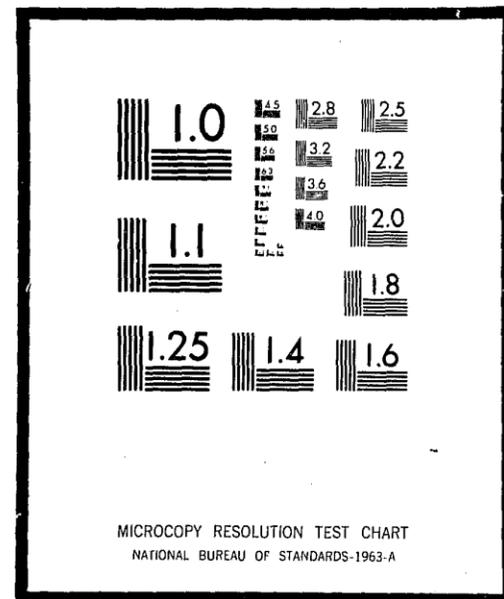


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LAW ENFORCEMENT ASSISTANCE ADMINISTRATION
NATIONAL CRIMINAL JUSTICE REFERENCE SERVICE
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SURVEY OF PRESENT POLICE DEPARTMENT
COMMUNICATIONS SYSTEM
FOR
CITY OF FORT WORTH POLICE DEPARTMENT

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WILLIAM B. CARR & ASSOCIATES, INC.
CONSULTING ENGINEERS
Fort Worth, Texas

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SURVEY OF PRESENT POLICE DEPARTMENT
COMMUNICATION SYSTEM
FOR
CITY OF FORT WORTH POLICE DEPARTMENT

INTRODUCTION

In compliance with Article 1, Paragraph 1.1.1 of contract number 7091 between the City of Fort Worth and this firm, the following report on the present Police communication system for the City of Fort Worth has been prepared. The purpose of this report is to inventory and evaluate the present communication system being used by the Police Department. In addition to the survey and evaluation of the system, broad recommendations will be made for improvement and design goals for the new communication system to serve the Police Department of Fort Worth. Included in this will be broad cost estimates that will be covered in detail under Phase II, along with the development of the final system plan.

In this report we will summarize the condition and operating procedures presently being used by the Police Department. The data used in this report which has been obtained, through personal interviews, personal observations and written material supplied us by both the Police Department and the Communications Department for the City of Fort Worth.

PRESENT SYSTEM

The following discussion and description will be primarily based on the seven

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items specified in the above referenced contract; however, as you will note, discussions, recommendations and comments are not limited to each of these items and may in many cases be overlapping between two or more of the general headings.

Present Equipment

The present radio equipment being used for the Fort Worth Police Department varies considerably in age as well as type and manufacture. A complete inventory supplied to us by the Communication Department is included in the appendix of this report. The Fort Worth Police System is composed basically of three VHF (155 MHz) mobile relay channels. In addition to these three channels, the Police Department is presently using one UHF (460 MHz) mobile relay channel in the operation of their foot patrol units in a high crime area. In addition to these basic channels the dispatcher of Channel C also has available the State intercity channel of 155.37 MHz.

Copies of all existing Fort Worth Police licenses are also included in the appendix of this report. In addition, the applications and supporting data for additional UHF channels are also included. More comments will be made regarding this later in the report.

Most of the mobile units presently used by the Police Department are the two channel type operating on either Channel A or B with the second channel being Channel C. Some units however, are single channel and some units are three

channels. As shown in the channel loading chart, Channel C is by far too congested for proper operation. Also as shown in the inventory list, numerous other equipment such as handy talkies, control units, and motorcycle radios of various types, as well as monitor receivers, are being used by the Police.

Recently, a new 20 channel logging recorder has been added to the dispatch area. This recorder provides the capability of recording all radio communications as well as incoming telephone lines. Also, equipment is presently on hand at the Communication Department to add an additional UHF mobile relay channel for a special Metro Squad in Fort Worth and Tarrant County. In addition to this equipment, the Communication Department also presently has additional VHF mobile relay units scheduled for installment at other parts of the City. Also, a second foot patrol UHF mobile relay is scheduled for implementation in a second area within the City.

