



Law Enforcement Canine Training



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LAW ENFORCEMENT CANINE TRAINING

EXECUTIVE SUMMARY

This study of law enforcement canine training at the Treasury Department describes canine training programs and training facilities. Descriptions of a number of programs follow a section providing a comparative analysis of programs and facilities. The major findings and recommendations are:

1. **Finding:** Very little scientific testing of law enforcement canine performance has been conducted.

Recommendation: In order to improve the data available to Treasury bureaus on canine training programs, a training and field performance testing protocol should be established based on an objective, scientific methodology.

2. **Finding:** A variety of reinforcement protocols are used for law enforcement canine training, but no scientific research which evaluates and compares these protocols was noted.

Recommendation: A research project should be undertaken to evaluate the range of canine reinforcement protocols.

3. **Finding:** Insufficient cost data are available on the many variables involved in law enforcement canine training and field activities.

Recommendation: Each Treasury bureau which currently trains canines, or which proposes to train them, should develop detailed cost and performance data to allow future evaluations of efficiency and cost effectiveness.

4. **Finding:** Analysis of the advantages and disadvantages of initiating, expanding or consolidating law enforcement canine training programs must address not only cost and capacity, but also the unique mission-based needs of the bureau.

Recommendation: If substantial expansions of canine training programs are proposed, or if a bureau which does not currently train canines should propose the establishment of a training facility, then the proposing bureau should present an analysis of the costs and quality advantages and disadvantages of operating a separate versus a consolidated facility.

LAW ENFORCEMENT CANINE TRAINING

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I. INTRODUCTION

This study of law enforcement canine team training at the United States Treasury Department is meant to serve as an information resource on canine training programs, and particularly on canine training facilities, so that future decisions regarding such programs and facilities can be made with the full benefit of baseline and comparative information.

The study begins with an overview of canine training and a comparison of programs. Unless stated otherwise, the expression "canine training" should be understood to mean training a law enforcement officer and a dog to function as a team in order to perform law enforcement functions. Discussions of the Treasury canine training programs follow, and Appendix 1 describes other Federal and State canine training programs.

Two Treasury Department bureaus, the U.S. Customs Service and the U.S. Secret Service, have active canine training programs to support their law enforcement missions. Several other Treasury organizations have law enforcement missions, but do not train or maintain their own canines. These are the Bureau of Alcohol, Tobacco and Firearms (BATF), the Criminal Investigation (CI) function of the Internal Revenue Service (IRS) and the Federal Law Enforcement Training Center (FLETC). All of these agencies use canines from local law enforcement agencies when such use is necessary.

The Bureau of Alcohol, Tobacco and Firearms, for example, has a National Emergency Response Team program which has been very effective in responding to a variety of law enforcement emergencies nationwide. As part of the work done by these teams, canines are used to detect explosives or arson accelerants. Trained canine teams are borrowed from local law enforcement agencies (state and/or local) through an established national network. BATF maintains a close relationship with the Connecticut State Police Canine Program and frequently makes use of canines trained by that organization.

Neither the U.S. Mint nor the Bureau of Engraving and Printing, which maintain very strict security standards at their production and storage facilities, utilize canines on a regular basis to support their security programs. These Bureaus indicated that if a particular security situation warranted the use of canines, they would seek the assistance of other law enforcement agencies. The Mint, however, apparently used canines in the late 18th century (see Appendix 5).

In order to better understand Treasury canine training programs, and to put them in a broader context, comparisons are made to four other canine training programs, namely, the United States Air Force Military Working Dog program, the Connecticut State Police Canine Program, the United States Capitol Police Canine Unit, and the United States Department of Agriculture Beagle Brigade. Separate chapters on each of these programs are included in Appendix 1.

II. COMPARATIVE ANALYSIS OF CANINE PROGRAMS AND FACILITIES

A. THE VARIOUS MISSIONS OF CANINE PROGRAMS

For the purposes of this study, we will classify the missions of the various canine programs as being either law enforcement or non-law enforcement. Under the classification of non-law enforcement programs we find missions which are both well known and popular.

Perhaps the most widely known non-law enforcement mission is that of the seeing-eye dog: the trained canine becomes the eyes for one whose sight is impaired. In addition, canines are trained for hunting, search and rescue operations (in snow as well as in other conditions such as dense woods or demolished buildings), livestock guarding and herding, and, simply, to be obedient.

This variety of non-law enforcement missions illustrates two basic characteristics of the relationship between Homo sapiens and canines. First, the domesticated canine displays a genuine desire to please its owner and to do those things which will evoke a pleased, rewarding response.¹ Second, the domesticated canine has demonstrated a remarkable ability to apply its extraordinary scenting capability in a variety of situations, and it has clearly shown that it can learn to execute a large number of tasks upon command. The repertoire of tasks ranges² from simply "sitting" to turning light switches on and off.

¹According to one author: "Indeed, one of the dog's most distinct characteristics is his affinity for man. Rarely is the dog thought of as an animal unto itself. Instead, stories of his companionship, loyalty, and service to man abound and are woven like a thread through all of literature." Samuel G. Chapman. *Police Dogs in North America* (Charles C. Thomas, Springfield, Illinois: 1990), Chapter 1.

²Jack Fincher, "All you have to do is tell them what you want," *Smithsonian* (January 1992), pp 80-87. Mr. Fincher describes the accomplishments of the Canine Companions for Independence, an organization that trains dogs to assist people with disabilities. Mr. Fincher writes, "It's amazing how many things dogs . . . can do for people who could not manage without their help. 'Service' dogs can turn light switches on and off, raise and lower window shades, lock and unlock wheelchairs, select books from shelves, open and shut doors and drawers, and carry a bedpan. . . . Another picks up its owner's immobile legs, using the tongues of her shoes, and periodically crosses and uncrosses them to stimulate circulation."

The law enforcement missions of the canine encompass at least six distinct tasks: patrol duty, cadaver search, tracking for fugitives or lost persons, and the detection of illegal drugs, arson accelerants, and explosives. Canines are seldom cross-trained to undertake more than two of these tasks; e.g., patrol duty and detection of accelerants, or patrol duty and explosives detection.³

B. SIZE OF TRAINING PROGRAMS

The determining factor for the size of canine training programs is the annual demand for canines and handlers. This varies by law enforcement agency, and Table 1 shows the estimated annual demand for canines in order to maintain authorized level of canine teams, by selected law enforcement agencies.

It is immediately apparent that the size of training programs is primarily a function of the rate at which canines are no longer able to perform the tasks assigned to them, due to physical problems caused by age and length of service (much like their handler counterparts). Once a canine program has reached what could be considered a current services level the number of canines required annually to maintain that field presence is determinable. Two other factors also influence the size of training programs: program growth and service to other agencies.

An example of program growth is demonstrated by the canine enforcement officer program of the U.S. Customs Service over the past three years. The success of the program, in terms of cost effectiveness and interdiction of shipments of illegal drugs, has supported an expansion in the number of canine enforcement teams. At the close of Fiscal Year 1989 Customs had 194 canine enforcement teams in the field. At the close of Fiscal Year 1992 there were 364 canine enforcement teams at work.

The combination of physical and human resources required to operate an effective training program is flexible in that the components can be varied (once a base program is established) to handle moderate changes in demand. But the training process is properly characterized as being labor intensive. With a facility of a given size, the output of a program can be varied by increasing class size, or increasing the number of classes

³Although the accomplishments of canines in non-law enforcement programs are fascinating as well as legion, the balance of this discussion will focus on law enforcement programs.

conducted annually.⁴ As shown in the Table 1, a program can be put together which can train as few as 8 or 10 canine teams a year. The Connecticut State Police program, for example, has the capacity and capability of training an additional 10 canine teams by changing class size. Unless a training program's capacity is exactly matched to the annual demand⁵ facing it, additional capacity is almost always available.

Table 1

Number of Canine Teams on Active Duty and Number Needed to Maintain Current Service Levels for Selected Law Enforcement Agencies: Close of Fiscal Year 1992

Agency	Number of Canines Teams on Active Duty	Number Trained Each Year to Maintain a Current Services Level
U.S. Customs Service	364	35
U.S. Secret Service	38	5
Military Working Dog Agency	2,075	300
Connecticut State Police	53	12
U.S. Capitol Police	30	8
U.S. Department of Agriculture	33	4

⁴A program does not have to train a large number of canine teams each year to be effective and successful. In Maryland, for example, there are at least four separate canine training programs: the Maryland State Police, Baltimore City Police, Montgomery County Police, and the Prince Georges County Police. The annual average number of canines trained is under 10 for each program. Samuel G. Chapman. Police Dogs in North America. (Charles C. Thomas, Springfield, Illinois: 1990) p. 41, ff.

⁵Competent trainers and instructors are the key ingredient for success in canine training programs, and there is an ample supply thanks to large programs such as that of the Military Working Dog Agency.

This brings us to the last factor affecting the size of the training program: service to other law enforcement agencies. Because excess capacity exists, many established programs have responded to the interest and needs of other law enforcement agencies by training canine teams for them. The Military Working Dog Agency at Lackland Air Force Base, for example, trains explosives detection canines for the Federal Aviation Administration. The Customs Service trains drug detection canine teams for the Customs bureaus of other countries. The Connecticut State Police trains arson accelerant and explosives detection canine teams for other local and state law enforcement agencies, as well as for the U.S. State Department. When service to other agencies becomes an established part of a program, of course, its output capacity will be adjusted to reflect the consistent demand.

C. SIZE AND SCOPE OF TRAINING FACILITIES

Given the level of annual demand for canines, the facilities required will be tailored to that program. Certain basic requirements will normally be present: large fields for obedience training and obstacle courses, classroom space, administrative offices, veterinary clinic, supply rooms, kennels, and parking lots and rooms or buildings which can be used to simulate actual working environments. Whether all of these will be present will depend on the scope and size of the training program. The facilities at Lackland Air Force Base (LAFB), where the Military Working Dog Agency (MWDA) is located, includes all of these elements; and there are special features of the MWDA program which set it apart from smaller, more typical programs.

Lackland Air Force Base is a major basic training facility, and it is in a state of transition; quarters for trainees are being gradually upgraded, and older World War II buildings are being replaced or made available for the use of the MWDA. Consequently, many buildings are available; one building has been configured as a warehouse in order to simulate an environment where drug or explosives detection canines might be working. Another is set up as a military barracks so that the canines would be accustomed to working in living quarters of military personnel.

In other programs we observed, these working environments were supplied by local, private sources. Both the Connecticut State Police and the U.S. Customs enjoyed good working relationships with warehousing operations, and their canines were welcome for training exercises during business hours. The Connecticut State Police have an arrangement with an international airport, and the airlines using it, to train canines in luggage areas and in aircraft.

An important facility in two of the programs we observed was the parking lot with a variety of vehicles used in training exercises: searches, drug detection and explosives detection. The vehicles are maintained in good physical (but not running) condition, and are usually obtained through forfeiture or confiscation operations. Included are vans, pickup trucks, buses, sedans, etc., which have been modified by installing extra compartments where contraband materials may be hidden. Again, the objective is to mimic the real world.

The inclusion of veterinary services is another example of the difference program size makes. Moderate or modest size programs have found that it is practical and satisfactory to contract for veterinary services from local veterinarians. The only program whose scale made it economically viable to include a complete veterinary clinic was that at Lackland Air Force Base.

Table 2 presents a summary of the scope of the facilities for selected programs. To summarize this discussion on size and scope of facilities, it is worth repeating that the annual demand for canine enforcement teams will, in most instances, be the determining factor for the size of the training facility.

D. COSTS OF TRAINING FACILITIES AND PROGRAMS

Data on the acquisition costs of most of the facilities visited were not readily available, so a full-scale comparative analysis of the capital costs of facilities would be difficult to undertake. However, data were available for the U.S. Secret Service (USSS). In Fiscal Year 1983, a small building and seven kennel runs were built for the USSS at a cost of \$500,000. It is estimated that the kennel runs cost approximately \$17,000 each.

It is not possible, however, to estimate the average annual capital cost per canine trained because of an extensive reinforcement training program. This program operates on a daily basis since all canine enforcement teams in the Washington area undergo weekly reinforcement training. In Fiscal Year 1991, the USSS added another eight and a half kennel runs at a total cost of \$152,000. The average cost of each run, therefore, was just under \$18,000.

Although highly detailed data on the costs associated with the training programs of the selected agencies we visited were not readily available, the data we did obtain made it possible to construct an estimate of the per-canine cost for each program. These data are presented in Appendix 4 for selected agencies.

Table 2
Physical Facilities of Canine Training Centers
For Selected Law Enforcement Agencies

Facility	U.S. Customs Service	U.S. Secret Service	Military Working Dog Agency	Connecti- cut State Police	U.S. Department of Agriculture	U.S. Capitol Police
Training Buildings	3	1*	9	1*	3	1*
Administra- tion Buildings	4	1*	6	1*	2*	1*
Total	7	1	15	1	3	1
Parking Lots	1	1	2	0	0	0
Kennel Buildings	3	1	4	1	2	0
Kennel Runs	151	16	690	13	16	14

* = dual use buildings

The per-canine data presented are not strictly comparable because of a number of variables which change from agency to agency. For example, only the U.S. Secret Service and the Military Working Dog Agency purchase their canines in Europe.⁶ Other variables which are not consistent between agencies are the class sizes and the number of weeks per class. Finally, the quality of the canine produced varies from 91 percent to 95 percent proficiency. All these variables have a direct, important impact on the per-canine cost of training.

