

HARPERSVILLE
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EXPLOSIVES DETECTION CANINE TEAM WORKSHOP
JANUARY 2, 3 & 4 2008

Reported By:

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GENERAL

On January 2, 3 & 4, 2008, a three day workshop for Explosive Detection Canine teams was held at Hoover Police Department's weapons range. The workshop was hosted by Hoover Police Department. Bomb Squad Commander, Sgt. Rod Glover served as the technical and safety supervisor for explosives handling and selection. Harpersville Chief of Police David Latimer, served as the workshop's canine adviser and trainer.

A total of thirty Canine Explosives Detection teams from several Southeastern states participated. Participants included active duty military teams, private military contractors and teams from federal, county and municipal law enforcement agencies. The active duty military teams were within a few days of deployment to Iraq. All other participating teams were currently serving their respective jurisdictions / agencies as detection teams.

The breeds of dogs participating included Labrador Retrievers, Sheppards, and Malanois. The dogs were handled by male and female teams ranging in age from early twenties to late forties and experience ranged from less than one year to over ten years in scent detection canine handling.

Participating teams were trained by a broad spectrum of individuals and agencies including various private firms, Bureau of Alcohol Tobacco & Firearms, U.S. military and others. Some few agencies represented in the workshop employed in-house trainers. Reward systems used included food, toy and praise.

The workshop was not designed or represented as a certification test and no such testing took place.

PURPOSE

The main goal for this workshop, as established by Sgt. Glover and Chief Latimer during the preliminary planning stages, was to offer explosives teams the opportunity to train with amounts of explosives and in circumstances consistent with what teams are likely to encounter in the field during deployment and in the detection of IEDs (Improvised Explosives Devices). Given that several of the teams that participated were active duty military personnel and en-route to a combat zone, and the fact that the military prohibits explosives teams from possessing or working with large amounts of explosives, we felt that this would help these teams prepare for duty. We also believed that offering any team the rare opportunity to work with large amounts of explosives was important. The basis for this is discussed at more length later in this report.

Another goal was to gather data concerning how well working detection teams detect the presence and identify the specific source of large caches of explosives. It is an accepted practice by most canine trainers and teams that they should train regularly. It is also typical however, to use small amounts of explosives, (a few ounces of powder or other explosive for example) as hides. One reason for such practice is of course the concern for the safety. Many agencies believe that using only small explosive hides lessens the chance of a large amount of explosives being left in an area and a tragic accident happening. While such a practice might arguably increase safety, limiting dogs to searching for such small amounts can condition them to only find a restrictive amount of odor. The common belief among some administrators and supervisors of canine programs is that, if a dog can find an ounce of C4, it should have no problem finding 25 pounds. As is discussed below, this widely held belief is not based on scientific data and shows a basic lack of understanding of the canine olfactory sense and more importantly of canine behavior as discussed in the **SUMMARY** section of this report.

SETUP

The deployment scenarios were devised by Sgt. Glover and Chief Latimer and incorporated realistic devices and amounts of explosives. Devices were assembled that included elements of an IED. The hides were placed at roadsides, in vehicles and in a simulated, populated village in which volunteers were working and performing various tasks and in areas and circumstances that closely simulated real scenarios. In one scenario, portions of a pig carcass were strewn across an outdoor area by an explosion to simulate the remains of a suicide bomber. More specific descriptions of the scenarios are below:

AMOUNTS AND PLACEMENT OF TARGET ODORS

In the village scenario, we placed two hides. One contained approximately 40 pounds of black powder. This powder was in a metal drum with a loose fitting lid. The drum was placed in a trash can lined with a plastic bag. The trash can was within a wooden lattice type enclosure. The village scenario incorporated people performing simulated construction tasks, such as hammering, sawing and other tasks. It also included two areas where cooking was taking place. A second hide in the village included one thousand feet of det cord, approximately one half brick of C4 and one cast booster, all contained in a nylon backpack. The back pack with the explosives was left sitting on a sidewalk, against a wall, easily accessible by the teams. Several other back packs were also placed in the general area. One of the back packs contained a piece of gauze with the odor of a female canine in estrus. Another contained a piece of gauze with the odor of a lactating female canine. All of the backpacks, with the exception of the one with the explosives, contained used clothing and toiletry items such as deodorant, after shave, etc.

In one of the roadside hides, we buried a 155 mm artillery shell, roughly six to eight inches deep. In two unoccupied vehicles, we placed 300 pounds of Pentolite boosters and in the other 300 pounds of Emulsion. In a culvert, near the area where the pig carcass was exploded we placed 50 pounds of Composition B cast boosters.

SCENARIOS

I Teams were briefed that a general bomb threat had been received. The threat was that an explosive device was left in the area. The team's assignment was to determine whether an explosive device was indeed in the area and to identify its location.

