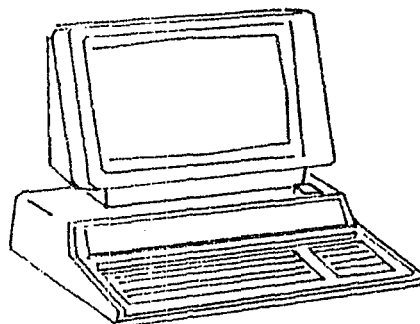110417

WILL MICROCOMPUTERS IMPACT

THE PATROL OFFICER

OF THE

SMALL POLICE DEPARTMENT?

Thomas D. Alder

Suisun City Police Department

POST Command College

Class IV

Will Microcomputers Impact the Patrol Officer of the
Small Police Department?

A *Five Year Forecast*

Thomas D. Alder
Suisun City Police Department

P.O.S.T. Command College
Class IV

Will Microcomputers Impact The Patrol Officer of the Small Police Department

Chief Thomas D. Alder
Suisun City Police Department, California

Written as the final thesis for the Commission on Peace Officer Standards and Training Command College, this paper examines potential and probable uses of microcomputer technology, specifically targeted at police agencies with fewer than fifty sworn personnel.

Development of microcomputer applications for small police departments is developing sporadically and without direction. For the most part, only those departments with a "computer guru" (expert) on staff have successfully implemented computer systems. A coordinated effort from law enforcement will be necessary if we are to have applications developed by law enforcement, rather than by professional programmers who may not have sufficient knowledge of the many facets of our job.

Author conducted a survey of several law enforcement agencies, then interviewed industry experts, as well as law enforcement executives who have been involved in automating their agencies. A functional five year plan for the small police agency was then developed.

This Command College Independent Study Project is a **FUTURES** study on a particular emerging issue in law enforcement. Its purpose is **NOT** to predict the future, but rather to project a number of possible scenarios for strategic planning consideration.

Studying the future differs from studying the past because the future has not yet happened. In this project, useful alternatives have been formulated systematically so that the planner can respond to a range of possible future environments.

Managing the future means influencing the future -- creating it, constraining it, adapting to it. **A futures study points the way.**

Production Notes

This report was produced on a Wyse PC 286 (an IBM compatible computer) using WordStar, Fancy Font, and a laser printer.

The author gratefully acknowledges the assistance and support received from Sgt. Ron Forsythe of this department; Professor John "Jack" Cassidy, Associate Professor of Business, San Jose State University; and the staff of FOG, the International Nonprofit Computer Users Group based in Daly City, CA.

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EXECUTIVE SUMMARY

Law Enforcement is constantly striving to increase its efficiency. The use of computers toward this goal has long been a part of police departments in large metropolitan areas throughout California, such as Los Angeles, San Diego and San Francisco.

Computers are becoming more powerful and less costly. Microcomputer technology is rapidly approaching the point where microcomputers will have the ability to replace existing minicomputers and will be able to perform most of the functions of today's mainframe computers.

Computer industry experts say that a new generation of microprocessors with powerful multi-tasking capabilities is now available. They believe that Law Enforcement agencies soon will have available $6,500 to $12,000 systems for police communication centers. These systems will be able to take emergency calls, search local databases, and get more information to the patrol officer much faster than ever before.

Microcomputers offer an affordable means to assist small police agencies in automating. The influence of computer technology in police work is growing, and microcomputers are becoming more accessible to non-programmers – more and more user friendly.

Police computer technology is no longer restricted to dispatching and communications, it's now being used for management information, to assist in decision-making, for comprehensive records retention and retrieval, as an investigative tool, for personnel scheduling and training, and for word-processing.

A police manager who intends to operate his department in a modern-day professional manner needs these tools to be more efficient while handling the job. Microcomputers will constitute the dominant force in computer technology, whether in the large or small agency.

Many law enforcement administrators believe the cost of implementing automation is prohibitive. Most point to limited city resources as a reason for not automating.

Yet funding sources are available. In Suisun City, the Police and Fire Booster Organization, a non-profit corporation whose major role was to provide funds to enhance the efficiency of the public safety departments within the city, sought to assist in automating the police department. They did so with a $12,000.00 first year grant and a commitment to fund the microcomputer project for the next five years.

To examine the issue of automating the small police department, questionnaires were mailed to a group of small to medium sized California police agencies who had previously expressed an interest in police computer software. The responses indicated that most agencies are satisfied with the computer

hardware they are currently using. Software functions are more limited. Not nearly as many agencies have police software as have computers. Many agencies that do have law enforcement software are only moderately satisfied with the programs, some are dissatisfied and others have stopped using the software due to program problems.

Agencies with microcomputers are gaining benefits from the word-processing capabilities. In some cases this is the only use.

A group of law enforcement administrators with experience in implementing computer plans discussed the results of the questionnaire. The group was also provided with information gathered from an extensive literature search.

The group concluded that police microcomputer application development should be concentrated, at least initially, in the area of support services such as communications, records, and crime analysis. Microcomputers in the office will make the department more efficient and, in that way, benefit the patrol officer.

The group believed that a functional microcomputer plan for a small police agency is as follows:

Year One: Purchase microcomputers for word-processing capabilities. This will serve to introduce microcomputers to staff, and will greatly increase efficiency.

Year Two: Implement data base management systems. The complexity of the system will be dependent on financial and internal capabilities. Software should be able to be modified to the department's specifications.

Year Three: Purchase additional microcomputers and network existing systems to facilitate sharing of information. Network hardware and software should be purchased from a source which has local service ability. A service contract calling for 4-hour emergency response should also be purchased.

Year Four: Continue software development. Based on a pre-determined priority analysis, additional functions should be added to the software, with a special emphasis on multi-tasking full function software for the communications center. Whatever software is developed or purchased must allow a dispatcher to quickly switch between functions without quitting the current task.

Year Five: Purchase microcomputers of the lap-top variety for the patrol cars. Initial use will primarily be for word-processing so that officers may prepare their reports in the field. The computers will have sufficient mass storage to support large data bases containing the master alpha file, city directory information, and local business information.

This plan is loosely formatted, allowing for frequent review in areas such as program design. Any plan which involves a field changing as rapidly as the microcomputer industry must allow sufficient flexibility to take advantage of new developments.

Computer technology is advancing at an incredible rate. Yet existing technology can perform the functions needed by the typical small law enforcement agency and will allow for upgrading to the "new" technology as it becomes available.

The increased power and decreased cost of microcomputers makes available to small police departments the ability to efficiently and affordably bring automation to the agency. There is no reason why even the smallest police department with limited funding can not justify the cost of microcomputers.

Current deficiencies are in the software development area. Organizations such as Search Group, Inc. are working to address these problems for the benefit of all criminal justice agencies. The solutions will not come overnight, but by beginning the automation process now, a department will be ready to implement the software as it becomes available and will be in an informed position to provide input into its development.

INTRODUCTION

INTRODUCTION

Advancements in computer technology are occurring at an incredible rate. A tool, which was once so expensive that it was available only to large corporations and federal agencies, is now on the desktops of more than 30 million Americans, a number which is growing every day.

Local law enforcement now has available the ability to process information with greater speed and accuracy than ever before. But are law enforcement agencies, who are traditionally slow to accept change, ready to accept the information age? Even more important, what impact will the advancements which are occurring in computer technology today have on law enforcement agencies in the future, and what should we be doing now to prepare for those changes.

Exactly what are these changes? We may listen in awe when we hear of "Star Wars" research and its effect on the defense of our country against foreign enemies. But as law enforcement administrators we must also explore what this technology may mean to our defense against threats closer to home.

As Chief of Police for the City of Suisun City, I examined this issue using the City's present and future situation as a model. The results are applicable to any department in a small but growing city.

As chief law enforcement officer for Suisun City, I need to know how to attain maximum performance and high productivity, while keeping a high morale in a department facing an increased work load from a growing crime rate.

Suisun City is a small city located in Northern California, midway between San Francisco and the State Capital of Sacramento. Over the past ten years, the city has changed dramatically. The population has grown from a 1977 population of 7,000 to today's population of 18,000 – a 257% increase. At one time

labeled "The fastest growing small city in California," City officials project Suisun City's population will more than double by the year 2000.

A Comprehensive Annexation Plan (CAP) prepared for the City reported the following:

> **Suisun City is a city with a commitment to enlarge the economic base, consolidate its urban pattern through the urban in-fill of bypassed vacant lands and to provide public services in an efficient and economical manner.**

Growth projections and economic restrictions necessitate increasing the efficiency of our existing staff if the City is to continue providing the same high level of service.

A consensus of opinion within the patrol and support services staff suggested that we look to microcomputers as a way to increase the efficiency, morale and productivity within a department that cannot increase staffing levels due to a general fund deficit.

In this paper I examine the feasibility of microcomputer use by the small police department, defined for the purpose of this paper as an agency with fewer than fifty sworn personnel.

Computer equipment discussed is of the microcomputer variety, due to the low cost of microcomputers in comparison to mini-computers or mainframes.

Being from a small police agency with eighteen sworn officers, I didn't feel all alone in examining this issue. In California 23% of the 413 Police and Sheriff's Departments have fewer than 10 sworn officers, 36% have fewer than 20 sworn officers, and an 60% have fewer than 50 sworn officers.[1]

We know that large agencies have the finances to experiment with and purchase hi-tech equipment; they have for years. Small police departments can no longer sit back and take a "wait and see" approach.

The effective police manager must have the appropriate information for

the identification of under-utilization of resources, or their misuses[2]; and he must know how to correct the problem.

In examining the above position, Ernie Hernandez, Ph.D., wrote in his book <u>Police Handbook for Applying the Systems Approach and Computer Technology</u>[3]:

> **This correspondingly means he must collect information, know why and how it is to be collected, and ultimately know what to do with the information. This is the only way the police manager will be able to intelligently respond to the increased demands for justification and accountability of his agency's performance.**
>
> **If the police agency's performance is adequate, the police manager must know why and be able to discuss it. If the agency's performance is inadequate in certain areas, then the police manager must not only know why this occurs, he must also know what to do about it to correct or improve the situation. If the agency's performance is adequate, but not as adequate as some new management information shows it can be (the information he has collected and analyzed shows some improvements can be made), then the police manager must implement the changes and decisions to enable the improvement.**

My decision to get on board and ride the wave of the future was highly influenced by Sergeant Ron Forsythe, a persistent patrol supervisor who for many years has tinkered with and played around with his personal microcomputer, doing police work. He convinced me that microcomputers are the wave of the future that can indeed impact the field officer, that they can be valuable tools in the hands of the field officer, and that the city can benefit by placing these machines in the care and control of its patrol officers.

It was my privilege to undertake the task of determining if other small law enforcement agencies in California, facing the same policing problems and concerns as the larger departments, have looked to the microcomputer as a cost efficient tool for their officers.

In implementing a microcomputer plan the following items should be considered:

1. The influence of computer technology in police work is growing.

2. Computer technology is becoming more accessible to non-programmers – more and more user friendly.

3. Police computer technology is no longer restricted to dispatching and communications technology, it's also now being used for management information, to assist in decision-making, for comprehensive records retention and retrieval (database and query technology) as an investigative tool, for personnel scheduling and training, as a word-processing tool, and as a report generator (formatting) device – including graphics for clarifying presentations, etc.

4. Computer technology is becoming more powerful and less costly. Microcomputers are affordable.

5. Soon microcomputers will have the power to eliminate existing minicomputers; and will also be able to perform most of the functions of today's mainframe computers.

6. A police manager who intends to operate his department in a modern day professional manner – needs these tools to be more efficient while handling the job. Microcomputers will constitute the dominant force in computer technology, whether in the large or small agency.[4]

The reason for choosing a project on the affects of the microcomputer on the field officer now and five years hence was simple, there is a need to be more efficient.

John Heaphy, in his 1978 article entitled The Future of Police Improvement[5] described it this way:

> Today there is a new outside impetus for police change. City after city across the country is facing serious if not critical financial problems. The day of the increasing police budget with larger numbers of sworn personnel is essentially gone, and the day of justifying what a department currently has in an effort to convince a city council to maintain it is fast approaching.

Many of the agencies involved in this project cited cost as an obstacle in expanding microcomputer use. Yet funding sources are available.

In Suisun City, the Police and Fire Booster Organization, a non-profit corporation whose major role was to provide funds to enhance the efficiency of the public safety departments within the city, sought to assist in automating the police department – not just the support services but also the field officer. They did so with a $12,000.00 first year grant and a commitment to fund the microcomputer project for the next five years.

As one researcher, Lucius Riccio, wrote[6] in The Future of Policing:

> Funding is available in sufficient amounts and a cadre of capable researches, who have honed their skill in criminal justice problems over the last 10 years, stand ready to do the job. The only ingredient that is lacking is direction. The field is "advancing" randomly, sporadically, with no specific goals in mind. An effort should be undertaken to define the field of police management science, indicate what has been done, and determine what must be done to significantly advance the science.

