

Dedicated to Reporting Developments in Technology  
for Law Enforcement, Corrections, and Forensics



## Is There a Doctor in the House?

**O**ne of the last places most people expect to see sophisticated technology is in a prison. "State-of-the-art" is more envisioned in the hands of the military, with its high-tech weapons and communications systems, or with the National Aeronautics and Space Administration's (NASA's) space shuttle flights and satellites, beaming information and images back from the heavens. But rarely do we imagine a prison as being equipped with anything more advanced than clanging gates and concertina.

However, Reggie Wilkinson, president of the 20,000-member American Correctional Association and director of the Ohio Department of Rehabilitation and Correction (ODRC), dislikes such a picture of correctional facilities.

Wilkinson has dedicated much of his energy to bringing technology behind prison walls. "I don't agree that we conform to the idea that prisons should not use new technologies," Wilkinson says. "Our goal is to provide tools that will allow our staff to be more efficient and effective. The more we learn about technology, the more efficient we can become," he says.

One of ODRC's—and Wilkinson's—greatest accomplishments is the department's move into telemedicine. It has been such a success that *Telemedicine* magazine in 1997 listed ODRC as the third largest user of telemedicine in the country, ranking it only behind Digital Care, a hospital system in Tulsa, Oklahoma, and the University of Texas Medical Branch in

Galveston, Texas, which provides medical services to the Texas Department of Criminal Justice.

According to Wilkinson, telemedicine allows ODRC to provide remote medical services to prisoners. From the prison's clinic, a health care professional presents the patient and operates the scopes and cameras that transmit the video images in real-time to a doctor at another location.

The advantages of telemedicine, Wilkinson says, are many. Prisoners receive care without incurring the cost of escorted hospital visits. Telemedicine gives the prison access to a wider range

of outside medical sources and specialized doctors. And, telemedicine provides a visual record of the visit, ensures the safety of the doctors, and reduces the potential for escape. This is important, he notes, since it was recently reported that more than 50 escape attempts occurred in this country from offsite medical facilities in one 12-month period.

"We can do consultations, post-operative medical reviews, and routine doctor's visits. We can read x-rays, or zero in and magnify certain areas of the body so the doctor can get a very clear picture. We can actually hear the heartbeat of a person through the system," Wilkinson says.

(See Doctor, page 2)

## Nighttime Eyes

**W**ith a new generation of night vision devices that see in the dark by detecting heat, there is no more hiding in dark corners, crawling under bushes, or crossing borders on a moonless night. No more tossing out evidence, ditching weapons, or stashing the drugs. Serving as test beds for these lightweight, handheld thermal-imaging devices, 10 Texas police agencies are putting some new "heat" on criminals by getting them out of the dark.

Developed by Raytheon Corporation and supplied by the National Institute of Justice (NIJ), these thermal imagers resemble a typical palm-sized camcorder, but with a much wider lens. They also can be linked to video recording systems for review of a police



(See Eyes, page 5)

ODRC's telemedicine program began with State funding in 1995. By the end of 1997, telemedicine capabilities were available at eight Ohio prisons. Eight more sites are expected to be online by spring 1998. Wilkinson anticipates additional equipment will be installed in a different facility every 90 days, until all of the State's 30 prisons are operational. He says, "I expect that we'll do the largest volume of telemedicine in the world. Right now we're the third largest. In just 3 years we've done 4,000 medical consultations."

Those consultations, Wilkinson notes, include a successful foray into telepsychiatry, something to which the inmates have responded well. He says, "It totally debunks the myth that you have to be in a room and on a couch to address your problems. The prisoners have been extremely responsive. They've answered questions and are not intimidated by the equipment at all."

But the additional magic of telecommunications is that it can offer more than just telemedicine services. ODRC uses the same equipment to conduct wardens' meetings, parole hearings at maximum-security units, and videoconferences with potential inmate employers. The department is also considering televisiting for family members and attorneys of prisoners on death row or in administrative segregation.

The Missouri Department of Corrections is already experimenting with televisiting. By teaming up with Sprint Communications and Kinko's, Inc., family, friends, and attorneys can go to their local Kinko's for a "virtual" visit with inmates housed in the State's Farmington, Jefferson City, and Western Missouri correctional centers.

