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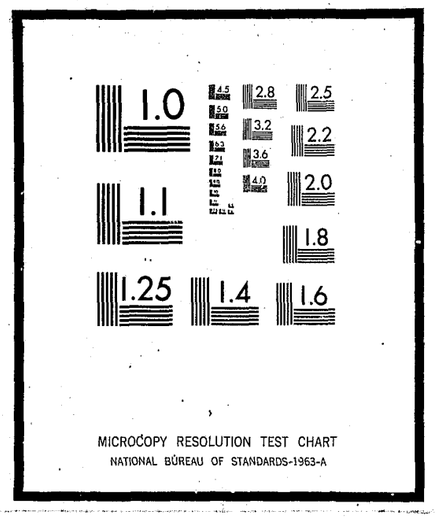


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PATTERN RECOGNITION AND INFORMATION CORRELATION PROJECT (PATRIC) — STEP IV-A - FINAL REPORT

FINAL REPORT

SEPTEMBER 1, 1972 THROUGH JUNE 30, 1973

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# I. PROJECT OVERVIEW

The Pattern Recognition and Information Correlation (PATRIC) Project is an approach to an automated system for tactical information correlation and retrieval. Because the volume of crime reports in the City of Los Angeles is staggering and cannot be effectively utilized for other than purely statistical purposes, PATRIC is attempting to enter data into its system and provide immediate access to City-wide information contained on crime reports, field interviews, Investigators' Final Reports on felony arrestees, Sex Offender Registrations, and connected pawned/stolen property records.

Assuming that similarities occur in crimes perpetrated by the same suspect(s), PATRIC provides tactical modus operandi information from crime and crime-related reports. Investigators receiving information are able to make systematic inquiries about events occurring in divisions other than their division of assignment. Radio car officers are supplied with patrol bulletins based on linked crimes presented in a composite to provide detailed deployment information.

A major example of additional uses for information processing tasks is the investigation of the utility and significance of detecting "multiple occurrences" of certain values such as names or license numbers.

The general purpose of the PATRIC Project has been expressed in the following goals:

A. Provide efficient and effective use of tactical and investigative police modus operandi (MO), suspect, vehicle, and stolen/pawn information files.

B. Provide users with filtered and distilled data in a timely manner.

C. Maintain a dynamic system capable of being readily modified as tactical MO considerations change to reflect contemporary conditions.

In order to achieve the stated goals, the PATRIC Project has been divided into a four-phase approach. Step I, January 1, 1971, through February 29, 1972, provided for the structuring of the data base, definition of data elements, determination of an initial software system and implementation of a limited test-bed operation involving six specially selected divisions. Step II, March 1, 1972, through August 31, 1972, was a six-month extension of



Step I in order to achieve the research objectives which were delayed due to an inadequate amount of data available for the first two months of Step I. Throughout Step I and Step II, operational information was supplied to the users while research was conducted to evaluate the utility of the data of the software characteristics. Definitive documents on system requirements and alternate system design approaches were also produced.

Step II-A, September 1, 1972, through June 30, 1973, encompassed completion of system and program specifications, and the preparation of requests for bids for the final system. A limited number of terminals continued to provide operational information. Step III, the final period, July 1, 1973, through February 28, 1974, will produce the awarding of the contract for the system, final system programs, and the implementation of the system of City equipment.

## II. PROGRESS TOWARD PRIMARY OBJECTIVES

The primary objective of the PATRIC System is to provide an automated police information system capable of rapidly manipulating large volumes of data and relaying filtered information to users to support line operations.

In general, support has been accomplished in two major areas: detection of crime patterns for patrol, and correlation of suspect, vehicle and modus operandi information for detectives.

### A. Detection of Crime Patterns

The main objective for support of the patrol function, as stated in the grant request, is as follows: Increase the quality and timeliness of data relating to crime frequencies by category and by location.

#### 1. Remote Data Input

A plan to make computer-accessible crime report data available within 24 hours of crime reporting was implemented in January. The key provision of this plan was for the coding and keying of Wilshire and Southwest crime reports at the divisional stations. These data served as source material for patrol deployment.

Evaluation of patrol support efforts conducted during Step II revealed a need for crime report data to be available within 24 hours of occurrence in order to identify and deploy on current crime patterns. Consequently, Step II-A embraced the task of remote data input: rapid input of crime report data at the divisional level, testing the feasibility of decentralized data input and the actual utility of 24-hour data.

