a project as far-reaching as SEARCH be undertaken without this type of careful analysis to establish the necessary foundations.

## COMPUTERIZED INFORMATION SERVICES FOR LEAA

by Alfred Sansone  
Acting Director, Systems Analysis Center  
Law Enforcement Assistance Administration  
U.S. Dept. of Justice

The Systems Analysis Center of LEAA is now developing a number of automated data processing systems which should aid substantially in fulfilling the information needs of the criminal justice community. Because of the newness of the Center, these systems are still in their developmental stages. Within the next five months, however, the first of these will be operative. Within a year we expect to have three interactive information systems operating on a nationwide basis, providing useful and timely data for use among local, state, and federal criminal justice agencies.

### Grants Management Information Service

The first of these information systems to be available is the grants management information system, or GMIS. The GMIS is intended to serve two basic purposes. The first is to provide management data for the effective direction of LEAA's complex and expanding grants program. The second is to provide State Planning Agencies with on-line access to the grants management data-base. The GMIS data base will provide information to operating and senior managers in terms of direction of program, degrees of success for classes of programs, and coverage of the designated target areas—police, courts, and corrections. A system of this nature would additionally serve as a tool to inform the states of grant activities being carried out in other states. It would also aid in the minimization of duplication of similar research and developmental programs. In addition, it would assist management at the federal and state levels in increasing the impact of grants by furnishing a factual base for grant program analysis. In short, the GMIS will be a significant tool to assist managers at various levels to monitor and increase the total effectiveness of the overall grant program and to provide information to Congress and the public on the utilization of funds. More specifically, by gathering and categorizing the subjective and financial information on each grant, the GMIS will function to recast this data into a format to suit the needs of the requesting office, be it the LEAA Administrator, Director of the Office of Law Enforcement Programs (LEAA), Congressional Liaison, etc. This will be achieved by categorizing each activity in multi-dimensional terms. The primary categories are the major components of criminal justice systems: police, courts, and corrections. Secondary categories are:

- 1) Type of assistance—state block grant, discretionary grant,

LEEP/Academic Assistance, NCJISS grants, National Institute R & D grants, fellowship program, contracts, technical assistance.

- 2) Duration of grant.
- 3) Funding—solely LEAA, matched, percentage of recipient contribution, actual dollar contribution.
- 4) Geographic—cities, states, regions, state consortia, national.
- 5) Demographic—relative population, actual population, congressional districting.
- 6) Methodology—organizational development, salary, research, education, training, physical construction, equipment.
- 7) Type of criminal activity—organized crime, crime against persons, crimes against property, civil disorder, overall.
- 8) Criminal Justice system type—manual, fully automated, hybrid.

This list is not intended to be complete. Upon completion of a thorough investigation of the LEAA program, additional categories may be needed.

The LEAA GMIS will be complemented by communications—linked state grant information systems maintained by the State Planning Agency within each state. These state GMIS's will contain additional program information at the level of detail for which the state has responsibility. For example, the sub-grants which result from an LEAA state block grant will be defined within the state GMIS in terms of the same categories of the LEAA GMIS. This commonality of terms and the resulting corresponding framework for the state and LEAA GMIS's will guarantee maximum interchange of information with minimum effort and cost.

The GMIS will respond to information needs at many levels. The primary goals will be:

- 1) *Program Monitoring and Management*—The single most important product of the GMIS will be the periodic reports which describe the aspects of the total LEAA program. Historic information will be available for comparison. Projected plans and goals will be added for evaluation of the program and status reporting. From this information, management plans can be implemented, modified, or significantly changed.
- 2) *Status of Grant Applications and Awards*—Each grant request will be tracked through the system as it is processed from the initial submission through evaluation, authorization, approval, implementation, and final evaluation. As each significant milestone in the procedure is achieved, the action accomplished will be recorded. This will enable program managers to determine the status of grants and to continually evaluate the processing of grant requests. This aspect of GMIS will enable program managers to respond to internal and external inquiries in regard to the status of grants in process.
- 3) *Financial Management*—By monitoring grants through the processing stages leading to final disbursement of funds from the federal level through the state sub-grant mechanism, the financial managers will be continually informed as to the financial status of the LEAA program from the most general to the extreme detail levels.
- 4) *Program Information Requests*—In the course of the LEAA daily business, unanticipated information requests continual-



ly arise from internal and external sources. Most often the time considerations of these requests are of a highly critical nature. That is, if the response is not generated rapidly, its value quickly diminishes. Within non-computer supported systems, the data response is most often compiled by a massive manual effort, involving the expensive time of managerial and technical personnel. The GMIS will be so structured that these "one-time" inquiries can be processed rapidly, accurately, and inexpensively. The most common examples of this type of data request are from the Administration officials involved in responding to Congressional information requests and fulfilling public information needs.

5) *Congressional Presentation Support*—The flexibility of the GMIS will greatly enhance the ability of LEAA to justify budget requests by improving the quality and depth of budget presentations to Congress and, additionally, to respond to unanticipated congressional requests for additional detail which arise during hearings, testimonies, etc.

The purpose of the GMIS is to meet information needs of managers at all levels.

This means that data elements which serve specific functional areas can be combined with data elements from other functional areas to create management information for decisions across organizational lines. This includes management officials at federal, state, and local levels.

Developing an LEAA/state coordinated data base will allow a succinct interchange of information between LEAA and states, or from state to state. This ability for a state to access the GMIS data base of LEAA and other state activities will reduce duplication of development efforts at the state level and aid in avoiding less productive projects by sponsoring an interchange of experience between states.

#### Technical Reference Service

Another LEAA information system under development is the technical reference service. This service will be designed to fill the reference needs of the entire law enforcement and criminal justice community—police, courts, corrections, prosecution, probation and parole.

The Reference Service will focus on research and development reports and documentation on action projects; however, it will also include books, periodical and journal articles, and films pertaining to law enforcement and criminal justice. In addition, it will serve as an index of available criminal justice information systems.

The groups to be served comprise LEAA including the regional offices, the State Planning Agencies (SPA's) and local law enforcement planning agencies, state and local police, legislative bodies, other government agencies with law enforcement responsibilities, professional associations, and private non-profit crime prevention and control groups. Other major components include courts and correctional agencies, the educational and research communities, and the general public.

The specific subject areas, activity areas, and categories which will be emphasized initially in-

clude: criminal justice planning, various LEAA funded projects, selected LEAA/SPA funded projects, police management and operations, police manpower (recruiting, training, utilization and development), law enforcement equipment, police-community relations, criminal justice statistical and information systems, computer applications in law enforcement and criminal justice, organized crime, and films related to the above.

State-of-the-art reviews will be produced in selected fields of law enforcement and criminal justice. The publication of an abstract journal on research and development findings, selected action project results, journal articles, and other activities are also envisioned.

The National Criminal Justice Reference Service, when fully operational, should play a major role in improving and strengthening law enforcement throughout the nation. It is expected that this system will be available within the next nine months.

#### Criminal Justice Statistics Service

The third automated information system being developed for the nationwide criminal justice community is the national criminal justice statistical system. The data-base for this system will contain Uniform Crime Reports for the past 10 years; social, economic, and demographic data from the Census Bureau; and victimization statistics now being developed. In addition, the system design will include the capability to access the LEAA grant information data-base so that statistical correlations may be performed involving grant objectives, crime rates, employment data and the like.

The users of this system will be LEAA researchers, SPA's, Universities, and criminal justice agencies which can effectively use such a data source, such as the IACP and the NCCD.

These users will be on-line to the statistical data-base through remote telecommunications terminals located at their various agencies.

Work is now in progress at LEAA to specifically define user needs, file organization, storage, updating, and retrieval capabilities. The national criminal justice statistical system should be operative within 12 months. The system design will include a determination of the degree to which this system must interact with the grants management information system and the technical reference system in the transfer of information from one system to another.

The development of these three LEAA information systems to produce data on grants, technical reference materials and statistical information should be a substantial step forward in making available the kind of data now needed by criminal justice agencies to fulfill their responsibilities. The Systems Analysis Center of LEAA is now moving forward as rapidly as possible in the development of these needed systems

and in the investigation of other areas where systems analysis techniques can strengthen the effectiveness

of criminal justice agencies at the local, state, and federal levels.

**SESSION IV**  
**STATISTICAL DEVELOPMENTS**

**SESSION CHAIRMAN:**

**James A. McCafferty**  
Assistant Chief  
Division of Procedural Studies  
and Statistics  
Administrative Office of the  
United States Courts

**THE NATIONAL CRIMINAL JUSTICE STATISTICS CENTER**  
**A Long-Range Program**

by **George E. Hall, Director**  
National Criminal Justice Statistics Center  
Law Enforcement Assistance Administration  
United States Department of Justice

The National Criminal Justice Statistics Center was established approximately one year ago. Since that time we have begun a number of projects and have developed some rather extensive plans for the future.

The Center basically performs three different but related roles. First, we provide statistical support to LEAA. This involves providing information for planning, budgeting and evaluation.

Second, we act as a principal criminal justice data collection agency for the Federal Government. In order to carry out this mandate, we collect, process and disseminate information on a broad range of criminal justice topics.

Finally, we support states and local units of government in the development and improvement of their own statistical systems.

Let us examine these roles more closely to see what the implications are for the criminal justice community as a whole.

The first role mentioned, that of providing support within the agency, would at first appear to have little relevance outside of the agency. However, the development of a general statistical data base available to states which was referred to earlier in Mr. Sansone's paper,<sup>1</sup> was conceived as a tool to supply rapid answers to questions from within the agency, the Congress and the Administration. However, it soon became obvious that the states needed a similar service to cope with their burgeoning statistical requirements. Thus the idea of supplying the states with terminal access to such a data base was born.

The collection and dissemination of data on crime and criminal justice is by far the largest, but not necessarily most important, function performed by the Center. Surveys and censuses are being conducted in a number of areas of crime and the administration of justice.

The major effort revolves around large sample surveys currently under development. These surveys, referred to as victimization surveys, will provide us with several new measures never before available.

First, we will be able to look at a new measure of the incidence of crime. For the past forty years, we have been depending on crimes known to the police to provide an overall crime rate. This is an extremely valuable measure of police workload, and to a large

extent provides an accurate indicator of changes in the crime level. However, this traditional measure has a number of limitations. One is that it basically provides only information on reported crimes and as we know, many crimes go unreported for one reason or another. These estimates also reflect different measurement standards between reporting agencies. Finally, the current program is voluntary with less than complete reporting.

Victim-based data also have imperfections. For example, recent work using reverse record checks indicate that for certain crimes, notably assault and larceny, people either fail to remember that they were victimized or they have changed their minds about the essential nature of the occurrence. However, the Center is now conducting a number of experiments to develop methods to eliminate these response errors or at least to quantify them.

These sample surveys will however provide a wealth of new information. For victims, we will be able to estimate the true economic and social costs of serious crime. Moreover, since these are general population samples we will use them to obtain information on the public's attitudes toward crime and law enforcement. Further, we will be able to ascertain the crime avoidance measures being taken by the general population and the cost of these measures. When appropriate, these surveys will also be used to discover the extent of public awareness of various criminal justice programs.

Experimental work is also underway to determine whether sample surveys can be utilized to obtain other crime measures. For example, the Center is examining possible techniques to use in surveys to estimate such things as the amount of white collar crime and the use of dangerous drugs.

Where do we stand now on these survey statistics efforts? In the past few months, four major research projects have been undertaken. As a result of these projects, carried out in conjunction with the Census Bureau, we feel that we can now measure a limited number of serious crimes. In January, some victimization questions will be included in the Census Bureau's Quarterly Household Survey to provide national estimates of personal victimization. This will mark the beginning of an ongoing national survey to provide this victim information on a regular basis.

In addition, major efforts are underway in San Jose, California and Dayton, Ohio, to obtain estimates of crime as well as attitudes about crime and law enforcement in the area. The data from these surveys will be used as part of LEAA's Pilot Cities projects in

those cities.

The Center's data collection efforts include a number of other projects. One of great importance, is designed to measure the level of employment and expenditures for criminal justice activities in the states, large cities and populous counties. These data will provide information needed by the states and communities for criminal justice planning purposes. The Federal Government also requires such information for legislative planning and the development of national goals. There is even a possibility that these data will take on even more significance. There is currently pending, an amendment to the 1968 Safe Streets Act to base the "pass through" requirement on the proportion of funds spent by the states and local units of government in the previous fiscal year. The Employment and Expenditure Survey would, in all probability, provide the basis for the new "pass-through" requirement.

The Center has also taken steps to discover just what agencies constitute the criminal justice system. To this end, a census was taken early this year. From this effort, we have developed a directory of criminal justice agencies which will be published soon. This project is also being used as the basis for the development of a study of court organization. This study will shed light on one of the major statistical problems in the measurement of the criminal justice system. The judiciary performs many functions outside of criminal justice, but planners need to know how much of each court's resources are devoted to the criminal process and how much to civil activities.

Also related to our census of criminal justice agencies is a detailed census of jails which was also completed recently. For the first time, we know how many county and city jails exist—4,023. We also know their capacity and to some extent the number and kinds of prisoners they contain.

In a related area, the Center is also assuming the responsibility for the National Prisoner Statistics program. This is one of the oldest continuous statistical series in criminal justice. The Center will modify the program by automating the data processing phase to be able to produce more timely information.

The discussion about jail and prison statistics brings us to a grey area between statistics collected at the Federal level and statistics generated at the state level. Both of the immediately preceding programs generate statistics based on the offender. Other papers this afternoon will go into more detail about an offender based statistics program operated at the state level. Hopefully the programs I just described will shortly be absorbed into the states' own statistical programs.

A major part of the Center's interest involves encouraging the states to develop their own statistical expertise and providing technical and financial assistance to achieve this end. In the area of offender

based transaction statistics, the Center is heavily committed to Project SEARCH and to the statistical efforts which are being carried out under the SEARCH umbrella. We hope that the SEARCH states will continue their active interest in the development of statistical programs. If the national interest is sustained, the Center will commit its grant funds to support these kinds of programs.

In addition to Project SEARCH, many states such as California, Minnesota, the District of Columbia, New Jersey and others are developing or have developed offender based systems on their own. We are watching all of these efforts with great interest and hope their techniques can be utilized by others as they develop their own offender based transaction statistics systems.

Since September, in different parts of the country there have been briefings sponsored by the Center to acquaint criminal justice administrators with the use of statistics in the operation of their programs. The Center is now planning a series of workshops which will be developed jointly with people from the more advanced states to further encourage other states to develop compatible systems. The initial planning for these workshops is now underway and we hope that there will be full development within the next several months.

The Statistics Center also has a grant program to provide discretionary funds to states to develop modules of full transaction systems. These modules can be in the area of police, courts or corrections. The systems must however be designed in such a way that they can be interfaced with the statistical systems of any other part of the system. In other words, work will have to be done on the establishment of unique identifiers within the criminal justice system of a state and tentative agreement would have to be reached on the establishment of a centralized statistical function within the state.

The development of this centralized statistics function within the states cannot be stressed too strongly. As the President's Crime Commission pointed out, "Difficulties inherent in dealing with thousands of different agencies, over which there is no Federal control, led the Wickersham Commission to recommend that the Federal Government deal only with state statistical bureaus. Because of their position within the state criminal justice structure, these bureaus could, it was felt, require the maintenance of necessary records and could, through training, and monitoring programs, insure the quality of the information reported."<sup>2</sup>

This quote is particularly significant since it not only stresses the development of State systems but alludes to the Wickersham Commission which made the same recommendation forty years ago. Although the need has been apparent for decades, it has now become acute. With the advent of computers talking

to each other at various levels of government, a chaotic situation will develop unless an independent central statistical function is developed in the states.

Along with its interest in developing the transaction statistics programs, the Statistics Center also has a grant program which has been used primarily to develop a statewide Uniform Crime Report capability in the states. UCR as you know, provides the other measure of crime—crimes known to the police. Moreover, it provides information on arrests and clearances, and to the extent that these data are offender based they tie in very well to an offender based statistics program. In the first two years of the statistical portion of the discretionary grants, approximately \$1 million will have been earmarked for the development of UCR programs.

Finally, the Statistics Center is encouraging the states to develop their own administrative statistics. Each of the states is required as part of its comprehensive plan to provide information on expendi-

tures, employees, and the institutions of criminal justice within their state. These data are needed at the state level to provide the state planning agency and others such as the state administration and legislature with the kinds of data needed to plan rational state programs. Similar data are also needed by LEAA to plan their own discretionary programs and to examine the reasonableness of the comprehensive plans presented by the states.

As you can see, the Statistics Center is embarking on an optimistic program for development of data at the national level and the encouragement of states to develop their own information at the state level. We feel that the entire area of the administration of justice can be improved markedly when the information describing the overall system is available to planners, scholars and administrators.

<sup>1</sup> Computerized Information Services for LEAA by Alfred G. Sansone.  
<sup>2</sup> Task Force report Crime and its Impact—an Assessment, President's Commission on Law Enforcement and the Administration of Justice, U.S. Government Printing Office, Washington, D. C. 1967, p. 124.

# CRIMINAL STATISTICS—STATE OF THE ART STATISTICAL DEVELOPMENT

by Charles M. Friel, Ph.D.  
Director of Research  
Institute of Contemporary Corrections  
and the Behavioral Sciences  
Sam Houston State University  
Huntsville, Texas

Around the turn of the century Mark Twain wrote that the American System of Justice was the greatest in the world. He did allege, however, that it suffered from one problem; namely the difficulty in finding twelve ignorant and illiterate men to serve on a jury. Quite possibly in Twain's day this was the only problem confronting the administration of justice; yet today, the problem of jury selection is only one of a myriad of problems threatening the efficient administration of criminal justice.

When we speak of the criminal justice system in 1970, we are speaking of the activity of 420,000 law enforcement officers in over 40,000 separate agencies at a total operating budget of 2.5 billion dollars a year. The system involves the decision-making of some 3,700 superior court judges and 15,000 lower court judges who are responsible for the sentencing of two million felons, and 30 million misdemeanants a year. Aside from the administration of adult justice the system is responsible for the handling of more than one million juveniles, 600,000 of which can be categorized as delinquent. The present system operates in excess of 3,400 county and county-city jails, 50 state penal systems, and employs 121,000 correctional workers who have custody over 1.3 million people at a total operating budget of 1.5 billion dollars a year.

This description of the criminal justice system is a statistical description. The figures that I used are criminal justice statistics. Though such a description may give you the impression that we involved in the administration of justice have a fairly good statistical grasp on the breadth and scope of the system, I submit that it is a false impression since the statistics I used are mere estimates and "guesstimates" derived from a variety of annual and statistical reports generated at both the federal and state level, various crime commission reports, and selected research articles. By no means is the statistical information we have about the administration of justice totally adequate in providing a reliable picture of the operation of the criminal justice system.

This brings us to the point of today's discussion; namely the state of the art in criminal justice statistics. The purpose of my talk this afternoon, therefore, is twofold:

1. To discuss criteria that can be used to evaluate existing criminal justice statistical systems or propose systems that are still on the drawing boards.
2. Discuss the state of the art of contemporary criminal justice statistics.

## *I. Criteria for the Evaluation of Statistical Systems*

Before we can adequately evaluate the state of the art of criminal justice statistical systems it is necessary to derive some criteria which can be used to determine the utility of such systems. I would like to suggest that there are at least two primary criteria that should be used in the evaluation of any criminal statistical system. These criteria are:

1. That the statistical system be relevant to some problem area in criminal justice which has a relatively high priority.
2. That the statistical system be reliable.

The primary criteria in planning or evaluating any statistical system is whether that system is relevant to a priority problem area within a criminal justice system. Frequently we find ourselves developing statistical systems in areas that may have little or no impact on the serious problems confronting the administration of justice. It is not a sufficient rationale to develop a statistical system in a given area simply because the data in that area is readily accessible. Nor is the fact that it is politically more feasible to develop a statistical system in a given area, sufficient justification for its design and implementation. I stress the importance of this criteria because the design, implementation and maintenance of any statistical system involves a major investment of time, manpower, and money. Currently we should be investing the major portion of our resources in developing statistical systems which provide information on priority problems and devote only a minimal effort in the development of those systems that are related to incidental problems.

The second criteria I would like to suggest for the evaluation of criminal justice statistical systems is that the system be reliable. Unless our current statistical systems and those that we plan to develop are sensitive enough to reflect the impact of the various programs that we initiate, such statistical systems are of questionable utility. Since we invariably use statistical systems to evaluate the impact of crime preventative, rehabilitative and other programs, we must assure ourselves that these systems are sensitive enough to reflect the impact of such programs. Any statistical system that is so grossly inaccurate as to be

incapable of reflecting the impact of our program should be either totally revamped or abandoned for the sake of an alternate system of greater reliability. Preserving and maintaining such inaccurate statistical systems contributes to the current level of misinformation, leads to poor planning and works against the intelligent administration of criminal justice.

Given these two criteria whereby to evaluate statistical systems let us move to the main point of today's discussion; namely the state of the art in contemporary criminal justice statistics.

## II. Contemporary Criminal Justice Statistical Systems

In discussing with you the state of the art one might choose a variety of approaches to evaluate contemporary systems. There are at least two approaches that might be used, the first of which I would like to call the "walking-backwards-looking-over-the-shoulder-approach." It seems to be an occupational hazard of practitioners within the criminal justice system to evaluate where we are today by looking at where we were a few years ago. Any evaluation of contemporary statistical systems which involves comparison of the state of the art today with where we were a few years ago produces a false impression of success. Obviously, if we have made any effort in advancing our information-gathering procedures we will appear more successful today than we were a few years ago. Going backwards has the two inherent limitations of giving the false impressions of success and providing no indication as to where we are in terms of where we should be.

I therefore suggest, that a better approach is to ask the question: "What is the state of the art in contemporary statistical systems relative to the priorities we have set for such systems?" Therefore, for the purpose of our discussion this afternoon, I should like to discuss the variety of statistical systems we have today relative to an idealized model which dictates what our statistical priorities should be. In adopting this approach one must assume that there is such a thing as an idealized statistical model which emphasizes such priorities. Unfortunately, there is no such model.

I believe that until recently one of the primary problems that has plagued the development of statistical systems has been the fact that we have not had an idealized model whereby to direct and evaluate our activities. This condition exists, I think, because we do not have any super-criminal-justice-administrator who sets such priorities. Traditionally, statistical priorities have been set by the various agencies within the criminal justice system, who by their very nature have little or no relationship with each other, other than the fact that the offender passes from one agency to another. I believe that it is only recently that we have developed a consensus of opinion as to

what are priority needs in terms of criminal justice statistics. Certainly, the Congress and the fifty state legislatures have indicated what they see to be the priorities in the administration of justice by the passage of various penal and procedure laws, as well as defining where funds will be spent. Similarly, LEAA and the various state planning agencies have emphasized informational priorities via their planning and funding activities. Various documents such as *The Challenge of Crime in a Free Society*, and the report of the Bureau of Census dealing with the national need for criminal justice statistics has set forth statistical needs which seem to reflect the consensus of opinion of practitioners within law enforcement, the judiciary and corrections.

A perusal of these various sources suggests that there are six priority areas in which we need statistical information. These include:

1. The incidence of crime
2. Census data
3. Transactional data
4. Recidivism data
5. Manpower/education/training data
6. Physical resources/programs/fiscal data

To return now to the main purpose of this discussion, that is to evaluate contemporary statistical systems, let us use this six point statistical model whereby to evaluate contemporary statistical systems.

### Incidence of Crime

There is no question that one of the primary areas in which we need timely and reliable data is in the area of the incidence of crime. We need information as to how much crime exists at any point in time, what is the incidence of various types of crime, is the current incidence of crime above or below expected levels, are there perceivable trends with respect to the commission of certain types of crime, etc.

At the present time we have at least two statistical vehicles which attempt to provide information on the incidence of crime; the *Uniform Crime Report* and victimology studies. At the present time the *Uniform Crime Report* as published by the Federal Bureau of Investigation receives offense information from approximately 8,000 local police agencies covering 92% of the population. The *Uniform Crime Report* does not attempt to gather statistical information on all types of criminal offenses, but limits reporting to index crimes including murder, forcible rape, robbery, aggravated assault, burglary, larceny over \$50 and auto theft. The inherent limitation of this type of statistical system is that it is totally dependent upon the victims or observers of a crime reporting such crime to the police. Since many crimes go unreported because of embarrassment to the victim or because the victim may feel that there is nothing that the police can do now that the crime has been committed, the *Uniform Crime Report*

represents a lower bound estimate of the true incidence of crime.

