

Breeding a Line of Super Sniffer Drug Dogs

Meet some of the sweetest narcs on the planet. These are super sniffer drug detecting dogs born at the CTAC-sponsored canine breeding unit in the U.S. Customs Service's dog training facility in Virginia. They are the second generation of American-born, Australian gene pool pups. Their older cousins are completing their training and will soon be deployed at ports of entry across the nation. That's bad news for drug smugglers. These pups have astonishing genetics going for them, as well as world class training.

The government of Australia sent a gift of very talented wet noses to the U.S. to help the U.S. Customs Service breed its first line of drug-detecting dogs. In the Australian program's unique experience, each new litter of these very carefully bred pups has produced a remarkably high percentage of dogs with a strong aptitude for the challenging work of detecting hidden shipments of drugs.

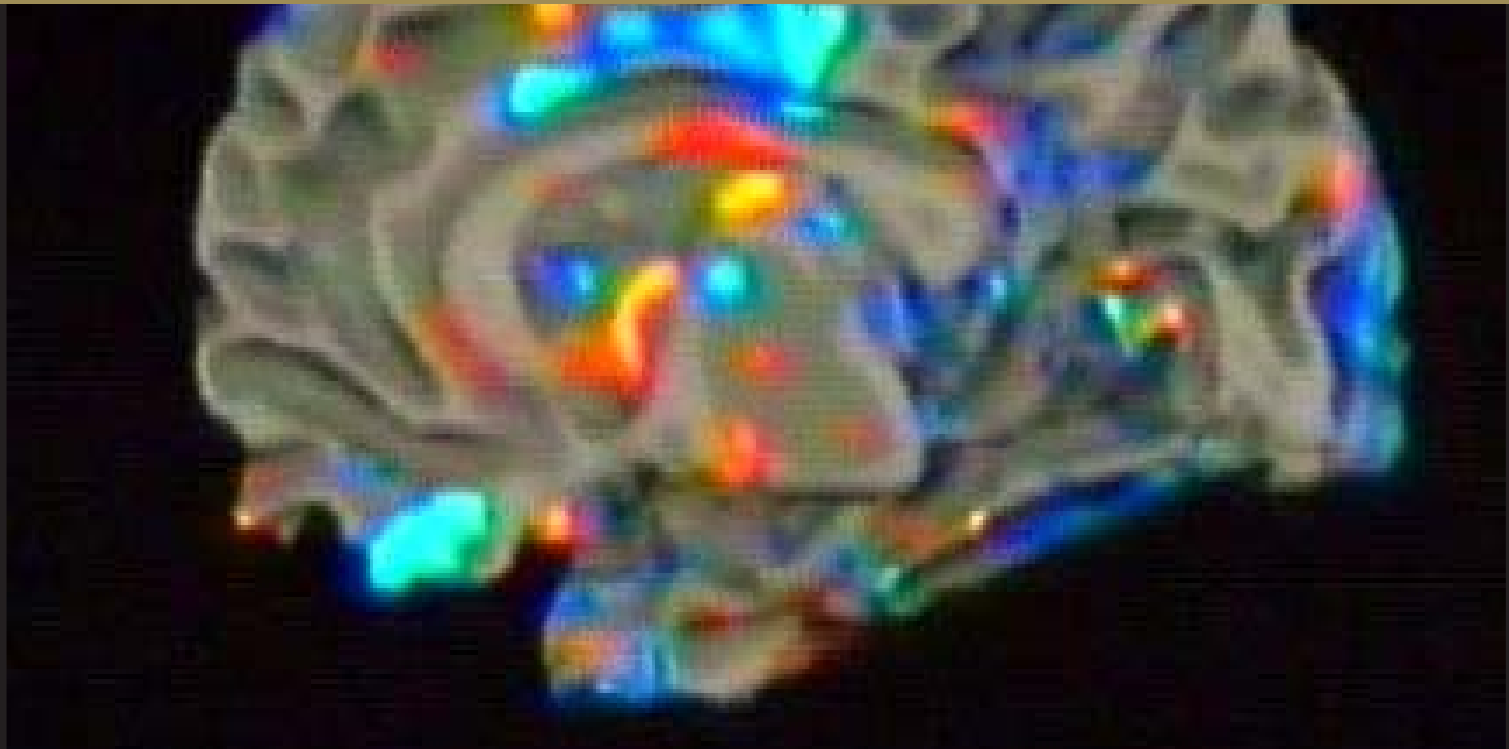
One of every two puppies born in the program Down Under meets the rigorous performance requirements of the U.S. Customs Service. Until now, the long-established U.S. drug-detector canine training program has relied exclusively on donated animals. At least 200 donated dogs must be screened to find just one dog who can make the grade.

The U.S. Customs Service/CTAC goal is to fully replicate the Australian program's spectacular success. There is a happy symmetry in all this. Australia's drug-detector canine program began years ago with a gift of fully trained dogs—from the U.S. Customs Service. (The photo below left shows pups at Custom's training center in Virginia being introduced to working on a conveyor belt.)



COUNTERDRUG TECHNOLOGY

Advanced Systems to Help Law Enforcement and Medical Science in the Struggle Against Drug Crime and Abuse



COUNTERDRUG TECHNOLOGY chronicles the work of CTAC, the Counterdrug Technology Assessment Center. In 1990, Congress created CTAC within the Office of National Drug Control Policy to coordinate the research and development of all federal agencies experimenting with advanced technology to fight drug crime, and to use its own budget to initiate and fund R&D in prevention, treatment and law enforcement science. With strong bipartisan support from Congress, CTAC is also providing advanced tactical systems and devices to state and local law enforcement agencies. Those technologies increase police effectiveness and safety.

For more information regarding ONDCP and CTAC, please visit our website at www.whitehousedrugpolicy.gov



Thermal Imaging



Digital Wiretaps



Breeding Drug Detectors



Advances in Drug Treatment

Pushing the Envelope: A Report from Dr. Al Brandenstein

CTAC's Director & Chief Scientist, ONDCP

These are exciting, challenging times for those of us who are applying science to the struggle against drug abuse and drug crime. In both medicine and law enforcement, CTAC is privileged to be playing a central role in the development and deployment of state of the art advanced technology. We are sponsoring some of the finest minds in the nation and their work gives us new hope as we seek more knowledge, better answers, and new medications to treat and prevent abuse while we make cops more effective and safer in their vital work.

Today, state and local police and prosecutors who have received help from CTAC's Technology Transfer Program are damaging drug dealers' operations across America. This CTAC program provides systems and devices that digitize wiretaps, covertly track suspects, securely share investigative information among regional law enforcement agencies, stabilize shaky surveillance video, detect hidden cash and drugs, locate money launderers, and see quite effectively through darkness. They are operational right now in over 1300 law enforcement agencies in all 50 states, as we fulfill an important Congressional mandate to bring federally developed technology to bear against drug crime at the local level.

In the pages of this magazine, you will get first person reports from police managers in Texas, New York, and Oklahoma, whose departments are making regular, highly successful use of these systems. Meanwhile, CTAC-sponsored, nonintrusive inspection systems are being used by the U.S. Customs Service to probe railroad cars as well as trucks and cargo containers for hidden narcotics. CTAC is also supporting research leading what we believe will be next-generation systems. They are designed not only to detect the presence of contraband but also to tell law enforcement exactly what kind of contraband is being hidden inside suspect containers without having to open them.