Equipment was acquired and personnel were acquired and trained during December 1972. Actual data input at Southwest and Wilshire Divisions began on a regular basis seven days per week in January. Editing and loading of the data was initially handled by PATRIC staff due to a delay in execution of the supplemental agreement to the consultant's contract.



Shortly after implementation of remote data input, PATRIC Analysts and their terminals were placed at Southwest and Wilshire to support patrol operations. Initial problems with data loading difficulties, system crashes, telephone line problems, and lack of clerical support impeded smooth operation. However, the difficulties were overcome and patrol support became a reality.

The remote data input effort providing timely data proved so beneficial that plans have been made to expand the effort in Step III. The input clerks will be centralized to facilitate supervision, but the equipment and methods will remain the same. The goal will be to input City-wide data within 24 hours.

#### 2. Patrol Module

Three new reports designed to aid the patrol function were produced and evaluated during Step II-A. These reports are as follows:

##### a. Adjacency Reports

The term "adjacency" denotes a cluster of reporting districts (RD) formed by a central reporting districts and all its contiguous reporting districts. Thus a geographic police division with 32 reporting districts would have 32 unique adjacency groups.

A daily report was programmed to list those adjacencies for which the level of criminal activity on the current day exceeded the average daily level experienced during the 14-day period immediately preceding the current day. By utilizing this report, the PATRIC Analyst located in a test division was able to produced patrol bulletins which pin-point crime patterns as they appeared. These patrol bulletins were issued as a deployment aid to patrol officers.

In actual practice the adjacency reports proved to not be of great utility. Terminal operators preferred to respond to actual user requests or to define a problem called to their attention

called to their attention by other means, leaving little time to scan the adjacency printout. Additionally, peaks on the printout were often caused by a general increase in crime rather than by a definable pattern, thus decreasing the utility of knowing areas of crime increase.

b. Felony Vehicle Report

The Felony Vehicle Report listed DR number, RD, date, crime type, weapon, suspect and vehicle descriptions for felony crimes occurring during the preceding 24 hours. Prior to issuing the report to patrol officers, the listed crimes were screened to eliminate those which had already been cleared, avoiding the possibility of stopping persons previously arrested or detained for these crimes.

Some officers felt that the Felony Vehicle Report duplicated information on the Daily Occurrence Sheet. However, most officers thought that the information was better organized and facilitated quick review of crime involved vehicles. The Felony Vehicle Report was often used as a supplement to the "hot sheet," listing only stolen vehicles.

c. Basic Car Plan Summary

The Basic Car Plan Summary listed all crimes which occurred in a given "Basic Car Plan Area" during the preceding month. This listing contained the premise, location, type, time of day and suspect and vehicle descriptions for all crimes in the area.

Reaction to the Basic Car Plan Summary was excellent. Lead officers appreciated a computer listing which saved them time previously spent scanning crime reports. Suggestions from divisional analytical staff included placing the address on the printout, creating a more complete record and virtually eliminating the need for pin maps. This suggestion will be incorporated at such time as the address is included in the PATRIC data base.



B. Correlation of Suspect and Modus Operandi Information

While the main emphasis of testing during Step II-A was on patrol support, correlation attempts for detectives continued to be processed as they were during Step I and Step II.

1. Detective Correlation Requests

Detectives assigned to the geographic divisions phoned their PATRIC correlation requests to the terminal facility at SDC. The terminal operator situated in Parker Center also continued to process correlation requests submitted by the specialized detective sections. Additionally, terminal operators were placed on-site at Wilshire and Southwest Divisions.

2. Correlation Evaluation

The Correlation Evaluation Forms devised during Step II were utilized to record the number of investigative hours saved, number of arrests made, and number and type of crimes cleared with PATRIC assistance. PATRIC users were also encouraged to utilize the space provided on the form for subjective evaluation of the information given them. The Evaluation Form was slightly revised mid-way through Step II-A to capture feedback more succintly and to serve as a basis for future personal follow-up interviews.

3. Multiple License Plate Report

The Multiple License Plate Report, provided primarily for Detective Bureau operations, contained vehicle and suspect information given on each crime report, F.I. and arrest report whose reported license number existed in at least one other data base entry.