Another statistical approach which attempts to provide information on the incidence of crime are victimology studies. A number of such studies have been conducted under the auspices of the President's Commission on Law Enforcement and the Administration of Justice. These studies conducted by the National Opinion Research Center, Survey Research Center of the University of Michigan and the Bureau of Social Science Research tend to indicate that the true incidence of crime is in some cases twice to three times that reported by the *Uniform Crime Report*. For example, the study conducted by the National Opinion Research Center based upon 10,000 interviews indicated that the incidence of forcible rape was three and one-half times higher than that reported in the *Uniform Crime Report*, while burglary was found to be three times higher and aggravated assault, theft, and larceny over \$50 was found to be twice as high. If the results of these studies are valid, then one might conclude that the incidence of aggravated assault could increase 100% as reported by the *Uniform Crime Report* before one necessarily had to conclude that there had been a real increase in the incidence of crime. It is quite conceivable, therefore, that recent increases in index crime might actually reflect the increasing responsiveness of victims who report crimes to local police agencies rather than an actual increase in the incidence of crime *per se*.

Probably the most serious limitation of victimology studies as an approach to the incidence of crime is the fact that they are not conducted on a regular basis. However, it is encouraging to report to you that LEAA is currently planning a series of victimology studies which should greatly enhance our knowledge of the incidence of crime.

### Census Data

The second priority area I have identified in which we need statistical information is census data. By this, I mean that we need reliable and timely data about the number of persons we have in process at various points within the criminal justice system. This is essentially the same thing as "head count data," or what we usually find published in annual reports.

What then is the state of the art with respect to statistical systems that provide census information about the various levels within the criminal justice system? Let me suggest that there are at least six areas in which we need census information within the criminal justice continuum. These include:

1. Number of persons arrested
2. Number of persons jailed
3. Number of persons handled by the courts
4. Number of persons probated
5. Number of persons imprisoned
6. Number of persons paroled

1) *Arrests* At the present time the *Uniform Crime Report* provides the only national statistics on the number of persons arrested. In 1969, the Bureau received arrest information from local agencies covering approximately 71% of the population. The *Report* does provide arrest information by age, race, sex, offense, area of the country and other demographic identifiers.

2) *Jails* The National Survey of Corrections, as reported by the President's Commission on Law Enforcement and the Administration of Justice, indicated that there are 3,473 jails in the United States having custody of approximately 141,000 inmates. They estimated that county based jails receive more than a million people a year and operate on a budget in excess of 141 million dollars a year. Aside from sporadic information of this type there is little regular statistical reporting of census data on county jails. This is predicated by the fact that most jails are county or county-city based. Other than some exceptions such as in the states of Alaska, Connecticut and Rhode Island where the administration of county jails is by state agencies, most jails are under county jurisdiction. Because of these administrative realities, it is extremely difficult to gather national census statistics on county jails.

There are, however, some encouraging signs of improvement in this area. To be sure, the movement toward regionalization of jail facilities will provide better statistical information on jail populations. In addition, recent activities of the Bureau of the Census, as well as studies being conducted by LEAA suggest that we can expect substantial improvement in the scope of statistical knowledge about jails.

3) *The Courts* As mentioned previously, the state courts in this country involve the activities of approximately 3,700 superior court judges and 15,000 lower court judges. In evaluating the state of the art of statistical systems which provide census information on the activities of the courts, one would have to say that there is a great deal of variability in statistical reporting state to state. At the Federal level, however, the Administrative Office of the United States Courts provides excellent statistical information on the operation of both the criminal and civil courts.

Among the original six participating SEARCH states (New York, Michigan, Minnesota, California, Arizona and Maryland) four can provide rather substantive information on court disposition and sentencing, in some cases reporting this information by offense, age, race and sex. Examination of statistical information in other states, however, indicates a great deal of variability with little state to state compatibility in the data available.

As in the case of jail statistics, I believe that there

are encouraging signs indicating the development of statistical systems for the judiciary. Certainly the recent address of Chief Justice Warren Burger suggests the judiciary itself is vitally interested in providing better management information for its own operation. I believe that this interest in statistical information by the judiciary itself coupled with the success of Project SEARCH and other activities of LEAA represent a significant impetus for the development of judicial statistics.

4) *Probation* A fourth area in which we need census information is probation. At the present time there are 37 states which have either a state administered probation system or a partially state partially local administered probation system. In such states, one can find annual statistical reporting which provides relatively substantive information on the utilization of probation. However, in those states in which probation is entirely county based, such as Texas, statistical information on the incidence of probation is difficult to ascertain. Among the six original participant states of Project SEARCH three are capable of providing statistical information on probation which includes in some cases data on admissions, releases and caseloads broken down by age, race and sex. As in the case of census information on judicial activity probation statistics vary widely from state to state with little compatibility among available statistics.

5) *Prisons* At the present time there are 48 Federal penal institutions and 50 state penal systems. Statistical information on prisons is probably better than some other areas we have discussed above. Fairly substantive statistical information on Federal institutions is provided by the Federal Bureau of Prisons. Each of the 50 state institutions do generate a variety of statistical information as found in their annual reports. However, at the present time there is no single statistical document which reports census information on the 50 state penal systems. Until recently, the *National Prisoners Statistics* published by the Federal Bureau of Prisons attempted to draw together statistical information on all 50 states. However, at the present time this statistical system is at a point of transition, and to my knowledge the responsibility for the future publication of the *National Prisoners Statistics* will be assumed by LEAA.

6) *Parole* The final area that I mentioned in which we need census information involved parole. All 50 states have a state administered parole system, and as such, can provide statistical information on parole terminations and revocations. At the Federal level the Administrative Office of the United States Courts provides rather substantive information on parole activities while the *Uniform Parole Reports* attempts to synthesize parole information among the states.

#### Transactional Statistics

Returning now to our idealized statistical model, a third area in which we have a vital need for statistical information is what I have called transactional statistics. By this, I mean a statistical system which can answer such questions as: "How much time does it take from arrest to final disposition?", "What percentage of felons arrested are probated and incarcerated?", "Is there any difference in the time from arrest to trial among persons who are bonded and those who have not made bond?"

Examination of the recommendations made in the *Challenge of Crime in a Free Society* indicates that one of the areas in which we have the least substantive information is in the area of transactional information. We seem to know very little about the flow of defendants through the criminal justice system. In asking the question what is the state of the art in terms of transactional statistics, it is fair to say that in the past we have had no information in this area other than a few research studies which attempted to track defendants from one point in the system to another. It has not been until recently that we have begun to make significant strides in attempting to put together transactional statistical systems.

One of the two primary goals of Project SEARCH has been to develop a prototype transactional system which will allow for the tracking of defendants from point of arrest to final exit of the system. I will not dwell on this effort of Project SEARCH since this afternoon Mr. Kolodney will present a paper which explores this activity in detail. I am happy to report, however, that several states including California, Michigan, and Texas have been experimenting with a development of transactional statistical systems. In addition, LEAA is planning to allocate funds for this kind of activity which should encourage other states to begin development of transactional systems.

#### Recidivism Statistics

The fourth vital area in which we need statistical information is in the area of criminal recidivism. It is absolutely prerequisite that we know the numbers of people that we are reprocessing through the criminal justice system. Although many might criticize the use of recidivism figures as a criteria whereby to evaluate the effectiveness of the system, I submit that recidivism figures are at least one criteria that can be operationally definable.

There are at least two contemporary statistical systems which attempt to provide information on criminal recidivism. Beginning in 1960, the Federal Bureau of Investigation began a program called *Careers in Crime* in which they studied the activities of approximately a quarter of a million offenders. The purpose of this study was to monitor the

criminal activities of these offenders noting the number of times that they were rearrested. The statistics on the *Careers in Crime* Program have been provided in the *Uniform Crime Report* since 1962.

There is probably no correctional institution in the country which does not provide within its annual report some estimation of the recidivism rate associated with that institution. For example, the Texas Department of Corrections reports a recidivism rate of 15%. There exists, therefore, independently generated recidivism figures for each penal system throughout the 50 states. However, these figures are usually based on a number of individuals who have recidivated to a given institution who had served a previous commitment within that institution. In no case, to my knowledge, do we have institutional recidivism figures based upon an individual's rearrest and commitment to penal institutions other than one of original commitment. Though this fact is frequently used as a criticism of recidivism figures generated by penal institutions, I submit that such criticism is unfair since it is almost impossible to determine whether an individual released from a penal institution in one state has been rearrested, convicted, incarcerated or probated in another state. Hopefully, through the development of such systems as suggested by Project SEARCH, we will have the statistical data base whereby to more accurately evaluate recidivistic activities.

It is worth mentioning that although we do have some indicators of felony recidivism, we have little by way of good statistical information on misdemeanor recidivism. This is an area in which we need a greater investment of manpower and money so that we may better understand our success and failures in the areas of the rehabilitation of the misdemeanor offender.

#### Manpower/Education/Training Data

It is absolutely vital in criminal justice planning to have adequate statistical information on manpower, education and training. It is necessary for us to draw a perimeter around what we feel to be the criminal justice system and identify the kind of manpower we have within that system. At the present time, we have very little statistical information on the numbers and kinds of people who function within the system. To be sure, the *Uniform Crime Report* provides some information on the numbers of law enforcement officers throughout the country. LEAA and state planning agencies have been gathering statistical information on criminal justice manpower as part of their planning function. The Bureau of the Census in its publication "*Criminal Justice Expenditures and Employment for Selected Large Government Units*"

does provide some information on manpower within criminal justice. Some statistics can be provided by the Department of Labor, who in recent years has had several grant research programs in the area of manpower and criminal justice. However, in terms of the state of the art it is only fair to admit that our knowledge in the area of manpower is extremely limited.

As an educator, I cannot stress strongly enough the need for better statistical information on the educational resources within criminal justice. As we work toward the renovation of the criminal justice system, plan new programs, implement new procedures, we are constantly facing the dilemma of recruiting qualified and educated manpower. I submit to you that this manpower cannot be generated over night. We need to begin now to identify the educational resources that can develop the manpower for tomorrow. Certainly, LEAA has done much to encourage criminal justice education. Through its grant and loan program it is providing a vehicle whereby thousands of individuals are being attracted to our colleges and universities for future vocations in criminal justice.

In conjunction with the need for statistical information on educational resources, there is a need for more timely information on the incidence, scope and breath of preservice and inservice training as they exist in the fields of law enforcement, the judiciary, and corrections. At the present time our statistical knowledge about the availability and kinds of preservice and inservice training programs is extremely limited. Again, I look to the leadership of LEAA and state planning agencies to provide more accurate and timely information in this vital area.

#### Physical Resources/Program Resources/Fiscal Statistics

Finally, I would like to discuss the sixth area in which I believe we need statistical information. In terms of the state of the art I believe that we have extremely limited statistical information about the physical resources, program resources and financial expenditures within criminal justice.

For planning purposes it is necessary that we have accurate and timely information about the hardware utilized within the criminal justice system. By this, I mean what do we have by way of communications equipment, automated record-keeping systems, management information systems, the current status of jails and penitentiaries, courtrooms, crime laboratories, educational facilities, preservice and inservice training facilities, etc.? At the present time the state of our statistical information with respect to physical resources is extremely limited. I would encourage both LEAA

and state planning agencies to begin to develop those statistical systems which will annually provide reliable feedback on the physical resources of the criminal justice system.

I would also suggest that it is important that we have better statistical information with regard to the kinds of programs we are conducting in law enforcement, the judiciary and corrections. Certainly, the field of criminal justice suffers from a lack of communication within itself since we do not usually share information about the kinds of programs we are conducting and their relative success or failure. Again, I would encourage both LEAA and state planning agencies to report more extensively the kinds of programs being implemented, be they manpower allocation programs, work-release programs, misdemeanor parole programs, etc.

Finally, I would like to stress the need for better statistical information about finances. Admittedly, every criminal justice agency from the smallest city-administered agency to the largest federally-administered agency can provide information on its budget. However, when I speak of fiscal information I mean statistical information that indicates where we are spending money relative to where our priorities have been set. It is not sufficient to know that we spend 2.5 billion dollars a year on local law enforcement. It is vital to know where the 2.5 billion dollars is being spent relative to the priorities we set in the area of law enforcement.

It is certainly axiomatic to mention that spending in the area of criminal justice is small in com-

parison to other governmental programs. It is, therefore, especially necessary for us to have detailed fiscal information which provides feedback on the disparity between where we are spending money and where we should be spending money relative to our priorities.

#### SUMMARY

Let me, therefore, briefly summarize what I feel to be the state of the art in criminal justice statistics. I have presented a six point priority model which pinpoints the areas about which we need statistical information. I have attempted to examine each of these six areas to determine what statistical information systems exist that provide information about each problem area. At the present time there do exist statistical systems that address problems in the areas of the incidence of crime, census information, and data on recidivism. If there is one fundamental criticism that might be made of these systems, it is that they lack reliability. With respect to the other three priority areas that I have mentioned, namely transactional information, manpower/education/training information, and physical resources/program resources/and fiscal data, I feel that we have a substantial absence of statistical information. I suggest, therefore, that while we attempt to increase the reliability, consistency, and compatibility of existing statistical systems we must invest considerable effort in developing statistical systems in these latter three areas.

## PROJECT SEARCH STATISTICAL SYSTEM: RESULTS AND EVALUATION OF THE PROTOTYPE

by Steve E. Kolodney  
SEARCH Statistical Coordinator  
Professional Staff, Public Systems Inc.

This paper describes the work performed in accomplishing the second objective of Project SEARCH.

- To design and demonstrate a computerized statistics system based on an accounting of individual offenders proceeding through the criminal justice system.

At the beginning of Project SEARCH a Statistical Methods Task Force was constituted and, after several conferences and consideration of subcommittee conclusions, it was recommended to the Project Group that:

- ... statistics required to describe the administration of criminal justice should be based upon sets of offender-offense-victim and legal processes facts developed systematically by examining individual criminal acts and individual offenders processed by criminal justice agencies.
- ... a group of individual offenders in separate states be examined and their progress, from entry into the justice system to departure, be traced out showing where and how criminal defendants once in the system leave it. Also, the subcommittee felt that this mortality approach would best provide an example of what could be done to describe the separate and varied systems of adult criminal justice in the participating states.

Such an approach permits entirely new dimensions to be added to the data base, such as time elapsed during processing, a fact with great budgetary implications, or the frequency of multiple actions towards the same offender, an information item with great implications regarding true arrest and conviction rates.

This approach is a step toward a *criminal justice statistics* system, not a police system, nor a judicial system, nor a correctional system.

None of the advantages of older systems are lost. The traditional summary data can be produced by analyzing cross-sections of the longitudinal files.

The Statistical Advisory Committee was formed to apply the new concept on a trial basis in the SEARCH states. This demonstration of possible methods and values of the tracking approach produced illustrations of basic problems in current systems. No central agencies possessed the necessary individual offender histories. Information had to be picked up in the field, at police departments, prosecutor's offices, lower and upper courts, and local and state correctional agencies. The frequent absence of any efficient personal identity linkage between different agency case records required that the number

of demonstration cases be finally reduced to 250 per state, in order to finish the task on schedule.

#### A DEMONSTRATION OF OFFENDER-BASED TRANSACTIONAL CRIMINAL JUSTICE STATISTICS

In response to the needs for statistical information developed within the criminal justice system model, the Statistical Advisory Committee of Project SEARCH sponsored, in each of the ten SEARCH states, an experimental tracing of offenders step-by-step through the entire criminal justice process. The form of this task was specific to this project. Because of time limits, the tracing was an exercise in constructing longitudinal records of an arbitrary group of 1968 arrestees, not a test of a standard recording method. Events subsequent to arrest were added to a master record for each defendant. The facts that were found scattered throughout the files of local police, county prosecutors, different levels of courts, and various state and local correctional agencies, were linked to show how each state's administration of criminal justice and adult criminal defendant processing could be analyzed. Reconstructions of this type are not feasible in an ongoing system. Tracking efforts should follow arrestee cohorts forward from the time of implementation of the new statistics system.

The small number of examples also prevented consideration of multiple arrests of the same person or similar repetitions, an accounting that should be provided in improved systems.

The objectives of the demonstration were to:

1. Locate "problem areas" associated with tracking offenders through the state criminal justice system,
2. Acquaint state and local personnel with these "problem areas,"
3. Determine the feasibility of conducting the operation on a larger scale,
4. Gain knowledge and experience that will aid in developing a satisfactory mechanism for the collection of the desired data on a continuing basis, and
5. Demonstrate the production of summary statistics describing each level or stage in the criminal justice process.

An individual who comes in contact with the criminal justice system is processed sequentially by different agencies. Information about the following four stages of offender-system interaction was collected:

- Stage 1—Police Action
- Stage 2—Lower Court (Pre-Trial Felony) Action
- Stage 3—Felony Trial
- Stage 4—Corrections Action

The arresting agency gave Stage 1 detail. The personal characteristics and criminal history of the individual were recorded, along with other information about the offense and the arrest disposition. Defendants who remained in the system entered Stage 2, where all data relating to lower court processing was secured. This included information on arraignments, hearings, and misdemeanor trials. Stage 3 described the processes and results of felony trials. Finally, for those who remained in the system, corrections action, Stage 4, was recorded.

The differences in the number of possible routes within stages were allowed for. Police and felony trial actions normally occur in only one sequence, although the offender may exit at any point. In the lower court and corrections stages an offender can follow several different routes without exiting from the system stage.

In lower court, for example, an offender might plead not guilty at an arraignment, but later plead guilty to a reduced charge at a misdemeanor trial. Both actions were recorded.

To be sure that all data was collected for all proceedings and to facilitate processing and later analysis, the concept of the cycle was developed. For each proceeding that occurs that is marked by a change in status, a full cycle is recorded to indicate the type of action and its results. Subsequent proceedings are recorded similarly until the offender either exits from the system or is bound over to felony court.

Exactly the same procedure was followed to record the offender's movement while under corrections supervision. For instance, a defendant found guilty at a felony trial might have been sent to a state correctional institution, and then paroled, then returned to the state institution on a technical revocation. In order to trace the individual's movements, all data for each change of status was again recorded in cycles.

#### Procedures For Search Statistical Demonstration

A set of data collection forms were developed and used during the experiment. The data elements collected at each stage, are provided in Exhibit 1. The subject's name and criminal I.D. number were used by some states to facilitate tracking, but were removed before the forms were keypunched and the data analyzed.

Each participating state was asked to track through its criminal justice system a total of 250 adult felony offenders who reached the pre-trial (felony) action, Stage 2. No attempt was made to secure a probability sample of offenders or offenses within the state—a state was permitted to select a single jurisdiction for which access to police records plus subsequent information was readily available. The project was intended only as an *example*, not a sample, of

how the actions taken toward defendants could be analyzed. The data gathering system used cannot be adapted for routine tracing of felony offenders.

To describe the project, explain the data collection forms, and define data elements, a data collection manual was compiled. The manual included sections about procedures, coding instructions, state codes, offense codes, and criminal justice terms, and outlined its function this way:

*The purpose of this manual is to provide instructions and methods for collecting data on 250 adult felons (per state) who reach the pre-trial court stage. The data to be collected relates to each major step of the criminal justice process, starting with the arrest and ending with the departure at the correction stage. The emphasis is on a small number of records well done, rather than a large number with incomplete data. The procedures given in this manual are, in many instances, quite general because of the differing criminal justice systems in the ten states. Some of the data elements requested on the forms may simply be inappropriate in a given state because of incompatible sequencing or formatting for that state. In this case, please record all difficulties on a separate sheet and submit it with the finished data.*

To make certain that comparable cases were tracked in each state, the example (*sample*) unit was carefully defined in the data collection manual.

*The sample unit is defined to be the person-arrest. In this regard, a case will simply be a given person at the given arrest. If multiple offenders are arrested for a single offense, each offender, if selected for the sample, would be regarded as a separate person-arrest and, hence, a separate case. For example, if 3 offenders robbed a grocery store and all 3 were arrested, this would constitute 3 person-arrests and each would be traced through the system separately (assuming each was chosen for the sample). On the other hand, the case of a single person who is arrested on a second or subsequent occasion would constitute a second person-arrest; for purposes of this demonstration, no attempt should be made to follow such subsequent arrest cases through the system. If the offender is charged with multiple offenses, only the action taken on the most serious offense charged at each stage (police, pre-trial, courts, corrections) will be followed.*

The data collected by each of the ten participating states was processed through a computer system. Tables were compiled separately for each state in the same analytical format.

Computer software was developed to reduce, process and analyze the information from offender-based records to demonstrate the production of summary statistics describing each level or stage in the criminal justice process.

The computer software had three primary design features:

- Editing the input records.
- Selecting desired subset of offenders.
- Generating descriptive statistics about individual offenders.

#### Statistics Generated by an Offender-Based Statistics System

Exhibits 02 through 11 are examples of the data content of this prototype system. The states are not

identified because the data represents a single jurisdiction within a state and *cannot* be construed as being representative of criminal justice processes in the state. Existing systems can produce only the type of data presented in Exhibit 02.

Exhibits 03 through 09 show elements of arrestee histories, felony trial plea changes, elapsed time, felony court outputs, correctional agency inputs, and arrestee fate at end of trace.

Exhibits 10 and 11 are system flow charts (each derived from the data from one state) depicting the fallout of offenders from the system at major departure points.

#### Feedback About Tracking of Offenders Through State Systems

After each state had finished tracing the "sample" of 250 adult felony offenders through its criminal justice system, the Statistical Advisory Committee established a set of questions designed to elicit feedback about the difficulties of procuring necessary data. The questions were asked of the Project Leader of the SEARCH state, the Leader of the Statistical Demonstration Project, and the clerks involved with the actual recording of data. The inquiries were designed to probe attitudes of those involved in the project (including representatives of agencies which were asked to provide data source documents) and to find out about difficulties related to design of the experimental system, the data elements, and the data collection and recording procedures.

Most of the SEARCH Project Leaders interviewed considered the Statistical Demonstration Project valuable and important. One Project Leader said that the experience of tracking an offender from point of arrest to final disposition made it immediately evident that the current status of record keeping procedures at various levels within the criminal justice system is inadequate for the purpose of tracking offenders. Although the records are sufficient for the purposes of the agencies that collect them and use them, they are too segmented to determine where an offender is at any point in time. There was also an increasing awareness that the Uniform Crime Reports cannot be used as a statistical base to describe the full range of problems in the administration of justice.

Another Project Leader described the demonstration as valuable in theory but questioned the meaningfulness of the data as it is presently being gathered. He thought that the effort was not an integral part of the SEARCH project, and would have had more success as a separately funded effort.

The states generally had little difficulty in securing and disbursing funds for the project. Although detailed cost per record accounting was seldom done, it appears that the collection and recording of the data averaged between \$3.50 and \$5.50 per record.

Personnel used during the project varied among states. Some states hired clerks to do the actual collection and recording of data; other states used college students who were working during the summer or brought in consultants; one state turned over the entire effort to a private firm which did the work and made a report on their efforts.

To collect the required data each state was asked to use source material and therefore had to contact many of the operating agencies within the criminal justice system. In all cases, inter-agency cooperation was excellent. Agencies went out of their way to be helpful and were often interested in the project and its outcome.

A major difficulty encountered in tracking offenders through the stages of the criminal justice system was that record keeping practices among different agencies do not permit a transactional search. The most common problem encountered was the lack of unique identifiers to link individuals between criminal justice agencies. Example units were often lost because of the filing methods. Some of the difficulties encountered stemmed from the inexperience of the people involved in the data collection, and the fact that data elements were not consistently recorded by the agencies.

In general the *Data Collection Manual* did not meet the particular needs of individual states in its description and definition of data elements. Better definitions of transactions are needed, and more training in procedural description would be desirable. Codes to describe a particular data element or operation in the criminal justice system have to be tailored to reflect the particular system of laws and processing in a given state. All main categories of data were collectable although they were often not consistently recorded for all offenders.

Particular data items that were troublesome include status at arrest, identifying changes in the pleadings, determining if a pre-sentence investigation was performed, determining the type of counsel employed both at the pre-trial stage and during the felony trial, and finding the required dates throughout criminal justice processing.

The data collection clerks, aside from the general problem areas already mentioned, had relatively little difficulty performing their task. The forms were adequate, both in size and layout; and it was no trouble to keep all information on a particular example offender together. In most states, an individual was traced through all stages of the criminal justice system by the same person; rarely, a different person recorded each stage.

