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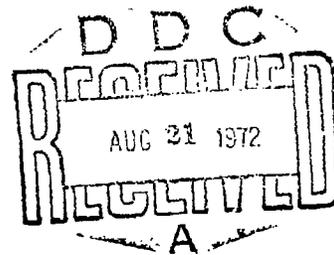
A FEASIBILITY STUDY ON TRAINING
INFANTRY MULTIPURPOSE DOGS

Final Report

By

Southwest Research Institute
8500 Culebra Road
San Antonio, Texas 78284

July 1972



APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

U. S. ARMY LAND WARFARE LABORATORY

Aberdeen Proving Ground, Maryland 21005

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13. ABSTRACT A 1-year feasibility study was conducted under the sponsorship of the U. S. Army Land Warfare Laboratory. The objectives of this study were to train German Shepherds to detect simulated mines, trip wires, caches, tunnel openings, and ambushes while working off leash and to track and to attack on command. Selection criteria and special food reinforcement training methods and procedures used to accomplish the objectives are presented. Results of these efforts and important evaluation exercises are explained. Features regarded to be significant in training acceptable candidate dogs are discussed. It is concluded that the training methods used in this study are applicable in training dogs to perform a multiplicity of tasks that are associated with operational employment of small infantry units.		

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FOREWORD

From the results obtained in a 1-year feasibility study, this report is intended to support the new infantry multipurpose dog. This effort was under the sponsorship of U.S. Army Land Warfare Laboratory, Aberdeen, Maryland; contract number DAAD05-71-C-0285.

The training methods employed were designed to produce five German Shepherds capable of detecting mines, trip wires, tunnels, caches, punji pits, and ambushes. Moreover, the dogs were trained to track and attack on command. The reliability of working the dogs off leash while performing these tasks was demonstrated.

The Methods and Procedures section of this report (Section III) presents training instructions and general dog-selection criteria as they are related to training an infantry multipurpose dog. Except for behavior reinforcement techniques, training methods are in accord with instructions in military manuals and publications. Space limitations have prevented discussion of all problems attendant to the training and maintaining of the dogs. More detailed information on military scout dog training and employment, however, is presented in U.S. Army FM 20-20.

In the latter part of Section III, the dogs' monthly performance records are presented and the conduct of significant evaluation exercises are explained. Section IV includes records specific to performance during evaluations and to the exchange of dog handlers in the last 3 weeks of the 12-month training period.

Section V discusses important training features that improve productivity in a project of this nature and assist in producing a well-balanced dog trained to accomplish detection, track, and attack objectives. Section V concludes the report with a brief description of the important characteristics of the five multipurpose combat infantry dogs trained during the feasibility study.

ACKNOWLEDGEMENT

The successful completion of this project would not have been possible except for the efforts of five individuals. They gave completely of themselves, their knowledge, strength, and experience to demonstrate the feasibility of training German Shepherds to perform as infantry multipurpose dogs. These individuals' performance, attitude, and indomitable spirit are acknowledged with gratitude. These people, in alphabetical order, are:

Mr. William Anderson
Mr. Robert Priest
Mr. Shirl Sharprack
Mr. Samuel Tomlinson
Mr. Plutarco Zertuche

Moreover, personnel from the U.S. Army Land Warfare Laboratory and from the Military Dog Committee of the U.S. Army Infantry School, Ft. Benning, Georgia, provided invaluable advice and assistance on training methods and practical usefulness of the infantry multipurpose dog. Their encouragement and understanding of the problems associated with the training project demonstrated their unity and seriousness of efforts in achieving the stated objectives.

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I. INTRODUCTION

Within the military dog program, there is an increasing tendency to use dogs to perform more than a single operational task. For example, the patrol dog and the scout dog, while capable of performing more than one task, are usually employed in different military roles. At this time the tracker dog, however, is primarily used only to track.

A. Objective

A study conducted at Southwest Research Institute (SwRI) considered the feasibility of training dogs to perform seven tasks, all of which were related to small infantry unit combat missions. At the end of the study, the dogs were to be turned over to the U.S. Army Land Warfare Laboratory. These dogs, in addition to the seven combat tasks, were also required to serve as sentries or guard dogs at base camps or other static situations. Dogs trained to perform these tasks, when properly used by experienced handlers, can prevent injury and the loss of human life caused by concealed ordnances, booby traps, and ambushes. Moreover, these trained dogs can facilitate military operations by locating tunnels, caches, and concealed intruders.

Training selected dogs to perform multiple military tasks is no longer a concept, but is a realistic approach to maximizing the usefulness of the combat dog.

An infantry multipurpose dog, in a military sense, is a dog that has been trained to scout or patrol off leash, track, and attack on command. The dog and handler work together in silence to warn friendly personnel of immediate dangers that might be encountered in patrol activities, sentry duty, and search operations.

Specifically the tasks required of the infantry multipurpose dog are as follows:

- (1) Mine detection
- (2) Trip wire detection
- (3) Tunnel opening and punji pit detection
- (4) Cache detection
- (5) Ambush detection
- (6) Track
- (7) Command control attack.

B. Utilization

Upon discovery of a mine or trip wire, the working dog warns the handler of danger by sitting near the target. Successfully tracking an escapee or detecting an ambush depends on the handler's ability to recognize certain actions of the dog that signal an alert or determine the manner of performance. Attack or intruder immobilization is by command from the handler.

In operational employment, the dog working beyond the handler receives direction by a "silent" whistle signal and by hand and arm gestures. When the dog detects a target, the handler and dog remain in position until the hazardous area is noted. The dog is then recalled from the sit position and directed to lead off a safe distance around the target. The dog indicating the discovery of an ambush or intruder is immediately recalled to the down position at the handler's side.

The presence of the dog and verbal warning from the handler may be sufficient to immobilize an intruder. If necessary, the dog will, on command, attack the intruder. During a personal search, the intruder is under the surveillance of the dog. Should the intruder attempt to escape or to physically threaten the handler, the dog will attack without command.

The dog is cued to tracking by using a 15- to 25-ft web-leash. Following the provision of a scent clue, the dog is then directed to track by verbal command and hand and arm gestures.

Another factor to be considered in the dog's utilization is inactivity when the dog is kenneled or otherwise not working. To maintain maximum efficiency the dog must be frequently worked and handled.

C. Response Stimuli

Proficiency of performance in detecting concealed targets is dependent on the presence of certain olfactory stimuli which the dog has been trained to associate with a sit response. The dog's visual and auditory sensory perceptors cannot be discounted as factors which may cause a response, but they are of secondary importance. The experienced handler will consider all aspects of weather, including terrain features and wind currents, in the employment of the dog. Whether the target is human or ordnance, the dog must contact the scent gradient before he can associate the odor with the alert response. The odor common to all training aid emplacements is residual human scent. Other odors, such as broken vegetation, fresh soil, oxidized metals, paint, plastics, and explosives (C4, dynamite, gunpowder) that represent mines, may differ among the various targets.

II. CONCLUSIONS

The training methods and behavioral reinforcement techniques used at SwRI produced dogs capable of performing the seven indicated military tasks while being employed by different handlers.

While other training methods may have been as effective, it was felt that, within the allotted period of 12 months, it would have been uneconomical to divide resources in exploring different training procedures. Once the training pattern was implemented, there was no margin for vacillation or an opportunity for a second beginning.

An important constraint is identified in the seventh task (command control attack) both in selection and in training. A mild-mannered dog with acceptable traits would have sufficed for the first six tasks. However, only a dog that agitates was determined to be compatible with attack training. Thus, selection for the seven-task training program essentially required a dog with a mixture of both temperaments. Since a dog with two inherently opposed characteristics is rare, the complete fulfillment of selection criteria was difficult. Undoubtedly, many dogs that could have been trained to perform the first six tasks were rejected because of their failure to agitate.

Perhaps undue caution was exercised in sequencing and integrating attack training. It was realized that, with the

proper dog, the entire spectrum of attack exercises could have been performed in 6 weeks. It was also realized, however, that while training attack dogs to perform less aggressive tasks, an unpredicted safety hazard would have been imposed on training personnel. For this reason, attack training was gradual and was accomplished for brief periods each week throughout the 12-month study. At the risk of incorporating a contradiction, a dog that readily agitates or is aggressive, with few exceptions, is more impressive in manner or learning and seems to be more reliable.

It is apparent that specific studies are necessary, particularly in the areas of selective breeding and shaping of behavior during the dog's first year of life. A standardization of desirable characteristics for young dogs to be compatible with the seven military tasks would assist in preliminary selection and future training of multipurpose candidates.

III. METHODS AND PROCEDURES

A. Experimental Animals

In this program, 45 German Shepherds, 1 Labrador Retriever, and 1 mixed German Shepherd, ranging in age from 10 months to nearly 3 years, were evaluated as potential candidates for multipurpose training. Of the 47 dogs, only 12 were acceptable. Of these 12, 6 were later removed from the multipurpose training schedule because of temperament deficiencies. It is noteworthy to mention that 2 German Shepherds in the original group of 12 were re-assigned to other training projects. They eventually became exceptional narcotic and explosive search and detector dogs. In the final training period, 5 of the 6 remaining German Shepherds were accepted as trained infantry multipurpose dogs by the U.S. Army Land Warfare Laboratory.

B. Training Personnel

At the inception of the program, two dog trainers were employed. One trainer had experience in breeding, showing, and training German Shepherds. The other trainer had 20 years experience in training military dogs. Both trainers realized the scope and magnitude of the project and readily accepted new methods of training. Of more importance to the project, however, was their enthusiasm, interest, willingness, and sufficient knowledge to realize that the project's purpose was to exploit the capabilities of dogs for military combat use.

In a short time, both trainers developed a sense of timing and application of food reinforcement. As the level of effort increased with dog procurement and extended training, an assistant dog trainer and two trail assistants were employed. A consultant psychologist was used one afternoon each week for the first 5 months to review, evaluate, and advise on training routines and behavior reinforcement techniques. Midterm in the program, the dogs were divided into two groups of 3 dogs each. Each trainer was assigned an assistant and a group of dogs. To facilitate track training, a tracking specialist was employed part-time to advise personnel and to train dogs in intermediate and advanced tracking. Supervision was constant and training schedules were prepared to produce uniform results.

C. Equipment

Approximately 3600 rounds of blank (NATO) M-14 ammunition, an estimated 2000 rounds of 38-caliber pistol blanks, 200 M-80 shells, and 50 bomb simulators were expended during the training and exercise periods. Arms consisted of two 38-caliber pistols and two M-14 rifles. Disarmed shells, hand grenades, mines, tin cans, boxes, plastic bottles, copper wire, string, fishing line, cartridges, black powder, smokeless powder, C4 mines, 40 percent nitroglycerin dynamite, and dropcloths were used to prepare training aids. A tractor posthole digger expedited the preparation of the tunnel-training area. Dog equipment consisted of choke chains, leather collars, leather harnesses, a 5-ft leather leash, 15- and 25-ft web-leashes, and two shock collars with transmitters. Communication during field exercises was maintained by radio receivers and transmitters. Vehicle support was accomplished with two carryall vans and one kennel trailer.

D. Animal Health and Care

1. Diet

Except on those occasions when dogs were deprived of a complete ration in order to encourage better performance in training through food reinforcement, the regular diet consisted of two-thirds Purina ChowTM and one-third Purina MealTM. At times, this diet was supplemented with AlpoTM or PrinceTM dog food. Daily rations were also supplemented with liquid vitamins and Wesson Oil during hot weather, and *Styrid Caricide*® (American Cyanamide Co., Princeton, N.J.) when mosquitoes were prevalent.

Usually the amount of rations offered the dog was somewhat regulated by the amount of PrimeTM dog food consumed during training periods. A dog properly oriented toward training would consume from one to two packages of Prime dog food in one day. Prime was used to motivate the dog in shaping desired behavior in respect to performance of most tasks.

2. Examination and Treatment

Fecal examinations were periodically accomplished. Disophenol® (DNP) (American Cyanamide Co., Princeton, N.J.) was used as indicated. The administration of *Styrid Caricide* in daily rations and strict sanitation of the kennels, however, were thought to be controlling factors in minimizing intestinal parasitic infections. Tick infestation among the dogs was prevalent during spring and summer, but was satisfactorily controlled by weekly dips in a solution of DermatonTM (Cooper and Nephews, Inc., Chicago, Ill.). Early in the training program, one dog, Herc, suffered a rattlesnake bite near the right carpal joint. Swelling of the leg and foot was pronounced, but was treated with ice packs and cold compresses. Reconstituted Polyvalent antivenim (crotalidae) (Wyeth Laboratories, Inc., Marietta, Pa.) was administered both intramuscularly and subcutaneously at 30-min intervals for 3 hr.

Heart worm examinations were performed prior to acceptance and quarterly thereafter. Whole blood examinations were made by the direct test and by the Knotts test. In the first quarter *Dirofilaria immitis* was identified in the blood of Herc. Treatment consisted of single intravenous

injections of Caparsolate Sodium® (Diamond Laboratories, Des Moines, Iowa) twice daily for 2 days followed by a regime of Diazan® (Elanco Products Co., Indianapolis, Ind.). This treatment in its entirety was repeated later in the year. The most prevalent veterinary medical problem was injury to the feet caused by cactus and grassburrs. Often these injuries resulted in abscesses or hematomas on the dogs' fore feet.

Radiography was performed on potential candidate dogs to determine the presence of hip dysplasia. Dogs showing Grade II dysplasia were rejected. Dogs were administered vaccines for rabies, leptospirosis, distemper, and hepatitis after being accepted for training and prior to shipment to the U.S. Army Land Warfare Laboratory. When not working, dogs were quartered in individual houses 4 x 4-ft with access to 4 x 8-ft concrete runs. Kennels were maintained and sanitized daily.

Weekly weights provided insight into the animal's general health and sufficiency of diets. This close check was particularly important during periods of food deprivation, which was necessary to cause the dog to be more receptive to food reinforcement techniques in early training. It is noted in Table I that Cynbad was extremely overweight at the beginning of training, but later stabilized at approximately 60 pounds.

TABLE I. MONTHLY WEIGHT GAINS AND LOSSES OF THE INFANTRY MULTIPURPOSE DOGS

Dogs	Weight in Pounds												
	1971										1972		
	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Herc	74	70	72	67	67	68	67	67	67	69	68	65	77
Zeus	52	50	52	49	46	50	49	51	51	50	48	52	53
Prince	-	-	67	67	65	65	65	66	66	66	66	68	68
Cynbad	-	-	80	74	64	65	60	59	62	60	60	63	61
Baron	-	-	-	-	-	69	67	69	68	70	72	76	77

E. Selection of Dogs

Timely acquisition of suitable dogs presented a significant problem with respect to training since schedules had to be organized according to time of selection and purchase. It would have been desirable to commence training with a sufficient number of candidate dogs in a single group so that the quantity of training would be uniform. Of those multipurpose dogs accepted by the Sponsor at completion of the project, Herc and Zeus were exposed to 11 months of training. Prince, Cynbad, and Baron were exposed to 9, 8, and 7 months of training, respectively.