A special-purpose software program, which sorts by vehicle license number, was written to produce this monthly report. The license number of each crime report added during the last month was compared with license numbers contained on other crime, FI and arrest reports occurring during the previous six weeks. License numbers matching on two or more reports were listed along with associated crime type, date of report, suspect and vehicle descriptions.

Reaction to the Multiple License Plate Report varied between divisions, often being a function of location of the report. Where it was easily accessible, both patrol and detectives considered it a useful tool. In divisions where the location inhibited use and familiarity, the report was considered to be of minimal utility. The same reactions were also noted for the Vehicle Description Report, described below.

4. Vehicle Description Report

The Vehicle Description Report listed the DR number, RD, date, crime type, premise name, and suspect and vehicle descriptions of all crime reports containing a vehicle color. Produced monthly, this report sorted its entries according to make-color combinations.

C. Evaluation of PATRIC System

In response to a request from the City Administrative Officer and various other City agencies, PATRIC conducted a self-evaluation during the seven-week period March 5 - April 21, 1973. Personnel resources were deployed in two test divisions, Wilshire and Southwest. Sufficient computer time was provided seven days a week in an attempt to closely emulate the final system and gauge its impact on the two divisions.

Evaluation efforts were conducted by PATRIC Analysts receiving feedback directly from users; by a statistical team which collected and recorded data concerning terminal usage, arrest and clearance rates; and by an impartial interview team soliciting comments from actual system users.

Based on the short seven-week period, statistical results were not conclusive, although arrest and clearance rates did increase, as did patrol observation arrests. Subjective evaluation by users proved more positive, indicating that PATRIC is indeed a valuable, time-saving tool.



The evaluation report, renamed a "Study of the Expanded Use of the PATRIC System" due to the incomplete and inconclusive results of the proposed evaluation, was presented to the City's Board of Grants Administration on June 27, 1973. The City Administrative Officer, a member of the board, was contacted prior to the meeting to discuss the study report, but indicated that he would like to see statistical results calculated for an additional six months. Consequently, PATRIC results will again be monitored during Step III.

# III. WORK PERFORMED

This chapter deals with all work accomplished other than those specific detective and patrol activities which have already been discussed.

## A. Preparation for Test of 24-Hour Data

By the end of September, System Development Corporation completed the Patrol Adjacency Group Report program. This special-purpose program processes an average day's input from a division in less than 30 seconds. It was utilized daily in conjunction with the remote data input effort to support patrol deployment.

Two of the six clerical personnel authorized to assist in conducting the test were obtained in December. An additional two personnel were diverted from existing project clerical staff to assist in the test. All equipment testing and personnel training was conducted in December, and installation in the divisions was accomplished in January.

## B. Generation of Periodic Reports

The DS/3 report generator produced the first Felony Vehicle Report and License Plate Report in October. The License Plate Report was provided monthly for 77th Street, Van Nuys and Administrative Detectives. Regular issuance of the Felony Vehicle Report was begun upon implementation of the 24-hour data input system. The Basic Car Plan Summary Report was issued monthly for each of the Basic Car Areas in Wilshire and Southwest.

## C. System Design Selection

In September, DS-3/OS (Operating System) replaced DS-3/DOS (Disc Operating System) as the operational data management system. This transition was implemented to take advantage of the OS version's higher speed (30 characters per second), lower downtime expectancy and comparative ease of maintenance. Only a few minutes of time were required to train PATRIC Analysts to use the revised system because few operational changes were involved.

## D. Changes in Data Base Structure

### 1. Pawn Transaction File



When the Pawn Transaction File first received input late in Step I, it was designed to include only data from certain pawnshop transactions in which the client sold an article. It was determined, however, that because of its limited volume, this file did not provide for the detection of multiple occurrence data necessary for correlation strategies. Consequently, it was decided that a limited number of data fields from all pawn tickets should enter the system. This would facilitate attempts to detect suspects by means of multiple pawn transactions.

Data fields extracted from pawn tickets and entered into the system were as follows:

a. Name
b. Sex
c. Date of Birth
d. Descent
e. Date
f. Store Code
g. Serial Number
h. Description of Property by Article Name
i. Dollar Amount
j. Division

However, due to the data base storage limitations and keyprocessing work load Data Service Bureau decided to suspend the Pawn file in February. The Pawn file continues to be identified as a useful file, but will not be operational again until the final system is implemented and storage limitations and keyprocessing work laod restrictions are resolved.