Intuitively, economies of scale should be enjoyed as training programs increase in size. The Military Working Dog Agency (MWDA), for example, appears to enjoy a lower per-canine training cost than that of the other three agencies (remembering that the Connecticut State Police do not pay for their dogs.) This may be the case, but since there are so many important variables whose values differ, a detailed cost analysis would need to be effected in order to make any definitive findings on this issue.

Finally, it is worth noting again that canine training is a labor intensive process. Economies of scale are certainly available in terms of organization and management as programs expand. These are not, however, as dramatic as those economies associated with spreading capital costs over larger and larger outputs.

E. THE BEST CANINE FOR THE JOB, AND APPROPRIATE TRAINING COSTS

Patrol Dogs

To be effective, patrol dogs must be strong and large. The canine must be able to physically stop, or at least intimidate, a suspected perpetrator. The German Shepherd and Belgian Malinois seem to fill this role especially well. In addition to their strength and mobility, these two breeds are highly intelligent, very social and they have exceptional olfactory capabilities.

⁶The preferred breeds are the Belgian Malinois or the German Shepherd, and these are purchased in the Netherlands or in Germany.

⁷For example, the MWDA is located in San Antonio, Texas, where the year-round, very mild climate eliminates the need for extensive heating facilities.

Finally, they have been bred so that their aggressive characteristic is very strong. The MWDA at Lackland Air Force Base will purchase either breed, although they have begun to lean toward the Malinois as the preferred breed. The U.S. Secret Service prefers the Malinois, and restricts current acquisitions to that breed. Both organizations purchase the canines in Europe.

Detector Dogs

A detector canine must display two basic characteristics, and almost any breed displaying such characteristics can be used as a detector. The canine's temperament must be sound and it must demonstrate a very bold attitude. This latter trait is one of independence and is reflected by the canine being hyperactive, very alert and inquisitive to all activity in its surroundings. The canine should not be aggressive toward people, but it should have an outgoing attitude, indicating the canine is convinced that the space it occupies belongs to it and that it will challenge anyone who attempts to drive it from that space.

The canine must also demonstrate a very strong, almost frantic, desire to retrieve a thrown object (sometimes referred to as a dummy). The animal must also display a very possessive attitude toward the retrieved dummy.

The U.S. Customs Service subscribes to this view, and they recruit their canines largely from animal shelters in locations along the Eastern Seaboard and the Midwest. Selection of canines is focused toward the larger breeds of working and sporting dogs such as German Shepherds, Golden Retrievers and Labrador Retrievers. It is not required that the canine be pedigreed.

The selection criteria motivating canine acquisition at the Customs Service are accepted in varying degrees by other agencies, occasionally with modest modification. The Connecticut

⁸Department of the Treasury, U.S. Customs Service. U.S. Customs Detector Dog Program (Washington, D.C.: 1978). The behavior described is very important since subsequent training is designed to develop and sustain a strong motivation to recover the dummy. During training the dummy becomes associated with the target substance, and the canine's aggressive response is actually motivated by a desire to retrieve the dummy and to play with it and the handler.

State Police, for example, will accept the large, sporting breeds, with a marked preference for the Labrador and the Golden Retriever.

Table 3 presents a summary of the breed and cost of canines used by selected canine programs. A canine with acceptable characteristics, meeting the selection criteria of a particular training program, can be acquired for a cost ranging from zero dollars to approximately \$2,500. Each program we observed has expressed satisfaction with its selection process and with the outcome: a canine trained for patrol duties or detection of drugs, explosives or accelerants.

F. CLASS SIZE, CLASS LENGTH AND NUMBER OF INSTRUCTORS PER CLASS

We noted previously that the variables of class size and duration of the training class were important factors in determining the per-canine costs of any training program. Another variable affecting per-canine costs is the number of students (i.e., canine teams) per instructor. The student to instructor ratio for selected training programs is presented in Table 4. In Table 5 we present a summary of the two variables class size and length of training for selected training programs.

It is apparent that there is significant variability in the student to instructor ratio among the programs we observed. This is an important factor explaining the differences in per-canine training costs.

⁹These dogs are obtained from Guide Dogs for the Blind in Smithtown, Long Island, and Guiding Eyes for the Blind in Patterson, New York. These organizations place pups in the homes of volunteers who raise the animals in a family atmosphere for 10 to 14 months. The objective is to enable the canines to develop social characteristics and to experience a home environment as a prelude to training and placement. Canines which are not deemed suitable to be seeing-eye dogs are given to the Connecticut State Police without charge.

Table 3

**CANINE BREEDS USED AND COSTS FOR
SELECTED CANINE TRAINING PROGRAMS**

Agency	Breed of Canine Used	Approximate Cost of Acquisition (including travel)
U.S. Customs Service	Various, Sporting & Retriever	\$600 (canines are donated)
U.S. Secret Service	Malinois	\$2,500
Military Working Dog Agency (USAF) 1/	German Shepherd and Malinois	\$2,000
Connecticut State Police	German Shepherd, Bloodhound, Labrador and Golden Retriever	None (canines are donated)
U.S. Capitol Police	German Shepherd	\$2,000

1/ Sporting breeds such as Labradors and Golden Retrievers are trained for explosives detection at the Federal Aviation Administration, and other small breeds (i.e., Beagles and Terriers) are trained for other special projects.

Table 4

TRAINEES (CANINE TEAMS) TO INSTRUCTOR RATIO

Agency	Canine trained for:			
	Patrol	Drug	Explo-sives	Accele-rants
U.S. Customs Service	n/a	6	n/a	n/a
U.S. Secret Service	6	n/a	6	n/a
Military Working Dog Agency (USAF)	3	3	3	3
Connecticut State Police	3.7	3	3	1.7
U.S. Capitol Police	6	6	6	n/a

n/a = Not applicable

Note: A canine team includes a handler and a canine.

Table 5

**CLASS SIZE AND LENGTH OF CANINE TRAINING
PROGRAMS, FOR SELECTED AGENCIES**

Agency	Class Size: Average Number of Trainees (a)				Class Length: Number of Weeks			
	Patrol	Drug	Explo-sives	Accele-rants	Patrol	Drug	Explo-sives	Accele-rants
U.S. Customs Service	n/a	6	n/a	n/a	n/a	10	n/a	n/a
U.S. Secret Service	(b)	n/a	6	n/a	(b)	n/a	20	n/a
Military Working Dog Agency (USAF) (c)	16	12	12	n/a	5	3	8.5	n/a
Connecticut State Police	11	6	6	5	14	6	6	7
U.S. Capitol Police	6	6	6	n/a	14	10	12	n/a

n/a = not applicable

NOTES:

- (a) All classes are for teams, which include a handler and a canine.
- (b) All canines are cross-trained for patrol duty and detection of explosives.
- (c) Canines are cross-trained for patrol and one of the two target scents: drugs or explosives.

G. TRAINING PROTOCOLS AND THE REINFORCEMENT/REWARD SYSTEMS

Canine training programs are premised on operant conditioning principles.¹⁰ The behavior modification sought in canine training programs is achieved through a paradigm with these three basic components: the cue, the response, and the reinforcer. Such a model, with respect to canines, would be this sequence: the "Sit" command is given; the dog sits; and the dog gets a reward. In more formal terminology:

In the presence of an environmental cue (such as the command 'Sit') a particular operant response (the dog sits down) will produce an event called a reinforcer. If this is a positive reinforcer, such as food or praise, it will increase the probability that the dog will sit when the command "Sit" is given.

A positive reinforcer is a stimulus or event that follows an animal's response and increases the probability of the recurrence of that response. . . Positive reinforcement is a reward for a behavior.¹¹

¹⁰Behavior and learning theory has identified two kinds of behavior: respondent and operant. The former refers to reflexive responses that are elicited by changes in the environment identified as stimuli. The salivating dog of Pavlovian renown is an example of respondent behavior, a result of classical conditioning. Operant behavior refers to voluntary responses which have an effect on the environment. One psychologist developed objective methods of studying the learning process empirically, and summarized the findings of his research in the Law of Effect. This stated that behavior is primarily influenced by its effects, and that an act that is followed by a satisfying effect is likely to be repeated. Scott Spretat and Susan Rogers Spretat, "Learning Principles", Veterinary Clinics of North America: Small Animal Practice. Vol. 12, No.4 (November 1982).

¹¹Ibid., pg. 597.

All the training programs we observed followed a training protocol based on operant conditioning.¹² As previously noted, however, the programs differed on such matters as student-to-instructor ratio, class size and class length. Two additional differences are the record keeping regimen and the reinforcement/reward system used in operant conditioning.

One program maintains detailed statistics on the canine's performance during each training exercise and for the duration of the training program. Other programs recorded performance only at the conclusion of training.

As to the reinforcement/reward system used, there was one agency which maintained that the food reward system was the best reinforcement regimen for training accelerant and explosives detector canines.¹³ Other programs used a combination of methods or avoided food rewards altogether.

Table 6 presents the current positive reinforcement systems used by selected agencies. Typically, we found that trainers believed that the reinforcement system used was a function of what appeared to work best for an individual canine. Most, however, started from the basic premise that praise or a toy (anything from a tennis ball to a "Kong" ball) would be

¹²The specific techniques employed in operant conditioning varied, although for specialty scent detecting canines the conditioning typically followed this sequence: imprinting with the odor, training to enable discrimination among other odors, and training in environments simulating the eventual working environments. The Military Working Dog Agency, for example, used scent boxes to imprint odors and develop discriminant ability. The U.S. Customs Canine Training Center used the "hole in the wall" protocol; and the Connecticut State Police used the "daisy wheel".

¹³The Bureau of Alcohol, Tobacco and Firearms (BATF) has indicated that they believe that a food reinforcement system is superior to all others. The BATF works with the Connecticut State Police to train accelerant and explosives detector canines.

satisfactory and sufficient. Most felt that a food reinforcement system was typically regarded as a less favored alternative, and that if used it should be discarded as soon as the canine could be weaned onto a praise or toy system.¹⁴

The exception to this general attitude is the reinforcement protocol employed by the Connecticut State Police (CSP) in the training of explosives and accelerants detector canines. The CSP is currently training specialty detector canines (accelerants and explosives) using a food reinforcement along with praise, but the protocol is based on a complete feeding system for the canines. Daily food intake is carefully monitored so that the canine is in no danger of suffering from malnutrition. However, canines trained for patrol duties, tracking and body searches are trained using a non-food reinforcer.

¹⁴The professional and scientific literature on animal behavior provides ample support for the premise that canine behavior can be modified using operant conditioning. A critical element in operant conditioning is use of a positive reinforcement (or reward). However, no scientific research was noted which shed any light on the issue of the relative value of different positive reinforcement systems. The most prevalent opinion we encountered among canine trainers and research psychologists was that positive reinforcement systems using praise or a toy were more effective than a food reinforcement system.

Table 6

REINFORCEMENT/REWARD SYSTEMS

Agency	Canine trained for:				
	Patrol	Drug	Explo-sives	Accele-rants	Agriculture Products
U.S. Customs Service	n/a	towel, praise	n/a	n/a	n/a
U.S. Secret Service	praise	n/a	praise, toy	n/a	n/a
Military Working Dog Agency (USAF)	praise, toy	praise, toy	praise, toy, or food	n/a	n/a
Connecticut State Police	praise, toy	praise & toy or food	food, praise	food, praise	n/a
U.S. Capitol Police	praise, toy	praise, toy	praise, toy	n/a	n/a
U.S. Department of Agriculture	n/a	n/a	n/a	n/a	food, praise

n/a = applicable

III. THE EFFECTIVENESS AND EFFICIENCY OF CANINE TRAINING PROGRAMS

A. THE EFFECTIVENESS OF CANINE TRAINING PROGRAMS

The ultimate test of the effectiveness of a canine training program is, theoretically, a very simple one: does the canine behave as it has been conditioned to behave?

More specifically, the answers to the following questions will tell us whether the training has succeeded. Does the canine, on cue or command, enter a building to search for and find a suspected intruder? Does the canine, on cue, take appropriate action to apprehend and hold a suspect? Does the canine, on cue, release the suspect or perpetrator? Does the canine, on cue, search for narcotics, explosives, or arson accelerants? Does the canine find the narcotics, explosives or accelerants when they are present? Does the canine use the appropriate active or passive alert?

We have deliberately made this list overly long to demonstrate that some behaviors are inherently visible: a canine fiercely barking at a suspect or physically attacking a suspect is a behavior which we can see, hear and touch (especially from the perspective of the suspect). Other behaviors are less observable from a physical perspective. To be sure, a canine which sniffs luggage to detect narcotics is clearly doing something. And when that canine notifies the handler that it has detected an odor, by alerting, it is clear that the canine believes that it has done its job.