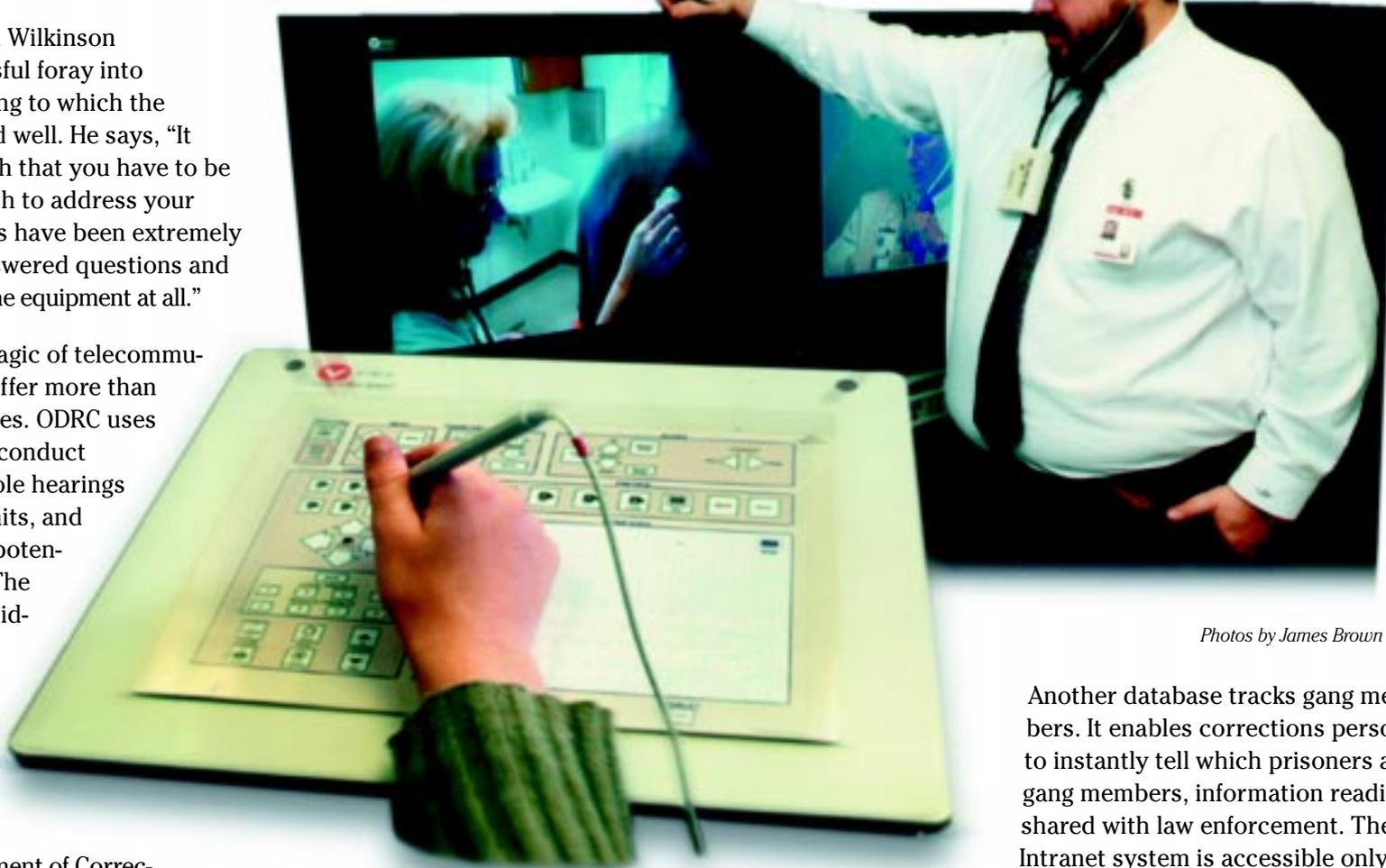
Missouri officials expect the cost savings to be tremendous. Attorneys save driving time when they need to meet with their clients. And for those attorneys who are court appointed, this videoconferencing capability can save taxpayer dollars. One Jackson County attorney, instead of spending 2 to 3 hours visiting several inmates, called ahead and had the prison schedule his clients for conferences that only took about 10 minutes each. And while videoconferences are not expected to replace face-to-face visits, they do allow out-of-State relatives, as well as those who have been banned from entering a correctional facility, to visit inmates.

Even the Missouri courts are getting in on the act. In Columbia, nonviolent offenders are arraigned each weekday at 1:30 p.m. At the jail a 27-inch television is housed in a secure metal cabinet. The screen is divided into four parts, allowing the defendant to simultaneously see the judge, the prosecutor, and the attorney. In the

courthouse, the judge, attorney, and prosecutor view the defendant on 13-inch monitors. There also is a 27-inch monitor for public viewing. This system has eliminated the need to transport prisoners 26 miles for arraignment and the attendant costs and security risks.

In telemedicine, the equipment is so sophisticated it is as if the doctor were right there. Examples of telemedicine technologies include a

ODRC recently purchased a drug detector for use during sweeps in the units and already does its own drug testing inhouse. Its Intranet and Internet system is one of the largest in the country, with about 1,700 pages. ODRC's policies and procedures are all online—printing of hard copies is minimized. Eventually department forms will be online, allowing them to be filled out and filed electronically.



Photos by James Brown

"derm" camera that sees through the outer layer of skin and a highly sensitive electronic stethoscope that allows the doctor to listen to a patient's heart. Telemedicine also employs faxing capabilities as well as accessing a patient's chart onscreen.

"These things don't come cheaply," Wilkinson says. But from his point of view, anything that makes ODRC more efficient is worth it. "We're fascinated by anything that is technologically oriented. Several years ago I attended a National Institute of Justice (NIJ) conference. When I came back, I started our own technology council that does on a mini basis what the Law Enforcement and Corrections Technology Advisory Council (LECTAC) does for NIJ.

"We bring in vendors who sell various products and then review the applicability of those products to determine if they are something that might be beneficial for us. We have a large database of information on all of the latest technology, from devices that let us listen for a heartbeat in the trunk of a car, to other types of sound-monitoring and personnel-location devices. We haven't bought everything we've seen, but we've exposed ourselves to an awful lot," Wilkinson says.

Another database tracks gang members. It enables corrections personnel to instantly tell which prisoners are gang members, information readily shared with law enforcement. The Intranet system is accessible only to prison personnel. The ODRC's Internet site is equally sophisticated, allowing the public to keep up with parole information or track the movements of a specific prisoner.

Wilkinson is a member of the Corrections Operations Subcommittee of LECTAC and serves as president of the American Correctional Association. He also works closely with his State legislature to secure funding for projects that will make the prison run more smoothly and efficiently. "Our super maximum security prison will be one of the most technologically advanced ever. We'll use palm readers for access control. Our surveillance devices will be very sophisticated, and our control systems will be state-of-the-art," Wilkinson says. "We haven't had a problem getting funding for these projects, primarily because the citizens of Ohio see them as a service, something that actually is a cost savings instead of just another expense."

