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PORTABLE POLICE-OWNED ALARM SYSTEMS

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SECTION I

INTRODUCTION

AUTHORITY

The research and documentation represented by this report was accomplished through the Equipment Systems Improvement Program (ESIP) sponsored by the National Institute for Law Enforcement and Criminal Justice. Specifically, the author has worked in a dual role of technical assistance to the Chief of Police in Columbus, Georgia, and as a field site analyst for ESIP; for the Chief of Police, the author was a principal in the design and implementation of Project CARES (Columbus Armed Robbery Enforcement Section); for ESIP the author was assigned task 816P entitled "Analysis of Equipment/Equipment Systems in Detection/Reporting" which includes a study of parameters and uses of portable, police owned alarms as a tool for police selective enforcement.

SCOPE

This survey concentrates on alarm systems which are owned and tactically deployed by police in selective enforcement activities. The system, hereafter referred to as Portable, Police Owned, Alarm Systems (PPOAS) is typified by those presently in use in Tampa, Florida, Los Anageles, California, Philadelphia, Pennsylvania, and more than fifty other municipal and county law enforcement agencies. These systems are being used primarily to effect on-scene apprehension of commerical robbers and burglars by allowing improved response time to these crimes. After a likely robbery or burglary target has been selected by police, a portable alarm system is surreptitiously installed. The owner and/or

employee is trained to perform some functions to operate the alarm such as activating a variety of sensors and arming and disarming the alarm according to the police schedule. Police units designated as responding units respond to alarm signals which are normally transmitted over the police radio system. The system of interest here includes the Operator, sensors, a logic component, a message generator, power supply, output, monitor and responding police units. (Figure I)

The scope of this survey is refined in the definition of the PPOA System. The characteristic of portability defines equipment, programs, and applications which are founded on tactical deployments of alarm equipment for selective, crime specific enforcement. Consequently, the survey specifically excludes programs and equipments which require permanent installation of alarm components. The characteristic of police ownership further restricts the scope of this survey. As opposed to police subsidized programs, wherein financial and procurement assistance are provided by the police to encourage commercial ownership of a particular alarm system, this survey is concerned only with programs and equipment which are owned, operated, and controlled by the police agency. Although the national experience shows some sporadic use of PPOA, for crimes other than commercial robbery and burglary the survey concentrates on these crimes for simplicity.

1] Finally, although some interviewees cited PPOAS for its crime prevention and/or deterrence effects the survey concentrates on apprehension; this concentration is justified since all known programs using PPOAS seek apprehension of offenders and none have actually

attempted prevention/deterrence strategies.

PURPOSE

The purpose of this survey was to document within one source a collection of the national experience with PPOA Systems. Further, to develop recommendations for further study and actions for the National Institute, should priorities dictate a continuing effort in this specific area. Finally, the survey is expected to be informative to those who contemplate the use and/or development of PPOA Systems in the sense that it documents guidance provided by experienced users.

METHODOLOGY

The survey began with a nationwide search to identify users and suppliers of PPOA Systems. The identification of suppliers was restricted to firms which have supplied PPOAS to police and/or offer a standard off-the-shelf product. It is estimated that this survey identified at least 90 percent of PPOAS users and suppliers (7 firms; 56 law enforcement agencies). None was deliberately excluded. International activity with the PPOAS concept was also sought but the search proved fruitless.

In October 1973, a letter requesting additional information on programs and products was sent to both users and suppliers. The

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1] Sporadic use of PPOAS were noted during the survey for auto theft, theft from auto, extortion, vice stake outs, vandalism, police building security, residential and vation home burglary, court room security, larceny, and personal security of dignitaries and police.

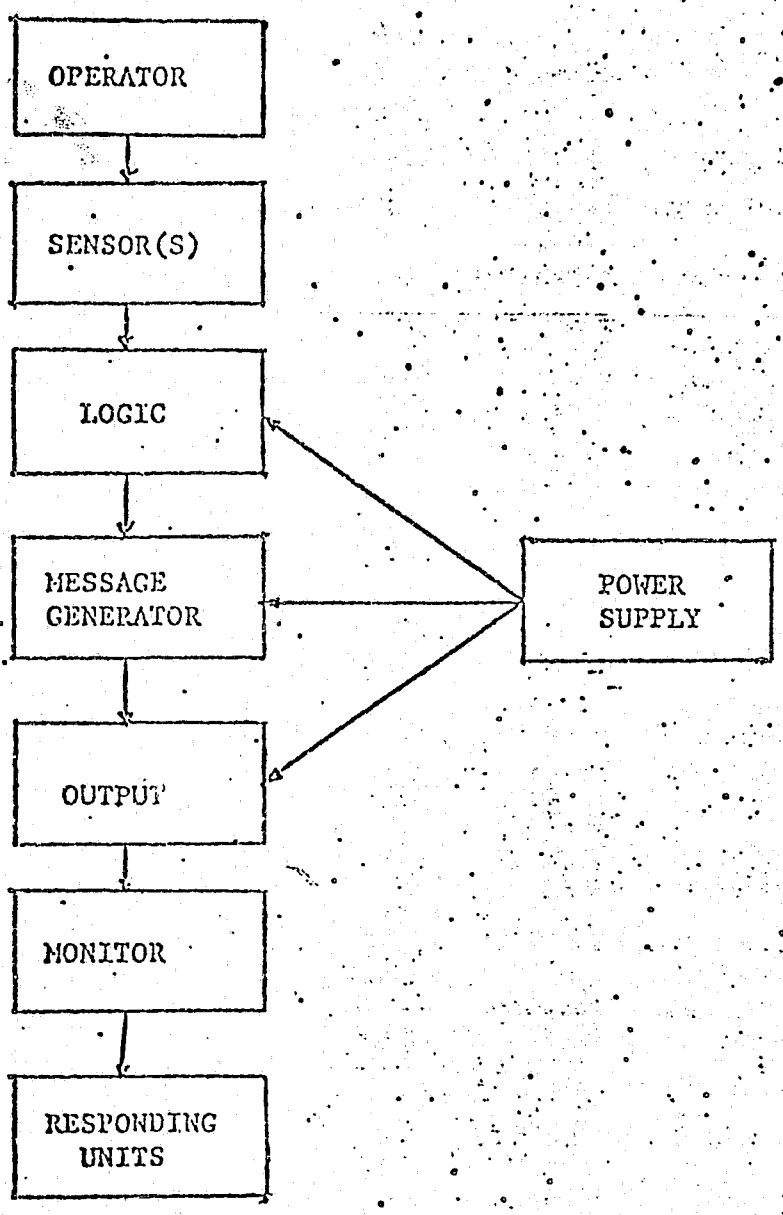

Figure 1-1 Block diagram of Portable Police Owned Alarm System (PPOAS)

responses to these inquiries were used to determine a schedule for visits and interviews by the author on criteria of the amount of experience with PPOAS, unique products and programs, and indications of the degree of expected cooperation.

In general, the interviews which were conducted sought to establish both the equipment and operational features of programs involving PPOAS, the philosophy here being that consistency among independent developers and users is an indication of agreement upon a particular issue. On the other hand, the interviews sought anomalies, innovations, and problems with particular interest to satisfy the purpose of dissemination experience to others. Finally, the study is supplemented with the author's pragmatic day to day experience as a principal in Project CARES, an active Columbus (Georgia) Police Department project which incorporates the use of PPOAS.

LIMITATIONS

The author's actual "hand on" experience with PPOAS and programs for their use is limited to experience with Project CARES. Consequently, in some cases, the experience reported here is not national in scope and no doubt suffers from the uniquenss of this environment. These cases are individually identified in the text which follows.

Further, the survey suffers from a general non-availability of evaluative information regarding the effectiveness and utility of PPOAS. Those bits and pieces of data which do exist are presented, but frequently are couched in a plea to the reader's intuition. These

limitations are the source of recommendations for further study and action.

REPORT ORGANIZATION

Section II BACKGROUND is a an encapsulation of a PPOAS development, implementation and results in Bakersfield, California. This example is used since Bakersfield is credited with the first application of the concept and equipment which are basic to the survey of portable, police owned, alarm systems.

Section III, PPOAS CONCEPT is a generic formalization of the PPOAS concept and includes assumptions and hypotheses of asset and liabilities. The formalized concept is followed by discussions of each of the assumptions and hypothesis in terms of user experience.

Section IV, SYSTEM DESCRIPTION provides details of each component of a generic PPOAS block diagram.

Section V, characterizes the users and manufacturers of PPOA Systems and refers to appendixes which contain lists of contacts and other perinent information.

Section VI, LESSONS LEARNED uses the concept and system description as a framework for citing the national experience evoked by the survey. Included are subsections on program planning, Implementation suggestions, and General Effectiveness of PPOA Systems.

The final section summarizes the findings of this survey and makes recommendations for action.

SECTION II

BACKGROUND

STAKEOUT

Police continually solicit and/or receive information and intelligence regarding planned criminal activities. Also police are often pressured to respond to criminal epidemics such as concentrated strings or commercial robberies or burglaries. These situations often give rise to a police response commonly referred to as a stakeout during which officers attempt to observe a crime covertly and apprehend the perpetrator(s) at the crime scene. These stakeout operations are extremely labor intensive, normally consuming the resources associated with two or more police officers for each geographical location expected to be the object of the anticipated criminal activity. Little is know about the effectiveness or efficiency of stakeout activities as compared with other possible police alternatives, however, on the surface then appear to consume a disproportionate amount of resources as compared with the results achieved. (Ref. 62) The fact remains, however, that most police departments are compelled for a variety of reasons to conduct temporary stakeout activities.

PPOAS CONCEPT

The development of the PPOAS concept began in Bakersfield, California almost 12 years ago. The basic idea is as follows: (a) The police department would procure a number of portable alarm systems which would be placed surreptitiously in potential commercial robbery and burglary targets. (b) Employees of these business establishments would

operate robbery sensors and/or arm the system for burglary during the course of closing the business. (c) The portable alarm would broadcast an alarm message directly over the police radio allowing police units to respond in time to apprehend the offender(s) at or near the scene of the crime.

During 1962-63, Officer John Ovens, Bakersfield's police radio technician, constructed 150 "voice radio alarms" from surplus motorcycle radios which had become obsolete when Harley Davidson converted their motorcycle electrical systems from six to twelve volts. Officer Ovens procured the obsolete radios from Bakersfield and other neighboring departments, removed receiver components, installed timer circuits, converted to an AC power source, and added an inexpensive tape recorder. The entire process required about one man day of labor and less than $100 of parts per alarm. (Ref. 1) Over the past eight years, an average of 120 of these alarms have been in continual use by the Bakersfield police.

The Bakersfield effort with PPOAS does not appear to have been program or project oriented. There is no recollection among those interviewed of stated objectives, formal planning, or serious evaluations. Rather, the construction of the voice radio alarms was viewed as an opportunity for pragmatic solution to rising robbery and burglary rates and as a more efficient method of conducting stakeout activities. Consequently Bakersfield Police have collected data on the voice radio alarm effectiveness only sporadically to satisfy specific needs such as false

alarm surveys, funding and budget justifications for city council, requests for information from other departments and correspondence with the Federal Communications Commission. Consequently, during the course of interview, conservative estimates of effectiveness were requested and are presented below as an indication of the general effectiveness of this basic PPOA concept over the past 11-12 years.

1.5	minute average response time (Time from voice radio alarm broadcast to arrival at scene of first responding unit)
100-150	Felons apprehended each year (approximately 90% burlars; 10% robbers)
80-85%	Conviction rates
1,000	Cases in 11-12 years of operation
2/1-4/1	False Alarm to Valid Alarm ratio (Ref. 1)

In additon to the above estimates, it was observed that the voice radio alarms were very much a part of the law enforcement effort in Bakersfield and in fact are considered an essential tool (Ref. 49). Most of those interviewed have accepted the concept cited above as a valid and more efficient alternative to stakeout operations.

The text which follows formalizes and expands upon the PPOAS concept and summarizes the national experience accumulated by later users and manufacturers.

SECTION III

PPOAS CONCEPT

The PPOAS concept is based on numerous inherent assumptions and hypotheses. The following paragraphs represent a generic formalization of these and provide the framework for presentation of the experience derived by the survey.