It should be said, while meaning no criticism to anyone involved, it was extremely difficult to obtain an inventory and it appeared that little or no records were being kept between the Communications and Police Department regarding equipment.

Frequencies - Number and How Used

As stated above, there are basically three VHF mobile relay channels, along with one UHF foot patrol channel, presently in service in the City of Fort Worth.

Applications are presently pending before the Federal Communications Commission for five additional UHF mobile relay channels. One of these channels is to be devoted to the Metro Squad units. Likewise, an additional foot patrol mobile relay is planned, and its license is pending before the Federal Communications Commission. As mentioned in the preceding section, the City of Fort Worth Police Department does have available the intercity frequency of 155.37. From our investigation, it appears that this channel is seldom used with most of the City's communication with other agencies being handled by telephone, straight lease lines or teletype.

Under the present system Channels A and B of the VHF system are devoted as beat channels with each one covering three districts. Each district is divided into six or seven beats with each channel covering approximately one-half of the city. This information is shown in a graphic form in the beat map and radio district map and the appendix to this report. Based on the information supplied us, the number of units on Channels A and B will vary between 27 and 33 for each of the channels.

The third or Channel C is devoted to all other Police functions. This includes but is not limited to those listed below:

- Youth Division
- Plain Clothes Division
- Detective Division
- Traffic Division
- Crime Scene Search Units
- Inspection and Intelligence
- Helicopter Patrol Unit

Special Enforcement Unit
Inspection Service Division
Deputy Chiefs
Community Relations
Chief of Police

At peak times this channel with all units in service would have 152 units operating on this channel. In a normal 24 hour period the channel loading would vary from a high of 152 to a low of 10. While it is no doubt Channel C is overloaded, we feel that the 152 figure is somewhat unrealistic as it is made up of 74 detective division units. The chief problem; however, with Channel C is not the basic units assigned to that channel, but the fact that Channel C serves as a record and information channel for all beat cars and other vehicles. Thus, Channel C alone must carry the total communication systems at times.

The problems of Channel C are further enhanced by the fact that practically all departments or divisions within the Police Department have control and dispatch capabilities on this Channel. It has also been observed that instead of using intercom provisions, intercommunication between departments and or the dispatcher is often via Channel C; thus, increasing its loading and decreasing its availability to field units.

As shown above, the loading on the two basic patrol channels is not overly excessive; however, their operation is hampered due to the tremendous loading being applied to Channel C. Thus, while additional channels are badly needed to handle all

of the police functions, it is our feeling it is possible to reshuffle basic assignments to alleviate some of the existing problems. Hereagain, this matter will be dealt with more later in this report and in Phase II.

Physically, Channel C is located on the Macon Street Tower in downtown Fort Worth. Channel A is located on the Meadowbrook Water Tower on Bridge Street in East Fort Worth, with Channel B located on the Calmont Water Tower on Interstate 20 in West Fort Worth. Standby equipment for these channels is also located at the Holly and Macon Street Tower locations. The UHF foot patrol mobile relay is located at New York and Maddox, at an old fire station presently being used by the Fire Marshalls. While this is a high crime area and the foot patrol is essential, its low antenna height has limited the usefulness of this patrol to the one geographic area. Therefore, at this time, additional foot patrol relays or total system redesign is badly needed.

Dispatch Methods in Control Points

The main dispatch area for radio Channels A, B, and C is three radio consoles located in a dispatch office in the basement of the Police Building. In addition, the intercity channel is also available at Console C. Console C, likewise, has a hot line news facility to a local broadcast station. However, we have learned during the course of this survey, that to use this facility, it was necessary to tie up Channel C from all the traffic. While this broadcast service is no doubt extremely beneficial to the Police Department, we feel that it can be better handled differently.

There are also five other consoles in the dispatch area which are being presently used for telephone answering positions. These positions are actually radio consoles, thus giving the telephone operator monitoring as well as control capabilities on any of the channels. In this way, any console can serve as a backup should the main console for that channel fail. The telephone positions and radio dispatchers are connected by a card conveyor belt system. Cards filled out for ambulances or wreckers are returned to the telephone operators via a home-made card chute. Under the present system, one of the telephone answerers (normally four) is assigned to ambulance calls and one to wrecker calls. This system considerably reduces confusion in dispatching ambulances and wreckers as needed.