To further examine the issue, I interviewed computer industry experts, conducted a survey of thirty-seven California police agencies, and put together a panel of law enforcement administrators to examine, on a five year projection, the question: "Will microcomputers impact the patrol officer of the small police department."

The objectives were as follows:

1. Get an industry perspective on advancements occurring in computer technology and, if the industry experts believe present and future microcomputers have or will have the power to handle the needs of the small police department, ascertain what they believe is necessary for the successful implementation of a microcomputer plan.

2. Determine if microcomputers are being used successfully by small police departments in California.

3. Identify future uses of microcomputers as seen by law enforcement administrators.

4. Further analyze issues relating to law enforcement, and outline a plan for the implementation of a microcomputer system to be in-place within five years.

METHODOLOGY

WHAT THE COMPUTER EXPERTS SAY

OBJECTIVE ONE: "Get an industry perspective on advancements occurring in computer technology and, if the industry experts believe present and future microcomputers have or will have the power to handle the needs of the small police department, ascertain what they believe is necessary for the successful implementation of a microcomputer plan."

In formulating a plan for law enforcement's future use of microcomputer technology, it is important to examine the capabilities of the technology. To obtain the industry's perspective, three experts were interviewed.

Jim McArthur, a senior consultant for the California Department of Justice, Commission on Peace Officer Standards and Training (P.O.S.T.) was interviewed at his Sacramento office. McArthur supplied a list of law enforcement agencies which have requested microcomputer software information. This list was used as the base from which surveys were later sent.

Ronald Jayne, Director of Systems and Technology Programs for Search Group, Inc., was very supportive when he learned of this project. Search is an organization created and operated by several states and dedicated to improving the administration of justice through the effective use of technology. They will be publishing a book for law enforcement agencies about microcomputers. Search assisted in the preparation of the survey.

George Morrow, a pioneer in the computer industry, was interviewed at his home in Hillsborough, California. Morrow founded Morrow Designs, one of the early microcomputer manufacturers and one of the first companies to market a full-function battery operated microcomputer. He is now Vice President of Engineering and Chief Scientist for a computer peripheral manufacturer as well as an industry analyst whose writings appear in many trade publications.

JIM McARTHUR – P.O.S.T. SENIOR CONSULTANT

Efforts in developing police microcomputer applications should be concentrated in the area of support services, according to Jim McArthur a senior consultant for P.O.S.T.

> **All the innovation that has occurred in the last 20 years still hasn't changed what a policeman is. Unless someone thinks of a different way to do patrol, regardless of what advancements occur in computers, how can you automate what the patrol officer does?**

The benefits to the patrol officer will be indirect, according to McArthur. He foresees computers in the office which will make the department more efficient and, in that way, benefit the patrol officer.

McArthur believes a lot of interest exists in law enforcement for the development of police microcomputer applications, but currently only agencies with a "computer guru" (expert) on staff have successfully implemented computer systems. He pointed to a handful of law enforcement agencies he knows of who have someone on staff who is very knowledgeable about computers. That person has either done the programming or has made it work.

Support services which McArthur believes could benefit most from computers include Crime Analysis, for the identification of crime patterns; Traffic, for pinpointing problem accident locations and identify selective enforcement areas; and Records, for management reports, warrants and alpha files.

McArthur has the following advice for the Chief of Police of any small police department considering computerization.

1. Purchase microcomputers with word-processing software. Use word-processing for all those things that the agency now uses a typewriter for.

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2. Purchase database management software. Initial uses could include Alpha files, Field Interrogation Cards, and various management reports including fleet maintenance and response times.

3. Examine proprietary systems. See which, if any, of the law enforcement software systems currently on the market could satisfy the agency's needs.

4. If the agency has 4-6 microcomputers, look into networking them so information can be readily shared.

5. If the agency has developed a system which calls for patrol officers to enter their own reports, that single entry should also generate workload information, update the alpha and property files, and update the crime analysis information. The report should stay in a queue awaiting approval from a Sergeant, prior to updating the main databases.

McArthur said his plan is not all inclusive, nor do each of the steps have to be followed. An agency could benefit by implementing only the first one or two steps, if that is all they had the funding for. As additional funding became available, the other steps could be implemented.

Computers in the car would only be of value if they served as terminals to a central computer at headquarters, according to McArthur.

The main value of something like that would be as a mobile terminal, not just for word-processing.

He believes the primary design criteria for a such a computer system in the patrol car is that it be a transmitter and receiver, allowing detailed information to be sent to the field officer from the dispatch center.

"All of the processing can be accomplished by the computers at headquarters," McArthur said.

McArthur also saw little value in Computer Aided Dispatch (CAD) systems for small agencies. He conceded they had value to a large agency with many police cars to keep track of, but for small agencies he described the features of such systems as nice, but unimportant.

> **There are a lot of crazy, wild things you could do with these systems, but none of them will change the way you patrol.**

A lack of quality software and a lack of training for police personnel is why law enforcement agencies in general are not getting full use of microcomputers, according to McArthur.

He said that the technology to put together a quality law enforcement system is already here, just waiting for someone to put together the pieces.

In summary, McArthur believes that Police microcomputer application development should be concentrated in the area of support services such as communications, records, and crime analysis. He does not believe that, within the next five years, patrol officers will be using microcomputers themselves; however microcomputers in the office will make the department more efficient and, in that way, benefit the patrol officer.

RONALD JAYNE – SEARCH GROUP

Ronald Jayne, Director of Systems and Technology Programs for Search Group, Inc., blames the structure of governmental agencies as the reason few microcomputer software vendors are addressing law enforcement's needs. He calls it the slow sell cycle.

According to Jayne, when a vendor sells a product to business, it's two to three weeks from sale to final authorization and delivery; where government agencies take up to a year. This is one reason criminal justice is five years behind business in automation.

The average life cycle for vendors of criminal justice agencies, according to Jayne, is three to four years; meaning that the average supplier of law enforcement software is out of business within three to four years. Because cities have only one police department, Criminal Justice applications are sold at a rate of one per city. Jayne said agencies are going to have to coordinate their needs if they are to convince software vendors that a viable market exists for the development of criminal justice software. He said that the Criminal Justice community hasn't pressured vendors into developing products to address their needs at the microcomputer level.

Jayne believes public domain software solutions, funded by state and federal grants, can fill a large part of the void, and that the shortcomings of the applications market can be compensated for, in part, through training.

> **Police Officers have to become more sophisticated. With the advent of computers, the more computer literate the officer is, the more successful he will be.**

Jayne recommends mandatory training for peace officers in such areas as database management, telecommunications and automated crime analysis.

The future of automation for criminal justice rests with the

P.O.S.T. certificate process. P.O.S.T. must certify training at the microcomputer level.

What does the future hold for law enforcement? Jayne is excited about advancements being made in microcomputer technology, yet concerned that criminal justice agencies are not taking full advantage of the opportunity to make use of the technology.

> **Technology will change whether criminal justice does or not. Criminal Justice needs to take advantage of those changes – to influence that change.**

He spoke of the power of the new microprocessors with multi-tasking capabilities, and sees law enforcement agencies being able be able to put a $6,500 to $12,000 system in dispatch which will be able to take emergency calls, search local databases and get more information to the patrol officer much faster than ever before.

> **Putting 32 bit technology in the dispatch center will have a major impact on the patrol officer. Within five years we will see 64 bit microcomputers with power which exceeds mainframe capability and at a price small to medium sized agencies can afford.**

As an example of the power of the microcomputer, Jayne spoke of a large agency with a $2,000,000 mainframe computer, which uses a desktop computer for crime analysis. The desktop computer has more than sufficient power to perform the task, and is more efficient in terms of cost and man-hours than had the same system been developed on the mainframe.

Jayne said the problem for criminal justice is not in the hardware area, but in software. He said hardware already exceeds the current needs of criminal justice. For law enforcement's future, Jayne sees very sophisticated integrated software, probably on icon based computer systems.

Apple Computer's technology with icons has the potential for major influence in criminal justice.

Jayne explained that the value of icon based systems is that they "protect" the user from the operating system, an area too complex for personnel to have to work with directly unless they have a great deal of experience and training. He further defines this area as ergonomics, the interfacing of computers and human beings.

Apple has an emergency service division which has developed systems for fire departments. Jayne believes Apple will integrate law enforcement into this division as well.

Whatever system an agency implements must be designed around the dispatch center, according to Jayne. There may be a place for lap top computers for patrol, but they have to be designed around the dispatch desk.

What's going to effect those guys the most is what's happening in dispatch.

Jayne believes microcomputers provide a low cost alternative to the million dollar plus mainframe systems. Microcomputers with an enhanced user interface, such as the Apple MacIntosh with its icon technology, stand the best chance of gaining user acceptance.

GEORGE MORROW – COMPUTER SCIENTIST/INDUSTRY ANALYST

In an interview at his Hillsborough, California home, computer industry pioneer George Morrow had some strong opinions about what must occur for law enforcement to obtain maximum benefit from microcomputers.

"Take someone that knows Police work and train them in computers, rather than the other way around", he said. "Do not hire someone who doesn't know your job to write software which will become a part of your job."

Morrow told a story of an automobile manufacturer who hired computer professionals to automate an automotive plant. The technology was capable of accomplishing what the automobile manufacturer wanted. The final result was less than perfect. Paint robots, instead of painting cars, painted each other. The plant has never opened.

Morrow said it isn't that the technology was not available. The sensors, the positioners, the stepper motors, all of that was available, but was not being used correctly because the people who were trying to get the programming together were people who, are great at writing specifications for computer systems, but don't know a thing about molding fenders on cars or painting them.

> **The people who need to write the programs so paint robots can paint cars rather than each other, are painters – people who paint cars, not people who "spec" computer systems. Its the same for Police Departments.**

Morrow went on to discuss the 80386 micro-processor, a new computer chip which he calls "A watershed event for the computer industry." According to him, there are a lot of software applications which have been written around the mainframe computer, and this (80386) processor brings most of the speed and power of the mainframe down to something on your desk.

Many software applications currently available only on mainframe computers can be easily made to accommodate desktop computers using this 80386 processor.

> **From day 1, IBM has sold 27,000 mainframes. Last year, 4 million desktop IBM compatible computers were sold. These machines are going to be compatible with this new breed of processors that are just beginning to make their way onto the market now, the 386. So suddenly, anybody that has put effort into software, has at their beck and call, millions of machines. Every one of these machines that are in the field potentially can become a mini-mainframe. If they are not 386 driven, a card could be added to the machine to give it that kind of power without costing all that much money, probably not more than $1000.**
>
> **So, all the software activity, I think, throughout the nation is going to be concentrated on these littler machines, little in cost, not little in performance. Already there is a great deal of activity simply because of the numbers. But now, not only do you have the numbers, but you have the performance.**

Morrow said there is no reason now to have to buy an expensive mainframe computer for almost any of the tasks that the average computing environment needs.

> **All of the computational stuff, all of your applications that have to do with databases . . . there is no reason why officers couldn't carry around in there car all of the information about outstanding warrants, without having to make a phone call or worry about accessing a machine up in Sacramento. You'll have to update it, but the machine in Sacramento has to be updated too. The technology to do it, and probably to present the officer a picture, is here now.**

For the future, Morrow envisions computer terminals in the patrol car accessing central databases and giving the law enforcement officer a better forewarning that someone being stopped is dangerous. It will have to be more than just a terminal accessing a main computer.

> For example, look at the parking violations in San Francisco; there is no reason why that has to be on-line. That information you would store locally so a police car in San Francisco could access it, but not a police car in Los Angeles.

The computer in the police car will perform a combination of tasks, according to Morrow. Police Departments will have a fast access local database, and a global database from which they won't worry about the response quite as much. Morrow defined slow access as one minute or greater.

> You would be doing both in car processing and remote processing. That kind of thing will mean that the system response will be a lot better. When the officer makes a request of the outside database, he won't be looking at as much information so the search will be much more efficient.

> What you have in the car will do a combination of remote processing and in car processing. That type of shared processing will make the system response much better. You're not asking for as much information. You're not going to be looking at all warrants or all traffic tickets. Those that are in the city the system that you're accessing need not even search, so the searches go faster.

Morrow pointed to the Toshiba and Compaq computers as examples of the type of machines capable of performing the in car functions he described.

He said within a year or two, that class of machine will be able to store 150 megabytes that an officer could carry around with him.

> The difficulty in making this happen will not be the hardware, it will be the applications environment. What you need to do right now is encourage the formation of a computer user group within law enforcement that would be both professional and recreational. I'm sure there exists a cadre of computer hackers in the various police departments. The computer buffs that are also in law enforcement should be working on the formation of a database management program that does things like what we have described.