### 2. Patrol File

During the first quarter of Step II-A, a file designed primarily to support patrol operations was defined. The file contained data obtained from all crime occurring during the most recent six to eight weeks in all divisions. The data for Southwest and Wilshire Divisions was obtained from the remote data input effort. The small size of the file allowed for rapid retrieval time. Several additional elements of information (e.g., Basic Car Area and deployment periods) were also included in the file to assist patrol analysis. The file was purged once every four weeks.

3. SID Evidence Input

During Step II, the PATRIC staff researched the possibility of inputting into the system selected information from Scientific Investigation Division. The software program for a data base which indicates the existence of latent print and ballistic information for individual crime reports was completed during Step II.

Latent print information was initially loaded in the "Update" file, accessed as a separate file and queried by the report number (DR) of concern. The information was later accessed as part of the file in which the initial crime was located. Research into the input of ballistic information was suspended due to the lack of suitable source documents.

4. File Purge Routine

The file purging recommendations described in the PATRIC Design Requirements were implemented during the first quarter. The robbery, crime, burglary and burglary-theft-from-vehicle files have been reduced to six months of crime reports. The F.I., suspect and pawn files have not been purged; they still date from December 1, 1971.

All purged crime report data are stored permanently on tape. It is possible to make this data available to the terminal operators when such a need exists.

5. Data Base Definition

In May new file definitions were created to coincide with a reorganization of the data base. Each file, i.e., burglary, crime, robbery, etc, now contains elements with common names so that crime types may be regrouped into different files as dictated by space requirements or other functional needs. PATRIC Analysts received two days of supervised training and terminal practice in order to familiarize themselves with new data elements and names.

E. Processing of Automatic Correlations

Utilizing the strategy guidelines provided during the Step II research, automatic correlations were attempted for each of the following crime types: burglary, robbery, child molest, child annoyance, indecent exposure,



kidnap, bunco, theft from person, and purse snatch. Results were then given to detectives for evaluation. The consensus of the detectives appeared to be that the automatic correlation results were interesting, but not particularly useful. The existing case load of each detective consumes all available investigative time and prohibits investigation into extraneous material. From a pragmatic standpoint, the detectives prefer "automatic" correlations which meet criteria they have defined. In this manner, all incoming reports are screened for match with specific report elements which describe a current crime of concern. When the cases are cleared, a new set of criteria will be established for a new problem. Thus, standard automatic correlation strategies have proved to not be of great assistance to investigators.

F. Regional Demonstration

The PATRIC Project staff conducted a video tape demonstration of the capabilities of the system to Los Angeles County law enforcement agencies on November 1, 1972. The purpose of the program was to acquaint potential regional users with the capabilities of the system. A fellow-up questionnaire was sent to each agency to obtain basic statistics about department size and area serviced. Also included was a question to gauge the interest in participation in PATRIC. Most agencies expressed interest in PATRIC but of course desired cost information prior to making a commitment to participate.

PATRIC staff needs to contact each agency personally to understand the different data processing methods and needs, and then to develop a realistic cost estimate. However, manpower was not available to undertake such a major task. Further investigation into regionalization was delayed until late in Step III.

G. Revision of Consultant Tasks

According to a provision in the consultant's contract, a reduction of certain specified tasks could be effected by mutual agreement between the consultant and the City's Project Director if a delay occurred in starting the tasks. The delay did occur, the provision was invoked, and the following tasks were deleted:

1. Build a Parolee File
2. Develop Multifile Capability

H. System Specifications

The major document produced during Step II-A was the system specifications, the definitive document on PATRIC's final system requirements. Data Service Bureau, due to a personnel shortage, enlisted the aid of SDC in producing the document. SDC wrote chapters dealing with specifics such as data base organization while DSB input more general data processing policy. The document was published March 20, 1973.

I. Purchase Specifications

Based upon the system specifications Data Service Bureau prepared additional accompanying information to serve as purchase specifications for the final system. Prior to release of the request for bid, the purchase specifications will be reviewed by the Data Service Bureau Board of Administration.

Submission of the specifications to the Board of Administration is being delayed until approval of Step III has been granted by CCCJ.

J. Training

An ongoing task of the PATRIC Project staff is training new project personnel and instructing potential system users.

The continued training of the system users is one of the most important project tasks because of the constant hiring and transferring of new officers. Special roll call training and supervisor's meetings presentations were given at Southwest and Wilshire Division to acquaint patrol personnel with the patrol support provided by PATRIC.