There is insufficient objective evidence to support the view that a canine drug or explosives or accelerant detector is successfully finding 100 percent of the contraband substances 100 percent of the time. Although there is anecdotal support for the view that these substance detector canines enjoy a success rate in the 90 percent range, there is almost no information about false positives; i.e., a positive alert when no contraband substance is discovered.¹⁵

¹⁵An undated, unpublished evaluation of the laboratory and field performance of an accelerant detector canine provides an example of the kind of objective evidence needed to evaluate detector canine performance. In this evaluation samples were taken whenever the detector canine alerted, and these were subsequently subjected to chemical analyses. A positive alert was only deemed successful if verified in the laboratory. H. C. Lee and D. A. Messina, "Evaluation of Arson Canine Testing Program", Forensic Science Laboratory, Connecticut State Police.

Recommendation: In order to improve the data available to Treasury Bureaus on canine training programs, a training and field performance testing protocol should be established based on an objective, scientific methodology.

B. EFFECTIVENESS OF THE REINFORCEMENT USED IN OPERANT CONDITIONING

There are a variety of reinforcement protocols in use by the Treasury Bureaus involved in canine training programs (toy, praise and food). Is any one of these reinforcement protocols superior to another?

As mentioned above, no scientific research was noted which addresses this issue, although there is substantial anecdotal evidence supporting one or another of the reinforcement protocols. Many sources suggest that the reinforcement used will depend on the preference demonstrated by the canine; in effect saying that an appropriate reinforcement system is one which works.

That said, most of the sources went on to observe that a food reinforcement system had more negative characteristics than other systems. One observer, for example, expressed concern as to whether a canine conditioned with a food reinforcer would work effectively if it were not hungry.

We can only observe that in light of the lack of supporting scientific research, all protocols apparently enjoy a substantial measure of success. Is it important that a "one best system" be identified? Perhaps, but only if that "one best system" enjoys characteristics which facilitate the conditioning program and enhance field performance.

Recommendation: A research project should be undertaken to evaluate the range of reinforcement protocols.

C. EFFICIENCY OF CANINE TRAINING PROGRAMS

Earlier, we identified a number of variables affecting the efficiency and cost effectiveness of canine training programs. These variables were acquisition of canines (Table 3), trainees to instructor ratio (Table 4), class size and length of the canine training program (Table 5).

It is currently difficult to draw any conclusions about the efficiency and cost effectiveness of the Treasury Bureau canine training programs. This is because of the number of variables involved coupled with the paucity of data available, and the need to separate direct training costs from the costs of supporting the field canine enforcement programs.

Recommendation: Each Treasury bureau which currently trains canines, or which proposes to train them, should develop detailed cost and performance data to allow future evaluations of efficiency and cost effectiveness.

D. SIZE OF TRAINING FACILITIES

It was noted earlier that the size of existing training facilities is basically a function of the program's mission, and the need to maintain a given level of field activity. For example, the U.S. Customs facility is extensive and has the capability of training over 200 canine enforcement teams a year. The U.S. Secret Service, by contrast, has a smaller facility and has the capability of training about 12 canine teams a year.

Since canine training is a labor-intensive activity, a training center of a given size generally has the potential for expansion of its output by addition of human resources and some rescheduling of the use of its facilities. The question of consolidation of facilities may be viewed as a mission-oriented issue. In economic terms, a facility which enjoyed all economies of scale, and which operated at low costs over a broad range of output, could be established to meet Treasury Bureau needs. This would be similar in scope to the extensive training program at the Military Working Dog Agency. A consolidated facility, however, might not be able to provide the unique emphasis required by individual, specialized programs.

Recommendation: If substantial expansions of canine training programs are proposed, or if a bureau which does not currently train canines should propose the establishment of a training facility, then the proposing bureau should present an analysis of the costs and quality advantages and disadvantages of operating a separate versus a consolidated facility.

IV UNITED STATES TREASURY DEPARTMENT LAW ENFORCEMENT CANINE TRAINING PROGRAMS

A. THE UNITED STATES CUSTOMS SERVICE CANINE PROGRAM

INTRODUCTION

The basic mission of the Customs Service is to collect and protect the revenue and to enforce Customs and related laws. By the close of the decade of the sixties, the abuse of drugs had grown from being essentially a local problem into a serious national threat to the health and safety of a large number of Americans. One of Customs' major responsibilities is the interdiction and seizure of contraband narcotics and illegal drugs. Using ingenious methods to bring drugs into the country, smugglers have presented Customs with an ever-growing challenge. As more attention has focused on illegal narcotics in the last two decades, this aspect of Customs' responsibility has taken on much greater importance.

In 1969, a study undertaken by Customs to assess the feasibility of using dogs in the detection of narcotics and illegal drugs concluded that canines would be a useful tool.¹⁶ During 1970, the Department of Defense supplied Customs with training facilities, logistics and temporary support at their canine training center at Lackland Air Force Base, Texas. By April, 1970, an experimental narcotic detector dog training program began that focused on marijuana and hashish. By August of that year, in response to the President's concern over the rise in "hard" narcotics usage, Customs embarked on an experiment to determine the feasibility of training dogs to detect heroin and cocaine. The result: it was indeed possible to train a dog on all four substances. In July 1974, Customs' Detector Dog Training Program relocated from Lackland Air Force Base to its present location at Front Royal, Virginia.

The primary mission of the canine enforcement team is to help in the interdiction of illegal drugs and narcotics. Customs inspectors and special agents suggest that they regard the canine as one of many tools in the fight against drugs and narcotics. Depending on the given circumstances, however, the canine may be the best tool available in the fight against drugs.

¹⁶This study, although never published as an official document, was cited in U.S. Customs Service, U.S. Department of the Treasury, U.S. Customs Detector Dog Program (Washington, 1978) pg. 2.

THE TRAINING FACILITY

The Customs Service opened the Canine Enforcement Training Center (CETC) at Front Royal, Virginia, in 1974. The facility is located in the Shenendoah Valley on property owned by the National Park Service, encompassing a variety of buildings in two separate locations, referred to as Site A and Site B.

The training program extends over a ten week period so the Center's capacity is 218 canine enforcement teams per year. The CETC staff consists of nine developmental trainers, twelve canine course instructors, three supervisory canine instructors, and other support staff needed to operate the facility.

The CETC is located in the foothills of western Virginia, and extreme cold weather could make it difficult to train in the winter months. However, arrangements have been made to use the military's facility in San Antonio, Texas, when necessary. Customs has been able to conduct training exclusively at Front Royal since the winters have been mild during the past few years.

Front Royal Facilities: Site A

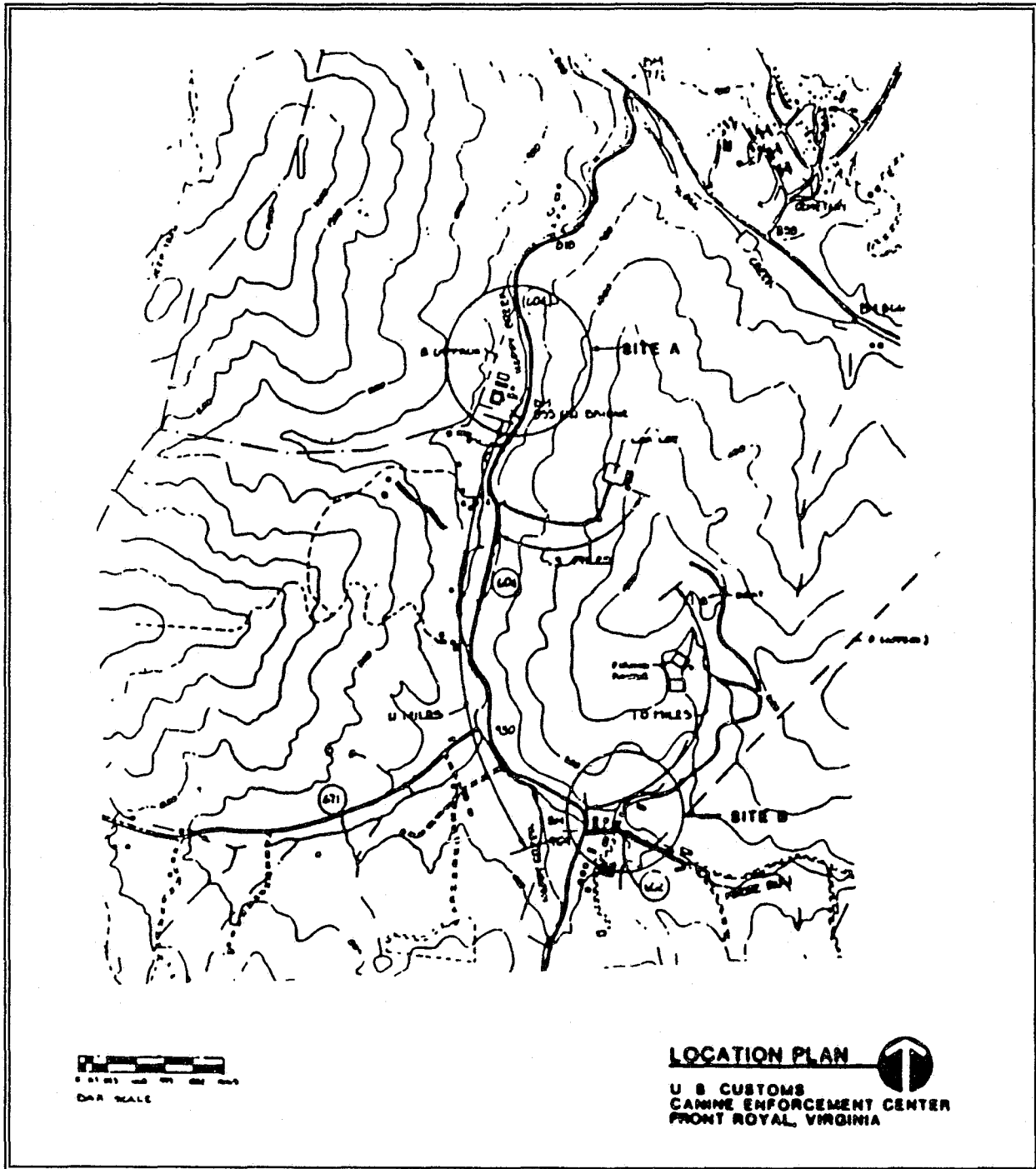
Much of the administration and support services associated with operating the CETC take place in Site A. This area includes the kennels, classrooms, offices, storage and maintenance facilities (See Figure 2).

Building 1 serves as the administrative offices of the CETC, including the instructors' offices, secretarial areas, supervisors' offices and breakout rooms. In addition, there is a conference room for briefings. This building, a remodeled hay storage barn, warehouses all the records and documentation on dogs at the training center as well as those in the field.

Building 2 is an open air breakout area used by students. Building 3 is the security office, which also contains the kennel support office, laundry facilities (one washer, one dryer) and the dog handler's locker area. This area also houses the food preparation facility for the kennel. The building is small compared to the size of the 73-dog-run kennel (building 4) attached to it.

FIGURE 1

MAP OF THE CUSTOMS TRAINING CENTER AT FRONT ROYAL



MAP OF SITE A, CUSTOMS TRAINING CENTER AT FRONT ROYAL



These kennels are in very bad repair: the floor and walls are cracking; poor ventilation causes condensation which rots the wood; and the water pipes are susceptible to freezing during the winter. In addition, the construction of this facility leaves very little room for expansion.

Building 3 also houses the Narcotic Storage facility. This contains all the materials used for training aids, from the pseudo narcotics to the contaminated luggage and boxes, which are locked in the instructor's locker. This is where the training aids are constructed as well.

Building number 6 is a 38-dog-run kennel, which includes a kitchen facility, laundry facilities (one washer, one dryer), and lockers. This building is generally in good repair; however, the ventilation system could be improved to decrease condensation that occurs when the runs are hosed down.

Building number 7 is a trailer used as a storage facility for training aids, such as empty luggage and boxes. Structures 8 and 9 are mini-barns used for maintenance and yard equipment storage. It should be noted that all maintenance done at the training center is undertaken by staff canine enforcement officers. This diverts the attention of trainers, instructors and supervisors who may have to undertake repairs.

The explosive storage area consists of 8 individual, special purpose steel lock-ups for the storage of arms, ammunition and explosives. This area is separated from the rest of the site by a large concrete wall. With the cessation of training for Saudi handlers and canines, this area has seen little use.

Academic training (2 weeks per training class) takes place in classrooms in Building 10, which includes foreign language translator booths and video systems. The proximity to the kennels makes the classroom susceptible to noise. The size of the classroom and the frequency of classes and training sessions has caused a shortage of space.

The recently completed isolation building contains another 40 kennels. This building is used to quarantine and isolate new animals as they are brought into the program. In addition, the building is used to isolate any sick animal that could have a contagious problem.

Building number 11 contains the pseudo narcotics preparation area. This new building is used in the preparation of the material used to simulate cocaine and heroin.

