Best Practices for Detection Canine Training & Testing

Homeland Security
Science and Technology

The Department of Homeland Security (DHS) is committed to using cutting-edge technologies and scientific talent to protect the Homeland. The DHS Science and Technology Directorate (S&T) is tasked with researching and organizing the scientific, engineering, and technological resources of the United States to help fulfill this protective mission. In its efforts, DHS S&T has established a long-standing portfolio focused on detection canine teams.

The mission of the DHS S&T Detection Canine Program is to provide the community with the tools, techniques, and knowledge to better understand, train, and deploy canines in their operational environment.

The purpose of this booklet is to share science-backed concepts and ideas that are proven to improve the quality and rigor of detection canine training and testing.

Use the correct format

- Depending on the goal of the training exercise, or the specific question being asked during testing, handlers and trainers have two formats to consider:

  o **Operational-based scenarios** should replicate a real-world search, and should be the cornerstone of all detection canine programs; though, there must be sufficient emphasis on reality-based scenarios: use a relevant contraband/target material (based on local and national trends), conceal the material in a realistic manner (e.g., as a simulated device), use an appropriate setting, and prepare a meaningful backstory for the handler

  o **Discrete presentations** (e.g., scent boxes, scent wall) also play a role in a comprehensive training and testing program; by employing distinct and obvious sampling points, such a setting is more controlled (i.e., reduced influence from factors like air currents, handler competence and search pattern), thus allowing handlers and trainers to focus more closely on the most fundamental skill of a detection canine: the ability to detect and respond to targeted materials/odors

Employ non-targets

- All training and testing exercises, regardless of the setting or format, should include intentionally placed non-targets, which fall into two categories:
  - o **Controls** are items/odors the canine may inadvertently associate as the target; these items need to be included to clearly communicate the specific targeted odor to the canine (e.g., it's the target material housed inside the scent bag, not the bag itself)
    - – Other examples include packaging, handling items (e.g., gloves), barrier materials, etc.
  - o **Distracters** are random, ever-changing novel items; they need to be included to ensure the canines are not simply responding to anomalous odors placed by a familiar person

- A ratio of five non-targets for every one target is a good benchmark

- An additional benefit of always adding non-targets to the exercise is that the odors and indicators associated with the activity of hiding a target (e.g., environmental disturbance, fresh human odor) will be present everywhere and cannot become the stimulus for the canine; thus, this practice helps keep the canine focused on the true objective: target odor

Follow rigorous procedures

- Consistent use of non-targets is a start, but procedures that further eliminate inadvertent indicators, bias, and "cheats" are still needed to avoid training and testing exercises that have been unknowingly undermined

- The use of clean gloves (e.g., polyethylene type designed for food handling) is recommended
  - o Reduces potential for contaminating the repeatedly used target sample/training aid with a reoccurring odor that may not be present on a threat/contraband item
  - o To avoid bias, distracters and controls should also be handled with clean gloves

- Controls should be stored in the same <u>manner</u> (not in same space) as targets (e.g., identical storage container)

- Trainers or handlers should maintain (and review) a log/record with date, aid type, placement details, and set duration to help avoid patterns

- Staff establishing exercises should be rotated; also, these individuals should use the same hide procedures/steps/actions for non-targets as they do for targets
  - o Placing some non-targets both before and after the target will ensure that set duration/ freshness of disturbances cannot become the stimulus for the canine

Enforce blind conditions

- Animals are excellent at recognizing patterns and reading humans; see "Clever Hans", the horse reported to be able to perform basic math but was instead found to be able to read his audience well enough to know when he had arrived at the correct number of hoof stomps

- Likewise, when a handler knows the target hide location in an exercise, they may inadvertently send non-verbal, subtle cues when in or approaching that area (e.g., pace change, body language)

  o These subtle, unintentional cues can quickly become the stimulus for the canine—and when these cues are not present, as in a real-world search, the canine may not perform as expected

- To combat this phenomenon, it is essential that some training and all testing be conducted "blind" (i.e., where the handler has no knowledge of target placement)

Limit target density

- It is appropriate to limit the number of exposures to targets as a function of time over the course of a training regimen or test event

  o First, in training and testing, it is important that the handler not always have an expectation of finding a target—otherwise, they could unrealistically guide/influence the canine (compared to what would be done in a real-world search), resulting in a false representation of the team's real-world detection capabilities

  o Second, the canine may begin to expect a certain frequency of finds, leading to false responses that are caused by anticipation, frustration, or time/distance issues

  o Third, highly trained canines learn, react, and adapt quickly; if not enough changes between exposures, they can start to respond to unintended indicators (e.g., visual mark, positional cue, extraneous odor), which drastically reduces the value of any subsequent training reps, likely encourages similar "cheating" in future exercises, and limits the significance of any performance data collected

Training aid considerations

- The integrity of the samples/aids used in training and testing is important—these items must be indicative of the odor of an adversary's material; some recommended practices include:
  - Remove extraneous odors/materials when possible (e.g., casing on block TNT)
  - Replace aids at regular intervals; most organizations recommend annually
    - Note: Old aids are still valuable as an adversary could have aged material; a combination of new and old aids can help achieve a diverse detection capability (but new and old aids should be stored separately)
  - Periodically train with aids from other departments/agencies to further diversify exposures
  - Use gloves when handling (refer to page 9)
  - Frequently replace any housing items (e.g., glass jars, scent bags) that are always present during the canine's exposure to the target material
  - Use proper storage to avoid contamination
    - Use a nylon arson evidence bag that is mechanically sealed (e.g., clip-and-seal product) as primary containment, and a quality food storage product as secondary containment

"The canine is the most versatile, flexible detection tool we have in the Homeland Security arsenal, but to meet the challenging threats we face today, the end-users need to employ rigorous training methods. Additionally, it's important to see that the tools and training methodologies they use are the best available to prepare them for a real word capability."

- Don Roberts, DHS S&T

"The community widely acknowledges that a good detection dog is an opportunist that will use their incredible sensory and perception capabilities to complete their task by any means necessary. Through some simple practices and precautions we can ensure that the *odor of the targeted contraband* is their stimulus, which will yield the most capable and reliable line of defense."

- Kevin Good, Battelle

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