Dogs were locally procured with a provisional 10-day trial to evaluate health and temperament. Those dogs failing to meet health and temperament requirements were returned to the owners. Dogs with even temperament and good health, having normal or Grade I hip dysplasia, were accepted as multipurpose candidates.

At best, the selection of dogs was often difficult. A wrong selection meant expending valuable training time that could have been used on the more successful candidate dogs. It was recognized that the common dog, regardless of breed, would probably have been unable to accomplish all required

tasks during the allotted training time. Thus, special traits were prerequisites to effective performance of all tasks. In some circumstances, dogs were selected that demonstrated excellent traits for detection training, but, when agitated, were weak in aggression. It was expected that sufficient training would teach most of the dogs to be more aggressive. This, however, was not the case.

Aggressiveness, sensitiveness, inquisitiveness, and adaptability were considered to be the more significant temperament traits to evaluate prior to selecting prospective candidate dogs.

1. Aggressiveness

Aggressiveness in a dog is a prerequisite to the task requiring intruder immobilization. An underaggressive dog is either timid and shy or is too friendly when challenged. An overly aggressive dog, however, is vicious and will attack without apparent provocation. He is usually intolerant of people and other dogs. The properly aggressive dog, on the other hand, should display boldness when agitated. This type of dog, usually loyal to the handler, should be willing to protect the handler from harm and to repeat an attack immediately after recall. It is also noted that a dog with the correct amount of aggressiveness is usually serious in performing most tasks.

2. Sensitiveness

To ensure good control and management during training, a dog of moderate sensitivity is very desirable. Sensitiveness means an awareness of the environment, of immediate situations, and of the handler's mood. An undersensitive dog appears to be stubborn and unapproachable. He usually ignores or is unresponsive to correction and sometimes appears oblivious to noise and his trainer's desires. This characteristic may indicate a natural ability for the dog to concentrate only on what is of immediate interest to him. A method of channeling this trait behavior into constructive training needs to be explored. This unresponsiveness, however, is of major concern to a trainer. An overly sensitive dog is shy, overly interested in self-protection, usually intolerant of gun fire, and displays untenable avoidance behavior when corrected. All the dogs that were evaluated showed various degrees of sensitiveness. Some were supersensitive to gun fire but were of even sensitiveness in more demanding situations.

3. Inquisitiveness

A dog's inquisitiveness determines, to some extent, his powers of concentration, his olfactory sensations, and his willingness to investigate and to work without

constant urging from the handler. An underinquisitive dog seems to be lazy or unwilling to work. He is difficult to motivate and is content to survive on basic necessities. An overly inquisitive dog appears to be easily distracted and is more interested in gamboling across fields after butterflies, birds, and wildgame than he is in working. This type of dog is unpredictable as performance varies from excellent to poor. Only in a sterile laboratory environment where distractions are minimal can the performance be predicted. A good candidate for the tracking task would be a dog with tempered inquisitiveness.

4. Adaptability

A dog with good adaptability is usually confident and responsive to people. He tolerates strangers and accepts a new handler with little change in behavior and performance. The dog understands what behavior is expected and is anxious to please the trainer or handler.

5. Summary

In an effort to obtain suitable dogs for the program, many excellent dogs were rejected because they failed to meet the criteria for aggressiveness and sensitiveness. The willingness to be corrected through repeated correction is mandatory for a good attack dog. The underaggressive dog cannot be stimulated to attack and the overly sensitive dog cannot accept the necessary correction for positive control during recall from an attack. Needless to say, firm control is essential once the dog has been trained to attack. As a result, those dogs exhibiting avoidance behavior because of the correction methods used in attack training are usually unacceptable.

F. Training

1. Trainer/Dog Relationship

a. Understanding the Dog

Essential to the developing and shaping of a dog's behavior is a trained, objective, and well-motivated trainer who appreciates the principal differences in behavior between man and dog.

To properly train a dog, a trainer must be aware of the dog's traits. Basic to the training of dogs is the fact that the dog is subject to the Pavlovian effect. He obeys instincts and stimuli that often cannot be detected by man. Since the dog lives in the first 2 or 3 ft of space above the ground, the ground and air currents within this space are important sources of odors for investigation. In most circumstances, the untrained dog is naturally disobedient. However, he enjoys human association and usually becomes closely attached to a single individual. The healthy dog also enjoys eating and playing and readily accepts praise. He feels a strong sense of protection for his acquired or assigned domain. Occasionally, the dog desires solitude, often taking long excursions in the woods, open spaces, or around the neighborhood. In an olfactory sense, he examines items of interest at a close range. Behavior and olfaction are the principal components to consider in training a dog to search, detect, and track.

The conscientious and experienced trainer also possesses several mandatory traits. He is patient and not easily irritated with his dog. He realizes that proficiency can be achieved through repetition of training methods once the dog understands a sequence of events that leads to a response. The trainer must realize that his response to correct behavior on the part of the dog must be timely, consistent, and understood by the dog. Likewise, correction for unwanted behavior in the dog must, in most circumstances, be applied immediately. If these training techniques are properly applied, undesirable behavior will eventually be eliminated or controlled and desirable behavior will be strengthened. To ensure that these techniques are properly implemented, the trainer must plan, organize, and execute with precision the required word, hand and arm gestures, and methods and procedures of reinforcement. He should then practice these training methods until they are routine before he applies them to the dog.

b. Positive Reinforcement

The food reward and food reward and praise methods of positive reinforcement were diligently applied in initial multitask training. It is imperative, however, that the trainer announce in some manner that the food reward is forthcoming. This announcement prevents the dog from becoming oriented on food alone and provides a verbal method of shaping positive behavior. A simple way of achieving this response is for the trainer to announce "good boy," and immediately follow with the food reward. In some cases, tactile praise may be used as a motivating force. Experience, however, indicates that this method can be overdone and only confuses or distracts the dog. Therefore, it is best to reserve tactile praise, when behavior reinforcement is by food reward, to those playful periods when interactions between trainer and dog are foremost.

2. Basic Obedience

Each dog was scheduled for a 10-day course in obedience training which was divided into three phases: (1) rapport, (2) on- and off-leash command control, and (3) performance on a confidence course.

a. Rapport

Rapport between trainer and dog facilitates basic obedience training. For the dog, it builds confidence, promotes trust, and fosters loyalty toward the trainer. Rapport is accomplished by the trainer through feeding, watering, grooming, and exercising the dog. During this period, the dog is introduced to food reinforcement techniques and to such commands as "no," "stay," and "heel." The trainer, however, should not create situations that might produce an avoidance behavior while attempting to build confidence in the dog. Rapport helps to establish the dog in his new surroundings and in accepting controlled activity.

b. Leash Training

On- and off-leash obedience training required the use of a choke chain, 5-ft leash, 25-ft web-leash, and two fenced areas in which to work. One of these work areas is 15 x 80 ft and the other covers an area 80 x 150 ft.

A timely jerk on the choke chain is used as a form of correction to reinforce the "no" command. Through repetition, the dog learns to recognize that "No!" means disapproval by the trainer. Positive reinforcement of proper behavior during obedience training is usually by praise alone, such as "good boy," followed by two pats on the shoulder. In circumstances in which these methods do not seem to have much effect on the dog, food reinforcement can be applied. However, food reinforcement should be reserved for multiple-task training.

During on-leash obedience training, the commands "heel," "recall," "sit," and "stay" are used. The dog soon learns to execute the commands by appropriately responding to the specific vocabulary word and, in more advanced training, to hand and arm gestures.

The trainer must apply all these training methods in a serious manner. Commands should be distinct and loud enough to be heard. Hand and arm gestures should be executed with precision. As training progresses, the trainer should frequently apply those commands to which the dog is most responsive. This procedure can assist in maintaining the dog's interest, which can serve to lengthen the available training periods for more difficult tasks. Training sessions should be discontinued before the dog becomes tired or bored, preferably after a good performance. The dog is then placed in an exercise pen. The trainer at this time provides fresh water and, if performance has been satisfactory during the training session, a small amount of food.

Although it is desirable for the dog to learn by positive reinforcement, correction is sometimes necessary. Corrections must be quickly and properly applied in those situations where there is a manifestation of undesired behavior.

The sequence of advancement in obedience training is from the 5-ft to the 25-ft leash and off-leash training in progressively larger pens. By the time training has advanced to the large fenced area, the dog should respond to verbal commands and to hand and arm gestures up to 150 ft from the trainer. Whenever the dog breaks and runs, the training schedule should permit brief periods of on-leash training while allowing for opportunities to let the dog succeed. When performance is satisfactory, the dog should be immediately returned to off-leash obedience training. To achieve a favorable response to the various commands, the distance between the trainer and dog should be shortened as necessary.

c. Confidence Course

Training the dog to use the confidence course requires patience and repeated encouragement from the trainer. If the dog does not master the hurdles, barrel jumps, tunnels, or bridge during the 10-day basic obedience training, daily exposure and practice will soon enable the dog to perform these exercises with minimum difficulty.

Confidence course training is begun with the dog on a 5-ft leash with the trainer assisting the dog in leaping small hurdles. The dog then gradually progresses to higher hurdles. A 25-ft leash can be applied once the dog has become proficient, but by this time the dog will usually

perform off leash. The word "course" announces this activity. The word "hup" encourages the dog trainee prior to jumping a hurdle.

Training a dog to work the confidence course not only provides an exercise period but improves timing and attitude. It gives the dog the occasion to work alone, eliminates certain fears, and builds an aggressive spirit that will be beneficial during detection, attack, and track training. It should be understood that obedience training prepares the dog for more specialized training and that it is continuous throughout the training period. Obedience training allows for control even in the most difficult of circumstances. It builds reliability and establishes a bearing in the dog that forms a favorable impression on observers and a frightening impact on intruders.

3. Mine Detection

Within the scope of simulated mine detection as well as with other similar targets, an operational dog must not submit to distractions, must maintain direction and proper distance from the handler, and must search for, detect, and respond by sitting 2 ft from the target.

a. Laboratory Training

In retrospect and founded on the results of experiments, the required sit response stimulated by certain scents should be conducted under controlled laboratory conditions prior to field-detection training. This laboratory conditioning will facilitate training, economize on time, and improve on uniformity of responsiveness and performance. Repeated correction on the exercise trail will often cause adverse behavior, particularly in the more timid dog. Controlled laboratory conditioning concurrent with outdoor training is a method which can lead to the dog's better understanding of what is expected of him prior to field training.

Although controlled laboratory olfactory conditioning was not used with the infantry multipurpose dog, it is recommended that future efforts apply confined conditioning prior to trail training. In one exercise, two olfactory dogs trained to react to a specific odor in a controlled laboratory environment responded with enthusiasm upon recognizing the training odors in outdoor exercises. A third dog was laboratory-trained to respond to the odor of dynamite. Upon his first exposure to field testing he responded enthusiastically to those cans containing the explosive. A fourth dog, trained to sit when he smelled dynamite in the laboratory, simply transferred this response to outdoor exercises whenever the odor was detected in samples placed on trails.

b. Grade One Training

In most instances during the initial phase of mine detection training, clean tin cans were heated to 450°F in order to remove unwanted odors. These cans were then scented with small quantities of dynamite and human odor. Scenting with human odor amounted to only handling the cans during preparation. In grade one exercises, the cans with screen covers are aligned 20 to 30 paces apart. The dogs are then introduced to the food reinforcement method by placing one or two cubes of Prime dog food on the wire cover. While on leash, the dogs are then directed from one

can to the other. Variations of this exercise alternated placement of cans or other objects from right to left while increasing the distance between targets. Once the dog has discovered that this exercise is a source of food, he can then be unleashed to work on his own. However, food should not be placed on the targets any longer than necessary because the dog should advance to the stage where food reinforcement is provided by the handler. Using the same cans, the handler begins training the dog to face and sit near the training aid. In preliminary training, the dog primarily works by visual clues. As an expression of curiosity, the dog will usually sniff the cans. This reaction, however, assists the dog in acquiring an odor profile that will be stimulus for advanced detection training.

The trainer can cause the dog to sit by gently pressing on the base of the tail and holding the food reward over his head. This action will eventually produce the desired response. It is important, however, that the handler announce "good boy" before giving the dog a food reward. Once the dog has accomplished the objectives in the grade one mine detection exercise, he is ready to progress to the next grade.

c. Grade Two Training

During this training phase, the dogs are exposed to trails or well-defined lanes that are mowed or cut through high or dense vegetation. Various human-scented objects are placed in the center and on each side of the trail. These objects, varying from 10 to 20 paces apart, are above ground and in clear view of the dog.

The object of the grade two exercise is to train the dog to work the length of a 25-ft leash and to learn the command "move out." Hand and arm gestures are given with the verbal command. The dog's behavior is reinforced with food each time he sits near a can. Failure to sit is corrected with a stern "no." The dog is recalled and positioned in the sit posture. If a dog fails to perform adequately at any sessions, he may be sick, disinterested in training, or otherwise unmotivated. Rather than alienating a healthy dog by forcing him to work, isolation for brief periods or dietary deprivation for 24 hr are often effective. If the dog performs well, advancement to grade three exercises should be considered. Training locations or trails should be changed as often as possible so that the dog does not become adjusted to a single situation. New trails often improve the dog's motivation.

d. Grade Three Training

Dogs in grade three training are challenged for the first time to locate targets mainly by olfaction. In this phase, the simulated mines are concealed in vegetation on both sides of the exercise trail. It is important that the trainer use an assistant to place the training aids. The use of an assistant avoids the possibility of the dog alerting on only the trainer's scent and prevents the trainer from unnecessarily cueing the dog to sit at the known locations. The assistant must accompany the trainer and dog to verify the position of the training aids. In this way, recall can be effected whenever the dog fails to make a detection or to correct in case of a false response. Once the dog has performed satisfactorily, a new trail should be prepared.

The distance between targets should progress from a minimum of 10 paces to a maximum of 25 paces. The assistant preparing the trail should ensure that an abundance of human scent is present by excessively handling the can and by touching the vegetation in the immediate vicinity of the training aid. However, the assistant should avoid handling objects other than the training aids or location sites. Since the dog should work downwind from the scent gradient so that conditions are in the dog's favor, ground wind currents should be evaluated periodically. The exercise trails should be from 200 to 300 meters long.

e. Grade Four Training

Grade four mine detection training is more complex since the targets are buried with tops exposed. The dog should be working off leash at a distance of 10 to 25 paces from the trainer. If this is not the case and the dog appears reluctant to move away from the trainer, frequent on- or off-leash exercises on unprepared (negative) trails might improve the distance response. Should the dog move so fast that control is inadequate, a trailing leash often serves as a deterrent. The object is for the dog to work at a safe, but controllable, distance from the handler. On the command "move out," the trainer should hesitate momentarily, allowing the dog to gain the desired distance and then walk at a steady pace without distracting the dog.

