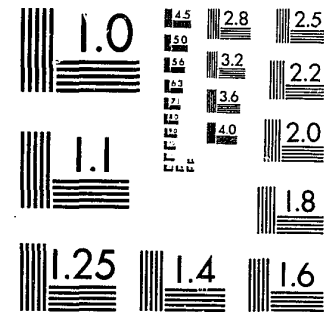


National Criminal Justice Reference Service

ncjrs

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

4/14/83

87024

43

MF-2

A REVIEW AND EVALUATION OF POLICE COMMUNICATIONS

A TECHNICAL ASSISTANCE REPORT

Prepared for

THE SHERIFF'S DEPARTMENT
GRANT COUNTY, WEST VIRGINIA

TASK NUMBER 7904301

Performed by

THE ASSOCIATED PUBLIC-SAFETY
COMMUNICATIONS OFFICERS, INC.
NEW SMYRNA BEACH, FLORIDA 32069

Under a Grant From

THE LAW ENFORCEMENT ASSISTANCE ADMINISTRATION

Advisor: George A. Praul

87024

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
PUBLIC DOMAIN/LEAA

to the National Criminal Justice Reference Service (NCJRS).

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

I. INTRODUCTION

The Grant County Commission and Public-safety agencies have identified the fact that communications capabilities for the police, fire, and medical service, and for the general public in need of assistance, are not adequate and need to be updated.

Grant County is located in the eastern portion of West Virginia and covers 478 square miles of very mountainous terrain. A population of 8,600 persons live in small communities located throughout the county and a large percentage live in the general area around Petersburg, West Virginia, the county seat.

The agencies providing law enforcement coverage for Grant County include the County Sheriff's Department, local police departments at Petersburg and Bayard, and state police from an adjoining county. Fire protection is provided by four companies located at Petersburg, Maysville, Mt. Storm and Bayard. Ambulance service is provided by a county-owned service in Petersburg and a private service also in Petersburg.

The public safety agencies of Grant County have expressed a desire to the Grant County Commission for the establishment of a consolidated communications center to serve the entire county. Planning has begun toward that goal. A commercial vendor has supplied a system proposal and cost estimates and the Grant County Sheriff's Department has requested technical assistance from the Law Enforcement Assistance Administration to analyze the proposal and recommend changes if necessary. Through an existing technical assistance grant this project was assigned by L.E.A.A. to the Associated Public-Safety Communications Officers Inc. which in turn selected and assigned the task advisor.

This report is the result of the task advisors visit to Grant County and investigation of the problem presented to A.P.C.O. The investigation consisted of data gathering, personal observations, and interviews with pertinent public officials. Interviews were conducted with, and data gathered from the following persons:

Edward Hiser, Deputy Sheriff
Richard Fulcher, County Coordinator
Linton Sites, President, Grant County Commission
Lawrence Spears, Executive Director, Region 8 Planning & Development Council
David Hill, Region 8 Planner

Copies of existing FCC licenses were gathered for analysis and the full proposal offered by the Motorola Company was examined in detail.

II. PROBLEM STATEMENT

Grant County officials have wisely chosen to establish a central dispatch system for all public-safety agencies in the county and they have received a proposal from the Motorola Company for the equipment to establish the system. However, the county has no expertise available to evaluate the proposal. The county officials further wish to have the actual needs identified and the proposal evaluated against the needs.

One major problem identified by the task advisor is the non existence of a written plan to be followed for implementing the consolidated dispatch system.

The basic elements to be considered in preparing a system plan and implementation schedule based on needs, and the elements to be addressed by this report include: Citizen Access, Command and Control, Interagency Communications, Information Systems, and Technical Requirements. By providing a detailed analysis and resolving issues in each of these areas, Grant County will be able to implement an adequate and cost-effective consolidation.

Outside factors requiring consideration in developing a system plan include the limited number of user agencies presently available to provide services, technical concerns relating to radio use in the federal "Quiet zone", and the fact that the Grant County Hospital services large areas of adjacent counties that do not have medical facilities.

III. PROBLEM ANALYSIS

This section is devoted to a detailed analysis of the problems to be addressed in each of the basic elements identified in Section II.

