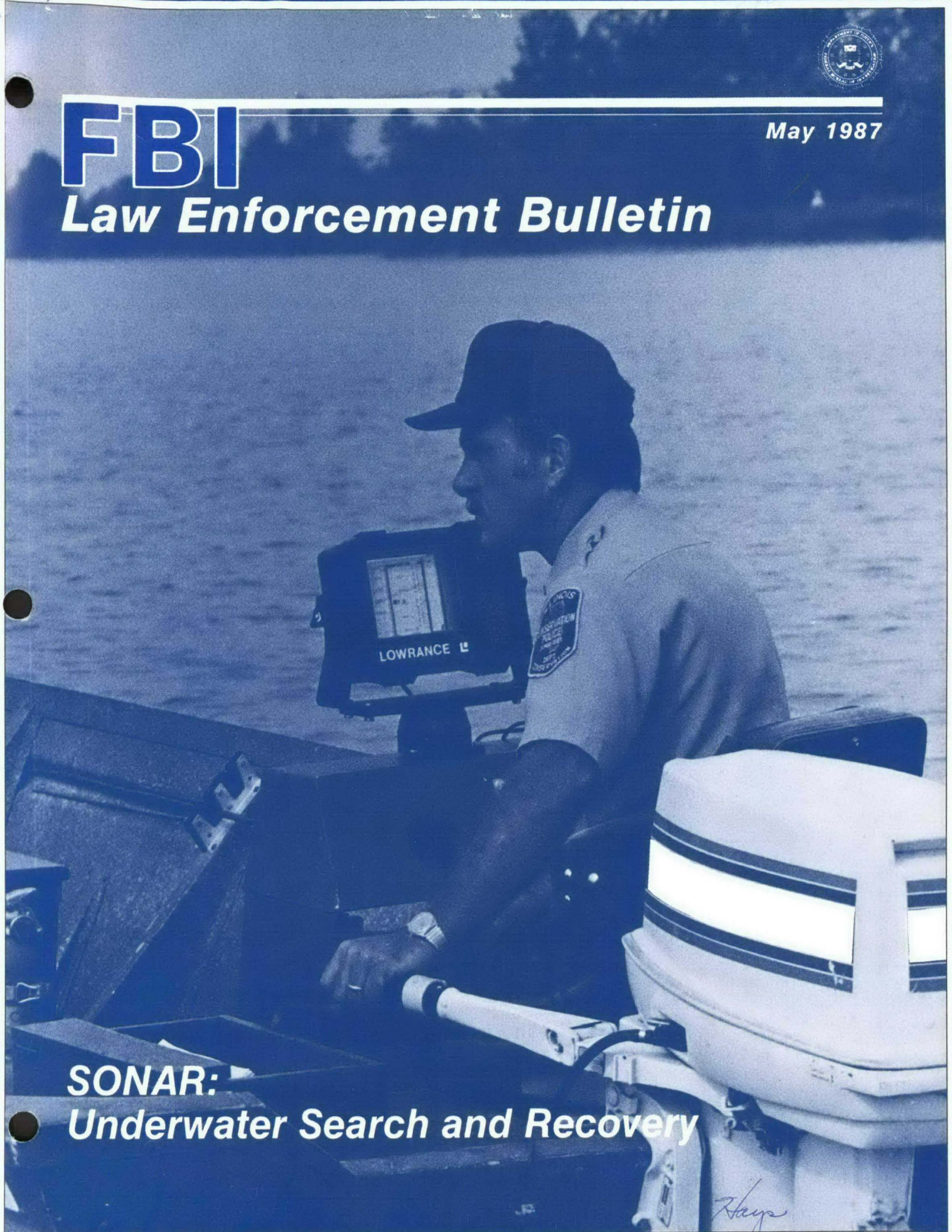
FBI
Law Enforcement Bulletin

May 1987



SONAR:
Underwater Search and Recovery

Contents

May 1987, Volume 56, Number 5

Equipment — **1** **SONAR: Underwater Search and Recovery**
By John W. Will

Operations — **6** **Use of a Video Camera for DUI Investigations**
By Lloyd Kilpack

Forensic Science — **10** **Making Effective Forensic Audio Tape Recordings**
By Bruce E. Koenig

18 **Book Review**

Technology — **19** **Televised Courtroom Proceedings as an Alternative to Prisoner Transports**
By Drew Rotermund

Legal Digest — **25** **Minimization Requirements in Electronic Surveillance (Part I)**
By Robert A. Fiatal

31 **Wanted by the FBI**

FBI
Law Enforcement Bulletin

United States Department of Justice
Federal Bureau of Investigation
Washington, DC 20535

William H. Webster, Director

The Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by law of the Department of Justice. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 6, 1988.

Published by the Office of Congressional and Public Affairs, William M. Baker, *Assistant Director*

Editor—Thomas J. Deakin
Assistant Editor—Kathryn E. Sulewski
Art Director—Kevin J. Mulholland
Production Manager—Mark A. Zettler
Reprints—Beth Corbin

The Cover:
This cover reflects the impact technological advancements have had on the daily operations of law enforcement, which is the underlying theme of this month's issue.

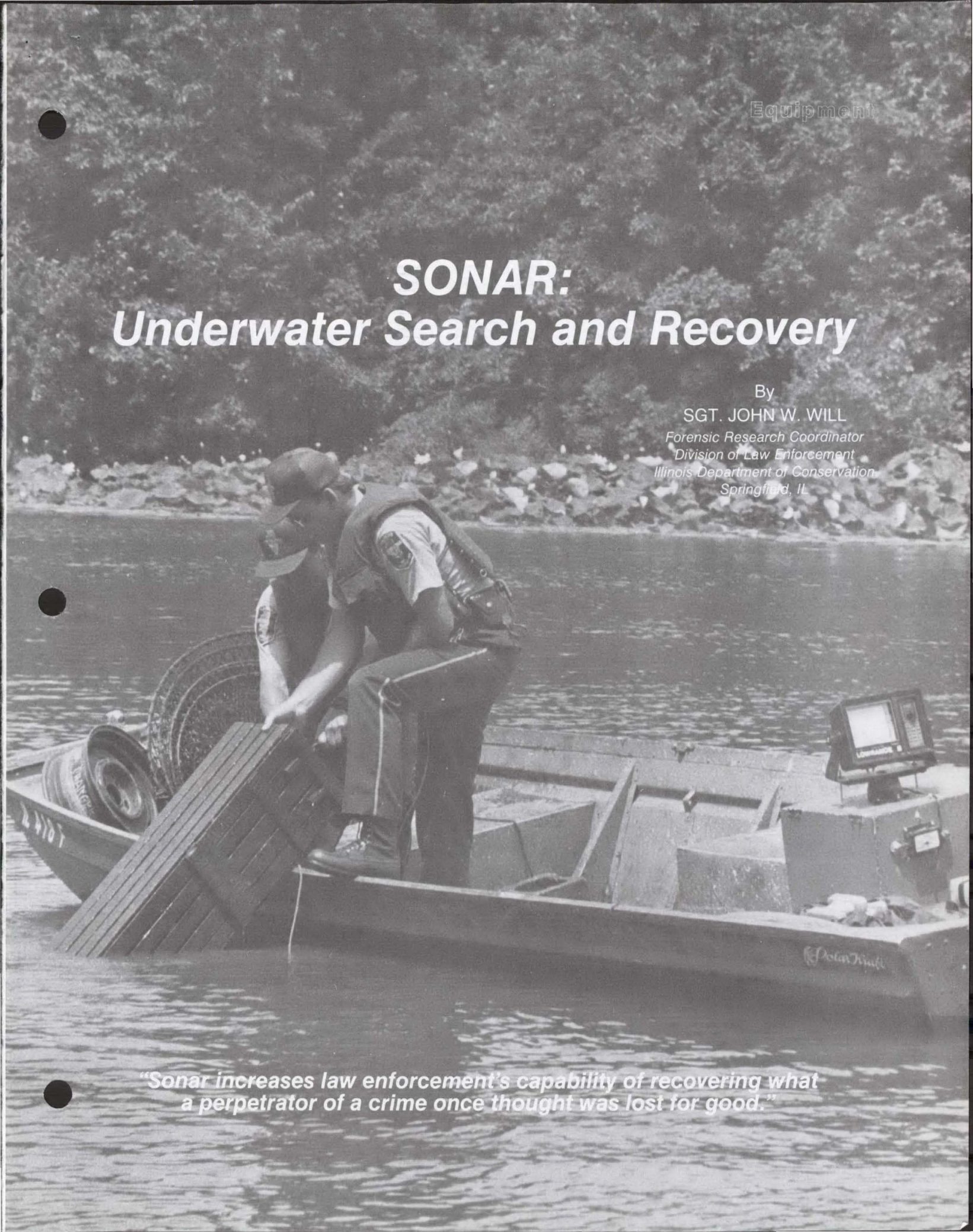
The FBI Law Enforcement Bulletin (ISSN-0014-5688) is published monthly by the Federal Bureau of Investigation, 10th and Pennsylvania Ave., N.W., Washington, DC 20535. Second-class postage paid at Washington, DC. Postmaster: Send address changes to Federal Bureau of Investigation, FBI Law Enforcement Bulletin, Washington, DC 20535.

ISSN 0014-5688

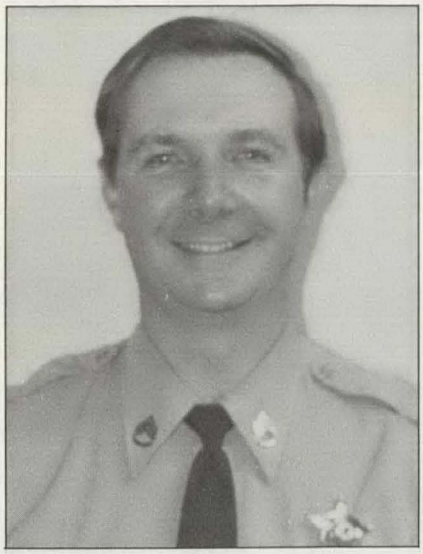
USPS 383-310

SONAR: Underwater Search and Recovery

By
SGT. JOHN W. WILL
Forensic Research Coordinator
Division of Law Enforcement
Illinois Department of Conservation
Springfield, IL



"Sonar increases law enforcement's capability of recovering what a perpetrator of a crime once thought was lost for good."



