THE COMMAND TERMINAL—A computerized law enforcement tool

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INTRODUCTION

The most crucial problems being faced by local law enforcement agencies today are the collection, analysis, and utilization of police-oriented data. Information is the life blood of any law enforcement agency, and there exists a continuous requirement to collect and produce data which provide information useful to operation, planning, records maintenance, and management decision making.

Police data may occur in many forms; i.e., contact reports, patrol observations, fingerprint files, arrest reports, warrant files, or other identification files. Government agencies at the federal and state level are currently collecting information and making it available to local law enforcement agencies via police teleprocessing techniques (see Figure 1). The NCIC (National Crime Information Center) operated by the Federal Bureau of Investigation in Washington, D.C. is an example of this type of system. It can best be described as a computerized index to documented police information concerning crime and criminals of nationwide interest. Over 25 states now have their own computerized law enforcement systems modeled after the NCIC.

With information pertaining to criminals and criminal activity being maintained at the federal and some state levels, it is to the advantage of police officers to have access to that information whenever possible. If a patrol officer at the scene of an incident or investigation is able to query these data banks at the state and federal levels for the “wanted” status of vehicles or people, he will be able to use this information to make a better judgment of his situation. The timeliness of this inquiry and subsequent response is extremely important, and should be typically less than three to four minutes. Unfortunately, most of the systems currently in use do not accomplish this in an efficient manner, and thus the prime user, the patrol officer, is discouraged from using the system because he usually cannot obtain responses in the time frame that he requires.

THE DISPATCH CENTER

The patrol officer's contact with supporting resources is through the radio or dispatch center. Almost all of his assignments and emergency directives come to him via radio communications and under the control of a radio dispatcher.

Radio dispatchers, monitoring the activities of a widely scattered fleet of vehicles, are the recipients of a vast amount of vital information which has to be sifted, organized, and made available for use in making operational and administrative decisions. The dispatcher's effectiveness depends critically upon the ability of his information handling systems to supply critical data as quickly as possible, with a minimum of wasted effort.

The functions of the dispatch center have changed tremendously in recent years. With the advent of modern communication techniques which can effectively place a two-way radio on every patrol officer, and with

Figure 1—General information flow
the mobile capabilities of law enforcement forces such as patrol cars, motorcycles, scooters, and even helicopters, the dispatch center has become a scene of busy and sometimes frenzied activity, with a corresponding increase in paperwork. Most radio rooms or dispatch centers are not prepared to handle the current volume of activity that exists in law enforcement agencies today. They are often overcrowded, understaffed, and are usually working under an antiquated system that has been “updated” only occasionally over the past years. Although the dispatcher is the field officer’s link to other law enforcement resources, responses to their requests for information are frequently delayed minutes, and sometimes hours.

Another important function of the dispatcher accepting complaints or requests for service from citizens is assigning the proper personnel to those incidents from a list of available resources. Recent studies show that 65 percent of all crimes can be solved if the police respond within two minutes of an occurrence of the crime, but if they are delayed up to five minutes, this efficiency drops to 20 percent. In making these assignments, the dispatcher usually makes use of policy and procedure guidelines, experience, and sometimes visual aids such as status boards. It is necessary that he have at his finger tips the status, location, and degree of availability of all of his forces, in order to assign the correct resource to each task.

RADIO TICKETS

The flow of data through a dispatch center is usually controlled by paper forms called radio tickets (or dispatch tickets, complaint tickets, etc.). This is a data collection method that has been used in police departments throughout the country for a number of years. As much as they may vary from department to department, radio tickets are generally used to record some basic facts about each assignment, event, or incident that requires the use of the police departments’ primary resource, manpower. Some of the most common elements of the radio ticket include: time complaint was received, type of incident, location of incident, unit number assigned, time dispatched, time of arrival on scene, a document control number, time assignment was concluded, etc. These tickets may be completed entirely by the dispatcher as the incident progresses, or may be later filled in by the patrol officer when he returns to the station. In larger departments the radio tickets are initiated by complaint clerks who take the complaints from the public and pass them on to dispatchers, who assign the mobile units and complete the radio tickets.

Current manual radio tickets provide a very important collection device in the data management procedures of a law enforcement agency. However, there are some serious drawbacks to their use. For instance, if the data are going to be input to a law enforcement management information system, then the information on the radio ticket must be recorded twice, once by the dispatcher as it occurs, and again by a clerk who codes the information into machine-sensible form. In some cases the physical environment of the dispatch room requires that some mechanical method be used to transport the radio ticket from one position to another, thereby increasing the time from receipt of complaint to the time the unit is dispatched.

Should a patrol officer wish to make an inquiry on a wanted person or car, the request for information must be logged on a radio ticket, and the dispatcher must relay the request via a terminal to the state or regional data base inquiry system. The dispatcher must input the inquiry in a very rigorous format, because errors will cause it to be rejected and necessitate its reentry. Not only is this activity frustrating to the operator of the terminal, but in emergency situations it could endanger the patrol officer who has asked for this information NOW and is unable to get it.

It is readily apparent that there are many stumbling blocks between the information system and its user, the officer on patrol. The system often appears unresponsive to his needs, so he tends to use it only when absolutely necessary, and not as part of a normal operating sequence. To cope with these problems, the attack must be launched at the nucleus of the difficulty, the radio room itself, its operating personnel and procedures, and the operator-information system interface. The radio dispatcher must be provided with an integrated mechanism for handling his normal dispatching and data collection duties, and also for interfacing with the automated information system in an efficient manner. A system has been constructed which will solve many of these problems. This system is called the COMMAND TERMINAL.