*For more information on the Ohio Department of Rehabilitation and Correction's telemedicine project and other initiatives, contact Reggie Wilkinson, 614-752-1164. For more information on the Missouri Department of Corrections' televisiting project, contact Tim Kniest, public information officer, 573-526-6482.*

# More Fire Power for Bomb and Arson Investigation

**W**e count on our law enforcement personnel to do so much in our society, but we don't always arm them with the tools they need to get the job done. That's what we're trying to do with the National Center for Forensic Science—give them what they need to do the job.”

—Marilyn Cobb Croach, Director of Federal Relations, University of Central Florida

In a move that will expand its ability to offer support and service to State and local law enforcement, the National Institute of Justice (NIJ) has opened the National Center for Forensic Science (NCFS) at the University of Central Florida (UCF) in Orlando. This new center, now part of the National Law Enforcement and Corrections Technology Center (NLECTC) system, will focus on research and training in the area of arson and explosives.



UCF has been known for many years for a prestigious forensic science program, a component of its Chemistry Department, which offers science-based baccalaureate degrees in two tracks: trace analysis and serology, according to department chair Glenn Cunningham, Ph.D. With program graduates currently employed by laboratories at all levels of local, State, and Federal Government, a perfect foundation exists for a partnership with NIJ and its NLECTC system.

“We survey our alumni every so often just to see what they think about our program here, what

changes need to be made, and what kind of problems they need help with in the field,” Dr. Cunningham says. “A couple of years ago they told us they wanted more training in handling situations where there might be arson or explosives involved. We felt there was a need we could fill. We talked to NIJ about forming this national center. We then prepared a proposal for the agency’s review. A planning grant was then approved and funded,” he says.

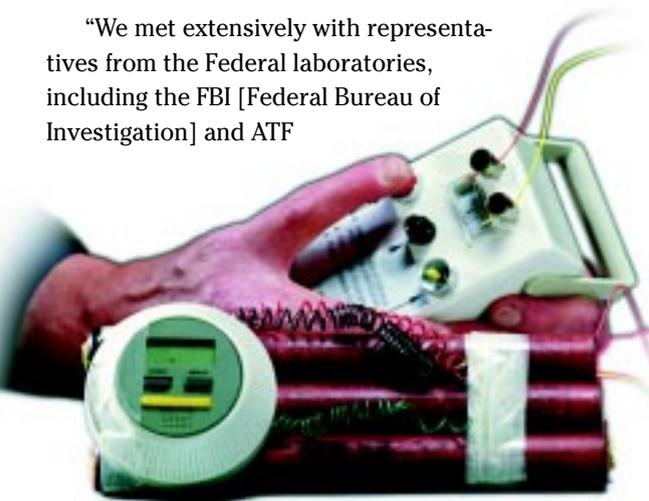
To determine what scientists needed and to keep from duplicating work done by other labs, UCF hosted a national needs symposium in August 1997 that was attended by more than 50 experts. The experts were divided into two working groups—one on arson and one on explosives analysis—and asked to identify problem areas. Their responses were then turned into a specific set of tasks and goals for the center, as follows:

- ◆ Develop a restricted-access electronic library for forensic and law enforcement professionals. This library will link to databases of other organizations and associations to provide a comprehensive source of expertise and research materials. It will be accessible to lab personnel and to crime scene technicians, who can tap into it from onsite laptop computers. This online access will include procedural guidelines, information on unfamiliar types of evidence, and contact names of individuals with indepth experience in a particular area.
- ◆ Provide support for the development of standard protocols for the collection and analysis of fire and explosion debris.

- ◆ Offer supplemental training via the Internet and through distance education and professional seminars.
- ◆ Conduct fundamental research to scientifically validate evidence collection and analysis procedures.

The symposium also resulted in the selection of a 13-member advisory board that includes forensic scientists from local, State, and Federal crime laboratories.

“We met extensively with representatives from the Federal laboratories, including the FBI [Federal Bureau of Investigation] and ATF



[Bureau of Alcohol, Tobacco and Firearms], to make sure there wouldn't be any project overlap,” Dr. Cunningham says. “We now have some of their top people on our board. We'll use the working groups and our advisory board to direct our research and training initiatives . . . no point in us duplicating research that is being done by the ATF or the FBI. They already do superb research in these areas,” he says.

Dr. Cunningham notes that a World Wide Web site is already in place, and work on the center's electronic library is under way. There is even a newsletter, appropriately titled *Debris*. Center staff also are developing new training courses for crime lab and law enforcement professionals. In the future, he says, the center will partner with the university's Institute of Simulation and Training, which currently focuses on using computer simulation to train in emergency preparedness. According to Dr. Cunningham, the institute's ability to do computer modeling can be extended into the area of molecular modeling to simulate explosions.

“We believe in strength in numbers and in a strong partnership between government, industry, and academe,” says Marilyn Cobb Croach, UCF's director of Federal relations. “We have an amazing research base here, with the Naval Air Warfare Center, the U.S. Army Simulation Training and Instrumentation Command, the U.S. Air Force's Simulation and Modeling office, and the U.S. Marine Corps Program Office, all located in Orlando. We believe we can join with these partners to take the knowledge to the professions that need it,” she states.