Sergeant Will

Chief Larry Closson

The murky depths of bodies of water have always been used as hiding grounds for the criminal's illegal tools. Detecting an illegal fish net, stolen vehicle, cracked safe, or the victim of a murder, once submerged, and solving the case becomes more difficult for the law enforcement officer. Most police agencies with water in their jurisdictions have also experienced the dangerous, costly, and time-consuming efforts to recover drowning victims.

With the aid of computerized sonar graph recorders, however, the underwater detection and rescue of submerged objects is not as large a task as it used to be. A skilled sonar operator can save valuable time locating the evidence, reduce down time for divers, and increase the safety factor for all involved.

History

Sonar became popular during World War II, as U.S. destroyers gridded out search patterns seeking the German submarines lurking beneath the water. Post-war improvement continued until the sonar became a sophisticated device capable of producing pictures of the underwater world.

With the sophistication of sonar came the appearance of commercial units on the market. Water enthusiasts, mostly fisherman, began purchasing the "flasher depth finders." These units emitted an electronic flash on a digital scale whenever the sound waves from the sonar struck a solid object and returned to appear as a flash on the scale.

The sonar graph recorder evolved from the flasher. However, instead of a flash, marks were etched on a roll of paper distinguishing fish and other submerged objects. Capable of zooming up to a 1-foot increment, yet ranging from zero to 8,000 feet, its water depths capabilities fell well within the areas needed for law enforcement investigations.

Variables

A specialized piece of equipment, like the sonar, is only as good as the operator's interpretation of the printout displayed on the screen. An operator should be first trained in the technical and scientific principles of the unit, which can usually be completed in a 2-day period. Once the operator knows the basic programming procedure for the computerized unit, he must then learn the unit's capabilities on the water in which he will be operating.

Time is the next factor. An operator must be allowed time to test the unit in order to understand the different variables that he will be working against and how these variables will effect the printout on the sonar.

The capabilities of the sonar unit depend on the number and degree of the variables involved, namely, water depth, current and turbidity, temperature and thermoclines, bottom structure, electrical interference, and size of the object sought. These problems become less difficult to overcome with more operating time and training for the operator.

Water Depth—The deeper the water, the more area the sonar can sound. The sonar screen displays a diameter area of the bottom a little more than one-third the water's depth. When water depth becomes less than 10 feet, sonar use is more difficult and the skill of the operator becomes very important.

Current and Turbidity—The faster the current, the more turbid the water becomes. Tiny particles suspended in the water prevent the sound waves

"With the aid of computerized sonar graph recorders ... the underwater detection and rescue of submerged objects is not as large a task as it used to be."

from penetrating into deeper water. The sensitivity of the unit must be increased to overcome the obstruction. Turbidity problems can generally be resolved, but add shallow water, and the sonar unit can become useless.

Temperature and Thermoclines—The sonar is so sensitive that it can print on the screen the different thermal layers in the water. The colder temperatures seem to allow for better sound wave penetration.

Bottom Structure—If a suspended object is being sought, then bottom structure will not be a factor. In most cases, however, the object in question will be on the water's bottom. The operator will have to determine if the bottom is soft or hard or if the bottom has weeds, submerged timber, etc. This can be done with a little experience and by observing the graph recording. Depending on the size and weight of the object, these factors can become very important.

Electrical Interference—Other boats with sonar units, police band radios, or poorly installed units can disrupt the unit's operation. However, properly installed units and a well-trained operator can eliminate most, if not all, of these problems.

Size of Object—The most important variable is the size of the object. The old statement "looking for a needle in a haystack" applies. The difficulty factor is not very high when looking for a vehicle, boat, airplane, etc., and the operator has a general idea of where the submerged object went down. As the size of the object sought becomes smaller and the body of water larger, and the operator does not know where the object went down, finding the evidence becomes more difficult. Locating a drowning victim or a stolen safe in one lake may be simple, but the same objects in another lake with the variables mentioned may be very difficult to locate.

Equipment

A sonar unit can be operated out of any style or size of boat and motor. However, an agency should choose a watercraft that can be safely handled in the type of water in its area and can comfortably carry the equipment and manpower needed. With the following equipment, a sonar unit is ready to respond to most search and recovery situations:

1) Computerized sonar graph recorder with swivel mount,
2) Two transducers, 20 degree and 8 degree,
3) Transducer switchbox,
4) Twelve-volt marine battery
5) Four to six floats with enough line and anchor for water depth, and
6) Graph paper (one roll per 3–4 hour usage).

Extra equipment should include all required safety equipment for boat operations, radios to keep in contact with other boats or land operations, and appropriate recovery equipment, e.g., body drags and hooks, divers, ropes, large magnets, and even heavy equipment for dragging out vehicles, etc.

The Search

If possible, all watercraft, except for the sonar boat, should be removed from the crime scene area. If this cannot be done, boats should be slowed to a no-wake speed.

The person in charge should have all facts concerning the case. Most important is a general location as to where the object sought entered the water. In a pond or strip pit, the point of entry is not as important as it would be on a large lake or river. On a small body of water, the whole water surface can be covered if need be, but on a lake or river, it would be very difficult to do a blind search.

Once the point of entry is determined, the sonar operator should buoy off a perimeter around that point of entry. This perimeter should be maintained until all areas within have been searched. If nothing is located, then new perimeters should be established. Depending on each situation, perimeters may be a 100 feet to several hundred yards radius from the point of entry.

A grid pattern is developed within the perimeter by the sonar operator. If a strong current is present, the pattern goes up and down with the current and not crossways. The same rule applies in a strong wind. Depending on the size of the object and water depth, the operator determines the width of the search pattern. The sonar soundings should overlap to be sure that the whole area is covered.

Speed is mostly determined by the size of the object. The smaller the object, the slower the search boat must go. Slower speeds allow for more-detailed pictures since more sound waves strike the object, giving a clearer picture. The sonar can be programmed to separate objects that are 1-inch apart. This becomes very useful when looking for small objects, such as a rope or line with a small diameter.

When a potential object is located on the screen, the operator should place a buoy in the water where the object first appeared. The operator then approaches the buoy from the opposite direction. When the object appears on the screen again, another buoy is set.

"Sonar is an excellent piece of equipment to add to a law enforcement officer's list of investigative and apprehension aids."

Figure 2 *Sonar printout depicting two hoop nets and their lines located in approximately 18 feet of water.*

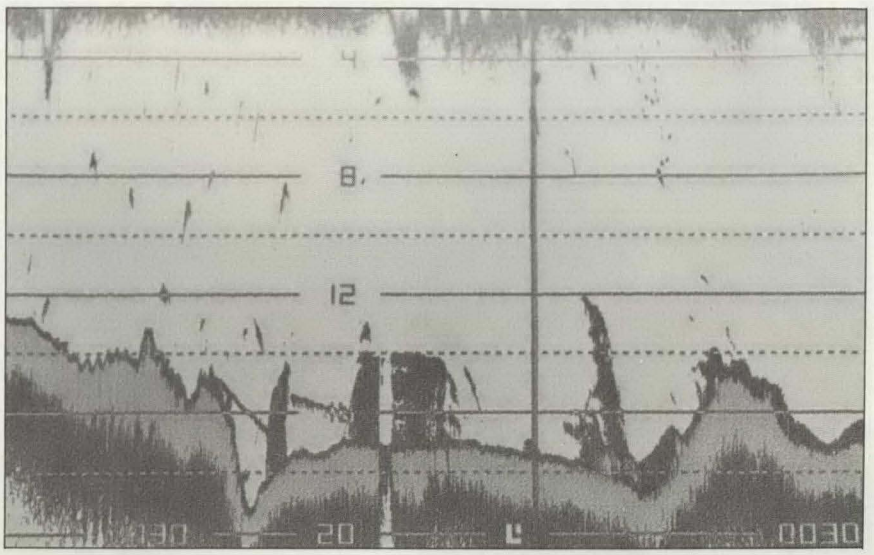
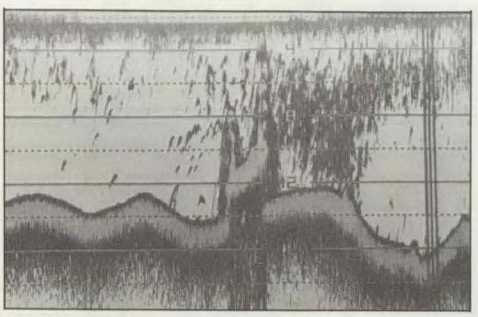


Figure 1 *Printout of a sonar image depicting a ferry barge that was located on the bottom of the Illinois River at a depth of 13 feet.*



The two buoys are then bisected by the sonar boat. When the object appears, a third buoy is set. A fourth buoy is then placed as the operator approaches the third buoy from the opposite direction. After the four buoys have been placed, a diamond or square should be formed by the buoys, and the object being sought should be in the center of the diamond or square. For large objects, like a car, in shallow water (30 feet or less), one marker should be sufficient.

The previously described method is best when looking for a single object in a specific location. When randomly searching for objects like hoop nets, gill nets, etc., buoys are not needed. The operator, or another person in the boat, needs to be familiar with the lake or river where nets could be set. These are then searched with the sonar. When a net is found, a drag or hook can then be thrown overboard to retrieve the item.

Capabilities

Law enforcement capabilities of the computerized sonar graph are numerous. Search and recovery is just one example. The sonar can be used to locate illegal merchandise, whether it be drugs, explosive, fish-live nets, etc., that are stored under water. A surveillance can be set up to watch the area to apprehend the criminal, or electronic monitoring devices can be attached that alert the officer when someone is removing contraband.