The consensus in the SEARCH states was that the demonstration project was very worthwhile and, in large measure, successful in meeting its objectives.



Participation in the project provided valuable experience of the problems to be met as statistical and information systems continue to develop in the states.

Exhibit 01: Data Elements for SEARCH Prototype Statistical System

OFFENDER CHARACTERISTICS

State  
State ID Number  
Age at Time of Arrest  
Sex  
Race  
Number of Arrests  
Number of Convictions  
Number of Jail 90 Days  
Number of Jail 90 Days  
Number of Jail 90 Days  
Number of Prison (State Institution)  
Status at Time of Arrest  
State of Supervision

STAGE 1—POLICE ACTION

Date of Arrest (Mo/Day/Yr)  
Arresting Agency  
Type of Arrest  
Apparent Intended Offense  
Primary Charged Offense (Most Serious)  
Police Disposition

STAGE 2—PRE-TRIAL (FELONY)

Pre-Trial Cycle Number  
Proceeding Type  
Offense Charged  
Date of Initiation  
Date of Completion  
Disposition  
Release Actions  
Offense Charge at Disposition  
Plea  
Length of Jail Term (Days)  
Length of Probation (Months)  
Amount of Fine (\$)

STAGE 3—FELONY TRIAL

Date Filed  
Offense Charged  
Initial Plea  
Final Plea  
Type of Trial  
Release Action  
Disposition  
Date of Disposition  
Reason for Dismissal  
Convicted Offense  
Pre-Sentence Report Available  
Length of Prison  
Length of Probation (Months)  
Length of Jail (Days)  
Amount of Fine (\$)  
Length of Work Furlough  
Type of Defense Counsel  
Non-Supervisory Sentence

STAGE 4—CORRECTIONS

Corrections Cycle Number  
Receiving Agency  
Date of Receipt  
Date of Termination  
Reason for Termination

Exhibit 02. Sample Output of a Discrete Variable  
(Available from existing statistical systems)

OFFENSE CHARGED BY POLICE  
FREQUENCY DISTRIBUTION TABLE

OFFENSE	NUMBER OF CASES	PERCENTAGE OF TOTAL ARRESTS
HOMICIDE.....	3	1.26
KIDNAPPING.....	3	1.26
SEXUAL ASSAULT.....	16	6.75
ROBBERY.....	8	3.37
ASSAULT.....	35	14.76
EXTORTION.....	1	.42
BURGLARY.....	49	20.67
LARCENY.....	9	3.79
STOLEN VEHICLE.....	17	7.17
FORGERY.....	13	5.48
FRAUD.....	7	2.95
EMBEZZLEMENT.....	5	2.10
STOLEN PROPERTY.....	6	2.53
DANGEROUS DRUGS.....	58	24.47
FAMILY OFFENSE.....	1	.42
FLIGHT ESCAPE.....	2	.84
WEAPON OFFENSE.....	4	1.68
TOTALS.....	237	100.00

Exhibit 03. Sample Output of a Continuous Variable  
(Not available from existing statistical systems)

NUMBER OF PRIOR ARRESTS

Mean = + 00007.77906      Standard Deviation = + 00008.76820  
Skew = + 00005.08522      Probability of Normality = 00000.00010  
Kurtosis = + 00006.20721      Probability of Normality = + 00000.00010

FREQUENCY DISTRIBUTION TABLE

NUMBER OF PRIOR ARRESTS	NUMBER OF CASES	PERCENTAGE OF TOTAL ARRESTS
00	65	27.42
01	32	13.50
02	19	8.01
03	23	9.70
04	15	6.32
05	9	3.79
06	9	3.79
07	7	2.95
08	9	3.79
09	3	1.26
10	4	1.68
11	3	1.26
12	5	2.10
13	3	1.26
14	1	.42
15	3	1.26
16	2	.84
17	5	2.10
18	2	.84
19	3	1.26
22	1	.42
23	3	1.26
24	2	.84
25	2	.84
27	1	.42
30	1	.42
31	1	.42
35	1	.42
39	1	.42
48	1	.42
52	1	.42
TOTALS	237	100.00

Exhibit 04. Sample Output of a Discrete Variable  
(Not available from existing statistical systems)

FELONY TRIAL PLEA

Frequency Distribution Table

	Initial Plea		Final Plea	
	Number Cases	Percent Total Arrests	Number Cases	Percent Total Arrests
Guilty.....	28	10.0	101	35.9
Not Guilty.....	119	42.3	9	3.2
Not Applicable.....	18	6.4	55	19.6
Exit From System Before Felony Trial.....	116	41.3	116	41.3
Total.....	281	100.0	281	100.0

Exhibit 05. Sample Output of a Continuous Variable  
(Not available from existing statistical systems)

TIME LAPSE BETWEEN FILING AND DISPOSITION—  
FELONY TRIAL

Mean = 00185.16049      Standard Deviation = 129.91943  
Skew = .60615      Probability of Normality = .55246  
Kurtosis = 1.08657      Probability of Normality = .27840

Frequency Distribution Table

Number Days	Number Cases	Percent Total Arrests
Less Than 10	11	3.9
10-25	11	3.9
26-50	12	4.3
51-75	7	2.5
76-100	14	5.0
101-150	18	6.4
151-200	18	6.4
201-250	32	11.4
251-300	13	4.6
301-350	12	4.3
351-400	10	3.5
401-450	3	1.1
451-500	1	.4
More than 500	3	1.1
Exit from system Before felony trial	116	41.3
Total	281	100.0

Exhibit 06. Comparison of Felony Trial Disposition  
(Percent of Arrestees)

(Not available from existing statistical systems)

COMPARISON OF FELONY TRIAL DISPOSITION  
(Percent of Arrestees)

Felony Trial Disposition	State A (%)	State B (%)	State C (%)	State D (%)	State E (%)	State F (%)	State G (%)	State H (%)
Dismissed		.4	19.2	15.1	4.9	1.7	9.2	
Acquitted	.5		.4	2.9	.8	12.7	1.3	1.0
Convicted— Felony	13.7	2.7	26.7	42.8	52.5	37.6	27.3	22.1
Convicted— Misdemeanor	4.1	1.8	12.1	16.2	6.6		14.7	16.8
Other	9.1		.4	4.9				16.8

Exhibit 07. Comparison of Offenders Entering Corrections  
Receiving Agency From Felony Trial

(Percent of Arrestees)  
(Not available from existing statistical systems)

COMPARISON OF OFFENDERS ENTERING  
CORRECTIONS RECEIVING AGENCY FROM FELONY TRIAL  
(Percent of Arrestees)

Corrections Receiving Agency	State A (%)	State B (%)	State C (%)	State D (%)	State E (%)	State F (%)	State G (%)	State H (%)
State Institution	4.1	1.8	6.0	16.7	37.7	19.9	13.4	10.5
Probation Agency	4.6		19.2	5.5	6.6	16.6	17.2	7.4
Jail	6.6		1.8	36.8	13.9	1.1	4.2	12.1
Other								1.7

Exhibit 08. Offender Status at End of Trace  
(Percent of Arrestees)  
(Not available from existing statistical systems)

OFFENDER STATUS AT END OF TRACE (Percent of Arrestees)								
Offender Status	State A (%)	State B (%)	State C (%)	State D (%)	State E (%)	State F (%)	State G (%)	State H (%)
Transfer								
Other Agency	3.6		2.5		1.6	.5	.8	
Trans. Law								
Enf. Agcy.	4.1		1.8		1.6			4.2
Release Police			1.8	5.2	14.8	.5	1.7	
Dismissed—								
Pretrial	5.6	19.2	10.3	8.0	16.4	23.2	18.9	22.1
Acquitted—Misd. (Lower Court)		.9	3.9		5.0			
Convicted—Misd. (Lower Court)	20.8	37.1	18.5	4.7	1.6		9.7	3.2
Civil Commit- ment		.9	1.1	4.4	1.6	.6	.4	
Dismissed—								
Felony Trial	.5	.4	16.7	14.9	.8	6.6	12.2	
Acquitted—								
Felony Trial	.5		.4	2.9	1.6	11.6	.4	1.1
Jail	1.0	37.5	.4	.5	.5	.5	1.3	
Probation	.5	.4	10.0	25.3	7.4	19.3	9.7	4.7
Prison		.4	8.9	10.4	25.4	15.5	12.6	6.3
Parole	3.6		2.5	5.0	2.5	1.7	1.7	3.7
Other								
Supervision				.8		1.7		.5
No More Info. Avail.	21.3		14.6		4.1	.5	3.4	39.5
New Arrest	4.1		1.8	3.9	.8	.5	.4	1.1
Other Exit								
From System	26.4	3.1	2.1	13.6	19.7	12.2	26.9	13.7
Invalid Responses	7.6		1.4					

Exhibit 09. Offender Status at End of Trace  
For Selected Offender Groups  
(Percent of Arrestees)  
(Not available from existing statistical systems)

OFFENDER STATUS AT END OF TRACE FOR SELECTED OFFENDER GROUPS (Percent of Arrestees)						
Offender Status	Selected Group of Offenders					
	All Offenders	Burglary Offenders	Not in System When Arrested	In System When Arrested	No Prior Arrests	Prison Prior Rec
Transfer						
Other Agency	.8			2.0	1.5	1.9
Released—						
Police	1.7		1.3	2.0		1.9
Dismissed—						
Pretrial	18.9	16.3	28.6	8.9	16.9	11.3
Convicted—Misd. (Lower Ct.)	9.7	12.2	15.6	5.9	7.7	11.3
Civil Commit- ment	.4			1.0		1.9
Dismissed—						
Felony Trial	12.2	6.1	7.8	13.9	7.7	13.2
Acquitted—						
Felony Trial	.4		1.3		1.5	
Jail	1.3			2.0		
Probation	9.7	14.3	9.1	11.9	7.7	11.3
Prison	12.6	16.3	9.1	12.9	10.8	30.2
Parole	1.7	2.0	2.6	1.0	1.5	1.9
No More Info. Avail.	3.4	4.0	6.5	3.0		3.8
New Arrest	.4	2.0				1.9
Other Exit From System	26.9	26.5	18.2	35.6	44.6	9.4

(Not available from existing statistical systems)

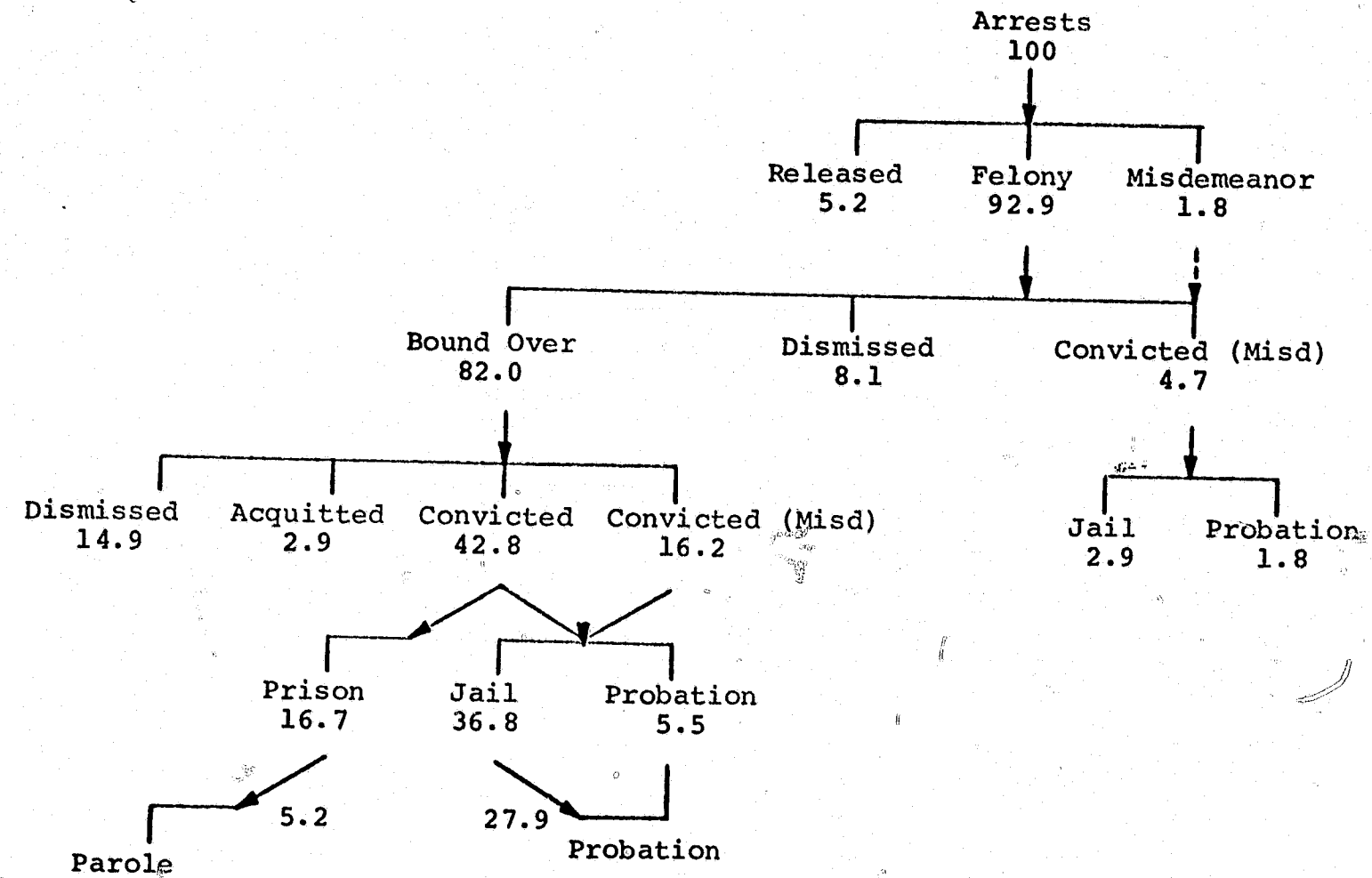


Exhibit 10. Flow of Arrestees Through Criminal Justice Systems (Percent of Total Arrests) (Example for One State)

(Not available from existing statistical systems)

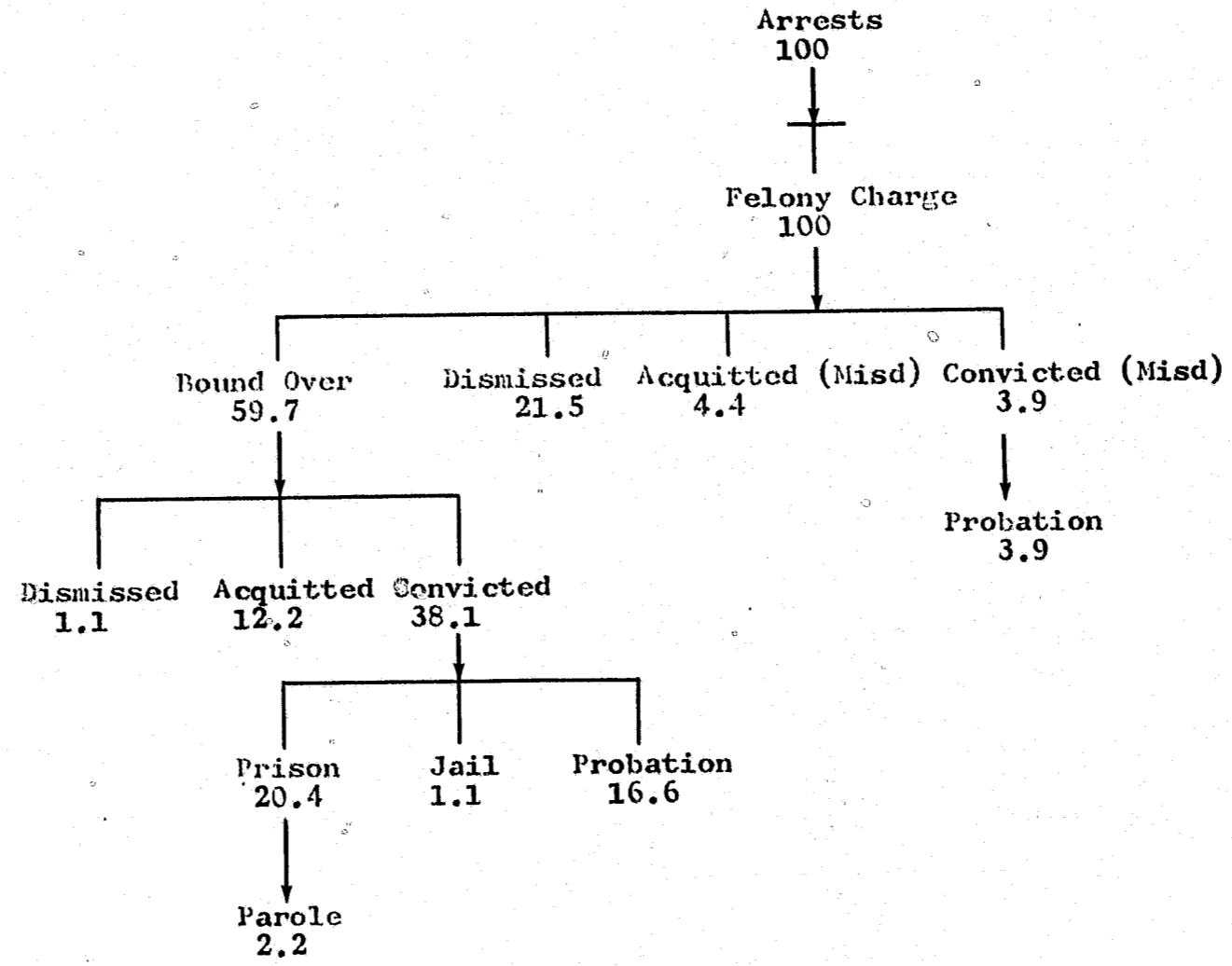


Exhibit 11. Flow of Arrestees Through Criminal Justice System (Percent of Total Arrests) (Example for One State)

## DEVELOPING INTEGRATED CRIMINAL RECORDS

by Ronald H. Beattie  
Chief, Bureau of Criminal Statistics  
California Department of Justice

There has been a tremendous resurgence of interest and concern about crime and the administration of criminal justice in the United States, particularly during the past three years. Following the issuance of the report of the President's Commission, Congress created the Law Enforcement Assistance Administration and appropriated money to improve and make more effective the efforts toward crime control throughout the United States. The Commission recognized immediately that there was a need for more accurate and complete information if any meaningful plans were to be made for analyzing the nation's crime problem. Also, with the advent of computers, the concept of developing large masses of detailed information on criminal offenders permeated into the general plan for action in the field of crime control. The assumption that significant data on each individual entering into the criminal justice process could be accumulated and integrated into a complete accounting of how individual offenders are handled after arrest is inherent in these concepts.

To place these concepts in a proper frame of reference, it may be constructive to briefly review the history of previous efforts in the United States to develop statistical information on crime. Actually, the concept of developing integrated data on criminal offenders is not as new and innovative as many seem to believe. In the 1920's a wave of interest developed in the crime problem, somewhat paralleling the current wave of concern, and several of the leading sociologists of that decade became particularly interested in this field. One of the first attempts to gather comprehensive and integrated information on crime occurred in Cleveland, Ohio in 1921. That year the Cleveland Foundation sponsored a comprehensive crime survey at a cost of \$50,000, which was then a rather substantial sum. This survey was directed by such eminent leaders as Dean Rosco Pound of the Harvard Law School and Felix Frankfurter, then on the faculty of the same school. A number of well-known authorities organized the inquiries into their respective fields of competence, including Richard Fosdick (police), Reginald Heber Smith (judicial administration), Alfred Bettner (prosecution), Burdett G. Lewis (correctional treatment) and Hermann M. Adler (the psychiatric aspects of criminal offenders). The statistical director of this survey was Charles E. Gehlke of the faculty of Western Reserve University of Cleveland. Two reports were issued on this survey.

A complete analysis of the data can be found in the principal report, "Criminal Justice in Cleveland," authored by Pound and Frankfurter. Also, a summary review of the project entitled "Outcome of the Cleveland Crime Survey" was prepared by Raymond Moley who served as director of the Cleveland Foundation.

The above survey was singularly noteworthy for its detailed discussion of the processes of criminal justice as applied in the City of Cleveland and encompassing Cuyahoga County. For the first time, mortality tables were constructed that depicted what happened to persons arrested as they went through the subsequent processes of criminal justice. Now, forty-eight years later, but I fear in much more limited fashion, we are again coping with the same problems in Project SEARCH with its ambitious goal of integrating offender data with information on the justice system itself. For historical perspective, I highly recommend to all those who are concerned with studying the present-day system of justice that they should become acquainted with the pioneering Cleveland study, particularly the 64-page summary by Mr. Moley.

Other comprehensive studies followed the Cleveland project, and in 1926 the Missouri Crime Study Survey was published. Professor Gehlke also served as the statistical director of this undertaking. In 1928, a crime survey was sponsored by the Illinois Association for Criminal Justice and a report of nearly 2,000 pages was published that gave a graphic portrayal of statistics on crimes, arrests and dispositions for the City of Chicago, with comparative data for other parts of Illinois and for the City of Milwaukee, Wisconsin. In 1928-29, several reports were issued by the New York Commission on Criminal Justice which developed data revealing the flow of persons through the criminal processes in the State of New York. My first experience in crime studies began with a survey of criminal justice in Multnomah County, Oregon. This survey was directed by Wayne L. Morse and a report was published in 1931.

All of the studies cited were designed to identify persons entering the criminal justice process at the point of arrest and to follow them through the system until an ultimate disposition was made of their cases. The necessary data usually were obtained by employing personnel to literally follow the record of subject defendants through the police departments, municipal courts and the various areas of correctional treatment such as probation, jail and prison. This was the beginning of what we might call "integrated statistics," a term recently echoed in many of the

states developing the SEARCH statistical model.

The activity in the 1920's was culminated when President Hoover established a National Commission on Law Observance and Information known under the name of its director as the Wickersham Commission. A report of this effort was published in 12 volumes during 1930 and 1931, providing a wealth of information. Report No. 3 of the series dealt with criminal statistics and was prepared by Professor Sam Bass Warner of Harvard Law School. Report No. 4 included mortality information on criminal offenders that had been developed from the surveys already cited and several others.

The Wickersham report, in essence, concluded that the methods of developing integrated statistical data on crime and offenders had been demonstrated and that plans should be laid to create a continuing accountability of offenders and of the processes of criminal justice, inasmuch as such information was absolutely essential not only to provide knowledge of the dimensions of the problem but also to allow for an evaluation of all steps taken to improve the efficiency of the criminal justice system. The Commission pointed out that the administration of criminal justice was primarily a matter of each state's responsibility and that each state should undertake within its own sovereign jurisdiction the development of comprehensive and integrated data relating to criminal offenders and the processes of justice.

During these same periods of time, efforts were undertaken to develop certain nationwide collections of data on crimes and criminals. The Census Bureau began the collection of information on individuals committed to and released from state and federal prisons and reformatories in 1926. The National Association of Chiefs of Police was active in promoting the development of information concerning crimes and persons arrested. The Rockefeller Foundation sponsored a study that resulted in a plan for the collection of such information. The study was published in 1929 in a volume called *Uniform Crime Reporting*. This volume outlined the forms and procedures to be used by a police department in supplying monthly or annual information. In 1930, the Association began such a centralized reporting scheme asking for the voluntary cooperation of local police departments throughout the country. The same year, Congress authorized the Federal Bureau of Investigation to undertake the operation of this project. This resulted in the annual series which is published under the title of *Uniform Crime Reports*.

The area of information on what happens to people prosecuted in the courts was examined in considerable detail by studies sponsored by the Institute of Law at John Hopkins University in the late twenties. A pattern for reporting the outcome of prosecutions in trial courts of general jurisdiction was developed from these studies and adopted by the Bureau of the

Census. The bureau tried to establish a collection of annual court disposition data, starting with the year 1932. At no time, however, did this series of reports cover more than 38 states. Because of this incompleteness in reporting and the difficulty in obtaining uniform comparable data from the local counties in the absence of any state responsibility for collecting, checking and editing the information, this series was abandoned in 1946.