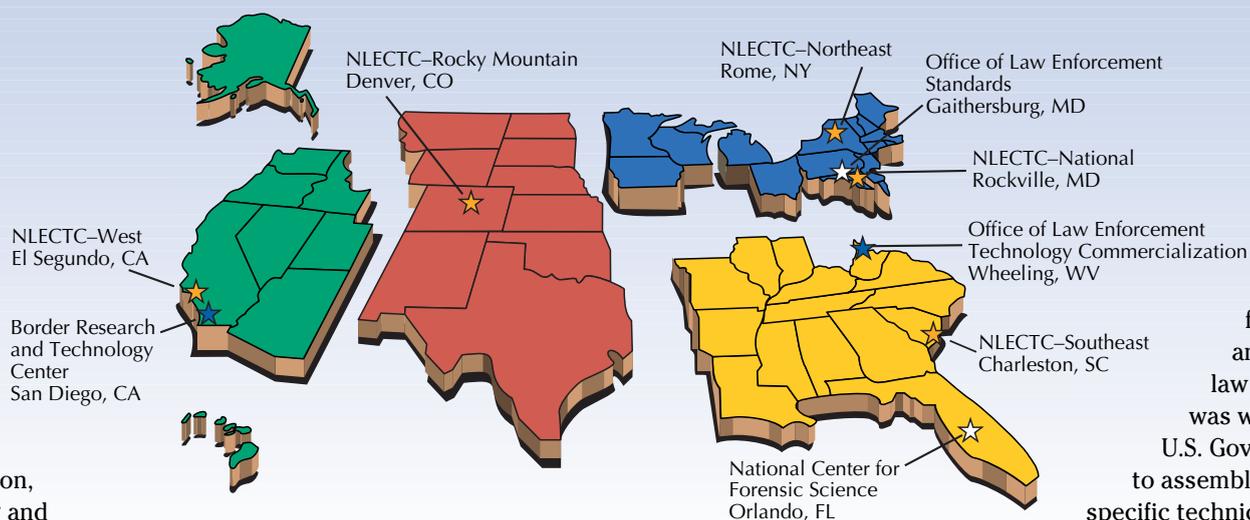
*For more information about the National Center for Forensic Science, call 407-823-6469, fax 407-823-3162, or e-mail, [natlctr@pegasus.cc.ucf.edu](mailto:natlctr@pegasus.cc.ucf.edu). The center maintains a Web site at [www.ucf.edu.ncfs](http://www.ucf.edu.ncfs). Or, you may access NCFS through the NLECTC Web site, JUSTNET, at <http://www.nlectc.org>.*

# We Got You Covered

The idea of using science and technology to combat crime has long sparked the imaginations of the criminal justice community as well as the general public. Beginning in the 1890s, Sir Arthur Conan Doyle, through his Sherlock Holmes stories, fascinated readers with techniques such as cataloging tobacco ashes to identify suspects' brands of choice. Real life soon found it was able to imitate fiction, when in 1891 the idea of tracing and identifying an individual transmitter by peculiarities

of the type first appeared in the Sherlock Holmes' tale "A Case of Identity." Three years later, such a process was invented to help authorities authenticate typewritten documents. Doyle was later called upon to assist in the investigation of London's "Jack the Ripper" case. During 1919 in San Francisco, Edward Oscar Heinrich, known as "the American Sherlock Holmes," opened the first modern laboratory devoted to crime detection. A chemist originally from Wisconsin, Heinrich went on to solve cases that included the Roscoe "Fatty" Arbuckle affair.

Despite strong interest, development and adoption of criminal justice technology has been a slow process. There were scattered early attempts to update police technology. An early example of police technology was the construction of the first modern polygraph in 1921 by a medical student and a police officer. However, it wasn't until the explosion of technology during and after World War II that law



enforcement agencies were able to learn from developments in other organizations, particularly the military. Radio equipment and surveillance aircraft found their way onto some larger police departments. But few devices were conceived and developed specifically for law enforcement applications. It was with this in mind that the U.S. Government began in the 1960s to assemble the resources to provide specific technical assistance to the Nation's law enforcement and forensic science—communities.

Formerly known as the Technology Assessment Program, the National Law Enforcement and Corrections Technology Center (NLECTC) system was created in 1994 by the National Institute of Justice (NIJ) as a component of its Office of Science and Technology. The goal of the NLECTC system, like that of NIJ, is to offer support, research findings, and technical expertise to help State and local law enforcement, corrections, and forensics personnel do their jobs more safely and effectively. The NLECTC system consists of facilities located across the country that are colocated with an organization or agency that specializes in one or more specific areas of research and development. Although each center and facility has a different technology focus, they work together and form a seamless web of support and technology development and information.

## REGIONAL FACILITIES

### NLECTC-National



P.O. Box 1160 • Rockville, MD 20849-1160  
**Phone: 800-248-2742 • Fax: 301-519-5149**  
**E-mail: asknlectc@nlectc.org**

- Voluntary public safety equipment standards and testing program management, including testing of body armor, metallic handcuffs, shotguns, and police vehicles and tires.
- Consumer product lists, testing bulletins, and equipment performance reports.
- NLECTC system Web site, *JUSTNET*.
- Equipment, technology, and research information hotline.
- NLECTC system newsletter, *TechBeat*.

### NLECTC-Northeast



26 Electronic Parkway • Rome, NY 13441  
**Phone: 888-338-0584 • Fax: 315-330-4315**  
**E-mail: nlectc\_ne@rl.af.mil**

- Concealed weapons detection technology.
- Contraband detection technology.
- Audio processing technology.
- Timeline analysis.
- Through-the-wall sensors technology.
- Distributed wireless communications.