At first, the partially buried mines should be arranged to provide visual as well as olfactory clues for the dog. When the dog discovers a target, the trainer should practice the stay command after the dog sits. At this time, the dog's pause at the target should be no more than 1 or 2 seconds before recall and reward. When recalled, the trainer announces "good boy" and follows immediately with a food reward. The handler should remain motionless after the dog responds to a target until the verbal command or hand and arm signal to come is executed. Repetition will teach the dog to properly respond to this chain of events. In preparing the trail for grade four exercises, the training aids should gradually progress from the least difficult to the more difficult. However, a few targets should always be placed in a manner that facilitates detection. As the dog becomes more proficient, the interval between targets should be increased, locations of emplacements should be varied, and the length of the exercise trail should be increased.

When the dog misses a target, he should be recalled for a second attempt. In the majority of cases, he will respond to the target on recall. Even though the dog initially missed the target, food reinforcement is recommended at each positive response in the early phases of training. It is always possible that ground air currents were not favorable to the dog's making a detection. When the dog obviously alerts on a target and does not respond further, he should be recalled and the necessary correction applied. The trainer should immediately give the "no" command when the target is passed. The dog is then recalled and made to sit at the target for several seconds. During this detention period, the trainer should remain silent until he moves the dog onward. If the dog does not respond by sitting at the detected target, the sit command should be given.

f. *Grade Five Training*

Grade five mine detection training is even more complicated. The dog is introduced to such sub-tasks as mine bypass directional hand and arm signals and the "silent" whistle.

Simulated mines are buried and covered with vegetation or earth, usually in the center of the trail. As the dog becomes proficient, the mines are covered with 1 in. of soil and placed from a few inches to 2 ft off the trail. When a buried mine is obscured from the dog's vision, he may paw as if to confirm its presence, either visually or by odor. This deficiency can be corrected by immediately invoking the "sit" command. This command warns the dog that he is on target, but that he must properly respond before receiving a food reward. A "no" command at this time might confuse the dog since he did discover the target. Immediately recall the dog after the sit response. If this action does not correct the behavior, the dog should be placed on leash and submitted to controlled practice sessions away from the training area. Precision in timing on the part of the trainer is of extreme importance in applying corrections under these circumstances.

g. *Circumventing Hazards*

Training the dog to bypass a target is rather simple as the handler remains 25 to 30 paces behind while working the dog. After recall, the dog is directed off the trail in a semicircle and back on the trail some distance on the other side of the mine. Before this maneuver is practiced, the dog should be repeatedly exposed to open field work where vegetation is dense and other natural obstacles are present. This exposure will accustom the dog to accept the additional work whenever dense foliage is encountered after leaving a well-defined trail. If bypass is difficult for the dog to manage while working off leash, training should occur in an area where ground cover and obstacles are absent before working on more advanced trails or rugged terrain.

h. *Control*

During open-field and cross-country training in the absence of trails, the dog should be directed by the aid of a "silent" whistle and arm signals. First the dog should be trained to respond to the whistle on recall if this has not been practiced during obedience training. This procedure is not difficult if the whistle is used after the command "heel" (come). Food reward and praise will reinforce this response. After only a few trials, the dog should be aware of the expected behavior. There are occasions, however, when the verbal command must be applied either as correction or simply because the dog cannot hear the whistle, e.g., in high winds or in the presence of other distracting sounds. The "silent" whistle can also be used to warn the dog to concentrate on a task or to obtain his attention so that directions can be given by hand and arm signals.

Training trails and areas should be changed frequently and longer periods of time should elapse after preparation of the targets before working the dog. These changes improve olfactory acuity and familiarize the dog in detecting aged target locations.

4. *Trip Wire Detection (Booby Traps)*

a. *Grade One Training*

Trip wire detection progresses through five grades of training. As in early mine detection training, the dog learns to sit after visually recognizing the presence of the target. In basic trip wire training, white string is usually replaced by camouflaged monofilament wire or nylon line to condition the dog to depend more on olfaction than visual detection. It is presumed that the dog responds to the presence of a well-concealed wire by identifying the lingering scent left by the individual preparing the wire emplacement. It has been noted that dogs respond just as frequently to a trip wire in the absence of a scented simulated ordnance object as they do if one is present. An ordnance object placed near a wire, however, offers an added clue for the dog. A wire drawn taut across and upwind on a trail may provide an auditory clue that signals the dog to alert. Moreover, on a fresh trail, it is likely that the dog recognizes a change in the natural or environmental odor profile of the working area when approaching the trip wire. It is doubtful that the dog alerts on a well-concealed wire by visual stimuli, although there are occasions when this might be true.

In introductory training, it is not advisable to use avoidance stimuli such as electrically charged wires or harsh correction procedures. The object is not to frighten the dog by the presence of a wire but to shape his behavior so that detection causes a willing response. Avoidance behavior is manifested when the dog sits at perpendicular lines (sticks or branches), sits too far from the wire, or leaves the trail to avoid encountering the target.

Grade one wire detection training should take place in a confined rectangular area about 10 x 80 ft. White string is used to facilitate visual detection. An 8-ft-long twine is placed at 10-ft intervals at an elevation of 1 ft. A lane about 2 ft wide separates the area's parameter fence from one end of the secured string to accommodate passage of dog and trainer around the training targets. After placing the dog on a 5-ft leash, training begins by moving the dog to each string. For the first few trials, it does not matter if the dog fails to sit. However, a food reward should be offered after a verbal "good boy" at each target location. When the dog learns that he receives food each time he goes to the string, the trainer can start working the dog into a sit response. The dog should not be permitted to touch or to pass through the string. Once the dog acquires the proper behavior, he can then be transferred to an open area on a short path containing only two or three wire locations at 20 to 30 meters apart. After several basic training sessions, the dog can then be worked off leash. Correction must be applied when the dog does not sit or when he overruns a string or wire. He should be reproved with the "no" command and returned to the missed target.

b. *Grade Two Training*

Grade two trip wire detection training utilizes white string, lowered to within a few inches from the ground. The same pen training methods apply as are used in grade one introductory training.

c. Grade Three Training

Grade three training is modified to include a mixture of trip wire targets. For example, the targets are alternated between white string and monofilament wire. Once the dog begins to respond to the thin wire, the white string training aid can be removed. The confined area training period should always be ended with a brief workout on a short trip wire trail. This procedure will vary as well as experience acquired in the pen is transferred to a more practical situation.

d. Grade Four Training

Grade four trip wire detection training is reserved for open trail work, since confinement training is no longer required. Targets should be dispersed at intervals of 30 to 40 meters. Distance control, recall, food reinforcement correction, and target bypass should be performed in the same manner as explained for mine detection training.

e. Grade Five Training

Grade five trip wire detection training advances the dog to the detection of camouflaged or concealed targets. In one sense, human scent clues should be apparent since preparation of camouflaged targets requires more attention than for those used in basic trip wire detection.

Variations of grade five training include detection of wires placed in different configurations and from one to two paces parallel to the trail or line of direction. Ground wind velocity should always be a consideration in these exercises.

5. Tunnel, Cache, and Punji Pit Detection

This group of tasks should be sequenced to follow mine and trip wire detection. The basic procedures for shaping the detection response does not differ from those employed in mine detection. For training purposes, pits, or rather large holes, serve to represent any one of the three targets. Punji pits, however, are usually 12-in.-wide X 12-in.-deep troughs dug perpendicular to the trail. Tunnels should be sufficiently large to accommodate a human decoy and are usually from 2 to 6 meters off the trail. A cache is either below or above the ground surface and placed from 2 to 25 meters off the trail or line of march.

Detection training progresses through two grades. The first grade introduces the dog to targets scented with human odor. By this time, the dogs should be sufficiently trained to work off leash at an appropriate distance from the trainer. By taking advantage of the dog's natural curiosity when encountering a trough or pit, his training will be facilitated. In some circumstances, dogs will sit without cueing, since they have become accustomed to responding to the scent of simulated mines and trip wires. The dog, of course, should be reinforced with verbal praise and food reward after recall from the target. Those dogs that are prone to investigate the hole by sniffing the periphery need only to be reminded to sit. A dog that passes the holes or hesitates, but does not sit, must be recalled. He is then accompanied by the trainer to the target and encouraged to sit. A proper

response should be reinforced with praise, followed by food reward. In more difficult cases, the dog must be worked on leash. Corrections should be invoked as required. In grade two training, the targets are camouflaged. This procedure teaches the dog to rely primarily on olfactory rather than visual detection. To improve detection, human decoys, objects of human apparel, and an assortment of other personal items are placed in tunnel openings or cache holes to represent a natural target.

6. Ambush Detection

a. Environmental Factors

Training dogs to alert on a human decoy requires the use of training areas free from human traffic, human scent, and other distracting influences. Consideration of terrain and ground wind velocity is of primary importance. Terrain should be flat and dogs should be worked downwind from the decoy. In initial training and in locations where wildlife is abundant, the trainer should know the precise location of the decoy. Thus, if the dog alerts on wild animals, the alert will not be mistakenly reinforced.

b. Response

Ambush detection requires the dog to stop while facing the decoy at distances up to 100 meters. Discovery of the decoy is a tense moment for the dog. Since the alert response is instinctive, food reinforcement is not as important as it is in training for other tasks in which the desired response behavior may be more difficult to achieve. Upon identifying an alert, the handler should take cover immediately and recall the dog to the down position. Food reinforcement should be used to assist in achieving proper behavior on recall. Overtraining or too frequent exposures in a single training session will unfavorably influence the dog's motivation. When practical, and for the purpose of enhancing motivation, a recall from an ambush alert can be followed by commanding the dog to search for the detected decoy, either by tracking or by following the airborne scent. This search will not only sustain motivation during training periods, but will also prepare the dog for more advanced training when his tasks become integrated. If the dog fails to alert because of inattention or absences of airborne scent, the concealed decoy should attract the dog's attention by moving or making a noise that will stimulate an audio or visual alert. At this time, the trainer can administer positive reinforcement to encourage the dog to respond to the presence of a decoy.

7. Tracking

Training a dog to track is a gradual process, progressing from simple basic exercises to more difficult advanced procedures. A dog cannot be made to track, but does so because it is a rewarding experience.

a. Testing Candidate Dogs

Before beginning training to track, it is advisable for the trainer to learn something about the dog's natural ability and desire to track.

On-leash exercises should be arranged in an area in which the dog has the opportunity to track

wildlife or the scent of another dog or a bitch in estrus. These scents are more important motivators than man scent and offer practical ways to characterize the dog's natural tracking behavior. The dog's willingness to track can be determined by the amount of pull or strain on the leash, duration of concentration, influence of distractions, willingness to search for a lost track, over-running distance at sharp turns in the track, and stamina.

Dogs serving as initial decoys with a handler provide the candidate tracker dog with a combination of scents. It is probable, however, that the dog will discriminate between the scents in favor of the dog or bitch decoy. When it is established that the dog trainee is capable of tracking, training must be practiced by using only human decoys.

b. Track Layer

The track layer is an integral part of a track-training team as he must carefully prepare the track so that the handler is aware of its location. This preparation can be done by scuffing the ground and using dropcloths. Employment of these methods also provides added incentive for the dog in basic track training. The track layer considers wind velocity and terrain during preparation and should always conceal himself so that the dog is upwind for at least the last 200 or 300 meters. The decoy's presence reinforces the dog. Clothing, food, or other objects at the termination of a track apparently are not adequate substitutes for the decoy who laid the track.

c. Dog Handler

It is essential that the dog handler have a special interest in the successful outcome of each tracking exercise and have the endurance and stamina nearly equal to that of the dog. The handler must remain alert to the dog's actions as they will indicate if the dog is tracking, has lost the track, missed a turn, or needs encouragement.

There is small margin for handler error. One of the major difficulties in tracking is the tendency for the handler to make the decisions or overrule the dog. Often the dog is misdirected from the track. If misdirections occur frequently, he will soon be discouraged from tracking.

The dog is cued to track by being harnessed to a 15- to 25-ft web-leash and following with the command "track." At this time, the handler moves his right hand at ground level in a sweeping gesture over the "scent pad" left by the track layer. If the dog loses the track, rescent the dog at the scent pad. The dog should be corrected with a "no" command for leaving the track in search of other scents or when distracted by the presence of wildlife. He should be reassured by frequent use of the command "track." Upon discovery of the decoy, the dog should receive an unaccustomed amount of praise.

d. Tracking Phases

Within the scope of multitask training, the three phases in track training are basic, intermediate, and advanced.

Basic Track. Basic training should begin with short, straight tracks 50 to 100 meters long with the decoy in the dog's sight. The dog is then released and encouraged to run to the decoy. At first, the decoy rewards the dog with praise and food. Note, however, that if the dog is exhausted, he will refuse the food. As soon as the dog becomes accustomed to this short procedure, the handler then becomes the only source of reinforcement. As the dog advances in training, the distance from the starting point to the decoy is increased. In the next step, the track becomes more complicated as the decoy takes concealment at right angles and downwind to the main track. This exercise is repeated with the dog on a 25-ft leash. At each training session, the right-angle track becomes progressively longer.

In high winds, the track layer's scent may blow downwind, which will usually cause the dog to follow the airborne odor. This odor may be 20 to 30 meters from and parallel to the track.

It is advantageous to conduct basic track training early in the morning. At this time, there is a slight temperature inversion with low wind currents. Also the ground is still moist and will tend to concentrate the track layer's scent.

Intermediate Track. In intermediate track training, the length of tracks is increased to 500 meters with two directional changes; tracks are allowed to age as long as 1 hr. The last 250 meters of the track are upwind. A well-defined scent pad is made at the start of each exercise. Three or four scented dropcloths properly placed on the track may be used to assist both dog and handler. If the dog loses the track, he should be returned to the starting scent pad or he should be rescented at the point where one of the dropcloths was discovered. If the dog obviously is not tracking, he should be walked to the prearranged location of the decoy. A tracker dog frequently takes wide casts when he loses the track layer's scent, which may be more noticeable at road crossings or at sharp turns in the track. The dog should have enough leash to allow him to range back and forth or to circle back in search of the lost track.

Advanced Track. In advanced tracking, olfactory capabilities, motivation, and stamina are emphasized as tracking distances are increased to 1000 meters and the track is allowed to age for 2 to 3 hr. Weather conditions are important considerations in advanced exercises as hot weather rapidly volatilizes the track layer's scent. Also, a heavy rain can wash away the scent, while a light rain tends to accentuate the odor.