FUNCTIONS OF THE COMMAND TERMINAL SYSTEM

The basic COMMAND TERMINAL System is composed of a minicomputer, a disk, a visual display device (CRT), a standard keyboard unit, a special function keyboard unit, a standard teletypewriter, and a set of operational computer programs. While the system is welded together logically into a total operating package, the dispatcher is physically confronted with only the
visual display device, the two keyboards, and infrequently, the teletypewriter (see Figure 2).

In many cases the visual display device can be integrated into the radio console itself, so that it is immediately in front of the dispatcher when he is seated in his normal operating position. The two keyboards are placed on the console desk top in front of the dispatcher. The teletypewriter, which is used primarily for hard copy output, may be located in various places, depending upon the department’s normal operational procedures. All other equipment may be located in a separate room with the communications equipment, or in any other suitable place. The system is designed to replace, on a plug-for-plug basis, the present real-time information system terminal. Since the COMMAND TERMINAL can emulate the previous type of terminal, no modification to the real-time system’s programs is necessary.

With the COMMAND TERMINAL, radio tickets are no longer pieces of paper to be completed in handwriting, time stamped, filed in slots, and ultimately key-punched to permit further analysis by computer. Instead, the radio ticket is an electronic form appearing before the dispatcher on a display device. The dispatcher fills in some of the blanks by utilizing a keyboard, while the system assists him by filling in others automatically (see Figure 3). In some cases, when data fields have been filled in by the dispatcher, an auto-
As name and vehicle checks come in from the mobile unit handling a specific incident, the dispatcher need only fill in the necessary fields on that unit's radio ticket. The system then automatically formats this data into the proper inquiry language, and transmits the resultant inquiry to the real-time system.

As a safety feature for the man on the street, the system contains a "watchdog timer" which notifies the dispatcher if no contact has been made with a particular unit within some predetermined amount of time. The amount of time permitted before an alert message is displayed can vary, depending upon the type of incident being handled.

Complete radio tickets, being recorded originally in machine-sensible form, can be sent directly to the management information system computer if it is capable of accepting data this way, or it can be recorded on any type of output medium desired, such as paper tape, punched cards, or magnetic tape.

Directed or point-to-point messages coming to the agency through the real-time-information/message-switching system are automatically routed for output to the teletype by the COMMAND TERMINAL's small computer. This precludes interference with the dispatcher's normal operation. Outgoing directed messages can be sent from the dispatcher's visual display unit, or the teletype. In either event, the system will handle all necessary formatting and the insertion of fixed message header elements.

SYSTEM CONFIGURATION

As mentioned before, the basic system consists of a minicomputer, a disk, a CRT with a standard keyboard,
and a function keyboard. One of the design goals in the development of the COMMAND TERMINAL was to achieve a satisfactory price/performance relationship with a sound functional system. The Honeywell H316 computer was selected as the system CPU. The Engineered Data Peripherals 3032 disk was interfaced in-house, and the basic sector size set at 128 16-bit words. This sector size was defined so as to contain a single radio ticket with an average number of entries, and to minimize the number of sector transfers when executing program overlays. The CRT used is a TEC Model 400 with a complete set of edit functions and standard alphanumeric keyboard. The special function keyboard was built in house and merely converts the dispatcher's finger stroke into an 8-bit character. All of the system functions are implemented by programming.

All of the computer programs were coded in DAP, the machine assembly language of the Honeywell computer. A disk-based monitor was designed to control the disk-resident overlay processors and data storage. Almost all of the data being handled are maintained on the disk. This includes completed radio tickets, radio tickets in progress, unit status tables, patrol area status tables, input and output message queues, and other user-specified information that needs to be maintained in real-time.

Due to the variety of data base structures and the individuality of each law enforcement agency, a major design goal was modularity of function programs. It is now a minimal effort to design and implement a tailor-made system to any agency's specifications. Parameters such as radio ticket format, patrol area labels, response patterns, and even incident priorities can be specified during an installation by a short system generation procedure.

EXPANDABILITY

The basic system is easily expandable both in core and disk size. For larger installations that require more than one dispatcher station, additional CRTs and keyboards may be added to the system (see Figure 6). However, each additional dispatcher station approximately doubles the processing requirements of the system, and therefore usually requires additional core and disk space in order to guarantee acceptable interaction of the dispatcher with the system. "Acceptable Interaction" is defined as the system's response to data input or action by the dispatcher, and has a maximum time lapse of two seconds. The COMMAND TERMINAL interface to a police real-time information system is usually via a modem and requires only specific for-

matting of already developed character streams, and is, therefore, relatively easy to implement.

SUMMARY

We have described a system that has been designed to facilitate the flow of police information through the dispatch station of a typical law enforcement agency. Particular attention has been given to system modularity, flexibility, and ease of modification for varied installations. Use of a general purpose computer as the system controller guarantees ease of expandability when future "add-ons," such as mobile teleprinters and automatic vehicle monitoring devices, become available. These two items would serve to automatically close the loop for an integrated command-and-control system.9

The COMMAND TERMINAL has proved itself a capable tool in a real-time computer-oriented dispatch environment. It is valuable because any tool that collects and organizes data in a complicated and changing fact situation is a significant aid to judgment.10 And that
is the goal—to provide a tool for our law enforcement officers.

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