### NLECTC-Southeast



7325 Peppermill Parkway • North Charleston, SC 29418-7404  
**Phone: 800-292-4385 • Fax: 803-207-7776**  
**E-mail: nlectc-se@nlectc-se.org**

- Corrections technologies.
- Surplus/excess U.S. Department of Defense property acquisition and redistribution assistance.
- Information management technology.
- Transportation security technology.
- Simulation training.

## RELATED FACILITIES

### Office of Law Enforcement Technology Commercialization (OLETC)



Wheeling Jesuit University • 316 Washington Avenue • Wheeling, WV 26003

**Phone: 888-306-5382 • Fax: 304-243-2131**  
**E-mail: oletc@nttc.edu**

- Location and evaluation of technologies for commercialization into the criminal justice field.
- Technology assessments, market and financial analyses, intellectual property evaluations, capital access information, manufacturer profiling and selection, and commercialization/business plans.
- Informational technology showcases and commercialization opportunity programs that connect the criminal justice community with manufacturers and technology developers.

### Border Research and Technology Center (BRTC)



225 Broadway, Suite 740 • San Diego, CA 92101

**Phone: 888-656-BRTC (2782) • Fax: 888-660-BRTC (2782) • E-mail: brtcchrisa@aol.com**

- Border crossing interdiction technology.
- Mobile radio interoperability technology.
- Contraband detection technology.
- Base station/repeaters technology.
- Infrared/night vision technology.

## AFFILIATED OFFICES

### Office of Law Enforcement Standards (OLES)



National Institute of Standards and Technology • Building 225, Room A323 • Gaithersburg, MD 20899

**Phone: 301-975-2757 • Fax: 301-948-0978**  
**E-mail: oles@nist.gov**

- Public safety equipment performance testing methodologies.
- Public safety equipment standards and operating procedures development.
- Standard reference materials (SRMs) for crime laboratories.
- Standard test methods for forensic analysis.
- Research and technical support to NIJ and criminal justice agencies.

### National Center for Forensic Science



University of Central Florida • P.O. Box 162367 • Orlando, FL 32816-2367

**Phone: 407-823-6469 • Fax: 407-823-3162**  
**E-mail: natlctr@pegasus.cc.ucf.edu**

- Fundamental research into the basic nature of fire and explosion reactions.
- Support for development of standard protocols for analyzing arson and explosion debris.
- Promotion of electronic media to exchange information about the forensic sciences.
- Educational opportunities to practicing professionals and full-time students.

### NLECTC-Rocky Mountain



2050 East Iliff Avenue • Denver, CO 80208

**Phone: 800-416-8086 or 303-871-2522 in the Denver area • Fax: 303-871-2500**  
**E-mail: nlectc@du.edu**

- Public safety communications.
- Weapons and ballistics systems.
- Crime mapping and analysis training and technical assistance.
- Corrections and law enforcement outreach support.
- Explosives detection and neutralization technology.

### NLECTC-West



c/o The Aerospace Corporation • 2350 East El Segundo Boulevard • El Segundo, CA 90245-4691

**Phone: 888-548-1618**  
**Fax: 310-336-2227 • E-mail: nlectc@law-west.org**

- Audio enhancement technology.
- Image enhancement technology.
- Vehicle-stopping technology.
- Computer crime technology.
- Trace evidence technology.

pursuit, crime scene investigation, or surveillance. But because these devices detect heat (infrared radiation) instead of visible light, they allow officers to “see” any heat-emitting object, even one hidden in total darkness. Officers can, for example, spot a suspect hiding behind or underneath bushes simply by panning the area or locate recently discarded evidence or weapons that still retain the heat of the suspect’s hands. Because of the heat emanating from the engine, even a parking lot full of cars can be scanned to find a recently driven vehicle.

“You can also use these cameras for search and rescue, to find people in the woods,” says NIJ program manager Tom Coty. “Infrared cameras used by fire departments have saved lives. In one city, firefighters used an infrared camera to scan a smoke-filled room. They found an elderly woman and saved her life,” he says. Because these devices detect images through temperature contrast, they also can be used in the daytime.

Thermal imaging, or infrared technology, is not new, Coty says. It has been used by the military for many years and increasingly sophisticated, long-range thermal imagers are used by the U.S. Border Patrol to intercept drug smugglers and apprehend individuals attempting to illegally cross our borders. While thermal imaging devices called Forward Looking Infrared (FLIR) have been installed on police helicopters, the NIJ project will assess the handheld and patrol-vehicle-mounted thermal imagers being

evaluated by four Texas police departments, three sheriff’s departments, and the Texas Rangers. NIJ anticipates that feedback from the evaluation will show the imagers to have greater mobility and agility for law enforcement use.

“There are many uses for infrared technology,” Coty says. “Officers can use them while searching darkened buildings or houses . . . without using a flashlight that would give the suspect an unwanted advantage. They can also use them to pick out vehicles that have been recently driven. In one case, an officer with an infrared unit mounted on the patrol car found a hit-and-run suspect’s car parked on a residential street. Its warm engine made it stand out among the other ‘cold’ cars. Additionally, officers will be able to spot recently made tire skid marks, detect the warm-water trail of a swimmer, or find recently discarded evidence by the heat it retains from the suspect’s hands,” he adds.

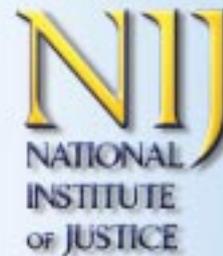
Coty says the project is actually a two-pronged effort. Through the University of Texas at Dallas and Raytheon, NIJ is evaluating the use and effectiveness of infrared technology. In the first phase of the project, Raytheon will document the effort required to install the thermal imagers, train operators, and determine how long it takes before the agency is effectively using the devices. In the second phase, the university will study the use and effectiveness of the devices and compare the information to data from a control group of agencies that did not receive them.

