

# APPENDIX E – TECHNOLOGY TRANSFER PROGRAM

## Introduction

The Technology Transfer Program (TTP) was established by Congress in 1998 and has provided both technologies and the training to more than 20 percent of the 18,500 state and local Law Enforcement Agencies (LEAs) nationally. From 1998 through 2002, the TTP delivered 4,811 pieces of equipment to 3,898 state and local law enforcement agencies in all 50 states and provided training and support with the delivery of each technology. Many applicants await technology deliveries pending receipt of additional funding for the TTP. At the end of fiscal year 2002, there were 1,777 pending applications.

The TTP is not a grants program, rather, the drug crime fighting technologies available from the program are limited to a catalog of items proven to be operationally effective by federal, state and local law enforcement. Its unique characteristics combined with its strong endorsement by the law enforcement community make it an excellent model for any technology transfer program. The TTP provides an efficient means for getting drug crime fighting technologies into the hands of LEAs serving on the front line. Its emphasis on pre-screening of applicants combined with training and follow-up with those LEAs that receive equipment ensure recipient agencies make full-use of the equipment.

An additional benefit of the TTP is that as it reaches more and more LEAs nationally, it creates de facto standards in terms of state-of-the-art technologies used by officers on the street. As the TTP program continues, the future ubiquity of its catalog of available technologies will lead to significant economies in terms of reduced training costs; as personnel move from one LEA to another they are more likely to be familiar with the new agency's technologies as these become standardized

Over the past five years, CTAC's lessons-learned provide useful insights for those tasked with the establishment of similar technology transfer efforts. The following provides unique TTP features organized in three parts: 1) TTP Underpinnings, 2) TTP Execution, and 3) TTP National Deployment Strategy.

## Underpinnings

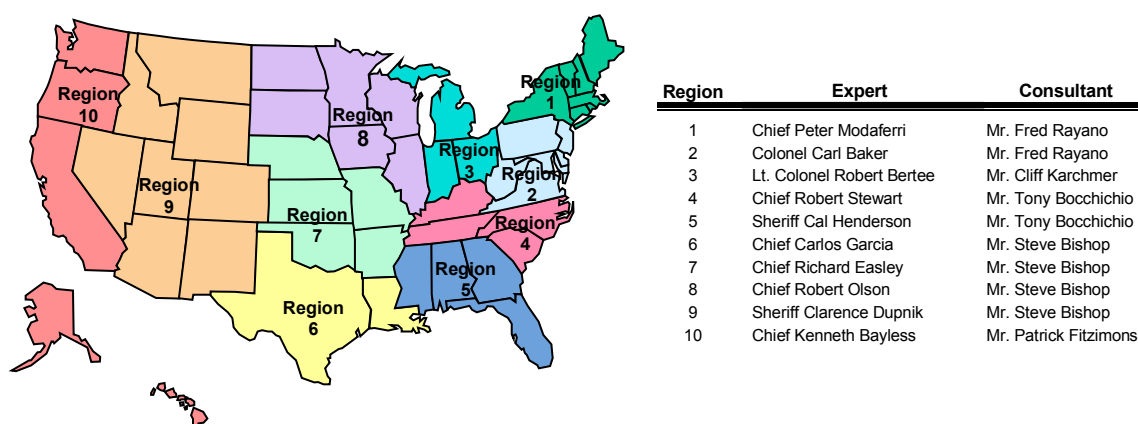
The TTP design is based upon the notion that the transfer of technology to state and local law enforcement is best done by an organization that understands the available technologies and has a stake in the development of them. Further, it is bolstered by the inclusion of regional experts from the law enforcement community who understand the needs of local communities and the utility of available technologies for law enforcement missions. Finally, the adoption and distribution over time of a uniform set of proven technologies creates valuable efficiencies for all state and local LEAs throughout the nation. These TTP underpinnings are discussed below.