When drownings or tragic accidents have occurred, a sonar printout can be used in a coroner's inquest or civil or criminal proceedings. For water safety, depths can be determined in highly traveled waterways to prevent beaching of watercraft. In the case of sunken vessels, water depth can be determined for clearance and recovery. (See fig. 1.) Another use of sonar is charting beach areas or any area that is going to be used by the public, which can prevent accidents or assist in a better safety plan. And when large chemical spills occur, the chemical, if it is insoluble in water, may be located with the sonar.

Sonar Success

In 1980, the Illinois Department of Conservation, Division of Law Enforcement, became interested in the use of sonar for locating illegal commercial fishing nets. (See fig. 2 and 3.) One sonar unit was purchased, and experimentation was begun to see if the unit had capabilities to serve our needs. As a result of this initial outlay, numerous arrests have been made, and thousands of dollars worth of illegal commercial gear has been confiscated due to the use of the sonar graphs.

As of 1986, 15 officers have received training on modern computerized sonar graph recorders. Conservation police officers have assisted other law enforcement and search- and- rescue agencies in locating drowning victims, suicide or murder victims, stolen vehicles, and other stolen items that have been deposited under water. (See fig 4.)

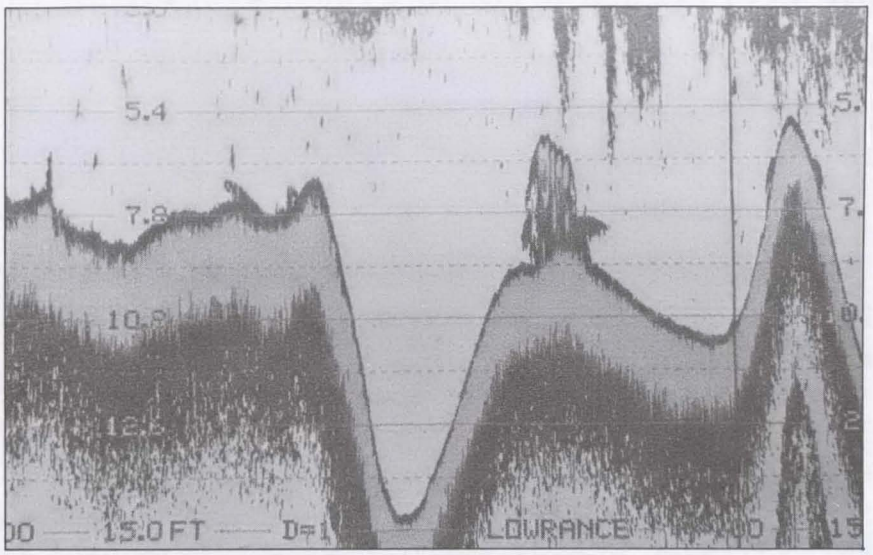
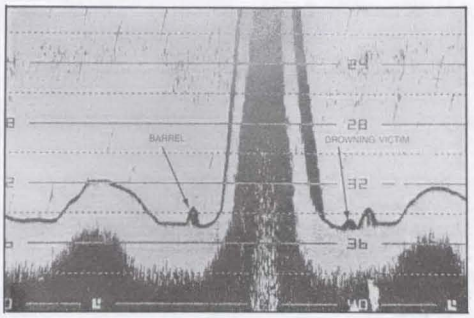


Figure 3 *Printout depicting an enhanced sonar image of a hoop net at a depth of approximately 10 feet.*

Figure 4 *Sonar printout of evidence in a strip mine pond.*



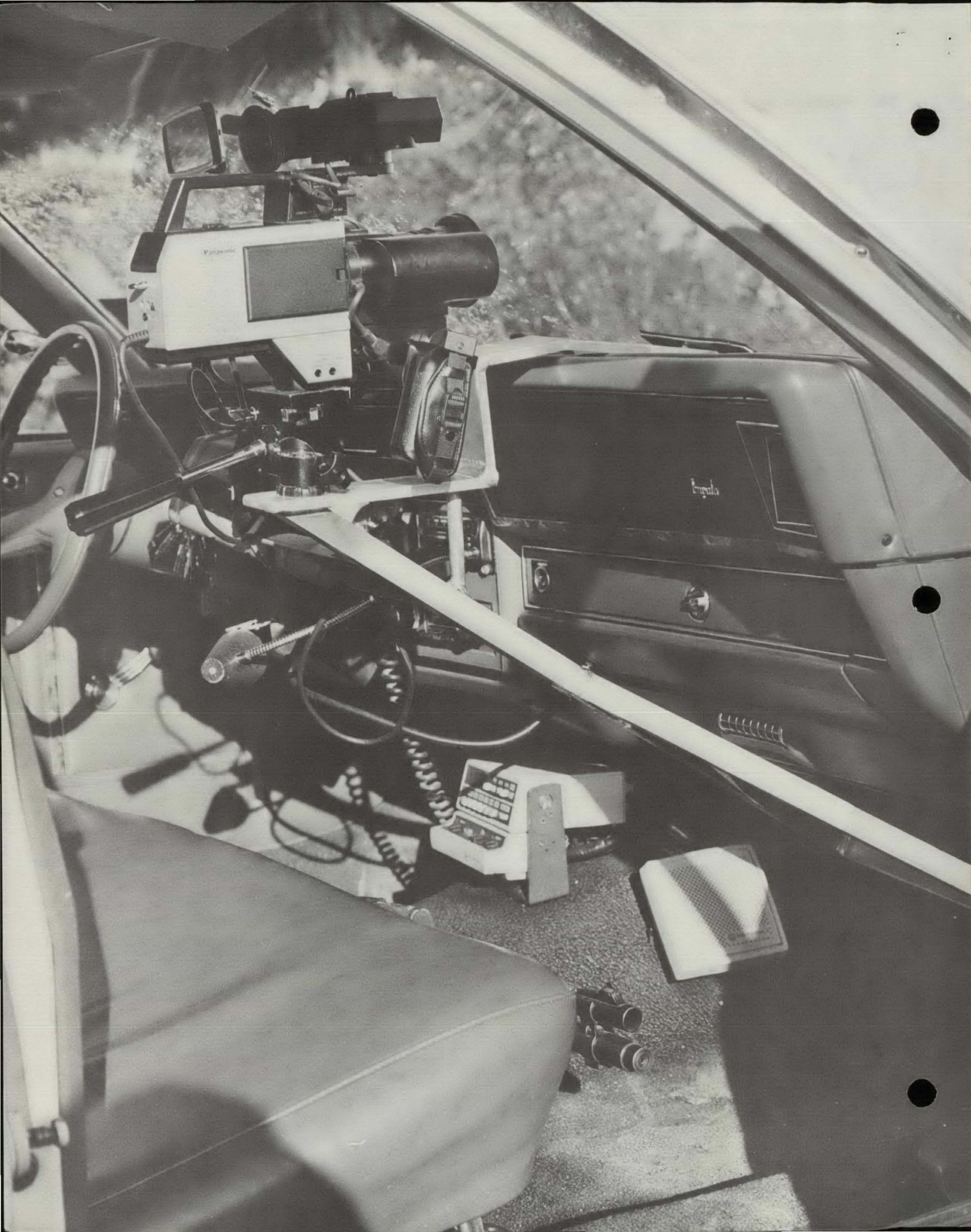
These officers are located throughout the State of Illinois, and upon request, respond to water crime scenes or accidents once they have evaluated all variables involved. As professionals, their determination if sonar is capable of locating the submerged object is respected. Searching for a handgun in 20 feet of water would be useless and a waste of time for all those involved if there is little chance of recovery.

Public response to the division's use of the sonar has been good. After seeing the capability and success of the units, sportsmen's groups and professional organizations have purchased sonar units and donated them to the division.

Summary

Sonar is an excellent piece of equipment to add to a law enforcement officer's list of investigative and apprehension aids. And as with any piece of equipment, the better trained the operator, the better the results from its use. However, sonar is not a cure-all. Everything that is deposited in the water will not be recovered, but the possibilities of finding it are increased with the sonar. If it is large enough to be located and shown on the graph paper, then recovery should also be possible. Sonar increases law enforcement's capability of recovering what a perpetrator of a crime once thought was lost for good.

FBI


Panasonic

Use of a Video Camera for DUI Investigations

By
SGT. LLOYD KILPACK
Police Department
Bountiful, UT

EDITOR'S NOTE:

Readers of the Bulletin *are advised that the information contained within this article is applicable only under Utah State law. Those in other jurisdictions should consult their legal advisers before implementing any of the techniques and procedures discussed.*

Historically, driving under the influence of alcohol or drugs within the State of Utah has been vigorously enforced. While other States in the Nation recognized a blood alcohol level of .10 or higher as a legal level of intoxication, Utah enacted a driving-under-the-influence law within a .05 to .08% presumptive level. A blood alcohol level by weight of .08% or higher erased any presumption.

Utah, like many other States, has responded to the increased awareness of the problem of driving under the influence. While organized citizen groups have brought about sweeping changes in laws that deal with drunk drivers, public demand has brought about new attitudes in all areas of the criminal justice system.

Effective August 1, 1983, the Utah State Legislature placed into effect a number of amendments to the existing Driving Under the Influence (DUI) Statute. The new law requires immediate confiscation of a suspected DUI's driver's license. The suspect is given a copy of the DUI summons and citation to use as a temporary driver's license. Included in the summons is a notice of intent to suspend driving privileges at the end of a 31-day period. The new law also includes mandatory jail or community service hours upon conviction. For subsequent convictions within a 5-year period, the penalties escalate dramatically.

Feeling the brunt of demands for intensified enforcement of DUI laws is the law enforcement community; a need to respond was without question. Administrators experienced these demands through legislators and city and county commissions; the judiciary sensed the need through the media, and at times, through a high number of "spectators" in the court room.

Laws with stiffer penalties have also caused defense attorneys to sharpen their skills. The usual low priority or mundane DUI defense has become a case requiring a great deal of time in both case preparation and presentation. Where there is suddenly so much to lose, each case is scrutinized to a point where there is no room for error on the part of law enforcement or the prosecution.