Front Royal Facilities: Site B

Building 1 (See Figure 3) is the luggage belt training building used to accustom the canines to actual working conditions. The plywood walls running around the inside of the building contain many recesses built in them to hold a training aid. Cardboard is placed over the recess to provide a visual barrier for the dog, and a training aid is used to imprint the odor with the canine. This procedure is repeated through many trials in order to reinforce the odor with the dog and to improve the canine and officer's search procedure. The building is relatively old, suffers from termite damage, is not insulated and does not have air conditioning.

The mail room and storage facility are located in building number 2. Included is a simulated mail conveyor belt and storage place for uncontaminated luggage and boxes.

The firing ranges are used for arms qualification. Both the small arms range and shotgun range fire into earthen berms.

There is a parking lot (250 feet by 350 feet) where a variety of motor vehicles used to train the dogs on narcotics detection are located. The first three rows of cars are used to train the canines to detect hard narcotics, and the last few rows are used for detection of soft narcotics. The lot contains abandoned automobiles (different makes and sizes), ambulances, trucks and buses.

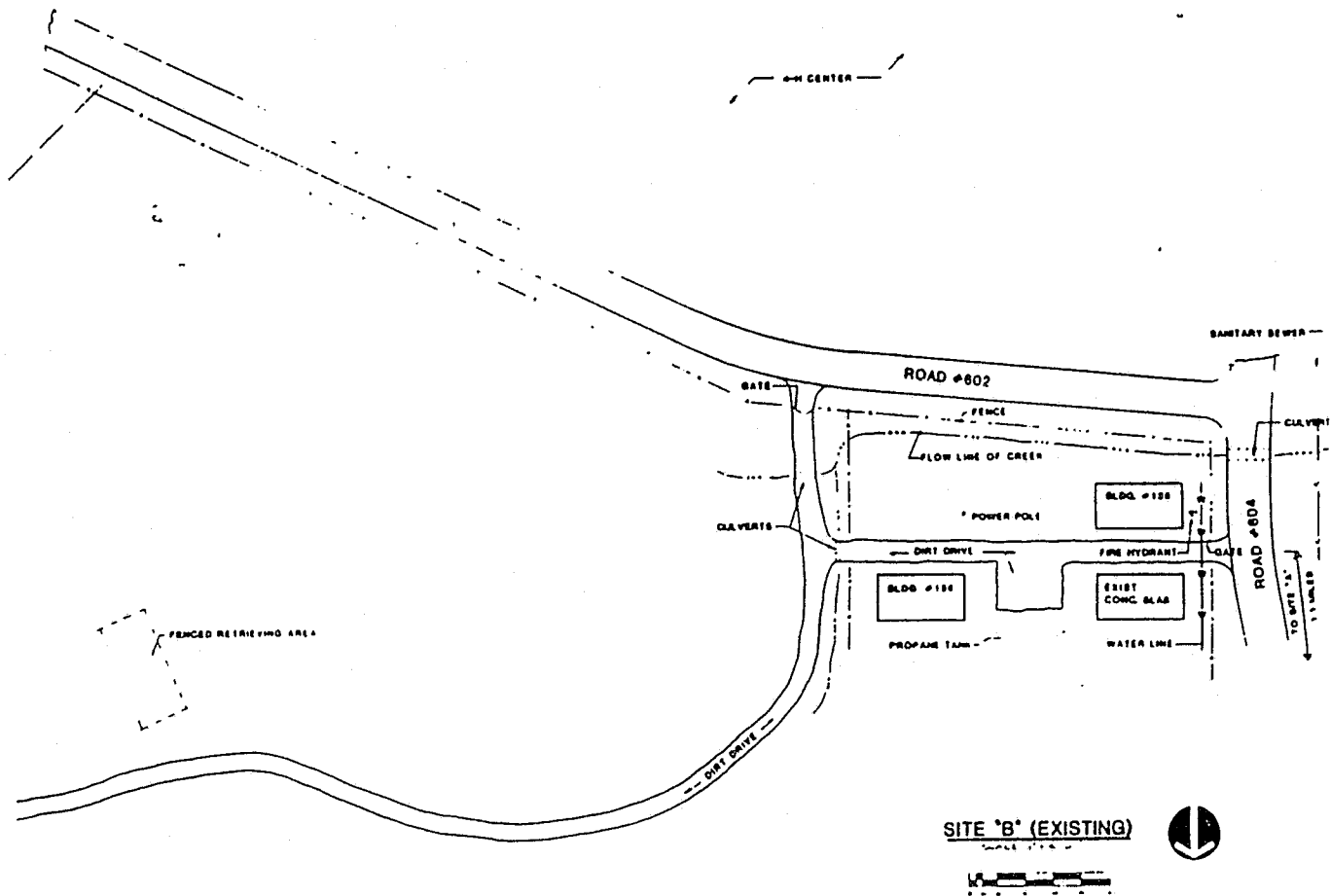
Training aids include one large boat and a small airplane. Although the facility covers much ground, space is limited because of its geographic makeup. Most of the open space occupied by the CETC lies at the top of a large hill, making expansion of existing facilities difficult.


ACQUISITION OF CANINES

Most of the canines that enter the training program at Front Royal come from animal shelters. Throughout the year instructors travel to procure dogs from shelters in three regions: the Southeast, the Midwest, and New York State. The instructors spend about three weeks on the road procuring ten dogs (the trailers hold a maximum of ten dogs). Because the instructors tend to procure dogs from the same region, they have established good relationships with many pound and shelter operators.

FIGURE 3

MAP OF SITE B, CUSTOMS TRAINING CENTER AT FRONT ROYAL



NO.		REVISION		DATE	
 DEPARTMENT OF THE TREASURY U.S. CUSTOMS SERVICE NATIONAL LOGISTICS CENTER WASHINGTON, D.C. 20540					
UNLESS NOTED OTHERWISE	UNLESS NOTED OTHERWISE	UNLESS NOTED OTHERWISE	UNLESS NOTED OTHERWISE	PROPOSED 5-YEAR DEVELOPMENT PLAN U.S. CUSTOMS SERVICE CANINE ENFORCEMENT CTR FRONT ROYAL, VA	
DESIGNED BY	CHECKED BY	PROJECT NO.	SCALE		
DATE	DATE	DATE	DATE		
				SHEET 17	

The trainers look for dogs which exhibit a natural desire to retrieve and are good physical specimens. The testing at the shelter has two elements: a game of retrieve to observe the dog's desire, and observation of the canine's adaptability to different environments. The latter might involve taking the dog into new parts of the building or automobiles, and having it walk on different kinds of surfaces. Because Customs' canines work around people and in different settings (airports, post offices, border crossings, marinas) it is necessary to ensure that the dogs are socialized and adaptable. This testing process may vary in length from 15 minutes to a half-hour. Approximately 98 percent of the canines selected for training come from shelters, and an instructor may look at as many as 50 dogs for each dog selected.

The trainers tend to pick large, good-natured sporting dogs (Labrador or Lab mixes) for the aggressive response training, and golden retrievers for passive response training. There are almost no Dobermans Pinchers or Rottweilers and very few German Shepherds in the program because they tend to be aggressive, unnecessarily intimidating the public.

After the selected dogs arrive at the CETC, they undergo ten days of medical and psychological exams to ensure that they are healthy and have a temperament appropriate for Customs' needs. Based on these tests, the instructor decides whether the canine should begin the four weeks of developmental and scent association training. It is worth noting that over 95 percent of the canines eliminated from the training process are dropped within the first three weeks of training.

THE TRAINING PROGRAM

In the early stages of the Customs' canine program, most of its officers were recruited from the Military Working Dog (MWD) Program at Lackland Air Force Base. As handlers left the military, they went to work for state or local police and the Customs Service, which was beginning to realize the value of canines in the fight against drugs.

All the officers who enter the program have one thing in common: an interest in dogs. Regardless of background, which need not include canine handling experience, each recruit must go through the training program at Front Royal.

Imprinting Process

After the dog has successfully completed the medical and psychological testing, it begins a four-week program designed to imprint the dog with the target odor. Scent association is taught in a variety of environments and helps to familiarize the dog with many different situations. For example, the scent

association training takes place in Front Royal's mock baggage building, at a local privately owned warehouse and in the mock post office. The imprinting process is designed to condition the canine to alert to a specific odor using a training aid impregnated with the target odor.

The training aid used to imprint the scent on the canine is a rolled-up towel, which can be laundered prior to use so that all odors are removed. In addition, the porous terry cloth towel emits odors easily, and is coarsely woven, allowing the dog's teeth to penetrate it. These training aids are prepared several hours before use and stored with the narcotic that will be used in training, permitting the odor to permeate the towel. A small cloth bag is attached to the aid so the narcotic odor freely escapes, ensuring that the towel is saturated with the target odor. As the canine advances into further stages of training, the type and quantity of narcotic is varied.

Reward System

The reinforcement system used as a reward in this traditional operant conditioning is the rolled-up towel used as a toy. This reward is appropriate and effective for Customs because of the locations in which Customs searches. The towel is much easier to control than a ball and its use as the imprint device maintains consistency by creating a correlation between the scent and the reward. This type of reward is preferred because it allows the officer to play a game of "tug-of-war" with the canine, increasing its desire to retrieve and reinforcing its aggressive response.

Training

Before the officers are matched with their canines, they are given two weeks of classroom training which focuses on the mission of the Customs Service, canine care, trade law, and weapons certification. Attempts are made to match an officer's personality with that of a given canine because they will work together during training and then in the field.

After the scent is imprinted, the canine and officer undertake an eight week course. This course focuses on getting the dog and officer accustomed to indoor and open air environments (luggage belts, post office belts, warehouses, automobiles, etc.), and to train the team in proper search procedures and patterns.

The goal of the training program is to accustom the canine and officer to use different search procedures in a variety of environments. Every effort is made to ensure there is no cross-contamination of target odors (e.g., marijuana or hashish with cocaine or heroin). All the elements used in training (e.g.,

suitcases, packages) are stored separately. This maintains the integrity of the training process, and it avoids the possibility of confusing the canine.

As training progresses, instructors take the classes to on-site locations at Dulles Airport, the Port of Baltimore and local warehouses to enhance their skills. Although it is impossible to simulate everything that occurs in the work place, field training provides real life situations which force the officer and canine to adjust to a variety of uncontrollable circumstances.

Performance Training in the Field

There are two types of field training: task-related and non-task-related. Task-related training is conducted daily in the canine's normal work environment, and it is designed to condition the dog to associate detecting narcotic odors in the work environment with the reward. Task-related training stimulates the canine's enthusiasm for detecting the narcotic odor and rewards the canine for finding the source.

Proficiency training exercises are carefully planned and conducted. If a canine's proficiency is to be maintained, the primary factor to consider is the canine's ability to detect narcotics in the normal work area. Canine enforcement officers (CEO's) are careful not to set up exercises which exceed the canine's capabilities.

Non-task related training takes place in locations other than the canine's normal work environment, and is designed to correct any deficiencies identified during normal employment or task-related training. Customs requires a minimum of four hours per week of non-task-related training. This type of training allows the officer to conduct exercises which stimulate the canine's motivation and refresh its capabilities.

Instructors from the CETC go into the field to recertify every canine annually. This recertification, or proficiency testing, takes approximately 2-3 days and is designed to discover problems a canine might be having. If such problems cannot be corrected on the spot the canine enforcement team will be rescheduled for intensive retraining.

Size and Length of Training Class

A training class at CETC has six canine enforcement teams and one instructor for the duration of the course. The CETC starts two classes at a time, with classes beginning every two to four weeks. This allows the CETC the flexibility to train the maximum number of teams within the given facility constraints. The training period for the canine is approximately twelve weeks:

four weeks with the trainer in developmental training (developing scent association), and eight weeks with the canine enforcement officer (CEO) trainee working on search techniques and patterns. The training period for the CEO trainee is ten weeks: two weeks in the classroom (focusing on firearm certification, Customs mission, and trade law), and eight weeks with the canine.

FIELD ACTIVITIES

Facilities at Customs' field locations vary. In all instances, the canines are kenneled, either on Customs property or with a contract kennel. Canines are not housed at the home of the canine enforcement officers, so that the canine understands that when it leaves the kennel it is time to work. Customs believes the canine will not differentiate between work and play if it is not kept in the kennel when not working.

Customs insists that upon successful completion of the training course, the canine enforcement team must be proficient enough to achieve the goals set forth at the beginning of the training period. Customs recognizes and stresses that a canine is not 100 percent effective 100 percent of the time. There are many factors which impact on the effectiveness of the canine: the amount of odor reaching the canine, the CEO, the weather, and the physical condition of the dog. Much like a human's, a canine's body can adjust to temperature. On extremely hot days however, the canine must rest at least 15 minutes in every hour worked in order to reduce the risk of heat exhaustion.

Customs' field Canine Supervisors remarked that when the new CEO and canine begin work, most of the problems lie with the CEO. Field supervisors remedy those problems by placing the new canine enforcement officer in eight weeks of supervised on-the-job training. Four weeks are spent with a canine supervisor and an additional four weeks are spent with a journeyman canine enforcement officer. This allows the canine enforcement officer to perfect search procedures and patterns, and to become familiar with actual field work.

Although a CEO and a canine work as a team, the canine can be used with other officers. However, if team members are shifted proficiency will initially decline, then return to normal levels. Customs does not, therefore, separate canine enforcement teams.