Coty notes that most of the departments and agencies receiving the thermal imagers will act as test beds and attempt to find new ways to use the technology. Some of the other agencies, however, have more specific plans: The Dallas County Sheriff’s Department will use the devices for warrant serving; the Grayson County Sheriff’s Department will use them in water rescue, marina and resort area surveillance, and in counterdrug operations; and the Texas Rangers plan to use the devices at murder scene investigations and during manhunts.

The cost of the thermal imager together with video recorders and other accessories can run over \$10,000. But according to Coty, “Law enforcement agencies should see a reduction in the cost of the sensors if a Department of Defense program is successful in reducing the manufacturing costs of the core infrared sensor components.”

Assisting NIJ in monitoring this grant is the Border Research and Technology Center (BRTC) in San Diego, California. BRTC, which is part of the NIJ National Law Enforcement and Corrections Technology Center system and is operated by Sandia National Laboratories, is currently facilitating the identification and delivery of advanced night vision and specialized illumination technologies to law enforcement agencies operating along the border.

**For more information about this project, contact Tom Coty, NIJ program manager, at 202-514-7683; or Chris Aldridge, project director, BRTC, at 619-232-1726 or 888-656-2782.**



### From the Director

*Law enforcement, courts, and corrections officials and officers working in the field know how crucial technology is to their day-to-day operations. In some circumstances, having the right tool can even mean the difference between life and death.*

*The technological revolution that has swept society as a whole in recent years has also affected the criminal justice system. Some technologies that not long ago seemed advanced—vests that can stop bullets, and electronic monitoring of probationers—today seem commonplace. But the revolution continues apace, with ever more spectacular advances now being made, or in the testing stages, or on the drawing board.*

*As the research arm of the U.S. Department of Justice, the National Institute of Justice (NIJ) has, since its founding 30 years ago, been in the forefront in sponsoring the development, testing, and demonstration of technology to improve the justice system. The development of DNA testing standards, soft body armor, and improved fingerprint evidence are some of the many areas in which NIJ has played a leading role.*

*More recently, with strong support from the Administration and the Congress, NIJ has accelerated the pace of its efforts. Less-than-lethal technologies to minimize the use of force, computerized mapping to pinpoint and analyze crime patterns, concealed weapons detection to prevent violence, methods of stopping fleeing vehicles to apprehend suspects, and improvements in DNA laboratories to aid in evidence testing—all these capabilities, and others, are now being explored by NIJ. Their application can mean even greater transformations in law enforcement operations.*

*TechBeat plays an important role as an essential link communicating the latest information about these developing technologies from the National Law Enforcement and Corrections Technology Center. By keeping law enforcement, courts, and corrections personnel current about the tools they can use, the newsletter makes a difference in controlling crime and ensuring justice.*

Jeremy Travis  
Director  
National Institute of Justice

## SIGN UP TO RECEIVE FREE REPORTS FROM THE NATIONAL CRIMINAL JUSTICE REFERENCE SERVICE

In addition to funding the National Law Enforcement and Corrections Technology Center, NIJ also supports the National Criminal Justice Reference Service (NCJRS), an international clearinghouse on crime and justice information. NCJRS staff respond to reference questions, provide referrals to other resources, distribute NIJ and other Office of Justice Programs (OJP) documents, and maintain a mailing list of over 45,000 registered users. If you are interested in signing up for the NCJRS mailing list, you may request a registration form using any of the following methods:



**FAX-ON-DEMAND.** Dial 800-851-3420, select option 1, then option 2. The registration form is #1 on the document index. The form will be faxed to you immediately.

**FAX.** You may fax your request for a registration form to 410-792-4358. You will receive a form promptly in the mail.

**E-MAIL.** Send an e-mail to askncjrs@ncjrs.org and request a registration form. It will be sent to you in the mail.

**WRITE.** Send a written request to NCJRS, Box 6000, Rockville, MD 20849-6000.

**CALL.** You may call an NCJRS information specialist and request a registration form. The number is 800-851-3420.

As a registered user, you will receive the bimonthly *NCJRS Catalog*, the quarterly *NIJ Journal*, and selected reports based on your criminal justice interests. For more information about NIJ and NCJRS, visit their Web sites:

<http://www.ojp.usdoj.gov/nij> and <http://www.ncjrs.org>.

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The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance, Bureau of Justice Statistics, Office of Juvenile Justice and Delinquency Prevention, and Office for Victims of Crime.

# Body Armor—A Common Sense Guide

**B**ody armor—an incredible 20-year success story—is a technology that has saved an estimated 2,057\* lives by not only providing protection from handguns, but also by preventing serious injuries from other types of assaults or accidents. Yet, while body armor is a common household word in the criminal justice community, questions about its selection and its use are just as common.

In response to these questions, the National Institute of Justice (NIJ) is publishing its new *Selection and Application Guide to Police Body Armor*. Although first published in 1989, with several subsequent brief updates and revisions, this latest version of the guide is the most comprehensive and up-to-date to be printed in almost 10 years.

“The intent of the *Selection and Application Guide to Police Body Armor* is to be the layman’s common sense guide to what body armor is, what it isn’t, and to help agencies select the appropriate type for their needs,” says Lance Miller, testing coordinator for NIJ’s National Law Enforcement and Corrections Technology Center (NLECTC)—National in Rockville, Maryland. “It will deal with procurement issues and show how to avoid the common pitfalls of buying body armor.