It is noteworthy in conjunction with an assessment of the above statistical projects that there was no development of the suggestion made by the Wickersham Commission that the respective states undertake responsibility for a comprehensive collection of data within their own jurisdiction as a basis for integrated criminal statistics. Somehow there was a feeling that because of the efforts undertaken in UCR and the Census Bureau series on court disposition and prison activity, that this, in itself, resolved the situation. Many of those concerned with the need for reliable information on crime, however, recognized the fact that little progress was being made toward a useful centralized accounting of crime. Among the leaders in this field was Dr. Thorsten Sellin who, at the request of the National Commissioners on Uniform State Laws, authored a uniform statistics act proposed for adoption by the states. This act sought to create within a state a central bureau headed by competent leadership to organize and develop the collection of data from all local agencies involved in the administration of criminal justice within the state.

No state actually created a central bureau under the provisions of this law until 1945 when such a bureau was created by executive order in California. Subsequently, legislation embodying the provision of the Uniform Act was passed in 1955. The only other state that has created a bureau following, in general, the provisions outlined in this model is Pennsylvania which recently established such a bureau in 1969. One other state, Minnesota, in 1934 created in their State Bureau of Criminal Apprehension, a statistics unit with responsibility for the collection of general information on crime and criminals. This bureau still exists but the statistical coverage has been mostly limited to UCR data and adult felony prosecutions. The recent up-surge of interest and the impetus of the SEARCH program may well result in the expanded activities of state bureaus from this point on.

The integration of criminal records is a major concern which must be faced by agencies concerned with the improvement of criminal justice, and we are indebted to LEAA for its concern and resultant promotion of activity to this end. This meeting and our consideration of the problem has been fostered by the SEARCH project under the sponsorship of LEAA. SEARCH as you well know has encouraged the exploration of ways and means of integrating

criminal data. My remarks will be directed towards the sometimes obscure but very real problems which will be encountered in dealing with criminal records based upon my 40 plus years of experience of working with local, state and federal agencies.

There are several basic points that should be discussed before an attempt is made to explain in detail just how an integrated criminal data system might be developed. These points are fundamental to any consideration of a system of integrated criminal statistics.

1. The primary responsibility for the development of criminal data lies with the states. Under the United States Constitution each state is sovereign in the field of criminal law and criminal administration. Only the state can assume full responsibility for developing, collecting and compiling information on crime from the agencies it has created to control the crime problem. Today there are 52 such sovereign jurisdictions in the United States—the 50 states, the District of Columbia and the Federal jurisdiction.

2. The concept of a system of integrated data on criminal offenders implies, at least theoretically, that there is a single responsible administering head or body of the criminal justice system in each state which will use factual data to better manage the system. In reality there is no such center of responsibility; the administration of criminal justice is carried out by different sets of agencies in each of the sovereign states without any central direction.

There is no question that there is a need for coordinated activity among the agencies with their separate responsibilities that exist in each of the 52 state jurisdictions. It is to be hoped that, through the growth of state criminal justice councils such as those created for administering LEAA funds allocated to each state, there will come into being a permanent, knowledgeable and representative council which can bring about the coordination of the activities of the multivariate agencies within a state. The implementation of a comprehensive plan for criminal justice obviously requires the existence of such a central coordinating body. Such an organization would both promote and better utilize an integrated body of information on the crime situation in the state. In fact, there could be little effective planning for improvements without an accurate knowledge of the existing facts on how the overall operation functions.

3. If no central responsibility exists in a state for the administration of criminal justice, how is this task carried out today? We have several so-called sub-systems which perform segments of the overall function of criminal justice administration. First, there are the primary law enforcement agencies—the police. They are charged with the maintenance of law and order, the investigation of criminal offenses and the arrest of persons who are alleged to have committed such offenses. These agencies include municipal police and county sheriffs and, in many states, state police, county constabulary, marshals, constables, highway patrol and other special agencies created to oversee certain aspects of criminal law regulations. For the most part, these local agencies are completely independent, being responsible only to municipal or county governments.

Secondly, there is another set of agencies involved in the enforcement of the criminal law which have the responsibility for prosecution. These prosecutors or district attorneys are usually locally elected officials who determine what persons are to be charged with criminal offenses. They have the duty of bringing official action against such persons in the courts of justice and to reach a determination of the charges officially made. Again, these prosecutors are responsible only to their local electorates and are completely independent of each other and of central control even though they operate under the established laws of a given state.

A third group of agencies are the courts that serve as the tribunals before which defendants are tried and their cases adjudicated. The criminal courts fall into at least two or more basic types. The so-called lower courts, which may include municipal, police, city, justice or county courts, have jurisdiction over the disposition of misdemeanors and the holding of preliminary examinations in the cases of offenders charged with felonies or indictable offenses. There is a higher level of court usually defined as a court of general jurisdiction. These trial courts are generally called district courts, circuit courts or superior courts. Usually they have exclusive jurisdiction to try and dispose of persons charged with felony or indictable offenses. The latter series of courts, for the most part, exist on a county or regional basis and generally the only supervision of their operations comes through review of individual cases on appeal. In addition, there may be other specialized courts such as juvenile courts, courts of domestic relations, family courts and others that have jurisdiction to handle certain types of delinquent or criminal cases.

A fourth criminal justice component exists in each state that might be termed the correctional system. And yet, even here there are several independent sub-systems. Jails and work houses are used to incarcerate prisoners convicted of misdemeanor offenses and are operated on a county or municipal basis. Probation departments to which convicted persons granted probation are directed for a period of supervision may be organized on a local, county and, in some instances, on a state-wide basis. Every state has its own penal system which usually includes one or more prisons together with such other types of institutions as reformatories, camps, farms and, in some instances, specialized hospitals.

Another separate responsibility which may or may not be a part of the administration of a penal system is that of parole. The large majority of persons incarcerated, particularly for long terms, are eligible for parole under certain specified conditions and limitations. The determination of the release on parole is usually made by a special parole board created to perform this particular function. Such agencies also decide when a parole should be revoked and the offender returned to prison.

There is still another sub-set of agencies in our system—the appellate courts where appeals are taken after conviction. They have the final decision as to the outcome of the prosecution of criminal offenders.

The reason that I have gone on at some length to mention all of these diverse functions and sub-systems, and there are many more that could be separately identified, is that any development of integrated criminal data would require the collection of the basic information from each of the agencies involved. What many people do not realize is that there is no standard and systematic record keeping provisions to be found even within any one of these particular systems, not to mention the fact that the data available in the separate sub-systems have no continuity or uniformity from one set to another.

4. With the advent of electronic computers and their tremendous capacity to store and retrieve data, it is easy to see why some imaginative planners have been intrigued with the possibility of designing models for a rather complete crime information system. It has been assumed that needed information exists in readily extractable form in the records of all agencies which come into contact with a criminal defendant. It seems logical that standard forms for reporting detailed information can be designed which would automatically feed such information into the computer storage. Presumably, if all the pertinent information from all the agencies involved were put into this great machine covering all criminal defendants, it would seem theoretically possible to quickly obtain any data desired on an individual or on any process through which individuals are carried in the system at any time. Thus inspired to adapt theoretical concepts to mechanized techniques well proven in the business world, a great deal of time, effort and money have been devoted to development of these models in the last couple of years.

It is of tremendous concern to someone like myself who has been involved for many years in collecting information from all types of criminal justice agencies to realize that the planners of today are quite unacquainted with the complexity and diversity of record sources in the existing system. Also, they appear not to have a practical approach toward organizing and standardizing the raw data that exists in the multitude of independent agencies that handle criminal offenders.

Apparently, the actual implementation of a plan is considered to be something entirely apart from creating the theoretical model. Presumably the model builders feel it is the responsibility of others to square theory with reality.

While I am in no way decrying the effort to set forth the models and objectives which we are hoping to obtain in the long run, I do assert that the tremendous effort and expense that has already been put into this area has really produced very little that is new or original regarding the concepts of integrated data and has not in any sense faced up to the practical problem of "how do we start from where we are?"

The objectives of a system of integrated criminal records sometimes seem confusing. The major emphasis of the SEARCH criminal history project was to create a standard identification record which would be indexed at a national center and stored in detail in the various state systems. Through inquiry to the index, access could be obtained to the information stored in any of the state systems. The main purpose of this was to provide an accelerated inquiry and response to law enforcement agencies to meet their basic identification needs. It was then conceived that the record on an individual would be enlarged to become a complete and detailed dossier, recording not only individual information about the person but also every transaction that occurred in the process of criminal justice through which the criminal offender passed.

Thus, even before any achievement of the original objective had been accomplished, the problem had become much greater and more difficult. It is one thing to provide fairly complete data relating to persons arrested and handled by law enforcement agencies, but quite another to acquire and incorporate every detail of an offender's first or repeated experience in some or all of the separate sub-sections of our criminal justice operation.

A further complication was introduced into the plan of these massive data bases with the suggestion that as all possible knowledge would be in the computer, any statistical compilation that was ever needed or desired could automatically be produced from the data base.

In reality, the reporting of the various agencies for primarily statistical purposes can be used to feed more accurate information into the data base. The

latter, however, can never create the detailed statistics needed to show the number and kinds of offenders for any given time and area, and the procedural activity of each agency in each of the sub-systems of justice.

From the above discussion, it should become rather clear that I have some grave reservations as to the practical development of integrated data along the lines that have been suggested in the proposed models.

It is my basic contention that the only sound way that we can develop adequate statistical data in the field of crime is to assume first that each state must take the responsibility for developing its own data; secondly, that each agency within a state involved in the handling of criminal offenders in any way must have a separate reporting system for the transactions that occur within its responsibility; and finally, that this reporting must be directed to the central bureau created for this purpose within the state. Through central accumulation of data which comes in from law enforcement, courts, prosecutors, jails, probation departments and all other types of agencies officially concerned, and with the exercise of responsibility for auditing these data, it will be possible to present an accurate statistical picture of the handling of offenders as well as a summarization of the activity of each separate sub-group of agency and of each individual agency.

There can be no substitute for the responsibility of a single center for accumulating and editing all the related information. This can not be done by the computer. Such a machine is a needed servant for the carrying out of the objectives of integrated data, but a computer is only a tool to be used by the responsible agencies. While the processing of much of the information reported can be mechanized, because of the diversity and the non-uniformity that will always exist in the information furnished on individuals by numerous independent sources, a great deal of the work in the central agency will involve manual searching and an individual determination as to how to fit together the data relating to each single offender that is reported in various and even contradictory terms.

One basic consideration which has been given very little attention is the degree of coverage that is practical in the collection of integrated data on criminal offenders. Theoretically, the thinking seems to be that, without any selectivity, all information on all persons arrested should be the subject of data collection. I would like to illustrate the problem by calling attention to the size of the problem as we have it in the State of California. In 1969, we estimate there were 1,300,000 recorded arrests for crime or delinquency apart from minor traffic infractions.

The following tabulation shows the distribution of

these arrests by adult felons, adult misdemeanants and juveniles, and also the number of persons arrested in each type that would appear to represent a serious enough type of criminal offender to be identified and entered into any integrated data-base system.

Type of arrest	Total arrests	Offenders to be included in the data-base system
Adult felony .....	200,000	140,000
Adult misdemeanor .....	700,000	80,000
Juvenile .....	400,000	40,000
	1,300,000	260,000

It will be noted that only about one-fifth of those arrested appear to involve a level of offense that would be included in the system. This represents all adult felony arrestees who are actually prosecuted, those arrested for misdemeanors which involve such offenses as theft, assault, narcotics and certain types of sex offenses and those juveniles arrested for offenses primarily of the felony type and who are actually prosecuted or taken through the juvenile court. In other words, there are 260,000 or one-fifth of the total offenders arrested who, on the basis of the level of charges and type of action taken, were involved in a felony or felony-related crime.

We have been able in California to develop a reporting scheme on individuals processed on felony charges from the point of filing a complaint. We have never gotten beyond summary-type monthly reporting on the other persons arrested and handled on some other basis than a felony complaint. We are currently trying to determine whether we can establish a uniform booking register to be used on the part of law enforcement agencies which would insure a complete accounting of all persons arrested and booked on felony charges. Such a register, of course, could also be extended to misdemeanor and juvenile arrests. We feel it will take some time to establish and perfect the accountability of felony arrests on this basis. This is the situation in a state that has a central statistical bureau and has been working with local agencies in the reporting of these data for a period of about 20 years. We think it may be possible in the next five years to actually account for all adult felons arrested with a high degree of accuracy and thus provide the framework for developing integrated data.

One other area of the crime problem that has rarely been associated with integrated data is the matter of the counting and classifying of crimes. Through the impetus of *Uniform Crime Reports*, we have been measuring crimes in terms of the number of offenses reported to law enforcement agencies and by them to the Federal Bureau of Investigation or, in California and a few other states, to a state bureau. As counted in these reports, crimes are events that have been brought to the attention of the police departments and, while presumably a certain uniformity of classification is to be expected, in reality, there

is no standard way of determining what event is to be counted as a crime by the multitude of law enforcement agencies which compile these reports. In the first place, only seven types of crime are used for this index. These particular offenses were chosen because they appeared to have the highest likelihood of being reported; but there is a tremendous unevenness to be found among law enforcement agencies generally as to how such events are actually defined for crime counting purposes. There is no way to audit or insure that general instructions for reporting are being followed by each agency. In other words, our measurement of crime on this basis is subject to an unknown amount of error and variability. There seems to have been in the past 40 years no serious effort to define and control these data that are thus reported. It is to be hoped in the years to come that not only will we have more uniform definitions and controls of such information, but that we will enter into a much more thorough analysis of the detail and description of the specific events reported as crimes. Crimes, as now reported within each of the seven classifications, range from rather minor and insignificant events or acts to some of the most heinous acts of criminal behavior. To lump all of these under one heading without any differentiation according to severity is in reality to perpetuate an inadequate measurement of the crime situation.

Not only should the detailed elements that occur in a criminal offense be available for analysis so that a distinction can be made between serious and less serious offenses, but the relationship between victim and offender should be shown, together with the circumstances, weapons, premises, etc. This is an area that has hardly been touched in the development of reporting and analysis of criminal data.

At this point, I think that the most constructive thing I can do from a practical point of view is to outline the steps that might be taken to establish and develop a statewide criminal statistical system which would provide integrated data not only relating to the offender but also descriptive of the various sub-systems and their processes.

1. The first and most fundamental step is to establish within a state an agency or a focus of responsibility for the collection and compilation of data and for continuing development of a criminal statistics system. There can be no serious collection of data or reporting of data unless it is purposefully collected by someone or reported to someone. This is an essential first step.

2. With the establishment of a state center for criminal statistics, what are the first steps that should be undertaken? Obviously, there is a need to catalog and identify all of the agencies in the state that officially deal with crime and delinquency and which thus will be the sources of the information collected or reported. Probably the first step will be to identify and contact each primary law enforcement agency in the state. A simple approach would be to obtain a copy of the crime reports prepared by each of these departments and sent to the FBI. This would give the state access to the major crime information now being reported and would make possible a detailed analysis of the data to an extent that is far beyond that which can be published in the national annual report. In addition to obtain-

ing information on crimes reported, an early exploration must be made as to the kind of arrest information that can be developed. Possibly, the first reporting should be a summary count of arrests but the matter of individual accounting of persons arrested for serious crime should be planned as soon as possible. This is a most significant area as arrest statistics are probably the best and most reliable data that can be produced to measure the real crime problem in a given jurisdiction.

The next area of reporting to be developed relates to persons prosecuted and processed through the criminal courts. Undoubtedly, the major emphasis to start with would involve felony-type offenses and offenders. Persons who after arrest are charged with a felony complaint may be disposed of by the prosecutor or, more frequently, through court action. Methods of regular reporting from each prosecutor and each court of general jurisdiction will, of necessity, be instituted as soon as possible.

The reporting of events and processes in the correctional area must also be planned for at an early stage in the development of the statistical center. Separate reporting schedules will be required from those agencies which maintain local jails, from probation departments and from state correctional institutions.

It will take a great deal of time and effort to lay the groundwork and to institute reporting procedures for all of these phases of activity. Presumably, after a few months of operations, a five-year program should be charted so that by the end of this period of time effective procedures would have been implemented to insure a genuine collection of essential data with respect to all phases of the criminal justice process within a state.

3. In designing the working plan for the collection of data, the actual records kept by the various local agencies should be examined in detail. In many instances, a standard system of record keeping might be proposed which, if adopted, should make the collection of essential data more uniform. This should meet the needs of the state bureau and also clarify or better organize the work of local agencies that report such data. Other determinations would have to be made as to how much detail should be sought on adult felony offenders and the processes applied to them as compared to information requested on adult misdemeanor offenders. Similarly, the juvenile justice field needs a descriptive type of reporting system.

4. A very important element in a criminal statistics system is the capacity to produce an annual compilation or summary of the processes followed in each of the sub-systems of criminal justice within the state. In other words, there must be a presentation of crime and arrest data for the most recent calendar year for each policing agency as well as for each county. State totals should be set forth with comparisons and trends over the previous years. The same types of data should be published as they relate to persons prosecuted and disposed of by the courts, to persons committed to jail, to those placed on probation, and to those incarcerated in state institutions. All of these delineations are annual summaries entirely separate from an overall accounting of what happens to the total number of offenders processed in the state during the same year. Each of these sub-systems is independent, and, as the various officials are primarily concerned with the functioning of their own particular agencies, they will want data for their respective departments separately prepared and analyzed.

There are two different methods of presenting information on the overall accountability of handling criminal offenders. One of the most accurate ways of doing this is to identify all of the persons brought into the system by an arrest during a given period of time and then follow those particular individuals through to their ultimate disposition, thus giving the mortality rate of those persons who fall along the way. The difficulty with this method is that it may take a long period of time to finally dispose of all the cases arrested in a given year. While the great majority of persons arrested in a year are disposed of in that year or shortly thereafter, there are always a few cases which

drag on for long periods of time.

A second method of approaching the accountability problem is to analyze and summarize the statistical data on all the persons who are disposed of during a given year, irrespective of the time they entered into the system or were arrested. Presumably, although the timing is different and some of the individuals handled will be different, the dispositions of a given year generally match very closely the ultimate disposition of those arrested during the year. The advantage of presenting data on the year's dispositions is that it can be prepared and issued in an annual report soon after the close of the year.

We have been able to integrate some of the general data collected in California by this latter method to show the particular disposition of persons who come under the system. Attached is a table taken from the 1969 report of the Bureau of Criminal Statistics which shows the general dispositions of adults arrested on felony charges during each year from 1965 through 1969.

During the five-year period, there was almost no fluctuation in the general dispositions of defendants arrested on felony charges in California. Each year, approximately one-third were released by the police without prosecution; another one-third were prosecuted and disposed of at the municipal or lower court level; and, only one-third of the total defendants reached superior court action.

Of those prosecuted in the superior courts, the proportions released and convicted remained quite stable during these years. There were, however, some marked changes in types of penalties imposed by the courts upon those convicted that reveal a shift in sentencing toward non-custody supervision. The proportion of defendants receiving prison sentences in 1969 was less than half of what it was in 1965. During the same period, the proportion of defendants placed on probation rose by more than 20 percent. Other differences can be found through a close examination of the data in the table that illustrates the kind of facts made available through a complete accounting for felony defendants.

5. Summary information, of course, has many grave limitations. It involves the classifying of data by many differently trained persons, and if a number of different agencies are involved, there is no way to insure complete uniformity. If individualized information is reported, the central bureau can relate the facts on each individual offender and on each transaction occurring in his care and thus insure a much higher degree of accuracy and uniformity. In short, the effort should be made to obtain individual information on each person arrested for a serious offense and how he is handled as he passes through each of the sub-systems of our criminal justice administration.

This type of reporting would require an individual report from police at the time of arrest showing the offense and characteristics of the person and the immediate police disposition. Also, it would require similar reports from those who prosecute the individuals on whom a complaint is filed and on those persons who go before the courts for disposition. It would require the reporting by jail and workhouse authorities of information on defendants who were received or released, and on the reason or authority for release. For those on probation, for those incarcerated in state institutions and for those placed on parole, the same type of information on each individual would be obtained. Because of the multitude of agencies involved and since there can be no real uniformity between individual agencies and the way they record certain types of information, it means that all data reported to the central bureau

has to be examined and edited to clean up and resolve discrepancies. Further, if the information of these individuals is to become part of one record as it is reported from the different levels of justice agencies, this process of checking, editing and matching information on each individual cannot be handled mechanically in a substantial number of cases. This is a function that can only be performed by a staff in a central agency.

In conclusion, let me re-emphasize the major points of this discussion.

1. Each state must be responsible for the development of its own statistics and integrated data.
2. There is a great need for a national center such as the one that has been created in the LEAA organization to assist the states in moving into their proper statistical responsibility, to outline and develop such uniform definitions and guidelines as can be appropriately applied to all states and to be the coordinating center for all of the information developed in the 52 sovereign jurisdictions.
3. Each central state agency must develop the collection of information directly from the various sub-sets of agencies involved in the administration of criminal justice.

4. As this information is reported on an individual basis, the central agency will analyze, edit, and audit the material received to insure its completeness and uniformity, and will make available the results with respect to each individual offender to the central data base. This is the only way that integrated data can be produced from the disparate sources of information existing in this field.

5. The central statistical agency would be responsible for the analysis and publication of annual summaries with respect to the work done by each of the sub-sets of agencies involved in criminal justice. It would also be responsible for presenting the overall picture of what has happened to the offenders as they are carried through the various sub-systems.

6. The basic geographical unit to be studied in the administration of criminal justice is probably the county, and there should be developed and made available summaries on a county basis, particularly for the densely populated jurisdictions. In addition, analyses and summaries on a statewide basis should be prepared.

7. Before adequate information on crime can ever be available there must be a much more thorough analysis of individual crime reports and a subclassification of the type of crimes which are reported in each of the major divisions.

8. Integrated criminal records will of necessity be developed slowly on a step by step basis. In any jurisdiction, it will require several years of well-planned effort before a base can be built that will supply needed statistical information and individual criminal history data.



DISPOSITION OF DEFENDANTS ARRESTED AND BOOKED ON FELONY CHARGES, 1965-1969

Percentage Distribution, by Year

Type of disposition . . . . .	1965	1966	1967	1968	1969
Total defendants . . . . .	103,331	107,374	126,986	149,495	180,577
Percent distribution . . . . .	100.0	100.0	100.0	100.0	100.0
Released by police . . . . .	32.3	32.1	33.8	35.5	32.8
Disposed of prior to superior court filing	32.1	32.1	32.8	31.4	33.0
Released - dismissed . . . . .	6.6	7.1	7.2	6.7	8.4
Prosecuted as misdemeanor or juvenile .	25.5	25.0	25.6	24.7	24.6
Original misdemeanor complaint . . . .	19.4	18.3	18.9	16.9	15.1
Felony complaint dismissed . . . . .	6.1	6.7	6.7	7.8	9.5
Disposed of by superior court . . . . .	35.6	35.8	33.4	33.0	34.2
Released . . . . .	4.7	5.2	5.0	4.6	4.9
Dismissed . . . . .	2.3	2.6	2.4	2.5	2.8
Acquitted . . . . .	2.4	2.6	2.6	2.1	2.1
Dismissed - to lower court prosecution .	1.1	0.8	1.1	1.4	1.3
Convicted in superior court . . . . .	29.9	29.8	27.3	27.1	28.0
By plea . . . . .	22.1	21.5	19.3	18.8	20.8
By trial . . . . .	7.8	8.3	8.0	8.3	7.2
Felony sentence . . . . .	18.3	18.4	17.4	16.1	15.3
Misdemeanor sentence . . . . .	11.6	11.4	9.9	11.0	12.7
Sentences					
Prison . . . . .	7.0	6.3	4.7	3.7	2.7
Youth Authority . . . . .	1.9	1.7	1.6	1.4	1.2
Probation . . . . .	15.1	15.6	16.0	16.8	18.4
Jail or fine . . . . .	4.8	5.0	3.9	4.2	4.5
Civil commitment . . . . .	1.1	1.2	1.1	1.1	1.2
Recapitulation					
Released . . . . .	43.6	44.4	46.0	46.8	46.1
Disposed of as misdemeanor or juvenile.	38.1	37.2	36.6	37.1	38.6
Prior to superior court . . . . .	26.5	25.8	26.7	26.1	25.9
In superior court . . . . .	11.6	11.4	9.9	11.0	12.7
Felony sentence in superior court . . . .	18.3	18.4	17.4	16.1	15.3
Final outcome					
Released (estimated) . . . . .	48.7	49.6	51.3	51.9	51.3
To local custody . . . . .	41.1	41.2	41.3	41.9	43.6
To State custody . . . . .	10.0	9.2	7.4	6.2	5.1

Project TRACE—

A SYSTEM FOR THE TRACKING, RETRIEVAL AND ANALYSIS OF CRIMINAL EVENTS

by Joan E. Jacoby, Director  
Office of Crime Analysis  
District of Columbia Government  
Washington, D.C.

