

# The Bio-Tech Canine

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On March 9, 1972 authorities at New York's JFK airport received a phone call informing them that an explosive device had been planted aboard a TWA passenger jet which had just departed for Los Angeles. The warning was sufficiently detailed that it was viable, and the airliner was ordered back to JFK. Once landed and the passengers removed, security staff stood by and watched as a German Shepherd named "Brandy" — a bomb sniffing K-9! — (at that time a rare and exotic creature), was brought on board with her handler. After a few minutes of tense olfactory exploration, Brandy signaled to her handler who uncovered an explosive device made up of C-4 with a timed detonator. According to the record, the bomb was deactivated just 12 minutes before it was set to explode. As a result of this dramatic event, the federal government began deploying bomb detection K-9s throughout U.S. airports as part of a broad explosives countermeasures program then under the aegis of the FAA. The program, now overseen by the TSA, has grown to about 300 teams at airports around the country, double the number deployed prior to Sept. 11, 2001.

Even before recorded history, evidence has shown a comfortable alliance between humans and K-9s. The trust and diversity of this relationship has benefited humankind in a variety of survival-related pursuits — hunting of prey, herding of flocks, guarding the home and in the waging of war. But is the present man/K-9 detection team that far advanced beyond pre-historic man following a K-9 and watching for signs that it has discovered game using its remarkable olfactory system? What does the future really hold for this timeless and legendary alliance?

Modern technology has endeavored to overtake the K-9's capability as a detection tool. Various technologically based detection devices, portable ion scanners, CTs, etc., have been developed and have proven effective in reducing the threat of terror. Yet, the measure of excellence still rests in the K-9's nose, and the speed and endurance of its motive platform.

All too often the role of technology with respect to K-9 use in this arena has been relegated to the issue of pitting modern high-tech developments against that of the unenhanced K-9 "nose." Companies that produce detection technology often consider themselves in competition with K-9 detection ability, while K-9 handlers and trainers are confronted with the lower maintenance costs and operational simplicity of non-animal solutions to bomb-sniffing. Yet the sensitivity and reliability of K-9 detection is soberly respected throughout the explosive-detection industry. Brook Miller, vice president of Barringer

Technologies, has been quoted as saying; "A dog's nose is probably the most sensitive piece of equipment going. They're enormously accurate."

Is it possible that the best answer to the question of the "ultimate explosive detection tool" is a marriage of 15,000 years of evolution with today's cutting-edge technology? Consider the following scenario: A highly trained K-9 that is able to respond to remote directional signals and is equipped with modern lightweight technological equipment that is able to remotely transmit real-time visual and audio information. Thus, we have an athletic responsive creature that is not only equipped with modern digital technology, but is in itself equipped with one of the most sensitive biologically based detection devices known—its nose! No man-made device has proven better and more practical at identifying and following a vapor plume to its source. Thus, the K-9 should not be seen as competition with modern electronic odor detection technology but rather seen as a collaborator and means of transportation. This new approach of combining the superb olfactory and search skills of the K-9 with modern microprocessor-based technology and instrumentation allows us to finally leave the "dark ages" of traditional K-9 use in explosive detection (as well as other odorants of concern) and enter a new era of electronic enhancement. Ultimately, we see this technology evolving to the point where we can remotely monitor a K-9 sent into a cave, field, vehicle or structure, as well as give it specific commands as to where and how to search or 'return'. Such operations can be carried out in daylight or under cover of darkness.

A variety of K-9 training and handling methodologies have been in use for over 75 years with almost no consideration given to the potential benefits of electronically enhancing the K-9 mission. We now know that K-9s can carry wireless video cameras, lights, GPS locators and communication devices which not only allow handlers to remotely issue commands but to also remotely hear sounds local to the K-9. We are presently on the verge of remotely monitoring the K-9's autonomic patterns which will allow it to speak silently with a remote handler. By combining the superb sensory skills of the K-9 with modern microprocessor technology it will be possible to use K-9s in standoff searches without having the K-9 on a leash or even within sight as it searches a remote area, vehicle, building or cave. Thus, investigation of difficult sites, forward clearing of areas, and suspicious vehicles can all be done from safe locations minimizing human risk. It even will be possible to combine K-9 olfactory ability with unique digital "modules" tailored for specific search applications. Thus, combining the K-9's sensory and learning abilities to respond to a wider variety of odors as well as specific human behaviors. With advanced microprocessor-based technology, we expect to see instrumented K-9s deployed in standoff searches, and in the detection of potential terrorists as well as the explosives or toxic substances which they might carry. Animals trained for such tasks cannot be accused of "profiling" since detection is based upon odor and behavior rather than by race or ethnicity!

Combining modern low-cost micro-technology with K-9 sensory sensitivity will significantly extend the well-known superiority of K-9s over artificial sensors in 'threat odorant' detection and

introduce the additional capability of identifying the specific odorant, its quantity and proximity as well as the terrorists themselves within seconds on-site! It is commonly thought, for example, that because of the volume of flow at airports, the use of K-9s with handlers for explosive detection is too expensive compared to artificial sensors. Yet, by appropriate tailoring of the digital “modules” to be used, combined with K-9 olfactory sensitivity, it will be possible to not only detect explosives or other dangerous odorants carried by passengers, at orders of magnitude lower threshold than artificial sensors, but also to identify the specific odorant detected on-site within seconds, not minutes. This would overcome one of the major obstacles confronting artificial sensor detection and identification, namely, the time-consuming “sampling process.” We are currently actively exploring the development of such a program.

Finally, K-9s can be instrumented in “stealth” fashion so that they can mingle in crowds and, with simple training, subtly communicate video, audio and autonomic information to a remote handler without arousing suspicion or panic.

Trained K-9s are becoming increasingly accepted as counterterrorism agents worldwide. We expect to see them equipped with better gear in the immediate future. Bio-tech dog days are definitely here. 🐾\*

## IABTI 2004 Photo Contest Winners

We are very pleased to announce the winners of this year’s Photo Contest. Everyone submitted great shots but the following were singled out for their excellence.

### **First Place**

Lane Griffin, Region I will receive one free year of membership for his outstanding shot in the Forensic Investigation category.

### **Second Place**

Dan Murphy, Region III will receive a \$25.00 gift certificate for IABTI Logo items for his entry in the Science & Technology category.

### **Third Place**

A tie for 3<sup>rd</sup> place! Jerry Sanchez, Region II submitted a ‘fiery’ shot of his team in Iraq for the Bomb Disposal Technicians category and William Hakim, Region I provided a thought provoking shot entitled “Bomb, Beer & Thumb” in the Bombing Investigations category. Both will be receiving an official IABTI cap.

### **Honorable Mention**

Cate Rushforth and Jeff Rodgers of Med-Eng Systems had some fun with their bomb suits, a cup of coffee and a pair of high heels! They submitted two entries in the Humor category.

**To everyone who participated - Thank You! Look for these photos to appear in future editions of the *Detonator* magazine.**

Get your cameras ready! After the whopping success of this year’s contest, we’ve decided to extend the competition period to encompass the next 12 months. Look for details posted on the IABTI website and submit your entries before 01 June 2005.