Morrow has spoken to computer user groups whose members regularly travel 40-50 miles to attend the meetings. The members use the meetings as as a resource. The meetings are social in nature, but are are also very much a resource for a sharing of software. Most of these groups have very large libraries of public domain software and use these meetings as the means for distributing it.

> I could see how it would be very much useful to you to have a special interest group. You people could be doing a lot right now with database management if you just knew that it was possible.

A law enforcement computer user group that's fairly computer literal, comprised of members from a different law enforcement groups would be the organization to fashion the programs that ought to be pursued, according to Morrow.

He pointed to the Toshiba and Compaq machines as powerful computers which would be good prototypes for the type of terminal processor that would be needed.

> They could probably be less expensive than the terminals that some law enforcement agencies have in their cars now.

Morrow's five year prediction for the marriage of the patrol officer and computer technology is for a microcomputer in the patrol car, accessing a main database by a cellular telephone type network, with local processing by the computer in the patrol car.

> That's the type of system you would want, and it could be accomplished with existing technology.

LAW ENFORCEMENT SURVEY

OBJECTIVE TWO: Determine if microcomputers are being used successfully by small police departments in California.

OBJECTIVE THREE: Identify future uses of microcomputers as seen by law enforcement administrators.

A survey of fellow law enforcement administrators was selected as the most efficient means of gathering the needed information to meet the above objectives.

Acting upon the advise of the Command College Advisory Board, Search Group, The National Consortium For Justice Information and Statistics, Sacramento, California, was contacted and asked if they would assist in the preparation of the survey.

Search consultants gladly agreed to participate, motivated by the fact that their non-profit organization has done extensive studies into mainframe and mini computer uses in law enforcement, and indicating that little research had been attempted into the uses and effectiveness of microcomputers within the law enforcement field.

A six page survey was prepared and presented to Search consultants for input of necessary modifications. Modifications to the survey included several questions in which the answers would be used for the benefit of Search's nationwide research project involving microcomputers in law enforcement.

Pilot surveys were given to administrators in the cities of Vacaville and Dixon. The survey design was again modified based upon input and suggestions from Executives within these cities. The final survey format was then completed and mailed.

Sections contained within the survey concerned agency data, present microcomputer use, degree of microcomputer satisfaction, software information,

programming data, future value assessment, effect of advancements in microcomputer technology on law enforcement, and training.

AGENCIES SELECTED TO PARTICIPATE

The project was designed to research the effectiveness of the microcomputer upon the field officer within a small police department. P.O.S.T. and myself had agreed that the definition of a small police agencies would be one that had fifty or less sworn officers.

With the assistance of P.O.S.T.'s Management Counseling Services, a list of police agencies meeting the above criteria was established – all of the selected agencies had been in contact with P.O.S.T. at one time or another seeking data concerning microcomputer hardware and software advice.

Thirty-Seven police agencies, having fifty or less sworn officers were selected and a surveys were mailed to each agency.

Twenty-Nine responses or 78% of the surveys were completed and returned; an extremely high completion rate according to Search. There was indeed an interest to know more about the microcomputer. Many of the respondents asked for a copy of the completed project. Statistical data on the following pages was compiled from 26 of the responses. Three surveys were excluded after finding that the agencies have more than fifty sworn officers, the pre-established minimum for qualification as a "small agency".

An overwhelming majority, 90.9% of the agencies responding, indicated that they were currently utilizing an IBM or IBM compatible microcomputer. Additionally, 90.9% responded that they were satisfied with the hardware they were currently utilizing.

Software function – Almost half of the responders indicated that they had

a customized police software package. Only four of the responding agencies indicated that they had interfaced or integrated their systems with other criminal justice agencies. Customized packages were primarily used for master name alpha files, records management, UCR mandated reporting, crime analysis, budgeting and known offender files.

Software satisfaction – 81.8% of all respondents indicated satisfaction with the software they were currently using.

Other microcomputer uses were word-processing, spreadsheets, and data base management. Only one agency used the microcomputer for graphics.

More than one-third of the responding agencies project that within five years lap top microcomputers will be in the hands of their officers.

Most were satisfied with the ease of use of the hardware. However, the majority of those responding indicated that the software of the future must be easier to use before microcomputers can be of real value to law enforcement.

A five year projection of microcomputer use by the field officer indicated primary uses to be:

#1 – Data base management for in-field access to master alpha file and field interview cards.

#2 – Integrated systems providing for officers to enter report information in the field which will be fed into a central computer.

#3 – Word-processing usage with officers typing their reports in the field.

Finally, survey results overwhelmingly supported increased training programs, sponsored by P.O.S.T., for patrol (88%), management (92%), and records personnel (92%).

Number of Microcomputers In Use

ONE
34.6%

0-PLAN WITHIN 12 MO
15.4%

SIX OR MORE
7.7%
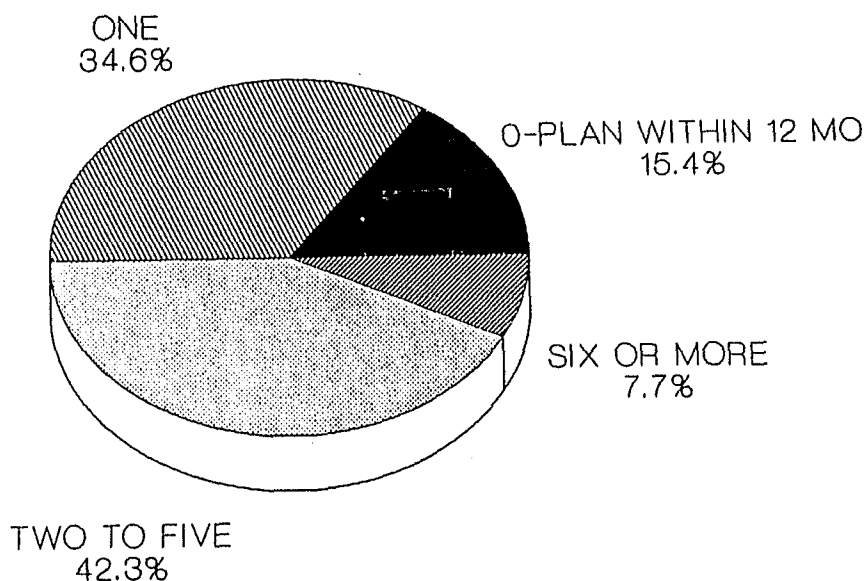
TWO TO FIVE
42.3%

QUESTION: How many microcomputers are currently in use?

Eleven departments, representing 42.3% of the respondents, reported having two to five microcomputers.

Nine departments, or 34.6% of the respondents reported having only one microcomputer.

Only two departments reported having six or more microcomputers.

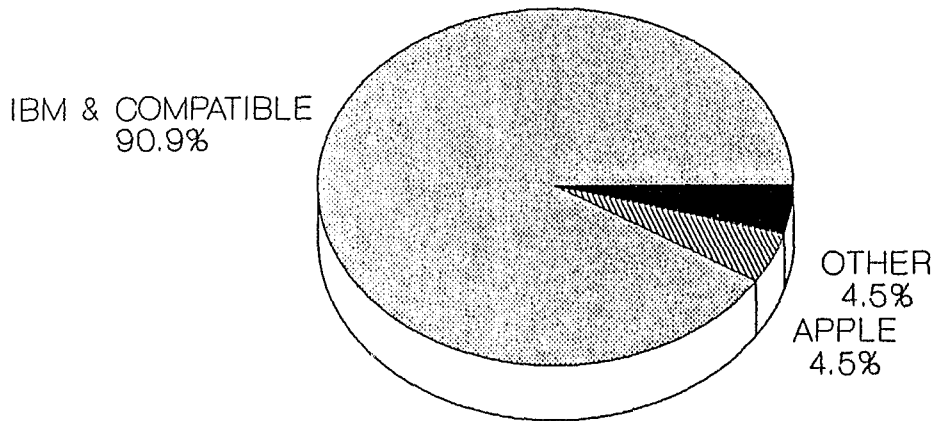The four departments reporting having no microcomputers indicated their intention to purchase within the next 12 months.

Type of Microcomputers

IBM & COMPATIBLE
90.9%

OTHER
4.5%
APPLE
4.5%

QUESTION: How many of each type of computer is used by your agency?

Of the 22 responding to this question, an overwhelming majority, 90.9% indicated that they were currently utilizing an IBM or IBM compatible microcomputer.

Only one agency reported having an Apple MacIntosh. Another reported having a Corvus system.

Not reflected in the graph is an agency reporting a Radio Shack Model 100 in addition to its IBM compatible.

A point worth recognizing is that Search pointed out that the Apple MacIntosh, with its icon technology, is ideally suited as the computer for law enforcement. According to our data, Apple has not yet penetrated the law enforcement field.

Satisfaction -- Hardware

COMPLETELY SATISFIED
54.5%

DISSATISFIED
9.1%

MODERATELY SATISFIED
36.4%
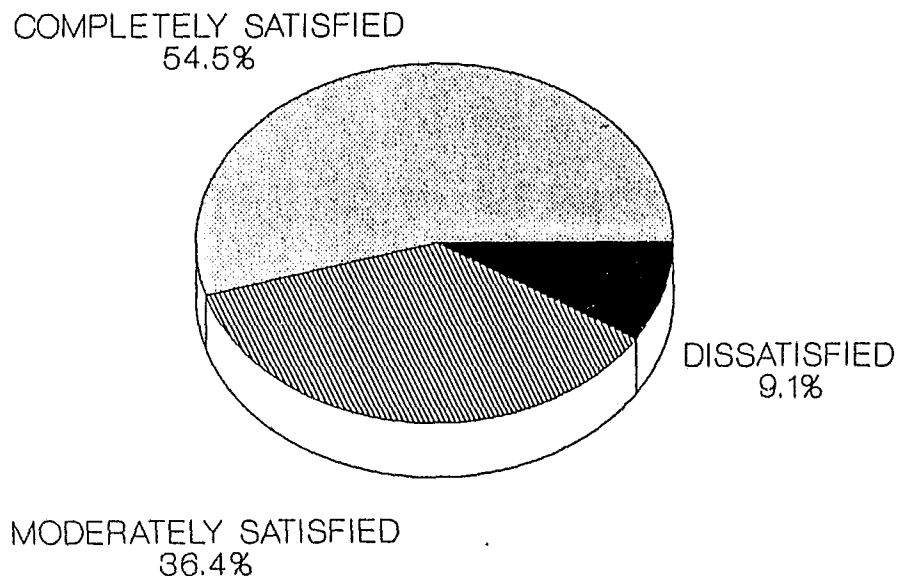
QUESTION: What is the degree of satisfaction with the effectiveness of your computer equipment (hardware only)?

Twenty of the 22 respondents to this question indicated satisfaction with current computer equipment. More than half of them (54.5%) indicating total satisfaction and 36.4% indicating moderate satisfaction. Only two reported dissatisfaction.

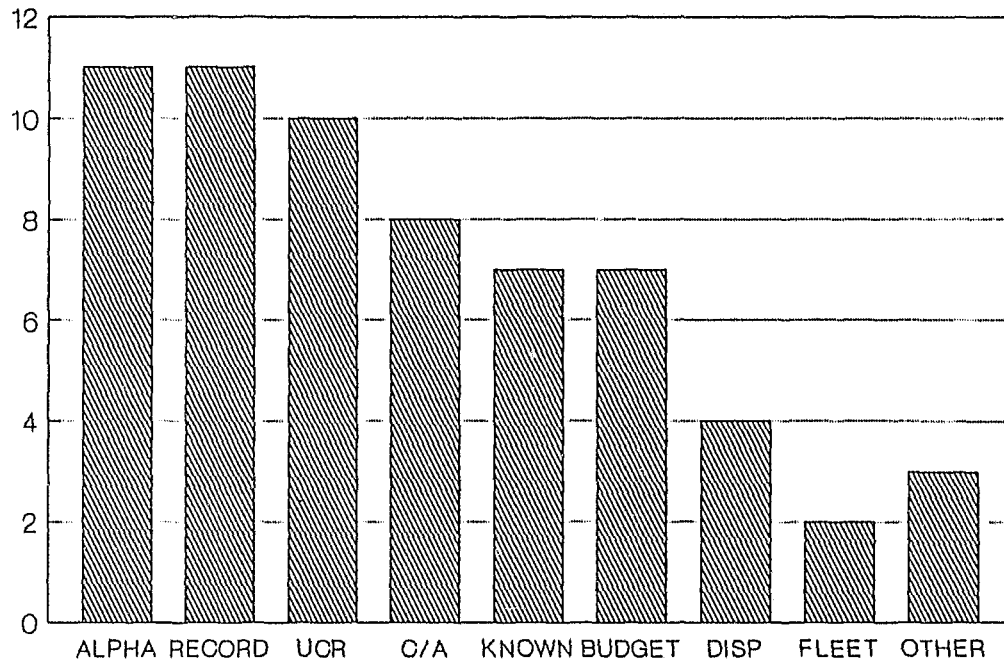Comments from the respondents included:

"We're not getting everything out of them that they can deliver due to user fear and low training time."