8. Intruder Immobilization and Intruder Detection

Attack training incorporates six subtasks: (1) agitation, (2) attack, (3) release on recall, (4) stand off, (5) search surveillance, and (6) attack or reattack without command. A prerequisite to attack training is a reasonably aggressive dog. The type of dog in this sense is independent and willing to confront an agitator.

a. Agitation

On-leash agitation is developed slowly by frequent but brief periods of agitation by an assistant. After

repeated short periods of agitation over several days, dogs that appear to enjoy attacking the agitator are taken through further training to develop on-leash tolerance, attack, and recall. The vocabulary used in this sequence is "no" or "easy," "get him," and "out heel." Tolerance is taught while the dog is sitting on the left side of the handler. The agitator runs toward the handler and dog and thrusts his protected arm close to the dog's face. He then retreats.

b. Attack

When the leashed dog will tolerate two such passes by the agitator, the handler gives the command "get him." The dog is immediately released to the length of the leash and allowed to attack and bite the agitator's sleeve for several seconds before recall.

c. Release ("Out")

The "out" command at this time is weak to the dog and, by itself, is meaningless. Therefore, "out" must be followed by the familiar "heel" command. At the instant the "heel" command is announced, a sharp jerk on the choke chain will usually cause the dog to release his bite. If this procedure is not successful, the following commands should be invoked in this order: the "no" command, sharp jerk on choke chain, "heel." As in all training circumstances, the session should be stopped at a successful point. Training should never be discontinued without the dog's having achieved his primary desire of attacking the sleeve. When the dog has demonstrated satisfactory responses, off-leash attack and recall can be practiced.

d. Stand Off

The dog is now ready for stand-off training or recall from an attack before execution. This first step in stand-off attack training may be a traumatic experience for some dogs. The routine tolerance, attack, and recall exercises are first practiced for a brief period. After the dog has made two successful attacks, the "out" and "heel" commands are given when the charging dog is midway between handler and agitator. A few feet of play should be allowed on the leash after the "heel" command so that the verbal correction "no" can be applied before the dog is snapped to a halt by the leash. The abruptness of the stop is a correction procedure wherein the dog becomes mindful of obedience to commands during stand off. This exercise should not be practiced without alternating between bites or letting the dog receive his reward by attacking the agitator. Stand off should be limited to only one or two trials during any period of controlled attack training. When control is satisfactory, the dog can progress to off-leash stand-off training.

e. Search Surveillance

Surveillance and attack without command are applicable in those circumstances where the handler may be involved in the capture and search of a suspected intruder. In this case, the dog should remain alert at the set position while the handler searches a motionless decoy intruder. The dogs should attack, or threaten to attack, the decoy spontaneously if the decoy moves. Usually the excitement of the procedure in which the decoy pushes the handler

to the ground will cause the dog to attack the decoy. During attack, the handler remains on the ground and encourages the dog with the command "get him." The dog is allowed to attack for a few seconds before recall. At the successful completion of each step in attack training, the dog should be reinforced with praise.

f. Intruder Detection

Basic intruder detection can be practiced while the handler and dog remain stationary. The intruder decoy approaches at a distance (100 meters) in a suspicious manner. This approach arouses the basic instincts of protection in the dog. The handler encourages the dog to react to the situation, thus strengthening this positive behavior. The decoy then takes concealment. He is then searched out by the leashed dog.

On initial exposure, the dog should be cued to react by verbal rather than olfactory stimulus. But while searching for the decoy, the dog's alert response is usually stimulated by an airborne scent. As training progresses, the dog can then search an open field by quartering the area of interest. The dog should always be worked downwind from the target. In advanced off-leash search, the dog can be silently directed to search for the suspected intruder. During this type of search, the handler must be particularly observant so that recognition of the dog's response is followed by appropriate action (recall and reinforcement).

Intruder search with reference to the dog's responsive alert is similar to that of ambush detection. Ambush training methods discussed in this report are applicable to intruder detection. Command attack training can be practiced after finding the decoy to promote motivation and to associate the behavior of immobilization and intruder detection.

G. Integration of Tasks

When dogs are considered sufficiently experienced in mine and trip wire detection, both of these tasks are integrated into all trail work for distances up to 500 meters. The proportion of targets is approximately two trip wires to five mines. The use of mines and trip wires in progressive training is continued in order to maintain uniformity in associating initial mine training to related and unrelated tasks. For example, mine or trip wire detection can be sequenced with ambush detection and followed by track and attack on a decoy intruder. Over a period of time, the dogs are trained in exercises that include all tasks and subtasks in one problem. These problems require exercise trails, often exceeding 1000 meters.

1. Night Training

Night exercises were performed between 1800 and 2230 hours. The targets included buried mines, trip wires, punji pits, tunnels, decoy ambushes and intruder decoys.

The conduct of the dogs and effectiveness of handler control during night exercises were beyond all expectations. Herc, Zeus, Baron, Cynbad, and Prince tended to work at longer distances from the handler and acted more independently and vigilantly while working in periods of darkness than they did during the day exercises.

Since human vision is limited in darkness, the dog's response to targets and alerts on decoys were not always recognized even though the handler was within several paces of the dog. It is interesting to note that, in this phase of training, dogs waited at the target until they were recalled or directed to move on. Prince was credited with preventing possible mishaps to personnel while working on an unscheduled trail containing unsuspected pits and tunnel openings. In this exercise, total reliability was placed on the dog in leading the handler and observers safely through the hazardous area. At each obstacle, Prince responded by sitting until directed to move on. Very few errors were noted in this exercise as the dogs responded to simulated ordnance objects, trip wires, punji pits, tunnels, ambushes, and tracking exercises. Prince and Cynbad were used off-trail to isolate decoys located 50 meters upwind and parallel to their alert positions. Occasionally, dogs would alert on wildlife, but this was surprisingly infrequent. Alerts to human decoys appeared more pronounced during night than in daylight training.

Intruder detection was considered to be successful as all dogs detected the decoy intruders as they attempted to gain the inside of an imaginary perimeter. Intrusion was detected by the handler when the dog stopped and alerted on the approaching decoy.

2. Silent Directional Training

Directional training is an important element in guiding a dog in open-field exercises. The "silent" whistle is used for recall and to gain the dog's attention when hand and arm directions are necessary. A short blast on the whistle will cause the trained dog to look toward the handler for instructive hand and arm gestures. Use of the whistle on a trail whenever a target is detected announces a "silent" recall, which moves the dog away from the hazardous area and to the side of the handler. Events are sequenced as follows: detection, sit, stay, recall, and handler acknowledgment (reward).

Without the defined boundaries of mowed trails which were used in the beginning of mine detection training, dogs sometimes roamed off course. A timely application of the whistle, however, proved to be an excellent method for retaining control of the dog until he had sufficient experience in open-field detection.

In these exercises, changeover from verbal recall was made by pairing the command "heel" with a long blast on the "silent" whistle. The handler reinforces the paired recall response with food reward; with practice the verbal recall can be eliminated. Easily managed and well-motivated dogs do not require food reinforcement for each recall response.

Some difficulty was experienced when the dogs were first introduced to the "silent" whistle recall from a target. In practically every instance, as the handler knelt to simulate protective action (as in combat conditions when the target was detected), the dog pre-empted the recall and returned to the handler. The stay command, however, was useful in detaining the dog at the target site until recalled by the whistle. It was also noted that the watchful dog was cued for recall by certain motions from the handler, e.g., reaching for the whistle or for food in the food pouch. These

deficiencies were eliminated when the handler remained motionless until the dog was to be recalled.

3. Water Crossing

The dogs were able to swim water crossings while remaining responsive to the whistle signal and to hand and arm directions. A water crossing slowed, but did not stop, the dogs after commanded to attack a decoy on the opposite shore. Even Prince, while not antagonized by agitation, willingly participated in this exercise.

4. Building Search

Although the dogs were not specifically trained in building search, they were exposed to this type of operation. From observations in one experiment, this task could be integrated into the training program with minimum difficulty by simply programming a few agitation and attack exercises both inside and immediately outside the training building.

H. Sequential Integration of Multiple-Task Training

Figure 1 illustrates the progression of training events which culminated in the shaping of the infantry multipurpose

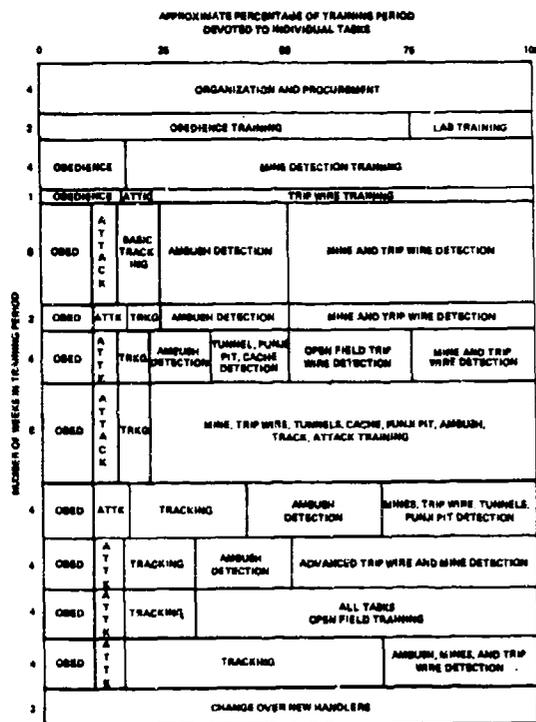


FIGURE 1. TRAINING SCHEDULE

dogs. It was not desired to produce a dog which was spectacular in the achievement of one or two tasks, as uniformity in performance of all tasks was desired with the infantry multipurpose dog.

I. Field Training Area and Conditions

1. Topography

Except for an excursion 40 miles north of San Antonio for the purpose of evaluating the dogs' performance in unfamiliar terrain, training was conducted at SwRI in an area over 1 mile long and approximately 1/2 mile wide. The area is limited by Interstate Highway Loop 410 to the west, Culebra Road to the north, Commerce Road to the south, and laboratories and kennels to the east. The natural terrain features, consisting of hills, flatlands, gulches, cliffs, ponds, high grass, dense thickets of scrub oak and native forests, were conducive to simulated military operational dog training. In general, the topography slopes upward on all sides from a relatively large basin located in the approximate northern half of the area. The lower land is relieved by a 1/4-mile escarpment extending east and west and by a rather large isolated plateau about 30 ft above the basin in the west. A dry river bed of rocks, an extension of Leon Creek, transects the upper quarter of the area from north to south, causing the appearance of sharp cliffs of moderate height in the extreme west and southwest sectors. Two adjacent ponds of two or more acres in size are located in the northeast portion. Two smaller ponds in the west are nearly centrally located, but are separated by the 20-ft-high escarpment. Vehicular access is by unimproved roads. Large cactus plants provide an injury potential to man and dogs and are frequently concealed by an overgrowth of grass or overlying vegetation.

2. Wildlife

The area is inhabited by a large rabbit and deer population. Skunks and opossums are present, but rarely seen. In the spring, summer, and fall, diamondback rattlesnakes are prevalent. Chiggers, mites, and ticks are constant sources of harassment during these seasons. This area was used to maximum effectiveness to condition the dogs to hardships representative of combat situations.

3. Weather

In the winter, temperatures may drop below freezing at night, rising to 40°F and above in the day. Because of wind chill, north winds during this season should be considered if outdoor exposure is for prolonged periods. The prevailing winds, however, are southeasterly and are responsible for high relative humidities (70 to 95 percent) that are common in early mornings. In midafternoon, the humidity may drop to a low of 34 to 46 percent. In June, July, and August the heat and humidity become oppressive by midmorning. In the afternoon, temperatures may rise to 99° or higher.

A diagram of the area and assigned training locations is shown in Figure 2.

4. Welfare, Texas

In mid-February of 1972, Herc, Zeus, Prince, Cynbad, Baron, and Peter were transported to a ranch community in Welfare, 40 miles north of San Antonio, Texas. The objective was to determine the dogs' performance efficiencies in new surroundings and over new terrain features.

Approximately 60 acres of the 80-acre ranch were used for tracklaying and cross-country trail preparation. The exercises consisted of simulated mines and trip wires, the latter targets being arranged parallel and perpendicular to 1000 meter-long trails.

The terrain on top of a large, flat elevation contained little vegetation since most of the top soil had been eroded. Islands of cedar forests, however, made passage difficult and served as obstacles along the exercise trails. Winds of 20 to 30 mph blew from the north with the temperature increasing from 62°F in the morning to 78°F by midafternoon. The relative humidity averaged 50 percent throughout the day. The representative odors of the targets were human scent and dynamite and human scent and C4 explosive.

The dogs demonstrated an exceptional off-leash performance. It was presumed that handler control might pose a significant problem. This, however, was not the case. Performance of this exercise is recorded in Table 8, in Section IV.

J. Monthly Progress in Training Exercises of Twelve Multipurpose Dogs

Daily records and performance scores presented in Table 2 were maintained and compiled every 30 days. The number of exposures to targets was fairly uniform for most dogs. Those dogs with performance deficiencies, however, required more effort in training time and, consequently, a higher number of exposures to targets. Reported mine and trip wire percentages also indicate similar proficiencies in tunnel, cache, and punji pit detection.

From May 1971 to December 1971, a composite efficiency rating of all dogs in mine and trip wire detection was nearly equal. From December 1971 to February 1972, the higher scores favored trip wire detection by a factor of nearly 4. This increase probably resulted because training emphasized trip wire detection and open field exercises during the last 2-1/2 months of training. In the latter case, mines were not as likely to be discovered as were trip wires.

K. Evaluation and Demonstration Exercises

Four important evaluations were conducted to ascertain progress in training and to identify specific problem areas associated with the dogs' performances. These evaluation periods were as follows:

Contractor's Evaluation, August 1971
Sponsor's Evaluation, September 1971
Sponsor's Evaluation, October 1971
Sponsor's Evaluation, December 1971.