At the same time, CTAC-funded medical research—our biggest R&D investment—is underway to learn more about the brain and create new medications to fight drug abuse. Among these endeavors are the bold, anticocaine projects at Columbia and Emory Universities, where Don Landry and Mike Kuhar have made major strides towards the development of medications to block cocaine overdose and prevent and treat addiction. Then there are the inspiring brain imaging projects at major medical research centers across the nation. What CTAC has done in this arena is to provide the world's most advanced brain imaging machines in exchange for a commitment from famed research institutions to devote significant time on



Dr. Brandenstein at brain research center in Boston.



Addict prepares to undergo brain scan.

the new brain scanners to drugs of abuse research. As part of the exchange, the research centers are training the next generation of medical researchers in this field which traditionally has not attracted much interest from bright young minds because of the stigma attached to drugs and the low priority given to it by the pharmaceutical industry.

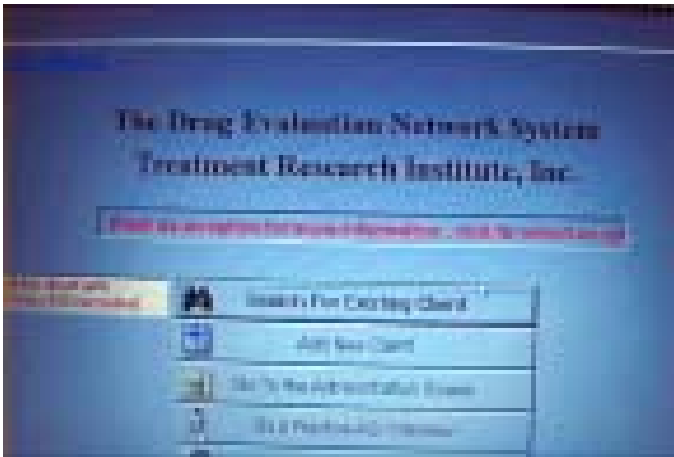
DENS: The Drug Evaluation Network System

Tracking American Drug Abuse in Real Time to Make Treatment and Prevention More Effective

CTAC has sponsored the creation of the nation's first digital, virtually real-time, Drug Evaluation Network System (DENS), allowing for the tracking of drug-related problems and drug use patterns across the country. The benefits of this system include earlier intervention in problem areas, more focused treatment care plans, and targeting of prevention efforts. DENS was conceived by two of the most respected authorities in substance abuse treatment, outcomes, and prevention: Columbia University Prof. Herb Kleber, M.D., and University of Pennsylvania Prof. A. Thomas McLellan, Ph.D.

Piloted for the past 3 years in 40 drug treatment programs and drug courts in six cities, DENS has proved itself and expanded. Under the operational guidance of Dr. Deni Carise of the Treatment Research Institute, DENS is now collecting information from the U.S. Department of Veterans Affairs' 200 drug and alcohol treatment programs as well as the statewide treatment system in New Jersey, and the Delaware Drug Courts. A follow-up study is underway with DENS in 300 drug treatment centers in Los Angeles. Additionally, another ONDCP-sponsored study, the RAMONA project, is being built into DENS to provide an estimate of the number of hard-core drug users in the U.S. Integrating RAMONA into DENS should produce more precise results than previous efforts, which did not have the immediate reach and rapid response of RAMONA.

DENS begins with an extensive profile of individuals entering treatment at a participating program, allowing comparisons of treatment efficacy while completely shielding each patient's privacy. In the future, the system will additionally track services received as well as treatment outcomes, providing solid, scientific measures of performance. This, in turn, is expected to create a wide range of new knowledge-based opportunities for treatment professionals and other decision makers. Today, long before it was expected, some treatment centers are using DENS information and software to streamline their new patient evaluation and the result is much faster identification of patient needs. "We are saving weeks if not months and that means patients get much more out of their time in the program than they would have without the DENS input into our process," one treatment center told us.



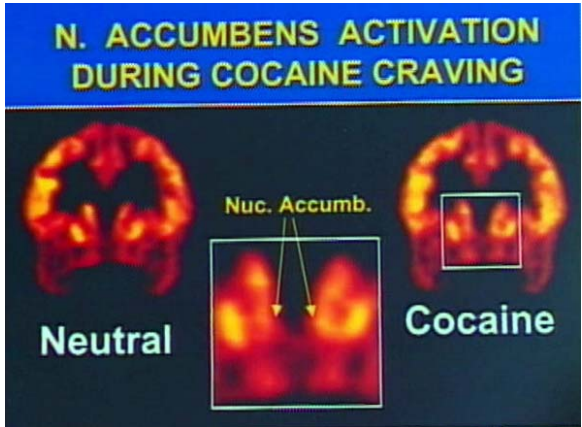
CLOCKWISE FROM TOP LEFT: Dr. Kleber; Dr. Carise listens to treatment center manager; DENS computer system being used at treatment center; detail from DENS terminal screen; Dr. McLellan.

Neuroscientists working on drug abuse today routinely discuss the role in cocaine dependence of a brain area called the nucleus accumbens. But it wasn't until 1997 that Dr. Edythe London (in lab coat, photo right) of the National Institute on Drug Abuse, was able to visualize—with high resolution—the function of this nucleus in the human brain of a cocaine addict by using a state-of-the-art Positron Emission Tomography (PET) scanner sponsored by CTAC for use at NIDA's Addiction Research Center in Baltimore. The PET instrument at NIDA will now be used by Dr. Diana Fishbein under CTAC sponsorship to conduct basic research leading to better management of recovering addicts. Today, Dr. London is based at UCLA where her new work focuses on methamphetamine dependence. The photos (right) show a young woman in a UCLA treatment research program, who consented to brain scanning, an interview and to be photographed. She told Dr. London that she believes her years of doing meth have damaged her brain, resulting in changed behavior.

Dr. London hopes that this line of study will result in new knowledge leading to the development of effective medications and behavioral therapies for people whose lives are being destroyed by meth. Also at UCLA, investigators at the Crump Institute on Molecular Imaging are bringing state-of-the-art techniques to bear on the problem of drug abuse from another unique perspective. With CTAC's sponsorship, Dr. Simon Cherry and his colleagues are developing a small PET

scanner with resolution fine enough to literally see gene expression in discreet nuclei of a monkey brain. This new instrument will allow injection of DNA and selective probes that can alter gene expression in specific monkey brain regions critical to the reward effects of cocaine and other abused drugs. The effects of such genetic manipulations on brain function will be studied at the molecular level with PET, and

ultimately can be related to drug abuse behaviors in nonhuman primates. For the first time, the links between drug abuse and brain function will be linked to the expression of certain genes that can then be monitored externally. While this may sound like science fiction, it is excitingly real and feasible and the implications for the development of counterdrug medications for humans could be breathtaking.



A team of medical scientists led by Dr. Nora Volkow at Brookhaven National Laboratory in New York State has used a Positron Emission Tomography machine, known as a PET scanner, and provided by CTAC, to examine the brains of former methamphetamine addicts. They had been off methamphetamines for as long as 11 months. What Dr. Volkow and her team discovered is chilling but not unexpected. Reported in the American Journal of Psychiatry, their study, funded by the National Institute on Drug Abuse, says the brains of these people appear permanently changed, leaving them with impaired memory and reduced physical coordination.