Porterville Police Dept.

"The system could use a larger mainframe for increased speed."

Seaside Police Dept.

Police Software Functions

QUESTION: How would you classify all major functions of your computer software?

Eleven agencies, or 42% of the respondents, report having custom police software packages. The respondents reported the following functions:

Function	Agencies
Master Name Alpha File:	11 agencies – 100%
Records Management:	11 agencies – 100%
UCR/Mandated Reporting:	10 agencies – 91%
Crime Analysis:	8 agencies – 73%
Known Offender Files:	7 agencies – 64%
Budgeting:	7 agencies – 64%
Computer Aided Dispatch:	4 agencies – 36%
Fleet Maintenance Records:	2 agencies – 18%
Other:	3 agencies – 27%

Other uses included traffic accident records, property file, citation file, and personnel records management.

Only four of the agencies with police software have integrated with other criminal justice agencies such as courts, jails, N.C.I.C. or N.L.E.T.S.

Nine of the software programs were "canned" packages purchased from a commercial vendor. The remaining two were custom written from agency specifications.

Satisfaction - Police Software

Completely Satisfied
27.3%

Moderately Satisfied
54.5%

Dissatisfied
18.2%
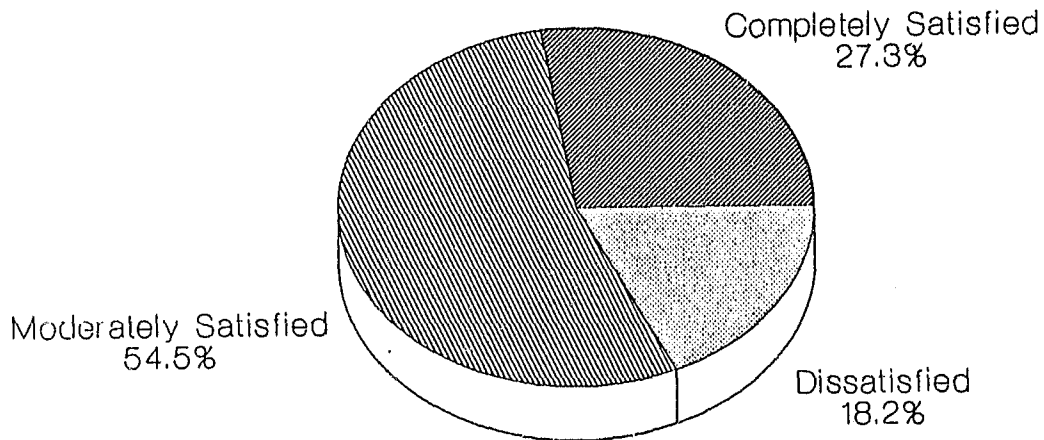
QUESTION: What is the degree of satisfaction with software currently in use?

An overwhelming majority of those agencies with police programs indicated satisfaction with the software (54.5% reported moderate satisfaction and 27.3% reported total satisfaction).

Two agencies reported dissatisfaction with their software citing limited capabilities, incompatibility with industry standard equipment, and "bugs".

One of these agencies discontinued purchased software after several months of use when attempts to rectify program design problems were unsuccessful.

Other Microcomputer Uses
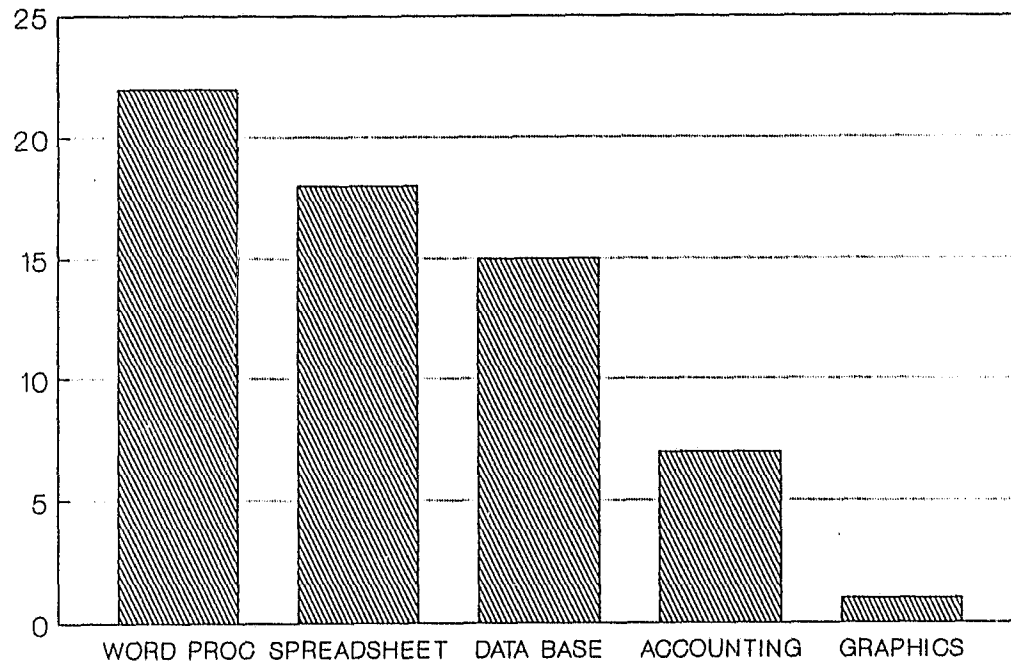
QUESTION: In what other ways is the agency using microcomputers?

Word-processing:	22 agencies – 100%
Spreadsheets:	18 agencies – 82%
Data Base Management:	15 agencies – 68%
Accounting:	7 agencies – 32%
Graphics:	1 agency – 5%

Five Year Projection
Greatest Benefit to Patrol Officers

Lap Top Computers
30.8%

Computer Aided Disp
19.2%

Crime Analysis
11.5%

Support Services
7.7%
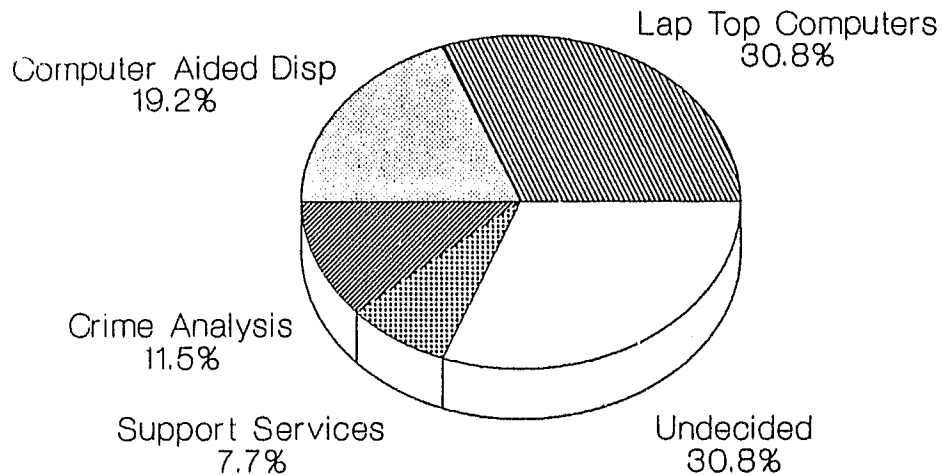
Undecided
30.8%

QUESTION: Five years from now, what microcomputer use which will be of the greatest benefit to the field patrol officer?

More than 30% of the respondents indicated they were undecided as to future benefits to the patrol officer of microcomputers. An equal number see lap top computers in the hands of their officers within five years.

Computer aided dispatch, crime analysis, and other support services comprised 45% of the responses.

Microcomputer Enhancements
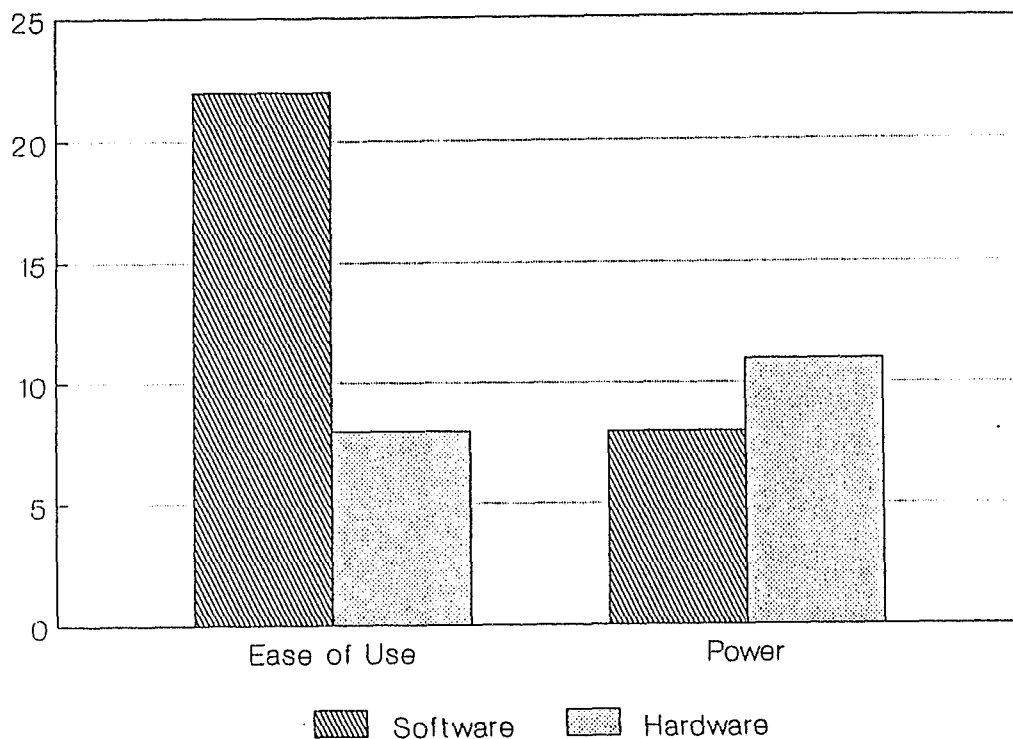
QUESTION: What must happen if microcomputers are to be of continued value in law enforcement?

The hardware must be more powerful
The software must be more powerful
The hardware must be easier to use
The software must be easier to use

Most were satisfied with the ease of use of their hardware, however 92%, or 22 of the 24 respondents to this question, indicated that software must be easier to use if microcomputers are to be of continued value to law enforcement.

Five Year Projection
Patrol Officer Use
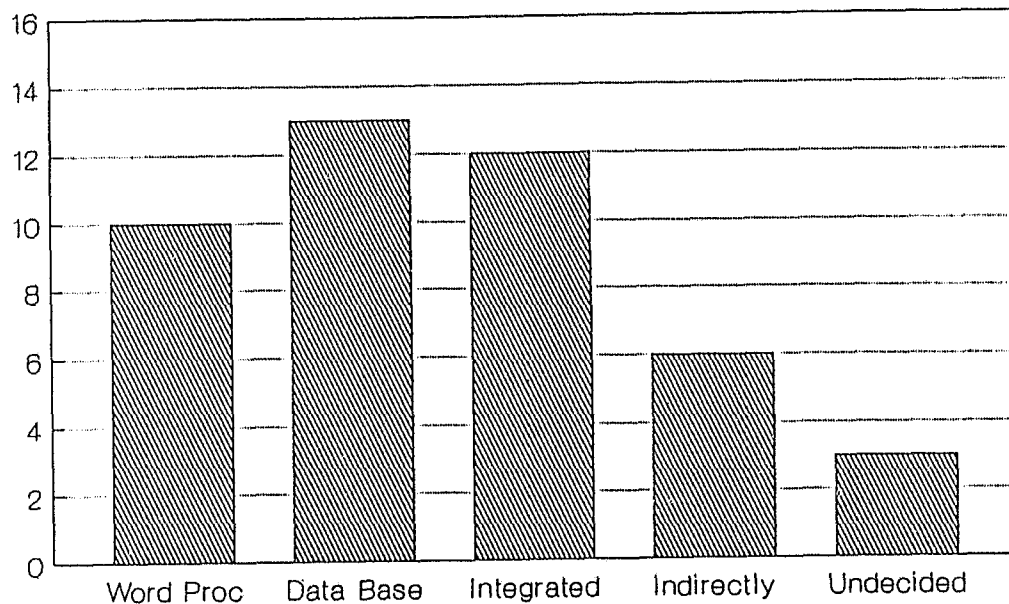
QUESTION: Five years from now, how will field officers be using microcomputers for?