A. Citizen Access:

A most important consideration in system planning is how the citizen needing service will be able to access the system. This is currently a severe problem in Grant County where except for the state police barracks located in an adjacent county, there is no single number a citizen can call for law enforcement services. Presently the sheriff's office may be called during the normal work week, or the county jail anytime where the jailor or his wife must answer the phone and radio a message. The police departments in Petersburg and Bayard also have office phones but they are not manned at all times and because they share the radio system with the sheriff they also depend on the jail at night for calls.

These conditions create a situation where the citizen needing assistance may try several different numbers, including toll calls, before reaching someone that can respond. In actual practice many times law enforcement officials are called directly at their homes by citizens needing help.

Citizen access to the fire services is likewise varied and depends mainly on volunteers manning the telephones at their homes. The ambulance service is in considerably better condition because calls are received at the hospital switchboard and dispatched or in the case of the private service calls, are taken directly by the provider.

It is quite apparent that provisions for non-toll telephone access by all citizens of the county must be a part of the system plan. Considerations to be addressed in planning to provide this access include management, system design, and training requirements.

Because the county is planning to implement the central dispatch system it follows that management of the access system will rest with county government and presumably the cost of telephone service will be paid out of the general county budget. The cost of the access system will be a direct result of the system design.

The county presently has three telephone exchange offices; however, two separate telephone companies are involved and both must be considered in the system design.

The third area of concern is training. This includes the training of personnel that will be answering incoming citizen requests and also the training of the general public as to how to use the system. It is very important to educate the public for the proper system use so that emergency calls are not missed because lines are busy with non-emergency traffic.

B. Command and Control

Management of the new system is a major consideration during the planning stage. Presently the law enforcement radio system is licensed and controlled by the Grant County Sheriff's Department. The fire radio system is controlled by individual fire companies and the medical radio system is controlled by the county government and the hospital.

It will be necessary to establish a management structure for the new system that includes some form of user agency input. Questions to be addressed by the system management team includes: personnel requirements, pay scales, fringe benefits, training requirements, operation procedures, required resource data, report forms, system evaluation, etc.

System design is also a major concern to the system planners and the management team. The proposal presented by the Motorola Company is a good start towards a system design. It would provide a very complete radio network; however, when evaluated from a cost effective point of view, it appears to be excessive in back-up capability.

Specific equipment items in the proposal that should be reconsidered based on need and cost effectiveness are as follows:

- The dual path microwave network.
- Full sets of base stations at three locations.
- Dual position dispatch console.

The proposal correctly identifies the need for transmitter sites at two mountain-top locations. This will be necessary to get adequate radio coverage in most areas of the county. The proposal also recommends microwave control links from the communications center to each tower location and this concept is certainly supportable based on known weather conditions and the potential for telephone line loss. The necessity, however, to provide two complete paths between all three locations is questioned, based on the purchasing of good quality equipment, and presupposing a reasonable service response time in the event of equipment malfunctions.

The same considerations are applied to the proposal's plan to install base stations at all three locations. It will certainly be necessary to install base stations at each tower site; however, with good quality equipment and reasonable service response time it should not be necessary to provide complete back up at the Communications Center.

In the case of the proposed dispatch console, the need for full two position operation is presently not seen. Modern dispatch consoles are designed for expansion capability should the need arise and the present plans allow for only one telecommunicator on duty at a time. During times of emergency when it would be desirable to have more than one telecommunicator on duty it is possible to procedurally separate the telephone and radio functions for greater efficiency. The only additional equipment necessary for this capability is a second telephone answering position located in the Communications Center.

Another major consideration is funding for the new system. Funding concerns include initial capital expenditures and continuous recurring costs.

The Grant County Coordinator is actively investigating numerous sources of funding assistance; however, some of the major cost factors to be determined for inclusion in the system plan are discussed here to aid him in possible grant application preparation:

Facilities Costs:

Grant County proposed to build an addition to the county ambulance building to house the Communications Center and the cost of this structure including plumbing, heating, electrical, air conditioning and general construction should be identified.