In the fall of 1983, the Bountiful Police Department, located 10 miles north of Salt Lake City, initiated a program to enhance field officers' testimony in the court room. With the new vigor in which DUI was being defended, the old adage "a picture is worth a thousand words" was applied by mounting a low light level video camera and portable recorder in a patrol vehicle. The use of video tape in the court room would depict more clearly what the field officer actually observed. The program was in no way intended to overcome problems associated with field performance, testimony, or prosecution practices.

Legal Considerations

Prior to purchasing equipment and implementing the program, the Bountiful City legal staff was consulted. To remain within parameters of the law with regards to gathering and maintaining evidence, a policy governing the operation of the DUI video was created. Case history regarding photographs as evidence, which also included a broad definition of photograph, had already been established.

Operations

The crux of the operational policy calls for the use of unedited video tape. Once filming of a DUI violation has begun, the camera and recorder must be kept running until the blood alcohol test is given and an interview has been

Sergeant Kilpack

Larry D. Higgins
Chief of Police

completed. This can be a problem, since in most cases, interviews as well as blood alcohol tests are not conducted in the field which required bringing the camera and recorder into police headquarters.

Once again the legal staff was consulted. It was concluded that a second camera and recorder could be positioned near the booking area to film all required events. Removing the tape from the original mobile recorder to the stationary recorder was allowed, with the date and time insert synchronized in both cameras.

Even so, a defendant may claim this to be arbitrary, since such controls permit the user to enter any date and time at will. In the event that interrupting the filming becomes a defense issue, the amount of time required to change the tape from one recorder to another can be documented.

This procedure and the circumstances surrounding the brief cessation of filming can be augmented through the verbal testimony of the two arresting officers. Operational policy regarding legal enhancement also includes filming the suspect's vehicle license number prior to the stop or while the driving pattern of the suspect is being observed. Immediately after the stop, a closeup of the suspect's face is taken for identification purposes. The facial closeup serves another purpose. A horizontal gaze nystagmus pre-test is given during the filming of the facial closeup.

Of crucial importance is the chain of custody of evidence. The video tape itself has become so effective in the court room that local defense attorneys are attacking every possible aspect to keep it from being entered as evidence. A current trend is to require the evidence custodian to testify regarding the chain of custody of evidence and its proper maintenance. If the evidence custodian has not been introduced to the jury during the jury selection process and is known to any member of the once-impaneled jury, his testimony may not be allowed.

Funding

Funding for the program is provided by the State of Utah. Utah code mandates that revenue collected in the form of taxes on liquor sales be allocated to cities, towns, and counties for the sole purpose of liquor law enforcement. Alcohol funds received from the State general fund must be expended for alcohol-related offenses and may not be used to supplement budget needs in any other area. Cities and counties receive funds from the State general fund based on a distribution formula set forth by the Utah State Legislature.

The formula takes into account the State's diverse areas of population. Other considerations include the number of previous alcohol-related convictions, the number of alcohol outlet licenses, and the number of rehabilitation and confinement centers within a city or county. These funds pay for staffing the program and equipment purchased by the Bountiful Police Department.

Since State liquor funds are used solely for alcohol-related enforcement, a time card denoting time spent on alcohol enforcement makes documentation relatively simple. Equipment purchased with alcohol funds is inventoried and accounting procedures document these expenditures.

Equipment

Equipment used in the program was purchased locally, which is a benefit in case maintenance or a replacement is needed. In both camera positions, mobile and fixed, a Panasonic color video camera, model number

"In the face of public demand to take positive enforcement action against the intoxicated driver, the DUI video program has been well-received by the community."

WV3230, was found to best fill the needs of the program. Each camera is equipped with an automatic focus feature. It is recommended, however, that each agency select equipment that best suits individual needs.

Initially, the automatic focus feature presented a special problem, since the video camera mounted in the patrol car automatically focused on the windshield of the car. To overcome this problem, the camera operator simply activates a manual override. While filming from a driving pattern to a facial closeup, the camera operator must continually view the subject through the camera's viewfinder. Also monitored through the viewfinder is the date and time of the occurrence, which is also on the video tape. The stationary camera located at police headquarters is mounted behind a protective glass barrier. Here too the automatic focus is deactivated and the camera is focused on an area near the intoxylizer unit, where all interviews, tests, and other information are gathered. For indoor sobriety or level of impairment tests, a dark colored line was inlaid in the floor tile. In the event of bad weather, a DUI suspect can be brought to the station where the field sobriety test can be administered under more favorable conditions. The level of impairment under these circumstances is filmed by the stationary camera.

Audio equipment used in the patrol car has recently been upgraded. A Comtrek wireless microphone model M-72 is used and is worn by the driver of the patrol unit. The driver narrates what he observes as the driving pattern is being filmed. He is careful to note the location of the incident, the direction of travel, travel speed, and the posted speed limit.

A Comtrek wireless receiver model PR-726 is used to record the audio portion, and an auxiliary microphone jack is provided on the camera by the manufacturer.

Once a driver suspected of DUI is stopped, high-beam headlights and a 6-inch quartz halogen spotlight are trained on the rear of the car, in accordance with normal nighttime patrol procedure. This allows the investigating officer to see into the car with a margin of safety and affords a sufficient level of light for video taping any field sobriety tests. The suspect is then escorted to the passenger side of his/her car to protect against other traffic. The camera operator moves the spotlight to the area where the field sobriety tests are to be given.

Conversation between the investigating officer and the suspect is recorded to capture on tape the suspect's slurred speech or other speech patterns characteristic to intoxicated people, such as slow methodical speaking, laughing, or overly talkative speech patterns. Confessions regarding activity prior to the stop are recorded as well.

Portions of the investigation that are quite frequently under close scrutiny are the *Miranda* warnings and any waiver that might be obtained. If a suspect refuses to submit to a test to determine his blood alcohol level, that refusal is filmed to be shown to a driver's license examiner at the hearing.

Results

In the face of public demand to take positive enforcement action against the intoxicated driver, the DUI video program has been well-received by the community. Several media sources have featured the program, reporting very positive remarks, and one field officer described the program as "the ultimate weapon" against the drinking driver.

During 2 years of use, the video tape has been taken into the court room only once. In that particular case, the defense attorney viewed the video tape prior to it being admitted as evidence. After viewing the driving pattern, field sobriety test, interview, and other elements of the case, the defendant, at counsel's advice, changed his plea to guilty.

In another instance, police officers were accused of damaging a vehicle while conducting an inventory search. In viewing the video tape, the alleged damage was visible prior to the police officers stopping the car. The video program in this instance provided excellent evidence of the original DUI charge and protected the officers in the face of alleged wrongdoing. In this type of case, the video program could also be used as evidence in other criminal proceedings, e.g., false report to police, insurance fraud, etc.

The Bountiful Police Department has also realized some very positive benefits from the implementation of the program. Police officers are spending less time in court, resulting in a decrease of funds normally spent for court overtime. Another benefit to the department is increased morale. Since the program is manned on a voluntary overtime basis, members of the department can augment their salary by working the DUI video car at their convenience. In short, the program, with associated positive media support, has provided the Bountiful Police Department with a response to community demand, an effective enforcement tool, and a program that is beneficial to its personnel as well.

FBI

Making Effective Forensic Audio Tape Recordings

By
BRUCE E. KOENIG, M.F.S.
Special Agent
Engineering Section
Technical Services Division
Federal Bureau of Investigation
Lorton, VA

Every year, tens of thousands of audio tape recordings are produced in this country involving criminal, civil, and administrative investigations by Federal, State, and local law enforcement agencies, regulatory organizations, security companies, etc. Some of these recordings are high-quality reproductions of the actual conversations; others are understandable but somewhat masked by noise and distortion. However, many are understandable only with repeated playing and the use of headphones, while the remainder have limited audibility.

How can a recording medium that is capable of capturing the very wide, dynamic range of Tchaikovsky's 1812 Overture, which includes cannons firing, fail to make a usable reproduction of a telephone conversation or pickup voices only a few feet from a microphone? Though the answer is not always obvious to the investigator, it can usually be traced to one or more of the following factors:

1) Interfering noise and unrelated voice information, such as radio and television broadcasts, background conversations, ventilation system sounds, etc.;
2) Degradation by the transmission system manifested in echoes, signal dropouts, distortion, etc.; and
3) Improper tape recorder techniques, accessories, maintenance, and connections.

With reference to the last factor only, this article will concentrate on the following topics involved in making effective tape recordings—audio magnetic tape, audio tape recorders, tape recorder operation, and copying audio tapes. For clarity, a glossary is included, with definitions of tape recording terms, manufacturer's lingo, and various technical nomenclature used in this article.

Audio Magnetic Tape

The writing paper, so to speak, of an audio recording system is magnetic tape, which stores voice and other information received through microphones, line-level connections, and other input devices. The tape is physically composed of a backing, binder, and magnetic coating; an extra back coating layer is sometimes added on premium cassettes and open reels to reduce slippage and static charge buildup. The backing provides the main support and substance to the magnetic tape and is composed of polyester plastic varying in thickness from approximately 0.20 to 0.75 mil (one mil = 1/1000th of an inch) in cassette formats and 0.35 to 1.50 mil in open reel tape. The width of the backing, and therefore the tape itself, ranges in standard increments from 0.15 inch for cassettes to 3 inches on some reels. The coating is composed of a magnetic oxide with very uniform microscopic particles that are smoothly deposited on the backing during the manufacturing process and held there by the adhesive binder.

There are presently four categories of magnetic tape, according to recording industry standards—type I-ferric oxide (Fe_2O_3), type II-chromium dioxide (CrO_2) or ferricobalt, type III-ferrichrome, and type IV-metal. Type I tapes are referred to as being normally

"Every year, tens of thousands of audio tape recordings are produced in this country involving criminal, civil, and administrative investigations...."

Special Agent Koenig

biased with standard equilization of 120 microsecond (120us), and types II and IV as high bias with equalization of 70us. Type III tapes have become obsolete in this country.