Ten departments, representing 38% of the respondents to this question, believe that within five years their patrol officers would be doing word-processing in the field.

Thirteen departments, representing 50% of the respondents, foresee their officers having use of database files, such as field interview cards and the master alpha file, in the field.

Twelve departments, representing 46% of the respondents, believe the computer in the field will be part of an integrated system with the report information entered by officers at the scene fed into a central computer.

Six departments, representing 23% of the respondents, say that field officers will benefit only indirectly from microcomputers; that they will have no microcomputers in the field. Each of those departments cited cost as the primary reason for this projection.

NOMINAL GROUP MEETING

OBJECTIVE FOUR: Further analyze issues relating to law enforcement, and outline a plan for the implementation of a microcomputer system to be in-place within five years.

Using a modified Nominal Group Technique[7], I conducted a group meeting involving a Police Chief, a Captain, a Lieutenant and a Sergeant, each from different law enforcement agencies and all with experience in the implementation of computer systems.

BACKGROUND:

Prior to the meeting, each participant was provide with an information packet consisting of the results of 'the our law enforcement survey and reprints of articles entitled "Information Management and the Small Police Department"[8], "Writing Police Reports with Portable Computers"[9], "Computer Usage in Small Police Departments"[10], "Law Enforcement Computer Systems"[11], "Careful Planning Spells Success In Choosing a New Computer System"[12], "A Tough Road Ahead For Administrators"[13], and "Livermore police break in their new computer system"[14].

PURPOSE:

Group participants were informed that this research was being done for a P.O.S.T. Command College project, examining the impact advancements in microcomputer technology will have on the field patrol officer of the small police department five years from now.

They were informed that my preliminary literature search and interviews with industry experts indicate that we should be focusing our attention in the following three areas:

1. Mobile Display Terminals

   Computer terminals in the patrol cars which will access a new generation high power microcomputer at the police station. Much like the terminals in use in larger agencies which access main-frame computers, but on a smaller, more cost efficient scale.

2. Lap top computers

   Dedicated computers which will be issued to each officer or assigned to each patrol car, but which do not constantly access a central computer. Primary use would be report writing and individual database management. Computer could be attached to a central computer at the end of watch for "uploading" of information and reports.

3. Support services

   Microcomputer uses which would benefit the field officer in an indirect manner. An example would be a Computer Aided Dispatch system which would flag hazardous locations and have that information to a patrol officer before he arrived on the scene of a call for service.

Participant were further informed that the final result may be any one of the above, or a combination.

PARAMETERS:

The following parameters were given to the group:

1. Subject was to pertain to microcomputers only, including desktop and lap-top computers.

2. Results were to pertain to small police departments, defined for the purpose of the project as a department with less than fifty sworn personnel.

3. A focal point was potential benefits to the field patrol officer.

4. Final projection was for a five year term.

STAKEHOLDERS:

Stakeholders are persons or groups who are directly or indirectly responsible for the outcome of issues and trends affecting the organization. These persons or groups can be supportive, allies, or competitors.

The first task of the Nominal Group was to identify the stakeholders and then to rate the likelihood of their involvement. Attachment One shows the resulting ratings of the stakeholders as well as the significance of stakeholder concerns should they become involved.

Below is a list of stakeholders and their anticipated positions.

1. PATROL OFFICERS – Support

Microcomputers make the job/workload easier and more efficient.

2. COMMUNICATIONS/RECORDS – Support

Data is more readily available and easier to access. Automation would be the much preferred system as opposed to manual entry and retrieval.

3. PATROL SUPERVISORS – Support

   Easier and more expedient access to data. More efficient automated crime report approval system.

4. COMMAND STAFF – Support

   Improved more efficient system, easier access to data. Would produce staffing level/workload data which could be significant.

5. CHIEF EXECUTIVE – Support

   Same reasons as Support Staff-patrol supervisors.

6. SUPPORT COORDINATOR/SYSTEMS MANAGER – Support

   His/her primary functions would be that of managing the automated system.

7. CITY COUNCIL/City Manager – Mixed

   Would clearly support if funding sources were obtained, however they would have to be "sold" on the effectiveness of such a system if city financed.

8. DEPARTMENT HEADS – Support

   More efficient data base system that they may have to a need to access for selective data.

9. COMMUNITY/TAXPAYERS – Support

   More efficient public safety system – possibility of reduced staffing as well as cost savings.

10. HARDWARE/SOFTWARE VENDORS – Support

Would certainly support due to the income potential.

11. P.O.S.T. – Support

Would be heavily involved in training – officer to command staff. Would be in favor of a more efficient system.

12. DISTRICT ATTORNEY – Support

Prosecutors would benefit from a more legible police report.

13. DEPARTMENT OF JUSTICE – Mixed

Would support improved record retrieval systems, they would be concerned that appropriate controls be in place to protect restricted data.

14. LABOR GROUPS – Mixed

Even though the workload would be made easier and more expedient there is a possibility of a mixed reaction from these groups due to the possibility of reduced staffing levels. Complaints may also surface from employees who fear computers.

CRITICAL MASS:

Stakeholders were then narrowed to the critical mass, those who could make or break the plan. The critical mass was identified as:

1. Chief Executive
2. Communications/Records
3. City Manager & City Council

4. Command Staff

5. Patrol Officers

6. Support Coordinator

Attachment Two charts the position of the critical mass. None of those in critical mass are seen by the group as blocking the implementation of a microcomputer plan.

TRENDS TO MONITOR:

Trends which have occurred since 1980 which affect law enforcement's use of computers were then identified. These include:

1. Increasing power of microcomputers.

1. Increased availability of law enforcement software.

2. Computer literacy of law enforcement personnel.

3. Decreasing cost of microcomputers.

4. Increasing number of law enforcement agencies automating.

5. Fear of automation.

6. Software vendor credibility and tenure.

7. Reliability of hardware.

8. Ease of use of software.

9. Increased criminal case load.

10. Decreasing per-capita law enforcement budgets.

11. Law enforcement's need for efficiency.

The group next narrowed these trend to the five most significant, forecast the direction of those trends from 1980 to 1995.

The five trends selected by the group are:

1. Law enforcements need for efficiency.

2. Decreasing costs of microcomputers.

3. Increasing power of microcomputers.

4. Availability of police software packages.

5. Increasing number of law enforcement agencies automating their operations.

The group's opinion on the direction these trends have gone and are going are as follows:

Need for Efficiency
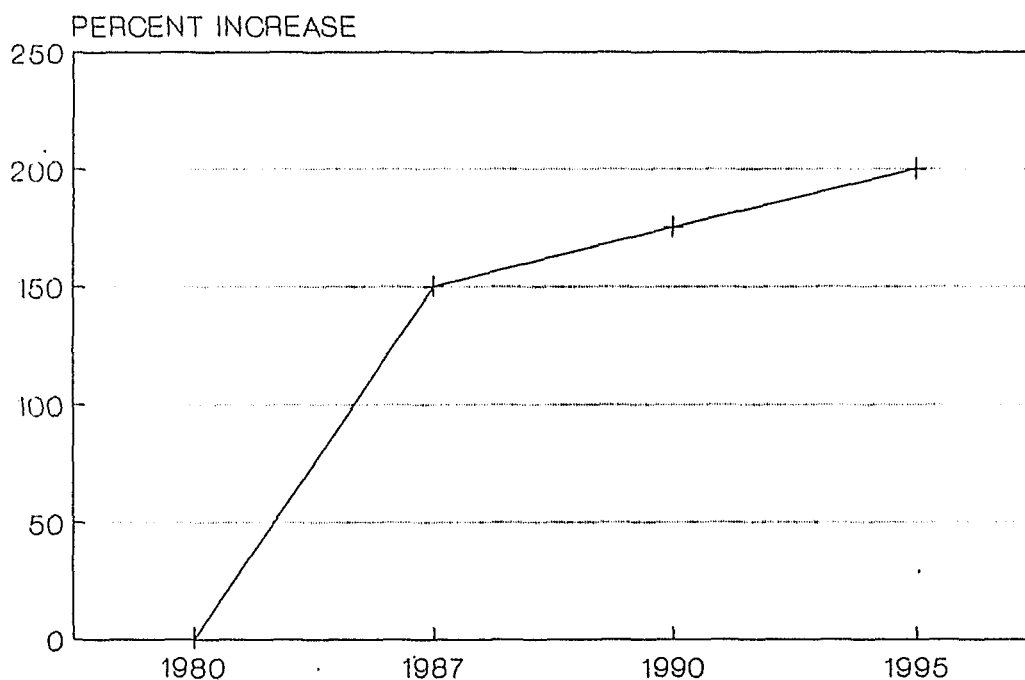
PERCENT INCREASE

As per-capita law enforcement funding has decreased, our need to become more efficient has increased. The group saw a significant increase in this area between 1980 and 1987, with the trend continuing through 1995.

Microcomputer Cost

PERCENT DECREASE
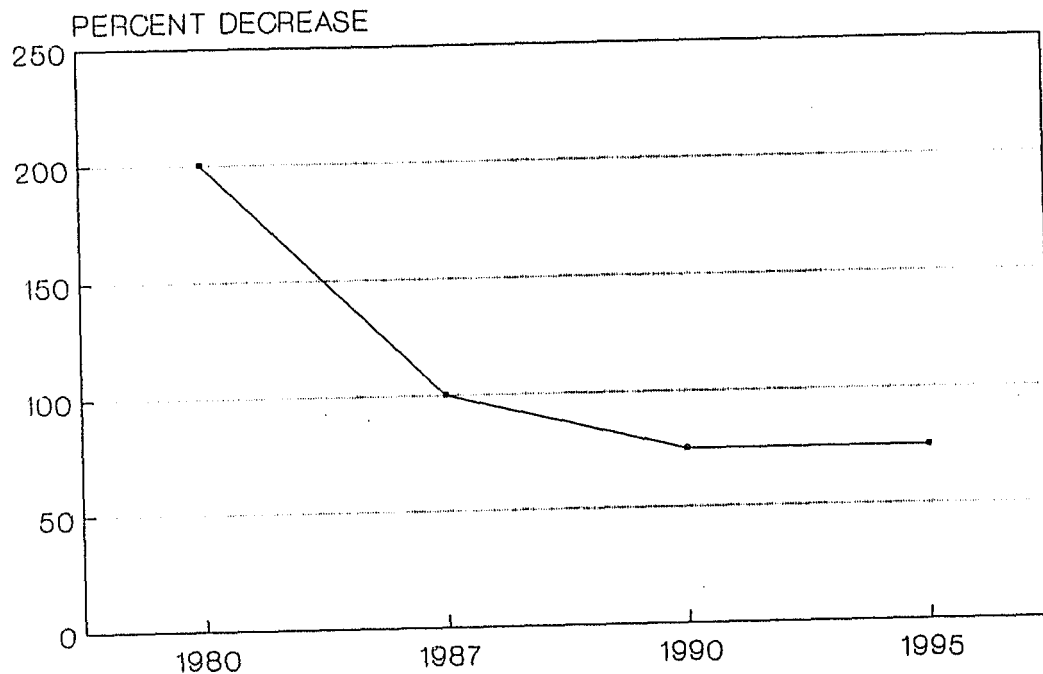
The dramatic decrease in microcomputer cost is due largely to volume production which began between 1980 and 1987. The shift through 1995 will be for more features, with prices leveling off by 1995.

Power of Microcomputers

PERCENT INCREASE
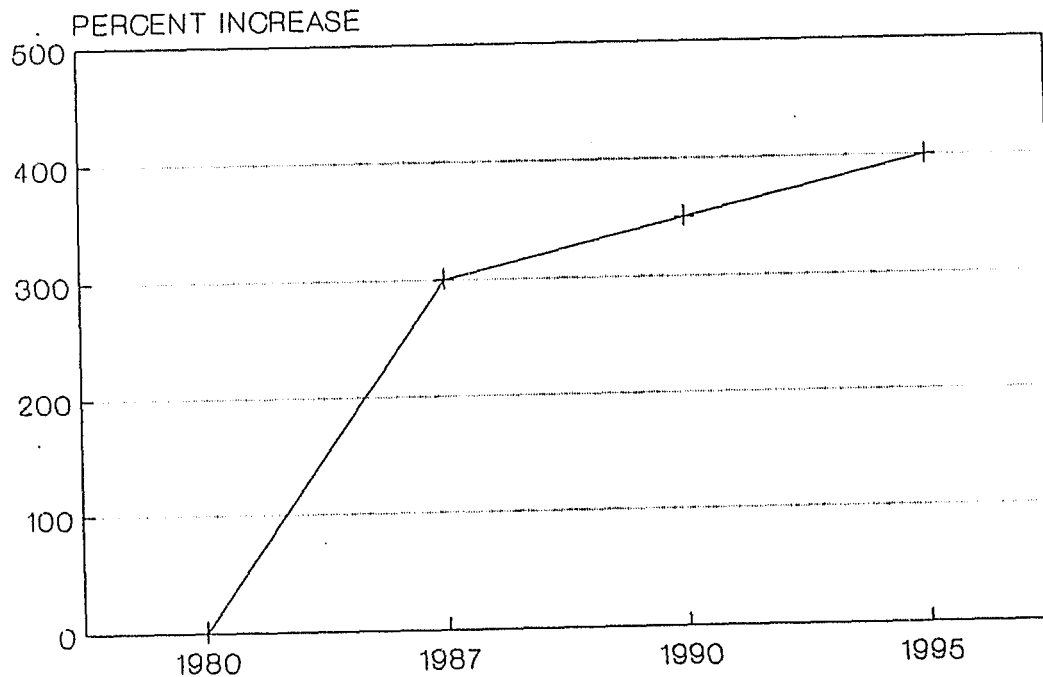
The advent of 32 bit microprocessors such as the 80386 and 68020 has dramatically increased the power of microcomputers. Computers with these processors are only just now reaching the market. Their development has begun a trend which will continue up to and beyond 1995.