BASIC PREMISE

The basic conept of the PPOA system is related to total response time or that period of time which begins with perpetration of crime until arrival of the police. Response time may be categorized in terms of contributors, e.g., in a commercial robbery of a convenience store, the following scenario is typical:

Offenders/Robbers contribute to response time by holding the victim at gun point while the money and other contraband are gathered; during this time the victim/employee is prevented from communicating his plight to police; offenders/robbers may further impede reporting of the crime by physically detaining and/or threatening him and/or disabling communications devices (telephone) which would be used to access police service;

Victims/employee contribute to response time depending on his access to a communications device and how quickly he uses this device to contact police;

Police contribute to response time depending on call receipt and dispatching policy and procedures, beat structures, travel time, physical environment, availability of units, etc.;

Traditionally, police have sought improvement in response time through the reduction of the police contribution to total response time.

The following paragraph, extracted from the Detroit Police

Departments' final report on Development of Electronic Robbery Stake-out Alarm System, is indicative of the futility of the traditional approach:

"In his attempt of affording the utmost of police assistance to the victim of the crime, the police officer has traditionally found that the one element most needed on his part was the one element most beyond the officer's control; a fore-warning that the crime is being perpetrated. Customarily, the call for help is consequential after the fact of the crime i.e. the crime has been perpetrated, the criminal gone, the police will come. With this rule of thumb in force, detection and prevention of the crime is (except in too few cases) non-existent.

Likewise, any protection from physical abuse to be offered the victim is non-existent. Furthermore, apprehension of the criminal is now made more difficult. His apprehension now becomes a matter involving the tedious process of investigative work conducted by the Detective forces. Even then, should the culprit be apprehended, and regardless of the amount of evidence produced or high quality investigative work performed, the fact of the matter remains that nothing insures a court conviction quite as well as when the perpetrator is apprehended while in the act of committing the crime." (Ref. 57)

The PPOAS concept, however, offers opportunities to reduce the response time contributions of the offender, the victim, and the police. The principal advantage perceived is that total response time can be reduced by providing a convenient, efficient, surreptitiously alarm

device which can be activated by the robbery victim or, in the case of burglary, by the offender himself.

ASSUMPTIONS

The workability of the concept is based on several basic assumptions.

(1) that police can successfully identify commercial robbery and burglary targets by using historical data, crime analysis, and intelligence sources. (This implies that certain commercial establishments are more attractive to offenders than others);

(2) that employees, managers, and owners of selected target businesses can be trained as willing operators of a police owned alarm system;

(3) that through the combination of high equipment reliability and control and administration by police, false alarm rates can be significantly lower as compared with commercial alarm systems.

ASSETS

Given that the assumptions cited above are true, several benefits can be expected from implementation of the PPOAS concept:

(1) Average total response time to commercial robbery and burglary calls can be significantly reduce with use of PPOAS;

(2) Reduced total response time provides for a higher porportion of on-scene arrests which in turn will develop sounder cases, higher clearance rates, better conviction rates and lower administrative court costs as a result of a higher proportion of guilty pleas;

(3) use of PPOAS in lieu of individual police officers on stakeout offers significant cost savings in accomplishing a stakeout operation;

(4) lower false alarm rates will elicit a more pyrposeful, ambitious and accurate police response to robberies and burglaries in progress;

(5) portable equipment allows a scheme of deployment which employs and takes advantage of mobility and tactical surprise; this scheme will enhance opportunities for on-scene apprehensions;

(6) Use of PPOAS will advantageously affect the crime rate of those offenses to which it can be applied.

LIABILITIES

The PPOAS concept also created several operational liabilities.

(1) the situation created by police arriving at crimes in progress increases the probability of a violent confrontation during which, police, victims, bystanders and offenders may be injured;

(2) there is a possibility that implementation of the PPOAS concept will or will appear to be competitive with local commercial alarm companies;

(3) inherent in the PPOAS concept is the possibility that the responding units would apply unreasonable force if the PPOAS are used to summon help for reasons other than a felony. For example, a misdemeanor such as shoplifting or merely a suspicious act.

(4) there appears to be some chance that police actions evoked by use of a PPOAS could result in legal liability of the municipality unless it specifically limits its liability.

The following section on lessons learned comments on each of the assumptions, assets and liabilities formalized above.

LESSONS LEARNED

This section suffers from a general lack of evaluative information of the PPOAS concept and equipment. It is significant to mention also that the literature is basically void of detailed experience of PPOAS users. The following paragraphs use the assumptions and hypotheses stated earlier as a framework for conveying the experience of selected users. Lessons must be presented informally because of the general scarcity of data.

WORKABILITY OF THE PPOAS CONCEPT

As mentioned above, the workability of the PPOAS concept depends on three assumptions- (1) The capability of police to select targets with high potential as a robbery or burglary target; (2) Willingness and trainability of employee/manager and owners of these targets; and (3) false alarm rates significantly lower than commerical counterput alarm systems. The text which follows repeats the assumptions and then discusses the experience of selected users.

(1) that police can successfully identify commercial robbery and burglary targets by using historical data, crime analysis, and intelligence sources. (This implies that certain commerical establishments are more attractive to offenders than others);

With regard to prediction of commercial robbery targets, several findings of a study of Commercial Robbery in Columbus, Georgia are of interest. First and perhaps most significant, it was found that an extremely small portion (5%) of the businesses in Columbus account for 72% of the commercial robberies; this portion consists of con-

venience stores, package liquor stores, and service stations (Ref. 62). The Phoenix, Arizona Police found that 60% of armed robberies reported in 1969 occured in convenience stores, liquor stores and gas stations. (Ref. 70). Good correlations are also suspected between commercial robbery targets and geographical locations, time of day and week, and number of employees/potential witnesses (Ref. 62).

The leverage available to a PPOAS user in prediction of robbery targets without doubt is a function of the particular user's environment; however, the consensus of users is that commercial robbery targets can be identified with reasonable success.

Several users' cited problems which indicate the predictive capability of police may decay as the criminal community learns of the PPOAS program. For example, Phoenix implies that degradation of success in predicting the probability of a robbery was caused by disturbance of patterns caused by an active project (Ref. 20). Another example is evident in Philadelphia's experience. There, performance in robbery target prediction appears to have degraded with time (Ref. 18).

Both Birmingham and Detroit reported general problems with regard to commercial robbery target selection. Detroit provided some quantification of the problem:

> "It is virtually impossible to locate then business places in a small area that have a high holdup potential. Usually in a group of ten there will be three or possibly four businesses that have had a high holdup experience" (Ref. 57).

With regard to prediction of commercial burglary targets Cedar Rapids provided some quantified results.

"Past burglary experience is a good predictor of future burglaries. The locations selected for alarms because of past burglary experience had a burglary rate of 19% as compared to 9% for all other business locations in the city." (Ref. 74).

The fact that Cedar Rapids' system is not portable nor tactically deployed indicates that police might might expect even better success in commercial burglary target selction with the flexibility offered by PPOAS.

Disruption of burglary patterns by institution of a PPOAS operation and subsequent learning in the criminal community appears to be less severe than in the case of commercial robbery. Two long term programs, which concentrate on burglary, Salinas (3 years) and Bakersfield (12 years), have demonstrated only nominal degradation in performance over the years (Ref. 41, 1).

SPECIFIC LESSONS AND REMEDIES

Two known PPOAS users have lost some control of the target selection role. Pressures from organized businessmens' groups have succeded in obtaining through political means, relatively long term "temporary" installations of PPOAS. The implication of this lesson is that

Birmingham suggest that their difficulty with target selection can be explained by loss of covertness during installation and testing of PPOAS:

"We have concluded that part of the problem of unsuccessfully placing the transmitters may be attributed to an inordinate amount

of activity at these locations by the officers who are responsible for the installation and the testing of the system. Although the officers are in plain clothes, the amount of time that they are required to be at the particular locations probably has caused potential robbers to become suspicious.

Several factors cause the officers to spend considerable time at the individual locations: the initial installation is rather time consuming; the owner, operator or employee that will activate the transmitter switch must be instructed in its operation; the system must be tested on regular basis, etc.

We are now attempting to overcome some of these problesm. To begin with, our initial equipment was completely battery operated; we are now acquiring converters to provide for the use of regular 110 volt outlets. This will eliminate visits to the locations for the purpose of changing or recharging batteries. Also, testing of the alarms are now being conducted by phoning the businesses and instructing the operator to activate the alarm at a certain time for testing purposes. These type problems should be carefully considered prior to your installation of the system." (Ref. 29).

Finally, Jackson Mississippi concluded that publicity of SIMDAC affected target selection success. In an early portion of this program it was concluded that SIMDAC deployments to a particular portion of the city simply caused the criminal community to concentrate on other areas. (Ref. 64).

(2) that employees, managers, and owners of selected target businesses can be tained as willing operators of a police owned alarm system.

Users agree that this assumption is representative of perhaps the weakest link of the PPOAS concept.

With regard to the willingness of managers/owners and employees the concensus of users is that at least initially, excellent cooperation can be expected. Detroit prepared a questionnaire to survey potential user business's attitudes about the PPOAS concept prior to proceding with system design. Analysis of the questionnaire allowed the following conclusion:

> "It was found that the full cooperation could be expected from the majority of those selected to participate in the alarming of their establishments (both proprietors and employees)." (Ref. 57)

Of the 24 respondents to the questionnaire:

(a) 100% indicated willingness to participate in a robbery alarm system program.

(b) 81% indicated no anticipation of difficulty in getting employees to activate the system;

(c) 96% indicated that they would activate the alarm at the first opportunity;

(d) 95% indicated that, during their most recent experience as a commercial robbery victim, they would have been able to activate a device placed somewhere on their person; and

(e) 70% indicated that they could have safely made movements with their hands including thouching their belt or putting their hands in their pocket (Ref. 57).

Several other users have cited general willingness of proprietors and employees to initially support a PPOAS program (Ref 1, 29, 54).

As a practical matter, however, proprietor/employee willingness and cooperativeness, expecially in commercial robbery applications, are in question by experienced users. For example, Tampa reported:

> "The sensors requiring human judgement prior to activation , created considerable consternation. Fear of being detected while activating an alarm was by far the greatest problem" (Ref. 73).

Even Detroit, whose questionnaire indicated validity of the assumption, was very pessimistic after accumulating some experience. Detroit's final report stated:

> "The weak link in the operation is the operation of the body sensors by the business employees. It has been determined that for any degree of success it is absolutely necessary that a body sensor be worn and be activated as soon as the holdup is suspected. None of the six legitimate activations were triggered by a body sensor. There has been a resistance to wearing of body sensors. People object to the inconvenience of concealing the sensor on their person and at times employ this objection to conceal a fear for their safety, which they believe would be in jeapardy if the holdup man discovers the sensor on their person." (Ref. 57).

Almost all PPOAS users concentrating on commercial robbery have indicated concern that employees make it know that the business is alarmed. Jacksonville cited an anecdote which illustrates this point. The Sheriff's department placed PPOAS in a group of potential robbery targets. One target had been especially prolific. No robberies were experienced in that target during the three weeks the alarm was installed; however, this target was robbed three times

in the week following removal of the PPOAS. Jacksonville concluded that employee had provided information regarding the presence of the alarm which ultimately became available to the criminal community. (Ref. 62).

Tampa cited the following experienc after having installed PPOAS in several high incident robbery targets:

> "Then for some unknown reason, there was a decrease in reported offenses before the first alarm related arrest could be made in what was previously our high incident area. In attempting to find a cause of the aforementioned decrease, we believe the human factor entered into the picture once again. Store employees informing the route salesmen that they were now equipped with the alarm and the salesmen then going to other stores and asking if they had the equipment. We, of course, do not know this happened, but it is plausible." (Ref. 73).

Detroit reported that alarms were placed in several targets which had very high commercial robbery experience. Generally, the robberies ceased when the alarms were installed, and employees making it known that the business is alarmed was cited as a major factor for cessation of the holdups. (Ref. 57).

Some data is available from Philadelphia with regard to employee performance as PPOAS operators in robbery applications. During 1972 and 1973 there were 23 robberies for which police cited employee performance as the reason for the robbers' escapes.