*Research and Development Program Link.* CTAC's supply reduction R&D program addresses broad-based, multi-agency needs that transcend the requirements of any single agency, and

concentrates on those technology applications that are potential candidates for TTP. This R&D component benefits the TTP as technologies are vetted prior to inclusion in the TTP catalog. Only after new systems are tested and proven do they become TTP candidates for use by state and local law enforcement agencies.

*Regional Experts/Program Support.* The TTP enjoys support from active-duty, nationally recognized, senior police chiefs and sheriffs who serve as regional law enforcement experts for each of the 10 regions across the country (See Figure E-1: TTP Regional LEA Experts). These experts review applications for TTP technologies from agencies within their respective regions, assist in evaluating the program, and provide advice on the operational utility of the technologies offered.

Figure E-1. Technology Transfer Program Regional Law Enforcement Experts



The TTP also benefits from ONDCP Interagency Agreements with the U.S. Army Electronic Proving Ground (EPG) and the U.S. Navy Space and Naval Warfare Systems Center (SSC). EPG and SSC provide contracting and procurement support services, as well as technical and program management functions for CTAC-sponsored projects. The contracting agents publish Broad Agency Announcements and Sources Sought Announcements from their parent organizations (U.S. Army and U.S. Navy) to solicit proposals for innovative concepts and approaches from industry, academia and national laboratories. They also coordinate the technical review and evaluation of these proposals with representatives from the federal, state and local user agencies. The contracting agents then negotiate and manage contracts with the successful vendors.

EPG manages the TTP contracting/technical program office. This program office employs a comprehensive “cradle-to-grave” approach. The TTP management team fills agency requests from bulk order contracts, conducts outreach awareness workshops for law enforcement agencies, provides mandatory training sessions for technology recipients, and maintains all program management reports, statistics, and records. A short chain of authority ensures a rapid-reaction capability for response to unplanned events requiring rapid deployment of technology. On September 17, 2001, EPG and CTAC delivered 100 satellite telephones to “ground zero” for first-responders to the World Trade Center attack to use until normal communications could be restored.

*Uniform Set of Technologies.* The TTP catalog of available technologies is divided into two broad categories: (1) handheld devices (e.g., night-vision devices, handheld contraband detectors) and (2) case management / investigative tools (e.g., link analysis software). At present, there is a high degree of standardization or uniformity among the handheld devices being used - as 20 percent of the state and local agencies nationally have received some of these available tools from the TTP. As these devices proliferate through TTP distribution, they become de facto standards and law enforcement personnel benefit as they work with or transfer to a similarly equipped law enforcement agency. As for the case management and investigative tools, these more complex systems today enjoy less penetration (5 percent) nationally. Over time, these more complex systems and architectures will evolve with input from the user community and the revised systems will proliferate to other LEAs that will benefit from receipt of proven case management/investigative systems.

TTP technologies support narcotics officers, regional drug task forces, and major city drug crime investigative units conducting large-scale conspiracy cases. The technologies available for transfer include information technology and analytical tools, communications intercept, tracking and surveillance, and drug detection devices. CTAC will continue to expand and upgrade the crime-fighting equipment available to state and local LEAs across the nation. The uniform set of handheld technologies combined with the necessary training to use and maintain them is provided in response to applications received from agencies serving smaller jurisdictions, while a uniform architecture for tracking, surveillance, phone intercept, and case building systems is intended to support those agencies serving larger jurisdictions.

## **Execution**

Execution of the TTP begins for a recipient agency with submission of an application processed with a number of checks and balances to ensure the desired technology fits the circumstances and capabilities of that agency. Based on those applications received over the past five years, 86 percent of TTP equipment has been delivered to agencies serving smaller jurisdictions; such agencies are often hard-pressed to obtain TTP-type equipment from any other source. The emphasis on training is a significant part of the program's success and agencies do not receive equipment until training is completed along with any relevant certifications. The TTP's interaction with an agency is ongoing; it does not end following approval of an application, completion of training or the delivery of equipment. Recipient agencies commit to regular follow-up with the TTP to ensure equipment is utilized in day-to-day operations and to identify any issues with a delivered technology for resolution.