Additional potential facilities costs will include site acquisition and equipment shelters at each of the proposed tower sites. It will also be necessary to provide electrical service to each tower site location.

Equipment Costs:

Most of the required equipment is included in the proposal from the Motorola Company; however, other items to be considered are office equipment for the Communications Center and most importantly, telephone equipment necessary for incoming and outgoing calls. The costs for basic telephone equipment, installation, and recurring charges must be identified. The single most important concern in this area is citizen access capability. Each citizen should be reasonably assured that a non-toll call for service can be made at any time without getting a busy signal.

Personnel Costs:

The largest recurring charges will be for personnel and materials and supplies. These items should be considered carefully because the system will require 24 hour a day continuous coverage. It will also be necessary to provide backup coverage when needed due to sickness, vacation, personal emergencies, position vacancies, etc.

System Cost:

With all areas considered, the system cost can then be identified in

two major categories:

1. Capital Expenditures

- A. Initial equipment purchase
- B. Facilities acquisition
- C. Replacement allocation

2. Operating Budget

- A. Personnel
- B. Materials and supplies
- C. Telephone recurring charges
- D. Maintenance charges

C. Interagency Communications

The items in this category to be considered, in developing a system plan, include frequency assignments and rules and regulations controlling frequency use.

Frequency Assignments:

In the area of frequency assignments, the Motorola proposal has recommended specific frequencies for each of the services that is to operate from the proposed Communications Center. These frequencies will provide the required interagency communications that are needed by Grant County.

Specific items in the proposal will require further clarification however, because the current F.C.C. licenses held by the public safety agencies do not agree with the Motorola Proposal.

As an example the proposal states that the frequencies to be used for Law Enforcement are 39.92 and 39.98 MHz. The sheriff's office is presently licensed on 37.28 MHz. 39.98 is an advisable inclusion for coordination because it is the statewide sheriff's frequency; however, 39.92 should be checked with the APCO frequency coordinator to determine suitability for primary use based on the location of other users of that frequency assignment.

The proposal lists 46.10 MHz as the suggested fire frequency; however the license issued to the Petersburg volunteer fire company is for 46.14 MHz. It is not known if a plan exists to add the second frequency to the mobiles or to change the mobiles over to 46.10.

NOTE: A valid FCC license could not be located for the Petersburg fire department. The only license available expired on November 8, 1978.

The only license that could be located for the EMS system is at the Grant County Hospital and list 155.280 and 155.340 MHz as permitted use. The proposal however, suggests the use of 155.235 MHz and states that the ambulance radios all have this frequency.

Rules and Regulations

The developed system plan must identify the actual frequencies to be used and the transmitter locations, power, antenna heights and gain, and the effective radiated power (E.R.P.). This information should then be forwarded to the APCO coordinator for verification, suggestions, and coordination before any construction begins. The proposed uses must also be cleared with the FCC as it relates to effect on the Quiet Zone.

Applications for FCC licenses need to be filed as early as possible to insure receipt of licenses when system startup is scheduled.

D. Information Systems

The current unwritten plan includes the addition of a terminal on the state information system in the proposed Communications Center. The steps necessary to insure this should be included in the system plan and will possibly include written agreements and telephone line requirements.

E. Technical Requirements

The technical requirements of the system should be defined in the written system plan. Many of the requirements are identified in the Motorola Proposal and will also be included in the specifications necessary for bidding. The system plan can be as general as the Motorola Proposal in listing the requirements; however, the specifications must be very detailed to eliminate any possible misunderstandings among potential bidders.

As an example, the proposal suggests a dispatch console and a 10 channel recorder, but does not specify all the capabilities required in the console such as inter-system patching, and makes no mention of the required number of recording tapes or their technical parameters.

To insure that the proposed system performs as anticipated after it is purchased and installed, it will be necessary to include every possible detail in the specifications before they are released for bids. It is also advisable to hold a pre-bidders conference to discuss any misunderstandings with potential bidders before actual bids are received.

IV. CONCLUSIONS

It is apparent from the discussions and analyses presented in Section 3 that there are a considerable number of unanswered questions to be addressed in the planning stages for the proposed new system. While most of the answers are presently known by one or another of the persons involved, there has been very little written documentation that can be reviewed and commented on by the County Commission and the proposed system users.