The two principal tape formats used in forensic applications are open reel and cassette. The open-reel or reel-to-reel style consists of a round plastic or metal hub, with a center attaching hole for the tape recorder, and two larger thin circular sides that form a spool on which the magnetic tape is wound. Normally, the reels are 5, 7, or 10½ inches in diameter and contain between 600 and 3600 feet of magnetic tape.

In the cassette format, both standard and miniature, each end of the magnetic tape is attached to a separate hub inside a plastic or metal housing that has lubricated slip sheet liners between the housing and the tape. This permits smooth operation as the tape is transported by the tape recorder from the supply to the take-up reel. The outside dimensions and shaping of each type of cassette—standard, mini, micro, and pico—have been closely controlled by the recording industry to allow complete compatibility within each cassette format; however, the length and thickness of the 0.15-inch tape inside a particular housing can be varied to allow different recording items. For example, standard cassettes can run from 5 minutes a side on a C10 to 1½ hours on a C180 length.

For forensic purposes, certain types and brands of magnetic tape produce the best recording results at a reasonable cost. Type I, or normal bias tape, should always be used, since the more expensive types II and IV, requiring a higher bias and needing special tape recorder features, are manufactured principally for recordings of music and professional voice broadcasts. To minimize tape stretching and breakage, especially when repeatedly played for transcription purposes, the thickest tape possible for investigative conditions should be used for the recording. Normally, this includes 1.0 or 1.5 mil open-reel tapes, C90 or shorter standard cassettes, and middle or shorter length miniature cassettes. If reels or cassettes with thinner tape have to be used for longer recording times, then greater care must be exercised in recording, playing back, and storing. Regular speed (not high-speed) copies should always be prepared of these tapes for transcription and review.

Tapes marketed by well-known manufacturers of magnetic tape products are always the best choice in forensic uses; cheap, store, and no-name brands are to be avoided. To minimize costs, a 6-month or larger supply of tapes can be purchased from a discount consumer outlet, professional recording equipment source, or even a reputable mail order company that provides quantity discounts. Open-reel tapes should be evenly wound on sturdy, unwarped plastic or metal reels and produce limited "oxide shed," that is, they do not quickly deposit a particle film on tape recorder components in contact with the tape surface. Cassettes should operate smoothly in rewind and fast forward recorder modes, with a minimum of chatter and squeal, and also have limited particle shedding.

Audio Tape Recorders

An investigator in the market for a new audio tape recorder will find a confusing array of features and formats, such as slow-speed, professional, miniature, digital, auto-reverse, and various noise reduction systems. Video recorders even have "hi-fi" sound. If recording needs are only for dictation, then

"... the four general types of tape recorders with good investigative capabilities are open reel, standard cassette, miniature cassette, and professional 'on-the-body.'"

a good quality microcassette unit would be a logical choice, while a top-of-the-line open reel or cassette tape recorder is recommended for classical music. But what about systems for forensic purposes where cost, weight, size, and voice quality are important parameters?

Presently, the four general types of tape recorders with good investigative capabilities are open reel, standard cassette, miniature cassette, and professional "on-the-body." Not included are eight-track recorders since they have become obsolete; video recorders due to increased size, cost, and complexity; and digital units because of high cost, nonstandardization, and large size. It should be noted, however, that the digital systems will most likely be the recorders of the future.

The four recorder formats being considered all operate basically the same, both mechanically and electronically. Mechanically, the magnetic tape is transported uniformly and at a standard speed from a supply to a take-up reel or hub across various tape guides and magnetic heads. To accomplish this accurately, many recorders use a system in which an electronically controlled motor rotates a small diameter metal shaft (the capstan) with the tape pressed against it by a larger diameter rubber disc (the pinch roller), much like clothes were squeezed in old-fashioned washing machine wringers. For convenience, many recorders have controls that also allow the tape to be quickly wound forward and backwards (fast forward and rewind modes), to be stopped and started in several ways, and to operate at different standardized tape speeds.

Electronically, when a tape recorder in the record mode receives an audio input from a microphone, telephone hook-up, other tape recorder, etc., the signal is supplied to a built-in record head, which is physically in contact with the magnetic tape as it moves. This head "writes" the incoming audio information on the tape by aligning the magnetic fields in the coating using a small precise electromagnet; thus, for each different sound input, the record head produces a particular magnetic pattern on the tape. There is also an erase head in contact with the tape, just preceding the record head, which erases any information already recorded on the tape. The third head in a recorder, the playback head, "reads" the patterns on the magnetic coating of the tape and converts them into an electrical signal, which is amplified, equalized, and then provided as an output to another tape recorder or to be listened to with headphones or loudspeakers.

When playing back a tape recording, the record and erase heads do not function, only the playback head, so that a recording is not changed or altered magnetically through listening or transcription. In less expensive tape recorders, the record and playback functions are usually combined into a single, dual purpose head. Bias, additional equalization, and other electronic adjustments are also made to the input and output signal by circuits in the tape recorder to provide more accurate recording and reproduction.

The first format, variously called open reel, reel-to-reel, or just simply reel, is easily the most professional of the four formats with numerous features and accessories. On different recorders, the width of the magnetic tape used can range from 0.15 inch to 3 inches, with the 1/4-inch size the most common in forensic applications, save one exception. The logging recorder that tapes incoming and outgoing telephone conversations, official radio traffic, and the time-of-day signal for a law enforcement agency normally uses tape widths of up to 1 inch, which allows as many as 60 different inputs to be recorded simultaneously, whereas the 1/4-inch units are limited to recording one to eight channels at a time. Standard tape speeds range from 15/32 inches per second (ips) on the loggers to 120ips on specialized professional systems, with most investigative applications at 15/16, 1 7/8, and 3 3/4ips. Table 1 lists the relative size, weight, and cost, plus other parameters of the open reel, standard and miniature cassette, and body recorder formats.

The standard cassette format is easily the most commonly used consumer audio tape medium for playback of music and the recording of speech information. Tape speed is normally 1 7/8 ips, but special units are available that operate at 3 3/4, 15/16, and 15/32ips, with 3 3/4 ips becoming obsolete. The configuration of a standard recorder allows either one or two inputs to be recorded in one direction; then the cassette can be turned over manually or reversed using an auto-reverse feature and recorded on the other side. Some recorder systems permit four channels of information to be simultaneously recorded, but then only one side of the cassette is usable.

The third style of tape recorders use miniature cassettes, which include mini-, pico-, and microcassettes. Microcassettes presently dominate the portable dictating market, while the minicassette is slowly disappearing. This format operates very similarly to standard cassettes, except for the much smaller housing sizes and the slower standard speeds of 1.2 and 2.4 centimeters per second (cm/sec), or the

equivalent of 15/32 and 15/16ips, respectively. Additionally, only one channel is usually available for recording on each side and a built-in microphone is almost always included.

The professional on-the-body recorder is produced primarily for concealment under the clothes of an undercover law enforcement officer or cooperating individual. Configurations vary according to the manufacturer and model, but the most popular and highest quality systems are of special open-reel or miniature cassette-like format, with dedicated microphones and playback units. As a class, body recorders almost always provide higher quality recordings than body transmitters or "bugs," which employ miniature FM radio transmitters and remote receivers. It should be noted, however, that provisions of the Federal Interception of Communications Statute and some State laws restrict the sale and use of many of these recorders except to duly authorized law enforcement organizations.

Referring to table 1, for many forensic applications where concealment is not necessary, the standard cassette format using the 1 7/8ips tape speed should be chosen, with the open reel reserved for long continuous recording time or when much higher quality is needed. For on-the-body use, the special units produced for this purpose are highly recommended, with microcassette recorders running at 2.4cm/sec and using external microphones as a second choice (the 1.2cm/sec and slower speeds are usable only when there is a limited amount of background noise and the talkers are fairly close to the microphone).

Table 1 also reflects that the standard cassette format used at 15/32ips or slower produces poor overall quality, though with an increase in recording time. If longer recording times are needed, then two interconnected recorders can be used in which the second one starts before the first ends.

Once the recorder format has been selected, table 2 will aid in choosing the

TABLE 1 Comparison of Four Tape Formats

	1/4-Inch Open Reel	Standard Cassette	Miniature Cassette	Professional "On-the-Body"
Cost	Expensive	Cheap to Expensive	Cheap to Moderate	Very Expensive
Size	Large	Small to Moderate	Very Small	Very Small
Weight	Heavy	Light to Moderate	Very Light	Very Light
Professional Features	Numerous	None to Numerous	Few	Few to Many
Maximum Number of Channels	8	4	1	2
Overall Quality at Standard Speeds	Excellent at 1 7/8ips or Higher	Good to Excellent	Fair at 2.4cm/sec	Fair to Very Good
Overall Quality at Slow Speeds	Good at 15/16ips	Fair to Good at 15/16ips & Poor at 15/32ips or Less	Poor to Very Poor at 1.2cm/sec or Less	Usually Only One Speed
Maximum Recording Time (Hours)	6(1 7/8ips) 12(15/16ips) (10 1/2-inch reel of 1.0 mil tape)	1 1/2(1 7/8ips) 3(15/16ips) 6(15/32ips) (C180 tape)	3/4(2.4cm/sec) 1 1/2 + (1.2cm/sec) or slower) (C90 tape)	2 to 3
Availability	Limited for Slow Speed Models	Limited for Slow Speed Models	Unlimited	Some Limitations

specifications and features needed in four commonly encountered applications. It should be noted that the listings pertain solely to the tape recorder and not the microphones, receivers, transmitters, and other devices used in these systems. Table 2 shows, for instance, that voice-activated and auto-reverse systems are not recommended, since a portion of the incoming voice signal can be automatically deleted, but battery check and power features are always useful. Most manufacturers provide information regarding their tape recorders, listing all the features of a particular model, but unfortunately, not necessarily all the specifications. Anyone buying a new style, brand, or model should try to get a money back guarantee on the tape recorder, in case the quality, features, and controls do not meet the demands of actual field conditions.