B. THE UNITED STATES SECRET SERVICE CANINE PROGRAM

INTRODUCTION

The mission of the U.S. Secret Service (USSS) Canine Program is to provide explosive detection and patrol support to the Service's protective divisions and their Uniformed Division Foreign Missions Branch. This is accomplished by deploying canine teams at the White House Complex, Foreign Missions, the Vice President's residence, and at sites visited by protectees. At the close of Fiscal Year 1992, the Service had 38 canine teams actively providing support to the protective programs.

The canine teams provide support for motorcade sweeps, material examinations, vehicle searches, suspicious vehicles/packages searches, patrol duties and personnel detection. Military and/or local police canines are utilized to supplement the USSS teams outside of Washington, D.C. The non-Secret Service canine teams would be used for outer perimeter security areas.

Training for canine teams is provided at the USSS's James J. Rowley Training Center in Beltsville, Maryland. In 1992, the USSS expects to conduct two canine basic classes, which are 20 weeks in length, and there will be five or six canine teams in each class. The number of classes scheduled each year is dependent on the needs of the Service, i.e., expansion and/or attrition. Three full-time trainers are currently employed, and each of them has over 20 years of experience as a canine handler and trainer.

Canines are trained to perform a variety of tasks, all under control of a handler who is paired with the canine at the beginning of training. This pairing continues after the training program, and the canine lives in the handler's home. The specific tasks which the canines are expected to perform encompass detection of the presence of explosives and basic patrol work, which includes criminal apprehension, tracking, scouting and article searches.

The USSS states unequivocally that there are no acceptable mechanical devices available that are capable of out-performing a canine in explosives detection. The only other acceptable alternative would be a hand-search conducted solely by Explosive Ordnance Disposal Teams. This would be a monumental task, especially in view of the diverse set of foreign and domestic locations to which the USSS protectees travel.

As part of their training, canines are exposed to conditions reflecting the environment in which they will operate when in the field. This includes vehicular traffic, hotel ballrooms and other areas, slippery flooring and noisy crowds. In addition, the canine must demonstrate that it is unafraid of gunfire.

THE TRAINING FACILITY

The USSS Canine Training Program occupies approximately 10 acres of the James J. Rowley Training Center in Beltsville, Maryland. This is a relatively new training facility, with the first building constructed in Fiscal Year 1983, and additional kennels added in Fiscal Year 1991. This building includes two offices for the canine instructors, a canine kitchen, and the kennels. A total of 13 full, indoor-outdoor kennels and three half-kennels are currently in use.¹⁷ Large, adjoining fields provide ample space for an obstacle course and field training exercises.

The main building, six full kennels and two half-kennels (used only for sick canines) were constructed at an approximate cost of \$500,000 in Fiscal Year 1983. In FY 1991, an additional eight full kennels were added at an approximate cost of \$152,000. To date, therefore, the total capital outlay has been approximately \$652,000.

ACQUISITION OF CANINES

The USSS currently uses two canine breeds: German Shepherds and Belgian Malinois. The Belgian Malinois has been selected as the breed which best supports the mission of the USSS, and the shepherd is being phased out through attrition. The canines in the USSS Canine Program are cross-trained for patrol duty and explosives detection, and the Service believes the following characteristics of the malinois make it the breed of choice:

1. The breed suffers from fewer physical defects common in large dogs; i.e., hip dysplasia, elbow arthritis and spinal problems.
2. The Malinois is faster, bites harder and has better olfactory performance than the shepherd.
3. The Malinois has a stronger work drive, is more sociable, and works better in a hot climate (because of its short hair).

¹⁷These kennels are used to house the canines during training, when the handler is out-of-town, or if the canine is sick.

The Belgian Malinois are purchased from the Police Dog Center in Liempde, Holland, at a cost of \$1,900 each.¹⁸ Two handlers/trainers travel to Holland to actually test, select and procure the canine at a cost of approximately \$3,600. This comes out to an average of \$600 per canine since 6 are usually purchased per trip. The cost per canine, therefore, averages \$2,500, or \$1,900 for the dog and \$600 for travel related costs. There are a number of criteria against which each canine is evaluated during the selection process, as shown in Table 7.

<p align="center">Table 7</p> <p align="center">Criteria Used by the U.S. Secret Service for Selection of a Belgian Malinois Canine</p>	
1.	The condition of the canine must be such that it is physically sound and capable of coping with strenuous working conditions.
2.	The weight of the canine must be at least 55 pounds.
3.	The height of the canine must be at least 22 inches at the shoulders.
4.	The canine must be between 12 and 18 months old.
5.	The canine must be a male.
6.	The hair coat of the canine can be any color; however, white canines with photosensitive nose or ears are unacceptable.
7.	The canine must be untrained but trainable.
8.	The canine must be sociable, have a good work drive, and be unafraid of gunfire, slippery flooring or vehicular traffic.

THE TRAINING PROGRAM

The canine program started with support from the District of Columbia Metropolitan Police Department's Canine Program. The implementation of the USSS own training program has also drawn

¹⁸This includes shipping and shipping crate, x-rays and a medical examination.

upon the efforts and experiences of the U.S. military working dog program, the Federal Aviation Administration and other local law enforcement programs.

In the field the canine and handler function as team; accordingly, they work together throughout the training program.¹⁹ The canines are cross-trained for patrol work and explosives detection, which is accomplished in 20 weeks.

Instructors are required to have three years of general experience and two years of specialized experience. Their background must indicate sufficient knowledge and ability to demonstrate, explain and instruct students in the use of equipment, techniques, principles and practices of training handlers and canines. Each of the three trainers on staff has over 20 years of experience as handlers and instructors.

The training program is based upon traditional operant conditioning, with positive reinforcement for desired performance. The ball reward is utilized for explosive detection and the praise system for patrol. The USSS considers consistency an important factor in the reward system, thus the use of the ball or praise. The food reward system is not utilized because it is felt that it is too difficult to control the canine's eating habits, and the canines are constantly working around food (e.g., banquets, kitchens, etc.).²⁰

Upon completion of the program, the canines are expected to perform the following tasks at an acceptable level of performance: detecting the presence of explosive odors, criminal apprehension, tracking, scouting and article searches. As noted earlier, these behaviors are learned while working in realistic environments. Cross-training is restricted to patrol and explosives detection, since these two behaviors support the protective mission of the Service.

The canine teams are trained in obedience for the first two weeks, and they are then gradually exposed to explosives detection and patrol training. Of course, obedience is stressed throughout the basic course (20 weeks). Scent discrimination

¹⁹The USSS believes very strongly in the socialization of the canine, so each canine is assigned to one handler and lives at the handler's residence. This to build a strong working relationship and bond between the handlers and the canines. The Service states that this is a strength of their program, allowing the canine to become socialized and accustomed to people.

²⁰Eating habits are hard to control because the canines live at the handlers' residences, and the canines travel frequently via commercial airlines.

training starts with imprinting, then proceeds utilizing the military paradigm described in section A of Appendix 1.

COSTS OF THE USSS CANINE TRAINING PROGRAM

In FY 1992, twelve canine teams completed training. We estimate that the average cost per canine trained is \$8,450, exclusive of facilities and other support costs. This includes the acquisition cost per canine, which is approximately \$2,500.

FIELD ACTIVITIES

Proficiency of both the canines and the handlers is maintained by retraining each of the canine teams eight hours per week: four hours in explosive detection and four hours in patrol duties. The handlers conduct daily motivational training of the canines using training aids (small amounts of explosives). This training serves to motivate the canines and to reinforce desired behavior and performance.

The USSS believes that semiannual blind or covert testing needs to be developed, and that this would improve the performance and operation of the canine program. Another worthwhile goal would be to utilize only USSS canine teams at sites visited by protectees.

APPENDIX 1. FEDERAL AND STATE LAW ENFORCEMENT CANINE TRAINING PROGRAMS

A. UNITED STATES AIR FORCE MILITARY WORKING DOG PROGRAM

INTRODUCTION

Except for a period during the Vietnam conflict, the U.S. Air Force has been the executive agency responsible for the Department of Defense (DOD) military working dog (MWD) program since the 1950's. The Military Working Dog Agency (MWDA), located at Lackland Air Force Base (LAFB) in San Antonio, Texas, is responsible for accomplishing the mission and related responsibilities of the Headquarters Air Training Command in training MWDs and handlers.²¹

Conceptually, the military working dog supplements and enhances the capabilities of security police personnel. The MWD enables security police personnel to perform their mission more effectively and provides a powerful psychological deterrent to potential offenders. The MWD team can be used in almost any military base area (including housing, shopping and industrial areas), enhancing patrol duties with the capability to detect controlled substances or explosives. Working alone, a security policeman would be much less successful in detecting drugs or explosives.

The MWDA has the responsibility for training MWDs for all military services and for the Federal Aviation Administration (FAA). At this writing, there are almost 2,000 military working dogs worldwide, as well as 75 explosives detector dogs trained by the MWDA now at work at the FAA. During Fiscal Year 1991, the MWDA trained and shipped almost 300 MWDs in order to maintain authorized levels in the field.

The MWDA has a staff of almost 175 personnel. There are over 100 experienced trainers/handlers, 30 supervisory personnel, and 35 support personnel. The support personnel include three veterinarians, six training aid preparation and control personnel, and an administrative staff.

²¹This discussion is based on observations made during a field trip to the Military Working Dog Agency at Lackland Air Force Base, San Antonio, Texas, and material included in a draft revision of Air Force Regulation 125-5, "Security Police, USAF Military Working Dog Program (November, 1991)."

The training programs at the MWDA, based upon operant²² conditioning, are designed to produce military working dogs which can perform a large number of tasks. A basic concept is that the canine is being trained to be successful; it will enthusiastically undertake to perform the tasks asked of it because it has been conditioned to associate a successful conclusion with a reward which reinforces the behavior. All canines are trained in either drug detection or explosives detection. In addition, all canines are trained in the basic guard/search/attack techniques. The MWD is not cross-trained to detect both drugs and explosives.

Upon completion of training at Lackland Air Force Base (approximately 12 weeks) the MWD is considered sufficiently proficient to effectively accomplish the tasks for which it is trained. The MWDA does not have the luxury of training a team (canine and handler) which stays together in the field. Contrary to the practice of many other law enforcement agencies, the MWD is always housed in a kennel; the handler does not take the MWD home where it may be treated as a pet. MWD's and handlers are each assigned to the field on an "as needed" basis. It would be unusual for vacancies for both to exist at the same time at one post.

Since the MWD and its handler will probably meet for the first time at the assigned duty post, a training period is required to put the finishing touches on the canine's training. First, there is the necessity to learn to work with a new handler. Second, there is the necessity to become acclimated to the new climate and physical surroundings. Canines, like people, are more effective in familiar surroundings.

THE TRAINING FACILITY

The MWDA is located on the site of an air force basic training center, and its physical facilities are not centrally located.²³ There are buildings housing the administrative operations, veterinary hospital, training aids preparation and control, basic training buildings, and at least four buildings

²²Operant conditioning results in voluntary responses which have an effect on the environment. Operant behavior results from this training paradigm: cue-->behavior-->reward. Scott Spreat and Susan Rogers Spreat, "Learning Principles", Veterinary Clinics of North America: Small Animal Practice. Vol. 12, No. 4 (November 1982).

²³Lackland Air Force Base is an Air Force basic training facility. Since the 1950's the base has been in the process of rebuilding, and the Military Working Dog Agency is housed in older buildings at a variety of locations on the base.

which have been converted to simulate warehouses and living quarters in which canines can be trained in realistic physical surroundings. An extensive obstacle course with adjacent field space for tracking, searching, and obedience training is located on a separate 10 acre tract. In addition, a large, enclosed parking area is available for maintaining a variety of motor vehicles which are used for drug and explosives detection.²⁴

Since some buildings are used on an ad hoc basis, it is difficult to state with precision how much real estate the MWDA occupies; but it is fair to say that more than 100 acres are involved. There are 15 buildings, not all of which are in top notch condition. Located in San Antonio, Texas, LAFB is not subject to extreme cold weather conditions. This makes year round maintenance of the buildings much easier.

The kennels are unheated, outdoor facilities, capable of housing 691 canines. All of the kennels are properly drained, supplied with water, and can be easily maintained at a high sanitary level. Recent renovations have included painting walls with special epoxy resins which resist soiling and impregnation with odors common to kennels. The kennels are enclosed with an 8 foot high security fence to prevent a MWD from roaming at large should it somehow get out of its kennel.

A veterinary hospital is located on site, and is staffed by three veterinarians who supply a complete range of medical services. All MWDs have annual physical examinations, periodic inoculations as appropriate, and medical care as needed.

It is difficult to estimate the capital costs entailed in creating the MWDA facility at Lackland Air Force Base. All buildings have been made available on an as required, space available basis. In addition, the MWDA is provided with the older buildings on the base, which implies that initial capital costs are unusually low. A new facility, comparable in terms of real estate and buildings, would probably entail substantial outlays.