The most appropriate course of action would be to identify a system development task group consisting of representatives of the county government, user agencies, and if possible the utility companies involved.

The work of this group would be to review each of the areas covered in this report and develop a written plan for the new system.

The specific sections of the plan have been briefly discussed in this report and that discussion should provide a starting point for the group's work.

The committee would hold discussions and document their findings and desires in each of the following areas:

Citizen Access

Command & Control

Interagency Communications

Information System Requirements

Technical Requirements

Most of the committee's work will be in the area of Command and Control because this is the internal workings of the system and where day-to-day problems will arise and need to be resolved.

Representatives of the telephone companies will be invaluable in the considerations of Citizen Access and can provide potential timetables and estimated cost figures.

It is advisable to make available to the committee a qualified person that will be able to translate a system design into technical requirements and then further transform the technical requirements into a bid specification package that will insure a reliable system that meets the needs and desires of Grant County, the system users, and the citizens.

While the establishment of this committee may appear to cause a lengthy delay in becoming operational, this is not necessarily so. Actually, as mentioned previously, most of the answers are already known to some of the individuals involved in the planning. It is just a matter of reaching concurrent decisions and documenting them to insure mutual understanding among all concerned. If the finest system possible were purchased and installed based on only one person's ideas it would probably not be understood or efficiently used by the agencies it is to serve.

V. RECOMMENDATIONS

The task advisor's recommendations are divided into two sub-sections based on the preceding discussions. First is the initial course of action for the county to follow, and second is specific recommendations based on the five general areas identified as required for system planning.

A. Course of Action

It is recommended that the Grant County Commission establish a system development task group as detailed in Section IV of this report. This group should be co-chaired by Deputy Sheriff Hiser and County Coordinator Fulcher.

The committee should meet approximately six times and devote each session to reviewing and documenting the system requirements based on each of the areas discussed in this report.

The results of the committee's decisions can then be translated to dollars by the co-chairmen and reviewed by the Grant County Commission. The Commission's approval is needed before funding can be applied for or equipment ordered.

Once the system design is documented, approved, and funding identified it is further recommended that the Grant County Commission retain the services of a qualified communications consultant, to prepare a bid package that includes both the legal and technical parameters to be followed by the bidders; conduct a pre-bid conference, review and make recommendations regarding the bids received, and provide final acceptance testing after the system is installed.

B. Specific System Recommendations

1. Citizen Access

(a) System Design:

If possible, 911 telephone service should be provided to all citizens of the county. In lieu of 911 it is recommended that common foreign exchange lines be installed to each telephone exchange office, in sufficient numbers to insure non-toll, non-busy access. In all cases, an individual citizen should have only one number to call for any emergency service.

(b) Training:

It is recommended that a full and complete training program be provided for the dispatch personnel. The program should include all aspects of public-safety radio, telephone techniques, and records keeping procedures. While it will be necessary to tailor any program for local needs, APCO can provide potential outlines from many areas of the country, plus the Law Enforcement course and training film series.

It is further recommended that a public information and education program be developed. The program should effectively teach the public how to identify an emergency and the procedures for reporting it. In addition to media coverage, it is possible also to include public education information in county tax billings or provide distribution of materials through local service clubs, etc.

If possible an evaluation plan should be devised to calculate the effectiveness of the public education program.

2. Command & Control

(a) Management:

It is the task advisor's recommendation that management of the

proposed communications system be vested in a single county employee who also serves as the supervisor of the Communications Center. This individual should be assisted in operational decision making by an advisory committee consisting of representatives of each user agency. The supervisor should report to the County Commission through the office of the county coordinator.

(b) System Design:

It is recommended that a procedures manual be developed that identifies the exact procedure to be followed for the processing of each type of citizen request. Internal resource files should be prepared that will assist the telecommunicators in following the written procedures; i.e., map files, lists of instructions, telephone number files, etc.

It is recommended that initial staffing be no less than one full-time supervisor and five full-time telecommunicators. Several part-time telecommunicators may be trained in advance for use as needed; however, the six full-time persons should be able to provide all the necessary coverage. The telecommunicators should be assigned to rotating shifts so that they all work identical schedules and pay scales should be set accordingly. Potential scheduling can be ordered from the APCO information service.