Also, in the dispatch area are positions for two call screen operators. These operators handle calls of such a nature not requiring a field officer on the scene. In this way, considerable load can be removed from the field units and still equally serve the public's needs.

Also, located in this area is a sergeant's desk, a partial console desk, logging recorders, a reference book table, and coffee bar. Soundproofing and acoustical treatment has been placed on the four walls; however, with the noise of the conveyor belt, the acoustics and noise level appears to be caused by the sound echoing between the hard objects in the room and the floor. Also, there appears to be possibly some problems in the way in which the microphones are worn by the

operators and possibly some level readjustments that could considerably reduce the background noise. Hereagain, this subject will be treated in considerable detail in the Phase II portion of this study.

As shown in the attached floor plans, floor space is at a premium in this area and additional space will be required to properly implement changes presently planned and those of a result of this study.

As discussed earlier, it appears to us that an additional problem facing the conditions on Channel C is the abundance of control points scattered throughout the Department. This information is shown in the appendix in list form. Here again, the lack of proper intercommunications between dispatchers, phone operators, and control points is evident. Also, it was observed that while a sergeant is in charge and responsible for the dispatch area, no monitoring facilities are provided at his desk. Thus, at any time, it is very difficult for the sergeant to be aware of the status and happenings of activities under his control. Telephone facilities are provided at his desk, which gives him communications to the outside or to any other operator in the room. While this is helpful, it is not adequate and when an emergency occurs, it is necessary for the sergeant to move to one of the main operating positions and become familiar with the total situation without adequate advance knowledge.

While not specifically listed as an item, we feel that possibly under all of these

headings should be the discussion of proper training and procedures. From what we have been able to learn during our survey, there is little or no training and no screening of dispatcher candidates as to their ability to perform satisfactory in that position. All of the training provided to the dispatchers is on an informal on-the-job basis. This method is not adequate to provide for proper dispatching to a police department with the requirements and size of the City of Fort Worth. In addition to the training, there appears to be a considerable need for revisions and establishment of definite operating procedures. As everyone is aware, communications is a lifeline of a police department, and the communications can be no better than the procedures employed.

Emergency Operation

From my observations and information supplied us, there appears to be little or no emergency procedures written or unwritten for radio dispatching. In addition to this, there appears to be a lack of emergency type equipment necessary for continuous and proper operation. A few of these examples are cited below:

1. No emergency lighting in dispatch room.
2. No backup control station for mobile relays should the console telephone lines or power fail.
3. No provisions for dispatching or monitoring by the sergeant in charge either normally or during emergency.
4. No emergency power available at equipment sites.

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Here again, these areas will be dealt with thoroughly in Phase II with definite recommendations for modifications and improvements.

Maintenance

Maintenance for the police communications as well as for the other departments in the City of Fort Worth is supplied by the Communication section under the Public Works Department. While this group has done a good job with the manpower and facilities available, it is our feeling that maintenance is not sufficient for the needs of the Police Department as was the case with the Fire Department. Due to the very limited area available to the Communications Section, it has been impossible to provide sufficient maintenance and installation to meet the needs of a growing city. It is also obvious from discussions and observations, that maintenance is only provided on a breakdown and need basis, and that sufficient maintenance is not available on a routine basis to assure a higher degree of reliability.

It is also brought to our attention that there appears to be poor communications between operational and maintenance personnel. Also, there is a high degree of confusion as to who should provide what, when, where, and why. Here again, in Phase II the subject of maintenance will be treated in some detail; however, from my prior work with the Fire Department and the work to date on the Police System it is totally obvious that additional maintenance facilities will be necessary to sufficiently support the needs of the City of Fort Worth. As mentioned earlier,

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lack of space for adequate installation room, maintenance room and part storage has been a problem for years with the Communication Section. Therefore, prior to Phase II we can accurately predict that a recommendation will be made for a completely new and adequate communications maintenance and installation facility. This facility should provide adequate room for service as well as installation and be readily excessable from throughout the City.