“The guide will provide extensive information as to why police officers should wear body armor,” Miller says. “It will include a detailed discussion of the Uniform Crime Report statistics, specifically those relating to the number of officers killed and assaulted. It will also look at the many technological advances and new materials developed by the body armor industry as well as the new methods of manufacturing body armor.

\*Source: The International Association of Chiefs of Police/Du Pont Kevlar Survivors’ Club®.

“We’ve worked closely with a number of folks in the industry who have been very supportive and have provided us with a lot of information,” Miller says. “It’s given us an accurate picture of the current state of body armor.”

The guide will also provide a history of the body armor program, which was created in the early 1970s when E.I du Pont de Nemours & Co. developed Kevlar®, a material the company intended as a replacement for the steel belting in radial tires. An NIJ scientist’s musing over whether Kevlar was also strong enough to stop bullets was the spark that started it all. Shortly thereafter, NIJ distributed 5,000 vests for field testing to law enforcement agencies throughout the country. Within 6 months, this new technology—which was

originally met with great skepticism—saved a police officer’s life.

“Body armor has changed tremendously from its original incarnation as a World War II flak jacket to its evolution into the lightweight but highly effective piece of equipment that it is today,” Miller says. “Those changes will be reflected in this newly released publication.”

The new *Selection and Application Guide to Police Body Armor* serves as a companion publication to NIJ’s *Body Armor Consumer Product List*, which details



the models and types of body armor that comply with NIJ Standard-0101.03.

**For more information about both publications, call the National Law Enforcement and Corrections Technology Center—National at 800-248-2742. For more information about NIJ’s body armor and other public safety standards and testing initiatives, contact Lance Miller at 800-248-2742, extension 5472.**

Photos courtesy of H.P. White Laboratory, Inc.

## New Publications

The following publications are available from the National Law Enforcement and Corrections Technology Center:

**TechBeat, Winter 1998.** Articles in this issue of *TechBeat* feature the U.S. Department of Defense excess equipment program, computerized crime mapping, and the ALERT™ police car.

**TechBeat, October 1997.** This issue of *TechBeat* includes articles on developments in image analysis and concealed weapons detection technologies, innovations in technology to stop fleeing vehicles, and efforts to improve security along the Nation’s borders.

**Preventing In-Custody Deaths.** This informational videotape, targeted to the many smaller county municipal jail facilities throughout the United States, details actions to prevent in-custody deaths related to positional asphyxia. The video provides jail personnel information about why and how positional asphyxia occurs and offers suggestions and recommendations to help reduce the potential of in-custody death. The video highlights the correct procedures to use when restraining a violent prisoner and safety precautions to follow to help jail personnel prevent medical problems.

**The National Institute of Justice and Advances in Forensic Science and Technology.** This bulletin presents information on recent advances in forensic science technology and evidence collection funded by the National Institute of Justice, including DNA identification, latent fingerprints, and questioned document examination.

**Police Body Armor Consumer Product List Update Fall 1997.**

This consumer product list (CPL) identifies models of armor that were tested and found to comply with the NIJ standard. CPLs are updated to include new models that have passed the test. This edition is an update to the Spring 1994 edition of the CPL; both documents are required to have a complete listing of NIJ-approved models.

The following publications will be available soon:

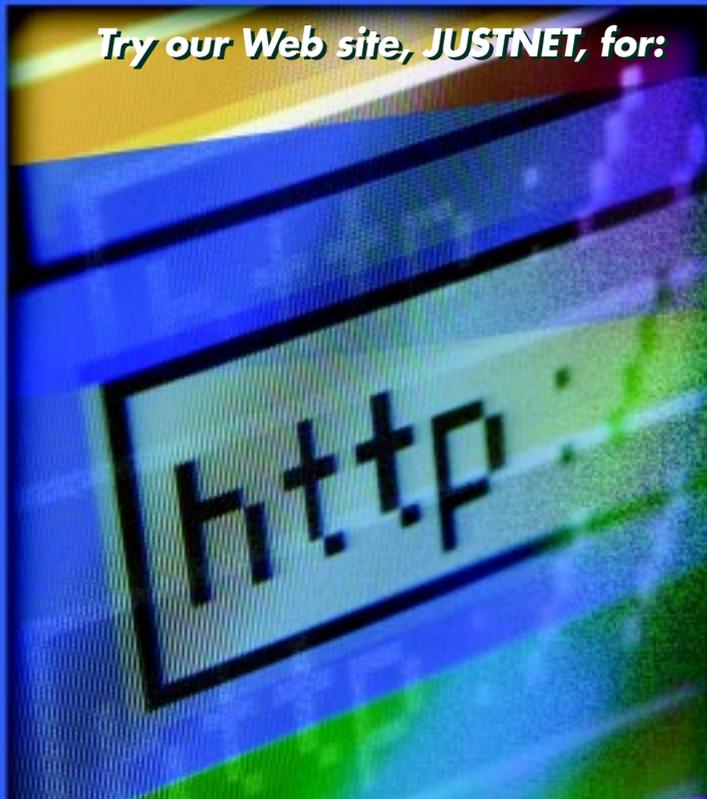
**Equipment Performance Report: Evaluation of Replacement Brake Pads for Police Patrol Vehicles.** This report provides complete results of the May 1997 comprehensive evaluation of replacement brake pads for police patrol vehicles. The report contains a large amount of data generated throughout the evaluation, which was conducted under a variety of test conditions.

**Equipment Performance Report: 1998 Model Year Patrol Vehicle Testing.** This report provides complete data on the 1998 Michigan State Police patrol vehicle testing.