It is very strongly recommended that at least the Center supervisor become a member of APCO and be afforded the opportunity and expenses to participate in APCO's meetings.

Based on the staffing recommendation and other influencing factors, it is recommended that only a single position dispatch console be installed in the Communications Center. If any remote command positions are provided, they should be able to be overridden by the console telecommunicator.

It is further recommended that in the planning for telephone service, sufficient non-emergency lines be installed for incoming calls that are not of emergency nature, and at least one non-published administrative line for outgoing calls when all incoming lines are in use.

A minimum of two complete telephone answering positions are recommended for the Communications Center. One should be at the dispatch console and a second on a desk located in the same area.

3. Interagency Communications

(a) Frequencies:

It is recommended that radio frequency selection be reviewed carefully with the APCO frequency coordinator, Mr. Emory Wright in Charleston, West Virginia (304-348-2361), and with the Federal Communications Commission relative to the Quiet Zone restrictions.

4. Information Systems

It is recommended that formal contact be made and necessary applications filed to insure that a terminal on the state information system will be provided and available as needed.

5. Technical Requirements

It is recommended that the system planning task group be afforded some assistance in reviewing any vendor proposals, from a person knowledgeable in public-safety technical system design.

The task advisors specific recommendations regarding the Motorola proposal are as follows:

- provide microwave only from the communications center to each tower site, and eliminate the the wagon wheel concept.
- reduce the dispatch console to one position only, but add innersystem patching capability.
- eliminate base stations at the Communications Center.
- utilize existing equipment where possible to reduce the amount of new equipment purchase.

It is further recommended that the equipment specifications supplied with the Motorola proposal be discounted and that a non-vendor communications consultant be employed to prepare the bid package. (see prior course of action recommendations)

APPENDIX A

Suggested Design of Standard Operating Procedures Manual

- I. Introduction
- II. Personnel information
 - (A) Work schedule
 - (B) Benefits and services
 1. leave
 - (a) sick
 - (b) vacation
 - (c) compensatory
 - (d) holidays
 - (e) emergency
 2. health insurance
 3. retirement system
 4. employee organizations
 5. injury on duty
 - (C) All other related departmental personnel rules and procedures
 - (D) Evaluation ratings
 1. probationary ratings
 2. permanent employee ratings
 - (E) Personal standards
 1. conduct
 2. appearance
- III. Schematic of actual work area
 - (A) Communications equipment
 1. name and
 2. function
 - (B) Position of forms used
 1. description and use
 2. position and final placement
 - (a) completion
 - (b) filing
- IV. Agencies the "Center" serves
 - (A) Agencies function
 - (B) Geographical depiction of agencies location
 - (C) Service provided to specific agency
 - (D) Equipment specific to particular agency
- V. Position of source documents
 - (A) Alarm books
 - (B) Emergency numbers
 - (C) City directories
 - (D) Maps
 - (E) Referral agencies

- (F) NCIC manual
 - (G) Officers per department
 - 1. shift assignment
 - 2. units
 - 3. home addresses and phone numbers
 - (H) Phone books of adjacent cities
- VI. Geographic patrol and fire areas
- VII. Glossary of job related terminology
- (A) Common radio terms
 - (B) Dispatching terms
 - 1. phonetic alphabet
 - 2. 2400 hour - time
 - 3. standard description
 - (a) vehicles
 - (b) persons
 - 4. 10 series and codes
 - 5. preferred words
 - 6. NCIC data
 - (C) Fire Department common terms
 - (D) Emergency Medical Service common terms
 - (E) Police Department common terms
- VIII. Telephone procedure
- (A) Number of rings
 - (B) How specific lines will be answered
 - 1. responsibility of administration calls
 - 2. responsibility of department calls for service
 - 3. 911 calls
 - (a) department calls
 - (b) fire calls
 - (c) other law enforcement agencies calls
 - (1) handle by department
 - (2) transferred to requested department
 - (C) Logging procedure for each type of call
 - (D) Procedures for non-service calls
 - 1. bomb/fire threats
 - 2. suicide
 - 3. harassment
 - 4. criminal intelligence
 - (E) Telephone paging
 - (F) Telephone log
 - (G) Long-distance calls