One of the reasons CTAC exists is to push the technology envelope on both demand reduction and supply reduction. Right now, for example, we're supporting scientists at the Massachusetts Institute of Technology's Lincoln Laboratory who have a new way of using lasers and ion spectrometry for detecting the presence of illegal drugs in sealed containers. The theory is exciting and we have decided to sponsor the work required to determine if the two technologies when combined will translate into a practical tool for law enforcement. CTAC's mission encourages us to look at bold new approaches and it puts us in contact with some uniquely talented people, like the auto mechanic who invented a rapid pursuit boat for busting drug smugglers. His story is also in this edition of COUNTERDRUG TECHNOLOGY.

During my more than 15 years at Defense and at ONDCP's CTAC, I've often been asked by friends outside government if the persistence of the drug crisis didn't make me doubt the focus of our efforts. When I could reply by describing some of our technology R&D programs and goals, they would often say, "Well, let's see if it ever works in the real world."

Today, the federal government's leveraged investment in counterdrug research and development is paying off across the horizon of science: from deep inquiry into the workings of the human brain to a canine breeding program that is producing the first U.S. line of drug-detecting dogs.

Meanwhile, the Thermal Imagers you see officers training on in the photo on this page, and some of the other Technology Transfer Program's systems and devices have directly reduced risk for cops while increasing their effectiveness. That is enormously satisfying for all of us, including the technology developers, the Army program managers who administer the Technology Transfer Program for us, and for my core team at CTAC.

Of course, genuine R&D always has some failures associated with it, but there is every reason to expect even more good news in the near future from this office as many of our investments in brilliant, innovative, scientific minds continue to pay off. Thanks for taking the time to learn about our work. Feel free to contact me at ONDCP/CTAC Washington, DC 20503.



Image from CTAC Video

Coordinating & Creating: *Carrying Out Congress' Command*

Not only does CTAC have the statutory responsibility for coordinating the entire federal counterdrug law enforcement R&D program but we also seek out and support scientists who are creating exciting new technologies to reduce drug demand or supply. Much of what we initiate is done in partnership with other agencies. Although our budget is quite small, our project portfolio is very diverse and its impact is being felt well beyond the federal law enforcement community, where some of the systems have already been associated with world famous investigations.

For instance, when FBI agents tracked and arrested the CIA traitor Aldridge Ames, they did it with the help of an advanced surveillance system originally developed by CTAC-sponsored scientists for extremely complex counterdrug cases. The FBI's system is capable of simultaneously following hundreds of vehicles and it is in routine use against drug traffickers.

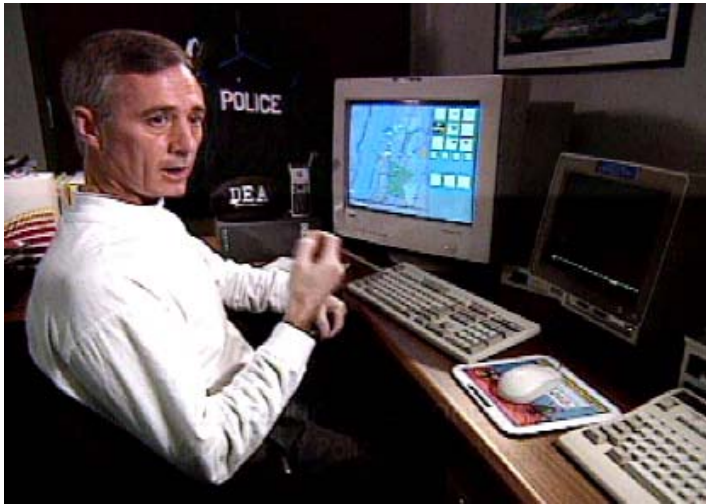
Today, scaled down versions of that system are available to local and state police through the Technology Transfer Program, adding significant power to local law enforcement's attack on increasingly technologically sophisticated, tightly organized drug traffickers. While it would be wrong to say that these systems have crippled the drug dealers, there is no question that their bite has been deep and painful for some criminals. And we've only just begun to hand out the sharp, high tech teeth.

In one Southwest town, city cops equipped with a CTAC tracking system seized \$1,000,000 in property, almost half a ton of marijuana, and busted twelve suspects.

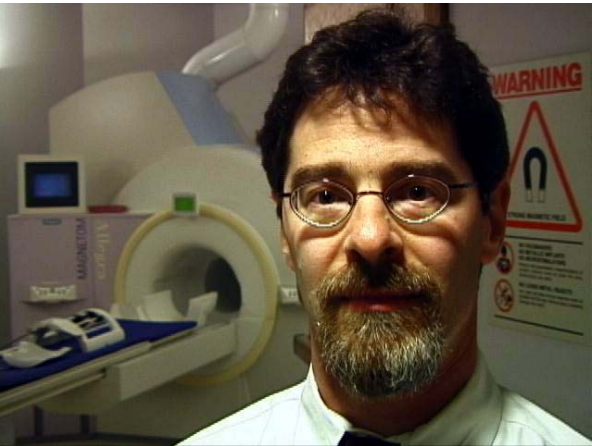
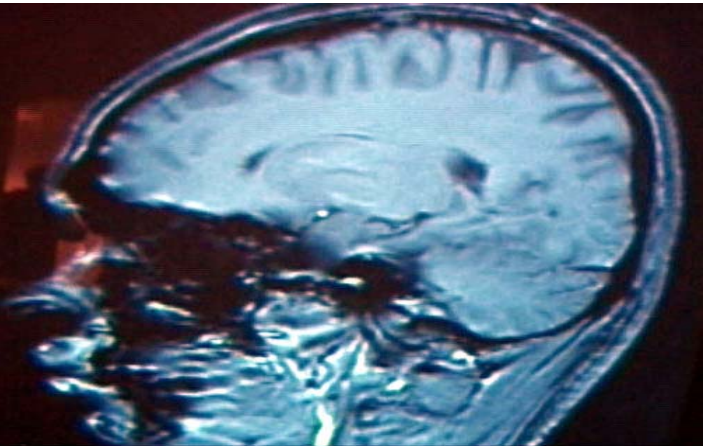
One West Coast local-county-state narcotics task force used one of our surveillance systems to inflict disruption and loss of cash and product on Mexican cartels to the tune of hundreds of kilos of cocaine and well over a ton of marijuana.

Local cops in one Southern city and Sheriff's officers in a different part of the South are using one of our surveillance systems to shake up local drug dealers. More than 60 indictments have been handed down in those two investigations, thus far.

TOP: Tracking cocaine conspirators in New York State.
CENTER: Aldrich Ames leaves Federal Courthouse in Virginia following arraignment. BOTTOM: State Prosecutor's display of drugs seized in Oklahoma raids.



Block Prevention and Treatment



Much of CTAC's research and development budget supports bold new efforts to obtain crucial information for the demand reduction side of the National Drug Control Strategy. In direct pursuit of that goal, CTAC is funding the construction of brain imaging centers to learn everything we can about the interactions of drugs of abuse as they enter the brain, and ways to block those destructive effects. Research institutions receiving these state-of-the-art scanners promise to give top priority access to scientists who are working right now on drug abuse questions and to train the next generation of brain researchers to focus on drugs of abuse.