These incidents can be roughly described as follows:

66% - employee activated the alarm <u>after</u> the robber(s) had fled;

17% - employee did not activate the alarm at all;

17% - employee <u>purposely</u> did not activate the alarm at all or activate it late.

It should be pointed out that these figures for the most part represent the performance of bank tellers since Philadelphia has concentrated its PPOAS use on bank robberies. (Ref. 18)

Employee willingness and performance as PPOAS operators in commercial burglary deployments appears to be less important with regard to sacrifice of program secrecy. Here the problem has been one of fals alarms creatdd by careless or improperly instructed employees. More details of this problem are presented in the paragraphs which follow.

(3) <u>that through the combination of high equipment reliability and control and administration by police, false alarm rates can be significantly lower as compared with commercial alarm systems</u>.

It appears that this assumption can be confirmed by the experience of PPOAS users and others. Several programs operating with emphasis on commerical robbery and others emphasizing commercial burglary have demonstrated significant improvements in commercial alarm systems in false alarm rates.

Specifically:

(a) Philadelphia recorded only seven false alarms during 1972 and 1973 a period when a total of 73 valid robbery alarms were received; (Ref. 18)

(b) Cedar Rapids' interim report stated:
False alarms can be reduced to an acceptable figure. During the first year of operation the false alarm rate for alarms under this experiment dropped from 79% to 52% and probably can be reduce further. The police patrol force has accepted this rate very well for they are catching burglars. (Ref. 74);

(c) Salinas has averaged a 50% false alarm rate during a 3 year period (Ref. 41);

(d) Bakersfield estimates every third alarm message represents a valid alarm (Ref. 1) and;

(e) Jackson indicates that, in essence, their false alarm are limisted to opening and closing times of target businesses (Ref. 26).

Several users have reported tremendous problems with equipment generated false alarms. Detroit and Tampa reported extreme problems with false alarms generated by body worn sensors and as a result of equipment reliability and installation procedures. During Detroit's operational experience with PPOAS the following categorization of PPOAS activations was reported:

A.	Accidental activation	105
B.	Honest legitimate activation - holdup, fear of holdup, etc.	6
C.	Activation for non-valid reasons (alarm used to summon police for other crimes)	10
D.	Equipment malfunction	27
E.	Miscellaneous - power failure	4
F.	Unknown	23
		175

(Ref. 57)

The programs which have experienced problems with high false alarm rates can generally be described as those which included:

(a) equipment development;

(b) a large number of different types of sensors including body worn sensors; and

(c) extensive installation efforts.

On the other hand, those programs which have succeeded in minimizing false alarms have for the most part used production equipment with one or two unsophisticated sensors such as switches, foot treadles and trip lines and have minimized technicalities required for installation and operation of the system (Ref. 1, 18, 41.)

PPOAS ASSETS

If the workability of the PPOAS conept is assumed, several specific assets are hypothesised to accrue to users. The following paragraphs use these assets as a framework for discussion of user experience.

1.) Average total response time to commercial robbery and burglary calls can be significantly reduced with use of PPOAS.

It should be reemphisized that here the discussion of total response time pertains only to that period of time from the onset of a commercial robbery or burglary until the arrival of the first police unit. Consequently contributions to response time from delays and indecisiveness of the offender(s) and victim(s) as well as police contributions are considered.

Theorectically if it is assumed that the PPOAS will allow reductions in response time in some cases then it follows that average total response time will be reduced. The question remains, however, of the significance of the resulting reduction.

Users attest almost unanamously that significant reductions in total response time have accrued through use of PPOAS. In several programs, for example, before and after data are available. In Philadelphia, police cited an average of five minutes police contribution to total response time to commercial robbery calls. Since implementing the Wireless Alarm System Program, average police contributions to total response time is estimated at less than thrity seconds. (Ref. 20) Tests run in Detroit (sample size 132) showed that the

average police contribution to total response time was 52 seconds in deployments which ranged from targets being several blocks apart up to 1.75 miles apart. (Ref. 57) In Tampa police contribution to commercial response time averaged three to five minutes without STAVS and 45 - 60 seconds with STAVS. (Ref. 36) Similar experience is evident in Birmingham, Bakersfield, Los Angeles, Jacksonville, etc. (Ref. 7, 1, 33, 63).

Further, if the PPOAS system is activated sometime during the robbery the offender's and victim's contribution to total response time is reduced. Little data exists on how often the employee/victims is willing to activate the PPOAS. (See assumption #2) Also, the relative success of sensors designed to activate the PPOAS through the robber's actions, e.g. removing currency from a cash register money clip sensor, is unknown. However, most users agree that the victim's and offender's average contribution to total response time is reduced through use of PPOAS.

Some data was reduced by the author from Philadelphia Wireless Alarm System incident reports. These data show that 63% of the time the PPOAS was activated sometime during the robbery by either the offender or the victim/employee during 1972 operations. (Ref. 18). Again, the reader is cautioned that Philadelphia PPOAS operators are normally bank tellers and may not exemplify the typical PPOAS operator.

Both intuition and experience indicate that average total response time to commercial burglaries is reduced through use of PPOAS. In

these cases the offender is actually the operator of the PPOAS. PPOAS users report average total response time to commercial burglary incidents in which the PPOAS is employed as follows:

Bakersfield - 1.5 minutes (ref. 1)

Columbus - Less than one minute (ref. 75)

Hayward - Less than one minute (ref. 51)

Salinas - 3 minutes (ref. 41)

2.) Reduced total response time provides for a higher proportion of on-scene arrests which in turn will develop sounder cases, clearance rates, better conviction rates and lower administrative court costs as a result of a higher proportion of guilty pleas;

A study conducted in Miami examined 49 unique factors of robbery for correlation with case clearance statistics. The following comment is quoted from this report:

> The speed of the police response (from time call received at communications room to arrival of police unit) is the most significant factor in the police process in clearing a robbery case. It appears far more significant than all other elements of the pplice process in handling a robbery case. (ref. 39)

The above stated asset of PPOAS use has been realized by each of the PPOAS users. Almost without exception, suspects of commercial robbery and burglary arrested on the scene of the crime have pleaded guilty.

Although users of PPOAS are nearly unanimous with regard to this asset two examples, one each for commercial robbery and burglary, are presented in the paragraph which follow.

Past arrest results of commercial robbery on scene apprehensions effected by Tampa's Selective Enforcement Unit using STAVS have been

reported as follows:

> "It is evident from the data that on-site arrests resulted in a much higher rate of conviction than arrests resulting from investigation by detective units. This is particularly true of the SEU clearances of convenience store robbery. The very low rate of no-disposition cases for on-site arrests leads to confirmation of the fact that the on-site arrests are quickly resolved via judicial disposition.
>
> SEU personnel reported that offenders apprehended during a robbery almost always tended to plead guilty when confronted with the evidence." (ref. 36)

Results cited by the Salinas Police Department of a PPOAS program aimed primarially at commercial burglary:

> "Our alarms were first put into the field in the early part of 1970, and during this first year these alarms were apprehended, were caught inside the building and saved the tax papers the expense of a trial as all of them confessed prior to a court trial." (ref. 41)

Subsequently, 37 more burglary suspects have been apprehended at the crime scene and all but two have pleaded guilty. These two were convicted by a jury. (ref. 76)

3.) use of PPOAS in lieu of individual police officers on stakeout offers significant cost savings in accomplishing a stakeout operation;

Arguments that the PPOAS is a more efficient method of accomplishing a stakeout vis a vis traditional methods are quite convincing.

Several users have documented their arguments with regard to this asset.

In Philadelphia prior to the implementation of the Wireless Alarm System Program, the primary police tactic against armed robbery was 50 two man stakeout teams. Each team was deployed to stakeout one, or occasionally when the physical layout permitted it, two businesses

judged to have high potential as robbery targets. The cost of this approach was cited as more than $1,000,000 annually exclusive of supervisory costs. (Ref. 20)

With the use of PPOAS, Philadelphia attained significant cost savings:

> "The 10 systems requested (costing $146,445 for equipment, plus $260,145 for personnel) will provide protection equal to that provided by 150 teams (cosing approximately $3,800,000 annually). (Ref. 20)
>
> ....by installing these systems at 10 "high risk" areas around the city, the Stakeout Unit will be able to provide protection on a city wide basis, utilizing only 21 men (one sergeant and 20 policemen). As mentioned before, this same degree of protection would require at least 300 men using the "standard scheme" (Ref. 20)
>
> Los Angeles' Robbery Homocide Division using their RATS System cites a 50% decrease in man hours expended on stakeouts.
>
> In most instances, a squad of ten men and a supervisor can cover all eight RATS locations. Without the use of the alarms, a total of 16 to 24 men plus supervisors would be needed to cover the same locations. On expanded use of the RATS alarms, the same squad of ten men could cover approximately 15 locations, depending on the area to be covered. With the use of 30 or 40 RATS, the Metro Task Force could be used as response units in conjunction with their regular duties. (Ref. 71)

Note: Typically, in a stakeout using RATS responding units are on foot.

Several medium and small sized departments which are new users of PPOAS have cited this cost saving asset even though, at the time of the survey, little or no success in on scene apprehensions had been obtained. For example, Coos Bay stated:

> "To date we have not any success in second guessing where a burglary may occur but our paid overtime in the area of stakeouts has been drastically cut."(Ref. 77)

Further, Chula Vista Police stated:

> To date, we have had only two "hits" on the alarms. In both instance the suspects were apprehended on the scene. I'm sure if we had more units to deploy our apprehension rate would be substantially higher. However, the alarms have more than paid for themselves just in man-hours saved that otherwise would have been expended on stakeouts. (Ref. 46)

The survey results contain additional examples which verify cost savings available through the use of PPOAS. On the basis of the national experience, users of PPOAS can expect considerable reductions in the resources required for stakeout operations.

(4) lower false alarm rates will elicit a more purposeful, ambitious and accurate police response to in-progress robberies and burglaries.

Discussions with policemen engaged as responding units in Jacksonville, Tampa, Columbus, Philadelphia, Bakersfield, and Los Angeles, have convinced the author that:

(a) Police quickly perceive lower false alarm rates demonstrated by PPOAS; and

(b) Higher priority and urgency are afforded PPOAS alarm messages through both department policy and individual officer initiative; and

(c) Police also perceive the increased risk of violent confrontations with a felon who is surprised in the midst of a criminal act.

Lower false alarm rates possible with PPOAS as compared with commercial alarm systems increase the odds of apprehension of suspects. Officers engaged as responding units appear to be favorably motivated by increased opportunity for apprehension. As mentioned above, Cedar Rapids patrolmen were quite happy with false alarm rates as high as 79% because "they are catching burglars" (Ref. 74).

Even Detroit's SEAR Program, which experienced the highest false alarm rate of any program surveyed concluded:

"False alarms have not been a major problem. They have acted as a training exercise for the equipment and personnel" (Ref. 57)

In sum the national experience suggests that individual officer initiative created by the perception of improved apprehension opportunity can be molded through training to achieve purposeful, ambitious, and accurate response to PPOAS alarm messages.

5.) Portable equipment allows a scheme of deployment which employes and takes advantage of mobility and tactical surprise; this scheme will enhance opportunities for on-scene apprehensions:

Although no data was found in the survey to support this asset of PPOAS, several intuitive arguments can be made.

The principal argument resides in the evidence presented above with regard to both general and specific learning about police PPOAS activities to the criminal community (see assumptions (1) and (2)). This evidence indicates that rends and patterns available to police as aids in prediction of commercial robbery and burglary targets are disrupted by active programs. Logic dictates that anticipation of these disruptions, or even quasi-random deployments, along with a scheme mobility and tactical surprise will enhance opportunities for on-scene apprehensions.

Also, it is not uncommon for police to receive information on planned commercial robberies and burglaries or they may actively seek such information from informers and informants as an alternative to target prediction. The advantages of mobility and tactical surprise are though to be of particular value in these scenarios.

6.) Use of PPOAS will advantageously affect the crime rate of those offenses to which it can be applied.