II In the village scenario, it was also advised that the area had not been evacuated due to security and other operational considerations, since a walk through by patrol officers and the bomb squad had not identified an obvious threat. The police were standing by to make a final decision on evacuation. This decision, they were told would be based in large part on what the team reported.

II In one scenario a pig carcass was exploded to simulate the remains of a suicide bomber. The two vehicles and the buried artillery round were placed along a roadway to simulate what the military teams were likely to encounter.

Teams were allowed to work through scenarios at their own pace and in the manner taught and prescribed by their respective agencies. Handlers were responsible for the interpretation of their dog's behavior and reaction to odors and to signal when their dogs made a "find". After having signaled to the monitor

that the dog had made a find, handlers were advised if the find was valid prior to the handler offering the dog a reward.

Monitors did attempt to note search behavior and recognizable body language changes during searches. No interpretations were communicated to handlers by the monitors during the scenario. These behaviors and the dog's reactions to odors are discussed in some detail later in this report.

CONCLUSIONS

The distracting odors did not seem to present a particular problem for the dogs. While several males spent time investigating and sniffing the backpacks with female canine odors, none were inordinately distracted by them and none false alerted to them. The food odors also did not seem to present a problem for either the food reward dogs or the dogs rewarded with toys. Several dogs did raise their heads and sniff toward the cooking areas, but again, none were inordinately distracted by the presence of food odors. As with the female canine odors and the food odor, the noise and activity of various construction tasks did not appear to significantly affect the search patterns of the canines.

Three of the teams detected and correctly signaled the location of at least one the hides within the village. The hide containing the black powder was detected and alerted to by several of the teams and was more frequently detected and alerted to than the back pack. The majority of the teams did not detect either of the hides in the village and/or false alerted to locations where no hide was placed. The false alert distinction for this report consisted of the handler identifying the wrong backpack or signaling in an area containing no hides. .

None of the teams properly alerted to either of the three hundred pound hides, the artillery shell or the fifty pound hide, without at least minimal assistance. Several of the canines exhibited a high level of interest in the hides, but never alerted.

After training and assistance, the majority of the teams were able to detect and properly alert to all of the hides.

No comment is made here with respect to any quality of work related to a specific reward system, since no discernable difference was noted. All noted alerts were "passive" or sit.

SUMMARY

It has long been the contention of some (including the authors of this report) who rely on scent detection canines as a part of our livelihood and safety, along with many in the veterinary research community, that without specific, targeted

training and conditioning exercises many dogs will not recognize dramatically larger amounts of substances as familiar or “target” odors.

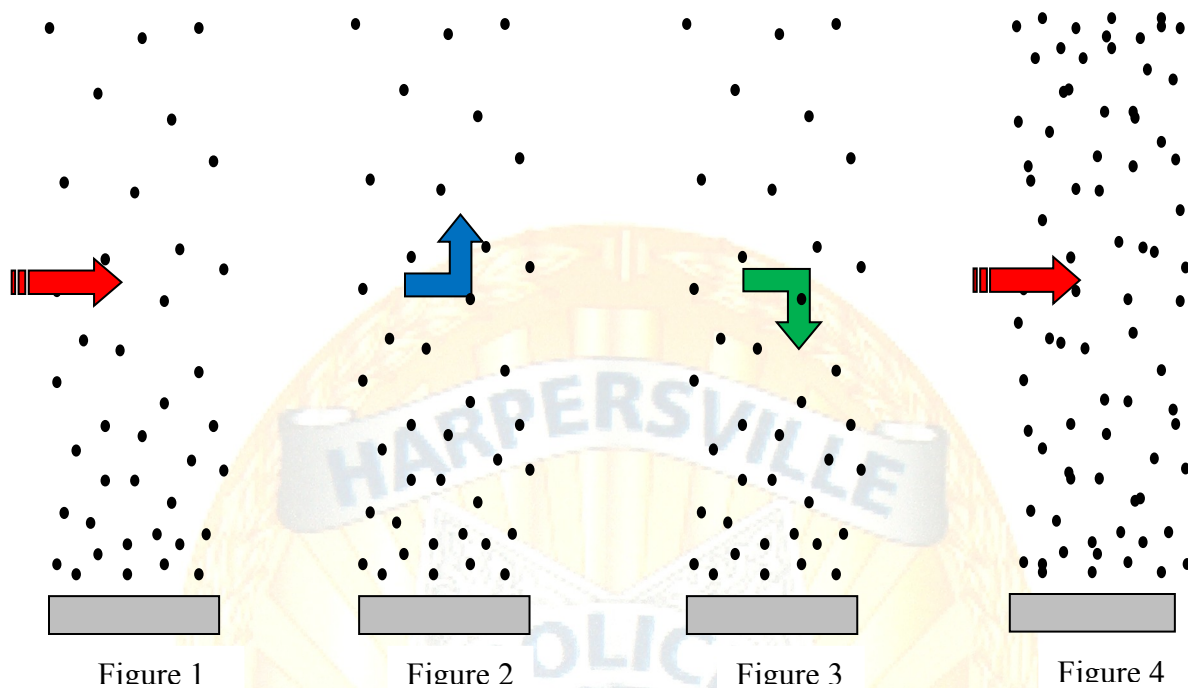
While it seems to contradict the natural assumption, based on human perception, the fact is that flooding a dog’s olfactory sense with a target odor (especially when the dog is accustomed to detecting only trace amounts of such an odor) does not make detection or identification of an odor source easier for the dog. Research and the experience of the authors of this report suggests in fact that many dogs perceive larger amounts of an odor as a completely *different* substance altogether. While many well trained dogs will exhibit a high level of curiosity about a large hide, unless that dog is properly trained to recognize large amounts of odor, it should not be unexpected that a dog would not readily alert to its source.