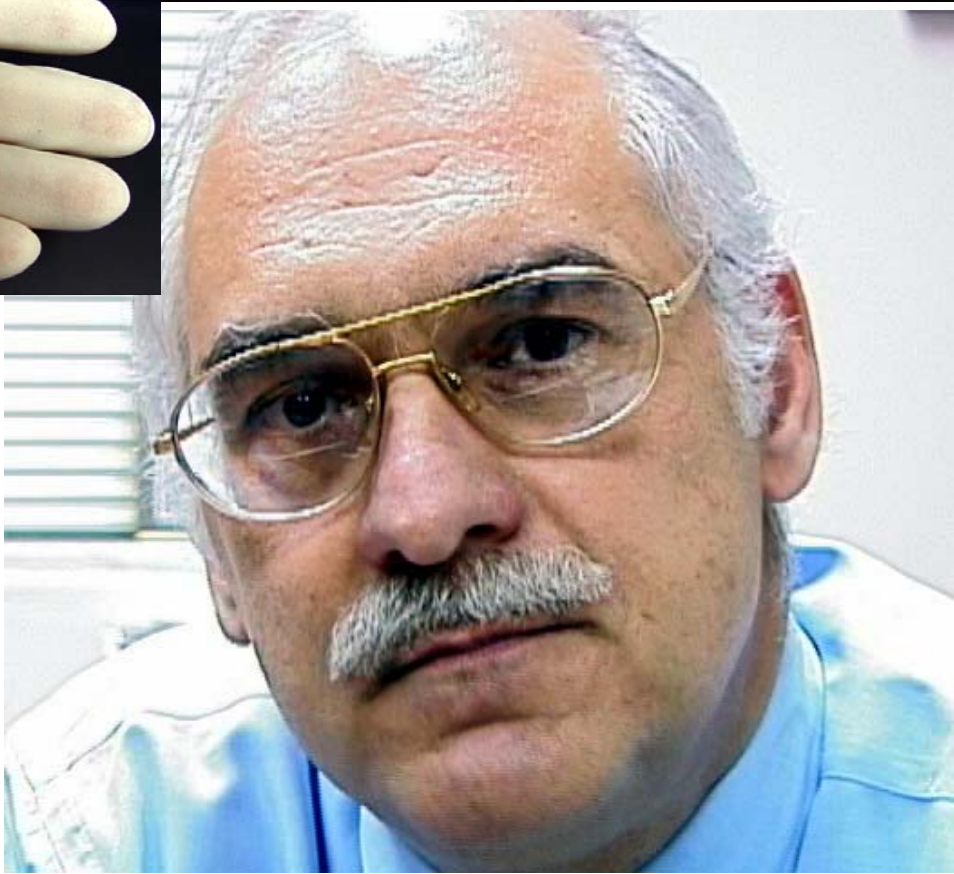
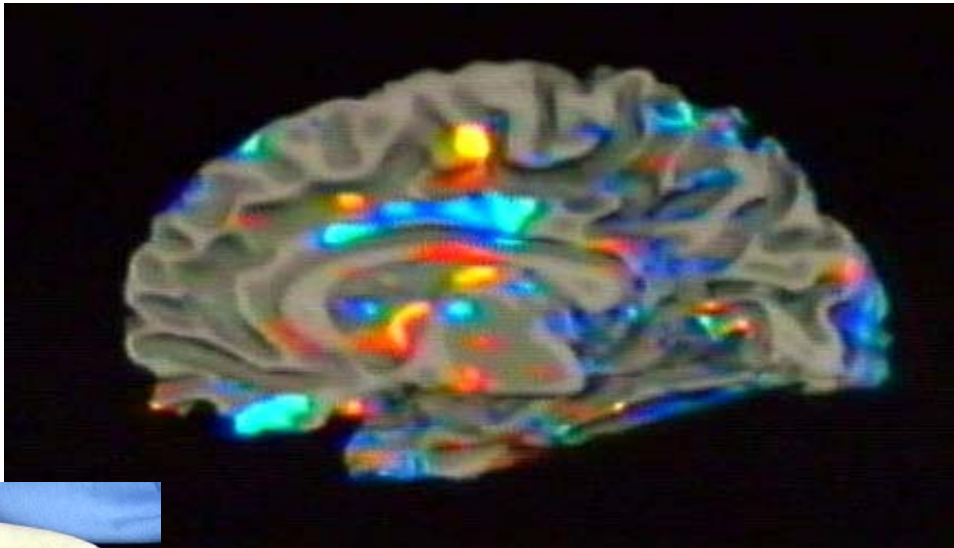
A massive, CTAC-sponsored Functional Magnetic Resonance Imaging machine, powered by a 7-Tesla coil magnet seen under construction in photos (left)—has been installed at Massachusetts General Hospital. It's the most powerful brain scanner in the world, according to Dr. Bruce Rosen (top right), who directs the use of the new FMRI. The hospital's chief clinician on this project, Hans Breiter, M.D. (above), sees the enormous machine's equally huge mission as, "Mapping the neurochemistry of human behavior itself and creating a virtual stethoscope for treatment professionals, ultimately allowing them to easily, reliably measure the effectiveness of everything they do on behalf of their patients." Other CTAC-supported advanced neuroimaging system installations are complete or scheduled at NIDA in Baltimore, Brookhaven National Laboratory on Long Island, University of Pennsylvania in Philadelphia, Harvard's McLean Hospital outside Boston, and at UCLA.



Unlocking Mysteries Deep in the Brain that

It is inside the brain that cocaine triggers euphoria and along with it, for some, a terrible craving that leads to the destruction of job, family, and self. Inside the brain is where Dr. Michael Kuhar's development will act if it is successful. His efforts—including the recent CTAC-sponsored phase—to create anticocaine medication span 15 years and have encompassed the testing and evaluation of some 500 chemical compounds. A dozen of the best of the 500 were administered to rats and then the best two of the 12 were chosen to be given to monkeys. In the Yerkes Primate Center at Emory University, Atlanta, Kuhar and his team are at the cusp of what could be a major breakthrough. "These two compounds have been injected into primate subjects thousands of times with no observable side effects and the subjects stop performing the tasks required to receive the cocaine, strongly suggesting that these medications eliminate the desire for the drug.

When we move into human subject trials, we will be watching very closely not only for evidence of effectiveness but against negative side effects including toxicity." The scientific community is closely watching Kuhar's pioneering work. A new pharma-



ceutical company focused solely on creating substances to heal drug abusers is negotiating to license and further develop Kuhar's compounds. Licensing by a company is essential for bringing new medications to market. There is reason to believe that if Kuhar (photo above) and Landry

both succeed, then their drugs could be used together to help cocaine addicts. Both researchers have done remarkable work, but it would be a mistake to assume that effective, safe anticocaine medication will be available soon; there's lots more testing before that day arrives—if it ever does.

The Technology Transfer Program: Applying for Advanced Counterdrug Technologies

Why this Program Exists

Law enforcement finds it increasingly difficult to penetrate drug crime organizations. Drug distribution gangs are based more and more on familial and village associations, and drug dealers often employ sophisticated communications technologies including cloned cell phones and e-mail. In response to this threat to our country, Congress funded the Technology Transfer Program to help state and local cops in their fight against narcotraffickers. Through the Technology Transfer Program, CTAC provides a wide range of overt and covert technologies—most of which had their start at CTAC or in the inventories of the FBI, DEA, DoD, Customs, and other U.S. agencies.