Availability of Police Software for Microcomputers

PERCENT INCREASE
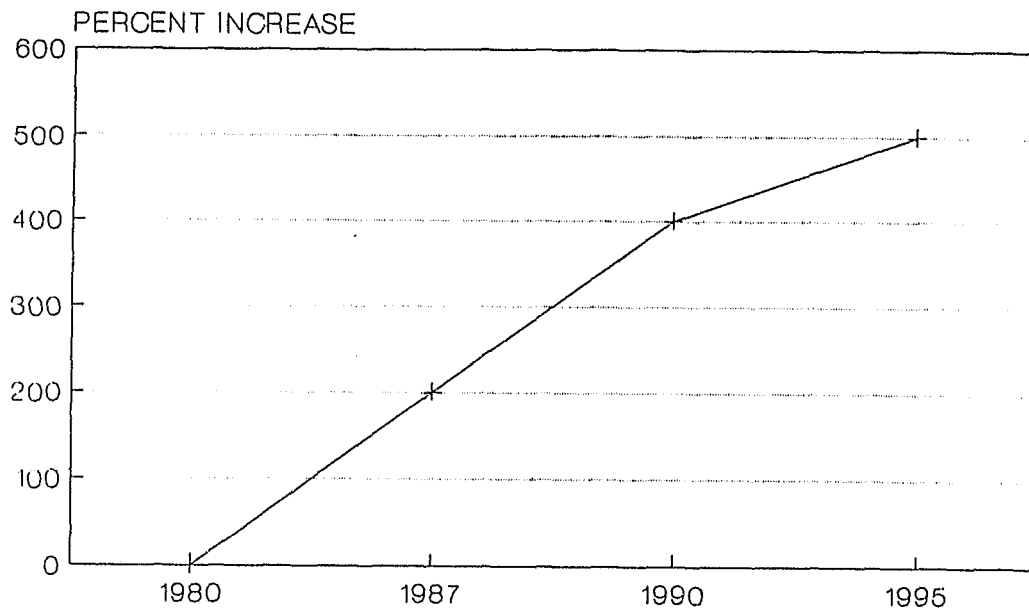
In 1980, before an industry standard operating system was established, few law enforcement software packages were available. Additional software packages have been developed in the past few years, yet microcomputers with sufficient power to support full function software are only just reaching the marketplace. Availability will increase dramatically as the installed user base expands.

Law Enforcement Agencies Using Microcomputers

PERCENT INCREASE
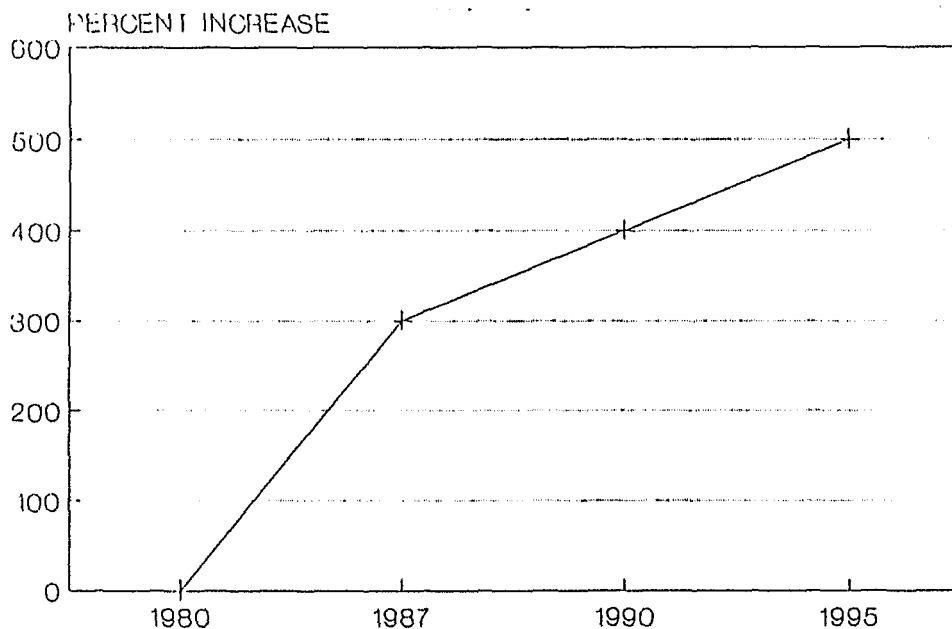
As costs come down and equipment capability increases, the number of agencies making use of automation will also increase. The graph shows a sharp increase between 1980 and 1987. The 1980 base that was virtually non-existent. The trend will continue to advance to 1995 when nearly every law enforcement agency in the state will have microcomputers.

CRITICAL EVENTS

The group next generated a list of critical events; events that MIGHT occur in the future that would significantly impact California Law Enforcement and significantly impact law enforcement's potential use of microcomputers.

The events identified were:

1. State Police Department – local police agencies are eliminated and a State Police Department is created with local precincts.

2. Public demand for increased police services – in the wake of police cuts of certain programs caused by budget cuts, a public safety initiative on the level of the recent Proposition 8 is passed by voters. This mandates increased police services but does not provide additional revenue to local agencies.

3. State funding for microcomputer use – in order to increase efficiency within smaller police agencies, the state commits to total funding of all microcomputer equipment to smaller police departments.

4. Donation of Computers – Large scale donation of microcomputers by private industry, such as Apple Computer Corporation donation to schools which put microcomputers into the hands of our school children.

5. Training – P.O.S.T. mandates microcomputer training at the basic academy level.

6. Hi-tech advancements – microcomputer power reaches the point where they replace mainframe and mini- computers.

7. County-wide system – mobile display terminals are placed into all county law enforcement units.

8. Legal Court Action prohibiting personnel data from being stored into microcomputers.

9. Consolidated County Management Information System.

10. Enhanced Statewide Computer System that allows local data such as warrants to be entered and accessed through the state system.

The group then selected the five most important critical events and therefore determined the probability factor in percentage of theses events actually occurring five years hence.

1. Hi-Technology Advancements – microcomputers replace mainframe and mini-computers.

1992 probability: 80%

2. Training – P.O.S.T. mandates microcomputer training at the basic academy level.

1992 probability: 90%

3. Consolidated County Management Information System.

1992 probability: 50%

4. Enhanced Statewide Computer System that allows local data such as warrants to be entered and accessed through the state system.

1992 probability: 20%

5. State funding for microcomputer use – in order to increase efficiency within smaller police agencies-the state commits to local funding of microcomputers.

1992 probability: 30%

CROSS IMPACT EVALUATION

A cross impact evaluation was then prepared, examining each critical event and accessing the impact on the probability of its occurrence if one of the other critical events were to occur.

If microcomputers replace mainframe & mini computers:

P.O.S.T. mandated microcomputer training	90% increases to 100%
A County-wide Management Info System	50% increases to 30%
Enhanced Statewide Computer system	20% decreases to 10%
State Funding for micros	30% decreases to 20%

If P.O.S.T. mandates microcomputer training at the Basic Academy level:

Microcomputers replacing mainframe & mini computers	No change
A County-wide Management Info System	50% decreases to 60%
Enhanced Statewide Computer System	20% decreases to 10%
State funding for micros	30% increases to 40%

If a County-wide Management Info System is formed:

Microcomputers replacing mainframe & mini computers	No change
Enhanced Statewide Computer System	20% increases to 40%
State funding for micros	30% increases to 40%
P.O.S.T. mandated Basic Academy Training	No change

If a Enhanced Statewide Computer system occurs:

State funding for micros   30% increases to 50%

P.O.S.T. mandated Basic Academy Training   40% increases to 100%

Microcomputers replacing mainframe & mini computers   No change

A County-wide Management Info System   50% increases to 60%

If the State provides funding for purchases of microcomputers for smaller agencies:

A County-wide Management Info System   50% decreases to 10%

Microcomputers replacing mainframe & mini computers   No change

P.O.S.T. mandated Basic Academy Training   90% increases to 100%

Enhanced Statewide Computer System   20% increases to 90%

SCENARIOS

SCENARIOS

Based on input from the law enforcement group and opinions expressed by industry experts, three scenarios have been developed.

Each of the scenarios fall within the realm of possibility, based on the trends and events postulated by the group, and the direction of the computer industry as evidenced by expert opinions in interviews and through literature searches.

The scenarios are written for the 1992 time period. Each is written from the perspective of a small police department in a city with a population of 25,000. While each of these five year predications are possible futures for the small police department, scenario three, is presented as the scenario which is most likely to occur.

SCENARIO ONE - Lap-top Computers

The date is April 18, 1992. Officer Woodruff, a patrol officer, is preparing for daily patrol. He inspects equipment: gun, handcuffs, briefcase contents, and computer.

Each officer on the Suisun City Police Department has been issued a lap-top computer, and its now a part of their equipment. When the Chief issued computers, he told the officers that these were "weapons to be added to their arsenal for combating crime."

When the computers were issued, Officer Woodruff, a fifteen year veteran officer, wasn't entirely convinced. After all, how could this fancy typewriter be used as a weapon.

As Officer Woodruff prepares to "hit the street" he signs out the necessary

daily equipment; a portable radio, stun-gun, car keys, and a computer disk.

He reports to the briefing room with his computer in hand. Before the Sergeant comes in, each officer reviews the files on his/her computer disks. The disk has information on selected activity since the last time Officer Woodruff worked, memorandums to be read, warrant and stolen vehicle information.

Officer Woodruff is presented with the following information:

> **Hello Officer Woodruff, welcome back to work. You last worked April 14, 1992. Significant activity which occurred during your days off are in a special file if you wish to review them.**
>
> **Lieutenant Smith wishes to see your prior to end of watch today.**
> **What would you like to do?**
>
> **(1) Review shift activity report.**
>   **(1A) Review shift activity which occurred on my days off.**
> **(2) Review memorandums**
> **(3) Review new warrants**
> **(4) Review stolen vehicles**

Officer Woodruff decides to check through each of the files sequentially. The shift activity report gives information about calls for service which may repeat, may show a pattern, or have a suspect outstanding. Below is one such entry:

<div align="center">

SHIFT ACTIVITY REPORT (BRIEFING LOG)
2300 April 15 – 1500 April 16, 1992

</div>

> **GRAVE SHIFT:**
> **2314 hrs   242 P.C.   L11, L6, R8**
> **Sunset Ave. @ Railroad Ave.   C92-12312**
> **Robert Terry reported being jumped by a transient while walking down the street. Suspect is described as a MMA 5-7 160 brn brn 40 yrs. dark clothing.**

Inter-office memorandums are distributed via computer. One of Officers Woodruff's memorandums is as follows:

To: All Personnel From: Lieutenant Smith
Subj: Communications section
Date: 4/15/92

Patrol personnel are again spending unauthorized time in the communications section, bothering the dispatchers.

Officers are reminded to General Order 77-1 which clearly states:

"Only communications and administrative personnel on department business are authorized to be in the communications section."

The Communication Center is not a place to visit. Continued failure to follow this general order will result in disciplinary action.

Officer Woodruff is presented with an option to delete the memo or file it in his personal area. He deletes it and moves on to check the warrant file.

The new warrant file in Officer Woodruff's computer contains all warrants received by the Suisun City Police Department since he last reviewed the file. This is presented for briefing information only. Searches are handled differently.

Officer Woodruff is presented with the following information:

WARRANT UPDATE LOG
April 15 – April 16, 1992
THE FOLLOWING NEW WARRANTS HAVE BEEN RECEIVED AND ARE VALID AS OF 1400 HRS. 4/16/92.