To obtain any of the above publications or to receive additional copies of the *TechBeat* newsletter, write NLECTC, P.O. Box 1160, Rockville, MD 20849-1160; telephone 800-248-2742; or download from JUSTNET at <http://www.nlectc.org>.

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## NIJ SPONSORS TECHNOLOGY INSTITUTE

More than two dozen law enforcement professionals from across the United States will be invited to Washington, D.C., this summer and given the opportunity to exchange information on existing and developing law enforcement technologies that could affect not only their individual departments but also the entire criminal justice community. Another conference will be held for corrections practitioners in the fall.

As part of an ongoing effort to promote effective and affordable technology in support of law enforcement, the National Institute of Justice (NIJ) will once again sponsor its Technology Institute, the goals of which are:

- ◆ To provide participants the opportunity for continued education on technologies applicable to law enforcement and corrections.
- ◆ To provide participants the opportunity to meet and interact with other professionals and thus learn from each other.

- ◆ To provide NIJ the opportunity to improve its programs based upon participant experience and comments.

Last August, 19 mid-level managers from law enforcement agencies across the United States attended the first such Institute. Participants shared the operational challenges that their departments have experienced and how they used technology to solve these problems. Participants also toured NIJ's Office of Science and Technology; the National Law Enforcement and Corrections Technology Center (NLECTC); FBI Headquarters; the FBI National Academy; the U.S.

Department of Justice; and the Pentagon, where staff gave demonstrations on various technologies under development or being used by their agencies.

*This year's Technology Institute for Law Enforcement is tentatively scheduled for July 26-31 in Washington, D.C. The Technology Institute for Corrections is tentatively planned for October 25-30 in Washington, D.C. For additional information and updates, contact Ashley Mushett of Star Mountain, Inc., at 703-960-7000, or access the NLECTC Web site, JUSTNET, at [www.nlectc.org](http://www.nlectc.org).*



# I've Seen Your Face Before!

**A** novel way of identifying suspects will soon be in the hands of law enforcement—a computer software program that lets investigators recreate the human head in three dimensions and then compare it to or search through 1 million faces in less than 1 second.

This software represents the latest and most sophisticated version of facial recognition technology, and Dr. Arsev H. Eraslan is the brain—or should we say the “face”—behind it. As the chief scientist at the National Institute of Justice’s (NIJ) Office of Law Enforcement Technology Commercialization (OLETC) in Wheeling, West Virginia, Eraslan holds a doctorate in aerospace engineering. He has spent 20 years teaching and more than 30 years doing research for the National Aeronautics and Space Administration (NASA).

It was Eraslan’s extensive experience that told him the two-dimensional mug shot/composite systems currently on the market could be improved. He knew there were newer and better technologies that would make the job infinitely easier and much more accurate. In November 1997, he began work to prove his theory by taking off-the-shelf technology originally created for the aerospace industry and combining it with 2,000 faces scanned in by the U.S. Air Force during a project to design new helmets and masks. The result was a program that can build a fully three-dimensional face.

“We have addressed the fundamental problem of all two-dimensional systems, which is that mug shots only have a front and a profile view. But most of the time people are captured

on tape at an angled view,” Eraslan says. “None of the existing methods can capture that to match it because the human head is three dimensional.”

Eraslan knew a three-dimensional problem required a three-dimensional solution. First, he divided the human face into 64 individual features. He then took the 2,000 three-dimensional scans done by the Air



The program also will be equipped with an automatic composite builder, which will allow the investigator to build a face while the victim describes the suspect. The investigator will be able to rotate the head to different angles and change the lighting to recreate the conditions that existed when the crime occurred. In addition, the software program will let investigators convert existing two-dimensional mug shots to three dimensional. They will be able to match each facial feature with the three-dimensional features built into the program.

“I take a 3-D nose and turn it frontwise and see how

it matches the front of your two-dimensional mug shot.

Then I check it against your profile. If that doesn’t work, I find another nose and compare it until I have a match. I do this with all the facial features until I construct a fully three-dimensional head. It’s a new approach. It’s tricky, but we’re very excited about it,” Eraslan says.

Force and sorted them into each of his 64 categories to create 256 possibilities for each feature. “We have 256 noses, 256 mouths, 256 foreheads, 256 chins. We can pretty much construct anybody’s face using these parts,” Eraslan explains.

Each of the program’s facial features are numbered. Comparisons are based on those numbers, which makes identification easier and faster. In fact, it is so fast that investigators will be able to search through 1 million mug shots in less than 1 second. “But the only thing we’re comparing is 64 numbers to 64 numbers. This also means you need only limited storage. You can store 40 million mug shots in a PC [personal computer],” Eraslan says.

According to Eraslan, the facial identity program does not require expensive equipment. It will run on a PC equipped with a 200 MHz Pentium processor. Agencies can keep the program entirely inhouse or set it up to network with other agencies.

Although the project is just 6 months old, Eraslan says he expects to have an alpha version and proof-of-concept demonstration ready by July 1998. If all goes as planned, NIJ will help commercialize the program through OLETC, which will work with a private vendor to make the program available to law enforcement agencies.

The National Institute of Justice is also developing other facial recognition technologies and applications. One application recently started with the ANSER Corporation will use various aspects of facial recognition technologies to enhance the operations of the National Center for Missing and Exploited Children. Additional information will be the subject of a future article.

*For more information about the facial recognition software initiative at OLETC, contact Dr. Arsev Eraslan or Tom Burgoyne at OLETC, 888-306-5382.*

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