Tape Recorder Operation

The first step in making high-quality forensic tape recordings is cleaning and demagnetizing (degaussing) the magnetic heads, guides, capstan, pinch roller, and other recorder parts in contact with the magnetic tape. Using cotton swabs moistened in commercially available head cleaner or isopropyl (not dentured) alcohol, all of the surfaces should be carefully wiped to remove accumulated particles from oxide-shed, foreign substances on the tape, and dust. If this is done after every 8 hours or so of recording and playback time, good tape contact with the heads and parts of the transport system will be maintained, and head wear will be reduced. Special care should be taken in selecting and applying head cleaners, since some brands can cause damage

TABLE 2 Tape Recorder Specifications and Features Needed for Certain Forensic Applications

	Telephone Conversation	Interview	Body Concealment	Transmitter System
Minimum Frequency Response (±3dB)	200–4000Hz	100–5000Hz	100–4500Hz	200–4000Hz
Minimum Signal-to-Noise	45dB	50dB	50dB	45dB
Maximum Wow and Flutter	0.5% peak 0.3% wrms	0.5% peak 0.3% wrms	0.5% peak 0.3% wrms	0.5% peak 0.3% wrms
Maximum Harmonic Distortion	3%	3%	3%	3%
AC Powered	R	R	NN	R
Battery Powered	R	R	R	R
Battery Check	R	R	R	R
Microphone Input	R	R	R	NN
Line or Auxiliary Input	R	NN	NN	R
Headphone or Monitor Output	R	R	R	R
Automatic Gain Control (AGC)	R	R	R	R
Peak Limiter	U	U	U	NN
Stereo Recording	NN	U	U	NN
Noise Reduction System	NN	U	U	NN
Pause Control	U	U	U	U
Tape Counter	R	R	NN	R
Changeable Bias	NN	NN	NN	NN
Changeable Equalization	NN	NN	NN	NN
Voice Activated System	NR	NR	NR	NR
Auto-Reverse	NR	NR	NR	NR

Legend: R = recommended
U = useful
NN = not needed
NR = not recommended

to plastic and rubber recorder parts with long-term use.

Demagnetizing is accomplished with a device called a head degausser or demagnetizer, which eliminates stray magnetic fields on the tape deck that add noise during recording and reproduction. Since the degausser, when activated, will erase magnetic recordings, all tapes should be removed from the immediate vicinity during its operation. After turning off the tape recorder and disconnecting it from all power sources, the degausser is turned on at least 3 feet away from the recorder, moved in small circles around the heads, guides, pinch roller, etc., without actually touching them, slowly moved away from the recorder, and then turned off at least 3 feet away. This process should be done after every 100 hours of tape recorder use, unless different instructions are provided by the recorder manufacturer. Commercial head cleaner and demagnetizer systems built into cassette housings should not be used, since they are only partially effective and can damage tape recorder heads if they malfunction.

Unless the internal or built-in microphone of the recorder is being used, the voice information coming from the room microphone, telephone hook-up, etc., should be connected via good quality shielded wire or coaxial cabling to the proper input connector of the tape recorder. Microphones are always plugged into the microphone (MIC) inputs; line-level sources, such as from other tape recorders or most transmitter receivers, are always connected to the line or auxiliary (AUX) inputs. A connection to the wrong input jack will result in either a very distorted or a low level, inaudible recording. The recorder can also be connected to either AC current from a wall outlet, DC power from a car cigarette lighter, or by installing new batteries in its internal compartment. Given a choice, a recorder should be plugged into an AC outlet instead of using batteries to insure a continuous source of power.

A determination is now made as to which tape recorder functions are to be used (correct tape speed, equalization, and bias for units with those adjustments) and which are to be deactivated (voice activation and auto-reverse). Usually, standard speed, normal bias, and 120us equalization are the normal setting. A noise reduction system, such as Dolby or DBX, can be used to minimize tape noise, but the tapes must be played back on a recorder using the same system to allow the best intelligibility. For example, if a recording is made with the Dolby switch on and then reviewed on a tape recorder using Dolby, the resulting audio will have reduced tape hiss. However, if the same recording is played back on a unit without Dolby, the tape hiss will be considerably amplified.

On an open-reel recorder, the new or bulk erased reel is placed and secured on the supply spindle, threaded through the guides and heads according to manufacturer's instructions, and then wound a few loops around the hub of the secured empty take-up reel, which should be the same size as the supply reel. The recorder is then placed in the play mode for a few seconds to insure smooth operation. With a cassette recorder, the tape in the cassette housing is manually moved forward, using the center of the take-up hub, until the brown or black tape is seen where it is spliced to the nonmagnetic leader tape. When "instant start" or leaderless cassettes are used, this procedure is not needed. With the first side of the cassette housing facing the user, the cassette is inserted in the recorder with the open end aligned with the heads and guides. Like the open-reel, the recorder should be run for a few seconds in play mode.

Test recordings should now be prepared under the same or similar conditions as the actual forensic application. For instance, if a consensual telephone conversation is to be recorded, the microphone or direct hookup connections should be made to the telephone that will be used, the recorder placed in the record mode, a test call made, and then, most importantly, the tape recording played back and carefully reviewed. If this tape recording is of poor quality, or worse yet, has no recorded voice information on it, corrections can be made to the system by replacing, fixing, or readjusting the components. Once the changes are made, another test recording should be prepared and reviewed.

If the system has VU meters instead of an automatic gain control (AGC) to set recording levels, the gain of the input signal is adjusted during the test recording by monitoring the meters while turning the record level controls, so that the loudest voice sounds are just below the red areas on the dials or the red lights on the LED displays. If two cassette recorders are to be connected to permit overlapping recordings of a long conversation, the input signal should be split with an appropriate cable to allow direct connection to each tape recorder. Before the conversation begins, the first recorder is placed in the record mode and allowed to run to almost the end of that cassette side (45 minutes for a C90). When the second recorder is started in the record mode, overlapping the first recording, the cassette in the first unit is then turned over or replaced to be ready when the second part is almost completed.

During the actual recording of the forensic conversation, the operator, if possible, should continuously monitor the incoming signal or the information recorded on the tape when a three-head recorder is being used. When record settings are manually adjusted, the VU meters are to be periodically checked to insure proper levels. At the end of the recording session, the tape is removed from the recorder, properly marked with the date, time, case number, initials of the operator, or whatever is legally prescribed. The safety tabs are always removed on cassettes to prevent accidental erasure, and the tape is placed in an appropriate tape storage container inside an evidence envelope, with a brief written statement on the location, individuals monitored, date, time, and case number. Either at the recording site or at the earliest convenience, the tape should be reviewed to determine if there is good voice intelligibility and for any indications of recording equipment problems that can be corrected before the next use. When the operator turns the custody of the recording over to another individual, the transaction is always appropriately noted to insure proper chain of custody. Storage of the tape is best in a secured location with moderate humidity and temperature and freedom from the magnetic fields of loudspeakers, televisions, and other devices.

Copying Audio Tapes

Once the original recordings are produced and marked, the next step is making copies for transcription, distribution to other interested individuals and organizations, inhouse review, and backup. The best copying method involves two or more tape recorders, one to play back the original tape and another to record the copies. A second method uses a high-speed copying system. With the recorder method, the original tape is played back on the same unit that was used in the recording process, or equivalent, connected via cables from its output or monitor jack to the line-level inputs (*not* the microphone or MIC jacks) of the other recorders. To produce the best results, copies should not be made on tape recorders that have AGC systems automatically activated for line-level inputs. Instead, models that have VU meters and manual record level controls should be used.

Normally, copies are made only on open reels and standard cassettes at recording speeds of 1⅞ips or higher, even if the original is a miniature cassette or a special format, since headphone jacks, quality loudspeakers, and line inputs often do not exist on these units to save space and weight. Cleaning, demagnitizing, record level settings, and the other appropriate procedures listed for making original forensic recordings are used in making these copies, since the copies will usually be the ones transcribed and reviewed by the typists and investigators. Copies are *never* made by placing the loudspeaker of one recorder next to the internal or external microphone of another, which would greatly increase noise and distortion.

The second method of copying tape recordings involves the use of high-speed copying equipment that can, for example, make multiple copies of both sides of a C90 cassette or an entire open reel in 3 minutes or less. Most high-speed systems on the market are limited to the standard cassette format and typically make one to three copies at a time; however, some expensive professional units allow hundreds of cassette or open-reel copies to be prepared simultaneously. At present, there are no available copying systems for miniature cassette or special format body recorders. High-speed systems, though much quicker than direct recorder copying, have problems with increased susceptibility to tape damage, lower recording quality except for the professional systems, and lack of monitoring capabilities.

Cassette copying units often run at 30ips or higher so that when the tape drags, due to misalignment, poor cassette housing construction, or equipment failure, the tape can be broken, stretched, or even wrapped around the capstan in a tight ball, ruining a portion of the original recording. The high speed also requires the magnetic head on the unit to read voice information reproduced at better than 100,000 Hertz, or 5 times the highest audible frequencies, which usually increases noise and distortion, except in the better units. Since the recording process cannot be monitored, omissions or problems are not detected until after the copying process is completed and the copies are reviewed. If a high-speed copying system is needed due to the large number of copies that have to be prepared of each original tape or because of short deadlines, then the following procedures are recommended:

1) Make a direct recorder copy first and then use this copy on the high-speed system to prepare additional copies;
2) Purchase a slower speed unit of approximately 10 times or less standard tape speed (20ips or less for high-speed cassette copiers) to minimize damage and quality problems;
3) Clean heads, guides, pinch rollers, etc., after every 30 minutes or less of use, since the copying systems run at much

higher speeds than a normal tape recorder; and

4) Spot check copies to insure that the record levels are correct and the recording quality closely matches the original tape.

Summary

Effective forensic audio tape recordings can be made if the user adhers to the following recommendations by properly:

1) Selecting tapes and recorder systems with the appropriate features and specifications;
2) Maintaining the equipment through cleaning, demagnetizing, and repair;
3) Connecting cables and auxiliary devices;
4) Testing the recording system before use;
5) Operating the equipment to produce the original tape;
6) Marking, reporting, and storing the original tape recordings, and
7) Making high-quality copies for transcription and review.