INTRODUCTION

The common complaint running through all crime and crime-related reports, debates and even public statements is that there is not enough information—or there is no information, or that information which does exist is either incomplete, the wrong type, out of date, or inadequate for one reason or another. This complaint is generalized enough to conclude that a planned, comprehensive, interrelated, set of current data must be developed to contribute to the understanding of the dynamics of the Criminal Justice System.

Not only have these needs been cited by the District of Columbia's Crime Commission, where on page 854 of the *Report of the President's Commission on Crime in the District of Columbia*, they state "the Commission's efforts to analyze the crime problem in the District and to formulate appropriate recommendations have been handicapped by major deficiencies in the information available about crime and criminal offenders." But, in addition, as a result of a conference which was called by the Bureau of the Census in 1968, and their publication entitled *Report on National Needs for Criminal Justice Statistics*, they state on page 56 that there are certain priorities which have been established by the conference participants.

To paraphrase their findings, the conference found that the priorities which were most common in tone or the most relevant to future work were:

1. Tracing offenders through the Criminal Justice System as they are affected by the decisions made about them each step of the way, should be an ultimate, if not an immediate goal of data-collection programs.
2. It is more important to have information on the weight of the population moving through the system than on the details of their administration, personnel and finance.
3. It is important not to oversimplify the complexities of either crime and the Criminal Justice System or the problems of devising data-collection programs to describe the most relevant aspects of these social phenomena. Data which are by-pro-

ducts of administration are often unsatisfactory for basic research to answer in-depth questions about the crime problem.

4. Since data-collection programs should be flexible enough to respond to specific research needs and to attempt to solve particular systemic problems, the standard classifications which must be developed should not necessarily be limited to legalistic classification and definition when others may better serve the manipulation of information for better understanding.

5. Despite priorities, data programs should be developed carefully and with considerable experimentation. They should build on what has been learned from existing programs, but should not, on the other hand, be limited to the scope of existing programs.

6. The ultimate and guiding principle for a data-collection system in the criminal justice field should be a concern to understand the crime problem.

With all the information deficiencies existing within the Criminal Justice System ranging from offender status and disposition, case workloads, court backlogs, sentencing practices, recidivism, drug abuse, etc., it is imperative that first priority be given to tracking the offender through the system to determine his status and disposition.

Project TRACE

Project TRACE developed by the District of Columbia Government for its local Criminal Justice System, is a total integrated management information system. This means that it is a conglomerate of subsystems operating in and among the components of the Criminal Justice System. As such, it satisfies the needs of operating agencies in the System; contains the requisite linkages and standards needed to track an individual through the System; and is fleshed out with additional information necessary for analysis, research, evaluation and management planning.

TRACE is based upon the assumption that data will not be accurate, timely-up-to-date or reliable unless it has an operational utility to the agency collecting it. Therefore every subsystem developed or used by TRACE—be it police, prosecutor, public defender, or corrections—has as its pre-condition, operational utility to that agency.

TRACE operates with the strategy that scarce dol-

lar resources should be spent on the weakest links in the tracking system and where the largest amounts of information can be collected for tracking and management planning, research and analysis.

Thus, if agencies already have automated information systems, minimal modification is made to these systems initially. A good example is the police departments, including Washington's, which have highly sophisticated automated systems. Yet in the areas of courts and corrections, historically, little money has been invested in information systems (manual or automated). Here, maximal effort has been expended by Project TRACE.

Since each component of the Criminal Justice System functionally interfaces with one or more other components, communication in terms of standard identifiers seems obvious and is assumed to exist. Unfortunately, this is not the case for as soon as a defendant moves from the police to the prosecutor, his identity as a person is lost; he becomes a case number. Yet when that case is disposed of, the need for individual identification is restored, but the means are all too often not available. The need for linkages and standards is obvious, well-documented and need not be examined further here.

TRACE requires three basic linkages: (1) The Complaint Number assigned by the police for each complaint or offense as it is reported to them. The value of this number lies in its ability to link co-defendants to the same offense. (2) The Police Department's Identification Number, (PDID), which is uniquely assigned to a defendant after he has been fingerprinted, photographed and identified. The value of this number lies in its ability to generate automated criminal history files and recidivism studies. (3) The Court Case Number which, assigned by the clerk of the court, provides the base for studies on case flow and work load. With these three numbers identifying the person's passage through the system, the minimal needs for tracking are satisfied and a base has been established for the further development of TRACE.

Most mandatory reporting systems stop at this point; relying on this collected information to suffice for planning, management, research and evaluation of both the operating agencies and the entire Criminal Justice System. However, TRACE does not stop at this stage. Instead, it overlays on the tracking system the data elements which can identify and measure the reasons for and impact of policy and values on the system.

With the desperate need for a tool to satisfy staff requirements, these data elements must be overlaid on the operating subsystems. Otherwise, who can predict the jail population; the impact of policy change on physically constrained facilities like detention centers, receiving homes, community centers; the impact of doubling police arrests on the

prosecutor, courts, bail agencies? Ultimately, the budget process demands more objective and quantifiable data. If these cannot be met, administrative and budget support for TRACE will be degraded.

Realistically, the chances of values and decision-reasons being added to an already operating subsystem (such as police) are minimal. But the opportunity still exists in agencies not automated. TRACE has taken advantage of this in two areas, the prosecutor and corrections.

The Department of Corrections was heavily supported by TRACE because it is the only source of data about the behavior of offenders subsequent to sentencing. The reason the prosecutor is crucial is that intake into the court system is largely defined by him. It is he who decides whether to drop or breakdown charges. It is he who decides whether to prosecute a case as a felony or a misdemeanor. It is he who participates in plea bargaining, not the police. In essence it is his prosecutive policies and the degree of his discretionary power which makes him the critical link in the system.

One may think that an alternative link between police and corrections could be the court itself (i.e., the clerk of the courts office performing this function). This would be true, under certain conditions, if only a mandatory reporting system is sought. Since TRACE is concerned with capturing decision-reasons such as why a case was dismissed, how strong a case was it, what elements contributed to certain types of dispositions, these questions could not be answered by a clerk's office. They can be answered only by the prosecutor as he makes the decisions or assesses outcomes. Hence, the court can contribute nothing to TRACE in this area, and therefore is not an acceptable alternative link.

Noting these limitations, the court could be used in lieu of the prosecutor depending on the following conditions: (1) Strong administrative line authority must exist since an automated information system is only as operable as the authority to enforce its compliance. (2) Management must be interested in optimizing the allocation of scarce resources. (3) Management must aim at increasing the quantity and quality of representation and services.

The prosecutor in Project TRACE is the only person who is able to simultaneously identify who comes into the system, match police to court charges, describe how the defendant is processed and identify why and how he exits. If one were to maximize scarce dollar resources, the prosecutor would be the component in the Criminal Justice System to receive maximum support. He is literally the middle man, the policy maker, the critical link in the system.

The prosecutor's problem is essentially an inefficiently operating, large-scale scheduling and staging process. In order to have as many cases as possible prosecuted on their merits, the prosecutor wages a

continual battle against postponements of trials by trying to ensure that witnesses are present, the police officer is in court, and reports and investigations are completed. In addition, the prosecutor trying the case must be as well prepared as possible.

Basically because of over-calendar and mass-production of trials, the prosecutor is faced with the problem of allocating his resources (men) to those cases which seem more urgent for trial relative to other cases.

In other words, the prosecutor needs a system for evaluating his workload in terms of where should he put extra, added, prosecutive strength.

Using statistical techniques, criminological theory and research, a weighting system was devised for the prosecutor which tells him two weeks in advance of trial not only what are his most important cases for that day; but frankly assesses any problems and states his probability of winning a conviction.

This is accomplished by the prosecutor completing evaluation sheets as each case is brought in by the police. The sheets capture information which measures:

1. The seriousness of the offense using Sellin and Wolfgang's Seriousness Scale.<sup>1</sup>
2. The seriousness of the previous record of the offender using Gottfredson's Base Expectation scale.<sup>2</sup>
3. The probability of the government's winning the case based on the prosecutor's subjective evaluation.

The data from the evaluation are fed into the computer, merged with other information such as the age of the case and has an urgency for conviction (W-W) score computed. Two weeks before trial the cases are sorted by the W-W score and presented to the prosecutor for his evaluation and special assignment to other prosecutors for handling.<sup>3</sup>

Since the urgency of a case is defined in terms established by the prosecutor, the model attempts to reproduce his subjective evaluation which would result after mature reflection and long experience. In situations where there are too many cases, too little time and where the prosecutor who handles the case is often insufficiently experienced, this model may prove to be an acceptable substitute. Operationally then, the system provides the prosecutor with a means for the daily evaluation of his workload.

In addition, the system has been designed in such a manner that as policies and procedures change, or even as social values change, the prosecutor can relay this to his system and update it. As an example, the Seriousness scale of Sellin and Wolfgang was developed in 1960 when the use of marijuana was equated with the same severity as using heroin. When the scale was tested for the prosecutor, this score had to be divided and changed to reflect not only the type of narcotic but to distinguish between possession and sale. Thus, the weights can be constantly tested and modified as necessary to keep with

the priorities of the prosecutor.

Another aspect of the feedback capability of this system which distinguishes it from mandatory reporting systems can be exemplified by an explanation of the "probability of winning." Presently this is a subjective assessment on the part of the prosecutor. However, in addition to recording this assessment, the prosecutor is checking a list of data elements which intuitively and based on experience have been explicated as the items most affecting the outcome of the case.

Not only are some of these items being published as problem areas for the prosecutor's calendar; but in addition, they are being stored until a large enough data base is built for analysis. The first analysis performed will define what relationship exists between the subjective probability, the factors supposedly determining case disposition and the actual outcome itself. It is hoped that this analysis will ultimately replace the subjective probability with an objective, derived probability.

Not all the aspects of TRACE are so innovative. The requirements of a management information system must also be met. Hence the integration of the various files will result in a number of sorely needed management improvements.

Most of these improvements can be located in the area of communication between interfacing agencies. Since the prosecutor records the disposition of cases, these can be automatically forwarded; by list, to police central records for arrest record updating; by tape, to police data processing for file updating and as the beginning of an automated criminal history file. Currently, the arresting police officer is responsible for determining the outcome of his case and reporting it to central records. The improvement in terms of time, money and accuracy are obvious.

The system will automatically provide a list of persons released on non-surety bond to the Bail Agency. This control list will permit the Bail Agency to check its registrants against those they should have under supervision. The system will notify all witnesses (including police) not only of court dates, but more importantly of changes in trial dates or even cancellations due to pre-trial dispositions. When every day in court after the first one can mean overtime pay for the police officer, the budget implications are obvious along with better utilization of the police manpower.

The system will notify daily the narcotics chemist of all cases for which a report will be due, thus giving him a control. In addition, it will inform him when the trial date is due, and whether his report is in or not.

Finally, the system will provide the Department of Corrections with a tape which can be merged with their automated system relieving some duplication

of effort. More importantly, since the tape will contain the Police Department Identification Number, for the first time a linkage can be established between the PDID Number and the Department of Corrections Identification Number (DCDC Number). At that time, the Department of Corrections will be able to communicate with the Police Department on a more reliable basis. Ultimately, it may even be possible to eliminate the DCDC Number and carry one unique common identifier throughout the Criminal Justice System.

#### CONCLUSION

In summary, then, Project TRACE encompasses

- the establishment of proper management procedures and practices necessary to support automated systems.
- the design and development of automated systems which have practical operational utility to the agency integrated

with other systems for tracking the individual through the Criminal Justice System.

- the overlay of data elements necessary for research, analysis and program evaluation.
- a feedback principle which because of the decision-reasons collected permits the system to reflect changing policies, procedures, even values and modify them where necessary.
- the basis for the development of a simulation model of the System.

<sup>1</sup> Sellin, Thorsten and Wolfgang, Marvin, *The Measurement of Delinquency*, New York, John Wiley and Sons, Inc., 1964  
<sup>2</sup> Gottfredson, D. M., and Ballard, K., Jr., "Differences in Parole Decisions Associated with Decision Makers" *Journal of Research in Crime and Delinquency*, July 1966.  
 Gottfredson, D. M., and Beverly, R. F., "Development and Operational Use of Prediction Methods in Correctional Work" *Proceedings of Social Statistics Section of American Statistical Association*, Washington, D. C., A.S.A., 1962  
 Gottfredson, D. M., and Bonds, J. A.; *A Manual for Intake Base Expectancy Scoring* (Form CDC-BEGIA), Research Division, California Department of Correction, Sacramento, California, April 1, 1961  
<sup>3</sup> Jacoby, Joan E., "Optimizing the Prosecutive Function in the District of Columbia," April 13, 1970.  
 Jacoby, Joan E., "A Strategic Case Calendaring Model for the Prosecutor," September 3, 1970.

## DATA MANAGEMENT SYSTEM FOR PROJECT SEARCH

by Dr. Valdemars Punga, Chairman  
Computer Science  
Rensselaer Polytechnic Institute of Connecticut

Thomas Schroeder  
Supervisor of Technical Data Management  
Pratt and Whitney Aircraft

David Weinstein, Director  
Connecticut Planning Committee  
on Criminal Administration

Nelson White  
Assistant Systems Director  
Travelers Insurance Company

This paper originated as a result of coordinated effort between the Computer Science Department of Rensselaer Polytechnic Institute of Connecticut, Inc., and the Connecticut Planning Committee on Criminal Administration with support and encouragement from the Aircraft and Insurance industries. The bulk of the paper constitutes the projects of Mr. Schroeder and Mr. White, developed as a partial requirement toward their Masters degree in Computer Science. Projects were supervised by Dr. Punga and Mr. Weinstein. Pratt & Whitney Aircraft and Travelers Insurance Co., where Mr. Schroeder and Mr. White are employed respectively, rendered support and encouragement without which the project would not have been accomplished.

#### INTRODUCTION

The collection and organization of data for the SEARCH file was started in Connecticut only in 1970. At the same time, we are planning and designing the future development of a comprehensive, integrated criminal justice Data Management System (DMS). DMS is a system of people, computers, procedures, documents, files and communications among the functional groupings of the Criminal Justice System: police, courts, prosecution, correctional institutions, parole, probation, and juvenile justice system. DMS will be designed for the purpose of efficient operation and management of the Connecticut criminal justice system.

All criminal justice agencies should participate and share a joint data base from which each draws and which each enriches through contributions.

The concept of a comprehensive computer-based record system which would contain records not only for the police, but also for the courts, penal institutions, etc., is a desirable, long-term objective.

SEARCH can form the nucleus of such an information system and, in fact, provide much of what we already need.

Some states started the development of a criminal justice information system as early as 1964. Starting late, Connecticut has a long way to go to reach their level of system implementation.

Strangely enough, there are some advantages to starting late and starting from scratch. Some of these advantages are:

- a.) Guidance from the experience and insights of those states who started earlier.

- b.) The state-of-art, techniques, software and hardware available for the design and implementation of a DMS system in 1970 are much more advanced than those of 1960.
- c.) Connecticut has no heavy investment into outmoded system and computer hardware, so that it has flexibility to introduce the most advanced equipment and techniques, without massive conversion cost.

SEARCH, as it is presently organized, is strictly an offender file containing primary police information—bare facts about the date of the arrest, charge codes, disposition codes, etc.; however, one can find many imaginative ways in which additional, useful information can be added to the file. This way we can develop a truly effective criminal justice information system.

For example, information concerning the previous addresses of offenders, names of his associates, and previous employment records could be added to the file. Offender records could be supplemented by:

- the arresting officer's narrative concerning circumstances of the arrest;
- the prosecutor's report explaining his point of view about the placement of charges;
- penal institution report about offender's behavior after incarceration;
- information about offender's educational background, family life, living environment.

Similarly, the cost of some crimes, like vandalism, arson, shoplifting, bad checks, etc., can be recorded in the file; in cases where the offender was the only provider, the cost of welfare can also be recorded after his incarceration. No doubt the SEARCH data management system in the future will be expanded, modified, or restructured.

Consequently, we have to introduce a system for SEARCH information, storage and retrieval which can, without reprogramming and without file restructuring, accept and adopt any future additions to the file.

The IMS/360 system was selected for this purpose. It satisfies remarkably well the requirements and standards we set for the planned criminal justice information system.

Our choice was conditioned also by the following factors:

- a.) Computer System 360, Model 50, at the Connecticut State Data Center will be used for criminal justice DMS implementation in Connecticut. This computer system software and hardware configurations, with its powerful OS/360 operating system and versatile communication links, has proven its ability to handle successfully the IMS system in many applications.
- b.) The major Connecticut employers—Aircraft and Insurance—use IMS/360 frequently. Many graduate students of Computer Science at Rensselaer Polytechnic Institute of Connecticut

ticut who work for these industries prepare their projects in the field of criminal justice information systems. These students have training and experience with the IMS system.

As was previously mentioned, we consider SEARCH only as a prototype of the more comprehensive criminal justice information system, which, in addition to criminal offenders data, should also provide data, for example, about organized crime, intelligence and modus operandi files, management, cost, etc.

It would be a great mistake to start implementation of a new information system only to find, by trial and error, what was wrong and how to correct it. Experimentation with a new information system is a very costly undertaking; however, a simulation model can be developed for any proposed information system and simulated on the computer. This way, costly experimentation is replaced by the computer model which will evaluate and compare various information systems and then choose the best one.

Accordingly, after discussion of what types of statistics could be derived from the SEARCH file, as it is presently organized, we shall discuss the IMS/360 applications to SEARCH, and finally develop a simulation technique for the optimal design criteria of a criminal justice DMS system.

#### USE OF SEARCH FOR STATISTICAL REPORTS—FUTURE POSSIBILITIES

As the criminal justice process is more intensively studied by state law enforcement planning agencies funded under the Omnibus Crime Control and Safe Streets Act, the need for reliable information about the nature and scope of the operations of the criminal justice system increases enormously. The thrust of the movement for better information seems to be in the direction of transaction, offender-based statistics or a subject-in-process information system. The facts generated by such systems will provide important insight into the processing of offenders through the criminal justice system; information which is not presently available in any accessible form.

The development of such systems is going to take time; considerable time. In the interim, the information which such systems would generate is still needed for planning, policy making and operational purposes. It would appear, therefore, that some good partial, temporary substitute source of data would be desirable.

The criminal history file created according to Project SEARCH criteria and format is such a substitute source of statistical data. It is, of course, a less than totally satisfactory substitute but it is, nonetheless, a useful source.

Using Project SEARCH criteria and format, all significant transactions between an offender and the criminal justice system are to be recorded, in sum-

mary form, in the criminal history file maintained on the subject. The criminal history file is, then, in truncated form, a subject-in-process or transaction, offender-based data base.

Without examining the total available data in the Project SEARCH criminal history repository, certain significant types of information or statistics which can be extracted from the files are worth noting. For example, there has been a hue and cry of late about the purported commission of crimes by persons out on bond awaiting disposition of prior criminal cases. I use "purported" because there is very little hard data available to support the arguments on either side of the issue. Some advocate preventive detention to halt the supposed commission of crime during the pretrial phase of the criminal justice process. Others argue that there is no evidence of commission of crimes during the pretrial phase which would justify detention of persons without bail.

The Project SEARCH criminal history file contains data which can shed some light on this controversy. Ideally, the file should contain information about pretrial release status, but even if it doesn't one need only have the computer compare the arrest and disposition date of a prior arrest with the date of a subsequent arrest. If the latter falls between the former, then one can surmise that the offender must have been free during the pretrial period and was charged with commission of a new crime during it. Some analysis could then be made of the characteristics of those who were charged with commission of new crimes during the pretrial period to find out what factors (e.g. crime type, race, sex, age) were related to recidivism during the pretrial period. Such information would contribute significantly to a rational resolution of the pretrial detention issue.

Some other uses of the criminal history data base are also worth mentioning. One very troublesome issue is that of the development of criminal careers. Multiple recidivists are, perhaps, the most difficult types of people for the criminal justice system to handle. One hypothesis about such persons is that subsequent reentries into the system are for increasingly serious offenses. There has been only limited testing of this important hypothesis. With a Project SEARCH criminal history data base, it is possible to examine current arrest and disposition charges as a function of offenses charged on prior arrests and dispositions. In this manner, the development of criminal careers as a function of crime type, age, sex, race or other characteristics can be tested. If the hypothesis were sustained, then we would have to ask ourselves the hard question of whether or not the criminal justice process is doing anything more than making increasingly dangerous people out of those passing through it.

The criminal history data bank can also provide valuable insights into the operations of the criminal

justice system. One important issue is how expeditiously the criminal justice system is handling its workload. Ideally, the criminal history file on each individual will provide a record of each major transaction the offender has had with the system and the date of such transaction. Thus, we can begin to plot time between transaction such as arrest, plea, trial and disposition. In this way we can derive hitherto unavailable information about the workings of the criminal justice system. Such information could be further refined by breaking it down by crime type, age, sex, race, prior offenses. Out of this would come useful data about where the delays are occurring in the process and what types of offenders are experiencing delays of varying lengths. Such data would also be useful in further computer applications such as simulation which could be employed in an attempt to make the criminal justice system function more efficiently.

Another important operation in the criminal justice process about which much heat and little light is generated, is charge-changing. We know, in a general way, that through a process of charge screening and plea bargaining, an offender may be arrested on one charge, or set of charges, presented in court on others, and disposed of by plea on yet another set. While we recognize that it is useful for each operation in the system to be allowed significant discretion in handling offenders, we are not always happy with the manner in which that discretion is exercised; especially so when someone else, further on down the line in the system, makes a decision which seems to undermine our own efforts.

The data in the SEARCH criminal history file can throw light on the charge changing process. We can, for example, begin to examine what happens to the major charges against an offender as he moves through the system. Multiple charges at arrest can be compared with charges entered in court, which can be compared in turn to charges on which the case is disposed of. Further, the fate of multiple charges can be traced and sentences can be correlated with prior arrests and the charge changing process. In this way we can begin to enlighten ourselves as to whether or not the defendants and the state are receiving fair treatment in the plea bargaining process.

These are but a few of the potential uses of the Project SEARCH criminal history file. Many other kinds of information which have been described as part of the presentations on transaction, offender-based and subject-in-process information systems can be extracted from the criminal history data base. This is true because the criminal history file is, in essence, the summary profile of all the transactions relevant to a criminal justice system. Until these more sophisticated systems are available, the valuable data in the criminal history files ought to be utilized as the best available, interim substitute.

#### IMPLEMENTATION OF PROJECT SEARCH USING THE INFORMATION MANAGEMENT SYSTEM (IMS/360)

The purpose of this study was to establish a Criminal History Data Base within the State of Connecticut containing all the required data elements as established by Project SEARCH. Connecticut's unique contribution to Project SEARCH will be an attempt to design a file and establish a system of offender-based data collection which will permit nearly automatic and simultaneous generation of statistical data and criminal history files. A further requirement is that this system and the concepts involved become a part of a total law enforcement management information system through which administrators of the criminal justice system at all levels and all agencies may interact in an on-line real-time environment. The remainder of this paper will discuss briefly the software chosen to meet these requirements and the structure of the Criminal History Data Base.

#### WHAT IS IMS/360

Information Management System/360 is an Operating System/360 system program designed to facilitate the implementation of a data base system in a multiapplication environment. IMS/360 may be used in a batch environment, a teleprocessing environment, or in a combined batch/teleprocessing environment. The two general facilities provided are those of Data Base and Data Communications. The combined facilities allow the collection, maintenance, and interrogation of data bases from a variety of teleprocessing devices with user-written application programs.

#### PRIMARY OBJECTIVES OF IMS/360

The first and basic objective of IMS/360 is to eliminate redundant data within the user's data processing environment. By reducing the number of copies of data, the requirement for data maintenance is also reduced and the accuracy of data available to users is increased. The second objective is to reduce application program maintenance. This should allow an IMS/360 user to apply a larger percentage of his data processing resources to future application design and development. A third objective is to provide on-line maintenance of data bases. On-line maintenance provides a mechanism for up-to-date data. This is again an improvement in the accuracy of data.