During the past 3 years, Congress has appropriated \$39,000,000, empowering CTAC to provide federally developed advanced devices and systems to over 1300 of America's 17,000 state and local law enforcement agencies. These technologies allow cops to see through darkness, detect money laundering, penetrate complex drug trafficking conspiracies with digital wiretaps, communicate across agency lines in real time despite incompatible radios, track drug dealers via satellite, share drug crime information among regional departments, and convert shaky, apparently useless surveillance video into clear, court-presentable evidence. Many arrests, indictments, and convictions have already been credited to the technologies, and officer safety has improved as a result of the deployment of the Technology Transfer Program.

Cop Friendly

State and local law enforcement agencies are often surprised at how easy it is for a qualified department to get high tech help from this program. At our regional workshop in Charlotte, North Carolina, the Charlotte-Mecklenberg Police Department's Deputy Chief Glen Mowrey looked out at the representatives of more than 200 police agencies and said, "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." So, CTAC's Technology Transfer Program is NOT a grant program. There is NO transfer of money. Instead, state and local law enforcement agencies decide what they need and apply for the available systems and devices that meet those requirements. Applications are reviewed thoroughly but quickly and so long as funds are available,



Photo from local TV news report of CTAC workshop

technologies are purchased and scheduled for delivery in coordination with training. The Program's goal is to get the technologies deployed rapidly to help local and state authorities do the most damage possible to drug criminals and their organizations and to increase officer safety.

How to Apply

To be considered for the Technology Transfer Program, a law enforcement agency must submit two documents: (1) An official letter signed by top management (Sheriff, Chief, District Attorney) and (2) the completed Technology Transfer Program application. **The letter** must (1) request participation in the Technology Transfer Program, (2) choose up to three among the listed technologies, and (3) agree to provide evaluation reports assessing the impact of the received technology on the department's drug enforcement efforts. **The signed letter of request must be mailed on your agency's letterhead to the program's administrators:**

Electronic Proving Ground
Counterdrug Office
Fort Huachuca, Arizona 85613-7110.

In addition you may complete the Technology Transfer Program application form on-line at the website, www.epgctac.com. Alternatively, you may request a catalog of the technologies available, which includes a copy of the form, by calling (877) 374-2822, Monday through Thursday, 9:00 a.m. to 6:00 p.m., ET.

HIDTA Preference

Preference is given to departments that are located in High Intensity Drug Trafficking Areas (HIDTAs) that can demonstrate a need for advanced technology assistance.

Mandatory Training & Evaluation

Departments receiving the technologies commit to using them and to evaluating them. Mandatory, scheduled training, which includes travel, precedes the delivery of any of the systems and devices, and there are follow-up evaluations at 60, 180, and 270 days.

What's Available

A full list of the systems and devices currently available from the Technology Transfer Program can be viewed on the website www.epgctac.com, or a catalog detailing the available technologies will be mailed upon request by calling (877)-374-2822.

Technology Transfer Program's Impact:

Fewer Places for Criminals to Hide as Federal High Tech Comes to Main Street

The Trans Pecos area of Texas is known for its harsh terrain, poisonous snakes, drug dealers, and tough cops. Shortly after the Trans Pecos Drug Task Force applied for and received its Mini-Buster Contraband Detector kit from the Technology Transfer Program, the kit's handheld density detector led cops to almost a quarter million dollars in cash hidden in the rear bumper of a vehicle. The fiber-scope that comes in the same kit made the marijuana in the gas tank of the vehicle an equally easy find. In Georgia, the Department of Public Safety made a drug dealer there truly unhappy when it used Mini-Buster technology to find \$1,000,000 in hidden currency. Fifteen indictments followed. Those cases reflect the broad and speedy impact that advanced technologies can have on local counterdrug law enforcement.

Nightmare and Testbeds

Before the Technology Transfer Program was proposed to Congress, CTAC wanted to make sure local cops would benefit from systems already in the federal inventory, so a number of towns, cities and counties were selected as test beds. One of them is Brownsville, Texas, at the border with Mexico. One night, Brownsville cops came under fire in an area where police estimate that a thousand dollars worth of marijuana walks into the U.S. each night on the backs of young Mexican men known as drug "mules."

Fortunately, the smugglers' security men were poor marksmen. In the exchange of gunfire that night, none of the

Brownsville officers was hit, but at least one of the criminals was killed. Still, it was a dramatic lesson to Brownsville's Chief of Police, Ben Reyna: "With the narcotraffickers having demonstrated their willingness to kill us, it became a matter of even greater urgency that we obtain effective, reliable, night vision capabilities. CTAC came through with a Thermal Imager originally developed for the Department of Defense, which we installed in an unmarked vehicle. The system senses heat and most specifically is sensitive to the average, normal human body temperature. The Thermal Imager is superior to ordinary night vision devices because its sensitivity to body heat enables it to locate suspects hiding behind bushes and to reveal a suspect's position even in absolute pitch black."

PHOTOS: Thermal Imagers and Mini-Buster deployed and in training.



CTAC's Quest for Anti-Cocaine Medications

In the early 1990's, cocaine was destroying lives across America and medical scientists had few answers. President Bush asked whether it would be possible someday to develop a vaccine against cocaine addiction. At Columbia University's College of Physicians and Surgeons in New York City, Don Landry, M.D., Ph.D., heard the President's words as a challenge and developed a radical idea: Create a medication that would circulate harmlessly inside the blood stream waiting to attack and destroy entering cocaine molecules, breaking them apart before the cocaine could get to the brain where cocaine becomes a powerful, addictive intoxicant. Dr. Landry believed that such a medication could cripple cocaine's power with a single injection, serving as a true vaccine against this form of addiction. According to his theory, the same medication would also be an effective antidote for cocaine overdose.

But Landry's idea was so starkly different from the then-mainstream research paths that it was rejected by the usual funding sources. Nevertheless, cocaine was penetrating much of U.S. society and there was (and still is) no medication available to treat cocaine addicts. The White House Drug Czar's high tech R&D unit, CTAC, was eager to see a treatment breakthrough on cocaine and was mandated by Congress to be open to new thinking. So CTAC provided research funds to launch Landry's potentially historic work. At roughly the same time, CTAC sponsorship also went to a few other brilliant scientists whose concepts held the possibility of desperately needed breakthroughs in the cocaine crisis.

Today, Dr. Landry has partially succeeded. He has created an artificial catalytic antibody that attaches to cocaine molecules as they enter the bloodstream at reaction rates that render cocaine inert in laboratory rats. Dr. Landry is working to sharply increase the reaction rates to make the medication effective for human beings. If he succeeds, he will have achieved his dream: a perfect blocker against the drug, "No matter how they ingest the cocaine, by smoking it as in crack, by inhaling it or by injecting it."

If Dr. Landry's medication can be made powerful enough to work in humans, it would give cocaine addicts a safe and effective way to begin new lives of sobriety—from behind a cocaine-proof wall. Recently, Columbia University signed a contract with a pharmaceutical manufacturer. The company will pay for a major portion of the next step in Dr. Landry's project.