- IX. Priority list of dispatch calls
- (A) Police
 - (B) Fire
 - (C) Emergency medical
- X. Dispatch procedures
- (A) Broadcast sequence
 - 1. general dispatched calls
 - 2. ATL'S of all types
 - 3. general information
 - (B) Emergency conditions
 - 1. officer down
 - 2. pursuit
 - (a) vehicle
 - (b) foot
 - 3. in-progress calls
 - 4. natural disaster
 - (C) Card/logging procedure
 - (D) Timing procedure
 - (E) Frequency selection
 - (F) Alert tones
 - (G) Unit selection
 - (H) Traffic stops
 - (I) Unit requesting information
 - (J) Unit requesting data
 - (K) FCC rules and regulations
 - (L) Radio paging
 - (M) Point-to-point radio procedure
 - (N) Monitoring other frequencies
 - (O) Radio log
- XI. Communication center rules of conduct
- (A) Authorized person
 - 1. officers
 - 2. visitors/guests
 - (B) Authorized equipment
 - 1. televisions, radio (AM/FM)
 - 2. books
 - 3. coffee pots, food supplies
 - 4. weapons
- XII. Procedure applicable to various functions
- (A) Monitoring jail lock-up by remote television
 - (B) Reporting problems in lock-up area
 - 1. fight
 - 2. jail break
 - (C) Reporting problems at headquarters

- (D) Procedure for adding, deleting or changing any source document
- (E) Using NCIC computer
 - 1. message construction
 - 2. record keeping
 - 3. validations

XIII. Any previously uncovered material

APPENDIX B

Designs of Priority Call Lists

(a) Listing drawn along general lines.

1. Priority I - Criminal Emergency -
These calls are the ones that require immediate response to incidents where there is an immediate threat to the safety of an individual, a report of a crime in progress, or a crime committed and an apprehension of the suspect offender is likely.
2. Priority II - Criminal non-emergency -
These types of calls are of a personal injury non-criminally related.
3. Priority III - Criminal non-emergency -
These types of calls are criminally related but are not of an emergency nature.
4. Priority IV - Non-criminal/non-emergency -
These calls are non-criminal and non-emergency.

(b) Specific guide lines.

1. Priority I - Officer down.
2. Priority II - Officer needs help.
3. Priority III - Officer requesting back-up.
4. Priority IV - Officer in pursuit -
 - (a) Vehicle
 - (b) Foot
5. Priority V - All other emergency calls -
(these may be broken down also)
6. Priority VI - Other non-emergency calls.

APPENDIX C

PREFERRED WORDS

OFTEN USED

WANT
CAN'T
TELL
NO
YES
SEND
GET
BUY
GIVE
CALL AND SEE
FIND OUT
GET READY FOR
LATE
ABOUT
WRITE DOWN
FIND
LOOK OUT FOR
FINISHED/THE END
UNDERSTAND
DON'T KNOW
WAIT
DON'T KNOW ABOUT IT
TOLD

PREFERRED

DESIRE
UNABLE
ADVISE
NEGATIVE
POSITIVE/AFFIRMATIVE
FORWARD
OBTAIN
PURCHASE
RELAY
CHECK
INQUIRE
PREPARE
DELAY
REFERENCE
COPY
LOCATE
OBSERVE
NO FURTHER
CLEAR
UNKNOWN
STANDBY
UNABLE TO ADVISE
NOTIFIED

APPENDIX D

Suggested Communications Training Curriculum

3-day training program (for present communications personnel)