Telephone Teletype and Computer Terminals

The telephone system that serves the Police dispatch area seems to be totally adequate. Possibly the only problem areas with the telephone is a high noise level from the conveyor belt due to poor acoustics in the dispatch room. As a small suggestion, we will recommend that a red button be added to all the call directors on the City switchboard line used for major emergency calls.

The teletype machines are presently located in the communication control area in the communication building. These machines are operated by the communication dispatcher who has control of all City frequencies at one common console. It is our feeling that the teletype machine could better serve the Police fuctions if all equipment is centrally located.

The computer terminals are presently located in the Rand I room adjacent to the console and dispatch area. Hereagain, this subject will be covered in some detail in the Phase II part of this study.

FCC Licensing

Attached in the appendix of this report are copies of all present FCC licenses for the Police Department of Fort Worth. It appears that the licensing is not totally in order. There is the possibility that some of the present control stations are not licensed.

SUMMARY OF PRESENT SYSTEM

To briefly summarize the Police communications would be to say that the system as presently exists would be as follows: The system is over crowded and tends to overload and provide inadequate services especially during times of emergency. There also exists a total lack of training procedures and maintenance to insure a proper and smooth operating system. It should be noted that while there appears to be considerable problems and difficulties in the system, that through considerable effort by the personnel involved a workable system is maintained.

GENERAL PROPOSED RECOMMENDATIONS

The detail recommendations for the new system design along with this design will be covered in Phase II of this study. The following are major items that will be developed under Phase II to provide a more adequate communications system to the Police Department. While these recommendations are somewhat long range in nature and are open in design, we will provide in some form various recommendations that we feel could be implemented at this time to help the situation as it presently exists.

In Phase II considerations will be given to the following:

1. More channels and better use of all channels.
2. Better and more dispatching positions. This will also include recommendations as to whether to totally consolidate the communication function or to divide it more along Departmental lines.
3. The recommendation and possible development of dispatcher training programs would be necessary such that in the more sophisticated systems necessary for proper Police operation maximum utilization could be obtained.
4. The development of new operating and operational procedures.
5. The development of a more comprehensive and suitable maintenance program.
6. While the basic system will be designed under Phase II as described above, options of several different techniques will be included.

While it is still our feeling that it is beyond the state of the art at this time to discontinue mobile units, the basic system will be developed around a total coverage of the City sufficient for either mobile or portable units. The system will be so designed as to incorporate in it any or all or a combination of the following

presently available techniques: The use of digital identification of all units, the use of digital identification and status reporting, the use of one-way mobile printers, and finally the incorporation of mobile computer terminals in the vehicles. Along with this, consideration will be given as to whether total coverage for portable units would be through in-car repeaters, numerous satellite receiving positions, or a combination of both. Here again, the exact dispatching techniques employed in the system will be somewhat dictated by the final configuration of the portable or mobile units used.

Based upon the present information as to quality and channel availability, we would estimate that the cost of a basic voice communication system suitable for the Police Department of Fort Worth would be approximately \$960,000.00. Depending upon the option or combination of options listed above, the price would increase to well over a million and one-half dollars. As an example, we would estimate that a basic system plus digital identification would be in the order of \$1,100,000.00. While a system employing only one hundred mobile computer terminals would be in excess of \$1,500,000.00. Here again, it will be impossible at this time to give a definite cost breakdown until Phase II is completed.

As discussed earlier, we feel that since the implementation of any totally new system is at the present time contingent upon suitable LEAA funding, that possibly minor modifications can make the present system somewhat more reliable pending

implementation of a totally new system. Basically, we feel consideration should be given to using Channels A and B for other functions than beat patrol, thus eliminating some routine traffic on Channel C, such that the Channel could be devoted more to City-wide emergencies and a record and information channel. Secondly, that through the development of better training programs and implementation of some procedural changes some reduction or better utilization of the available air time could be had.

Respectively submitted,



WILLIAM B. CARR
Registered Professional Engineer
State of Texas

END