#### REQUIRED TO MEET THE OBJECTIVES

In order to reduce redundant data and data maintenance, some means of combining application files is required. This is fulfilled through the data base facilities. Since IMS/360 may serve as a base for numerous applications of a user, it is required to provide a system which offers evolutionary growth. That

is, it must allow the user to start with one application and extend to many in an orderly manner. In order to reduce program maintenance, a high degree of data independence is required. Data independence is defined as the ability to create data structures required by applications without concern for physical storage of the data. That is, the ability to manipulate the data in its physical representation without impacting the application program. The ability to manipulate data includes the abilities to change and add data, change and add data types, change and add data relationships. Another requirement in reducing program maintenance is to support high level languages. IMS/360 supports COBOL and PL/I as well as Assembler language. They are supported for data base calls and for calls dealing with teleprocessing devices. For on-line update, large volumes of transactions with rapid response are required. While the volume and response are functions of many user variables, typically, the volumes would be measured in thousands of transactions per hour and response times would be measured in seconds.

#### IMS/360 DESIGN PHILOSOPHY

Program and data integrity has probably influenced IMS/360 design more than any one single factor. Since many application programs will be using common data bases, some means of assuring data integrity and protecting one program from another had to be designed into the system. User application programs are each run under a different OS/360 protection key. This protects one program from another. The IMS/360 control region which has responsibility for reading and writing all data has its own storage protection key. A log tape which is written by IMS/360 can be used to reconstruct data bases and to back out activity from the data base. Recovery from machine or system malfunction is an IMS/360 responsibility. When the system fails, it is the responsibility of IMS/360 to back out activity in process and cause applications to be restarted. The application programmer need not get involved nor is he required to maintain information necessary for restart. By separating logical data structures from physical data storage, the application program becomes insensitive to the organization and access method used to acquire data. Through the use of logical terminals, application programs can be written in a relatively device-independent manner. That is, the application program can deal with a logical terminal which at different times could be associated with a number of different 1050's and 2740's. No modification to the application program is required. Through the use of logical terminals, a physical terminal can be maintained without the need to halt operations normally performed by that terminal. The logical terminal normally associated with the physical terminal being maintained can be associated with a different physical terminal.

#### IMS/360 AS AN EXTENSION OF OS/360

IMS/360 is not an application program and provides no application code. It should be viewed as an extension of OS/360 in three areas:

1. The OS/360 data management facility is extended to include a data base facility which supports a hierarchical and inter-related hierarchical data structure capability.
2. OS/360 data communications facilities are extended to allow a terminal to be used for a number of applications. There is no necessity to dedicate a terminal to an application. All physical terminal and communication environment functions such as message queuing and scheduling are provided by IMS/360.
3. IMS/360 checkpoint/restart facilities provide a constant monitoring of the data base/data communications facilities for recovery purposes. On-line updating would not be practical without this facility. The checkpoint/restart facilities are message or transaction oriented.

#### SUBSYSTEM

IMS/360 can be viewed by the application programmer as an environmental subsystem. All services in relation to data bases and data communication devices are provided by IMS/360. The application program deals with logical data bases and logical terminals. IMS/360 deals with physical data bases and physical terminals. IMS/360 can be viewed as an environmental subsystem by the system programmer. IMS/360 structures the complete data processing environment provided by OS/360 into a data base/data communication environment.

#### DATA BASE FACILITY

The data base facility includes a number of capabilities and is implemented through the use of Data Language/I (DL/I). A great deal has already been said about data independence. This is accomplished by separating the logical structure of data with which the application program deals from the physical organization and access method. DL/I data bases provide a capability to allow the data base to accommodate new data types. This can be done without requiring modification to programs already using the data base. The data base can grow in both volume and scope. Scope means new data and new applications without modification of existing programs. Data base records within the same data base may vary from one byte to millions of bytes. This is not to say that they should, but the capability is included to accommodate this kind of variance. Utility programs are provided for reorganizing data bases and for recovering data bases. Data bases may be referenced from a batch program or from a teleprocessing program. This can be done concurrently or independently.

#### LOGICAL DATA STRUCTURE

The logical data structure supported by Data Language/I is hierarchical, segmented data. The hierarchical segment approach allows for variable

length application records to be composed of a variable number of fixed length segments.

#### PHYSICAL DATA STORAGE

There are two basic data base organizations supported by Data Language/I. These are hierarchical sequential and hierarchical direct. There are four data base access methods supported:

1. Hierarchical Sequential Access Method (HSAM)
2. Hierarchical Indexed Sequential Access Method (HISAM)
3. Hierarchical Direct Access Method (HDAM)
4. Hierarchical Indexed Direct Access Method (HIDAM)

Regardless of the organization or the access method used, an application program can always view the data as a logical hierarchical structure. From one running of the application program to the next, the organization and access method can be changed without requiring the application program to be recompiled.

#### DATA COMMUNICATIONS FACILITIES

##### PHYSICAL TERMINAL SUPPORT

1. The 1030 Data Collection system is supported in a non-switched environment.
2. All components of the 1050 system are supported for both switched and nonswitched networks.
3. The 2260 is supported in a remote mode nonswitched environment.
4. The 2740 Model 1 is supported in a switched and non-switched environment.
5. The 2740 Model 2 is supported in a nonswitched environment.
6. The 2780 is supported on a nonswitched line. All components are supported, including card reader, printer, and punch.
7. Multidrop or point-to-point operation is supported for 2740 Model 1 and 2, 1050, 1030, 2260, and 2780 on nonswitched communication lines.

#### MASTER TERMINAL

The master terminal is a user-designated terminal which functions as a system resource controller. The IMS/360 master terminal is analogous to the OS/360 console. It is used for the communications resources to start and stop communication lines, physical terminals, and logical terminals. In the scheduling area, transactions, programs, and data bases may be stopped, locked, unlocked, or started. The master terminal is used for starting and stopping the system by invoking the checkpoint/restart facilities. Dynamic system status can also be displayed at the request of the master terminal.

#### LOGICAL TERMINAL CONCEPT

The application program deals with a logical terminal which is associated with a physical terminal. One or more logical terminals may be associated with a single physical terminal. Each logical terminal may be employed by a different IMS/360 user. Different security criteria may be applied to each logical terminal. Logical terminals may be ignored or re-assigned to different physical terminals. This is performed through the master terminal. This ability provides for added system availability.

#### CRIMINAL HISTORY DATA BASE DL/I STRUCTURE

The contents of a variable length data base record (composed of a variable number of fixed length segments) can best be visualized by reference to an outline form presentation of the various segment types by level number (Figure 1) and also by a hierarchical structure diagram (Figure 2).

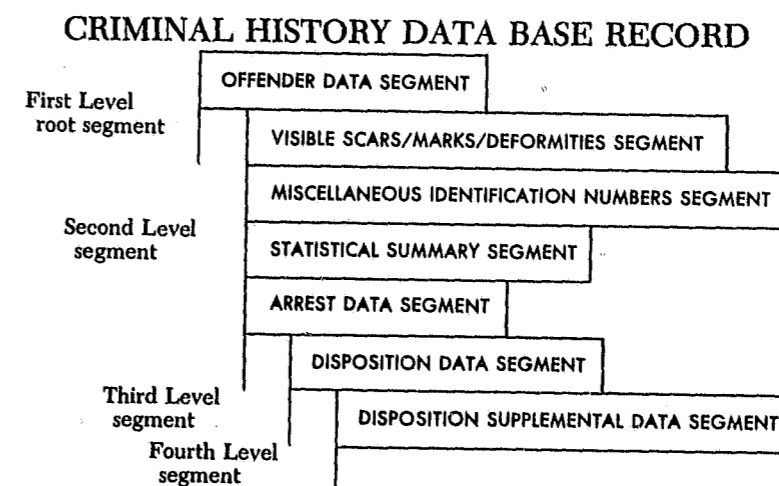


Figure 1. Criminal History Data Base Record Segment Level Structure

The highest level (level one) segment or root segment is the Offender Data Segment. All segments immediately subordinate to the root segment are called second level segments: Visible Scars/Marks/Deformities Segment, Miscellaneous Identification Numbers Segment, Statistical Summary Segment and Arrest Data Segment. Third level segments are related to the second level segments. In this structure, Disposition Data segments are related to Arrest Data Segments. Fourth level segments are related to the third level, etc.

## CRIMINAL HISTORY DATA BASE RECORD

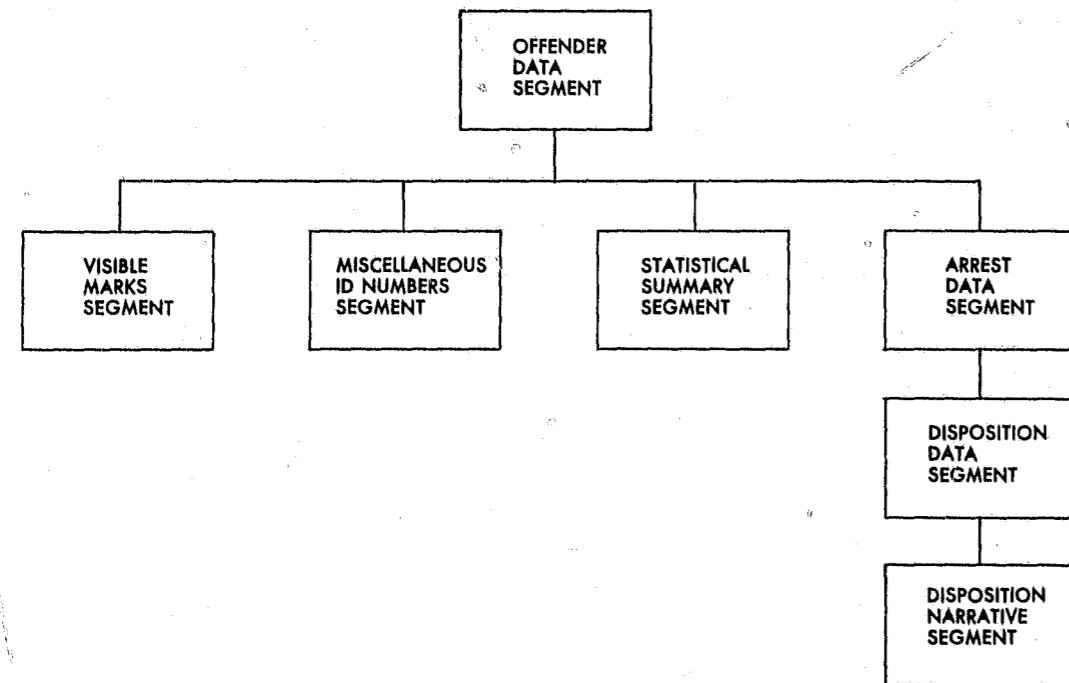


Figure 2. Criminal History Data Base Record Segment Logical Hierarchical Relationship

### SEGMENT TYPE CONTENTS

Provision has been made in this initial data base structure to accommodate all data elements as outlined in reference (3).

#### 1. OFFENDER DATA ROOT SEGMENT

This segment type contains all current personal information about the individual offender and occurs once per data base record.

#### 2. VISIBLE SCARS/MARKS/DEFORMITIES SEGMENT

This segment type contains coded entries to indicate the physical characteristics of the offender concerning scars, birthmarks, tattoos, deformities, missing body parts and artificial body parts and aids. Its frequency of occurrence is variable.

#### 3. MISCELLANEOUS IDENTIFICATION NUMBERS SEGMENT

This segment type contains any agency assigned identification number. Its frequency of occurrence is variable.

#### 4. STATISTICAL SUMMARY SEGMENT

This segment type consists of data elements whose purpose is to present statistical information on an offender's arrest/disposition history in a summarized form. There will be one segment per offender for each generalized offense code charged to the offender.

#### 5. ARREST DATA SEGMENT

This segment type contains all data pertinent to the arrest of an individual. This data is the starting point for traversing the particular criminal justice system for a given offender. This segment type occurs once for each date/arrest combination.

#### 6. DISPOSITION DATA SEGMENT

This segment type traces the flow of offenders through the criminal justice system following the initial arrest. Information will be included on outcomes of arrest, pre-trial hearings, trial, sentencing, correction (including probation and/or parole) and post-conviction.

#### 7. DISPOSITION SUPPLEMENTAL DATA SEGMENT

The purpose of this segment type is to provide any narrative

description needed to further explain unusual or extenuating circumstances concerning any Disposition Data Segment.

A more detailed description of the data base organization and contents can be found in reference (9).

### INITIAL USAGE

The development of this data base in the format specified satisfies the criteria outlined for inquiry and retrieval of criminal histories prescribed by the SEARCH Project Group. The data base as structured can be effectively used by system designers to produce all required management and statistical reports but the true benefits derived from the use of a system such as IMS/360 lie in the ability to expand the scope of the system easily and still maintain effective control over the usage of EDP resources. The time-phased structuring of the Arrest/Disposition data segments illustrates the flexibility of the data base for simulation analyses. It readily lends itself as input to a feedback flow model of the entire criminal justice system (comprising police, prosecution, courts and corrections) to depict the flow of offenders through the various agencies and the recycling of offenders back into the system because of recidivism.

### SAMPLE DATA BASE RECORD

Figure 3 depicts a sample Criminal History Data Base Record containing variable occurrences of the different segment types as it would be physically stored on a direct access device.

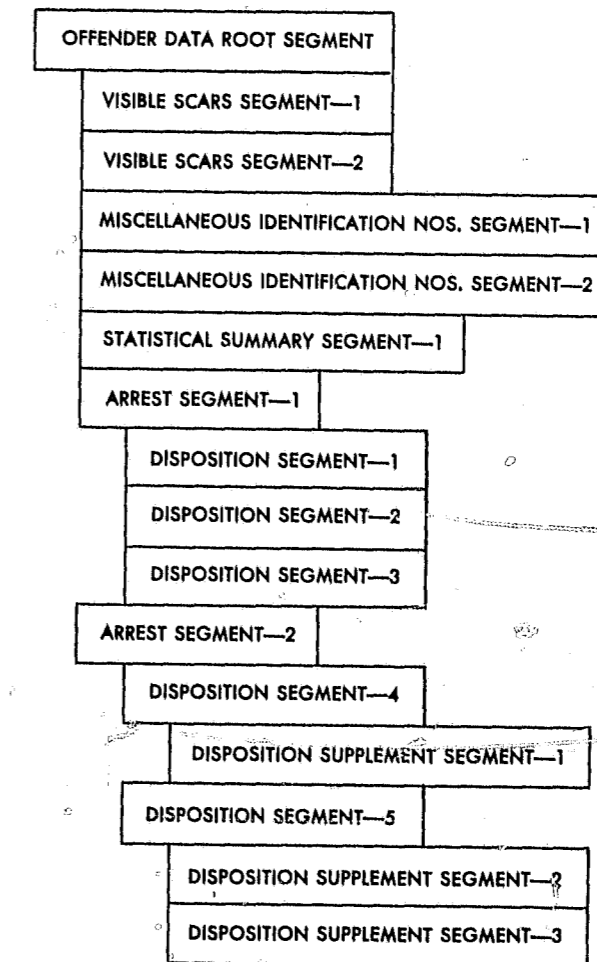


Figure 3. Segment Level Structure of Sample Criminal History Data Base Record

Figure 4 depicts the sample record from a hierarchical viewpoint.

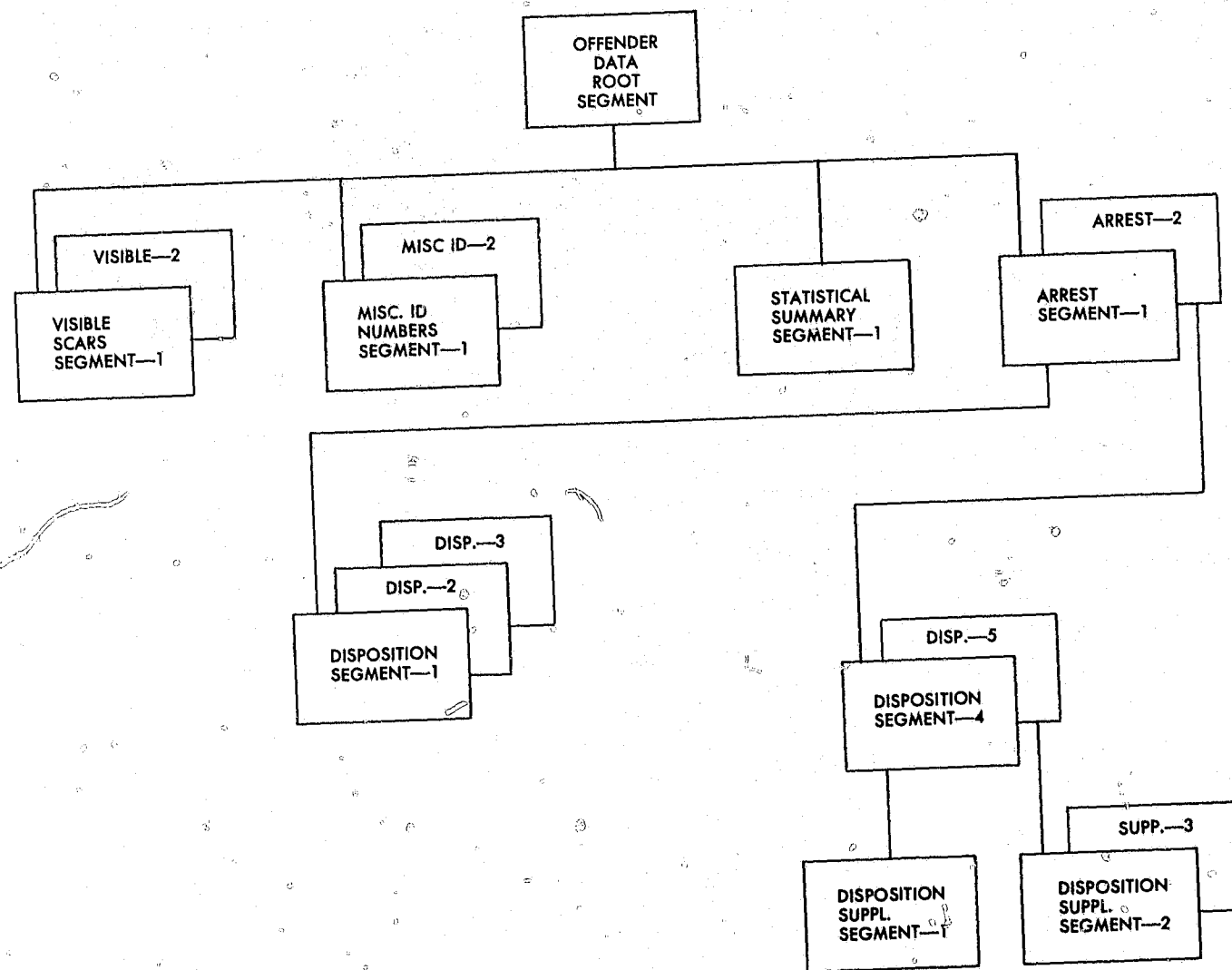


Figure 4. Hierarchical Structure of Sample Criminal History Data Base Record

#### SYSTEM EXPANSION

While the data base structure discussed satisfies the criteria for Project SEARCH, administrators of the criminal justice system within any state have a need for much more information to satisfy the day-to-day requirements of both intra-state and interstate agencies. To develop the type of integrated system that is needed, more data bases must be created and new information must be added to the Criminal History Data Base. Access capability to the Criminal History Data Base can be greatly enhanced by the development of a cross reference Data Base as discussed in reference (10). Data elements such as phonetic name code, FBI Number, Social Security Number, Fingerprint Classification and many other types of identification numbers may be cross referenced to the Agency Identification Number sequenced data base containing offender histories.

#### DATA BASE EXPANSION

This section will discuss some possible points of expansion within the Criminal History Data Base and the potential usefulness of the information. Figure 5 depicts the Segment Level Structure diagram of an expanded data base.

##### 1. ARREST DATA SEGMENT

This segment type may be expanded to include information concerning the arresting officers, location and time of arrest. This data may be used in conjunction with employee records data bases and resource allocation management.

##### 2. MODUS OPERANDI SEGMENT

This segment type contains information concerning the pattern of events followed and may be used in conjunction with Wanted Persons files, Crime Report files and Suspect Description files.

##### 3. VEHICLE/WEAPON USAGE SEGMENT

This segment type contains information concerning all vehicles and/or weapons used in the offense. This information can be used in conjunction with files containing vehicle registrations, gun registrations, and stolen/pawned property files.

##### 4. PROPERTY/VICTIM DATA SEGMENT

This segment type contains information concerning descriptions and value of property involved and pertinent information concerning victims of offenses.

##### 5. ALIAS/NICKNAME SEGMENT

This segment type contains any other names the defendant has used and is used in conjunction with the phonetic name code cross reference file and Wanted Persons files.

##### 6. OCCUPATION HISTORY/LOCATION SEGMENT

This segment type contains information concerning the of-

fender's employment record of occupation classification and location. It may be useful in predicting the potential mobility of known criminals.

##### 7. EDUCATIONAL HISTORY SEGMENT

This segment type contains a complete educational history of the offender including schools attended, dates and locations.

##### 8. RESIDENCE HISTORY SEGMENT

This segment type contains information concerning the location, duration and types of residence used by the offender.

##### 9. FAMILY/ASSOCIATES SEGMENT

This segment type contains all pertinent information regarding names, locations and relationships of other persons to the offender. There are several uses for this type of data. For example, if the offender is the sole support of a family, his arrest may trigger action from a social worker or welfare department. If all previous cellmates are included, the segments will tend to link known criminals together.

##### 10. MEDICAL HISTORY SEGMENT

This segment type contains any unusual physical or emotional conditions of the offender that could possibly identify him from a Wanted Persons or Crime Report file.

#### CONCLUSION

The last example of an expanded data base and its potential usefulness is but one of a great number of possible data organizations. Every state has its own internal system requirements and they must be developed on an individual basis. However, the primary emphasis to effect a framework for a total Law Enforcement Management Information System is an expandable system whose growth and use are readily controllable by the system planners. Today, systems designers are evaluating computer systems not only with regard to programming systems and hardware, but also in relation to the needs of the user operating environment. In this respect there are increasing demands to interface with large centralized information files. IMS/360 provides a number of features which facilitate implementation, change, and expansion of such application systems and information files. The use of IMS/360 can be considered pertinent to the needs of most data processing users. Using IMS/360, a data processing installation can design its applications to interface with the information files from remote terminals, in the more conventional batch mode, or in combination. These features, coupled with the ability to respond to the frequent and anticipated high-volume information requests, make IMS/360 a powerful new tool for the data processing user.

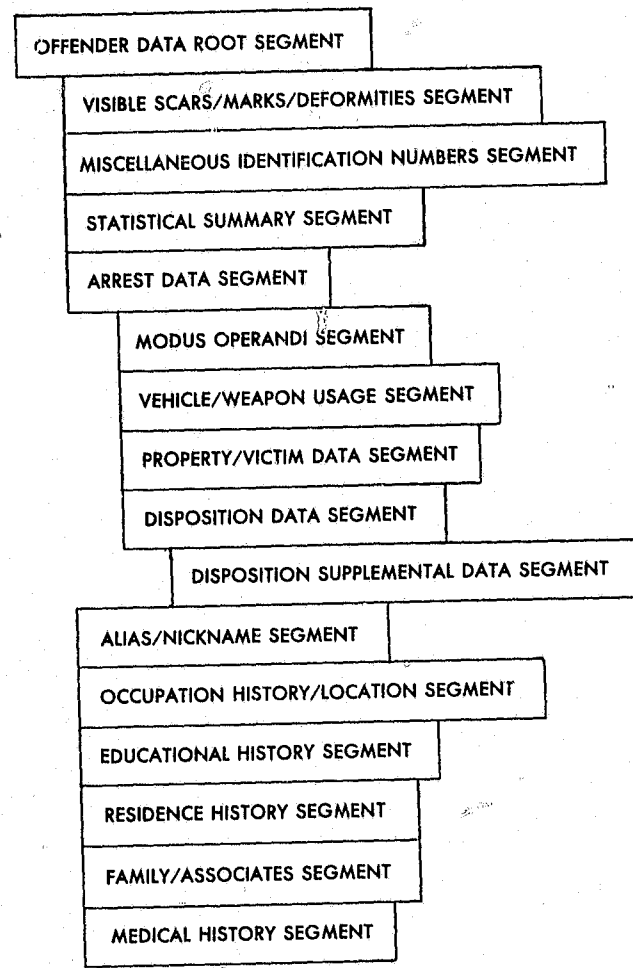


Figure 5. Expanded Criminal History Data Base Record Segment Level Structure

## DATA MANAGEMENT SYSTEM SIMULATOR—DMSS OVERVIEW

### Introduction

The Information System designer's job is not one to be envied. He is faced with the nearly insurmountable task of selecting a data management system which cannot only bridge the gap between the logical user requirements and the physical realities of the storage media and computer hardware but, at the same time, keep overhead at a minimum. In order to accomplish this, the Information System designer must select from a large and complex set of interrelated criteria these alternatives that *he feels* will optimize the data management system with which he is concerned.