*Application Process and Technology Distribution.* Applications to the TTP are reviewed on a first-come, first-served basis, though a submission does not guarantee an agency will receive any TTP items. Agencies may begin the application process with the submission of a web-based or hardcopy form. Applicants select up to three available technologies and must respond to questions regarding the need for them. A number of checks and balances exist within the application process to ensure the most rational distribution of available technologies. Among these is the requirement that the head (e.g., Police Chief) of each agency endorse the application.

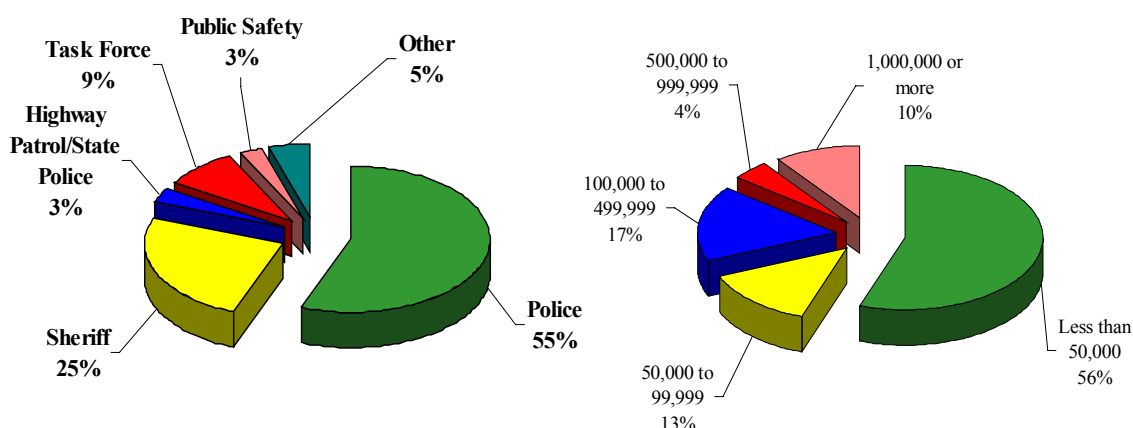
During the application process, the respective TTP regional expert provides a subjective judgement as to whether:

- The technologies requested will improve the operational capabilities of the requesting department or organization.
- The organization has the requisite infrastructure to integrate the technology into its daily operations.
- The equipment is too complex for the organization.

These experts also have the ability to modify an agency's application by the substitution of one technology with another or to change an applicant's technology rankings. TTP regional experts also judge that an applicant agency faces a significant level of drug-related crime and determine that there is a reasonable expectation that the requested technology will be used to support investigations of such crime. State and local law enforcement applications for TTP technologies continue to increase along with awareness of the program.

Over the past five years, 86 percent of TTP applications and deliveries involved agencies serving populations of 500,000 or less (See Figure E-2 for the distribution of TTP deliveries by agency type and jurisdiction size). The predominant mix of technologies requested by and provided to smaller jurisdiction agencies was comprised of thermal imagers, drugwipes, mini-buster kits, and body worn transmitters. Eighty percent of TTP applications and deliveries involved police departments and sheriffs' offices. Applications for the more complex systems (AVTS, VoiceBox, Data Locator, VideoDetective System, and Interoperability Communications system)<sup>1</sup> were received from task forces, police departments, and sheriffs' offices from the larger jurisdictions serving populations of 500,000 or more. 30 percent of TTP deliveries have been to state and local agencies located within one of the High-Intensity Drug Trafficking Areas (HIDTAs).

Figure E-2. Deliveries By Agency Type / Population Size – fiscal year 1998 – 2002



<sup>1</sup> The Advanced Vehicle Tracking System (AVTS) is a covert vehicle tracking system with mapping display. VoiceBox is a multimedia digital collection system for Title III investigations. The VideoDetective System is a PC-based, real-time, plug-and-play video enhancement system that eliminates jitter and camera motion. For wireless interoperability applications, the TTP currently deploys a modular interconnection system providing interoperability for incompatible radio systems.