This asset of PPOAS use is probably the most important in terms of value to law enforcement agencies; however, little evidence is available upon which to surmise whether benefits in crime rate reduction actually accrue to PPOAS users.

The absence of thorough and comprehensive evaluation of this aspect of the PPOAS concept represents a severe deficiency.

The most serious evaluation of program success in terms of PPOAS program impact on crime rates was accomplished by The MITRE Corporation. This study sought to resurect programs data and consequently did not have the benefits of directing data collection through experiemental design. Consequently, results are necessarily cautious regarding STAVS impact on the city-wide commercial robbery problem. (Ref. 36)

PPOAS Liabilities

Along with the assets discussed above use of PPOAS creates several risks and hazards. These hypothesized liabilities are discussed in terms of intuitive argument and user experience in the paragraphs which follow.

1.) the situation created by police arriving at crimes in progress increases the probability of a violent confrontation during which, police, victims, bystanders and offenders may be injured;

Both intuitive argument and actual experience can be used to support the hypothesis that this liability accrues to PPOAS users. The primary concern applies to commercial robbery in which armed offenders, already stressed by the situation of the crime they are committing, are confronted by responding police.

A Miami Police Department study of factors involved in robbery arrests is used for intuitive argument. This study showed:

(a) police encountered resistance only 2% of the time when arresting robbery suspects;

(b) in 6% of the cases, robbery suspects were armed when arrested; however

(c) in 64% of the cases offenders were armed during perpetration of the robbery. (Ref. 39)

Using this information, and assuming there is good correlation between the likelyhood that a suspect will resist arrest and the condition of being armed, the odds of violent confrontation would appear to be drastically increased during on-scene arrests of commercial robbery suspects..

The only data which could be collected was taken from incident reports concerning Philadelphias' use of PPOAS. A review of 73 1972 and 1973 PPOAS incidents showed:

7 Robbers shot.
0 Police Officers shot
3 Robbers injured in struggles
3 Police officers injured in struggles
3 Shootings in which no one was injured.

From these figures it appears that the odds of some sort of violent confrontation are at least 1/10 when offenders are surprised during the act of commerical robbery.

Philadelphia PPOA Program administrators stated that such confrontation, especially shootouts, had detremental effects on the police reputation and that employee operator cooperation had suffered. Further, as cited above (assumption 2) the indications of a trend toward employee/operators purposefully refraining from activating the PPOAS until after completion of the robbery are thought to have been caused by publicity of such violent confrontations. (Ref. 18).

Other users have been successful in avoiding shootouts and other forms of violent confrontation during on-scene arrests of commercial robbery offenders. Tampa for example in a progress report on STAVS

operation stated:

> "The operation of the system in a manner that did not alert the criminal until his apprehension enabled the twenty-nine (29) subjects to be arrested without injury to the complainants, the police, or the criminal, which is very gratifying." (Ref. 73)

This record suggests that through development of tactics and training of responding units violent confrontations during on-scene arrests can be minimized.

A study being conducted by the International Association of Chiefs of Police should be of interest for current and potential users of PPOAS. This study is directed at the problem of violence during on-scene apprehensions of robbers. The report entitled "Robbery Events: A Risk Reduction Manual for Police," should be available in draft form in late summer 1974.

(2) <u>There is a possibility that implementation of the PPOAS concept will or will appear to be competitive with local commercial alarm companies:</u>

Several users have cited difficulty with PPOAS programs as a result of commercial alarm companies perception that police are competing in the alarm market; however, experience has shown that programs which adhere to short term installations and which avoid permenant installations can successfully cope with this problem.

Two users, Salinas and Jackson, cited proliferation of commercial alarm demand among businesses which had been temporary recipients of police owned equipment (Ref. 25, 51). Obviously proliferation of commercial alarm systems is an issue viewed differently by police,

the suppliers, and the consumer; it is not addressed here.

(3) Inherent in the PPOAS concept is the possibility that the responding units would apply unreasonable force if the PPOAS are used to summon help for reasons other than a felony. For example, a misdemeanor such as shoplifing or merely a supicious act.

As discussed above, the arrival of police at a commercial robbery in progress is thought to greatly increase the probability of a violent confrontation. The problem here is that in spite of instructions provided by police, the employee operators of PPOAS historically have activated these alarms for reasons other than robbery in progress. For example, in 1972, the Philadelphia Wireless Alarm System, although used exclusively for commercial robbery was activated 40% of the time for offenses other than robbery such as larceny, bad checks, or shoplifting, or even because the employee/operator thought a customer looked suspicious. Similar observations have been made in Detroit and Tampa. The Detroit SEAR alarm was activated for reasons other than commercial robbery more often than it was activated for commercial robbery despite specific, repeated instructions to employee/operators that improper use could be tragic. (Ref. 57).

The national experience indicates that police use of PPOAS creates a reasonable force dilemma of approaching a scene where experience has shown high odds of a violent confrontation with a fleeing felon yet a good chance that the suspect has committed what may be a misdemeanor, or an act which looked suspicious to a nervous clerk.

(4) There appears to be some chance that police actions evoked by use of a PPOAS could result in legal liability of the municipality unless it specifically limits its liability.

Although evidence is scarce in the PPOAS user community, there appears to be a possibility of legal actions against the police or municipal user of PPOA systems. Poor response time, malfunctions of the equipment, extension of unreasonable force could be constructed as police negligence. Two cases are known where such liability was implied. In one case a proprietor of a business which was robbed claimed the city was liable for the full amount of the robbery loss due to the negligent acts and/or omissions in the discharge of the officials (police) duty to protect citizens in distress. (Ref. 35). In this case police response time to the robbery in this case had amounted to 40 minutes due to a number of explainable problems. In the second case, Kelly Vs. Korger Company, the plaintiff's wife was shot and killed by a robbery offender while a customer in the defendent's store. During the robbery a clerk activated a silent alarm which brought the police to the scene. The customer was taken hostage and intentionally shot while being pursued by the police. The court ruled if there is an opportunity to comprehend the danger, negligence can then become a jury question. (Ref. 61).

The specific outcome of these civil actions is unimportant; the lesson here is that the courts have and apparently will consider suits resulting from PPOAS system malfunctions and risky situations which become more probable as a consequence of PPOAS system use.

SECTION IV

PPOAS Components

Figure 4-1 is a generic block diagram of the PPOAS System which is used to explain the basic components , variations, and characteristics. The format of the paragraphs which follow is designed to first cite details of the Bakersfield voice radio alarm followed by additions, modifications, accessorial capabilities and sophistications added by the various users and manufacturers. Jargon and technical terminology, perculiar to the field of electronics has been avoided purposely.

OPERATOR

Referring to Figure 4-1, the operator of the Bakersfield system is normally the proprietor as an employee of a ~~small~~ small business, a principal of a school, or in some cases, police officers. In a typical installation, having selected a possible commercial robbery or burglary target, a patrol officer makes an initial survey of the premises, installs the alarm, and instructs the operator in functions which include sensor activation and arming the alarm. Police instruction to the operator emphasized a false alarm free operation and the fact that the installation is temporary and under control of the police department.

System development of this component has included several approaches. Several programs using PPOAS have concentrated heavily on training of the target population of small buisness operations/employees. (Ref. 47, 54). Numerous users have concluded that the operator is perhaps

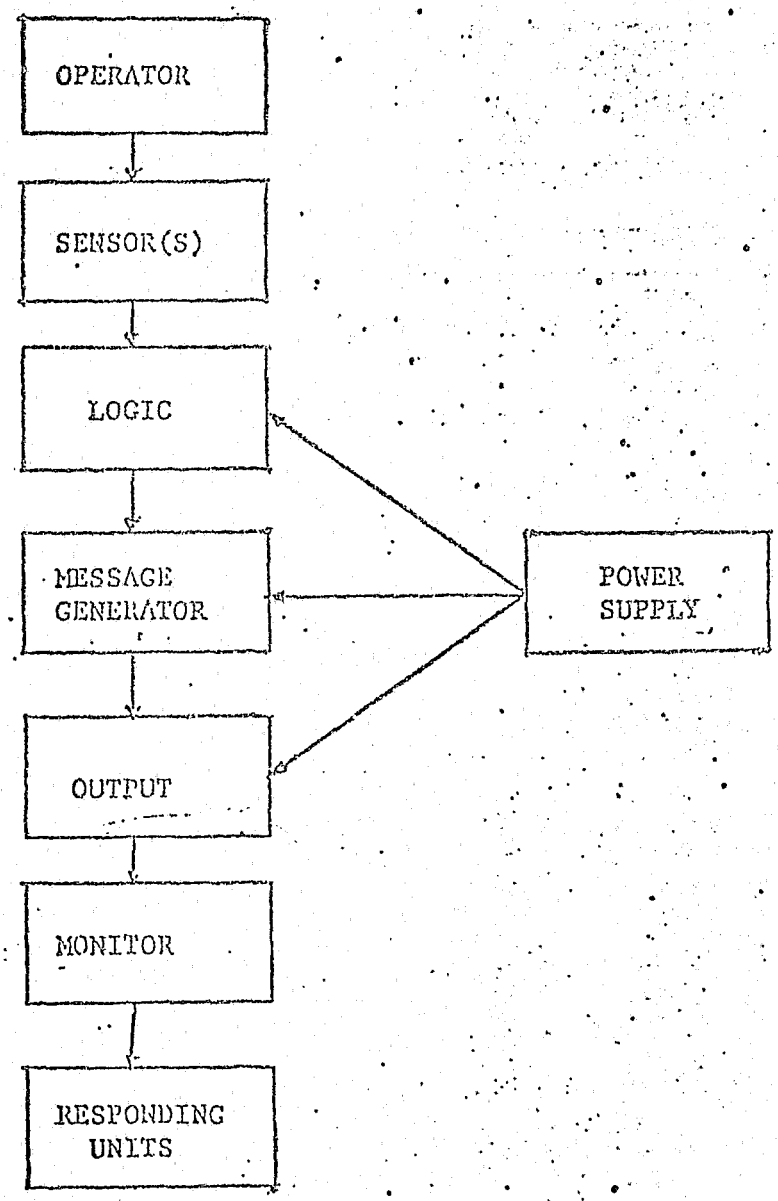

Figure 4-1 -- Block Diagram of Portable, Police Owned, Alarm System.

the weakest link in the entire PPOAS System. The operator/employee if not properly trained and controlled can sacrifice covertness of the program and endanger themselves, responding police, and bystanders. Users of PPOAS cited numerous antidotes where in operator/employees frustrated or compromised the police mission by improper operation of the PPOA System. The classic is the operator/employee who brags about his ability to summon police and demonstrates the ability to acquaintances and customers.

As a supplement to training of operator/employees, several users have established thresholds for the number of false alarms which will be tolerated. When this threshold is exceded the system is simply removed and relocated to another target premise. (Ref. 18, 25, 41).

Tampering and the damage to the police owned equipment and a mission has been common. Several users have devised documents to be signed by authorized agents of selected target businesses which establish liability of the ~~buisness~~ business for damage to equipment caused by negligence. (Ref. 25, 54).

SENSORS

The Bakerfield system uses two relatively simple sensors almost exclusively. For commercial robbery applications an extra no sale button installed in the cash register is used as a robbery sensor. For commercial burglary installations, a monofilament trip line device is employed. This sensor consists of a two pound test fishing line fitted with a plastic tab which deactivates a microswitch when disturbed. The

trip line is stretched across doorways, hallways, or attached to items. Officers depend on experience, history of illegal points of entry to the premise and common sense in locating trip line sensors.

A wide selection of sensors has been used in conjunction with PPOA Systems. Figure 4-2 shows the types of sensors which have been included in selected programs, and illustrates the variety of solutions which have been attempted. The experience of users with regard to sensors can be summarized with several generalities. It appears that users have been overly optomistic regarding the general utility and reliability of the more sophisticated sensors such as microwave, infrared, ultrasonic, acoustic, etc., which are sensitive to the environment of the alarmed premise. Several programs have indicated that sophisticated sensors, while attractive in concept, are not practical for repetitive temporary installations, consume disproportionate amounts of time for installation, and are more subject to falsing. The classic example is the Tampa STAVS Program. This program has the largest and most sophisticated sensor complement of any PPOAS program known. (See Figure 4-2). After extended operations, exclusive use of floor treadle or tape switch placed adjacent to cash registers and a manual switch located in a back room office or store room has evolved. Several of the more sophisticated sensors purchased for commercial burglary applications have never been used and are viewed as sunk costs by program administrators. (Ref. 36).