In simple terms, most trained detection dogs appear to perceive a difference that we don’t clearly understand between a few ounces of C4 and 50 lbs of C4. While the subject of this workshop was explosives detection dogs, this applies to all disciplines of canine scent detection; narcotics detection, arson and pest detection canines, such as termite dogs.

There are several possible explanations for why dogs would fail to recognize or be able to effectively locate large concentrations of odor as easily as they do smaller amounts. The first, as mentioned earlier, is a lack of training on such large concentrations of odor. The logistics and the safety implications involved with a team having regular access to hundreds of pounds of an explosive are prohibitive as is the expense involved with procuring and properly storing such amounts.

Another issue is that dogs can have a difficult time following a vapor trail when it is so profuse as to make it difficult to discern its direction of travel. The three drawings below are greatly simplified representations of vapor production and movement from a target substance, but do serve to illustrate odor concentrations as they emanate from a substance.

The red arrow in Figure 1 depicts a dog entering a vapor cone emanating from a target substance. Note the disbursement of odor molecules as they grow more widely spread with distance from the source. The blue arrow in Figure 2 represents a dog that has turned left and progresses away from the source of odor. The green arrow in Figure 3 shows what a well trained dog will do in response to recognizing that the odor is growing less intense as it followed the direction of the blue arrow.



The dog will search for a more intense concentration of odor until it comes to (and many times passes by then returns to) the source. Figure 4 shows a dog entering a vapor cone of such intensity that it causes even well trained dogs a problem identifying the direction of travel of vapors. Further compounding this, the longer the dog remains in the high concentration of vapors, the longer a dog is exposed to high levels of odor the more its sense of smell is over-loaded the point of olfactory fatigue becomes an issue. Once a dog's olfactory sense is overwhelmed, they must be removed from the area and allowed to purge their olfactory cavity of scent molecules. Dogs can then of course be brought back into the area and the search resumed. However, recognizing the behavior patterns exhibited by a dog that has had its senses over loaded requires a high degree of experience and training. Most handlers don't know what to look for because they don't train for such circumstances.

The above illustrations are greatly over simplified, since no account is made for the effect of air movement, temperature, humidity or physical obstacles. These principles are better left for other workshops and research venues. The illustrations are meant to show the physical abilities (and limitations) of dog teams. These are the abilities that are exploited by most K9 training programs while teaching dogs to identify and follow vapor cones to odor sources.

Dogs don't really have to learn how track an odor, they've been doing so for millennia to survive; they simply have to learn how to perform a methodic search of an area and do so in manner that pleases us and they must learn what odors we want them to find.

To better understand the dogs innate ability to follow trace amounts of odor, consider that tracking dogs seem to have little problem discerning the direction of travel of a subject along a track. Consider how useless the ability to track prey at all would be if dogs weren't able to figure out which way to go to gain on their prey when they crossed the track.

RECCOMENDATIONS

It is an easy assumption to make that poor or sub-standard training methodology is the culprit for a dog not detecting these larger hides. This is not necessarily always the case. Even well trained dogs exhibit a tendency to not recognize high concentrations of odor as targets unless they are exposed to them in training and conditioning exercises. Unless handlers and canines train regularly with large amounts of odor they may not recognize the behavior patterns exhibited by dogs that have reached the point of olfactory fatigue before identifying the source of an odor.

Based on the data gathered at this workshop and the work experience of the authors, it is recommended that all canine scent detection teams modify standard training procedures to incorporate regular exposure to large amounts of hides. This practice should include all disciplines of canine scent detection. Teams should have access to varying types and amounts of explosives in the hundreds of pounds on at least a bi-monthly basis. In addition to training routines, these higher amounts of explosives should also be incorporated into annual certification test procedures.

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