1. Explanation of Contractor's In-House Evaluation in August 1971

In August 1971, SwRI conducted four test exercises to evaluate the proficiency and working habits of dogs while in training, performing for trainers, and for three persons with little or no handling experience. The first exercise was designed to test the dogs' progress over lengthy trails of 600 to 700 meters, on which only a few targets were placed. Training aids were dispersed from a vehicle to

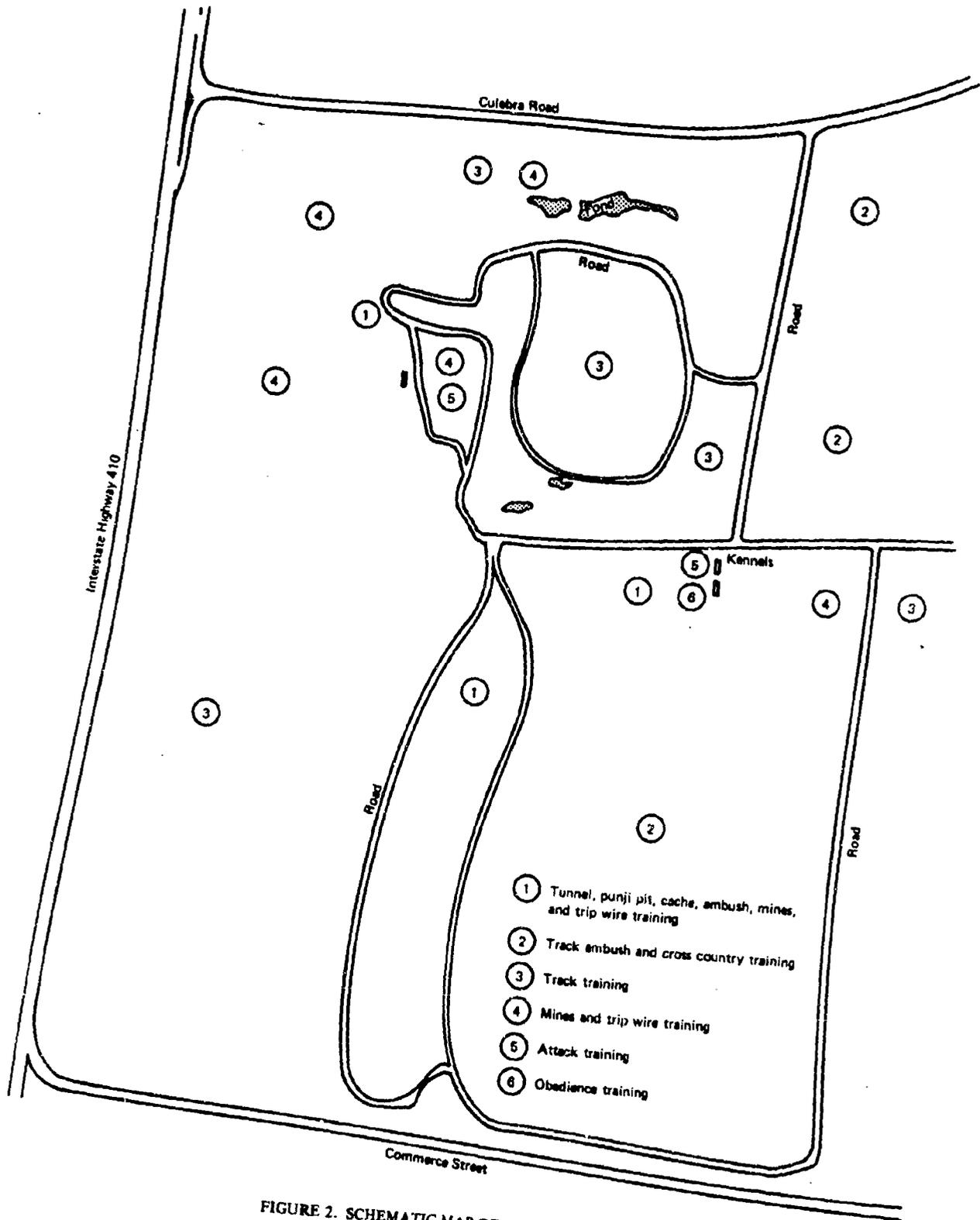


FIGURE 2. SCHEMATIC MAP OF TRAINING AREAS

TABLE 2. AVERAGE MONTHLY SCORES AND EVALUATIONS

	Herc	Zeus	Prince	Major	Duchess	Spoylet	Bandy	Liquish	Cynbad	Baron	Bullet	Peter*
<i>May/June</i>												
Mines Detected, percent	82.5	85.0	69.0	52.0	66	50	36	-	-	-	-	-
Trip Wires Detected, percent	95	77	39	43	51	60	70	-	-	-	-	-
Grade	3	3	2	2	2	2	2	-	-	-	-	-
Mode	On leash	On leash	On leash	On leash	On leash	On leash	On leash	-	-	-	-	-
<i>June/July</i>												
Mines Detected, percent	72	65	75	53	52	46	Dropped - not motivated	71	52	-	-	-
Trip Wires Detected, percent	76	88	73	75	58	68		57	31	-	-	-
Grade	3,4	3,4	2,3	2,3	2,3	2,3		1,2	1,2	-	-	-
Mode	On and off leash	On and off leash	On leash	On leash	On leash	On leash		On leash	On leash	-	-	-
<i>July/August</i>												
Mines Detected, percent	63	66	60	53	52	Dropped - not motivated		56	73	-	-	-
Trip Wires Detected, percent	62	65	60	60	70			53	50	-	-	-
Grade	5	5	4	4	4			3,4	3,4	1	1	-
Mode	Off leash	Off leash	On and off leash	On and off leash	On and off leash			On leash	On and off leash	On leash	On leash	-
Amibush Response	Good but slow to respond to stimulus	Very good	Very good	Fair but showed no interest	Very good			Very good	Very good	-	-	-
<i>August/September</i>												
Mines Detected, percent	89	70	63	59	Dropped - unreliable			Dropped - shy, unreliable	76	-	-	-
Trip Wire Detected, percent	100	74	70	100	too playful (female)			(Labrador retriever - Female)	57	-	-	-
Grade	5	5	4	4					3,4	1	1	-
Amibush Response	Good	Excellent	Excellent	Fair					Excellent	Good	Fair	-
Tracking	Fair	Good	Good	Poor					Excellent	Good	Good	-

TABLE 2. AVERAGE MONTHLY SCORES AND EVALUATIONS (Cont'd)

	Herc	Zeus	Prince	Major	Duchess	Spoylet	Bandy	Liquish	Cynbad	Baron	Bullet	Peter*
<i>September/October</i>												
Mines Detected, percent	82	73	77	Dropped -					70	49	28	-
Trip Wires Detected, percent	85	72	75	not					58	4	38	-
Tunnels Detected, percent	58	75	75	motivated					41	63	75	-
Pits Detected, percent	50	100	100						100	38	50	-
Ambush Response	Good	Good	Fair						Fair	Fair	Good	-
Tracking	Fair	Good	Good						Good	Fair	Good	-
Grade	5	5	5						5	3	3	-
<i>October/November</i>												
Mines Detected, percent	72	80	78						57	73	Dropped -	-
Trip Wires Detected, percent	95	75	77						66	58	not motivated	-
Attack and Stand Off	Off leash control difficult	Excellent, but soft bite	Will not agitate						Excellent	Good		Will not agitate
<i>November/December</i>												
Mines Detected, percent	57	81	60						80	43		53
Trip Wires Detected, percent	91	73	80						68	57		28
Open Field Trip Wire Detection	Excellent	Good	Confused						Fair	Poor		-
Grade	Adv	Adv	Adv						Adv	5		2
<i>December/January 1972</i>												
Mines Detected, percent	61	98	62						92	60		54
Trip Wires Detected, percent	90	100	80						70	95		75
Composite Performance	Excellent	Excellent	Good						Excellent	Fair		Fair
Grade	Adv	Adv	Adv						Adv	5		3
<i>January/February</i>												
Mines Detected, percent	81	80	80						80	80		76
Trip Wires Detected, percent	90	79	89						92	63		80
Attack	Good (on leash)	Excellent	Poor						Excellent	Good		Poor
Ambush Response	Excellent	Excellent	Excellent						Excellent	Good		Good
Tracking	Good	Fair	Fair						Good	Good		Fair

*Grade 4.

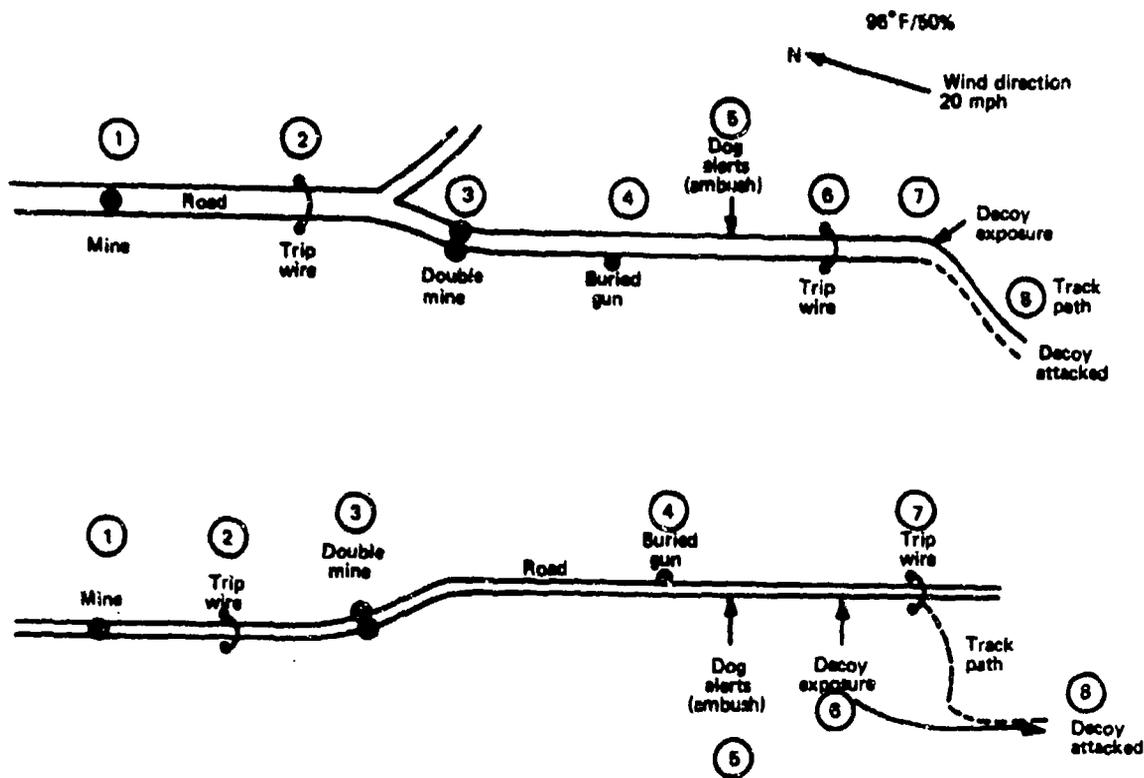


FIGURE 3. EXERCISE TRAILS DIAGRAMS FOR HERC AND ZEUS

eliminate human-scent contamination between targets along two test trails—one for Herc and one for Zeus (Figure 3). Prince, Major, Duchess, Liquish, and Cynbad were tested 72 hr later on the same trails and identical targets, excluding ambush detection and attack.

A second test exercise was conducted in which the dogs were controlled by untrained handlers during mine and trip wire detection. The third test was performed in a similar manner, but limited to tracking problems. A fourth test was designed as an experiment to determine if the dogs would discriminate between control samples and samples containing only dynamite in the presumed absence of human scent.

Figure 3 illustrates the conditions and placement of simulated mines, trip wires, and a gun cache in the first exercise for Herc and Zeus.

Background noise included small arms fire from distances of 50 to 300 meters. Except for radio communication between the decoy and an observer in the patrol party, talking was minimal. At each correct response, the test animal was reinforced by food and praise from the trainer.

For the less advanced dogs, mines were partially buried in the center and on both sides of the road. Trip wires were a few inches high and were blended in with the surrounding area. The gun cache was buried 2 meters off the trail. During this training period, an alert was recorded when the dog moved in on the cache but failed to respond by not

sitting. The results of the test are recorded in Table 4, Section IV.

In the second exercise, three persons other than the dog trainers participated as handlers in a multihandler demonstration. The target emplacements were unknown to the new handlers. Results are recorded in Table 5, Section IV.

In the third exercise, the three exchange handlers worked the dogs during on-leash tracking tests. The prepared tracks were 20 min old and 300 meters long and consisted of two turns. Dropcloths were not used. Results are recorded in Table 6, Section IV.

The object of the discrimination exercise was to determine if dynamite in the presumed absence of human scent was sufficient to stimulate an alert or sit response in the dog.

Cans designated as ammunition cans were sterilized before adding a small quantity of nitroglycerine dynamite. Except for unopened food cans, all negative controls were similarly sterilized but were empty. The test was conducted in a heavy rain along an asphalt road after an assistant in a rubber rain suit and rubber gloves placed the cans at 15- to 20-meter intervals. The results of this exercise appear in Table 7, Section IV.

2. Explanation of Sponsor's Evaluation in September 1971

A demonstration exercise using four dogs was prepared and executed in early September of 1971. Results

were generally unsatisfactory. Poor performance is thought to have been caused by preparation procedures unfamiliar to the dogs. Examples of these procedures are deep target burials, excessive distances between targets, change from trails to roads, distractions from observers following the dogs and handlers, and upwind air currents.

Herc, Zeus, Prince, and Cynbad were selected for the demonstration. Herc and Zeus were scheduled to perform seven tasks while Cynbad and Prince were each scheduled for six tasks. Four individual trails were arranged, three of which were located in areas unfamiliar to the dogs. A fourth trail was located in the vicinity of a recently used training area. The exercise was presented with as much realism as possible with a scenario that reads as follows:

General. On 1 September, isolated enemy units were consolidating for a two-prong offensive sweep across Yucca Flats in an attempt to capture a section of Commerce Road, now occupied by friendly forces. It is expected that the enemy's 15th Red Rifles will flank the attack along the high ground at Rattlesnake Hill to the west and Chigger Pass to the east.

In an effort to offset the attack, Bravo Company will lead friendly forces north on Quail Road, turning east at Hackberry Junction to Red Tick Forest and retain control of Oak Ridge Road. Alpha Company will proceed on Quail Road north of Hackberry Junction, turning west on Scorpion Drive to Ridge Road where enemy contact is expected. Charlie Company will advance to Rattlesnake Hill to secure Diamondback Trail and Helotes Village. The First platoon will link with the First Marine Parachute Brigade south of Culebra Road in an effort to dissolve the enemy's frontal attack.

Situation. Intelligence reports have identified the enemy's use of buried antipersonnel mines and booby traps. Stores of guns and supplies are buried along routes of attack. A captured enemy soldier reports extensive underground tunnels and fortifications. Commanders at a staff meeting have unanimously concurred in the use of the infantry multipurpose dogs.

Four trails approximately 600 meters long were prepared, using various scented objects to represent concealed ordnance targets. Figure 4 illustrates the sequential order of target emplacements and wind direction. Each trail in Figure 4 is identified by the dog exposed to this exercise.

The manner of performance during the demonstration was noted and recorded in Table 9 of Section IV.