Perhaps the most significant advance which related to sensor

TYPE OF SENSOR	Bakersfield, California "Voice Radio Alarm"	Detroit, Michigan "Robbery Stake-Out Alarm System"	Los Angeles "Remote Alarm Transmission System"	Tampa "Sensortized Transmission Alarm Vodep System"	Philadelphia, Penn. "Wireless Alarm System"	Jackson, Miss. "SIMDAC"*	Stockton, California "Booby Trap"	Columbus, Georgia "Project CARES"
ROBBERY SENSORS								
Cash Register (Last Bill)		X		X	X			X
Cash Register (No Sale Button)	X							
Floor Treadle or Tape Switch		X		X	X		X	X
Undercounter Button				X		X		
Employee (Pocket Durress Button)		X	X	X			X	X
Employee (Waist Belt)				X				
Employee (Pocket Money Clip)		X		X				X
BURGLARY/INTRUSION SENSORS								
Microwave				X				
Infared				X				
Utrasonic				X			X	
Vibration				X				E
Mass				X				
Acoustic				X				E

*System for the Improvement of Detection and Apprehension of Criminals

X: Operational Sensors
E: Experimental Quanties

Figure 4-2: Types of sensors in selected PPOAS Programs.

	Bakersfield, California "Voice Radio Alarm"	Detroit, Michigan "Robbery Stake-out Alarm Syst	Los Anageles "Remote Alarm Transmission Systcm	Tampa "Sensortized Transmitted Alarm Video Syst	Philadelphia, Penn. "Wireless Alarm System"	Jackson, Mississippi "SIMDAC"*	Stockton, California "Booby Trap"	Columbus, Georgia "Project CARES"
Magnetic Door/Window Switch				X			X	X
Microwave and Ultrasonic and Circuit						X		
Trip Line	X						X	X

*System for the Improvement of Detection and Apprehension of Criminals

components has been the use of equipments which allow a selected premise to be alarmed without wire connections between sensors and the other equipment components. This feature was developed initially by Mr. Charles A. Holt for the Los Angeles Remote Alarm Transmission System (RATS). Holt's design used small, inexpensive garage door opener type transmitters and receivers, hereafter referred to as local transmitters and local receivers. These devises are built under Federal Communication Commission Rules Subpart E of Part 15, Low Power Communication Devices which provides for unlicensed operation of garage door controls and other similar miniature transmitters. (Ref. 56). The range of this type of transmitter varies considerably depending upon the environmental conditions where it is used, but for the purpose of the PPOAS concept as applied to commerical robbery and burglary is normally adequate. Althoug a discussion of range without mentioning other parameters is somewhat crude, interviewees suggest that actual range capability is somehwere between 100-300 feet. Holt's concept allows the local transmitter itself to be sued as a duress button or when connected to virtually any other type sensor, as a wireless connection to the componenets shown in Figure 4-1 which are normally packaged together and inconspicuously placed in the alarmed premise.

The Detroit and Tampa Police Departments continued with this concept, apparently independently. (Ref. 38, 57). The Tampa/Martin Marietta joint venture added the dimension where by several garage door opener type local transmitters were tuned to unique frequencies such

that their signals could be distinquished and processed differently by the logic component (see Figure 4-1). This capability allows sensors to be classified according to their use and propensity for falsing. For example; sensors can be classified as day (robbery)/ night (burglary); further, it is well known that some intrusions sensors are more subject to false alarms than others. By using a number of different local transmitters, an alarm priority system can be built into logic circuits whereby the more reliable sensors are given higher credibility than other sensors which have higher falsing rates.

With the description of improved methods for sensor installation described above a number of innovations for personal body mounted duress sensors is configured as a waist belt. The user activates the sensor and sends an alarm by pushing out his stomach. (Ref. 38). A body worn pocket money clip transmitter, and antenna combination has been used for situations wherein the potential victim, eg., a service station attendant, can activate a sensor and send alarm by removing a specified bill from the clip. (Ref. 30) In general, the concentration appears to have been on development of sensor/ local transmitter combinations which will allow more covert activation of the PPOA equipment.

Little development of intrusion sensors for specific use with PPOA systems is known; rather commercially available sensors such as those listed in Figure 4-2 have been used. However, the U.S. Army has recently issued a Material Need for an improved Facility Intrusion

Detection System (FIDS) which will include development of improved duress sensors. Specifically, duress sensors which are activated automatically by physiological manifestations of stress in the wearer are to be developed. (Ref. 58)

LOGIC

The logic component of the Bakersfield system consists of a timing circuit which controls the message generator so as to comply with Federal Communications Commission (FCC) rules and regulations.

The term logic is used rather loosely here to describe the PPOAS component shown in figure 4-1. This component may accomplish two functions:

1. Timing and control of the message generator and output components to satisfy FCC rules contained in Part 89;
2. Elimination of false alarms through the use of "AND"/"OR" circuits time gates, etc.

The PPOAS as defined in this paper falls under Part 89 of the FCC rules (Public Safety Radio Services) which are concerned primarily with licensing of transmitters and receivers to insure electromagnetic compatibility are well known and are not stressed here. However, one portion of Part 89 applies specifically to PPOA type systems. Specifically, present rules permit the use of land-mobile police frequencies for remote alarm signaling purposes as long as alarm messages (voice and non-voice) do not excede six seconds in length and are not repeated more than five times. (Ref. 59).

Recently, the Technical Standards Branch of the FCC interpreted the rule to require that the alarm transmitter be turned off after each six second message and turned on again for each subsequent message (Ref. 49). Consequently, to be compliance with Part 89, PPOAS must include timing logic to turn the alarm transmitter off and on each six seconds and fail safe timers to insure the ~~no~~ 30 seconds transmission periods are not exceeded.

The second function of the logic component is elimination of sensor generated false alarms. The Tampa/Martin Marietta STAVS and Jackson, Mississippi SIMDAC Systems have provided most of the experience in this area. The Tampa System garage door opener type transmitters which were built so as to provide three unique signals. The Logic component in STAVS was ~~designed~~ designed to process each of these signals differently. That is, the three uniquely tuned transmitter types are used to establish an alarm priority system and to control the message generator, and output components and to operate accessory evidence collection equipment. Exhibit 4-1 is a table reproduced from a Martin Marrietta proposal to the city of Jacksonville, Florida. It is included here merely to illustrate the use of logic circuits to eliminate sensor cause false alarms. The class A, B, and C alarms correspond to the three uniquely tuned garage door opener type transmitters.

The Tampa STAVS Program has essentially ~~abendoned~~ abandoned the use of ~~local~~ local transmitters and the logic circuits for false alarm screening (primarily because of maintainability and reliability of the equip-

EXHIBIT 4-1

PROGRAM/CONTROLLER FUNCTIONS

Illistrations of Logic component of PPOAS designed to lower sensor caused false alarms.

DAY SETTING

Class A Alarm Received

Within three (3) seconds, the transceiver is activated, telephone dialer starts dialing and video tape recorder-started operation continues for one (1) to ten (10) minutes as determined by master timer setting or until reset manually

Class B Alarm Received

A single Class B signal of three seconds minimum and not sustained for more than ten (10) seconds duration will initiate operation of the video tape recorder only and establish a window or timing gate coincident with the video tape recording operation. The video tape recorder will operate 30 seconds and shut off automatically unless a second signal is received. Receipt of another Class B signal within the timing window will initiate both radio and telephone alarm transmission along with continuance of the video tape recorder operation. Operation will continue for the duration preselected on the master timer or until reset manually. A Class B signal sustained for ten (10) or more seconds will actuate the video and tape recorder at three seconds and initiate both radio and telephone alarm transmission at the end of ten (10) seconds. Operation continues for the duration of master timer setting or until reset manually.

Class C Alarm Received

The alarm processor will not respond to Class C signals while in day setting.

NIGHT SETTING

Class A Alarm Received

Operation is identical to day setting.

Class B Alarm Received

One or more Class B signals will start a 30 second timer. At the end of the 30 seconds a window will open through which Class B signals can pass to initiate radio and telephone alarms. This window will remain open for 120 seconds during which time the video tape recorder will operate, and two seperate Class B signals or a single Class B signal sustained for ten (10) seconds or longer will initiate alarm transmission.

Class C Alarm Received

Class C signals are elevated to Class B signal status in night setting. Operation is as described above.

Source: Reference 60

ment.) (Ref. 36). However, several cities which have recently taken delivery of PPOA Systems are continuing the development of false alarm screening logic funtions. (Ref. 28, 47, 54.)

MESSAGE GENERATOR

The Bakersfield system uses an inexpensive reel-to-reel tape recorder to generate a pre-recorded alarm message. The message gives the type of offense and name of business and is repeated six times as specified by the FCC.

The message generator component has been the source of a major branch in the design and use of the two basic types PPOA systems- Digital and Voice.

Digital message generators normally use tone reeds or frequency shift keying (FSK) to generate a combination of tone and time coded alarm signals. Typically, the more sophisticated digital message generators (also called encoders) compile a message which includes a security tone and multiple, discrete, time correlated tone bursts which can include an address (coded identification of the alarm location), a test function, and a power monitor function. (Ref. 6, 13).

Voice message generators, on the other hand, use either a tape recorder or deck to generate a voice alarm message. The content of the voice message voices considerably from user to user, but basically serves to identify the locations where the alarm has been placed.

The recorder varies also depending on the supplier, however, most use a medium quality brand name cassette type recorder. In

addition, most suppliers have begun to use endless cassettes which are considered more reliable.

As a final note, two anomalies were encountered in Detroit and Los Angeles PPOAS. The Detroit systems message generator component generated both digital and voice messages in a fail safe, redundant design. The Los Angeles RATS system which uses a tape recorder for message generation has two-track capability.

OUTPUT

The Bakersfield radio voice alarm, as mentioned above, incorporates a motorcycle radio transmitter which is the only source of system output. The taped message is broadcast on police frequency allocated to the patrol division.

The output component of PPOAS equipment has taken several forms and provided for numberous functions. The primary item, however, is a transmitter which transmits the alarm message (either voice or digital) either directly to responding units or to some centralized receiver station. Most of the users surveyed use existing licensed land-mobile frequencies for these transmission. [4] Those users whose equipment transmits a voice alarm in most cases depend on self dispatching of responding units. That is mobile units designated to respond to the alarm normally do so upon hearing the alarm message on their radio without instrucitons from a police dispatcher.

On the other hand, those departments using PPOAS which transmit digital alarm messages normally depend on central dispatching schemes.

There are several reasons cited for selection of digital systems. In several cases, the use of digital signaling has been selected on the basis of overloaded existing communications channels. Others apparently have chosen digital over voice systems as a result of the FCC's pending action to restrict the allowed message lenght for unattended alarms. (Ref. 59, 78).

Normally, users of PPOAS with digital output have adopted centralized dispatching schemes. Centralized dispatch is necessitated because digital output must be decoded before it is useful. Consequently, an additional equipment component normally called an annunciator is required. This component is discussed under MONITOR.

In additon to transmitting the alarm message, the output component may provide for: (1) activating evidence collection equipment such as cameras, video tape equipment, or tape recorders; (2) operating a telephone dialer to establish a telephone line connection between the alarmed business so that a police officer can listen to activities taking place in the business; (3) activating a roof top beacon or other visible local alarm to aid responding units (Helicopter units). (Ref. 37).

POWER SUPPLY

Power for the voice radio alarm is provided by a 110 volt oulet in the premise selected for alarming.

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[4] Although several have applied for a separate frequency allocation for PPOAS, the FCC has authorized only one known request; this was for the Jackson Mississippi SIMDAC Program.

Most PPOA equipments have incorporated AC/DC power supplies whereas the Bakersfield system was AC only operations. The rationale for battery operation with trickle or float charging is that the filtering of 117 AC power sources is electronically complex, expensive and not always successful in eliminating spurious signals and interferences which could affect other componenets of the PPOA equipment. Most users and suppliers have chosen an AC/DC power supply and normal operation on DC.