Art Dacanay   288 P.C., 261.5 P.C.
Bail: $15,000
OMA 5-8 160 brn brn glasses
Address: Unknown

William Smoother   459 P.C. 11350 H&S
Bail: $200,000   ***ARMED & DANGEROUS***
WMA 5-9 165 blk brn mustache
Address: 701 Cedar Street
Vehicles: 1990 Jeep – Red

Ken Leymen   470 P.C., 476a(b) P.C.
Bail: $1,000
WMA 5-5 130 red brn mustache
Address: 500 Union Ave.
Vehicles: (none-repossessed)

END OF FILE

Officer Woodruff scans the stolen vehicle file and finds there have been no new entries since he last worked. Sergeant Profitt enters the briefing room and shares some words of wisdom.

> OK, listen up. You've all reviewed the activity information. Note the assault on Railroad Avenue and give that area extra patrol. This is the third jogger mugged out there in the last two weeks.
>
> The Detectives are asking for our assistance in the service of search and arrest warrants at 500 Union Avenue. Check your computer entry under SMOOTHER. Officers Woodruff and Byerley report to Sergeant Pitts for further briefing at 1600 hrs.
>
> Pay attention to the memo from Lieutenant Smith and stay out of the communications center. He's really hot this time and looking for a human sacrifice, don't let it be you.
>
> That's it. Beat assignments are on the board. Hit the street.

Briefing time is shorter than the past, and no one needs to listen to the Sergeant reading a typewritten briefing log. Discussion is limited to any special instructions or action plans based on the briefing information. It's a better system.

Officer Woodruff is now ready to begin patrol.

During the course of the shift, he takes a burglary report, some miscellaneous reports, recovers a stolen vehicle and arrests a wanted felon. Not a bad days work.

Officer Woodruff uses his computer for local warrant checks and stolen vehicle checks. He still has access to the statewide network by radioing in, but the radio traffic is greatly reduced since he uses the computer himself to do his own checks.

It's now end of watch. Officer Woodruff turns in his computer disk with his other equipment. The reports will go in for review by the supervisor. If corrections are needed, the report will be on the disk he is issued when he begins his shift tomorrow, along with the appropriate notations from the Sergeant. Field contact information that used to be written on a field interview card is now put on disk for appending to the main file in dispatch.

When Officer Woodruff reports to work tomorrow, he will have a disk waiting for him with updated warrant information, a stolen vehicle update, and another briefing log. No doubt, there will be new memorandums for the brass also.

That reminds him, Lieutenant Smith wanted to see him. Wonder if it could be about the coffee he spilled on the communications desk.

Some things never change.

SCENARIO TWO – Mobile Display Terminals

In 1992, radios in the patrol cars of the Suisun City Police Department are only a part of the communications link between the communications center and the patrol officer.

Suisun City joined the rest of Solano County a couple of years ago in installing mobile display terminals in each of the police cars. The terminals access a county main-frame computer.

Solano County Sheriff Department is the county link to the state computer for D.M.V., N.C.I.C., and N.L.E.T.S. information. Integration with the county's mainframe computer began in 1986, when Solano County tied the state computer line to their mainframe computer and began leasing terminals to the other law enforcement agencies in the county. Installation of the mobile terminals was a logical progression.

The terminals are more than simple teletype machines. They access the county's mainframe for state computer access, and the cities own microcomputer as part of a computer aided dispatch system.

Officer Woodruff has just started his patrol shift. After checking his patrol car, he notifies dispatch that he is in-service by tapping a key, then entering his radio number. When he has a partner, he enters his partner's radio number as well. The communications center now knows that Officer Woodruff is available to handle calls for service.

When Suisun City first installed the mobile display terminals, all calls for service were transmitted to the officers via the terminals. It created problems. An officer could not accept and acknowledge a routine call without pulling off the road to read his terminal. Some officers felt confident that they could read, type and drive at the same time. The city now pays higher automobile insurance premiums owing to the resulting accidents.

Suisun City has now returned to dispatching by radio. If background information relevant to the call is needed, that information is relayed to the officers via mobile terminals. Confidential information can be relayed in the same manner.

The communications center has received a report of a drunk driver. The

information is radioed to Officer Woodruff.

> **5L6, Suisun – Clerk from Stop 'N Go, Sunset Ave. @ State Route 12, reports a drunk driver just left their parking lot eastbound on State Route 12. Vehicle is described as a red Datsun Pickup, Calif. license 1A3110**

Officer Woodruff drives to the area and parks in a position of surveillance. He uses his computer terminal to check the license plate, and finds that the registered owner is from Rio Vista, about 20 minutes east of Suisun City on State Route 12. Confident that he is in a good position to spot the truck, he waits. A few minutes later he sees the truck, follows it for a short distance, observes excessive weaving, and radios to dispatch that he is making the stop. Another officer arrives to assist. The driver is arrested.

Officer Woodruff uses the terminal to access D.M.V. records, warrant information, and local contact records. Without tying up radio time or having to go the office, he finds that the driver of the truck has a suspended license, an outstanding warrant for failure to appear on a prior drunk driving case, and has had two previous arrests for drunk driving by the Suisun City Police Department. The driver refuses any tests, so Officer Woodruff radios in that he will be enroute to county jail. When he arrives he presses a key on the terminal to inform dispatch that he has arrived. After booking his prisoner, he returns to the cars and presses another key to inform dispatch that he is clear for other calls.

Overall, Officer Woodruff is pleased with the mobile display terminal, although its major use is to augment the radio and allow him to do for himself things which he once had a dispatcher do for him.

SCENARIO THREE – Lap-top Support Service & In-car Microcomputers

Suisun City is proud of its computer system. Five years ago the department began automating many functions. Today, staffing levels are determined on a needs basis, with accurate management reports showing peak service demand times. The schedule is adjusted monthly to accommodate changes in needs.

The first step in automating our department occurred five years ago. Six microcomputers were purchased and, for the first year, were used almost exclusively for word-processing.

Next, a needs assessment for records and communications was conducted to determine which functions could benefit from automation. Warrant and alpha files were automated first, allowing for computerized retrieval of outstanding warrants and criminal contact information.

Management reporting was the next area to benefit from automation. Dispatch began entering daily log information, resulting in an information base from which management personnel could obtain an accurate representation of crime patterns, and from which month Uniform Crime Reports were printed.

Once support services were taken care of, our next step was to put microcomputers in the patrol cars. Our officer's love them, as do the patrol Sergeants, the District Attorney, and anyone else who regularly reviews our reports. Following is a typical shift for Officer Dave Woodruff, a patrol officer with the Suisun City Police Department:

1430 hrs. – Officer Woodruff reports for duty. He checks the computer to see if the reports he turned in at end of watch yesterday were all approved. One report is in his area on the computer, with a note from the Sergeant detailing some areas which need expansion if Officer Woodruff is to justify his search based on probable cause. He make the corrections and puts the report back in the

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queue for the Sergeant to approve. He then checks his electronic mailbox for any new mail. Officer Kelly is having a party and all personnel are invited; Lieutenant Smith would like whoever "borrowed" the software computer instruction manuals return them immediately.

1500 hrs. – Officer Woodruff begins his shift. In the car with him is a microcomputer. The microcomputer looks like a lunch-box, and is mounted at the top of the radio console. Officer Woodruff is happy with his partner.

The microcomputer in the patrol car has a copy of the department's central database. Through this, Officer Woodruff can access information on criminal contacts and daily activity. The information is updated weekly by the department's systems manager.

During the course of his shift, Officer Woodruff takes several crime reports. Upon returning to his patrol car, he pulls up the appropriate "form" for type of call, and types the information into the computer. The file box full of forms he used to carry around with him is now a thing of the past.

At the end shift, Officer Woodruff submits his reports for approval. If any corrections are needed, he will get the report back with his supervisors notations. Once approved the information is added to the department wide data base electronically, without the need to re-entered by clerical personnel.

Within the next two years, the department plans to have the microcomputers in the cars access the central dispatch computer through a system similar to car phones. It will eliminate the need for computer disks to be passed back and forth. Still, this system is much better than the old hand written reports the department once used.

The department took a slow, systematic approach to implementing its computer system. The system grew gradually, and is designed in such a way that it can continue to grow as technology advances and as funding is available.

ACTION PLAN

ACTION PLAN

Using scenario three as the most practical for a small police department, given the affordability and capability of the equipment, the following action plan is presented as a means to bring about the desired future.

GOAL

By the year 1992, the Suisun City Police Department will have in place the following computer system:

1 – Microcomputers in the patrol cars which patrol officers will use for word-processing reports. Statistical information from the reports will be appended to a central database. System will eventually be capable of accessing a central computer through a cellular phone network or by radio frequency.

2 – A full function microcomputer system in the records & communications center which supports:

A. Multi-tasking, the ability to perform more than one function at a time, allowing the dispatcher to work in one area such as entering or printing the daily briefing log, and then switch to another area such as the warrant file without interrupting the first task and with no noticeable degradation in system performance.

B. Generation of management reports including calls for service, traffic and criminal activity, and alcohol enforcement.

C. Master name or "Alpha" file.

D. Daily log file, for briefing logs.

E. Warrant file.

F. Uniform Crime Reports.

3 – Department wide, password controlled, network access to the dispatch computer system, primarily the master name file.

METHODOLOGY

To accomplish our goal, a five year plan has been implemented. The critical mass were involved from the initial planning stages. A task force consisting of the senior dispatcher, the records & communications supervisor, and the Sergeant who now serves as system manager, was assembled and outlined the final specific plan.

The first year of the plan calls for microcomputers for the Chief of Police, the Lieutenant, the Sergeant's office, and the Records & Communications supervisor. These were identified by the committee as the offices that generated the most "paper" within the department, including management reports, correspondence, internal reports and memorandums. Primary use during the first year is expected to be in the area of word-processing.

A city council member and local businesswoman assisted in the acquisition of additional computer by founding "The Suisun City Police and Fire Booster's Association". The boosters provided funding for the first year implementation of the computer plan, with a commitment to continue the funding.

Additional information was needed concerning the feasibility of putting microcomputers in the field. A patrol officer, David Woodruff, was given use of a lap-tap Radio Shack model 100 computer for a 60 day period. During that 60 day period, the officer generated 83 reports using the word-processing capability of the computer.

Feedback from Officer Woodruff and his supervisors was very positive. Reports containing minor errors, which otherwise might have been approved, were sent back for correction. Corrections could be easily made and reports re-submitted for final approval. Officer Woodruff reported that, in his opinion, he was able to complete reports in half the time it would have otherwise taken. The only negative aspect of the project involved the limited flexibility in the format of the printed reports.

The next phase was to gage the acceptance of full function microcomputers by the remainder of the patrol force. Radio Shack Computer Center arranged for a 60 day evaluation of a Tandy 3000 HL microcomputer and printer. The software package "Q&A" by Symantec Corporation was selected for word-processing software because of its ease of use. We established a report format, and each officer was issued a floppy disk with the format file.

During the course of 60 day pilot program, nearly all crime reports in excess of one page were done on the computer. Officers used the computer during lunch hours and before and after shift, just to get time on the computer. Patrol supervisors were liberal with the time they allowed officers to spend in the office working on the computer.

The trade off was a drastic reduction in time needed to complete reports.

As "Q&A" contains a spelling checker, the number one cause of report rejection, spelling errors, was nearly eliminated.

Patrol Sergeants set up rotational schedules within their shift for computer access. They reported in increase in preventative patrol time; the officers spent less time in parked cars writing reports.

The pilot program was a tremendous success. At the conclusion of the 60 day evaluation, the computer had become so firmly entrenched in the day to day operations of the patrol force that funds were reassigned from other categories and the equipment purchased. My Lieutenant informed me "if you take that away from them now, you'll have a mutiny."

Clearly microcomputers would be of value to the patrol force. However, full function lap-tops would be of the greatest value. Such machines are available, but are presently within the the $3,000 to $4,000 price range. The price of these lap tops is expected to drop due to their increased market penetration and corresponding volume production.[15]

As stated earlier, nearly all of the critical mass are expected to be supportive of this project. Three groups, The City Council/Manager, D.O.J., and Labor, were perceived by the nominal group as having mixed feelings about such a plan.

The City Council/Manager concerns will be from the cost effectiveness viewpoint. As demonstrated in Suisun City's first year implementation, alternative funding sources are available. The City Council is now very supportive of the project.

Department of Justice will likely not become directly involved in our implementation until such time as access to the state computer system is relayed to mobile units. This phase is not within our five year projection.

While the potential for labor group concern does exist, such concerns can be eliminated through accurate dissemination of information. Labor has, to date,

accepted and embraced the first year implementation of this plan. As long as any misperceptions of computers replacing personnel are dealt with, labor will continue to support this plan as a mean of making the job easier and more efficient.