The underlying assumption with regard to the TTP's equipment distribution is that federal, state, and local law enforcement agencies (LEAs) all need advanced technologies to conduct their drug-related criminal investigations, but to a different scale and complexity. The federal LEAs employ the technology to carry out complex, large-scale, drug-related criminal investigations while state and local LEAs need identical technologies but usually on a smaller scale for drug-related criminal investigations and daily operations.

*Training, Retraining and Outreach Emphasis.* The TTP's approach to training stems from the knowledge that technologies are tools and not in and of themselves solutions for law enforcement problems. Officer training and routine use of technologies ensure successful technology deployment. This approach also takes into account the realization that training is not a "one shot deal." Training sessions for TTP catalog equipment is provided regularly throughout the year to provide ample opportunity for first-time and refresher equipment use instruction.

TTP user training is provided with no out-of-pocket costs for the recipient agency. This hands-on training is required *before* any equipment is delivered. Training is provided to each recipient by the commercial vendor and by law enforcement officers who use the equipment in daily operations. In some cases, certification for equipment operation (e.g., thermal imagers) is provided as well.

Recipient agencies commit to respond to a variety of feedback requests including 90-, 180-, and 270-day evaluations. The 90-, 180- and 270-day evaluation forms request specific objective and quantifiable data regarding results achieved with use of TTP equipment. Agencies provide information as to the number of cases in which the equipment was employed and details of specific operational experience with the technology. In addition, recipients provide subjective comments as to the utility of a particular technology. These subjective comments provide a vital feedback loop for insights into the strengths and weaknesses of the TTP and/or its offered technologies as well as a vehicle for recipients to offer suggestions to improve the program.

TTP evaluations submitted to date indicate that the technologies offered are readily integrated into the operations of state and local agencies. Recipient agencies confirm that TTP equipment improves counterdrug operations. In general, following receipt of TTP equipment, agencies report an increase in drug-related arrests and seizures and a dramatic improvement in officer safety.<sup>2</sup>

## **National Deployment Strategy**

In order to bring about the standardization of law enforcement technologies, a national deployment strategy was developed for the TTP. This strategy is driven by a vision for the TTP as the model for delivery of advanced crime fighting technologies to state and local law enforcement.

The strategy for the TTP is to maximize the delivery of hand-held devices with training to the state and local agencies serving the smaller population sizes (less than 500,000) and to provide

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<sup>2</sup> In FY01 seizures reported using new TTP equipment included \$91MM of drugs (4 tons of marijuana, 1,000 pounds of cocaine and 550 pounds of methamphetamine), \$5.6MM in cash and 38 vehicles valued at \$500,000.

case building investigative tools to the agencies and task forces serving the larger population sizes (500,000 and greater). A number of core competencies make successful execution of the TTP strategy possible. A highly respected management team oversees the TTP. Links to technology R&D efforts, coordination with other federal technology efforts, an ability to deliver solutions in a cost-effective manner, and an application process that ensures delivered solutions are in fact used by recipient agencies characterize other core competencies of the TTP. Program results are regularly measured against program goals to ensure objectives are met; the TTP employs regular feedback mechanisms to understand results from the field so that issues may be resolved. Going forward, the TTP will continue to innovate with the inclusion of additional advanced technologies after these are vetted by TTP testbeds.