MONITOR

The Bakersfield voice radio alarms are monitored directly by patrol division beat cars through their standard mobile radio equipment. The dispatcher also monitors alarm messages to provide backup and record keeping functions.

The monitor function follows the basic branch in types of PPOAS mentioned above under MESSAGS GENERATOR. PPOAS using a voice alarm may be monitored on portable or mobile radio equipment by uniformed patrol division units, as in Bakersfield, or by dedicated units operating undercover. In other words, the voice alarm messages are monitored by standard police communications system.

Systems which use digital message generators require an additional monitoring component normally called an annunciator. This component decodes the coded digital message and displays the information content in useful form. The annunciator for digital PPOAS is

normally a central, permanent installation at the communications center of the using agency; however, one manufacturer has designed and manufactures a portable mobile annunciator which can be placed in a police car or located in a storefront command point in the vicinity of the stakeout targets. (Ref. 55). Two other manufacturers are contemplating annunciators for use by each of the responding units (Ref. 6, 67). This capability would allow the digital PPOAS to operate without a requirement for central dispatching of responding units. However, additional portable monitor components would still be required.

RESPONDING UNITS

As mentioned above, Bakersfield patrol division beat units dispatch themselves to the scene upon hearing the voice alarm message.

Several different types of responding units have been observed in the user community. These include uniformed patrol division beat cars, detective units, tactical units and specially trained police personnel dedicted to a PPOAS program.

The scheme which uses normally deployed beat cars as responding units is more common in the small and medium-sized departments. The larger departments have normally specialized the responding units either by drawing from investigative or tactical squad manpower or providing dedicated personnel for PPOAS programs.

PPOAS USERS & EQUIPMENT MANUFACTURERS

PPOAS USERS

A total of 56 law enforcement agencies which have used or are planning use of PPOAS were identified in this survey. Appendix I provides a list of these agencies along with contacts where known.

The subgroup of PPOAS users represents a very broad range of law enforcement agencies. PPOAS have been purchased and utilized by a police force of a town of as few as 4,000 residents (Tehachapi, California) as well as by large police departments such as Los Angeles, Detroit, and Philadelphia. In addition, one program was noted in which 3 counties and 3 municipalities have joined in a regional program for use of PPOAS.

Users of PPOAS can also be characterized according to geographic regions. There appears to have been a disproportionate amount of activity with the PPOAS concept in California and Florida than elsewhere in the nation. The proximity of active programs and/or manufacturer's plants appears to have influenced the development and proliferation of PPOAS programs. Figure 3-1 shows the geographical distribution of agencies using or planning use of PPOAS.

As would be suspected, the more ambitious equipment development projects have been instigated by the larger agencies such as Los Angeles, Detroit, Jacksonville, and Tampa police departments; however, several medium sized departments, Bakersfield, California, Columbus, Georgia, and Jackson, Mississippi have sponsored major development of the PPOAS concept (ref. 1, 54, 27).

In general, the communication of program results to the law enforcement community has been extremely poor. With the marginal exceptions of company sales brochures, occasional newspaper articles and grant applications, the literature is virtually void of substantive material regarding PPOAS programs. The Detroit Police Department's final report on the development of an Electronic Robbery Stakeout Alarm, ref. 57, is thought to be the most complete document available; however, this report has not been published outside department/grant administration circles. The MITRE Corporation is preparing a report on the Tampa STAVS (Sensortized, Transmitted Alarm Video System) project. (Ref. 26)

Prospective users of PPOAS apparently do seek out the experience of other agencies using PPOAS; however, it appears that normally these activities are restricted by budgets and lack of knowledge regarding the state-of-the-art nationally. Good business practice dictates that references and referrals from manufacturers' sales representatives include satisfied customers. The author noted that it is extremely difficult to identify and learn from programs branded by their instigators as unsuccessful or failures.

PPOAS EQUIPMENT MANUFACTURERS

The survey identified 7 companies which are currently involved in varying degrees with the PPOAS market. Appendix 2 identifies these companies and provides addresses systems names and contacts where known.

Several characteristics and generalities are evident as a result of the survey. First, there appears to have been only sporadic attempts at marketing of PPOA equipments. This is somewhat surprising in light of the general attractiveness of a PPOAS to law enforcement agencies. It would appear from the broad range of users (very small agencies to very large sophisticated agencies) that the national market would be significant and substantial enough to interest even the larger electronics firms. One possible negative stimulus to industry interest is a pending change to FCC rules and regulations regarding the use of public safety radio frequencies for secondary, unattended alarming purposes. (Ref. 59) Proposed changes which are pending at publication of this survey would decrease the current limit for transmission time allowed for broadcasting alarm signals from six seconds to two seconds. This change would require the use of digital signaling and thus the segment of the industry which builds PPOAS using voice alarm messages has adopted a wait and see attitude toward new models, inventory, and marketing. (Ref. 1, 66, 67, 68). Another, and perhaps more significant reason for the apparent lack of interest in the PPOAS marker is the general lack of evaluative information. This deficiency is discussed in more depth in Section VI, PPOAS PROGRAMS. Finally,

the general absence of national marketing efforts may be due in part to the fractured and decentralized nature of the alarm and security industry in general. A glance at the Thomas Register illustrates the large number of small businesses participating in alarm system endeavors (Ref. 3).

The second characteristic relates to development of PPOAS equipment. It is interesting to note that very little private capital has been invested in the development of improvements to PPOAS equipment. The Federal government through LEAA grants and Department of Defense Contracts has been the primary sponsor of PPOA equipment developments (Ref. 8, 27, 37).

OPERATIONAL REQUIREMENTS

The accumulation of experience from the PPOAS user community suggests a synthesis of operational requirements. In many cases these requirements translate conveniently to system/equipment requirements. In other cases the operational requirements should be allowed to influence program administration in the form of training programs, operational techniques and procedures, strategies, and tactics. In these cases specific administrative techniques accumulated by the PPOAS community are offered for consideration. The following paragrpahs list and comment on these specific operational requirements.

COVERT OPERATIONS

Throughout the national experience there has been consistent concern regarding program covertness. This feature is sought to preserve the inherent value of a tactical, strike force, type enforcement which utilizes the elements of surprise and uncertainty against the potential offender. The critical aspects of the covert operation appear to be the vehicle used by and the appearance of the responding ~~officers~~ units, the time required for installation, testing, and preventative maintenance of a PPOAS and the reporting and publicity afforded to an apprehension which occurs as a result of successful alarm use.

In Columbus, Georgia, the Police Department has conducted several experiments which demonstrated the difficulty of obtaining a truly covert operation. Several alarms were deployed in a field test mode as commercial robbery alarms; rental cars used were exchanged every other day; officers dressed to conform to the styles prevalent in the target areas. The

results of these exercises were quite disturbing. Intelligence sources showed that the PPOAS deployment was well known by the criminal community in a matter of days. Although some instances thought to be robbery casing operatings were observed, commercial robbery essentially stopped in the city for about 2 weeks. Further, several instances were observed which were thought to be area reconnaissance actions during which responding units were actually sought out during a casing operation. (Ref. 62) In Jacksonville, Florida, the Sheriff's Department alarmed a set of robbery targets, one of which has been particularly prolific. No robberies were experienced in that target during the time the alarm was installed, but it was hit three times in the week after the alarm was removed. (Ref. 63) There are numerous other examples in the experience of other departments which are illustrative of the necessity for covertness.

Several users cited the necessity of avoiding direct publicity of the PPOA program and equipment operation. (Ref. 18,25) Each of these users have program objectives which favor apprehension of offenders and feel that publicity will arm the criminal with knowledge of the program sufficient to cause him to shift his activities to crime other than robbery or burglary or perhaps to avoid portions of the city where alarms have been installed. (Ref. 25).

Equipment characteristics which derive from the requirement for covertness are as follows:

1. Equipment designs should seek to minimize the time required for installation of equipment components;

2. Equipment should be designed so that preventive maintenance (e.g. replacement or charging of batteries) can be avoided during an entire temporary installation cycle. This period is estimated at 30-45 days of unattended operation;

3. Equipment should be inconspicuously packaged. Los Angeles suggested nestable containers such that an officer delivering and retrieving the equipment would appear to have entered the garget business and departed with the same container. (Ref. 33)

4. Equipment designs should allow for a test function which can be performed without officers visiting the alarmed premise;

5. Equipment designs should strive to maximize reliability and minimize equipment generated false alarms.

Specific countermeasures which have been used by the PPOAS user community to improve program convertness are listed below:

1. The use of stationary stakeouts for responding units, e.g., garages of vacant houses, storerooms of a centrally located target, employee break room of a business. (Ref. 18)

2. Use of rental cars contracted for with a stipulation for frequent exchange of vehicle. (Ref. 54)

3. Use of frequently changed disguises such as facial hair, wigs, clothing, and headware. (Ref. 37, 54)

4. General abstinence from publicity of any sort especially in reporting successful apprehensions can be explained without mention of the PPOA system. (Ref. 1, 18, 41)

5. It is suggested that the unit operating the PPOA System seek interdepartmental assistance from a specialized unit which operates undercover. The narcotics squad provided invaluable assistance in covert operations in the Columbus, Georgia project.

6. Some departments have provided training to proprietors of target businesses on hiring policy where a contract janitor service was thought to be the source of criminal intelligence about PPOA installations. (Ref. 54, 63)

7. In one program, a press conference was conducted, an overview of the PPOA program presented and cooperation of the press requested and granted. (Ref. 54)

8. Several other users do not volunteer information regarding the techniques and equipment used when a successful apprehension is made. These users explain to the press that police were acting on prior information or responding to an alarm without providing details. (Ref. 18, 41, 49, 51)

SIMPLICITY OF OPERATION

This requirement is one of the more important reported here. The experience of practically every user surveyed points to simple and straight forward operation of the PPOA equipment.

The most dramatic illustrations of this issue are compiled in the experience of Tampa's STAVS system and Detroit's Electronic Robbery Stakeout Alarm System. Tampa's experience is summarized in Reference 36:

> "Unlike the intended concept of having equipment that was highly mobile and which could be transported from place to place easily, the STAVS equipment appeared to be quite the opposite. The installation appeared to be complex and relatively immoble." (Ref. 36)

Detroit reported that in the early stages of their program with regard to problems encountered after the PPOA system was operational:

> "1. In attempting to use the alarm station in its entirety as it was designed, even a simplified instruction booklet proved to be very complicated to non-technicians.
>
> 2. Set up time of the alarm stations proved to be very time consuming.
>
> 3. .... "(Ref 57)

Los Angeles cited simplicity of operations as an absolute operational requirement. Interviewers there stated that simplicity is required not only to reduce installation time for preservation of covertness but also to reduce training requirements for police and employee/operators. (Ref 33)

PHYSICAL SECURITY

Several departments have lost PPOA equipment to the criminal community. (Ref 1, 25, 75) The motive for these thefts is not clear, but it is suspected that either the criminal wanted a PPOA for examination

and development of a defeat tactic or the appearance of the equipment was such that it was an attractive burglary item, (i.e., an expensive looking electronic device).

The implications of this experience are that equipment designs should provide for physical security and be inconspicuously packaged. Theft alarms were incorporated in the designs of Tampa's STAVS and Jackson's SIMDAC. The STAVS system incorporated a mercury switch sensor internal to the alarm processor which caused an alarm to be broadcast to responding units. (Ref. 38) The SIMDAC system included an electronic siren internal to the alarm processer which activates by a swtich when the alarm processor is lifted from the surface on which it rests. (Ref 25) Other systems have incorporated design features whereby an alarm message is broadcast if the 117AC power source is disconnected. Finally one user has considered securing equipment to a structural component of the alarmed building with padlock and chain.

MAINTENANCE OF POLICE CONTROL

Absolute control of target selection activities and retention of the flexibility and mobility afforded by a PPOA system is desirable. This control may be challanged by local pressure groups and individuals and through insistance that a particular group of business or residences be provided with PPOA equipment. In two municipalities several alarms had been "Captured" by an influential group of businessmen; in another, the average installation periods can be measured in years rather than days or weeks.