3. Explanation of Sponsor's Evaluation in October 1971

Representatives from U.S. Army Land Warfare Laboratory and U.S. Army Military Dog Committee reviewed the performance of multipurpose dogs Herc, Zeus, and Cynbad in track, mine, and trip wire detection, tunnel detection, ambush detection, and, with the exception of Herc, attack exercises. Prince was observed in the performance of a dual exercise of ambush detection while tracking. The reviewer's comments upon an exit interview are reconstructed from notes and memory and are reported in Section IV of this report.

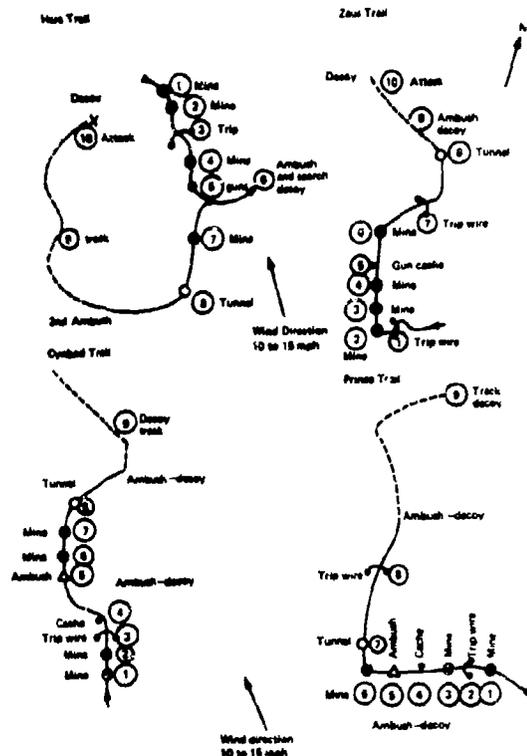


FIGURE 4. EXERCISE TRAIL DIAGRAMS FOR FOUR TEST DOGS

4. Explanation of Sponsor's Evaluation in December 1971

A six- and a seven-task demonstration for evaluation purposes were performed for representatives from the U.S. Army Land Warfare Laboratory and U.S. Army Military Dog Committee. The trails were prepared as indicated in Figures 5 and 6. Moreover, an experiment was performed to determine the practicality of training dogs to scout while on a tracking mission. The results of this tracking exercise are illustrated in Figure 7, Section IV.

Two trails over 1000 meters long were prepared which could integrate seven tasks into one exercise. All exercises terminated with a track demonstration from the site of an ambush. Zeus and Cynbad performed the intruder immobilization task after discovering the track layer decoy.

Zeus, Herc, Cynbad, and Prince were tested over two different trails in a 24-hr period. The virgin trails were approximately 1000 meters long. The handlers were unaware of target positions when the first two dogs were tested. Moreover, the handlers were guided from point to point by referenced landmarks. In two exercises, dogs worked the first trail in reverse order. Figures 5 and 6 represent types and placement of targets.

Observations were noted in the 2-day exercise and are recorded in Table 10 in Section IV of this report.

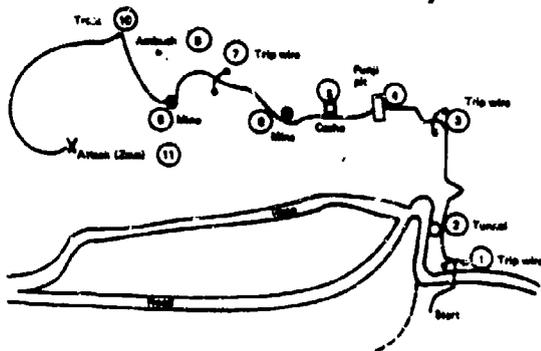


FIGURE 5. EXERCISE TRAIL DIAGRAM FOR ZEUS AND PRINCE

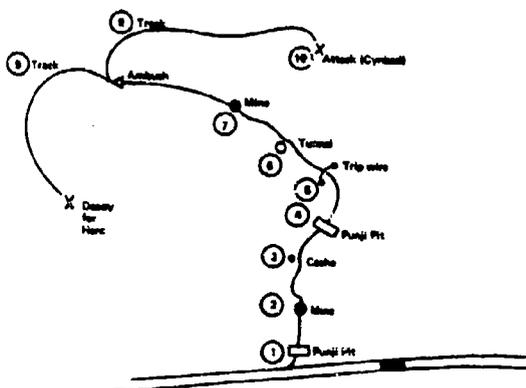


FIGURE 6. EXERCISE TRAIL DIAGRAM FOR HERC AND CYNBAD

L. Changeover to Military Dog Handlers

Handler changeover from contractor to military personnel was accomplished in 3 weeks. Four recently trained U.S. Army enlisted personnel began rapport training with the dogs immediately upon arrival at SwRI. This training consisted of caring for and managing the dogs for the first 2 days. The next 3 days were utilized for obedience training and close order drill, which were practiced for brief periods each day before exposing the dogs to tactical field exercises. Initially, emphasis was placed on scouting activities, followed by patrol exercises. Semiformal lectures and demonstrations on tracking and attack procedures were provided to the new handlers in order to introduce them to these training methods. Observations of the dog's performance are recorded in Table 13, Section IV.

M. Final Demonstration of Dogs with Military Handlers

During the third week of military-handler training, a final evaluation of the dogs' performances with the new handlers was accomplished by the Sponsor. Most of the exercises were conducted according to schedule.

A total of 4 days was allowed for evaluation of the multipurpose dogs with their military handlers. The first 2 of

these days were devoted to separate task exercises, such as mine, trip wires, tunnel, punji pit and cache detection, ambush detection, attack, and track. The last 2 days were used to demonstrate the dogs' capabilities in integrated seven-task situation exercises. These exercises terminated in a short track and attack of a decoy. Observations were noted and recorded in Tables 10 and 12, Section IV.

Demonstration trails were prepared containing simulated buried mines, trip wires placed perpendicular and parallel to the trail, tunnels, caches, and punji pits.

The plan for ambush demonstration considered the placement of decoys approximately 300 meters apart. The attack demonstration was conducted with the dogs while on and off leash. Track demonstrations were performed in two

TABLE 3. INFANTRY MULTIPURPOSE DOG EVALUATION

Time	Task	Dog
<i>First Day</i>		
0800	Intermediate track	Baron, Prince, Zeus
1000	Patrol	Herc, Cynbad
1200	Lunch	
1300	Attack	Herc, Cynbad
1400	Ambush detection	Earon, Prince, Zeus
1600 to 1700	Critique and kenneling of dogs	
<i>Second Day</i>		
0800	Intermediate track	Herc, Cynbad
1000	Patrol	Baron, Zeus, Prince
1200	Lunch	
1300	Attack	Zeus, Baron
1400	Ambush detection	Herc, Cynbad
1600 to 1700	Critique and kenneling of dogs	
<i>Third Day</i>		
0800	Advanced tracking	Baron, Prince, Zeus
1100	Sponsor's time	
1200	Lunch	
1300	7-task trail	Herc, Cynbad
1600 to 1700	Critique and kenneling of dogs	
<i>Fourth Day</i>		
0800	Advanced tracking	Herc, Cynbad
1100	Sponsor's time	
1200	Lunch	
1300	7-task trail	Baron, Prince, Zeus
1600 to 1700	Critique and kenneling of dogs	

Note: Those dogs that are not on a scheduled task may be re-evaluated to determine the scope of their effectiveness.

stages. The first was an intermediate track and the second was an advanced track. For this demonstration, intermediate and advanced tracks are defined as follows:

- Intermediate track—The track is more than 1 hr old and at least 500 meters in length with one or more right-angle turns.
- Advanced track—The track is approximately 3 to 4 hr old, 1000 meters long, and consisting of two or more turns. Moreover, a test is conducted to observe the tracking dog's response to the presence of trip wires and mines.

The multipurpose infantry dog evaluation schedule of activities is shown in Table 3.

Observations of the dog's performance with the military exchange handlers are illustrated in Figures 8 to 15 and recorded in Tables 13 and 15 in Section IV.

IV. RESULTS

A. Results of Contractor's In-House Evaluation in August 1971

In the first portion of Exercise 1, Herc and Zeus were evaluated in the following areas: distance response; detection of mines, caches, and trip wires; and performance of decoy attack. Zeus, very slow to move out, failed to establish proper distance from the handler for the first 75 meters.

TABLE 4. PERFORMANCE RESULTS OF PRINCE, LIQUISH, CYNBAD, MAJOR, AND DUCHESS

Dog	Distance Response	Mines Detected, percent	Trip Wires Detected, percent	Gun Cache
Prince	Adequate	48	50	Alert
Liquish	Adequate	66	0	Sit
Cynbad	Adequate	33	0	Sit
Major	Poor	18	75	Sit
Duchess	Adequate	33	50	Alert

TABLE 5. PERFORMANCE RESULTS OF THE CANDIDATE DOGS WHEN WORKED BY HANDLERS OTHER THAN TRAINERS

Handler	Dog	Mines Detected, percent	Trip Wires Detected, percent	Control	Remarks
A	Liquish	90	0	On leash	Off leash dog ran away
A	Duchess	0	0	On leash	Not interested
B	Cynbad	72	-	Off leash	Excellent distance control
B	Herc	77	100	Off leash	Superb performance
C	Zeus	80	100	Off leash	Superb performance
C	Prince	50	100	Off leash	Initial excitement but performed well
C	Major	33	0	75% of time On leash	Required encouragement and cues; gun shy

After the first detection of a buried road "mine," his performance steadily improved to the extent that he was working at an estimated 30 to 40 paces in front of the handler and pinpointing every target emplacement. When the trainer informed the observers of an alert, the decoy, stationed about 75 to 100 meters southeast of the dog, was requested by radio contact to expose himself for a few seconds. At this exposure, Zeus indicated a strong tendency to give chase but was properly brought under control and subsequently finished the trail exercise by sitting at a trip wire approximately 50 meters beyond the alert site. Zeus was then placed on leash and commanded to follow a 70-meter track in pursuit of the decoy concealed in a ravine. This exercise was terminated by an on- and off-leash attack.

Herc performed superbly well in this exercise, detecting all targets as well as instantly attaining and maintaining adequate distance from the handler. Herc's on-leash attack was more aggressive than that of Zeus, as he vigorously reacted to the defensive efforts of the decoy.

Tables 4 through 7 illustrate the results of the various test exercises.

From results and impressions, the general manner of performance of the dogs is reported in Table 8.

B. Results of Sponsor's Evaluation in September 1971

Prior to the demonstration, most of the training was conducted in forests on wildlife and manmade trails. Trail distance seldom varied from 75 to 150 meters, and targets were abundant during this rather confined training. These deficiencies were corrected for the evaluation exercises, however, by relocating training areas more frequently, increasing the length of the trails, and deploying fewer targets.

Before the demonstration exercises, it was predicted that based on past achievement, the four dogs would perform with an accuracy of 60 to 90 percent. Herc's performance was considered to be excellent, but he had the advantages of a southerly wind and the familiarity with the area in which the demonstration was conducted. In addition, there was little or no distracting influence from detonating simulators, M-80 shells, and blank small arms fire. The other three dogs

TABLE 6. PERFORMANCE RESULTS OF BASIC TRACKING EXERCISES

Handler	Dog	Results
A	Zeus	Overtook decoy's turn, did not track
A	Cynbed	Followed decoy
B	Duchess	Followed decoy
C	Herc	Did not track, interested in airborne scent
C	Liquish	Performance was excellent as the dog remained on the track, but lost the decoy's second turn

TABLE 7. RESULTS OF OLFACTORY DISCRIMINATION TEST USING DYNAMITE SAMPLES AND CONTROL NEGATIVE ODORS IN THE PRESUMED ABSENCE OF HUMAN SCENT

Dog	Target	Response	Remarks	
Zeus	Ammo can	Sit	Was not corrected	
	Unopened can	Sit		
	Empty can	Smelled		Moved on
	Ammo can	Sit		Moved on
	Empty can	Smelled		
Prince	Ammo can	Sit	Nosed over, moved on	
	Unopened can	Smelled		
	Empty can	Smelled		Moved on
	Ammo can	Sit		Moved on
	Empty can	Smelled		
Liquish	Ammo can	Sit	Walked by control	
	Unopened can	None		
	Empty can	None		Walked by control
	Ammo can	Sit		Walked by control
	Empty can	None		
	Ammo can	Sit		

TABLE 8. GENERAL PERFORMANCE RATINGS

Dog	Objectives									
	Mine	Trip Wire	Cache	Tunnel	Ambush	Track	Attack	Distance Control	Obedience	Motivation
Herc	1	1	1	1	2	3	2	1	2	1
Zeus	2	2	2	2	2	1	1	3	1	2
Prince	1	1	2	2	1	2	3	3	2	2
Cynbed	1	3	2	2	3	1	2	1	2	1

*1 = Good performance.
 2 = Marginal performance.
 3 = Unsatisfactory performance.

worked at a disadvantage. They were usually upwind of the targets; terrain was unfamiliar; overhead foliage was lacking; ambient temperature had increased significantly; and the targets were dispersed at greater intervals. Furthermore, there were probably other factors related to the poor performance of the three dogs that could not be determined. In general, distance control was good, and with the exception of one occasion, the dogs did not digress from the trail.

The results of the unsatisfactory performance by the three dogs are reported in Table 9.

C. Results of Sponsor's Evaluation in October 1971

The results of this evaluation are indicated in the following comments:

- The workability, performance, and operational distance of the dogs with respect to terrain were impressive.
- The selection of the six dogs for extended training was good.
- Dogs should be more vigorous in attack and should be allowed to progress to desired level of aggression while on leather collar.
- The choke chain should be applied to moderate aggressiveness, and the out command should be enforced by a sharp snap across the nose or by a pinch in the epiglottic region.
- Dogs should not be led around trip wires. The handler should always remain behind the dog.
- Dogs should be trained to select routes around U-shaped trip wire emplacements.
- Dogs should not be permitted to explore or investigate tunnel openings. An immediate sit response should be demanded.

TABLE 9. PERFORMANCE RESULTS OF HERC, ZEUS, PRINCE, AND CYNBAD

Target	Response
<i>Herc</i>	
1	Sit
2	Sit
3	Sit
4	Recall sit
5	Sit
6	Alert 75 m from decoy
7	View obstructed; it is presumed that Herc sat, but was recalled before confirmation.
8	Sit
9	Herc tracked 100 m and then appeared to be searching on airborne scent. Finally directed to decoy's position. The dog's poor performance seemed to be influenced by the handler.
10	Attack on leash. Would not stand off on command.
<i>Zeus*</i>	
1	Missed, corrected on recall
2	Missed, corrected on recall
3	Missed, corrected on recall
4	Missed, recall sit
5	Missed
6	Missed, probably due to human error
7	Dog's alert was undetected by handler, problem repeated with success
8	Missed, recall sit
9	Tracked 75 m, became entangled in brush while casting. Directed to decoy's position.
10	Stand off was terminated on command.
<i>Prince</i>	
1	Missed, recall sit
2	Missed, recall sit
3	Alert, commanded to sit
4	Alert, commanded to sit
5	Excellent alert, 15 paces from decoy
6	Sit
7	Missed, recall sit
8	Recall sit
9	Excellent execution of track within 25 paces of decoy. Would not go in on position.
<i>Cynbad</i>	
1	Missed, recall sit
2	Missed, recall sit
3	Missed, recall sit
4	Missed, recall sit
5	Missed, problem repeated, animal alerted on noise from decoy.
6	Missed
7	Missed
8	Missed, recall sit
9	Excellent track; when animal became entangled in brush, the leash was removed. Decoy's position was immediately discovered.
*The dog appeared to be working on the trail, but, for some unknown reason, he did not react to targets.	