*TTP Vision.* The TTP was first authorized by Congress in 1998 to transfer technology to state and local law enforcement agencies. Since that time, the program has grown to be a recognized leader by law enforcement agencies for technology transfer. The vision for the TTP is summarized as follows:

*Fundamentally change the equipment procurement paradigm of the state and local law enforcement community from single, independent purchases of equipment to a cohesive strategy to obtain and integrate a common set of technologies into daily operations. The TTP will transform the current mindset to one that also accounts for the required equipment commonality, knowledge, resources, training and follow-up to ensure successful technology deployment.*

This vision guides TTP efforts going forward. In many cases however, agency heads find it difficult to obtain technology funding as elected officials tend to select more short-term, visible funding activities, such as hiring additional officers. As one local law enforcement official addressing colleagues noted:

"All of us in this room understand the politics of local law enforcement budgeting. For a chief or a sheriff to go before local elected leaders and ask for more money to buy technologies instead of to hire additional officers is quite difficult."

A lack of adequate funding prevents state and local law enforcement agencies from procuring and successfully deploying usable technologies. The TTP vision is realized as agencies adopt procurement approaches that account for all necessary components of successful technology deployment.

*TTP Core Competencies.* Regular coordination with other federal agencies involved with law enforcement technologies ensures that the needs of law enforcement agencies are taken into account. These needs are then matched with available and developing technologies. Such technologies are first deployed in testbeds to ensure viability in an operational environment. Less than 10 percent of the TTP budget is consumed for administrative expenses and Congress has recognized the TTP for its penchant for combining results delivery with frugality. With its training requirements, the TTP increases the likelihood that equipment will be successfully deployed. Regular follow-up ensures equipment use in daily operations and provides a channel to address any problems with the equipment or its use.

*TTP Going Forward.* The TTP is a successful “cradle-to-grave” federal technology deployment program that serves law enforcement well. As a model for other law enforcement technology transfer programs, it needs no structural or functional modifications.

The TTP catalog evolves over time along with the needs of the law enforcement community to ensure that the proper set of technologies is offered. This effort includes the introduction of new technologies to the program, improvements to existing systems, and the elimination of technologies that no longer meet operational requirements or that can be replaced with next-generation technology. New technologies added this year include an advanced case management system, a search engine to allow for searches across multiple databases, a wireless video transmitter and receiver kit, a covert vehicle tracking device, and an advanced infrared camera.

In the near-term, areas of greatest interest for inclusion of technology in the TTP include the following:

1. Support the officer on the street with standardized and easy-to-use advanced crime fighting technologies.
2. Support specialized regional drug crime task forces and major city LEAs with the successful deployment of more complex, larger scale systems for case management and investigative tools.

The TTP will support the officer on the street by providing high technology equipment to increase the effectiveness of personnel resources and improve officer safety with further deployment of items such as thermal imagers and mini-busters. The TTP will continue to deliver hand-held devices and systems in response to requests from investigators working on individual cases. Support activities will include:

- Hold additional regional one-day workshops to maintain an awareness of the TTP.
- Introduce new hand-held devices and equipment as they become available to accommodate those agencies returning to the program for additional items.

The TTP will also support specialized regional drug crime task forces and major city departments with the successful deployment of more complex, larger scale systems for communications interoperability and data mining applications. Steps to introduce more of these complex case management tools into the mix include:

- Conduct highly focused workshops concentrating on case management tools to introduce these items to agencies that can use them but have not yet requested them.
- Fulfill those requests for the more expensive case management tools (formerly withheld due solely to funding limitations).

In addition, the TTP will include extensive training sessions for agency personnel before they receive new equipment. Certification for use of certain technologies (e.g., thermal imagers) has already been incorporated into the initial training to assure safe and proper use of the systems. Additional retraining sessions will be established for the agencies that already have a system. Training and retraining sessions along with workshops pass on first-hand knowledge gained from operational use of the equipment. These sessions enable the program to leverage its prior investments to benefit new users.

A new series of regional workshops will focus on the more complex case management systems. Attendance will be limited only to those departments capable of deploying systems of this complexity and those departments willing to devote internal resources necessary to install, train and maintain the systems. This approach was demonstrated at Lakewood, Colorado in August 2001, with the installation of a communications interoperability system at the Lakewood Police Department. The Lakewood Police Department provided all facilities and resources to install, train, operate and maintain the system which now supports communications connectivity for approximately 20 federal, state and local agencies and task forces within the neighboring jurisdictions.