Since the success of the Information System relies largely upon its data management system to provide flexible data organization, efficient data storage and effective data processing, this intuitive judgment is, clearly, not the most desirable way in which to select an optimal data management system configuration. The Data Management System Simulator—DMSS—is designed to replace this intuitive judgment with a set of clear and concise "practical" alternatives. The Information System designer is then, through the application of analytical evaluation techniques, able to select an optimal alternative.

### Definitions

Before describing DMSS, a few key terms are defined here to establish a common frame of reference.

*Data management systems* are concerned with data organization and structure, logical accessing schemes and physical storage devices.

*Data structure* deals with elementary data items and data components. An *elementary data item* is the atom of the data structure; that is, the smallest piece of raw datum identifiable to the data management system. Each elementary data item possesses certain attributes that describe it to the system. The most important of these are length, occurrence and inter-item relationships.

A *data component* is a collection of related elementary data items, and the smallest unit handled by the data management system. By collecting items into a data component the amount of overhead, both hardware and software, required to handle this unit is less than the total overhead required to handle, independently, each item comprising the data component. Each data component also possesses descriptive attributes, the more important of these being occurrence and inter-component relationships. A data component may contain only one elementary data item when it is required to handle that particular item individually.

*Data organization* deals with logical records and data bases. A *logical record* is a collection of inter-related data components and as such is a computer oriented description of a "real-world" phenomenon. The most important attribute associated with logical records is the relational one. Each logical record is uniquely identifiable to the data management system by a *key* comprised of one or more elementary data items.

A *data base* is a collection of related logical records. In general, a data base contains a large number of logical records, each record having a complex structure.

A *logical accessing scheme* is the software program that interfaces the logical record description with the physical storage device. This program provides the user with the means to store, retrieve, modify, index, etc. logical records, with little or no concern with the characteristics of the storage device.

The *physical storage device* has certain characteristics with which the data management system must concern itself. Generally, these are divided into two areas, capacity and timing. Capacity is usually a measurement of the number of characters of information which can be contained on a physical storage device. Timing is concerned with the amount of time required by the physical storage device to find and retrieve the information stored on it.

### The Simulator

The Data Management Simulator is composed of three discrete models, related through their inputs and outputs. Figure 6 is a schematic illustration of the relationships between these models. The first model, the Logical model, requires as input the description of the elementary data items and/or the data components. The output from the Logical model consists of a set of simulated logical records. Next, the Physical model inputs are these logical records and descriptions of the logical accessing scheme, and of the physical storage device of the data management system configuration under study. The outputs produced by the Physical model are the amount of physical device storage required, the utilization of that storage, the amount of core storage required, and an access distribution table. The Processing model uses these results along with the logical records produced by the Logical model to time the retrieval of information from this simulated data base. Two different types of timings are obtained: first, the time to sequentially retrieve every logical record in the data base; second, the time to randomly retrieve one thousand logical records. By using the techniques presented in the Evaluation section of this report, the outputs of the Physical and Processing models can be analytically evaluated to deter-



mine the optimal data management system configuration.

The following sections explain in greater detail each of the DMSS models and the analytical evaluation techniques. However, to provide a definitive example for illustrating the various aspects of the DMSS models, a Project SEARCH data base will be used. Appendix A defines the elementary data items

and data components comprising this data base. The data base exhibits the following characteristics:

- Variable-length elementary data items (NAME).
- Multiple-occurring elementary data items (IDENTIFICATION NUMBER).
- Multiple-occurring data components (VISIBLE MARKS).
- Hierarchical relationships between data components (Figure 2).

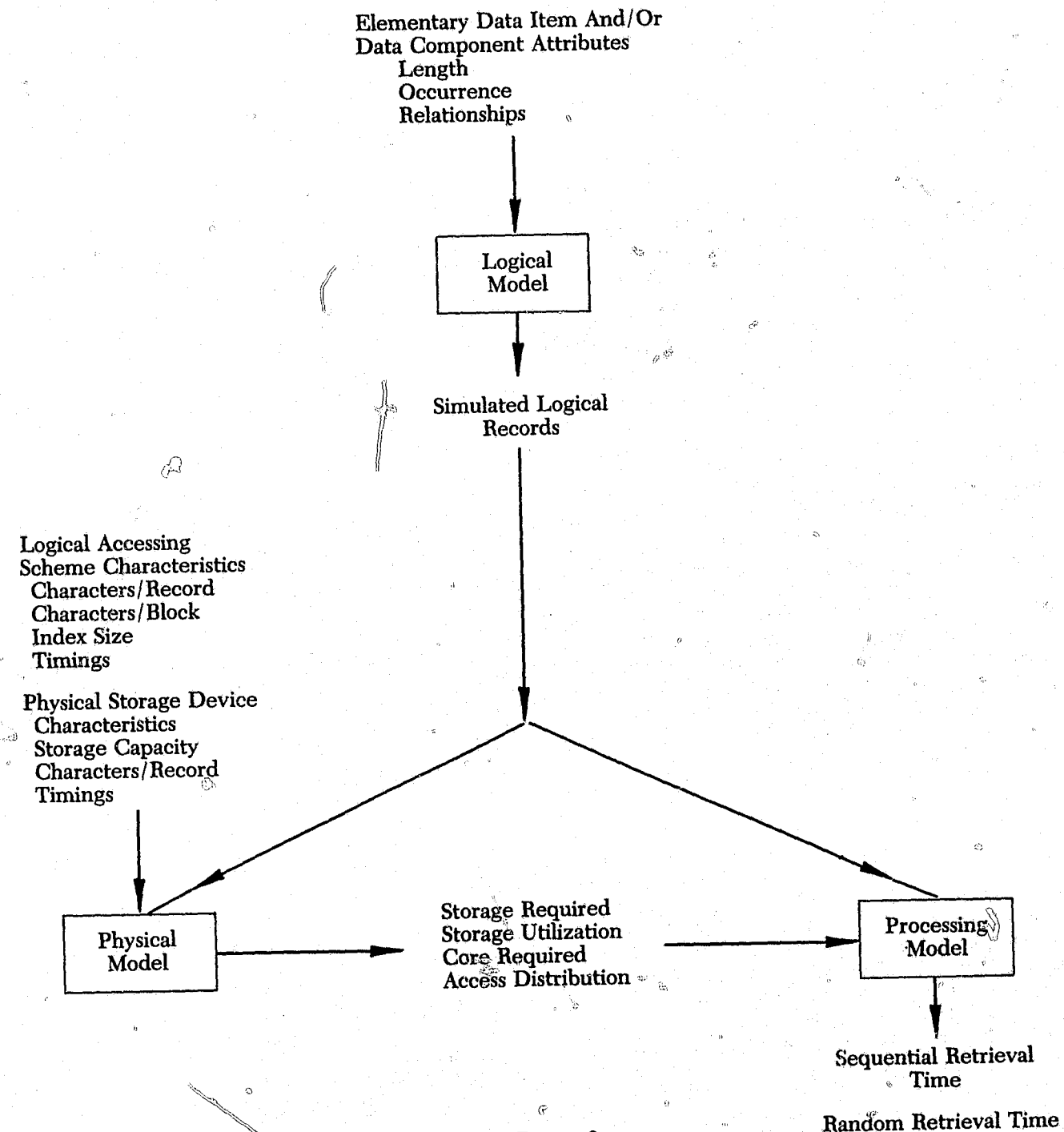


Figure 6

## DATA MANAGEMENT SYSTEM SIMULATOR—DMSS

### DETAILED PRESENTATION

#### The Logic Model

As illustrated in Figure 6, the function of the Logic model is to produce simulated logical records. The Information System designer must supply the Logic model with a detailed description of each elementary data item and data component comprising the logical record. The three most important attributes contained in these descriptions are length, occurrence and relationship. The importance of these attributes and the dependency of the Logic model on them is explained in greater detail in the remainder of this section.

#### Length Attribute

In order to provide flexible data organization and efficient data storage, the length attribute of an elementary data item or a data component can be either a constant or a variable. In the Project SEARCH Data Base, for example, the elementary data item "SEX" has a constant length of 1 character; whereas the length of the elementary data item "NAME" can vary from a minimum of 15 characters to a maximum of 30 characters. This variability is input to the Logic model as a probability distribution table where the probability associated with each length represents the probability of that length occurring in a random selection. Figure 7 illustrates these two different types of length attributes.

A constant length attribute presents no problems to the Logic model. However, when the length attribute is represented by a probability distribution, the Logic model must compute an optimal "constant" length in order to minimize the overhead required to handle a truly variable length data field.

A variable length data field can be represented as a constant length of one character occurring a variable number of times. Since the data management system must be able to handle this variability, a control field must be appended to each occurrence of the constant length data field. Thus, if the control field length is only one character, which is sufficient except in extreme cases, the storage overhead is one hundred percent and multiple accesses are required to collect the entire data field. Obviously, a more optimal choice for a constant length exists. The algorithm used by the Logic model to compute this optimal length is now described.

LENGTH ATTRIBUTE	
LENGTH IN CHARACTERS	PROBABILITY OF OCCURRENCE
15	1%
16	5%
17	14%

LENGTH ATTRIBUTE	
LENGTH IN CHARACTERS	PROBABILITY OF OCCURRENCE
18	11%
19	20%
20	17%
21	12%
22	8%
23	4%
24	2%
25	1%
26	1%
27	1%
28	1%
29	1%
30	1%

SEX  
CONSTANT—1 CHARACTER CODE  
M—MALE  
F—FEMALE

Figure 7

The Logic model first generates a cumulative distribution table from the probability distribution table, beginning with the shortest length and ending with the longest. Next, the Logic model constructs a matrix A, according to the following procedure:

1. For each length  $i$ , set  $A_{i1}$  equal to the  $i$ -th entry of the cumulative distribution table.
2. For  $i = 1, 2, \dots, n$  and  $j = 2, 3, \dots, n$

$$A_{ij} = \begin{cases} A_{k1} - A_{i1} & \text{for } k \leq n \\ 0 & \text{for } k > n \end{cases}$$

where  $k = i + j - 1$

Using this matrix A, the Logic model evaluates the following equation for each constant length:

$$RV_i = (L_i + C) \cdot \left[ \sum_{j=1}^n A_{ij} \right] \quad (1)$$

where:

- $L_i$  is the  $i$ -th constant length,
- $C$  is the length of the control field,
- $A_{ij}$  is the associated matrix entry.

The minimum ranking value computed corresponds to the optimal constant length.

To illustrate how this algorithm functions, the elementary data item, NAME, from the Project SEARCH Data Base will be used. The probability distribution table for this data item is shown in Figure 7. The control field length need only be one character long. The constant lengths used in the calculation are the entire range of lengths stated in the elementary data item specification. The matrix A, the constant lengths, the constant length and the control field, and the results of the evaluation of equation (1) are tabulated in Figure 8. Note that the optimal length is twenty-five characters, a fact not readily evident from the input data.

i	Ai1	Ai2	Ai3	Ai4	Ai5	Ai6	Ai7	Ai8	Ai9	Ai10	Ai11	Ai12	Ai13	Ai14	Ai15	Ai16	RVi
15	.01	.05	.19	.30	.40	.67	.79	.87	.91	.93	.94	.95	.96	.97	.98	.99	174.56
16	.06	.14	.25	.25	.62	.74	.82	.86	.88	.89	.90	.91	.92	.93	.94	0	175.27
17	.20	.09	.31	.48	.60	.68	.72	.74	.75	.76	.77	.78	.79	.80	0	0	152.46
18	.31	.20	.37	.49	.57	.61	.63	.64	.65	.66	.67	.68	.69	0	0	0	136.23
19	.51	.17	.29	.37	.41	.43	.44	.45	.46	.47	.48	.49	0	0	0	0	99.40
20	.68	.12	.20	.24	.26	.27	.28	.29	.30	.31	.32	0	0	0	0	0	68.67
21	.80	.08	.12	.14	.15	.16	.17	.18	.19	.20	0	0	0	0	0	0	48.18
22	.88	.04	.06	.07	.08	.09	.10	.11	.12	0	0	0	0	0	0	0	35.65
23	.92	.02	.03	.04	.05	.06	.07	.08	0	0	0	0	0	0	0	0	30.48
24	.94	.01	.02	.03	.04	.05	.06	0	0	0	0	0	0	0	0	0	28.75
25	.95	.01	.02	.03	.04	.05	0	0	0	0	0	0	0	0	0	0	28.60**
26	.96	.01	.02	.03	.04	0	0	0	0	0	0	0	0	0	0	0	28.62
27	.97	.01	.02	.03	0	0	0	0	0	0	0	0	0	0	0	0	28.84
28	.98	.01	.02	0	0	0	0	0	0	0	0	0	0	0	0	0	29.29
29	.99	.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30.0
30	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31.0

Elementary Data Item NAME      Optimal Length Calculation

$$RV_i = (L_i + C) \sum_{j=1}^{16} A_{ij}$$

\*\*Optimal length is 25

Figure 8

### Occurrence Attribute

Additional data organization flexibility and data storage efficiency is achieved through the occurrence attribute. Similar to the length attribute, the occurrence attribute specifies either a constant number of occurrences of an elementary data item or data component for each logical record, or a variable number of occurrences expressed as a probability distribution table. For example, in the Project SEARCH Data Base the data component "OFFENDER" occurs only one per logical record; but the data component "ARREST" can occur from one to nine times per logical record. The two different types of occurrence attributes are shown in Figure 9.

The occurrence attribute is processed by the Logic model in the same manner as the length attribute. A constant number of occurrences is handled in a straightforward manner whereas, for a variable number of occurrences, an "optimal" constant number must be computed. The method employed to compute the optimal constant number of occurrences is analogous to the method used to compute the optimal constant length.

As with the length attribute, a control field must be appended to each occurrence of the elementary data item or data component to facilitate the handling of this degree of variability by a data management system. Again, a control field length of one character is most probably adequate. However, differing from the length attribute, the control field overhead is not as extreme, since the total length of the data field is ratioed with the control field length. For example, the length of the ARREST data component is fifty-four characters and adding a control field of one character results in an overhead of less than two percent. Following is a description of the algorithm used by the Logic model to compute the optimal number of occurrences.

OCCURRENCE ATTRIBUTE	
ARREST	
NUMBER OF OCCURRENCES	PROBABILITY OF OCCURRENCE
1	43%
2	26%
3	13%
4	8%
5	4%
6	2%
7	1%
8	1%
9	1%
10	1%

OFFENDER	
CONSTANT—ONLY ONE OFFENDER COMPONENT PER LOGICAL RECORD	

Figure 9

First, the Logic model generates a cumulative distribution table from the probability distribution table, beginning with the minimum number of occurrences and ending with the maximum. Next, the Logic model constructs a matrix A, according to the following procedure:

1. For each occurrence i, set Ai1 equal to the i-th entry of the cumulative distribution table.
2. For i = 1, 2, . . . , n and j = 2, 3, . . . , n

$$A_{ij} = \begin{cases} A_{k1} - A_{m1} & \text{for } m \leq n \text{ and } k \leq n \\ A_{n1} - A_{m1} & \text{for } m \leq n \text{ and } k > n \\ 0 & \text{for } m > n \end{cases}$$

where k = i · j and m = i · (j - 1)

Using this matrix A, the Logic model evaluates the following equation for each number of occurrences:

$$RV_i = i \cdot (L_i + C) \cdot \left[ \sum_{j=1}^n (A_{ij} \cdot j) \right]^2$$

where:

- Li is the i-th number of occurrence,
- C is the length of the control field,
- Aij is the associated matrix entry.

The minimum computed ranking value corresponds to the optimal number of occurrences.

To illustrate how his algorithm functions, the data component, ARREST, from the Project SEARCH Data Base will be used. The probability distribution table for this data component is shown in figure 9. A control length of two characters is required.

The matrix A, the number of occurrences, the length including the control field and the result of the evaluation of equation (2) are tabulated in Figure 10. The optimal number of occurrences is two and, as with the length attribute, is not a directly discernible choice.

### Relationship Attribute

The most important attribute affecting the data organization being simulated is the relationship attribute. The Logic model relies upon this attribute to describe how the parts of the logical record (data components) relate to one another. Two relationships exist between components: physical and logical. Both of these relationships can be expressed as a "precedence-subsequence" hierarchy.

The logical precedence-subsequence hierarchy can be illustrated by considering the relationships inherent in a family tree structure. The ancestors (precedence) and the descendents (subsequence) of any person can be easily traced starting at any point in the family tree. In addition, the sibling relation-

ship, those persons having common parentage only one generation removed, can be derived. The sibling relationship also orders these persons by age. For example, in the Project SEARCH Data Base, the "OFFENDER" data component has no ancestors or siblings, and four descendants: "VISIBLE MARKS," "MISCELLANEOUS NUMBERS," "STATISTICAL SUMMARY" and "ARREST." The "STATISTICAL SUMMARY" data component has no descendants, has "OFFENDER" for an ancestor and has "ARREST" for a younger sibling. "ARREST" has "DISPOSITION" as a descendant, has "OFFENDER" as an ancestor, but has no siblings. Figure 11 illustrates these relationships schematically and figure 12 shows them in a tabular arrangement.

The physical precedence-subsequence hierarchy is concerned with the arrangement of data components on a physical storage device and as such is dealt with in the Physical model section.

**Conclusion**

As stated in the introduction to this section, the

Logic model generates simulated logical records. In order to provide the Information System designer with the broadest spectrum of simulated logical records without overwhelming him with mountains of data, the Logic model generates eight types of simulated logical records whenever possible.

The optimal logical record is generated from optimal constant length elementary data item or data components and optimal number of occurrences for the data components. The random logical record is generated by randomly sampling the probability distribution tables both for length and occurrence. The remaining six logical record types are generated by sampling the probability distribution tables at the fifty percent, sixty percent, seventy percent, eighty percent, ninety and ninety-five percent probability levels.

All eight of these simulated logical records are supplied to both the Physical model and the Processing model. The simulated logical records for the Project SEARCH Data Base are shown in Figure 13.

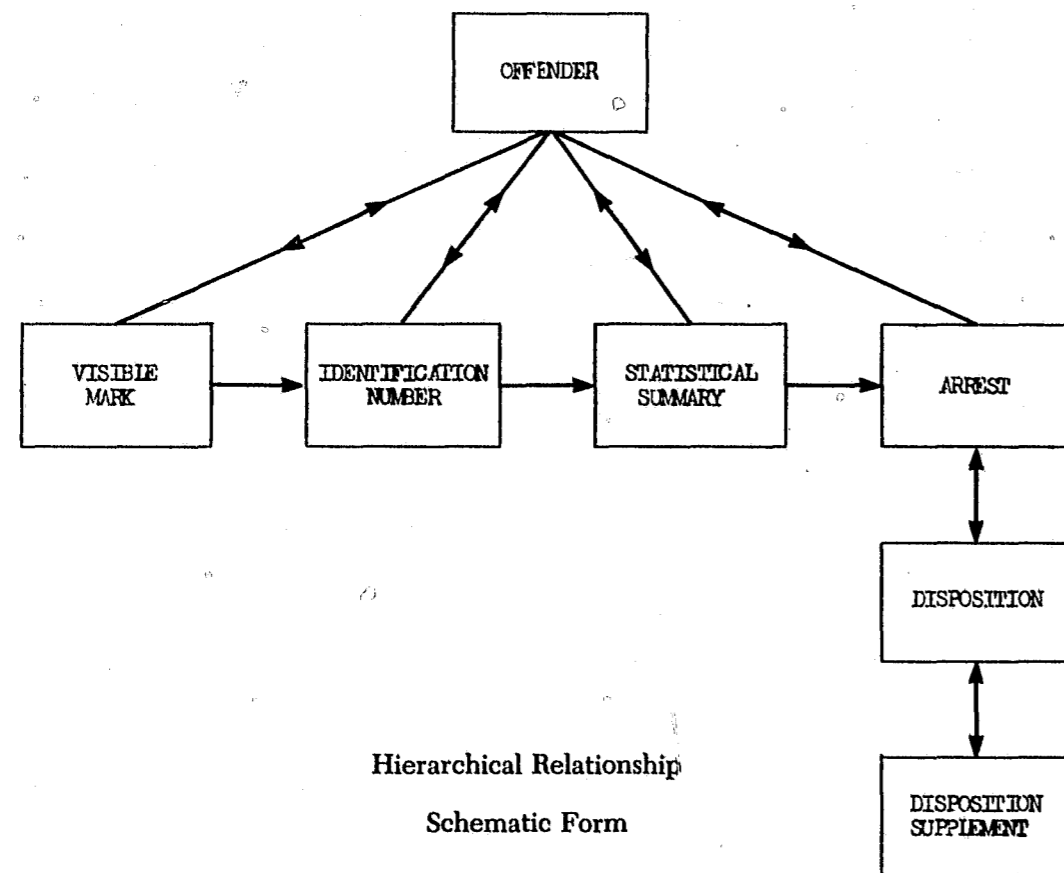
Data Component ARREST  
Optimal Number of Occurrence Calculation

i	i · Li	i · (Li + C)	Ai1	Ai2	Ai3	Ai4	Ai5	Ai6	Ai7	Ai8	Ai9	Ai10	RVi*
1	54	56	.43	.26	.13	.08	.04	.02	.01	.01	.01	.01	301.41
2	108	112	.69	.21	.06	.02	.02	0.00	0.00	0.00	0.00	0.00	242.02**
3	162	168	.82	.14	.03	.01	0.00	0.00	0.00	0.00	0.00	0.00	254.17
4	216	224	.90	.08	.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	280.99
5	270	280	.94	.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	314.61
6	324	336	.96	.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	363.42
7	378	392	.97	.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	415.87
8	432	448	.98	.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	466.10
9	486	504	.99	.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	514.13
10	540	560	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	550.00

$$*RV_i = i \cdot (Li + C) \left[ \sum_{j=1}^{10} (A_{ij} \cdot j) \right]$$

\*\* Optimal number of occurrences is 2.

Figure 10



Hierarchical Relationship  
Schematic Form

Figure 11

COMPONENT	ANCESTOR	DESCENDENT	SIBLING
OFFENDER	NONE	VISIBLE MARKS IDENTIFICATION NUMBER STATISTICAL SUMMARY ARREST	NONE
VISIBLE MARKS	OFFENDER	NONE	IDENTIFICATION NUMBER
IDENTIFICATION NUMBER	OFFENDER	NONE	STATISTICAL SUMMARY
STATISTICAL SUMMARY	OFFENDER	NONE	ARREST
ARREST	OFFENDER	DISPOSITION	NONE
DISPOSITION	ARREST	DISPOSITION SUPPLEMENT	NONE
DISPOSITION SUPPLEMENT	DISPOSITION	NONE	NONE

Hierarchical Relationship

Tabular Form

Figure 12

Data Component	Length	Number of Occurrences By Logical Record Type							Optimal
		50%	60%	70%	80%	90%	95%	Random	
Offender .....	176	1	1	1	1	1	1	1	1
Visible Mark .....	12	0	1	1	2	2	4	3	2
Identification Number .....	17	1	2	2	2	3	3	1	2
Statistical Summary .....	30	1	1	2	3	3	4	3	3
Arrest .....	56	1	1	2	2	4	5	2	
Disposition .....	42	3	3	3	3	4	5	3	3
Disposition Supplement .....	32	0	0	0	1	1	1	0	0
Total Logical Record Length .....		405	434	646	880	1749	2525	683	688

Simulated Logical Records

Figure 13

**The Physical Model**

The function of the Physical model is to map each of the eight simulated logical records onto one or more physical records, based on the requirements of the logical accessing scheme to be used, and the characteristics of the physical storage device or devices upon which these physical records will reside. Then, for each unique physical record created, the Physical model generates a simulated data base from which physical storage requirements and utilization and access distributions are computed.