ACQUISITION OF CANINES

The military work dog must be capable of confronting and stopping a person, which mandates that the canine selected for

²⁴The vehicles are a collection which includes small trucks, vans, buses, passenger vehicles and military vehicles. Special compartments have been constructed which duplicate possible concealment locations for drugs or explosives. The vehicles are obtained from impounded, surplus or confiscated inventories, then restored to realistically appropriate condition.

the job must be large, physically strong, with an aggressive nature. The canine must also be amenable to being socialized since its partner will be a person. Because of its breeding history and performance, the German Shepherd is typically the preferred breed of canine for this work. The Belgian Malinois has successfully claimed a role for itself since it has demonstrated traits which are equal to, and perhaps exceed, those of the German Shepherd. USAF policy is to prefer the German Shepherd, but to accept the Belgian Malinois.²⁵ Since German Shepherds bred in the United States have a marked tendency to suffer from hip problems, the MWDA has been obliged to look to Europe for its supply of canines.

The acquisition process starts with a pretest of canines at the acquisition location in Europe. Canines must be between 12 and 36 months of age, weigh at least 55 pounds, and measure at least 22 inches high at the shoulder. The canines will naturally have been socialized during this early growing-up period, but a premium is not placed on these behaviors since the MWD is always kept in a kennel when not actually working (handlers are not permitted to keep the MWD in their homes). Canines are accepted only after passing a temperament evaluation test. These tests attempt to establish that the canine can accomplish initial critical tasks.

The average acquisition cost for each canine is about \$2,000. This includes shipping the animal back to the U.S., the expense of handlers who travel to Europe to pretest and select the animals, and miscellaneous expenses related to health requirements.

THE TRAINING PROGRAM

In the field, the MWD is in reality a team encompassing both canine and handler. The MWDA, however, does not train teams which are then assigned to the field as a unit. Rather, it trains canines and handlers who are then assigned to the field where vacancies exist. In this discussion, it is important to note that it is sensible to discuss training of canines separately from the training of handlers. For example, in the training of handlers in patrol activities, an experienced MWD is used; in effect, the canine is one of the trainers.

For handlers, the basic training involves handling a MWD. This involves obedience training and obstacle course work before proceeding to the techniques involved in the more demanding

²⁵The Draft AFR 125-5, at Paragraph 3-4.a. specifically states that "the preferred breed is the German Shepherd; however, Belgian Malinois, Dutch Shepherd, or mixed German Shepherd breed (predominately German Shepherd traits) dogs are acceptable."

patrol (i.e., guard, search and attack activities). The trainees are closely monitored by experienced handlers, and the trainee typically works with an experienced working dog in the early stages of this training. There are about 100 experienced dogs in residence at the MWDA. This training extends over a 6 week period, after which the handler is ready to learn how to handle a MWD in drug or explosives detection. Each of the two detection courses is 5 weeks long, so the basic training for a handler is 11 weeks.

The training periods for the canines are expressed in days and vary from animal to animal. Like their partners, all canines do not learn at the same rate. The average drug detection program covers 13 days of training in this activity, while the average explosives detection program covers 43 days of training. Since the basic patrol training is 25 days, a canine is in training either 38 or 68 days.

At the MWDA, the canines are not cross-trained for drugs and explosives. Experience has dictated that the canine first be trained in either drug detection or explosives detection, and then trained in the basic patrol activities. If the canine has not been trained for aggressive patrol duty, there will be more options for a shift of the canine out of the MWD program in the event it cannot successfully complete either the drug or explosives detection training.

Experienced handlers are involved in training the canines in all phases of training, and the trainers are closely monitored by supervisory instructors. In addition, a timely, accurate record of all phases of training is maintained, so that a canine's progress may be pinpointed at all times. This record follows the canine throughout its military career.

Training techniques for the canines are based on the basic operant conditioning. The canine is trained to perform a task in such a fashion that it will not only enjoy the activity but it will receive positive reinforcement. The positive reinforcement may take the form of verbal and physical praise (petting, stroking), toy (in the form of a "Kong" ball, squeeze toy or regular ball) or food. These three forms of reward are used throughout training, and the frequency of use will vary depending upon the temperament and needs of the canine.

Training aids are a critical element in the development of the MWD team. In the guard/search/attack training, the training "aid" is an individual who must be found, apprehended, or attacked. This offender typically wears only a heavily padded sleeve on the right hand and arm, which is "offered" to a canine

which is attacking.²⁶ Although complete body "armor" would provide better protection in training, it is both expensive and clumsy.

The training aids used for drug detection training are small, sealed canisters which contain a sufficient amount of the targeted drug to provide a detectable scent. The canister is perforated at one end to enable the odor of the drug to permeate its surroundings. The MWD is trained to detect at least four controlled substances, and may be successfully trained to detect other illegal drugs in the field.²⁷ The materials used in the training aids are obtained from law enforcement agencies which have confiscated such drugs during normal enforcement activities.

Materials used in training for explosives detection receive more than the careful handling accorded controlled substances because of the destructive power of the explosives. Risks associated with handling explosives are minimized, however, by strict observance of proven safety protocols in handling and transporting the explosives. Actual explosives, obviously, must be used if the explosives detection training is to be successful.

The staff handling the preparation, storage and distribution of training aids for the MWDA is also responsible for supplying training aids to the field for use in proficiency training. These operations are maintained under carefully controlled conditions.

It was noted earlier that the MWD has unique qualities used to enforce military laws and regulations. The MWDA has a set of clear objectives which makes those qualities effective:²⁸

²⁶The canine is not trained to attack only the arm of the perpetrator. In fact, the canine will bite whatever part of the body is most conveniently accessible. One supervising trainer related that although he had never been bitten on an arm during training, he had received several bites to his stomach and side and to both his legs.

²⁷The four target drugs are marijuana, hashish, cocaine and heroin. Detection of methamphetamine is a skill which may be added in the field.

²⁸Although these objectives have been couched in terms of a MWD team, the MWDA considers that handlers and the MWD are two separable and distinct "products" of its training program. The team would not function without both halves. In the following discussion, however, we will focus upon the tasks the MWD is expected to master with the understanding that the handler is also mastering the mirror of those tasks.

1. To train a MWD team which is effective in patrol activities;
2. To train a MWD team which is effective in detecting controlled substances; and,
3. To train a MWD team which is effective in detecting explosives.

All MWD teams are trained to accomplish objective 1 and either objective 2 or 3. The MWD is never cross-trained to accomplish both objectives 2 and 3. The sequence typically followed is to train the MWD in either drug detection or explosives detection, and then to follow up with the training for patrol. The MWD is taught to give a passive response upon detecting either drugs or explosives.

Training the MWD for the patrol functions involves training in obedience, controlled aggression, building search, scouting and patrolling, small arms fire, escort, and vehicle patrol. Using the praise and toy reward²⁹ system the MWD is conditioned to display the desired behaviors.

In the area of obedience, the dog must execute the commands sit, down, heel and stay on the verbal direction of the handler. These must be achieved while the dog is at the handler's side and also while the handler is at least 10 feet away. In addition, the dog must respond to the handler's commands at a distance of at least 40 feet. When given the command to stay the dog must remain in the sit position for a reasonable length of time.

The controlled aggression tasks involve a false run, an attack, a stand-off and a search and attack. In each of these critical behaviors the dog must be responsive to the directions given by the handler.³⁰

²⁹These behaviors are discussed in Chapter 5 of Draft AFR 125-5, "MWD Performance Standards and Evaluation Procedures".

³⁰For example, Paragraph 5-2. b. (5) of Draft AFR 125-5 discusses the performance standard for the "search and call-by", a critical performance: "(a) Initial. The dog must, on the command STAY, remain in the down or sit position while the handler searches a suspect who is 10 feet from the dog. After the search, the handler moves to a position 10 feet to the rear and two paces to the right of the suspect, then facing the dog, commands the dog to HEEL. The dog must return to the heel position without biting or displaying aggression toward the suspect."

Training the MWD for drug detection at the MWDA is begun by imprinting the target odor, utilizing the scent box protocol. To meet the performance criteria on any one odor, 7 sequential steps, with a total of 45 separate unassisted trials must be accomplished.³¹ A "trial" is essentially an opportunity for the dog to successfully detect the odor of a controlled substance. The training begins with an aid being placed in a cardboard box, and the dog is allowed to detect the odor with a reward for detection and subsequent alert.³² Table 8 shows the scent box training process.

During this basic training (and all other training as well) the dog is being conditioned to succeed at the task presented. The handler does not respond to unwanted behavior with negative reinforcement; instead, there is no reward, and the dog is presented with a new opportunity to perform the task successfully. Dogs, like people, react differently to different situations. The handler and trainer must be alert to recognize problems which the dog may be having with a task, and to provide an unhurried opportunity for the dog to overcome those problems.

Once the basic training for imprinting with scent boxes is completed (i.e., the dog meets the criteria for detection of the target odor), the task is performed in more natural surroundings. For example, the dog is taught to perform the search for a target odor in a bedroom or an office, a truck, a passenger vehicle, a warehouse or an airplane. This training exposes the dog to expected working environments, conditioning which is essential since the dog will be uncomfortable, and may be confused, in unfamiliar surroundings.

³¹As noted earlier, the drug detector dog is trained to detect four drug odors: marijuana, hashish, cocaine and heroin.

³²Canines are trained to give either an aggressive or passive alert. An aggressive alert has the canine attempting to physically reach the source of the odor, using its paws to scratch and its jaws to bite through the container. Drug detector canines trained by the U.S. Customs Service are trained to give an aggressive response when searching vehicles and containers. The passive alert has the canine sit when the target odor is detected. This method is used whenever people may be the "carriers" of the target substances, and when the targets are explosives.

Table 8
SCENT BOX USE*

Step I--One box	AID	Five Trials			
Step II--Two boxes		AID	Five Trials		
Step III--two boxes		AID	Five Trials Switching Positions		
Step IV--three boxes			AID	Five Trials	
Step V--three boxes	AID			Five Trials position 1,3,2,1...	
Step VI--four boxes				AID	Five Trials
Step VII--four boxes	AID				Fifteen Trials Position 1,3,2,4,1... Total 45 Trials

*To meet criteria, all trials must be unassisted, correct final responses.

NOTE: This illustration shows the seven (7) sequential steps a dog must successfully accomplish in order to meet criteria on any one odor. This must be accomplished before the dog can be advanced to the next odor.

Source: Department of the Air Force, DOD Military Working Dog Agency.
Military Working Dog Owners Manual (Lackland Air Force Base, Texas: June 1991)

These exercises are situations where the dog should actively search, sniffing areas and objects as shown by the handler. The search must be systematic, and nothing which is a potential hiding place may be overlooked. When the dog smells an odor it is trained to detect, it should try to go to the source of the odor and alert. The handler then rewards the dog and continues the search until the exercise is completed.³³ Drug detection dog teams should achieve and maintain a 90 percent accuracy rate. If a detector dog has an overall average of 90 percent, but is below 90 percent on a specific substance, training is increased on the specific substance to raise the detection rate of the dog.

Training the dog to detect explosives follows the same procedures as the training for drug detection. Imprinting the target odor starts with the scent boxes and progresses to "field" exercises. The explosives detection dog teams should achieve and maintain a 95 percent accuracy rate.³⁴

COSTS OF THE PROGRAM

Unofficial estimates of the costs of procuring and training the military working dog suggest that this unique security assistant, which has a working life averaging about 7 years, is a sensible investment. The following are the average procurement and training costs per MWD, by function, for Fiscal Year 1992:

Patrol Dog	\$ 9,672
Patrol/Drug Detector	12,929
Patrol/Explosives Detector	13,359

FIELD ACTIVITIES

The majority of the drug explosives detector dogs are initially certified by the MWDA. Each MWD team (i.e., the MWD and handler) undergoes certification by the base security authority when first assigned to duty. Quarterly recertification is required thereafter.

An actual demonstration is not required for recertification unless records show a reliability rate below the required performance of accuracy rates. Full recertification is also required whenever a MWD team's proficiency training has been interrupted for 30 consecutive days or more for any reason.

³³Draft AFR 125-5, Paragraph 5-3. b., which discusses the procedure for determining efficiency of the MWD team.

³⁴The explosives detector dog is trained to detect a number of different types, including TNT, C-4, and smokeless black powder.

The MWD team may be assigned in response to specific requests from other Federal government agencies or local law enforcement agencies. For example, explosive detector dog teams may be assigned at the request of the U.S. Secret Service for presidential protective duties. In such instances the team is assigned as a unit; a military working dog may never be assigned for use without its handler. Use of the MWD team is restricted for the purpose requested; searches of individuals by either drug detector dogs or explosives detector dogs are not authorized or permitted.