"Laboratory rats treated with this anti-body respond to cocaine the same way they respond to water and doses of cocaine that would otherwise kill them have no effect at all."

Dr. Don Landry,
Cocaine Vaccine Developer



TOP: Dr. Landry and an assistant in his lab at Columbia University in New York. BOTTOM: Landry describes how his artificial antibody attacks cocaine molecules in the blood stream, tearing them apart, rendering them inert.

The DARPA Connection: Continuing a Proud Tradition

Much of the technology we are applying today to counterdrug police work—including smuggling prevention and detection—flows from previously classified military initiatives, some of which I helped along as an Office Director of the Defense Department’s Advanced Research Projects Agency (DARPA).

At DARPA, we never lost sight of the fact that everything we did had to translate into more missions accomplished and more lives saved. A similar philosophy guides CTAC’s research: Help doctors prevent and treat abuse, help cops make more high-quality arrests, and improve officer safety by boldly pursuing new scientific ideas and adaptations which hold the promise of breakthrough in our wide ranging struggle against every aspect of the drug problem.

Learning more about law enforcement’s requirements has stimulated fresh, new thinking as well as innovative applications of existing national security technology. Some of our systems literally reach for the sky to enhance police capabilities. Sheriff Jim Connolly of rural Fillmore County, Minnesota, made history by being the first cop to use handheld Global Positioning System (GPS) units to obtain a narcotics search warrant. The search yielded almost a hundred pounds of marijuana and three felony arrests—no small matter in his rural community. Sheriff Connolly’s real-world testing of the counterdrug enforcement value of miniaturized GPS (another DARPA development) by a small, widely dispersed, local law enforcement agency, is a reflection of our strongly held view that CTAC functions best when we listen and learn from the professional in the streets. And in American law enforcement today, the word “streets” takes on many different meanings—and requirements—depending on the kind of community, the terrain, and number of officers available.

TOP: Dr. Brandenstein listens in Burlington, Iowa. CENTER: Sheriff Connolly on patrol with GPS in hand. BOTTOM: Dr. Brandenstein and Brownsville, Texas, Police Chief Ben Reyna with Thermal Imager at CTAC-sponsored training session in Phoenix, Arizona.



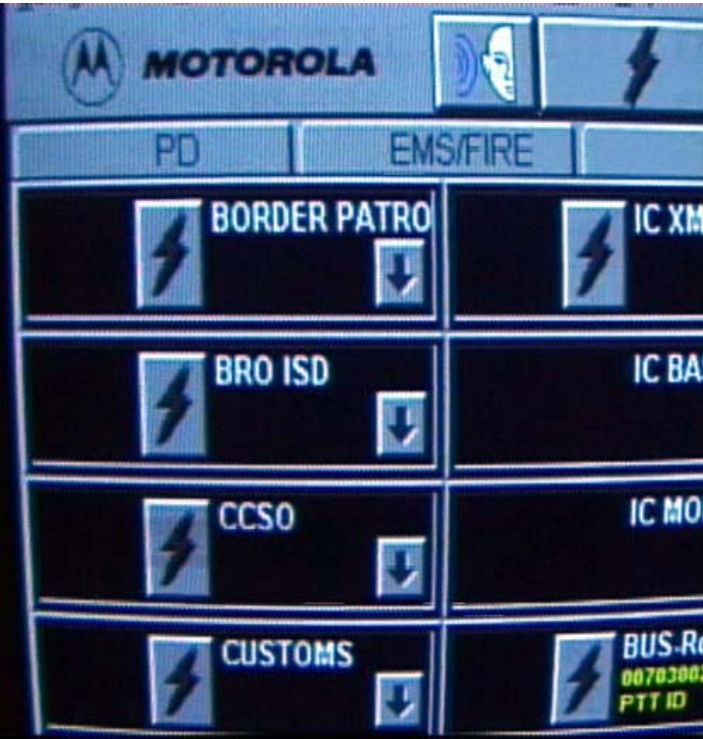
Now, when Brownsville cops go on night operations, they are supported by the Thermal Imager, so it no longer requires a muzzle flash to reveal the location of a hidden enemy. Chief Reyna has obtained local press coverage of the Thermal Imager’s capabilities by way of warning the opposition that any attempt to ambush his men will have immediate and potentially fatal consequences for the perpetrators. Since then, the guns on the other side of the Rio Grande have been silent, but the drug dealers continue to attempt to penetrate the U.S. at Brownsville.

One dark night, Brownsville police on patrol with the vehicle mounted thermal imaging device detected a small, blacked out shark boat inbound from Mexico, and alerted nearby federal and other local law enforcement agencies. Within hours, the boat with its cargo of almost a thousand pounds of marijuana and the vessel’s crew were in police custody. Chief Reyna believes this case would “not have existed without the Thermal Imager,” and the dope would have gotten through.

Wireless Interoperability to the Rescue

Today, the challenging border city of Brownsville has the additional law enforcement edge of the CTAC-sponsored, phone-patch-based system that permits local, county, state, and federal agencies to use their otherwise incompatible radios to communicate seamlessly in real time. This system, named RIOCOM by Chief Reyna, has tremendous implications for first and second responders to emergencies and for carefully planned, multiagency narcotics operations. The system is so user friendly, confidence is routinely acquired by an experienced 911 dispatcher with less than one hour’s training. It takes less than 15 seconds of computer mouse clicks to link up five agencies in real time!

The only thing different about communicating through the Wireless Interoperability system’s phone patch is that when each cop using the system finishes speaking, he must say “go ahead” to let the other connected cops know it’s clear for them to speak.



TOP: Brownsville Chief Reyna speaks to some of his cops. BOTTOM: Detail of Command and Control Screen from Brownsville Interoperability System.

By day, a team of Brownsville cops works at bridges between the U.S. and Mexico, supporting the U.S. Customs Service and the Border Patrol. The local cops use the Mini-Buster kit's fiberscope to look into gas tanks, the under-car mirror, and the Mini-Buster (Photo right) to hunt for density changes in door and side panels—locations favored by drug dealers to hide their money heading back into Mexico.

Chief Reyna says the combination of CTAC-supplied Thermal Imager and Mini-Buster search devices has led to many arrests and seizures. “These technologies not only make my people more capable, but they have also added to the morale of our troops. My officers work in unpredictable, dangerous environments and it is satisfying for them to know that Washington not only bothered to learn about what they do, but has done something significant to help them. They are all very aware of the systems and we have a rigorous training program that eventually will give many of my 300 officers hands on knowledge of the Thermal Imager and the whole Mini-Buster kit. One of my detectives has truly mastered these devices and now he is called on by CTAC to teach other departments.”

*Data Locator / Direct Access:
CTAC Responds to a Call for Help*

In the nation's heartland, perched above the Mississippi River, sits the small city of Burlington, Iowa. Dealers hustling crack cocaine and meth amphetamine were damaging the quality of life in this picturesque town. City, county, and state leaders of SEINT, the Southeast Iowa Narcotics Task Force, desperately needed to make their cops more knowledgeable and therefore more effective in the struggle against the expanding challenge from the drug dealers. CTAC responded by sending engineers to Burlington to create another system testbed, installing the Data Locator/Direct Access System. This technology provides capabilities for secure exchange of electronic mail, access to existing or custom-built databases, and police intelligence analysis of information over a standard internet connection. The system comprises three major components:

- (1) A multilevel database access system for connecting to designated databases
- (2) A secure communications function for sending and receiving electronic mail, inquiries, and notification of investigation events and coordination
- (3) An integrated package of National Crime Information Center (NCIC)-standard formats for exchanging information and entering intelligence information into a database and/or existing databases maintained by one or more agencies.