- Old simulated mine holes should be covered to prevent dogs from responding to recovered emplacements. It is advisable to use new training lanes or allow old ones to age for 72 hr.
- The difference between the dog's response to an empty tunnel opening and to one containing a man was obvious. Thus, his ability to discriminate and to communicate to the handler the absence or presence of man is a bonus benefit in tunnel detection.
- Herc and Cynbad required enforcement of handler's commands.
- Herc and Cynbad should be trained with consistency at seriousness.
- Cynbad should be encouraged to sit rather than lie down when indicating the presence of a target.
- Zeus missed two trip wires.
- Zeus should be consistently motivated.
- Prince could probably be trained to attack by controlled agitation from a stranger.

As a result of these comments, certain corrective measures were taken which added sophistication to the training procedures and improved the performance of all dogs.

D. Results of Sponsor's Evaluation in December 1971

Although in this evaluation Zeus had overall excellent response, he had some difficulty in reacting to a tunnel target. Shifting air currents delayed his reaction to this particular target. The overriding airborne scent from the ambush target located 100 meters from the alert location undoubtedly distracted Zeus, causing him to fail to detect the last mine target until he was recalled for a second attempt. Control was excellent as the dog executed all commands and maintained adequate distance ahead of the handler.

On the same trail 24 hr later, Prince performed exceptionally well but missed the tunnel target where Zeus experienced a delayed alert response. The tunnel position was on the upward slope of a steep hill, and wind currents were not in favor of the dog's making the detection. Since the last target was not encountered, it could not be considered an error, but rather an unavoidable omission from the test for this dog.

Herc's performance was superior in this exercise as he maintained exceptional poise while working the second trail.

TABLE 10. PERFORMANCE RESULTS OF ZEUS, PRINCE, HERC, AND CYNBAD

Sequential Placement of Targets											
Dog	Trip Wire	Tunnel	Trip Wire	Punji Pit	Cache	Mine	Trip Wire	Mine	Ambush	Track	Attack
Zeus	Sit	Sit	Sit	Sit	Sit	Sit	Sit	Missed	Alert	Handler error	Stand off, search, reattack
Prince	Sit	Missed	Sit	Sit	Sit	Sit	Sit	Sit	Alert	Found decoy	Not performed
	Punji Pit	Mine	Cache	Punji Pit	Trip Wire	Tunnel	Mine	Ambush	Track	Attack	
Herc	Sit	Sit	Sit	Sit	Sit	Sit	Sit	Alert	Found decoy	Not performed	
Cynbad	Sit	Sit	Sit	Sit	Sit	Sit	Missed	Alert	Found decoy	Stand off, search, reattack	

He located and sat at all targets, detected an ambush, and successfully terminated a tracking exercise after a second cue on the track layer's scent.

Cynbad performed well overall, but he missed the last mine target on the trail and was not as positive in the ambush alert as he could have been. The tracking exercise was performed satisfactorily, after which intruder immobilization was demonstrated. Also, attack, recall, reattack, and stand off were impressive, making all aspects of this exercise satisfactorily executed.

In all cases, exercises were conducted in silence, with dogs being managed and directed by the "silent" whistle and hand and arm signals. A composite score of all dogs was 0.86. Zeus and Cynbad each missed one mine emplacement, and Prince failed to detect the tunnel target. General performance results are recorded in Table 10.

The December evaluation also included an interrupted tracking experiment in which two trip wires were strung 50 meters apart across the track. Results indicated that it was possible after an alert to reorient the dog to track at the target site. Specifically, Prince was cued to track at the scent pad which began the 250-meter track; he responded to the first trip wire by sitting and then scanned and bypassed the second trip wire. Missing the decoy's turn, he was then

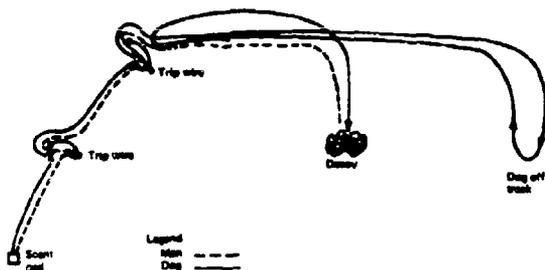


FIGURE 7. RESULTS OF INTERRUPTED TRACK EXPERIMENT

returned to reidentify the track layer's scent at the second trip wire. At the second scenting, Prince successfully tracked into the decoy's position. Results of this experiment are illustrated in Figure 7.

E. Welfare, Texas, Test Exercise in February 1972

All dogs responded exceptionally well to the new environment, a training site 40 miles from San Antonio, Texas. The motivation exhibited by handlers as well as dogs undoubtedly contributed to the overall successful performance. Results of this exercise are recorded in Table 11.

F. Results of Military Dog Handler Changeover in February 1972

The Army-enlisted handlers established rapport with the respective dogs in the first one or two days, phasing in on-leash obedience and close-order drill training. At first, the dogs were reluctant to respond to the down hand and arm signals and generally disregarded the stay command. Formation drill, however, was impressive, and, after three days' practice, the dogs became more responsive to obedience commands from the new handlers. Generally, there was a tendency, during the changeover period, for the new handlers to limit the dogs to conventional Army scouting and patrolling practices rather than utilize them in multiple-task exercises.

Although no major problems developed as a result of the changeover, Cynbad was prone to paw or scratch at buried targets, and additional types of unwanted behavior appeared. For example, one of the dogs became reluctant to sit at ground targets. A possible contributing factor was that the new handlers did not consistently apply food reinforcement as was thought necessary.

Most of the exercises consisted of relatively short trails incorporating ambush detection with ground targets; in view of these and all other parameters for evaluation, the dogs performed satisfactorily during the handler changeover process. Computed percentage results of performance with the new handlers are noted and recorded in Table 12.

TABLE 11. PERFORMANCE OF HERC, ZEUS, CYNBAD, PRINCE, AND BARON AT WELFARE, TEXAS

Target	Response	Remarks	Target	Response	Remarks	
<i>Herc</i>			<i>Cynbad (Cont'd)</i>			
Mine	Sit	Touched wire	Trip wire	Sit		
Trip wire	Sit		Trip wire	Sit		
Mine	Sit		Trip wire	Sit		
Mine	Sit		Mine	Missed		
Trip wire	Missed	Recalled to sit	Track	Tracked to decoy		
Mine	Sit		<i>Prince</i>			
Mine	Sit		Mine	Sit		Recalled to sit
Trip wire	Sit		Mine wire	Sit		
Mine	Missed		Mine	Sit		
Mine	Sit	Mine	Missed			
Trip wire	Sit	Touched wire	Trip wire	Missed		
Mine	Sit		Mine	Sit		
Trip wire	Sit		Mine wire	Sit		
Trip wire	Sit		Trip wire	Sit		
Mine	Sit		Track	Tracked to decoy		
Trip wire	Sit		Trip wire	Sit		
Mine	Sit		Mine	Sit		
Trip wire	Sit		Trip wire	Sit		
Trip wire	Sit		Trip wire	Sit		
Mine	Sit		Track	Tracked to decoy		
Trip wire	Sit		Trip wire	Sit		
Mine	Sit		Mine	Missed		
Trip wire	Sit		Track	Tracked to decoy		
Mine	Sit		<i>Baron</i>			
Mine	Sit		Mine	Missed	Recalled to sit	
Track	Tracked to decoy		Mine	Missed		
Mine	Sit		Trip wire	Sit	Recalled to sit	
Mine	Sit		Mine	Sit		
Track	Tracked to decoy	Mine	Sit			
Mine	Sit	Touched wire	Mine	Sit		
Mine	Sit		Trip wire	Sit		
Trip wire	Missed		Mine	Sit		
Mine	Sit		Mine	Missed		
Trip wire	Sit		Mine	Sit	Recalled to sit	
Mine	Sit		Trip wire	Missed		
Mine	Sit		Mine	Sit		
Mine	Sit		Trip wire	Sit		
Mine	Sit		Track	Tracked to decoy		
Mine	Sit					

TABLE 12. PERFORMANCE OF DOGS DURING HANDLER EXCHANGE

Dog	Types of Detection				
	Trip Wire	Mine	Catch	Tunnel	Full Pit
Herc	90	40	80	100	100
Zeus	66	100	100	100	80
Prince	90	53	70	-	0
Cynbad	70	70	87	100	0
Baron	20	33	50	-	-

G. Results of Sponsor's Evaluation of Dogs' Performances with New Handlers in March 1972

1. Intermediate Tracking

Exercises in this phase consisted of six tracks over 500 meters long and from 1 to 2 hr old. Performance is depicted by the accompanying diagrams (Figures 8 through 12) and brief explanations.

Baron completed the tracking exercise in approximately 12 min. At the second turn, however, the dog overcast by about 15 meters.

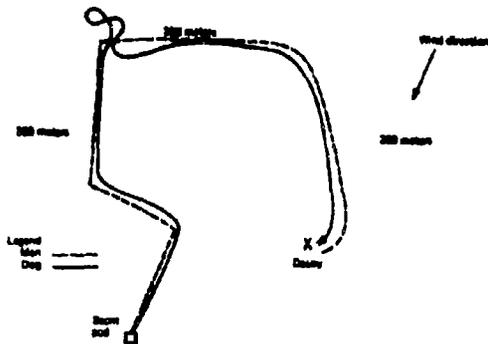


FIGURE 8. PERFORMANCE OF BARON ON AN INTERMEDIATE TRACK

Zeus lacked positiveness in maintaining the initial portion of the track but apparently was remotivated midway and sustained a good track until encountering the decoy. Track time was 25 min.

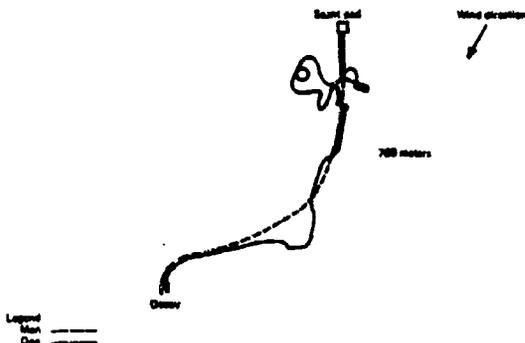


FIGURE 9. PERFORMANCE OF ZEUS ON AN INTERMEDIATE TRACK

Prince started on a 2-hr-old track, but was recalled off the track for resenting by a disbelieving handler. The dog was returned to the start point a third time but was misdirected off the track by the handler. Shortly thereafter, Prince was distracted by a rabbit and the exercise was terminated.

Herc executed a satisfactory track but had to be rescented at a dropcloth left by the track layer at the first third of the exercise. In the latter portion of the track, a wind shift was noted, making the discovery of the decoy by airborne scent a likely possibility. Track time was 10 min.

Cynbad tracked very well for the first 200 meters, but, unknown to the handler, was distracted by deer. After 15 min on a false track, Cynbad was returned for

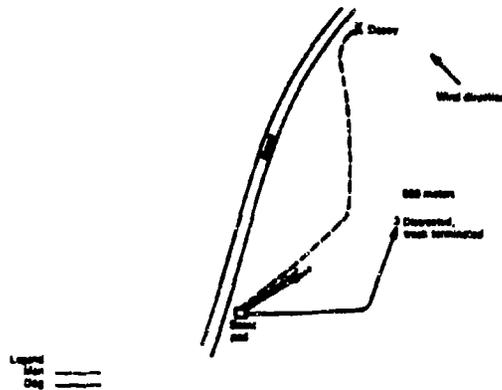


FIGURE 10. PERFORMANCE OF PRINCE ON AN INTERMEDIATE TRACK

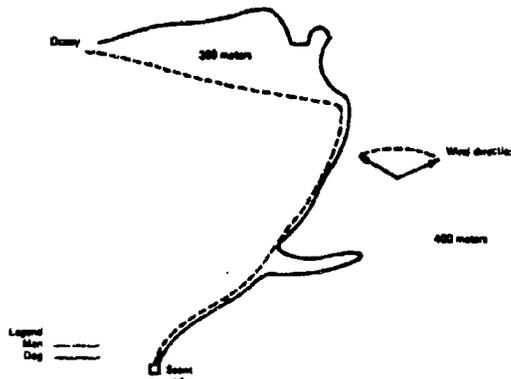


FIGURE 11. PERFORMANCE OF HERC ON AN INTERMEDIATE TRACK

resenting on a dropcloth located midway on the track layer's course. The track was terminated at the decoy's position 30 min from the original start point.

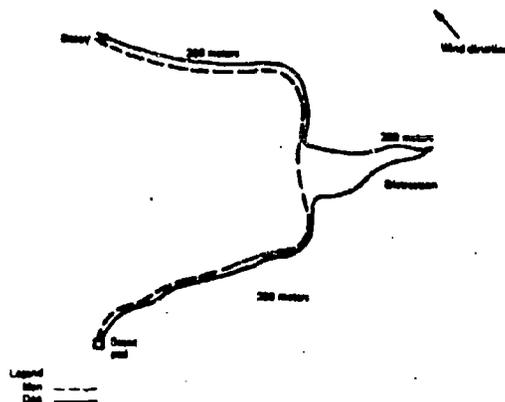


FIGURE 12. PERFORMANCE OF CYNBAD ON AN INTERMEDIATE TRACK

TABLE 13. PERFORMANCE OF DOGS DURING ATTACK EXERCISES

Dog	Agitation (False Run)	Attack	Recall	Stand Off	Search Restriction	Remarks
Herc	✓	✓	✓	Not tested	Not tested	On and off leash
Zeus	✓	✓	✓	✓	✓	On and off leash
Cynbad	✓	✓	✓	✓	✓	On and off leash
Baron	✓	✓	✓	✓	Not tested	On and off leash

represents satisfactory performance in that particular exercise.

4. Ambush Detection Exercise

The results of the ambush detection exercise are given in Table 14.

5. Mine, Trip Wire, Cache, Tunnel, and Punji Pit Detection Exercises

The results of the mine, trip wire, cache, tunnel, and punji pit detection exercises are presented in Table 15.