SPECIFIC PLAN

With consideration to the opinions of the computer experts, law enforcement, and other research data, the following five year plan has been developed for the Suisun City Police Department. I believe it to be applicable to any agency with less than fifty sworn personnel.

Year One: Purchase microcomputers for word-processing capabilities. This will serve to introduce microcomputers to staff, and will greatly increase efficiency.

Year Two: Implement data base management systems. The complexity of the system will be dependent on financial and internal capabilities. Software should be able to be modified to the department's specifications.

Year Three: Purchase additional microcomputers and network existing systems to facilitate sharing of information. Network hardware and software should be purchased from a source which has local service ability. A service contract calling for 4-hour emergency response should also be purchased.

Year Four: Continue software development. Based on a pre-determined priority analysis, additional functions should be added to the software, with a special emphasis on multi-tasking full function software for the communications center. Whatever software is developed or purchased must allow a dispatcher to quickly switch between functions without quitting the current task.

Year Five: Purchase microcomputers of the lap-top variety for the patrol cars. Initial use will primarily be for word-processing so that officers may prepare their reports in the field. The computers will have sufficient mass storage to support large data bases containing the master alpha file, city directory information, and local business information.

The plan is loosely formatted, allowing for frequent review in areas such as program design. A plan involving an area which is advancing as rapidly as microcomputer technology must allow sufficient flexibility to take advantage of new advancements, yet maintain short and long term goals.

CONCLUSION

CONCLUSION

If I were to give one piece of advice to a fellow administrator considering the automation of his department, that advice would be "Press On – Don't Wait!"

As evidenced by expert opinions, the computer industry is advancing at an incredible rate. Yet existing technology can perform the functions needed by the typical small law enforcement agency and will allow for upgrading to the "new" technology as it becomes available.

The increased power and decreased cost of microcomputers makes it possible for small police departments to efficiently and affordably bring in automation. There is no reason why even the smallest police department with limited funding can't justify the cost of microcomputers.

Current problems are in the software development area. Organizations such as Search Group, Inc. are working to address these problems for the benefit of all criminal justice agencies. The solutions won't come overnight, but by beginning the automation process now, a department will be ready to implement the software as it becomes available and will be in an informed position to provide input into its development.

APPENDIX

ENDNOTES

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GLOSSARY

80386 Processor: The primary computer chip used in the central processing unit of new generation microcomputers. The chip provides for increased processing speed and access to greater internal memory over conventional micro-processors.

Alpha File: A law enforcement term for a master name file, usually consisting of criminal contact information.

Artificial Intelligence (AI): The field of computer science relating to the development of human-like features for computers, such as deductive reasoning.

Bit: The smallest unit of memory; it consists of one on/off switch. A bit is one eighth of a byte.

Bug: A program design error which is not always immediately evident and usually surfaces when you have the greatest need for the software to operate properly.

Byte: A group of adjacent binary digits that a computer processes as a unit.

CAD: An acronym for Computer Aided Dispatch, a term for law enforcement software for the communications center.

Cellular Telephone: A telephone which accesses networked telephone cells through the airwaves. Conventional mobile phones are of the cellular type.

Central processing unit (CPU): The primary "brains" in a computer. The CPU is the chip that process the computer's data and performs the instructions in a program.

Crime Analysis: A manual or automated system for analyzing crime patterns for the purpose establishing crime patterns.

DBMS: Acronym for Data Base Management System. A program that lets you put information into and get information out of a database.

Database: A structured collection of related information stored on disk. In conventional terms, a card file in the library would be a database and the individual cards would be records.

Desktop computer: A term for Personal Computer, which small enough to allow the processing unit and terminal to fit on the top of a desk.

Guru: A recognized expert in computer hardware or software.

Hacker: Someone with competent computer skills who enjoys "tinkering" with computer hardware or software.

Hard Disk: A rigid, magnetically coated disk designed for mass storage.

Icon: On-screen representation of a computer command (e.g. a trash can image to represent the deletion of a file).

Kilobyte (K): 1024 bytes. Memory and storage are usually measured in K bytes (e.g. 640k is 655,360 bytes).

Local Database: A database with limited access. Usually limited to the computer on which it is stored. Also used to represent a database with access limited within a network.

MIPS: An acronym for Million Instructions Per Second.

Mainframe: Large computers with multiple input/output channels which allow a large number of users simultaneous access. Generally in the one to two million dollar range.

Megabyte: A unit of measure equal to 1024 kilobytes, or 1,048,576 bytes.

Micro-Processor: Processor for a microcomputer.

Microcomputer: A small computer of the desktop or lap-top variety, generally in the $500 to $5000 range.

Mini computer: A computer in the $25,000 to $75,000 range which permits four to fifteen users simultaneous access.

Multi-tasking: The ability to run several programs at the same time on one computers.

Multi-user: The ability for many people to run programs simultaneously on one computer.

N.C.I.C.: National Crime Information Center.

N.L.E.T.S.: National Law Enforcement Teletype System.

Networking: The process of establishing communication between multiple microcomputers.

On-line: Used either to describe the use of a computer system or to describe communication between two computers.

Operating System: The program that controls your computer and allows you to run other programs.

Peripheral: Hardware added to a computer (e.g. printers, voice synthesizers).

Personal Computer: A microcomputer of the desktop or lap-top variety.

Proprietary: Privately owned. Usually relates to copyrighted software.

Prototype: An original model from which others are patterned.

Public Domain: Belonging to the community at large. Usually refers to software which can be freely shared with others.

Queue: A list of files waiting for further processing, such as printing.

RAM: An acronym for Random Access Memory, the internal electronic memory used by the computer.

Spreadsheet Program: A program that calculates numbers on a grid similar to an account's spreadsheet.

Terminal: A device such as a video display unit used to access a computer. Ordinarily without data processing capability.

Word-processor: A program to enable editing and formatting of text.

Police Departments Responding to Survey

Chief Jimmie Kennedy .... Anaheim Police Department
Chief L.K. Herendeen .... Antioch Police Department
Chief Robert Session .... Barstow Police Department
Acting Chief John Funston .... Beaumont Police Department
Chief Franklin Fording .... Bell Police Department
Chief Pierre Bidou .... Benicia Police Department
Chief G.W. Peterson .... Ceres Police Department
Chief Ulrich Bullerjahn .... Chico Police Department
Chief Gerald Galvin .... Clovis Police Department
Chief Raegene Cation .... Colusa Police Department
Chief Dan Nelson .... East Palo Alto Police Department
Chief Robert Norman .... Foster City Police Department
Chief Oliver Posey .... Glendora Police Department
Chief Joseph Palla .... Healdsburg Police Department
Chief Leonard Taylor .... Manteca Police Department
Chief Gregory Caldwell .... Montclair Police Department
Chief John Carroll Smith .... Mountain View Police Department
Director A.E. Olson .... Pacifica Department of Public Safety
Chief Bob Harmon .... Placerville Police Department
Chief James Nunes .... Pleasant Hill Police Department
Chief N.E. "Woody" Williams .... Porterville Police Department
Chief Steven Fryberger .... Rocklin Police Department
Chief James West .... Saint Helena Police Department
Chief James Corrigan .... Salinas Police Department
Chief Joseph Kozma .... San Jacinto Police Department
Chief James Moore .... San Marino Police Department
Chief Virgil Epperson .... Seaside Police Department
Chief Phillip Green .... Twin Cities Police Department
Chief Charles Byrd .... Weed Police Department

NOMINAL GROUP PARTICIPANTS

Captain James Manzer

Administrative Services Division Commander

Vacaville Police Department

Captain Manzer was instrumental in research and in initiating an automation system, including a microcomputer system for the Vacaville Police Department which ties into a mini-computer.

Chief Rick Fuller

Dixon Police Department

Chief Fuller recently researched and is now installing his city's first microcomputer system. Prior to his appointment with Dixon, Chief Fuller was a Captain with Clovis Police Department and was in charge of Administrative Services, including automation and records.

Lieutenant Larry Welch

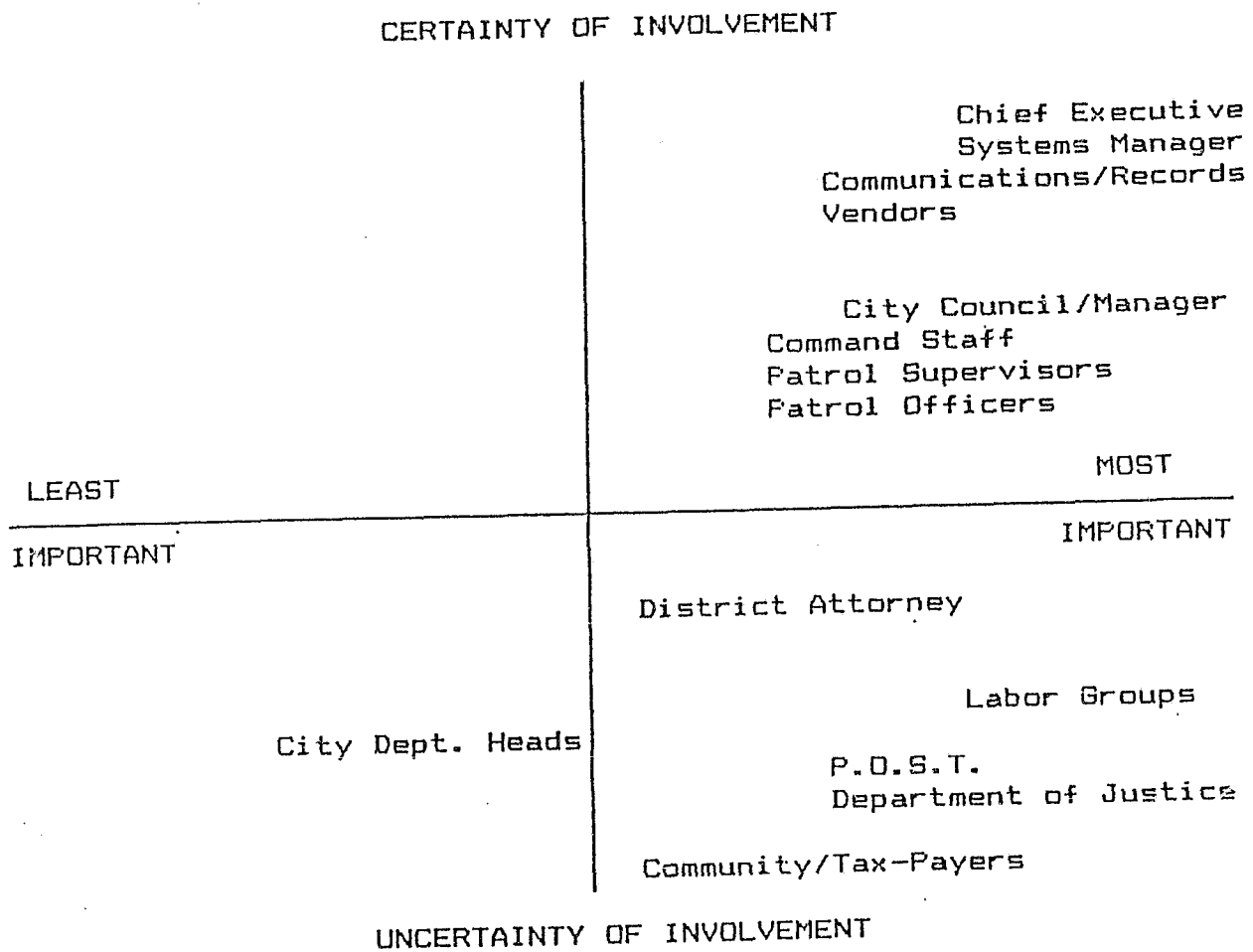**Solano County Sheriff's Department**

Lieutenant Welch is in charge of Administrative Services – including Management Information Systems (automation) for his agency. He has done hundreds of hours of research into computers and their uses as part of a county wide automation internal automation plan.

Sergeant Ron Forsythe

Suisun City Police Department

Sergeant Forsythe introduced automation into the Suisun City Police Department by utilizing his own microcomputer for search warrant preparation, case file management, and report writing. He designed a three year implementation plan for the agency, which began with the purchase of four microcomputers. He is also President and Chief Executive Officer of FOG, an international computer users group which publishes monthly computer newsletters and provides technical support for computer users in 25 countries.

STAKEHOLDER RATING

CERTAINTY OF INVOLVEMENT

Chief Executive
Systems Manager
Communications/Records
Vendors

City Council/Manager
Command Staff
Patrol Supervisors
Patrol Officers

MOST

LEAST

IMPORTANT

IMPORTANT

District Attorney

Labor Groups

City Dept. Heads

P.O.S.T.
Department of Justice

Community/Tax-Payers

UNCERTAINTY OF INVOLVEMENT

Attachment One