Existing databases of images, text, video, or audio data, whether developed by law enforcement agencies (LEAs) or non-LEA organizations, may be connected to the system. Suitable for employment within a single department, large/small regional organizations, or task forces, the system is an integrated package consisting of hardware, software, cryptographic cards, and product training. Multiple systems may be interconnected to extend capabilities as required by the nature of the law enforcement challenges.

Darren Grimshaw—the SEINT Commander at the time of our visit to Burlington—directed the planning of the drug house raid pictured here and made routine use of the Data Locator/Direct Access System in that planning. “As a result,” said Grimshaw while reviewing a videotape of the operation, “we knew the number of rooms and the number of toilets in the place and were able to make sure we had officers assigned to hit those locations so fast that it was pretty much impossible for the suspects to flush the evidence. As any cop working narcotics knows, this is no small matter. Cases can be lost if the evidence disappears.”

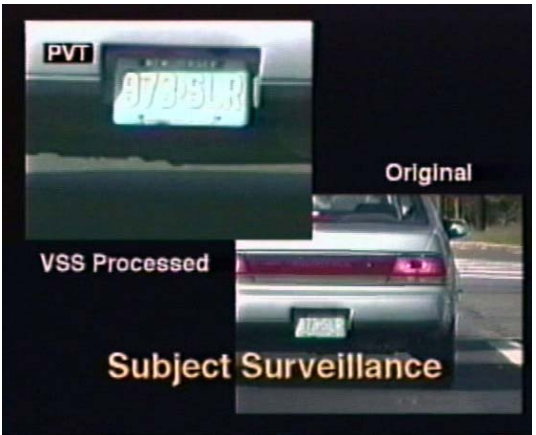
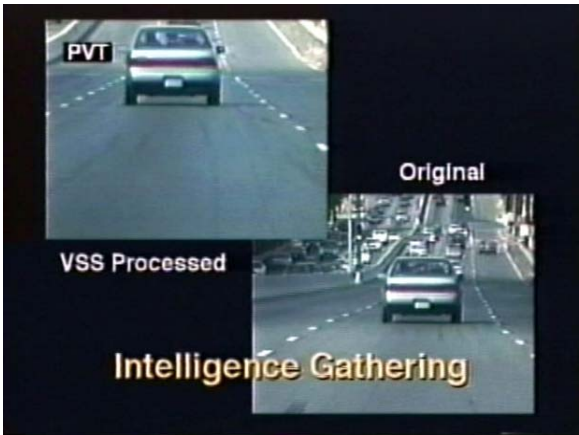
RIGHT: Three nonintrusive inspection applications of the Vehicle and Cargo Inspection System, currently being deployed at U.S. ports of entry: fixed position for trucks and tankers, portable for vehicles, and rail site to inspect trains.

BELOW: At an M.I.T. nuclear engineering lab in Boston, CTAC-sponsored scientists working to develop CAFNA, a neutron interrogation technique which they hope will be the next generation of nonintrusive technology, met with Dr. Brandenstein during a quarterly review of the project.



Video Stabilization:
A CTAC-FBI Partnership

Developed by CTAC-funded scientists in partnership with the FBI, this advanced technology system takes shaky surveillance video, processes each frame through software developed to meet this complicated challenge, and transforms what had been useless and frustrating into clear, hard evidence. In Pima County, Arizona, where Sheriff Clarence Dupnik is a pioneer in the use of advanced technology to combat drug crime, the Metropolitan Area Narcotics Trafficking Interdiction Squad, known as MANTIS, obtained the Video Stabilization System through the Technology Transfer Program and used it to draw maximum information from some very shaky surveillance video. Results so far: 21 arrests and over \$100,000 cash and property seized.



By Land or By Sea or By Air: Busting Bulk Shipments

Following a CTAC assessment of system efficacy, the U.S. Customs Service is purchasing 40 Vehicle and Cargo Inspection Systems (VACIS) for deployment at U.S. ports of entry for nonintrusive imaging of sea going containers, trucks, and other vehicles that may contain narcotics, explosives, or weapons. VACIS units—which use low-dose Gamma rays to detect and define anomalies—have been essential to successful investigations by Customs and other agencies resulting in major seizures of narcotics and arrests that damaged the operations of some narco-trafficking organizations. CTAC has also sponsored the development and testing of the railroad version of the system.

Meanwhile, CTAC is supporting the research of two teams of scientists in different parts of the country who are closing in on what may well become next-generation, highly effective, nonintrusive inspection technologies that could further impair the drug cartels' use of U.S. ports of entry.

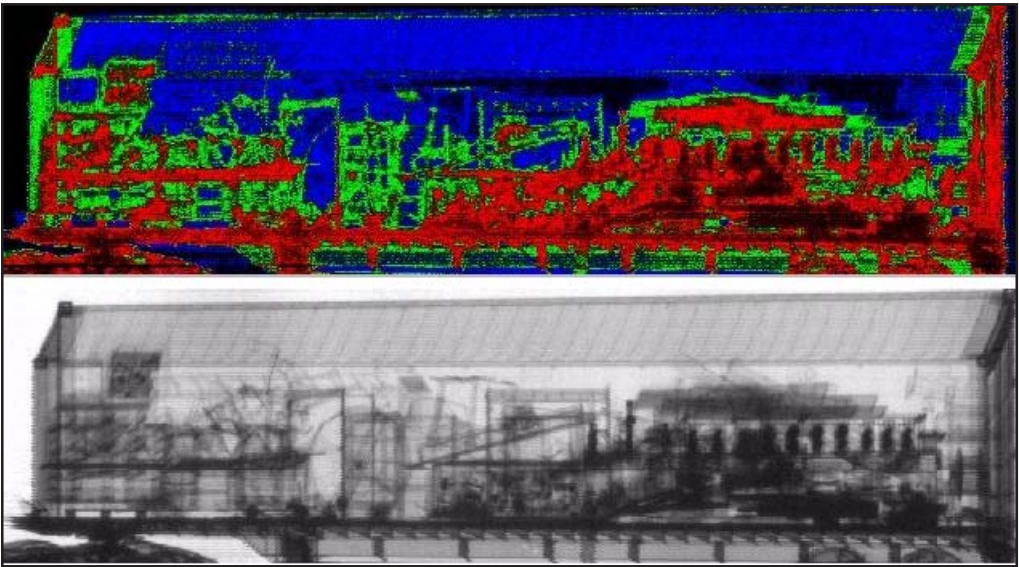
Under development: Western Kentucky University's Neutron Probe is easily transportable and designed to rapidly determine whether sealed sacks are the legal goods their shippers' manifests describe. The system detects and analyzes electronic signatures unique to specific substances and therefore should be able to differentiate between bags of legal chemicals and grains and illegal drugs hidden in the same bags.