TABLE 14. AMBUSH DETECTION RESULTS

Dog	Location	Wind Speed, mph	Distance from Decoy at Time of Detection, meters	Control by Handler
Herc	Downwind	10 to 15	100	Excellent
Zeus	Crosswind	5 to 10	200	Good
Prince	Crosswind	5 to 10	150	Fair
Cynbad	Downwind	10 to 20	150	Good
Baron	Crosswind	5 to 10	175	Good

TABLE 15. PERFORMANCE OF DOGS IN SCOUTING ACTIVITIES WITH NEW HANDLERS

Target	Distance in Paces	Response	Target	Distance in Paces	Response
<i>Herc</i>			<i>Prince (Cont'd)</i>		
Tunnel	65	Sit	Mine	84	Miss
Punji pit	110	Sit on recall	Trip wire	82	Sit
Mine	85	Sit	Tunnel	70	Stop, commanded to sit
Trip wire	65	Miss	Cache 32 m	100	Alert not identified
Tunnel	63	Sit	Mine	58	Alert
Trip wire	100	Sit	Trip wire	76	Sit
Cache 27 m	90	Sit	Mine	83	Stop, commanded to sit
Mine	100	Miss	Mine	80	Sit
Mine	100	Sit	<i>Cynbad</i>		
Mine	100	Miss	Mine	80	Miss
Trip wire	100	Sit	Mine	90	Sit
Punji pit	-	Sit	Punji pit	90	Stop, commanded to sit
Mine	-	Sit	Trip wire	80	Miss
Trip wire	-	Sit, touched wire	Cache 30 m	95	Alert
Cache 25 m	80	Sit	Tunnel	87	Alert, did not sit
Ambush 100 m	130	Positive alert	Punji pit	35	Sit
Punji pit	65	Sit	Tunnel	85	Alert, did not sit
<i>Zeus</i>			Trip wire	52	Sit
Trip wire	50	Sit	Cache 20 m	100	Positive alert
Tunnel	85	Stop, commanded to sit	Trip wire	80	Sit
Punji pit	85	Sit	<i>Baron</i>		
Tunnel	35	Sit on recall	Tunnel	65	Sit
Cache 30 m	87	Positive alert	Punji pit	110	Sit on command
Trip wire	95	Sit	Mine	85	Sit
Punji pit	80	Stop, commanded to sit	Trip wire	65	Alert, bypass broken wire
Mine	90	Miss	Tunnel	63	Sit on command
Mine	75	Sit	Trip wire	100	Miss
Mine	90	Sit	Cache 20 m	90	Alert not identified
Ambush	100	Positive alert	Mine	90	Sit
<i>Prince</i>			Mine	100	Sit
Mine	55	Sit	Mine 7 m	100	Miss
Tunnel	79	Sit	Trip wire	100	Sit

V. DISCUSSION

A. Reinforcement

The importance of food reinforcement in training the infantry multipurpose dog cannot be underestimated. Primarily, it conditions the dog to respond to a stimulus more quickly than by praise alone. In addition, it minimizes the necessity for a close one handler/one dog relationship, facilitates handler changeover, and encourages uniformity of response. As a result, a dog trained by the food reward method may be distracted by poorly timed praise, as praise and petting are properly associated with a play period.

Another factor to consider is the type of dog to be trained. An exceptionally friendly dog may react to praise and tactile reinforcement for brief periods, but is usually more distractible than a dog that is responsive but does not require a display of affection or petting from the handler. Dogs possessing the latter characteristic are more amenable to food reinforcement techniques. To achieve a balance, it is visualized that verbal praise such as "good boy," which always precedes the food reward or tactile praise, might eventually condition the dog to respond to a set of vocabulary words as conditioned reinforcers in lieu of these other techniques. Any signal can be used to supplement "good boy" just as long as it is paired with reinforcement and serves to announce to the dog that the next event will be a pleasant experience.

As a rule, the food reward technique does not apply after the dog has been subjected to rigorous activity or when he is thirsty, sick, or satiated. Therefore, during periods when dogs are disinterested in food, work efficiency may be considerably reduced. With respect to the infantry multipurpose dogs, food reinforcement was seldom if at all used during attack and ambush detection training. In advanced tracking, the primary reinforcer was discovery of the decoy. As stated earlier in the section, food reinforcement in training the infantry multipurpose dog is extremely important.

B. Cueing

Cueing a dog to respond to an odor by sitting can be useful in controlled situations, such as initial training or introduction to a new search environment; however, such a technique must be avoided in advanced training. Continuous cueing by the handler prevents the dog from becoming self-reliant and encourages the development of erratic behavior in search and detection operations. Often, unknown to the handler or trainer, repetitive training sessions can cause procedures to become so habitual that possibly the dog can detect certain reactions or behavior in the handler that will initiate a response, whether false or legitimate. It is for this reason that the trainer should not be responsible for concealing targets. It is always best that the trainer/handler be unaware of locations or positions of the training aids when working with a fairly reliable dog so that the formation of a behavior link from the handler to the dog is prevented. Thus, the proper use of the services of a trainer assistant is necessary to develop objective training methods.

C. Correction

Correction methods are required and must be applied at the proper time, but they should never be expressions of trainer impatience, nor should they be used when the dog has not learned the expected behavior. In special circumstances, when the trainer or handler cannot decide on an appropriate correction or when the need for correction becomes excessive, the dog should be returned to the kennels, placed in a correction box, or staked to a tree. First, however, the dog must be given an opportunity to successfully complete the assigned task regardless of its simplicity. All training sessions should be ended with the dog as the victor.

The vocabulary word "no" should always precede any physical correction. This combination will eventually have the dog responding to the "no" command in anticipation of the handler's disapproval. In obedience and attack training of the multipurpose dog, the choke chain was used, and, in track training, a forceful "no" command served to warn the dog, particularly when performance was influenced by extraneous distractions. Correction for unwanted behavior in mine, trip wire, cache, tunnel, and ambush detection was more in the form of the handler's display of displeasure by announcing the "no" command, recalling the dog for reexposure to targets, withholding the food reinforcement, or using the "sit" and "stay" commands.

The type of correction and its method of application differ, depending upon the dog involved. With reference to the multipurpose dogs, it was apparent that Herc and Baron would tolerate correction by the choke chain only to a limited degree before becoming aggressive toward the handler. Zeus and Cynbad were more responsive to the choke chain and more easily trained in obedience without becoming either aggressive or submissive; however, these two dogs were more opportunistic than Herc or Baron and would soon take advantage of the handler who did not correct them for misbehavior. Prince, on the other hand, had a low tolerance for choke chain correction with a tendency to carry avoidance behavior into the work situation. Prince, Zeus, and Cynbad should be corrected gently when performing trail work as overcorrection adversely affects their performance.

In an experimental approach to remote correction, a radio shock collar was applied to one bitch in an effort to correct her habit of running to the kennels when off leash. Three periods of shock application, a total cumulative time of less than 2 seconds, favorably corrected this behavior but seemed to accentuate inherent traits of shyness and nervousness in the dog. Moreover, the dog became reluctant to leave the handler whenever she was removed from the kennel. The bitch's unpredictable, excitable reaction to electrical stimuli was so unpleasant to observe that this method of correction was considered barbaric and never applied again. Further, these results suggested that the shock collar should not be used on an off-leash aggressive dog while personnel are in the area because the dog's reactions might be dangerous. In general, it is advisable to avoid harsh correction unless there is some assurance that it can be effectively applied; correction procedures must be humane and properly timed.

D. Training Specifics

1. Obedience Training

Experience has shown that obedience training should be practiced in a location removed from the detection training area. The dogs become inhibited if they are corrected for lapses in obedience while they are working detection problems. For example, if a dog does not respond to the "heel" command on a trail, appropriate action is to note the deficiency and implement correction procedures as required in obedience training. When the dog is performing well, a command can go undetected because concentration might be on the discovery of an ordnance object or other target rather than on the response to verbal direction. Enforcement of a missed or ignored command can be liberalized during trail training.

It was noted that some dogs responded to targets by first sitting and then easing to the down position to wait for the trainer who might be 30 to 50 meters behind. In advanced training, the trainer/handler can do one of three things: blow the "silent" whistle for recall, give the "sit, stay" command, or elevate the dog to the sit position by lifting up on the dog's harness and at the same time give the commands "sit, stay." The latter command is emphasized with the stay hand and arm signal. After the dog sits, the trainer/handler should recall and give the appropriate reinforcement to the dog, or, in early training, provide a food reward immediately after the dog is sitting. In this way, he is reinforced for detecting the target and for sitting.

In early training, it was noted that after the initial excitement of finding an ambush decoy (an accomplishment compounded with blank rifle and pistol fire), a "break" period was thought necessary. This provided time to calm the dog before continuing the trail exercise. To force the dog to work while still excited by discovery of the decoy and related events would cause the handler to resort to undue correction which might tend to erode the dog's aggressiveness and willingness to respond to the ambush detection. It was found, however, that this period of excitement diminished to manageable limits with repetition of the exercise.

2. Training Sequence

With involvement of attack and track exercises in multipurpose training, primary consideration should be given to the relationships of the tasks and the desired degree of proficiency required to achieve an acceptable blend of accomplishments. Thus, emphasis is not necessarily on importance or difficulty of the task.

It is contemplated that it would be undesirable to train the dog to be a successful attack dog before accomplishing other training tasks, the reason being that he might be dangerous while working around people in other types of task instruction. Neither is it desirable to make the dog an accomplished tracker before some proficiency has been established in human detection. At first, emphasis should be placed on mine detection with a gradual introduction to attack and track training which should be for short periods early in the program. Eventually, sequential integration of all tasks will produce a manageable dog capable of accomplishing the specified tasks in a single exercise problem.

3. Dog Handling

An often overlooked aspect in dog training is the handler's attitude. A quality necessary in both handler and dog, if they are to achieve desired goals, is proper motivation. A lack of motivation is an expression of a poor attitude which can be transferred from handler to dog. In the course of training, an unmotivated dog is replaced with one that wants to work. A motivated dog, however, does not have this exchange privilege with regard to a disinterested handler. As a result, the dog will gradually lose his enthusiasm, and his native instincts will predominate over the influence of previous training if he is forced to work with such a handler.

The dog handler must have the desire to be well trained and be capable of feeling emotional impact without involvement as he observes the performance of a well-trained dog. This, in essence, should be the trainer's or handler's reward. The trainer/handler must be given rightful consideration in all working endeavors. He, as well as the dog, must know the objectives or his expected performance in a given activity, and it is important to remember that a trainer/handler will lose interest if he is expected to train inferior dogs to become quality workers. This use of inferior dogs causes discouragement in the experienced trainer since, more than likely, he has predicted his and the dog's failure. When a trainer is assigned a mixed group of superior and inferior dogs, he will usually devote more time to the former; moreover, the dog trainer who is more responsive to dogs that are willing workers should not be denied this basic professional need since assurance of success in training will then become a reality.

E. Significant Characteristics of the Five Infantry Multipurpose Dogs

1. Herc

This 3-yr-old male German Shepherd presents the appearance of being very serious. He does not tolerate people as well as the other dogs in this group, and so caution must be used when he is approached. It is not advisable to attempt to pet this dog during periods of inactivity, and, even while playing, he may inflict painful nips on the handler. If it were not for the fact that his performance in all areas is excellent, he might have been rejected because of overaggressiveness. It is thought, however, that attack training promoted this hidden tendency. During this particular activity, he is bold and thus will not hesitate to attack, overcoming natural barriers in pursuit of a decoy agitator. This overzealousness is the reason he is trained on leash during attack. Although Herc responds well to all targets, at times he is hesitant to respond to simulated mines. However, his alert to an ambush is positive; he excels in trip wire detection; and he is obedient and responsive to the "silent" whistle as well as hand and arm signals.

2. Zeus

A 4-yr-old male German Shepherd, Zeus is the most adaptable of the five dogs. He is responsive to all obedience commands but can be distracted by wildlife, a tendency especially prevalent during early training. When attentive to work, Zeus excels in performance, although he does not possess the serious qualities displayed by Herc. This

dog gives the impression that work is a game, but this is probably because of the effortless manner in which he performs all tasks. He is an excellent demonstration dog for attack exercises, performing double stand off and showing the willingness to reattack a decoy prisoner at the slightest provocation. Zeus is not a hard biter, but his attack is convincing. He was prone to be sleeve oriented until corrected. This dog is easily directed by hand and arm signals on land as well as while swimming; however, impatient correction by the handler while working trails will cause some avoidance behavior in Zeus, usually resulting in lowered performance. He is excellent on airborne scent alerts and fair in tracking, demonstrating excellent tracking abilities while working off leash but apparently feeling somewhat restrained while under handler control.

3. Prince

This 2-yr-old male German Shepherd is characterized as the most sensitive in this group of dogs. Although he occasionally displays aggressiveness in the presence of strangers, he will not assail familiar persons in attack exercises. Generally, Prince is tolerant with humans, but, because of his sensitivity, correction methods must be carefully applied. He is better than the average tracker, performing well on trails, and can work track problems concurrently with ambush exercises. During the latter activity, he usually provides an unmistakable alert. Although the presence of wildlife may sometimes interfere with his effectiveness, he shows no performance decrement when confronted with obstacles such as brush, cliffs, and water. Thus, Prince is an easy dog to control off leash in open field problems.

4. Cynbad

A 2-yr-old male German Shepherd, Cynbad is tractable, submissive to correction, and tolerant of people

and other dogs. He responds well to whistle recall and can be silently directed over various types of terrain and into water. Although he is prone to overreact to buried simulated mines, he can be corrected by the "ait" command. Cynbad is above average in tracking and is excellent in the performance of ambush detection and attack. Because of his readiness to accept food reinforcement, training by this method in all activities but attack and ambush detection can be regularly practiced to maintain proficiency; however, correction must be applied in all circumstances to avoid the erosion of desired behavior.

5. Baron

This 2-1/2-yr-old male German Shepherd gives the impression of being overinquisitive and tends to be more stubborn and willful than the other dogs in this group. As a result, more desirable behavior can be obtained from Baron by positive reinforcement rather than by harsh correction. He responds well to whistle recall followed by verbal praise and small pieces of food, but overcorrection by use of a choke chain stimulates aggression in him, especially toward an unfamiliar handler. In this respect, Baron is somewhat similar to Herc in that attack training and prolonged agitation extend his aggressiveness beyond the limit required for the safe conduct of such exercises. Baron's main deficiency is overextending his distance from the handler and maintaining too rapid a pace while working prepared exercise trails; he tends to alert merely by slowing his pace and glancing in the direction of simulated ordnance objects. Of course, correction should never be overlooked in employment of any dog, but, with Baron, it is absolutely necessary in the interest of maintaining desired behavior. Controlled practice sessions during which the leash is employed when necessary, along with timely food reinforcement for good performance, will cause significant improvement in his effectiveness.