- I. Introduction
- II. The Radio Operator
 - (A) Level of responsibility
 - (B) Qualifications
 - (C) Accountability
 - (D) Professional ethics
- III. New 911 emergency system
 - (A) Agencies involved
 - (B) Manchester Police Department's role
 - (C) System Description
- IV. Telephone Technique
 - (A) Answering
 - (B) Routing
 - (C) Handling
 - (D) Logging
 - (E) Contacting volunteer firemen
 - (F) Logging fire calls
- V. Geography
 - (A) Roadway
 1. highway
 2. interstate
 3. mile-marker
 - (B) Subdivisions
 - (C) Common name streets
 1. numbering systems
 2. zoning
 - (D) Frequent accident locations per city
 - (E) Frequent call locations per city
 - (F) Area of jurisdictional cooperation
- VI. Communications form
 - (A) Present
 - (B) New
 - (C) Procedures for using forms

- VII. Microphone Techniques
 - (A) FCC rules and regulations
 - (B) Brevity
 - (C) Preferred words
 - (D) Standard descriptions
 - 1. persons
 - 2. vehicles
 - (E) Broadcast sequence
 - (F) General data
- VIII. Computer
 - (A) NCIC
 - (B) NLET
 - (C) Intra-state message switching
- IX. Trainee evaluation
- X. Trainee critique

APPENDIX E

HOURLY BREAKDOWN OF 3-DAY PROGRAM

MONDAY

8:00 A.M.	-	8:50 A.M.	Introduction
9:00 A.M.	-	9:50 A.M.	911 System Overview
10:00 A.M.	-	11:50 A.M.	Telephone Techniques
		lunch	
1:00 P.M.	-	5:00 P.M.	Telephone Techniques

TUESDAY

8:00 A.M.	-	10:50 A.M.	Contacting Volunteer Firemen and Logging data
11:00 A.M.	-	12:50 P.M.	Geography
		lunch	
1:00 P.M.	-	5:00 P.M.	Geography

WEDNESDAY

8:00 A.M.	-	8:50 A.M.	Forms
9:00 A.M.	-	11:50 A.M.	Microphone Techniques
		lunch	
1:00 P.M.	-	2:50 P.M.	Microphone Techniques
3:00 P.M.	-	3:50 P.M.	Computer System
4:00 P.M.	-	5:00 P.M.	Evaluation and Critique

APPENDIX F

SUGGESTED MATERIALS TO BE USED IN TRAINING PROGRAM

HANDOUTS

1. FCC rules and regulations - selected ones
2. Phonetic alphabet
3. Preferred word list
4. 2400 hour - time list
5. Social Security numbers by state

BOOKS

1. Commercial Vehicle Identification Manual, First Edition, National Automobile Theft Bureau, 1973
2. Commercial Vehicle Identification Manual, Second Edition, National Automobile Theft Bureau, 1978
3. Public-Safety Communications Standard Operating Procedure Manual, Associated-Public Safety Communications Officers, Inc. 1977
4. National Crime Information Computer Manual, Federal Bureau of Investigation, 1978
5. National Law Enforcement Teletype Originating Agency Identifier Manual
6. United States Identification Manual, First Edition, Drivers License Guide, 1976
7. 1979 Drivers License Guide, Drivers License Guide Company, 1979
8. 1980 Drivers License Guide, Drivers License Guide Company, 1980
9. 1970-1980 Passenger Vehicle Identification Manual, National Automobile Theft Bureau

CONSULTANT LIST

(This listing consists of those hardware and software vendors who have exhibited at APCO Conferences and any consulting firm that has an APCO member.)

This listing is provided without comment as to quality, character and/or performance of the firms or the individuals named therein.)

ABT ASSOCIATES INC.
56 Wheeler Street
Cambridge, MA 02138

ANTENNA SYSTEMS ENGINEERING COMPANY
2639 Walnut Hill Lane
Dallas, TX 75229

SAMUEL V. BELL JR.
KY State Communications Consultant
University of Louisville
Electrical Engineer Dept.
Louisville, KY 40208

BOOZ ALLEN APPLIED RESEARCH
4733 Bethesda Avenue
Bethesda, MD 20014

JOHN T. BROWN
Consulting Radio Engineer
P. O. Box 427
Pleasant Grove, UT 84062

CAPITAL SCIENTIFIC CORP.
Communications Consultant Service
2637 Connecticut Ave., N.W.
Washington, D.C. 20036

CASCADE CONSULTING CORPORATION
Suite 109
4522 Southwest Water Avenue
Portland, OR 97201