At the Massachusetts Institute of Technology, other CTAC-sponsored scientists are developing CAFNA, the Coded Aperture Fast Neutron Analysis system. The goal of this research is to

develop a system that not only detects anomalies inside any cargo container but also reports the nature of the contents to the law enforcement officer operating the system. CAFNA, like the Neutron Probe, uses advanced signal processing to determine the elemental composition of the contents of the container under suspicion. These projects are very promising, but until rigorous field testing is completed, we will not know if the systems will ever be tactically deployed.



VACIS scans truck.



VACIS detects contraband.

VoiceBox Digital Wiretap Eliminates 90% of Paperwork

Peter Modafferi
*Chief of Detectives,
Rockland County, NY
District Attorney's Office*

CTAC's VoiceBox digital wiretap system is "a real success story. The savings in manpower and other resources are truly amazing. This VoiceBox medium in my hand contains more data, easily retrieved than in all the tapes and transcripts on this table from a previous, analog wiretap, which made data retrieval a nightmare."



Captain Joe Tripodo
New York State Police

"The system is very management friendly. It puts a computer terminal and audio monitor on the supervisor's desk," says Tripodo, commander of the Rockland County Drug Task Force. Because of that audio monitor, "I have had the opportunity to personally dispatch detectives to carry out surveillance based on in-progress, taped conversations that I heard in real time while sitting at my desk doing other work. That feature of the system allowed us to save possibly crucial time—that ordinary lag—that comes between a wireroom monitor hearing something interesting and a supervisor learning of the information and acting upon it."



Malcom Atwood
*Director, Oklahoma Bureau of
Narcotics & Dangerous Drugs*

In Oklahoma, the state's Bureau of Narcotics and Dangerous Drugs (OKBNDD) works major cases with VoiceBox and the state narcotics agents have been making aggressive use of it since the day the system arrived. Less than three hours after delivery, VoiceBox was assembled, checked out, up and running on a very hot wire which has led to many indictments, convictions and seizures and continues to yield fresh investigative leads. "The CTAC-provided VoiceBox system makes simple and easy what used to be truly exhausting, irritating, overwhelmingly time consuming and discouraging. VoiceBox not only eliminates 90% of the paperwork, it has truly revolutionized the way we do wires. As our Wire Intercept chief said the other day, 'You're not going to get Mr. Big by buying dope from him on the corner, you're gonna have to go up on a wire, get his e-mail, his cell phone, and VoiceBox makes this task a whole lot easier!' Even police departments that in the past decided they could not afford the manpower needed to meet the broad requirements for summaries, copies to opposing counsel, etc., should rethink the desirability of doing wires—if they had VoiceBox. The system changes everything," says Atwood.



Friends Under the Dome

In 1990, Congress created CTAC, the Counterdrug Technology Assessment Center, within the Executive Office of the President and the Office of National Drug Control Policy. CTAC coordinates research and development by all federal agencies experimenting with advanced technology to fight drug crime. CTAC also uses its own budget to initiate and fund R&D in prevention, treatment, and law enforcement science. With strong bipartisan support from Congress, CTAC is also providing federally developed advanced tactical systems and devices to state and local law enforcement agencies. None of CTAC's accomplishments would be possible without the strong bipartisan support we have always enjoyed in Congress. In the top photo, Rep. Jim Kolbe of Arizona and Sheriff Dupnik of Pima County, Arizona, took a firsthand look at the VoiceBox digital wiretap system in operation.

Another strong supporter of CTAC's mission is Senator Ben Nighthorse Campbell of Colorado (at left in middle photo, with Dr. Brandenstein and scientists), a former U.S. Air Force police officer whose time as a cop makes him more aware of what officers need to be effective against drug crime.

In the bottom photo, Rep. Steny Hoyer and CTAC's Al Brandenstein demonstrate the Mini-Buster Contraband Detector and the Thermal Imager night vision technologies at a meeting of local and state police commanders in the congressman's Maryland district.



Photo courtesy of the Prince Georges County Journal

Mission Accomplished: Advanced Technology Pursuit Boat Concept Becomes Reality, Goes Operational



BOB PERETTE might have been content to run his auto repair shop in a Boston suburb, never invading the offices of federal bureaucrats breathing fire and demanding attention for more than 4 frustrating years. If only it hadn't been for that newspaper story he read.

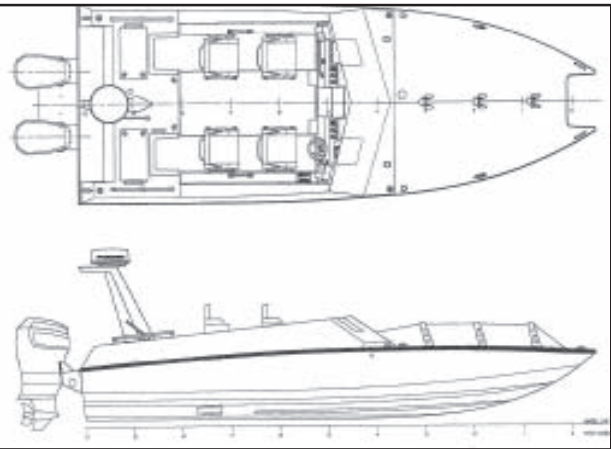
"US Customs was chasing a boat with \$15 million of heroin in it and the Customs boat broke down. I turned to my wife and said, 'I can help these guys.'" Perette could not have known that in that moment he had begun a passionate pursuit that would get him branded by some as obsessed and would ultimately revolutionize law enforcement's capabilities.

He networked his way to the officers who put their lives on the line to chase the fast drug boats on the high seas and in coastal waters and he listened. Perette learned that even when the good guys' boats don't break down, the slam-slam-slam of the boat bouncing through the water physically exhausts the boat crew, making them much less capable in the event of a confrontation. Even if they won the chase, they were more vulnerable in a fight.

So Perette studied boat designs looking for stability and speed. He decided on a split hull catamaran, bought a used one, and began tearing it apart and rebuilding it, over and over again. After spending most of his life savings to create the NightCat, after paying MIT to test its design, and still failing to get through to decision makers in federal law enforcement agencies, Perette went for help to his member of the House of Representatives, William Delahunt, a lawmaker who had taken the time to visit drug producing countries and listen to the cops who are on the front lines there and in the U.S. Delahunt forwarded Perette's development to CTAC.

Under its Congressionally mandated test and evaluation function, CTAC sponsored sea trials of the NightCat 27 and the results were the Navy's version of a standing ovation. The U.S. Naval Surface Warfare Center's experts pushed the 75 m.p.h. boat hard, turning it smoothly at speeds that would capsize others. And that awful whomping, the terrible, exhausting vibration, was all but eliminated. The Navy called Perette's drug smuggler chaser, "a superior riding and handling craft when compared to any craft in the present inventory."

During the summer of 2000 the first production line model of the NightCat 27 was handed over to the U.S. Border Patrol's South Florida Task Force. Bob Perette's dream had come true. Today, the NightCat is on patrol off Florida, making life a lot tougher for drug smugglers and a lot safer for law enforcement.



Mission Accomplished: CTAC Director Brandenstein, Assistant Chief Keith A. Roberts, Miami Sector Border Patrol, Designer Perette and Congressman Delahunt at the boatyard in Hingham, MA.