The use of testbed prototype evaluation programs will continue to support the core R&D program and the TTP. These testbeds will continue to evaluate operational configurations for law enforcement technologies. Active-duty law enforcement officials will continue to serve as experts to determine the optimum configurations for new technologies so they may be added to the TTP.

These technology testbeds will continue to produce new capabilities and new "versions" or components to overall system architectures. These enhancements will be provided as updates to those agencies that have received previous versions of the systems. The linking of the TTP to law enforcement technology R&D efforts sets it apart from other programs.

## **Conclusion**

In five years, the TTP has had a significant impact on the technological capabilities of state and local law enforcement agencies as more than 20 percent of all such agencies nationally are TTP recipients. It enjoys the endorsement of the law enforcement community and praise from Congress for its effectiveness. In short, the TTP works. It is a federal program that consistently delivers results with accountability. The TTP provides an excellent model for similar technology transfer programs.

The current list of technologies available from the TTP is given in Tables E1 and E-2.



Table E-1. LIST OF TECHNOLOGIES: *Complex Case Building Systems*

TECHNOLOGY	DESCRIPTION
<b>ACISS Narcotics &amp; Intelligence Records Management System</b>	Software System that can store, manage and link all information collected by a narcotics unit. Image, video or audio files can all be intelligently related to any subject, vehicle, intercepted phone call, address or report for case management.
<b>ADACS (Advanced Digital Audio Collection System)</b>	Complete turnkey system capable of intercepting, decoding, recording, and playback of landline and wireless telephone communications. Provides for automatic matching of the Call Data Channel and Call Content Channel.
<b>AVTS (Advanced Vehicle Tracking System)</b>	Using GPS-enabled “tags” attached to suspects’ cars and trucks, lets officers map real-time vehicle position. Includes a user-friendly mapping software package operating on a PC base station. Multiple vehicles can be tracked simultaneously.
<b>CBSS (Cellular-Based Surveillance System)</b>	Covert transmitter and receiver system monitors and records evidence audio through the cellular network and VHF bands simultaneously. Components may be used separately and will integrate with existing VHF audio surveillance systems.
<b>Digital Information Gateway (DIG) Software</b>	Information retrieval software that allows the search of any number of databases, documents, and web sites simultaneously. DIG scales to task forces, divisions, organizations, or even agencies.
<b>Digital Pager Intercept</b>	Intercepts, time-stamps, and records messages, either numeric or alphanumeric, sent to suspects’ digital pagers. In specific cases, the messages are relayed to the case officer's own pager. Can intercept up to eight separate channels of pager traffic.
<b>Interoperability Communications System</b>	Using computer-aided switching technology, connects multiple LEAs on disparate systems to a central radio system. Vastly improves real-time interagency communications during counternarcotic investigations. Permits each agency to assign its circuit to an agent or patrol vehicle and lets the two agents communicate directly in the field: no dispatchers needed.
<b>LINCOLN (Local Intercept Network Collection – Online Network) Wiretap System</b>	Title III telephone intercept system permits CALEA-compliant switch-based intercepts with several wireless carriers including Nextel, VoiceStream, and AT&T Wireless. Ranges from single-line to multi-line networked wiretap system. Package comes with LINCOLN server hardware, workstations, Pen-Link analysis software, and CALEA interface hardware.
<b>Multimedia Processing System</b>	PC-based video processing workstation with predefined application filter systems to solve common video or image problems such as demultiplexing, low light images, and object stabilization. Additional applications to process complex video problems are available.
<b>Pen-Link Analysis Software</b>	Telephone surveillance software provides complete, end-to-end data collection, distribution, and analysis systems. Helps build and integrate call, subscriber, event, seizure, and case files; stores complete case data; and provides instant network access to images, audio, and video.
<b>R3000 Navigator Telephone Surveillance System</b>	Expandable digital telephone-intercept system for Title III investigations that allows interception and decoding of CALEA-compliant digital messages. System provides LEAs a logical path of migration from traditional analog intercepts to digital switch-based telephone surveillance.
<b>SPIN (Suspect Pointer Index Network)</b>	Provides automated entry, retention, and analysis of multimedia investigative data (images and text). Users at nodes throughout a given jurisdiction can enter suspect and case data, including mug shots, on this networked, wireless system that provides complete data search capability.
<b>VisuaLinks Software</b>	Software package to identify and graphically highlight underlying patterns, trends, anomalies, or new relationships in data by using advanced link analysis techniques.
<b>VoiceBox</b>	Allows live, LAN-connected monitoring and collection of telephone, Internet, room-probe, fax, and video transmissions using a built-in dialed number recorder (DNR). Includes a networked printer, CD workstation, courtroom playback workstation, and high-level data backup.