FBI

References

F. Jorgensen, *The Complete Handbook of Magnetic Recording* (Blue Ridge Summit, PA: Tab Books, Inc., 1980).

Recording Basics, 3M Company (undated).

J.M. Woram, *The Recording Studio Handbook* (Plainview, NY: ELAR Publishing Co., Inc., 1982).

GLOSSARY

automatic gain control (AGC)/automatic level control (ALC)—a feature on many tape recorders that decreases louder input sounds, which results in increased amplitude for lower level signals.

auto-reverse—a feature on some tape recorders that allow tapes in the record and play modes to switch automatically to the opposite side or direction without manually turning over the cassette or reversing the open-reel tape.

azimuth alignment—the positioning of a magnetic head to achieve perpendicular alignment with the tape edge; of importance in high frequency response and tape recorder to tape recorder compatibility.

bias—an ultrasonic signal added during the record mode to improve the linear response of tape recordings.

body transmitter—a miniature on-the-body, FM transmitter system connected via radio link to a remote receiver ("body bug" or "bug").

bulk eraser—a device used to erase an entire recording tape by using a strong alternating magnetic field.

capstan—the driven shaft in a tape recorder that rotates against the tape, pulling it through the machine at constant speed during record and playback modes.

cross-talk—unintentional mixing of signals between different channels, for example, on a stereo tape recording.

DBX—a commercial noise reduction system that requires the signal to be encoded (compressed) before being recorded on tape and then decoded (expanded) when played back. Usually only available on professional or expensive consumer tape recorders, the system does not decrease noise in the incoming audio signal, but rather limits the noise added in the recording process.

decibel (dB)—a logarithmic ratio of sound amplitude between two sources; often one source is referenced to the lower threshold of human hearing.

distortion—a change in the audio signal caused by the recording system, which is normally nonlinear in nature.

Dolby—a commercial noise-reduction system that requires the signal to be encoded before being recorded on tape and then decoded when played back. The Dolby A system is limited to recording studio applications, Dolby B is already encoded on most commercial cassette recordings and is a common feature on cassette decks, and Dolby C is an improved version of Dolby B available on better cassette recorders. This system does not decrease the noise in the incoming audio signal, but rather limits the noise added in the recording process.

dropout—the brief loss of the recorded audio due to imperfections in the magnetic tape or discontinuities in the input signal.

equalization—the selective amplification or reduction of certain frequency bands to compensate for changes in the audio signal occurring in the recording process or to satisfy personal listening tastes.

equalizer—a device that changes the frequency response of an audio signal.

flutter—a loss of recording quality caused by rapid tape speed changes due to irregularities in the tape path. Normally measured with wow as a percentage of the peak or weighted root-mean-square (wrms) average of the original input.

frequency—the number of sound vibrations in a second, measured in Hertz or cycles per second. The limit of human hearing is approximately 20 to 20,000 Hertz.

frequency response—the range in Hertz of the flat response of a tape, tape recorder, or other device, for example 20–16,000 Hertz ±3 decibels.

half-track—a tape configuration that simultaneously records two channels of information on an open-reel tape or one channel on each side of a cassette or each direction for an open reel.

harmonic distortion—a loss of recording quality due to the addition of unwanted harmonic components to the audio input signal by the recording system. Usually measured as a percentage of the original input.

head degausser/demagnetizer—a device used to neutralize residual or induced magnetism in tape recorder heads and guides.

Hertz (Hz)—a unit of frequency measurement equal to one cycle per second.

hum—undesirable low frequencies generated by an AC power supply and equal to 60 Hertz and harmonics (60, 120, 180 Hertz, etc.) that are added by the input source or the recording process.

input—the audio or electrical information provided to the recording system through terminals, jacks, or receptacles.

jack—a plug connector used to interface the input or output circuit of a tape recorder to another device.

leader tape—the nonmagnetic tape often placed on both ends of open reel and cassette tapes, which cannot be recorded upon.

line input—a high level signal from a tape recorder or other device.

magnetic head—the ring-shaped electromagnet across which the tape is drawn in a tape recorder, which either erases a previous recording, converts an audio input into a magnetic pattern on the tape, or changes the magnetic pattern back to an audio signal.

(cont. pg. 18)

GLOSSARY (cont.)

microphone—a device for converting sound energy into electrical energy.

microphone input—a low level audio signal originating from a microphone.

monitor output—the combination headphone and line output connector for many small tape recorders.

output—the electrical signal provided from the recording system or other device that supplies loudspeakers, headphones, and other tape recorders.

patch cord—a shielded cord or coaxial cable with plugs or connectors on both ends that wires various audio equipment together.

pause control—a feature on many tape recorders that allows the tape to be stopped and started in the record mode while the magnetic heads remain in contact with the tape; produces quieter and shorter record mode interruptions in the tape.

peak limiter—a feature on a few tape recorders that reduces the amplitude of short duration input signals, like pops and clicks.

quarter-track-a consumer track configuration that allows two channels of information to be recorded simultaneously in each direction on open-reel tapes and on each side of standard cassette tapes.

signal-to-noise ratio—the difference between the loudest signal that can be properly recorded by the system and the inherent noise floor of the device.

stereo—the recording of an audio source through two microphones using two separate tape recorder channels.

tape guides—grooved pins or rollers located before, between and after the magnetic heads to correctly position the tape against the surfaces of the heads.

track—the path on magnetic tape on which a single channel of information is recorded.

voice-activated system—a feature on a few tape recorders that automatically starts and stops the recording process depending on the presence or absence of audio information. Sometimes called a voice actuated or actuation system.

VU meter—a dial or LED display which reflects the signal level that is being applied to the magnetic tape in the record mode and received from the tape in the playback mode.

wow—a loss of recording quality produced by slow fluctuations in tape recorder speed and caused by irregularities in the tape path. Normally measured with flutter as a percentage of the peak or weighted root-mean-square (wrms) average of the original input.

Book Review

Survival Communication: Writing and Speaking for Law Enforcement Officers by Stephen D. Gladis, Kendall/Hunt Publishing Company, Dubuque, IA, 1987, $7.75, 77 pp.

To would-be professional writers, Strunk and White's *Elements of Style* is *the* handbook for writing improvements; for law enforcement personnel, *Survival Communication* will be the "how-to" book. Strunk and White teaches how to improve your writing, while *Survival Communication* teaches how to get started writing and speaking.

As part of the FBI National Academy faculty, author Gladis helped develop the academy's program in communications, so necessary in law enforcement management. To advance, or just to survive, in any police department takes an ability to communicate, both verbally and in writing. This work could also be titled "Career Communication," as it emphasizes the necessity for managers and executives, which so many National Academy graduates become, to communicate by memo, report, or through speaking before political leaders, superiors, subordinates, judges and juries, and most important, the public.

Survival Communication gets you started, through such techniques as "fast writing," "free writing," "brainstorming," and "webbing." To one brought up on Strunk and White, these terms are a shock—and a revelation. Writing literally terrifies so many of us, but these techniques show how to meet, and beat, this terror. "Free write" and "revise," today's terms for thinking and editing, have worked for National Academy attendees and for this author.

Two chapters in this book are reprinted from articles by this author that originally appeared in the *FBI Law Enforcement Bulletin*. The first, on preparing an informative speech, is the shortest and best exposition on this subject in a long time. No wonder the author was recently made the FBI Director's speech writer. Other chapters on verbal communications include basic methods of persuasion, nonverbal communication (facial expressions and gestures), and the most neglected area of speech preparation, the post-speech question-and answer period. The last chapter, "Communicating in a Crisis," will be invaluable to police executives faced with a hostage crisis or other newsmaking event. Today's chief knows the impact the news media can have on the department.

This work is the result of National Academy officers' requests for written material that they could study after the concentrated course work at the academy. A supplement to Gladis' first book, *Survival Writing,* this author's academic qualifications, two degrees in writing and currently a candidate for a doctorate, his writing background and sense of what will work for police officers are invaluable to police communication survival. Survival in the career of law enforcement is as dependent on the pen (or today, the word processor) as it is on the sidearm and the ballistic vest. This book can make up for any training shortfall in this area.

SA Thomas J. Deakin, J.D.

Televised Courtroom Proceedings as an Alternative to Prisoner Transports

By
1st SGT. DREW ROTERMUND
Alaska State Troopers
Fairbanks, AK

Law enforcement agencies charged with the responsibility of transporting and guarding prisoners during criminal arraignments may benefit substantially from the use of a television or video system linking the jail and the courtroom. Such systems serve as "alternatives" to transportation, dramatically reduce the commitment of agency time and personnel, improve public safety and courtroom security, speed the release from jail of "bail outs" and O.R. releases, and virtually eliminate the potential for civil liabilities from in-transit incidents. All this assumes, of course, that such systems and procedures are legal in the particular jurisdiction, that the involved court system will agree to conduct proceedings using these systems, and that interagency cooperation among the involved agencies is possible to permit such a system to function properly.

A "live" courtroom arraignment. The equipment to the left of the clerk is the audio recording system for the courtroom and TV system. The cables and switches to the lower left of the clerk allow her to switch the system from "live" to VCR for playing the "rights" video tape and then back to "live." She controls all audio volume levels from her station for the enitre system.

The TV monitor and camera system that the judge uses is in a cabinet that can be closed when the courtroom is used for other proceedings. In the far background is the 40" TV monitor for the attorneys and audience to view the defendant. The equipment is placed so that it does not have to be moved; the judge simply swivels his chair to the left when using the TV system. Note the 5" TV monitor that allows the judge to see himself as the defendant sees him.

Sergeant Rotermund

Captain Donald Lawrence
"E" Detachment Commander

Background

Alaska is a State that derives the majority of its public revenues from oil royalties and oil taxation. In the early 1980's, faced with projections of a lengthy future trend of decreased revenues, the Alaska State Troopers (AST) actively sought ways that would allow them to perform assigned duties and responsibilities with equal or greater efficiency, but at reduced cost and commitment levels. The Fairbanks Judicial Services Unit office, which serves the needs of the Alaska court system in interior and northern Alaska, developed a proposal to eliminate the daily need for troopers to transport and guard prisoners being moved between the jail and the courthouse for arraignments. Since the responsibility was statutorily mandated, the proposal was an alternative method to accomplish that responsibility, using technology that had come into existence since the statute was enacted. The concept was not original, since several jurisdictions in other States had already developed and used the technology, some successfully and others less so. Research, correspondence, and telephone contacts brought sufficient data and information to Fairbanks to permit formulating plans for a system designed for local needs and compatible with local resources.