B. CONNECTICUT STATE POLICE CANINE PROGRAM

INTRODUCTION

The Connecticut State Police (CSP) consider the canine an important tool in enforcing the laws of Connecticut. The canine program in Connecticut is one of the older programs in the United States, having started in 1937 with the use of tracking canines.³⁵ Seven years later the CSP expanded its program to include the use of Doberman Pinchers in patrol work. The program was terminated in 1947, but subsequently reactivated in 1963.³⁶

The canine program at the CSP is part of the Emergency Services Unit. After training, the state trooper and the canine are considered a team which is not separated under normal operating conditions. The canine lives at the trooper's home, with the trooper's family. At this time there are 50 teams operating, 40 of which are restricted to patrol duties and 10 which have been trained for one of the specialty duties: detection of accelerants, drugs, explosives or cadaver search.³⁷

Three state troopers are assigned to training duties, and their home base is the Canine Training Center (CTC) at the Leo J. Mulcahy State Police Complex in Meriden, Connecticut. The CTC's main training areas and kennels occupy about 6 acres of the Complex's 100 acres. Other buildings and motor vehicle compounds at the Complex are also available for training canine teams in normal, realistic environments.³⁸ These trainers can handle an average of 7 classes per year.

The size of each class depends upon the nature of the training, e.g., patrol or detection of drugs, accelerants or explosives, and can range from only 4 canine teams to as many as 14 canine teams. On average, the present program has the capability for training 60 canine teams per year. An important feature of the program is its emphasis upon training the team in

³⁵Samuel G. Chapman. "Police Dogs in North America", Springfield, Illinois: Charles C. Thomas, 1990, page 24.

³⁶The CSP's program in 1947 was described by Chapman as a "modest all-purpose program." Ibid., page 24.

³⁷Although patrol dogs are cross-trained for drug or explosives detection, or cadaver search, accelerant detector dogs are not cross-trained.

³⁸Class size and length of training period vary with the type of duty expected.

the actual geographical and physical environment in which it will operate. The final week of formal training, particularly for the accelerant detection team, is accomplished at the trooper's permanent duty post.

At the conclusion of the training program the detector canine is expected to perform at an acceptable level of performance whenever called upon to do so. This performance level is maintained in the field with one day of training per month for the patrol canines and quarterly training sessions for detector canines. There is a periodic review and testing in the field of canine performance. The canine team is expected to perform under all climatic conditions normal to the State of Connecticut, but performance levels are affected by conditions of extreme cold or heat.

THE TRAINING FACILITY

The size of the training facility comfortably accommodates the CSP's annual goals for the training program (i.e., an average of 60 canine teams a year). A small building provides classroom space and other administrative functions. There is a canine obstacle course covering an acre, and ample field space for use of the training aids such as the daisy wheel, box and baggage searches.

The facility has a kennel with 13 runs, and these are used for housing canines which are in training. The kennels enable the canines to either stay indoors or to go out. The kennels are maintained by part-time support staff.

The training facility is adequate for the basic training of the canines because an integral part of the training process is to work the canine in the actual field environments in which it is expected to perform. To this end, the CSP has a number of informal arrangements with the private and public sector through which training is conducted "on location."³⁹ This results in a canine which gradually learns to cope with the noise and confusion present in the real world, with the expectation that the canine will function much more effectively.

³⁹ For example, exercises to train canines to detect explosives are conducted at the international airport in Hartford. Canine teams search incoming luggage and warehouse areas, and they board empty jumbo jets in order to search for explosives.

The need for medical services is filled by contracting with veterinarians in proximity to the training center. Each canine receives a complete physical examination, inoculations against common canine diseases, and medical treatment as required. The feeding program for each canine is also reviewed and approved by the veterinarian.

ACQUISITION OF CANINES

The breeds of choice for canines trained as accelerant or explosives detectors are the Labrador and Golden Retriever, obtained from Guide Dogs for the Blind in Smithtown, Long Island and Guiding Eyes for the Blind in Patterson, NY. These breeds are selected because of their temperament and intelligence, and they are also used for narcotics detection. The canines are neutered upon acquisition in order to remove their sex drive.

The German Shepherds are obtained from Fidelco Guide Dog Center in Bloomfield, Connecticut (without cost, at an age of from eight to fourteen months) or from private individuals; and it is the breed used for patrol work, cadaver search, and tracking. The shepherd's size and aggressiveness make it very effective in performing these police duties, and some of them are cross-trained for narcotics detection. Bloodhounds are also used for tracking, but their use is limited to this function. The CSP's canine program does not incur any acquisition costs since all canines are obtained as donations.

THE TRAINING PROGRAM

The canine program of the CSP encompasses training for all aspects of patrol duty and at least five specialty assignments: narcotics, explosives, and accelerant detection; tracking and cadaver search. The time required for each type of training is indicated in Table 9.

The three trainers are state troopers who have had extensive experience as handlers and trainers. A recent retiree who was the senior trainer, for example, had a total of 25 years experience as a canine handler and over 16 years experience as a trainer. This level of experience enhances the depth and quality of the program, and produces "graduates" with high performance skills.

The training of the canines is based upon operant conditioning, with positive reinforcement for desired performance. Negative reinforcement, or punishment, is not normally employed when the canine displays unwanted behavior. In scent detection exercises, for example, the proper technique when a canine stops searching is to return to the starting position

and to start the search over. This has the benefit of avoiding confusion in the mind of the canine, and does not diminish the confidence which the canine might have acquired to that point in the training.

The rewards used for positive enforcement depend upon the expected activity resulting from the training. These include simple praise, a toy, or food. The reward used, by type of activity, is shown in Table 10.

<p>Table 9</p> <p>Training Time Required for Each Kind of Activity</p>	
Patrol Duty	14 weeks
Accelerant Detection	6 weeks
Explosives Detection	10 weeks
Narcotics Detection	6 weeks
Cadaver Search	3 weeks
Tracking	<ul style="list-style-type: none"> - incorporated into patrol course - 3 weeks, Bloodhound training

<p>Table 10</p> <p>Reward Used for Positive Reinforcement for Each Activity</p>	
Patrol Duty	Toy and Praise
Accelerant Detection	Food
Explosives Detection	Food
Narcotics Detection	Toy, Praise, and Food
Cadaver Search	Toy and Praise
Tracking	Toy and Praise

The use of food as a reward and for positive reinforcement started in 1986 with the training of a canine for arson accelerant detection.⁴⁰ The success of the food reward system, based upon the canine's basic instinct for survival, persuaded the CSP that it would also be effective in training and developing the explosives detector canine. Therefore, all accelerant and explosive detector dogs are on food reward. As a matter of policy, however, canines which were trained for patrol duty and then cross-trained for explosives detection remain on the toy/praise reward system, since retraining to a food reward system would be difficult.

The aids used in training exercises are prepared and controlled by the instructional staff. The materials used as aids in CSP training are obtained from a number of sources. Some are purchased from pharmaceutical companies; explosives are obtained from the bomb squad. Other materials are obtained from the courts and from other law enforcement agencies: contraband materials which are typically confiscated and made available on an "as needed" basis.

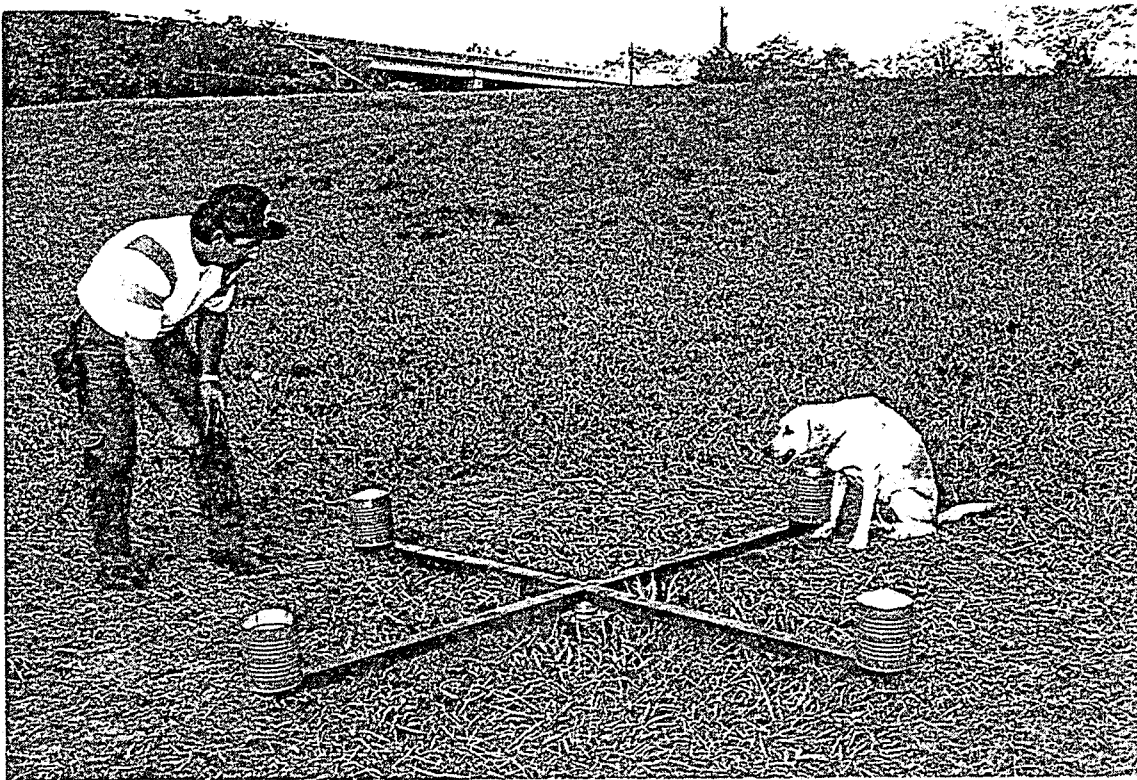
It is the policy of the CSP to cross-train canines in patrol capability plus one of the specialty capabilities. The patrol training is accomplished, then the canine is cross-trained in one of the specialty duties. There are, however, several exceptions. Canines used as accelerant detectors are trained for that purpose and none other since they must be available on short notice for arson work anywhere in the country. Bloodhounds are used exclusively for tracking are not cross-trained for patrol duty.

When training the canine for detecting target odors a variety of containers are used for the training aids. These include concrete blocks, cardboard boxes, and cans mounted on a daisy wheel, as shown in Figure 4. During the imprinting of the target odor, the canine is exposed only to the training aid. Once imprinting is achieved, the canine is exposed to more complex exercises which are designed to teach the canine to discriminate between the target odor and other non-target odors. The rapidity with which the canine masters detection of all

⁴⁰In 1986, the Connecticut State Police and the Bureau of Alcohol, Tobacco and Firearms (BATF) cooperated in a pilot project designed to train a canine to detect arson accelerants. This pilot project followed a feasibility study conducted by BATF. Also, BATF has a testing protocol based on scientific methodology that tests both the accelerant and explosives detection canine. The testing is conducted by ATF forensic chemists, and ATF reports that the testing protocol has been presented to the International Civil Aviation Organization and the scientific community through meetings and seminars.

FIGURE 4

The Use of Cans on a Daisy Wheel to Teach Olfactory Selection



target odors varies with the individual animal, but the objective is 100 percent success in alerting to target odors.⁴¹

The drug detector canines are trained to detect four illegal drugs: heroin, cocaine, hashish and marijuana. The accelerant detector canines have been trained to recognize 18 document accelerants typically used in arson cases. The explosives detector canines can recognize five basic explosives groups, with the extraordinary result that the canines are able to detect over 12,000 explosives.

COSTS OF THE CSP CANINE PROGRAM

Exact costs of the training operation are not readily available, but an unofficial estimate of the cost of training one canine can be made based upon the number of instructors and an estimate of the annual operating costs of the canine training facility. These data suggest that the average cost to the CSP of training a canine is just under \$13,000.⁴² As indicated above, this does not include any acquisition cost for the canine itself.

FIELD ACTIVITIES

The canines live in the homes of the troopers/handlers, who are responsible for the feeding and care of the animal. The trooper is also responsible for field training designed to maintain the performance level of the canine. All specialty detector canines are required to receive three consecutive days of training each quarter, while all other canines undergo one day of training per month. The trooper/handler is responsible for providing or securing training whenever the canine is observed to be performing at an unacceptable level.

The accelerant, narcotic and explosives detector teams are assigned to normal duty posts, as are all other canine teams. Teams with these two specialties, however, are available on a moment's notice to respond to arson incidents or bomb threats. Both serve in the National Response Team program of the Treasury's Bureau of Alcohol, Tobacco and Firearms.

⁴¹Mr. Douglas Lancelot, a former instructor in the CSP canine program, suggests that a canine's potential is evident very early in the training process.

⁴²These estimates assume the following: 1) annual instructor costs average \$109,000; 2) annual operating costs are \$100,000; and 3) 16 canines are trained each year.

C. UNITED STATES CAPITOL POLICE CANINE UNIT

INTRODUCTION

The Capitol Police Canine Unit (CPCU) was established in 1971 when the U.S. Congress allotted funds for the acquisition of twelve dogs. All were trained as patrol dogs, and six were cross-trained in explosives. Until the Capitol Police began their own training program in 1979, the canines were trained by the Metropolitan Police Force, Washington, D.C. The CPCU currently has 30 canine teams working in the field.

The Capitol Police are responsible for security at the Capitol complex and other buildings that congressional leaders may be visiting. In addition, they also provide protection for foreign dignitaries. The canine team is primarily used in "searching and securing" buildings to ensure that there are no explosives. They are also used for patrol duty. The Capitol Police estimate that they conduct 35,000 security searches in a given year.