ALLAN K. CHAPMAN
Telecommunications Consultant
P. O. Box 543
Santa Rosa, CA 95402

ROBERT D. DOERING, Ph.D. P.E.
Associate Professor
Industrial Engineering and Management Systems
P. O. Box 25000
Orlando, FL 32816

JOHN R. DUBOIS
Communications Consulting Engineer
7005 Heatherton Trail
Minneapolis, MN 55435

R. JAMES EVANS
Communications Consultant
2803 Southwood Drive
East Lansing, MI 48823

PAUL GRATTON, ENG.
421 Argle
Westmount
Quebec H3Y 3B3 CANADA

FREDERICK G. GRIFFIN, INC.
Engineers & Planners
7212 Timberlake Road
Lynchburg, VA 24502

HARTECH, INC.
P. O. Box 88
Littleton, CO 80160

THE HOWLAND COMPANY, INC.
Engineering
2971 Flowers Road South
Atlanta, GA 30341

BERNARD JOHNSON INC.
5050 Westheimer
Houston, TX 77056

THE R. W. JOHNSON COMPANY
P. O. Box 803-Hazelwood Hill
Ben Lomond, CA 95005

KENNEDY ENGINEERING CO.
P. O. Box 2667
Santa Fe Springs, CA 90670

KENNEDY ENGINEERING CO.
3450 Lakeshore Ave.
Oakland, CA 94610

KENNEDY ENGINEERING CO.
P. O. Box 35669
Phoenix, AZ 85069

KUSTOM DATA COMMUNICATIONS, INC.
John J. Kinney, Special Consultant
7777 Leesburg Pike, Suite 211
Falls Church, VA 22043

F. S. MASON ENGINEERING, INC.
1700 Post Road
Fairfield, CT 06430

MICHAUD COOLEY HALLBERG ERICKSON
& ASSOCIATES, INC.
Consulting Engineers
310 Plymouth Bldg.
Minneapolis, MN 55403

MICHAUD COOLEY HALLBERG ERICKSON
& ASSOCIATES, INC.
400 Sibley St.
St. Paul, MN 55101

W. M. MONTGOMERY
Consulting Engineer
3618 Rainbow Drive
Minnetonka, MN 55343

NUMERIC COMPUTATIONAL SYSTEMS, INC.
Application Systems, Research & Dev.
935 Penn Circle
King of Prussia, PA 19406

NUMERIC COMPUTATIONAL SYSTEMS, INC.
Data Processing Operations:
2325 S. 12th St.
Philadelphia, PA 19148

NUMERIC COMPUTATIONAL SYSTEMS, INC.
Administrative Services:
3914 Somers Drive
Huntington Valley, PA 19006

PROTECTION ENGINEERING
Dr. Walton N. Hershfield, P.E.
Jay E. Helms, P.E.
37 Golden Hind Passage
Corte Madera, CA 94925

SACHS/FREEMAN ASSOCIATES, INC.
Corporate Office:
7515 Annapolis Road, Suite 408
Hyattsville, MD 20784

SACHS/FREEMAN ASSOCIATES, INC.
Midwest Office:
2970 Maria Avenue, Suite 115
Northbrook, IL 60062

S.I.C., Inc.
P. O. Box 803
Havertown, PA 19083

SPECTRA ASSOCIATES INC.
P. O. Box 2044
Cedar Rapids, IA 52406

SPECTRUM RESOURCES, INC.
P. O. Box 1141
St. Charles, MO 63301

STANFORD RESEARCH INSTITUTE
333 Ravenswood Avenue
Menlo Park, CA 94025

TELECOMM CONSULTANTS, INC.
178 W. Longden Ave.
Arcadia, CA 91006

THATCHER ASSOCIATES
564 Market St., Suite 612
San Francisco, CA 94104

WEBSTER COMMUNICATIONS
115 Bellarmine
Rochester, MI 48063

FREDERICK S. WOOD, P.E.
Consulting Engineer
89 South Ellicott St.
Williamsville, NY 14221

WILLIAM B. CARR & ASSOCIATES
1205 Hardgrove Lane
Burleson, TX 76028

END