Table E-2. LIST OF TECHNOLOGIES: Tactical Tools to Support the Officer

TECHNOLOGY	DESCRIPTION
<b>Audio Surveillance System</b>	Covert body wire transmitter and receiver system includes a concealable body wire transmitter, repeater for extended range capability, and a receiver base station that can record transmissions on either audio cassette or professional mini-disk. Provides superior sound recording in the field.
<b>Body Worn</b>	Miniaturized, multi-channel transmitter with voice privacy and low probability of detection (VPLPD) capabilities. Can be worn inconspicuously and can defeat both detection and eavesdropping devices.
<b>Drugwipe</b>	Surface residue drug test kit that identifies trace amounts of cannabis, cocaine, opiates, and amphetamines. Officer wipes swab across surface such as dashboard or doorknob and inserts swab into vial. Color change indicates presence of narcotics.
<b>Mini-Buster</b>	Self-contained portable contraband detection kit that locates hidden compartments and bulkheads. Includes an ultrasonic range finder to detect false walls; a flexible fiber optic scope for remote viewing inside inaccessible spaces such as fuel tanks; and other assorted steel probes, extension mirrors with flashlights, and pocket pencil inspection probe.
<b>Mini-PIX Wireless Video Surveillance</b>	A wireless video transmitter and briefcase receiver kit containing all the necessary elements for on-body and off-body wireless video surveillance applications.
<b>Night Vision Kit</b>	Amplifies images in low light using military-strength night vision goggles with built-in infrared illuminator and a 50-millimeter (mm) lens; an interchangeable 70-300 mm lens with variable gain; a 3-power (3X) magnifier, and a very fast optic snap-on telescope.
<b>PicoDAC</b>	A pocket-size, 12.5-ounce, powerful, rugged, digital signal processor for field use to improve audio from telephones, tape recorders, live microphones, and radio receivers. Equipped with 10 filter and bandwidth combinations to filter the most commonly encountered noise.
<b>Sentinel Global Positioning System (GPS)</b>	Small covert GPS tracking system and data logger that provides law enforcement with data on all movements and patterns of the vehicle. Data can be downloaded from a few hundred feet through a built-in spread-spectrum RF link.
<b>Thermal Imager</b>	Night vision device senses heat, not light, and generates real-time video in all lighting conditions including total darkness. Can be hand-held or mounted on a vehicle rooftop. Remote operation from inside vehicle permits 360-degree pan, 40-degree tilt using joystick. Can detect a human out to 1,500 feet. Designed to withstand harsh weather conditions.
<b>ThermoVision Scout</b>	An ultra-compact, lightweight, rugged infrared camera with a built-in color 2.5-inch liquid crystal display (LCD) to reduce peripheral vision impairment compared to eyepiece imagers.
<b>VideoDetective Interceptor</b>	PC-based video enhancement system that eliminates jitter and camera motion from real-time or previously recorded video of license plates or suspects. Provides video editing capability, zoom mode, and image digitization and storage for superior evidence processing.