Intuitively, the two suggestions are made toward the solution to this problem; (1) Police administrators in a position to resist the above mentioned pressures should be well armed with positive arguments for maintaining necessary target selection control and flexibility of the system. (2) A demonstrated record of the tactical advantages of mobility, flexibility, and surprise should be maintained.

TAMPERING AND PHYSICAL ABUSE

Tampering and physical abuse by employee/operators and police officers respectively dictates a rugged design of PPOAS equipment components.

Occasionally, equipment has been physically damaged by employee tampering; in other cases it is thought that tampering with external controls and settings may have resulted in false alarms and or failure of the alarm to activate during an actual burglary or robbery. In Columbus, Georgia, for example, field testing of two PPOAS for about 2 months resulted in physical damage to both alarm processors. The external antennas of both PPOAS were broken off and "disappeared".

Further, equipment receives a good measure of wear and tear through cycles of installation, removal, transport, reinstallation, etc., plus continuous testing. Mechanical features such as switches, containers, connectors, etc., should be designed to accommodate continual use. Experience shows that police are not gentle with equipment.

To cope with tampering by employee/operators several users have prepared release forms which hold the responsible party liable for unreasonable abuse or negligent damage caused to PPOAS equipment (Ref. 25, 54). Also it appears that the number of external controls should be minimized and that containers for equipment components should be made in accessable to unauthorized persons.

FALSE ALARMS

The substance of this issue is to the PPOA concept. PPOA equipment should outperform its commercial alarm counterpart in terms of holding false alarms to a minimum. The obvious reasons for this is that responding units become lax in their procedure, quickly lose confidence in the system and waste considerable police resources in responding to false alarms. Further, when a unit responds to a false alarm in a business equipped with PPOAS, the covert aspects of the operation suffer. The national experience indicates that equipment generated false alarms can be minimized once a PPOA system is debugged; thereafter, most falsing is a result of employee carelessness; there are, however, reported instances where the alarm is deliberately set off by an employee to reassure himself or prove to a bystander or friend that the police will respond quickly at his command.

It is suggested that an employee/operator profile be developed and that this profile should heavily influence procedures for training prospective PPOAS employee operators. Columbus, Georgia, for example, found that the typical employee of the commercial robbery target (convenience grocery store) earns minimum wage and is typically a transient employee (turnover of employees in convenience stores average about 70% every quarter). (Ref. 62)

In coping with false alarm problems several administrative techniques have been employed:

1. Many departments have established a false alarm limit policy, whereby the PPOA equipment is removed after 1, 2, or 3 alarms. (Ref. 1, 51, 76)

2. At least one department installs PPOA equipment only after an initial interview with proprietor/employees has shown that care and cooperation in the operation of the alarm can be expected. (Ref. 25)

3. Some PPOA users have specified logic circuits in the alarm processor which screens out false alarms as a function of the type of sensor which is activated. (Ref. 24, 37, 47, 48, 54, 60)

4. Most users carefully instruct proprietor/employees in false alarm free operation of the PPOA equipment upon installation.

5. One department has instituted a management control mechanism is which a moving average of false alarms is compared with a reasonable threshold which if exceeded will bring about management action. (Ref. 54)

6. One user instructs employee/operators to immediately call the police if the PPOAS is accidentally activated. (Ref. 42)

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July 30, 1975

Captain Al Terry, SPD Patrol
Larry Gunn, Director
Law & Justice Planning Office

Stakeout Alarms Program

Some time ago, I promised to share some thoughts on your stakeout alarm project and to restate some of the philosophy which is inherent in the original concept. I've divided my thoughts into the following sections: I. Generalities about Successful Projects; II. Project Goals and Objectives; III. Evaluation; IV. Operations Policy; and V. Implementation Suggestions.

I. Generalities about Successful Projects

Without a lot of explanation or citing of references, allow me to simply state my beliefs about the essential elements of successful projects in general. First, the project should be viewed as an integral part of the department's overall improvement program. With regard to this element you have several things going for you. This project fits very nicely with the traditional apprehension orientation of patrol and it will be run by patrol in its entirety. Further, it represents one of the few logical choices for use of preventive patrol time. Finally, more apprehensions are expected, accompanied by lower costs per apprehension.

The second element is a personal commitment of a core of command staff and leadership. At the outset, conceptual presentations by the LJPO were enough to achieve this element. You should strive to reinforce this element throughout the project.

Third, the project should satisfy some need of the rank and file officer. I think we agree that this element should drive the operational design of the project. You should be aware that there will be attempts to dilute the patrol officers' autonomy and responsibility both internally from the patrol chain command and externally from other department divisions; in fact, you may have to defend against extra-departmental influence. Examples include suggestions that CID can select targets better, saturation deployment of alarms on a geographic basis, and deployment of alarms to satisfy a public relations problem or particular pressure group.

Fourth, the project should satisfy some need of the community. Our analyses show burglary and robbery, the targets of this project, as priority target crimes. These analyses show that

R.O.Wade

the level of fear/intolerance generated, the frequency, the amount of loss/injury and the availability of points of intervention to reduce those crimes are among the biggest in the City. Our planning information shows that if you make 100 arrests for burglary with the alarms, that group of offenders will have been arrested before for 149 burglaries, 67 larcenies, 42 robberies, 40 auto thefts, 28 assaults, 23 narcotics offenses, 3 rapes and about 50 other miscellaneous felonies. Convictions will be obtained in practically all cases.

Fifth, the project should be designed to attain continuing support. You have a real advantage in this element. The City Council has already given full financial support to the project. OMB has accepted the logic of continuing costs. In essence, you have an institutionalized project at the outset.

Sixth, evaluation should be integral to the design of the project, not an afterthought. I think from comments you have made to me in the recent past that we are in precise agreement on evaluation. LJPO has excellent capacity in evaluation. We will take the responsibility for evaluating the project and, if success is shown, become advocates for you for continued or expanded funding and emphasis.

II. Goals, Objectives and Target Performance Measures

A. Goals

1. To increase the arrest and conviction of commercial burglars and robbers.

2. To reduce the extent of commercial burglary.

B. Objectives

1. "On-scene" arrest rates will be significantly increased for burglaries and robberies occurring in businesses with stakeout alarms when compared to rates for non-equipped businesses.

2. Conviction rates for burglary and robbery will be significantly higher and for more serious charges in arrests resulting from stakeout alarms than for other burglary and robbery arrests.

3. Personal injuries to police, offenders, victims, and bystanders will not be significantly greater in either number or severity for arrests made in response to stakeout alarms than for arrests produced through other means.

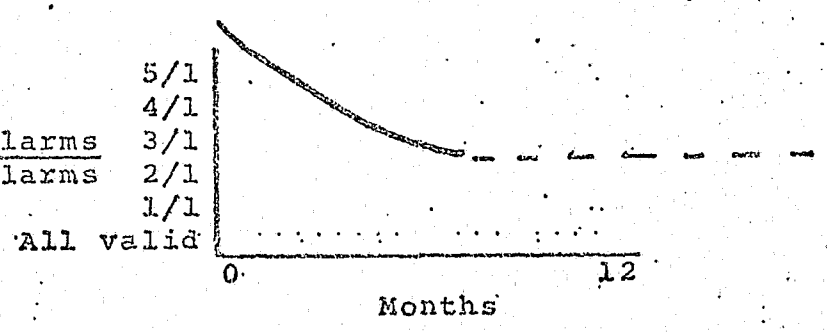
4. The cost of the stakeout alarm project will be lower than the estimated cost of using police-present stakeouts in producing the arrests achieved by the project within the first year of operation.

5. Commercial burglary rates will be significantly reduced when compared to the pre-project period and other comparable jurisdictions. (A statistically significant measurable impact upon robbery is not anticipated through this project since it is anticipated that the majority of stakeout alarms will be used for burglary detection.)

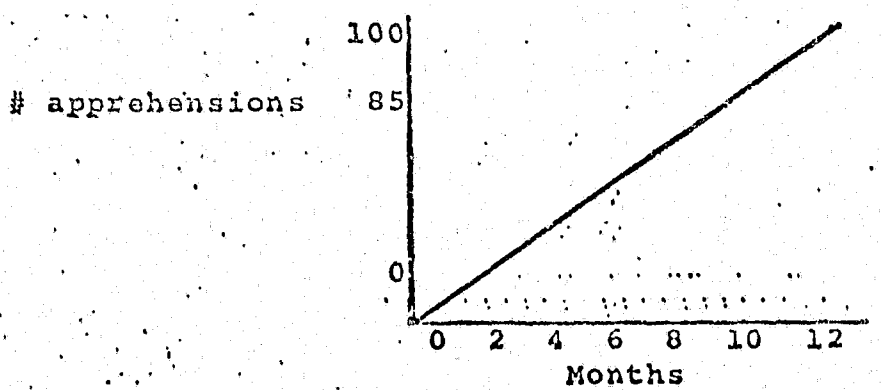
C. Target Performance Measures

These have been included primarily for your use as project manager. I envision a monthly progress report which will allow you to control the project and wave a red flag for problem areas. I'm sure you will want to add to the list.

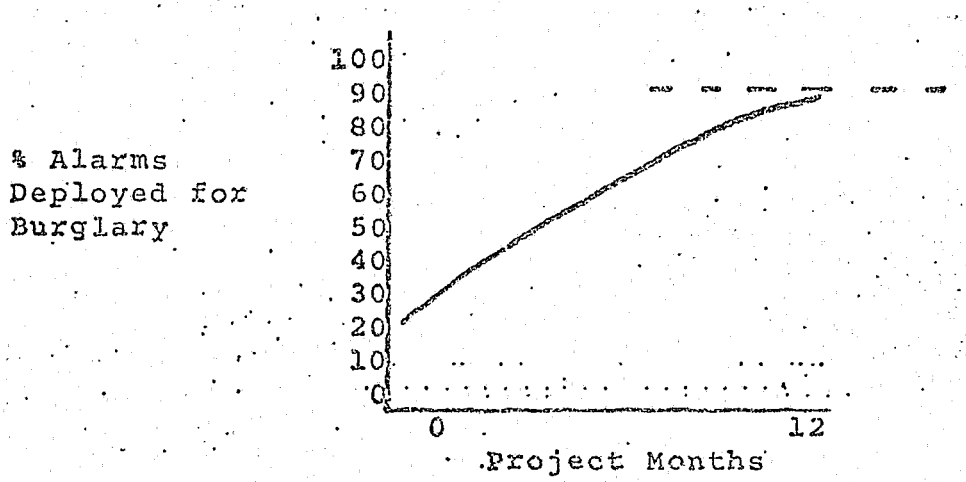
1. The ratio of false to valid alarms should probably begin at a rate of about 5 to 1 and decrease over the first year to a steady state of 2-3 to 1.



2. You should expect at least one on-scene apprehension per alarm per year with some improvement over time.



3. Initially, officers will attempt to concentrate robbery stakeouts. Because of the response time of a system using beat officers to respond, average response time will not be good enough to systematically make apprehensions. My view is that optimum deployment will be 90% burglary/10% robbery deployment.



4. In robbery deployments the odds of offenders being armed with personal firearms is about 75 percent. Officers arriving at the scene can apparently choose between risk avoidance or shootout. In burglary there is less risk but the project manager should have a progress reporting mechanism to ensure risk avoidance policy is being carried out. Two extremes are cited as guidelines:

Program 1 -- shootouts between police and offenders in 10% of on-scene arrests (Philadelphia)

Program 2 -- no shootouts between police and offenders in 35 on-scene apprehensions (Tampa)

5. Response time should be an element for management control. While Major Connery can provide a better estimate of what your expectations should be, the latest information he gives us indicates travel time to emergency calls is now running about 3.60 minutes.

6. You may also wish to monitor tampering and damage to equipment, theft of equipment, the frequency with which alarms are removed for cause, etc.

7. Finally, if the evaluation is to be valid, you will need a means of monitoring the accuracy and completeness of data collection.

III. Evaluation Design

Objectives 1, 2, and 3 will be evaluated by comparing arrest, conviction, and injury information from burglary and robbery cases involving stakeout alarms with a random sampling of an equivalent number of cases occurring during the same time period. Comparison data will be obtained from official police, prosecutor and court records.