Regular training was also provided at several schools at the Police Academy. An attempt has been made to minimize duplication of content between the schools, but certain basic operations must be explained repeatedly to ensure comprehension of the system's capabilities.

A new addition to the training schedule during Step II-A was a two hour time block for instructing each class of recruits at the Academy. In this manner, potential policemen received an introduction to PATRIC prior to being assigned to divisions and receiving more specialized instruction in system use and capabilities.



PROBLEMS

Several major problems adversely affected project operations: contract execution delays, unanticipated personnel problems, and temporary diversion of personnel resources to provide the evaluation requested by the City Administrative Officer.

A. Contract Delays

Signing of the initial SDC contract for Step II-A was delayed when PATRIC was informed that the contract did not contain certain standard provisions, previously not required and the existence of which was unknown. As a result, the contract could not be signed until September 11, 1972.

A second major delay was in the execution of the supplement to the contract which primarily provided support for remote data input via a computer operator for the editor machine and an additional two hours of early morning computer access seven days a week, necessary to provide full patrol support.

The supplement was started through channels in November and had reached the Mayor's Office by the end of February, and was signed in early March. The delay caused PATRIC personnel to work early morning hours in the capacity of a computer operator, and to have 24-hour data accessible for only two watches.

B. Personnel

Several delays were encountered in obtaining personnel authority for filling new positions. For example, grant funds were available to provide four clerical positions, but authority was not approved by the City Council until six weeks later. Moreover, there has been a lack of qualified candidates and various problems with certifications from the Civil Service lists. Two existing clerical personnel were diverted to the remote data input effort, leaving secretarial support shorthanded. The problem became more acute when Analysts were placed in divisions without clerical assistance. Often valuable computer time had to be ignored in order to prepare patrol bulletins in time for appropriate watches. Three clerical vacancies were finally filled to assist the analysts and the project secretary.

Additionally, an unforeseeable emergency leave and a personality conflict depleted the ranks of available analysts, and led to numerous changes in terminal operators in one division, much to the detriment of user confidence and system familiarity.

C. Evaluation

As discussed in a previous section, the City Administrative Officer requested an evaluation of PATRIC. During the seven-week period chosen, all efforts were concentrated on the evaluation. Two additional administrative personnel served as PATRIC Analysts, diverting their attention from accounting duties and computer support for specialized detectives. Additionally, an administrative task force was detailed to collect and monitor statistics and assist in user interviews. One policeman was also deployed to operate a terminal for Administrative Detectives, vacated by relocating the previous analyst to an evaluation test division.

Consequently, only minimal attention was paid to special usage correlation requests, liaison with detectives employing the vehicle reports, system trouble-shooting, regionalization, demonstrations, training, and many other tasks.

D. Step III Approval

A problem already foreseen at the end of Step II-A is the delay in approval of the Step III grant by CCCJ. The unknown status as of July 1 will cause an interruption of computer support for an indeterminate length of time. Additional equipment needed for Step III cannot be ordered yet, and will delay system expansion due to time between order and delivery. Also, the release of the request for bid on the final system is being delayed, which will result in shortening the contract period, either excluding certain potential vendors, or creating the need for a grant extension.



## V. SUMMARY

During Step II-A PATRIC directed its attention to the remote data input effort and related patrol support, evaluation of system benefits, and publication of specifications documents.

Remote data input efforts began with the acquisition of personnel and equipment in December and installation in divisions in January. Soon thereafter, PATRIC Analysts became resident at the two divisions and began utilizing the 24-hour old data.

In conjunction with a system evaluation, two additional analysts were moved to the two divisions to support investigators. In an environment which closely emulated the final system, the effects of PATRIC were scrutinized. Statistical results were not definitely conclusive, but subjective evaluations by users were highly favorable.

The major product of Step II-A was the finalizing of PATRIC system requirements, detailed in a document published in March. The system specifications were compensated for by the two month grant extension, and other problems were gradually resolved.

Problems worse, of course, in the areas of personnel for the evaluation. However, most delays were compensated for by the two month grant extension, and other problems were gradually resolved.

The only remaining problem is the interruption of PATRIC continuity until approval is received from CCCJ for the Step III grant. Until approval is forthcoming, PATRIC and its staff must remain at a virtual standstill.

END