**The Logical Accessing Scheme**

Only two generic types of logical accessing schemes exist:

1. Sequential accessing, or "get-next" accessing.
2. Content accessing, where access is controlled by the content of one or more data fields in the record. There are two principal variations of content accessing:
  - a. Tree structured indexes.
  - b. Randomizing.

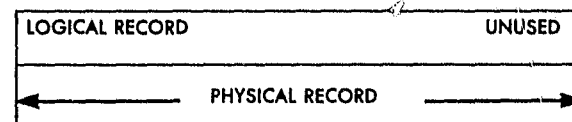
The Information System designer must select from these types of logical accessing schemes the one which best suits his application.

The characteristics of the sequential accessing method required as input to the Physical model are:

1. The number of characters per physical record. This number may be a variable or a constant. The physical record length can exceed the logical record length or require that the logical record be segmented into multiples of the physical record length. Figure 14 illustrates these two concepts.
2. The number of characters per physical block. As with the physical record length, this number may be a variable or a constant. In either case, the physical block may contain one or more physical records.
3. For each software function, such as OPEN, CLOSE, GET, PUT, etc., available to the sequential accessing scheme the time required for the computer to perform this function is required.

**PHYSICAL RECORD LENGTH**

Physical record longer than Logical records:



Logical record longer than Physical record:

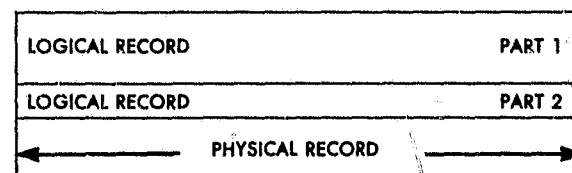


Figure 14

For both the content accessing schemes, all of the characteristics of the sequential accessing scheme are necessary. However, for the software functions, the timings may change, or additional functions such as INSERT, DELETE, INDEX, RANDOMIZE, etc. may exist, requiring additional timing parameters. Additionally, the data fields upon which the content accessing will be performed must be identified. Each data field may be an elementary data item, a group of data items or an entire data component. If more than one data field is used for content accessing, the relationship between these data fields must be specified as well.

Based upon the characteristic of the logical accessing scheme chosen by the Information System designer, the Physical model maps each of the simulated logical records onto one or more physical records. The algorithm used to perform this mapping when the physical record is greater than the logical record is:

$$PR = \left\lceil \frac{PB}{LR} \right\rceil$$

where: PR is the physical record length  
 PB is the physical block length  
 LR is the simulated logical record length  
 [ ] is defined as truncate to integer.

If the logical record is greater than the physical record, no mapping is required. Figure 15 illustrates the mapping algorithm for the eight simulated logical records generated from the Project SEARCH Data Base.

**LOGICAL RECORD LENGTH**

Physical Block Size	50%	60%	70%	80%	90%	95%	RANDOM	OPTIMAL
7249	405	434	646	880	1749	2525	683	688
3476	425	452	658	904	1809	3619	723*	723*
2254	433	495	693*	1155	3476*	3476*	693*	693*
1649	448*	448*	748*	1122	2254#*	2254#*	748*	748*
	409	546	819*	1649*	1649#*	1649#*	819*	819*

**NOTES:**

- \*: Physical record sizes duplicated for a physical block size.
- #: Logical record size greater than physical block size.

**MAPPING ALGORITHM**

Figure 15

The Physical model removes from further consideration any of the physical records generated by the mapping algorithm which is not uniquely defined. A physical record is uniquely defined if:

1. No other physical record has the same length.
2. When another physical record which has the same length exists, the physical block length is different. Thus, for the Project SEARCH Data Base, only twenty of the thirty-two generated physical record lengths are uniquely defined.

For each uniquely defined physical record, the Physical model generates a simulated data base of one thousand logical records, as ten sets of one hundred logical records.

#### Data Base Generation

In order to generate a simulated data base, the Physical model must have the ability to generate simulated logical records. Therefore, the complete description of the logical record, the Information System designer supplied the Logical model, must also be made available to the Physical model.

As each simulated logical record is generated, the Physical model examines the record data component by data component. For each of the uniquely defined physical records, as each data component is added to the logical record, the lengths of the physical and logical records are compared. If the physical record length is larger, another data component is generated. However, when the logical record size becomes larger than the physical record size, an additional physical record is created. The newly created physical record is called an overflow record. If extremely large logical records are generated, more than one overflow record may be necessary. Depending upon the software accessing scheme, one of two methods of handling "overflowing" data components is employed:

1. The entire data component is placed into the overflow record and the space remaining in the primary physical record is left unused.
2. The data component is split between the primary physical record and the overflow record. With this method no unused space will exist in the primary physical record.

Figure 16 illustrates both these methods. The following assumptions are made concerning the illustration:

1. The physical record size is 405 characters on which 365 have been allocated.
2. The data component to be added next is 56 characters long.

For each uniquely defined physical record, the Physical model tabulates the following information as the data bases are generated:

1. An overflow distribution table.
2. Storage requirements on the physical storage devices for both primary records and overflow records.

The overflow distribution tables relate the logical

record size, the physical record size and the physical block size to the number of records requiring no overflow records, one overflow record, two overflow records, etc.

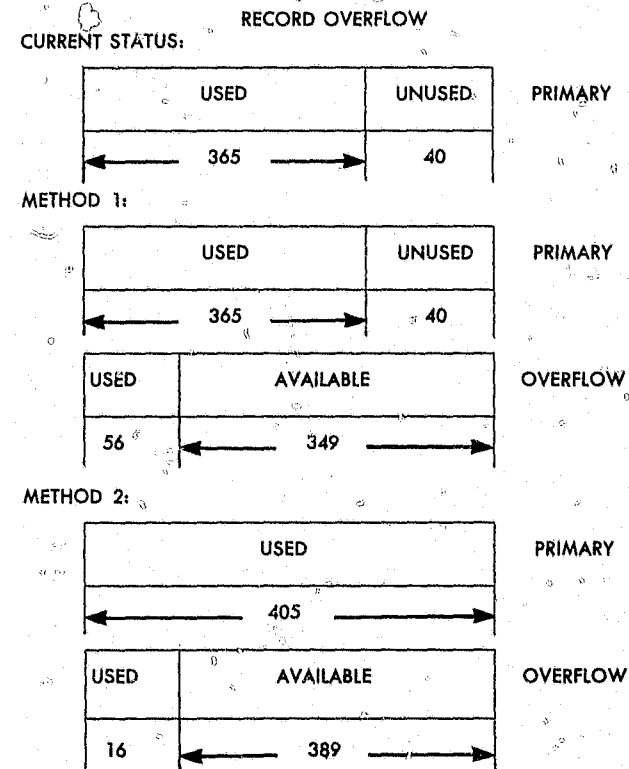


Figure 16

As an example, Figure 17 presents the overflow distribution tables created from one logical record size and the four related physical records. Note that these overflow distribution tables present to the Information System designer, information about the data base not readily deduced from the inputs to DMSS. Referring to Figure 17, the fact that the smallest physical block size, 1649 characters produced the largest physical record size, 819 characters is not inherently apparent. In addition, the data base related to the smallest physical block size contains the fewest overflow records, 2,200, and the largest percentage, 78.0%, of primary records.

The storage requirements relate the logical record size, the physical record size, the physical block size to the amount of physical storage required and the utilization of that storage. The physical storage required is derived from the number of primary records and overflow records generated, the physical record size, and the physical block size. The utilization of the storage is computed from the amount of unused space in the primary record and the overflow record, created by either the size of the logical record being smaller than the size of the physical record(s) required to contain it or from the employ-

ment of the method 1 overflow technique (see Figure 16) and the total amount of space required. Figure 18 illustrates the physical storage required and Figure 19 the utilization of that storage, for the same logical record size, physical record size, and physical block size as the overflow distribution tables of Figure 17. From Figure 18, the Information System designer can determine the amount of storage required for each generated data base. Additionally, the extendability of the data base can be derived from Figures 18 and 19. For instance, using the Percent Used from Figure 18, the extendability of the data base for logical record size 688 is computed as:

Physical Record Size	Number of Records
723	2000
693	1800
748	2136
819	2528

The core storage requirements are computed from the size of the input/output buffers and the size of the core storage resident portion of the software accessing scheme. The size of the input/output buffers is the same size as the physical block size. However, depending upon the application program, the number of input/output buffers and the size of the software accessing scheme varies. Figure 20 presents three types of application programs, LOAD, RETRIEVE and UPDATE, and the associated number of input/output buffers and software functions.

#### Conclusion

The Physical model provides the Information System designer with a set of concrete data from which to select a logical record size, a physical record size and a physical block size. Much of the data generated by the Physical model is not readily available or intuitively obvious to the Information System designer. Still, additional information is required before the optimal data base can be identified.

Therefore, the overflow distribution tables and the physical storage device requirements are passed to the Processing model.

#### THE PROCESSING MODEL

The Processing model simulates two basic Data Processing uses of a data base:

1. The sequential retrieval of the entire data base.
2. The random retrieval of one thousand records of the data base.

The Processing model uses the timing characteristics, (the rotational delay time, the positioning time function and the data transfer time), of the physical storage device, the logical accessing scheme overhead time in conjunction with the overflow distribution tables and physical storage requirements supplied by the Physical model to compute processing time for these two functions.

#### Sequential Retrieval Time

The sequential retrieval time generated by the Processing model reflects the total amount of time required to read each record of the data base in its entirety. Therefore, the sequential retrieval time is computed by two distinct algorithms:

1. The time required to read the records in the primary area.
2. The time required to read the records in the overflow area.

The computation required to compute the read time for the records in the primary area is dependent on the following data computed by the Physical model:

1. The amount of primary storage required.
2. The number of records in the primary area.
3. The size of the physical record
4. The size of the physical block.

In addition, these physical characteristics of the physical storage device are required:

1. Minimum time to position read mechanism.
2. Average rotational delay time.
3. Time to transfer one byte of data from the physical storage device to core memory.

Also, the time required for the logical accessing scheme software to perform the READ and FETCH functions is required.

The algorithm to compute the read time for the primary records can be expressed as follows:

$$PT = (NPCYL * POS) + ((XFER * PB) + (AROTD * (TRK / PB))) * (NOREC / (PB / PR))$$

where:

- NPCYL—number of cylinders required to contain the primary records.
- POS—time required to position the read mechanism one cylinder.
- XFER—time required to transfer one byte of data from the physical storage device to core memory.
- PB—size of the physical block.
- TRK—size of the physical storage track.
- NOREC—number of primary records.
- PR—size of physical record.
- AROTD—average rotational delay.

The algorithm required to generate the time needed to read the overflow records is much more complex. First, the number of overflow records required by each primary record is computed in the same manner as Physical model did, in order to generate the data base. Then the time to retrieve each overflow record is computed separately and summed for each primary record.

The computation requires, in addition to the requirements of the primary algorithm, a frequency distribution table for the time required to position the read mechanism.

Logical Record Size—688

Physical Record Size	Physical Block Size	Number of Overflows	Number of Occurrences	Percent of Total	Cumulative Percentage
723	7249	0	7030	70.30	70.30
		1	1450	14.50	84.80
		2	1510	15.10	99.90
		3	10	.10	100.00
693	3476	0	6830	68.30	68.30
		1	1330	13.30	81.60
		2	1810	18.10	99.70
		3	30	.30	100.00
748	2254	0	7290	72.90	72.90
		1	1260	12.60	85.50
		2	1440	14.40	99.90
		3	10	.10	100.00
819	1649	0	7800	78.00	78.00
		1	1020	10.20	88.20
		2	1180	11.80	100.00

Overflow Distribution Table

Figure 17

Logical Record Size—688

	Physical Record Size	Physical Block Size	Number of Records	Amount of Storage
Primary.....	723	7249	10,000	50
	693	3476	10,000	50
	748	2254	10,000	56
	819	1649	10,000	63
Overflow.....	723	7249	45,000	282
	693	3476	50,400	280
	748	2254	41,700	261
	819	1649	33,800	242

Storage Requirements

Figure 18

Logical Record Size—688

	Physical Record Size	Physical Block Size	Total Characters Required	Total Characters Used	Percent Used
Primary.....	723	7249	7,249,000	5,788,850	79.86
	693	3476	6,952,000	5,683,490	81.75
	748	2254	7,519,344	5,870,574	78.07
	819	1649	8,245,000	6,067,370	73.59
Overflow.....	723	7249	32,535,000	20,662,200	63.51
	693	3476	34,927,200	22,070,000	63.19
	748	2254	31,191,600	19,648,300	62.99
	819	1649	27,682,200	17,007,400	61.44

Storage Utilization

Figure 19

Application Program Type	Number of Buffers		Read	Software Function		Alter
	Input	Output		Write	Insert	
Load.....	0	2	N	Y	N	N
Retrieve.....	2	0	Y	N	N	N
Update.....	1	1	Y	Y	Y	Y

Core Storage Requirements

Figure 20

The algorithm can be expressed as follows:

$$OT = \sum_{i=1}^{NOVER} (F(R(NOCYL) + R(ROTD)) + (XFER - PR))$$

F—positioning time function.  
 R—randomizing function.  
 NOCYL—number of cylinders required to contain the overflow records.  
 ROTD—rotational delay time.  
 XFER—time required to transfer one byte of data from the physical storage device to core memory.  
 PR—size of the physical record.  
 NOVER—number of overflow records for this primary record.

### RANDOM RETRIEVAL TIME

The Processing model generates the time required to randomly retrieve one thousand records in their entirety. Therefore, like the sequential retrieval time, two distinct algorithms are needed to compute the random retrieval time:

1. The time required to read a record in the primary area.
2. The time required to read a record in the overflow area.

The computation required to generate the read time for the overflow records is identical to that used for computing the overflow record time for the sequential retrieval.

Likewise, the algorithm used to compute the read time for a primary record is similar to the same computation. The only difference in the algorithms is the elimination of the summation and the replacement of the number of overflow cylinders by the number of primary cylinders.

### Conclusion

The two processing times generated by the processing model aid the information system designer in selecting an optimal data base. They provide a measurement of the time associated with the overflow distribution and the storage utilization. Figure 21 illustrates these timings for the same logical record size, and same physical record sizes and physical block sizes as the overflow distribution tables Figure 18 and the storage utilization, Figure 19.

### Evaluation

The two basic constraints imposed by management, time and cost, must remain utmost in the Information System designer's evaluation of an optimal data base. However, additional constraints exist which are closely related with the outputs of the Data Management System Simulation; the physical storage constraints, the logical accessing scheme constraints and the core storage requirements for the processing programs. For example, if the amount of core storage required is excessive, there will be no room for processing programs. Likewise, a utilization of the primary area that is extremely high would indicate that future insertions of primary records

would cause the primary area to overflow, thus adversely affecting the process timings.

Although there are several methods for evaluating the outputs of the DMSS, only two approaches are considered: the 'Ranking' method and the 'Equivalency' method.

### The Ranking Method

The Ranking method requires that the Information System designer rank each output produced by DMSS. For example, the utilization of primary area could be ranked as follows:

1. Select the optimal utilization and assign it the ranking value 1.
2. Select the next most optimal utilization and assign it the ranking value 2.
3. Continue this process until all utilizations have a ranking value.

Next, the Information System designer, must weight the types of output produced, that is the relative importance of each type of output produced must be determined. The "Lottery" method of measuring utility used in Decision Theory could also be applied here to determine this weighting factor.

Having accomplished establishing both the weighting factors and the ranking values, a ranking factor is computed for each physical record size, by summing the product of the weighting factor and the associated ranking value. The minimum ranking factor identifies the optimal data base.

Figure 22 presents the Ranking method in a tabular form.

### The Equivalency Method

The Equivalency method depends on the ability of the Information System designer to reduce each output to a cost figure. For example, if the cost of renting a computer is \$300 per hour, then the cost of sequentially retrieving the entire data base for the physical record sizes in Figure 21 are:

1. 723—38 min. 13 sec.—\$191.08
2. 693—53 min. 40 sec.—\$268.33
3. 748—31 min. 4 sec.—\$155.33
4. 819—20 min. 24 sec.—\$102.00

Also, the Information System designer must estimate the percentage of usage of the data base each of the processing times represent. Lastly, a weighting factor must be assigned each output type using the same technique employed by the Ranking Method. To simplify the computation, the weighting factors associated with the processing times should reflect the usage percentages.

The Information System designer can determine the optimal data base by taking the minimum value of the sum of the products of the weighting factor and the associated cost factor of each output for each physical record.

Figure 23 presents the Equivalency method in a tabular form.

### LOGICAL RECORD SIZE 688

PHYSICAL RECORD SIZE	PHYSICAL BLOCK SIZE	SEQUENTIAL RETRIEVAL TIME	RANDOM RETRIEVAL TIME
723	7249	00:38:13	00:02:03
693	3476	00:53:40	00:02:02
748	2225	00:31:04	00:01:49
819	1649	00:20:24	00:01:39

Processing times

Figure 21

PHYSICAL RECORD SIZES	OUTPUTS				
	01	02	03	04	..... On
S1 .....	R11	R12	R13	R14	R1n
S2 .....	R21	R22	R23	R24	R2n
S3 .....	R31	R32	R33	R34	R3n
•					
•					
•					
Sm .....	Rm1	Rm2	Rm3	Rm4	Rmn
Weights .....	W1	W2	W3	W4	Wn

Where:  $R_{ij}$ ,  $i = 1$  to  $m$  are the ranking values for output  $j$   
 $W_{j,i} = 1$  to  $n$  are the weighting factors assigned to each output.

Evaluating the expression:

$$\text{MIN} \sum_{i=1}^m \sum_{j=1}^n (W_j) (R_{ij})$$

yield the optimal data base.

Ranking Method

Figure 22



PHYSICAL RECORD SIZE	OUTPUTS				
	01	02	03	04	..... On
S1 .....	C11	C12	C13	C14	C/n
S2 .....	C21	C22	C23	C24	C2n
S3 .....	C31	C32	C33	C34	C3n
•					
•					
•					
Sm .....	Cm1	Cm2	Cm3	Cm4	Cmn
Weighting factor .....	W1	W2	W3	W4	W5

Where:  $C_{ij}$ ,  $i = 1$  to  $m$  are the cost factors for output  $j$   
 $W_{j,i}$  = 1 to  $n$  are the weighting factors assigned to each output, NOTE the weighting factors applied to the processing times reflect the usage percentage.

Evaluating the expressions:

$$\text{MIN} \sum_{i=1}^m \sum_{j=1}^n (W_{j,i}) (C_{ij})$$

yields the optimal data base.

Equivalency Method

Figure 23

**1. OFFENDER Data Component**

This data component contains all one time personal information about the individual.

Elementary Data Items

- 1.1 *State Identification Number*  
10 Characters—alphanumeric
- 1.2 *Name*  
30 Characters—alphanumeric
- 1.3 *Sex*  
1 Character—alphabetic
- 1.4 *Race*  
1 Character—alphabetic
- 1.5 *Place of Birth*  
2 Characters—alphabetic
- 1.6 *Date of Birth*  
6 Characters—numeric
- 1.7 *Height*  
3 Characters—numeric
- 1.8 *Weight*  
3 Characters—numeric
- 1.9 *Hair Color*  
2 Characters—alphabetic
- 1.10 *FBI Number*  
8 Characters—alphanumeric
- 1.11 *Social Security Number*  
9 Characters—numeric
- 1.12 *Operator's License Number*  
23 Characters—alphanumeric
- 1.13 *Fingerprint Classification*  
20 Characters—alphanumeric
- 1.14 *Skin Tone*  
1 Character—alphabetic
- 1.15 *Occupation*  
7 Characters—alphanumeric
- 1.16 *Eye Color*  
2 Characters—alphabetic
- 1.17 *Phonetic Name Code*  
4 Characters—alphanumeric
- 1.18 *Photo in File Code*  
1 Character—numeric
- 1.19 *Fingerprints in File Code*  
1 Character—numeric
- 1.20 *Educational Grade or Degree*  
2 Characters—alphanumeric
- 1.21 *Address*  
30 Characters—alphanumeric
- 1.22 *Marital Status*  
1 Character—alphanumeric

**2. VISIBLE SCARS/MARKS/DEFORMITIES**

*Data Component*

This data component, if present, contains the abbreviated description of each visible scar, mark, tattoo, amputation, deformity, etc. for an offender.

- 2.1 *Visible Scars/Marks/Deformities Codes*  
10 Characters—alphabetic

**3. MISCELLANEOUS IDENTIFICATION NUMBER**

*Data Component*

This data component, if present, contains any miscellaneous identifying numbers for an offender.

- 3.1 *Miscellaneous Identification Number*  
15 Characters—alphanumeric

**4. STATISTICAL SUMMARY Data Component**

This data component contains statistical information on an offender in a summarized form.

- 4.1 *Generalized Offense Code*  
2 Characters—numeric
- 4.2 *Generalized Offense Description*  
16 Characters—alphanumeric
- 4.3 *Number of Arrests*  
2 Characters—numeric
- 4.4 *Number of Corrections*  
2 Characters—numeric
- 4.5 *Number of Jail Sentences less than 90 Days*  
2 Characters—numeric

**5. ARREST Data Component**

This data component contains all data pertinent to an arrest of an offender.

- 5.1 *Charged Offense Code*  
4 Characters—numeric
- 5.2 *Date of Arrest*  
6 Characters—numeric
- 5.3 *Charged Offense Description*  
25 Characters—alphanumeric
- 5.4 *Age at time of Arrest*  
2 Characters—numeric
- 5.5 *Status at time of Arrest*  
1 Character—alphabetic
- 5.6 *State of Supervision*  
2 Characters—alphabetic
- 5.7 *Arresting Agency Identification Number*  
3 Characters—alphanumeric
- 5.8 *Assistance Code*  
1 Character—alphanumeric
- 5.9 *Type of Arrest*  
10 Characters—alphanumeric

**6. DISPOSITION Data Component**

This data component traces the flow of an offender through the criminal justice system following the initial arrest.

- 6.1 *Disposition Code*  
4 Characters—numeric
- 6.2 *Date of Transaction*  
6 Characters—numeric
- 6.3 *Disposition Abbreviation*  
30 Characters—alphanumeric

**7. DISPOSITION SUPPLEMENT Data**

**Component**

This data component contains variable information for various disposition codes as presented in the DISPOSITION data component.

**7.1 Supplemental Data**

30 Characters—alphanumeric

**REFERENCES**

1. **Project SEARCH**—System for Electronic Analysis and Retrieval of Criminal Histories  
Paul K. Wormeli  
Public Systems Incorporated  
San Jose, California
2. **Project SEARCH**—Revised Project Plan (Draft) Submitted to the Law Enforcement Assistance Administration by the SEARCH Project Group, April, 1970.
3. **Project SEARCH**—Standardized Data Elements for Criminal History Files  
Technical Report No. 1  
January, 1970
4. **Project SEARCH**—Operating Manual  
January, 1970
5. **Information Management System/360 for the IBM System/360**  
Application Description Manual  
Form No. H20-0524
6. **Information Management System/360 for the IBM System/360**  
Program Description Manual  
Form No. H20-0634
7. **Information Management System/360 for the IBM System/360**  
Operations Manual  
Volume 1—Systems Operation  
Form No. H20-0635
8. **Information Management System/360 for the IBM System/360**  
Operations Manual  
Volume 2—Machine Operations  
Form No. H20-0636
9. **State of Connecticut Criminal History Data Base File Record Specification Guide**  
Thomas V. Schroeder  
Pratt & Whitney Aircraft  
East Hartford, Connecticut
10. **State of Connecticut Cross Reference Data Base File Record Specification Guide**  
Thomas V. Schroeder  
Pratt & Whitney Aircraft  
East Hartford, Connecticut

THE NATIONAL SYMPOSIUM ON CRIMINAL JUSTICE INFORMATION AND STATISTICS SYSTEMS WAS PART OF AN INFORMATION DISSEMINATION EFFORT UNDER PROJECT SEARCH, GRANT PROJECT DF022 AND DF041 (SUPPLEMENT) FINANCED BY THE LAW ENFORCEMENT ASSISTANCE ADMINISTRATION OF THE UNITED STATES DEPARTMENT OF JUSTICE AND THE FIFTEEN PROJECT STATES—ARIZONA, CALIFORNIA, COLORADO, CONNECTICUT, FLORIDA, ILLINOIS, MARYLAND, MICHIGAN, MINNESOTA, NEW JERSEY, NEW YORK, OHIO, PENNSYLVANIA, TEXAS AND WASHINGTON.

**END**