For objective 1, an increase of on-scene arrests, additional data will be collected to document the manner in which stakeout alarms cause increased on-scene arrests. Since it is assumed that the alarms will result in decreased police response time which will in turn increase the likelihood of arriving while the offender is still on the scene, two measures will be important in verifying this assumption. The first is the response time between the initial commission of a crime and the police arrival. For the alarm sites, this will be the time between the alarm broadcast and police arrival. For non-alarm sites, this time period will be from the initial reporting of the crime occurrence by victims or observers to police arrival. The second measure which is anticipated to have a crucial effect upon how quickly officers respond to alarms broadcasted by the stakeout equipment is the false alarm rate and the reasons for such false alarms. Information on response time will be collected from dispatch records while false alarm measures will be maintained in equipment logbooks (see data collection forms).

Higher conviction rates and more serious charges (objective 2) are assumed results of the following factors: (1) more on-scene arrests will occur; (2) on-scene arrests result in more sufficient legal cases; (3) on-scene arrests and more sufficient cases result in more offenders admitting guilt; (4) on-scene arrests, more sufficient cases, more admissions of guilt will result in less plea bargaining; and (5) as a benefit of these factors, court dispositions should show higher convictions, for more serious charges, and be reached in a shorter period of time.

In order to verify the string of assumptions outlined above, the following additional data on both stakeout alarm cases and a random selection of other cases will be collected.

1. On-scene arrests: from data to evaluate objective 1.

2. Legal sufficiency: the number of cases accepted for prosecution out of the number of arrests for burglary and robbery.

3. Admitting guilt: the number of arrested offenders that admit guilt out of the number arrested for burglary and robbery.

4. Plea bargaining: the number of cases plea bargained out of the total number of cases accepted for prosecution.

5. The time interval between arrest and court disposition.

6. Trial charge and court disposition.

Objective 3, no significant increase of arrest related injuries, will be evaluated by arrest reports resulting from stakeout alarm and non-stakeout alarm cases. Risk of injury will be assessed by determining (1) the number of persons injured to any extent, and (2) the extent of injuries that occur. The second measure will be broken into 4 categories: injury not requiring more than first aid; injury requiring medical attention; injury requiring initial hospitalization; and death.

Objective 4, lowered stakeout cost, will be computed by comparing the equipment and project personnel costs for one year with the personnel cost of establishing a two-man stakeout for the periods covered by stakeout alarms which result in an on-scene arrest. For example, if an alarm is placed in a particular site and activated for 80 hours a week for a period of 10 weeks and then broadcasts an alarm that results in an on-scene arrest, the cost of making that arrest through conventional stakeout procedures would be 1600 manhours (2 persons x 80 hours a week x 10 weeks).

Objective 5, reduction of commercial burglary rates, will be evaluated by comparing pre- and project-period rates in Seattle with rates from comparable jurisdictions. This non-equivalent control group design will allow an assessment of the extent to which commercial burglary rates are being reduced by project operation as opposed to more general regional or national factors influencing crime rates.

In addition to the information cited above, data will be collected to monitor operational and placement difficulties, maintenance requirements, mechanical reliability, store owner/employee training and operation of equipment, damage to equipment

caused by mistreatment, misuse of equipment, and (if it occurs) reasons for store owners refusing placement or requesting removal. It is anticipated that the majority of these data requirements will be met by maintaining an equipment logbook and alarm activation report (see attached forms).

IV. Operations Policy

The following are some suggested rules of thumb for formulating operations policy:

A. Keep things simple. Attempts to cope with every contingency will be counterproductive. Murphy's Law will be in effect at all times and if you spend a lot of effort trying to plug all the holes, attention to objectives will suffer.

B. Employees/proprietors/managers of commercial establishments will be the weak link in the stakeout alarm system. Very simply, this element will consume more time and contribute more problems than any other.

C. Publicity? My thinking in this aspect is unclear. Publicity could contribute deterrence at the expense of apprehensions. I think I would favor testing the apprehension strategy first and add publicity at the beginning of the second year of operation.

V. Implementation Suggestions

A. Publicity. If you opt for minimizing publicity, a press conference could be held announcing the project, giving general information, and asking for cooperation on no publicity. Tim Burgess tells me this could work in Seattle and it has worked elsewhere.

B. City liability. I've attached a draft release form which will release the City from liability and serve as a deterrent to tampering and property damage. I would suggest that you ask Joe Coleman to review this and obtain a review for you from the Corporation Counsel.

C. Draft data collection forms are attached. This is the data we would need to carry out the evaluation described in III above. You may wish to add some of the management controls suggested in II.B.

D. Letter to commercial alarm companies. I've drafted a letter from the Chief to alarm companies which should preempt complaints about the Department competing with profit makers.

Don Vert can also take your case to the associations and individuals as he already has the forum for this exchange. You should, however, convert Vert or con Vert before asking him to do this as I suspect he still favors the TAC II equipment with dedicated responding units.

E. Implementation pre-test. It may be worthwhile to test your plans on a smaller scale than City-wide. In this way you may save on training resources by having refined operations procedures, data collection, training agendas, operations policy, etc.

LGG:jn
Attachments

ATTACHMENT #1

AUTHORIZATION AND ACKNOWLEDGEMENT

THIS AGREEMENT made between the City of Seattle and the Proprietor specified below:

1. The Seattle Police Department agrees to temporarily install and maintain a portable alarm system on the Proprietor's premises located within the City limits of Seattle, Washington.

2. This system when properly operated will report an alarm directly and instantaneously to the Seattle Police Department.

3. The Proprietor agrees that in the event of failure of the system to operate properly, there is to be no right of action against the City of Seattle or any of its officers, agents and employees for damages resulting therefrom, and in consideration of the City's installing said equipment, the Proprietor waives and discharges and disclaims all claims or causes of action for damages or right to such claims and causes arising out of or in any way connected with such equipment or the use thereof.

4. It is agreed that the system remains the property of, and under the control of the Seattle Police Department.

5. It is further agreed that the Seattle Police Department may disconnect the system and remove said equipment from the premises at any time.

6. The Seattle Police Department will be responsible for all repairs and maintenance of the equipment, resulting from normal wear and tear, but retains the right to recourse in cases of negligence and abuse.

Stakeout Alarm Serial # _____

Date Installed _____

Date _____

WITNESSES:

_____

_____

This _____ day of _____, 19___

Business Name _____

Business Address _____

_____
(Authorized Signature)

_____
(Position)

ATTACHMENT #2

STAKEOUT ALARM LOGBOOK

Alarm Number _____

Officer Assigned To _____

Car Beat _____ Watch _____

Date Assigned _____

Date Equipment Returned _____

==========

TO BE FILLED OUT BY BEAT PATROLMAN

INSTALLATION, MAINTENANCE SHEET

(Complete items 1, 2, 7, and 8 if alarm broadcast not receivable by dispatch)
(If business does not want alarm installed, complete items 1, 2, 3, and 3a)

Installation Record

1. Name of business _____ Date installed _____

2. Address _____ Date removed _____

3. Type of business _____

3a. If refuse installation, reason why _____

4. Owner/Manager _____

5. Liability agreement signed by _____

6. Setting: Burglary _____ Robbery _____

7. Installation time required _____

8. Did installation require relocation (yes/no) or high-gain antenna (yes/no) for dispatch to receive signal?

9. What hours will alarm be used for?

Sunday _____	Thursday _____
Monday _____	Friday _____
Tuesday _____	Saturday _____
Wednesday _____	

10. Sensors used:

	Number	Type
1.		
2.		
3.		
4.		

11. Reason for installing alarm at this location _____

_____

12. Training owner/employees:

	Person	Time Spent
1.		
2.		
3.		
4.		
5.		

13. Dates equipment tested: _____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

14. Service, maintenance required:

	Date	Reason	Time period equipment out of service for repairs
1.			
2.			
3.			
4.			

15. Alarms:

	Date	Time	Reason	Case # if appropriate
1.				
2.				
3.				
4.				
5.				

16. Incidents/offenses not signaled by alarm:

	Date	Time	Offense	Case #
1.				
2.				
3.				
4.				

17. Reason equipment removed: _____

_____

18. Comments regarding equipment installation at this location: _____

_____

_____

STAKEOUT ALARM INCIDENT DATA SHEET

Indicate if this case is:
A. Stakeout Alarm # _____
B. Control case _____

1. Stakeout alarm: Valid _____
False _____
Did not work _____

1a. If control case, or alarm not activated: How discovered/reported _____

_____

2. Offense _____

3. Case number _____

4. Date _____

5. Time _____

6. Target: Business Name _____
Address _____

7. Response time:

a. Time of alarm broadcast/911 operator receive call _____
b. Time of dispatch assignment to unit _____
c. Time unit arrive at scene _____
d. (Alarm broadcast/call received): Before During After (circle one)
e. If alarm after offense, how long after occurrence _____
f. Remarks: _____

_____

8. Complete this section if false alarm, otherwise go to item 9

a. If human error:

i. Which sensor _____
ii. Location of sensor _____
iii. How tripped _____
iv. Why tripped _____
v. Remarks _____

_____

b. If improper installation:

i. Component(s) _____
ii. Type of unit _____
iii. Who installed _____

b. If improper installation (continued):

iv. Was installation modified by employees? _____

v. Remarks _____

_____

c. If faulty equipment:

i. Component(s) _____

ii. Serial number(s) _____

iii. Specific problem(s) _____

iv. Name of part(s) _____

v. Part serial number(s) if applicable _____

vi. Remarks _____

_____

9. Complete this section if valid alarm, otherwise go to item 10.

a. Sensor activated _____

b. Location _____

c. Activated by: offender owner employee other (circle one)

d. If after, how long after? _____

e. Remarks _____

_____

10. If incident occurred and alarm not activated, give reason: _____

_____

_____

If control case, or alarm not activated, how was incident discovered, reported?

_____

_____

11. Arrests/Clearances

a. Where and when: check all appropriate

i. At scene _____

ii. Near scene _____

iii. Same day _____

iv. Result of arrest on another charge _____

v. Other (specify) _____

_____

_____

12. Injuries? Yes _____ No _____

a. Who injured? Indicate number of persons injured and type injury

	Number	Type Injuries
1. Officer		
2. Victim		
3. Bystander		
4. Offender		

b. Describe circumstances/injuries, extent of medical attention: _____

_____

_____

_____

13. Description of offense: attach copy of offense report

14. Arrest Disposition

	Suspect #		
	1	2	3
a. Name			
b. Race/Sex/Age/DOB			
c. Arrest Date			
d. Prior Arrests/Dates			
e. Admit guilt?			
f. SPD disposition this arrest			
g. Date			

15. Prosecution Data

	Suspect #		
	1	2	3
a. Charge/Superior or Municipal			
b. Accepted for prosecution? Date			
c. If not accepted, why?			
d. Plea bargain? If yes, what conditions			
e. Trial charge			
f. # continuances requested/accepted, who request, reasons for			

16. Court Data

a. Judge hearing case
b. Defendant counsel, private, public
c. Plea, guilty/innocent
d. Trial by jury/judge
e. Date trial began/ended
f. Disposition
g. Sentence

Suspect #		
1	2	3

ATTACHMENT #3

DRAFT
LGG:jn
7-30-75

John Doe Security Services, Inc.
Seattle, WA

Dear Mr. Doe:

The City of Seattle has appropriated funds for purchase of police owned alarm systems for use in stakeouts. We are currently taking delivery on this equipment and it will be placed in service during August, 1975.

As I mentioned above, the alarms are portable and have been designed for temporary use. The average installation period is estimated at _____ days; they will be moved frequently to maintain tactical and surreptitious deployment.

The purpose of this letter is to inform you that the Police Department is not in competition with any private enterprise and will adhere to its current policy of not making any recommendation for or against a particular brand of equipment or company. Our sole purpose is to detect and apprehend criminals.

There is substantial evidence available from other cities using portable police-owned alarms that those businesses who participate in police alarm projects are more inclined after a temporary installation to seek permanent assistance in commercial alarm marketplace.

If you have further questions about our operations, please feel free to inquire.

Sincerely yours,

Al Terry
Project Director

END