ACQUISITION OF CANINES

The Capitol Police get their dogs through public donations and a purchasing agent in Germany. Like the military, they are looking for big, intimidating dogs that can be trained in patrol and detector duties (all the dogs are now cross-trained). German Shepherds have continued to meet their general requirements for police service and specialty functions. The Belgian Malinois though long admired by Capitol Police instructors for its high prey drive, has been avoided based on its temperament and the nature and sensitivity of the geographical working environment.

In the early years of the program, the CPCU went abroad to acquire canines. However, this turned out to be prohibitively expensive; they now acquire canines through a purchasing agent. The CPCU have executed an agreement with a former canine trainer for the German State Police, with specifications and requirements for the purchase of canines.

Before the canines' arrival, they undergo a complete medical examination. This includes all the necessary shots, full hip and shoulder x-rays to check for dysplasia and a complete blood test. Upon arrival, they undergo an additional medical exam for heartworm. To date, the CPCU has not had cause to return a canine to the agent.

TRAINING PROGRAM

The CPCU combined and modified police and military directives focusing on canine training. They believed that the military style of training, which is very rigid, does not adequately represent situations encountered on the street.

Training begins when the canine is between 14 and 18 months old. Canines work in the field for about 7-8 years before retiring at 8-9 years of age. The optimal size for the training class is four teams and an instructor, which allows for individual attention when needed, while still keeping to the training schedule. Larger classes can become restless, resulting in poorly trained canines and handlers. A limitation of six canine teams, per instructor has been set as a standard for all courses of instruction.

The trainer places the target substance in canvass bags and hides these in different locations. This is to get the canine to key on the canvass bag and the odor and to build motivation and work drive toward the source of the odor. When the dog gets more proficient in its ability to locate the bag, the trainer will begin to focus on teaching the canine the proper response, which is to sit at the location of the target odor. As the canine learns the appropriate response, the substance is removed from the bag and placed in its natural state, with the trainer varying the height and depth of its placement and the packaging of the substance. The Capitol Police introduce four new scents a week, with a total of 16 introduced during the course.

About 90 percent of the canines are rewarded using a "Kong" ball. This ball is odd shaped and bounces wildly, keeping the canine's motivation at a high level. The trainers avoid a food reward because they do not want the canine to start keying on the wrong odor. In cases where the kong ball is not used, they will use a rag. Only in extreme cases will the canine be rewarded with food.

After the training begins the canines will spend approximately three days a week on the streets and in building sites. The training schedule runs 26 weeks total. The length of the class is longer because all canines are cross-trained in explosives and patrol work. The canines and handlers undergo a twelve week explosives class, then a fourteen week street patrol and criminal apprehension course. After the completion of the initial twelve weeks, the canines spend several months in the field and then they return to complete patrol training. This allows the canine and handler to hone their skills before starting a new training procedure. Besides improving performance, it allows the trainers to correct any problems that might have developed while out in the field.

In addition to the instructors' training program, the program offers a four week trainers' instruction program. This helps ensure that all the officers involved in training will have uniform knowledge of training procedures.

After the completion of the training regimen, the canine should be quicker at recognizing the target substance, faster at responding appropriately, and be strongly motivated. Capitol Police estimate that a dog works approximately four hours during an eight hour shift. After the first four weeks in the field, they estimate that a canine will be about 80% effective, a rate with which they are more than satisfied. After an additional six months in the field, they estimate that the canine team will average a 90% or better rating of proficiency.

D. UNITED STATES DEPARTMENT OF AGRICULTURE BEAGLE BRIGADE

INTRODUCTION

The Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is responsible for keeping pests and diseases from entering the United States. As the largest employer and biggest industry in the nation, agriculture is under constant threat of attack. The attack comes from countless pests and diseases which can enter this country in a variety of ways.

Forbidden fruits and vegetables can carry a whole range of diseases and pests. For example, a single infected orange can introduce the Mediterranean fruit fly. If the Medfly were allowed to establish itself in citrus-producing states, the industry could lose billions of dollars each year. State and Federal governments have spent as much as \$100 million to eradicate outbreaks of the Medfly.

APHIS inspectors are on duty at airports, seaports, border stations, rail and truck yards to inspect passengers and cargo entering from foreign countries. In Fiscal Year 1990, APHIS inspectors cleared entry for 475 million people and 370,000 aircraft entering the U.S. Inspectors made more than 1,000,000 interceptions of prohibited products, finding and confiscating nearly 58,000 plant pests and diseases.

The Department of Agriculture's Beagle Brigade began in 1984 with a single dog at Los Angeles International Airport, and today the beagle teams work at 15 international airports.⁴³ The beagles sniff luggage for the scent of agricultural products and animals. If they detect something, the dogs execute a passive alert by sitting next to the suspect bag; the handler will then search the bag for contraband.⁴⁴

As Customs' canine units are but one tool in the effort to interdict illegal drugs and narcotics, so too is the Department of Agriculture's Beagle Brigade. However, some aspects of the Beagle Brigade differ significantly from the U.S. Customs

⁴³These international airports are Atlanta, Logan, O'Hare, Newark, Detroit, Dulles, Oahu, Houston, LAX, Miami, JFK, Orlando, San Juan, San Francisco, and Seatac.

⁴⁴The USDA also has a Postal Detector Dog Unit which is separate from the Beagle Brigade. These canines are of medium size and aggressive. They are trained to execute an aggressive alert, and are located at these international postal facilities: Secaucus, N.J., Los Angeles and Oakland, California, Oahu, Hawaii and Miami, Florida.

Service. Unlike the willful smugglers faced by Customs, people who import prohibited products tend to be unaware of the prohibition on those items. Willful smuggling of prohibited agricultural products is not as lucrative as smuggling of drugs, lessening the extent to which people are willing to attempt this. In addition, people who import prohibited plant and animal products are not as well organized or as creative in concealing these items as those that Customs faces.

Those attempting to import prohibited food products or who fail to disclose importation of certain legal food products face civil rather than criminal penalties. If products are not declared, the importer will face civil penalties of \$50 to \$100 on agricultural items. Travelers may contest the fine, but it can be increased to \$1,000 if the court rules against them. Each month, about 1,700 people are fined a total of approximately \$100,000.

THE TRAINING FACILITY

APHIS operates Beagle Brigade training centers in New York, Miami, and San Francisco. Each training center serves as the supplier for that region. The training centers are located at airports. Agriculture believes (as do most other trainers) that the best way to ensure quality training is to simulate the work environment as closely as possible.

ACQUISITION OF CANINES

The Department of Agriculture obtains its canines from shelters and pounds, and it will accept donated dogs. The Department of Agriculture will utilize only beagles because of their sense of smell and their friendly demeanor. The beagles are cooperative and gentle with humans. This last characteristic is extremely important because of the beagles' work area, where people go to retrieve luggage. This environment would be difficult for many breeds to work in, given the commotion and confusion generated by crowds and luggage. The beagles are raised in packs and stay calm when confronted with this situation. The beagle's size and durability allow it to inspect luggage that might not be easily accessible.

TRAINING PROGRAM

Agriculture has made arrangements with airlines using New York's Kennedy International Airport to utilize terminals that are not being used at certain hours for training purposes. This allows them to train canine in the same location that the canine will eventually work. Agriculture has also made kennel

arrangements with the Animalport office at the airport. Agriculture built a small kennel (eight runs with two dogs per run) next to Animalport, which checks and feeds the dogs.

A trainer will spend five weeks imprinting target odors with the beagles. After the conclusion of the five-week course, the beagles and handlers begin a seven-week course focusing on search procedures and patterns. The total length of the course is 12 weeks. In the past canine handlers were classified separately from inspectors, but this changed on January 1, 1992. Today, canine handlers and inspectors are integrated within APHIS.

Before attempting to train the detector beagle, the trainer will: 1) establish the alert response the dog must learn upon detecting the target odor; 2) determine the primary reward used as a reinforcement; 3) determine the criterion the beagle must meet before moving on to the next task; 4) identify the order of the items the beagle is to detect; and 5) decide the weight or number of items to be used to reach each criterion.

The actual imprinting procedure is similar to the one the military uses. The target odor is placed in a box and the command "seek" is given so the beagle hits the odor and responds properly. Additional boxes are gradually added.

As additional trials are conducted the handler gradually increases the time period from the time the beagle sniffs the odor to the time the beagle is cued to sit. This allows the beagle to make its own decision to sit without verbal or physical direction from the handler. The training process with the boxes is done repeatedly, until the beagle meets the first criterion detection level. After that level has been met, the beagle's behavior is shaped by changing the search pattern, searching distance, and the search time. Quantities of the items are also changed so that the beagle's capability meets operational needs. In addition to introducing variability in the training process by using suitcases instead of boxes, non-target items (e.g., fish, cookies, and clothes) are included with the target items. As the beagle reaches the criterion detection level on each odor the daily number of trials is reduced on that odor. The largest number of trials are conducted on new items.

In order to ensure that the beagle is searching as efficiently as possible, the handler develops a search pattern. The handler uses both verbal and hand gestures to cue the beagle to search from left to right and up and down. As the training progresses the need to cue the beagle decreases as the beagle searches on its own. Although the overall search pattern does not change significantly, the beagles are conditioned to search for openings that will allow the smell of prohibited items to escape.

Proficiency training is an extension of the initial training, utilizing many of the same procedures. Proficiency training is necessary to correct deficiencies and to maintain performance levels. The handler will strive to increase the performance of the beagle by increasing the difficulty level of the search. This is achieved by the careful placement of training aids throughout the area to be searched. Proficiency training is conducted on a continuous basis, and exercises are based on the needs of the particular beagle.

Validation testing is an extension of proficiency testing, and it is designed to establish the credibility of the detector team from a legal standpoint. Validation training is conducted at the end of the training course by the course trainer. Validation tests must be realistic and random. Once the canine and the handler have successfully completed the validation testing, they are ready to be sent to their home port.

Agriculture estimates that it takes about three months for a new beagle to become acclimated to the new environment. Although the results for the first two months tend to be mediocre, the progression after this period is rapid and steady. The Department of Agriculture chronicles the development of the canines through three stages. They are:

Stage One

Canine will respond to almost anything. 1-2 months in this stage is expected.

Stage Two

Canine will respond to many non-prohibited foods. The length of time in this stage is variable and dependant on the origin of flights worked.

Stage Three

Canine responds more selectively, predominantly to prohibited foods. The canine is working very efficiently and responding less, but continues to have an excellent success rate.

The reward for the beagles is food. If it is determined that there is or was any item in the case that may have left the target scent, the dog will be rewarded with a treat.

The beagles wear bright green jackets that say, "Protecting American Agriculture," which this makes them easily identifiable to the public. Travelers treated the beagles very well, freely allowing them to sniff their luggage, and generally did not view this as a threat, but rather, as a necessary precaution.

The canines rest for twenty minutes of each work hour, and for longer periods if they show signs of tiring or losing interest in their work. After the beagle retires, the handler has the option of keeping it as a pet.

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Appendix 3. Canine Training Program Addresses and Contacts

**Bureau of Alcohol, Tobacco & Firearms
U.S. Department of the Treasury
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**Attention: Mr. James L. Brown
Chief, Explosives Division
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Front Royal, VA 22630**

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**James J. Rowley Training Center
United States Secret Service
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**Attention: Special Agent Neil Kennings
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**Department of Defense Military Working Dog Agency
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**Plant Protection and Quarantine
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<p style="text-align: center;">Appendix 4</p> <p style="text-align: center;">COST OF PROCURING AND TRAINING A LAW ENFORCEMENT CANINE FOR SELECTED LAW ENFORCEMENT AGENCIES: END OF Fiscal Year 1992</p>				
	U.S. Customs Service 1/	U.S. Secret Service 2/	Connecticut State Police 3/	Military Working Dog Agency 4/
<p>Note: The "per canine" costs are not strictly comparable because of differences in costs included, class sizes, number of days training per class and number of classes per year.</p>				
Number of Canines Trained:	102	12	12	300
Cost of Procuring and Training, Per Canine:				
Patrol Canine	n/a	n/a	\$13,063	\$ 9,672
Explosives Detector Canine	n/a	\$8,450	\$11,430	\$12,654
Drug Detector Canine	\$12,600	n/a	\$8,708	\$10,874

n/a = not applicable

- 1/ The per canine cost reflects the total cost of operating the training center, plus transportation and per diem costs for acquisition of canines which are donated to Customs. Subsistence allowances for officers attending training classes are also included.
- 2/ This is the direct cost of two trainers plus per canine acquisition cost of \$2,500. Canines are cross-trained for patrol duty and detection of explosives.
- 3/ The CSP program has no canine acquisition costs.
- 4/ The cost for cross-training canines for patrol and drug detection is \$12,929; for patrol and explosive detector canine, \$13,359.

Historic Treasury Seal With Canine



A Treasury seal, circa 1800, depicting a watchdog guarding the key to a strongbox. According to legend, the dog is "Nero," the first watchdog of the U.S. Mint in 1793.

Appendix 6. ACKNOWLEDGMENTS

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The primary author of this report was Alexander J. Basso, to whom questions may be addressed at the telephone number listed below.

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