Data Collection and Extrapolation

To determine if sufficient cost and personnel savings can be realized from such a system, data must be collected, analyzed, and then extrapolated. Quantifiably measurable data categories should be carefully selected to survive scrutiny and antagonistic review, i.e., miles driven, personnel hours expended, prisoners moved, etc.

Recognizing that court proceedings are human interactions, constant variables will preclude exact extrapolations. From the data collected over a 1-year period, to account for seasonal variations, norms can be established for the commitments to a "10 prisoner day," a "14 prisoner day," etc. With such information available, sophisticated estimations are possible. (See fig. 1.)

In the "With Television" example in figure 1, the last four columns can be reduced to "0" if arrangements can be made for jail personnel to assume the responsibility for moving the prisoners to/from the TV room in the jail and guarding them while there. This, of course, involves shifting responsibilities to another agency, along with the associative budget complications, but the feasibility of such an arrangement should certainly be explored.

Equipment and Procedures

The Fairbanks courthouse and the Fairbanks correctional center are distinct multiple story buildings located 1 mile apart, with no natural or manmade obstructions existing at roof level between the two buildings. The television transmitters and receivers are mounted on the roofs of the buildings. The microwave TV system transmits in color on a frequency not common to home television reception, although there would generally be no objection to public broadcast since these are public proceedings.

Both the courtroom and the jail TV room have one TV camera, one 23-inch TV monitor, one 5-inch TV monitor for the participants to view themselves, microphones, and a telephone for attorney-client conferences. Additionally, the courtroom has one 40-inch TV for the audience and attorneys to view the defendant and a VCR playback unit

"... a television or video system linking the jail and the courtroom reduces the commitment of agency time and personnel [when transporting and guarding prisoners during criminal arraignments]."

Figure 1

Without Television
(Transport)

# Prisoners	# Vehicles to Transport	Round Trip Mileage	# Troopers to Guard/Transport	# Personnel Hours Expended
9	3	14.4	3	6 hr
10	4	19.2	4	7 hr 15 min
11	4	19.2	4	7 hr 15 min
12	4	19.2	4	7hr 45 min
13	5	24	5	9 hr 30 min

With Television
(No Transport)

# Prisoners	# Vehicles to Transport*	Round Trip Mileage	# Troopers to Guard/Transport**	# Personnel Hours Expended
9	1	2.4	1	2 hr
10	1	2.4	1	2 hr 15 min
11	1	2.4	1	2 hr 30 min
12	1	2.4	1	2 hr 45 min
13	1	2.4	1	3 hr

*This is the trooper's assigned patrol vehicle that he uses to drive himself to and from the jail. No prisoners are transported.
**One trooper can handle 10–15 prisoners, since they never leave the jail facility. No transports occur.

used to play a pre-recorded "advisement of rights" tape at the beginning of the day's proceedings. In a room immediately adjacent to the courtroom and in the "booking" area at the jail are telecopier facsimile machines, which allow documents to be transmitted directly between the court and the jail.

Prior to the start of the day's proceedings, the jail transmits to the court, via facsimile machine, a roster of the in-custody defendants to be arraigned. The court clerk returns to the jail, again by use of the facsimile machine, copies of the complaints and other documents for the court defendants. At both the jail and the court, the TV and audio equipment are activated, adjusted, and balanced, as necessary. As the court clerk prepares the courtroom, the prisoners are escorted into the TV room at the jail and given copies of their complaints or other legal documents, as well as a written advisement of rights handout. When ready, the jail guard/trooper advises the court clerk who, in turn, notifies the judge. The jail guard/trooper functions as bailiff in the jail TV room for the proceedings.

The judge commences the proceedings with a general introduction and explanation of the TV system and how it will function. On record, he queries the jail guard/trooper about the quality of the TV picture and sound at the jail. If all is operating properly, the proceedings begin with the playing of the pre-recorded "rights" videotape, controlled by the court clerk from her station in the courtroom. After the "rights" tape, the judge comes back "live" on the TV and summons the defendants individually on camera at the jail.

The TV cameras are mounted on top of each TV monitor, giving a true eye-to-eye picture of each participant to the other. Each camera is adjusted to transmit a head-and-shoulders picture. The defendant cannot see anyone except the judge in the courtroom, but he can hear and speak to the attorneys through the audio links. No video recordings are made of the proceedings; however, the audio is recorded just as during a live courtroom proceeding. As each defendant is arraigned, he/she is returned directly to the "booking" area of the jail, where processing continues according to court documents which come to the jail directly from the clerk at the courtroom via the facsimile machine.

Benefits

The savings from such a video system are readily apparent, but it must be recognized that these benefits accrue *only* to the agency responsible for transporting and guarding prisoners. Other agencies involved (court, D.A., jail) reap none of this harvest; however, incidental benefits do exist which serve as incentives for these agencies to cooperate in the operation of such a system.

The court system will enjoy heightened courtroom security, since the absence of prisoners in the courtroom eliminates the potential for courtroom incidents and disturbances. The jail spends less time "checking out" and later "checking in" prisoners as they are

no longer transported from the institution to the courtroom. There is also the possibility of less contraband, since prisoners are not taken out of the institution, and "booking" personnel have the luxury of being able to process prisoners immediately one-at-a-time as they come off camera, rather than receiving a car load en masse from the courtroom after arraignments of all prisoners. Defense attorneys will have their clients out of jail faster on bailouts and O.R. releases, as individual out-processing at the jail can begin immediately after coming off camera instead of waiting in the courtroom until all defendants are arraigned and then transported back to the jail as a group.

Interagency Cooperation

Regardless of the accrued benefits, a television/video system cannot feasibly be operated without the support and cooperation of the other agencies involved. At the jail, space must be allocated for the TV room, and provisions must be made for equipment security. It must also be recognized that the jail will bear the monthly operational cost of electricity to run the equipment.

At the courthouse, a courtroom will have to be modified to accommodate the TV equipment. If the courtroom is to be used for other proceedings during the day, some consideration must be given as to how the equipment is set up or stored in order to maintain the decorum of the courtroom. Like the jail, the court system bears the ongoing monthly electricity costs of equipment operation.

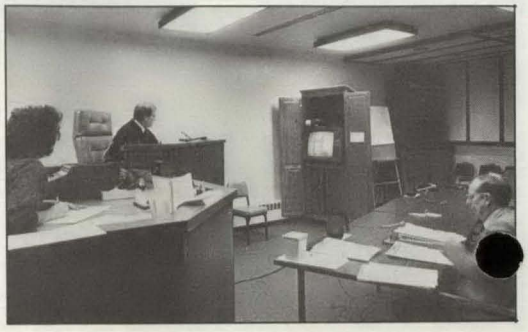
All personnel involved with the system's operation must agree to work together, rather than individually. Training has to be considered for the operators, and occasional "user" meetings should occur to discuss problems and procedural adjustments. It is imperative to the long-term success of the system that it function at least as efficiently as the transport/guard system worked in the pre-TV days. Anything less virtually guarantees attack from opponents and probable loss of the system because of operational inefficiencies.

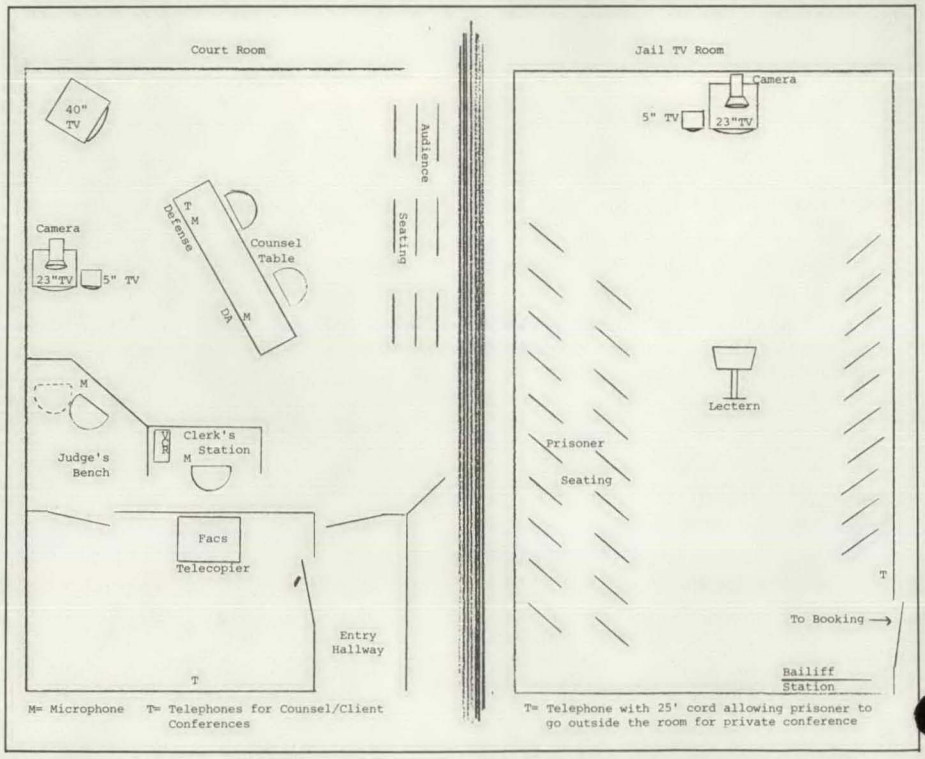
Legal Issues

The use of television for court proceedings in criminal matters dates from 1972, when Illinois first used video telephones to conduct bail hearings.[1] By 1975, its use was being tested in various jurisdictions.[2]

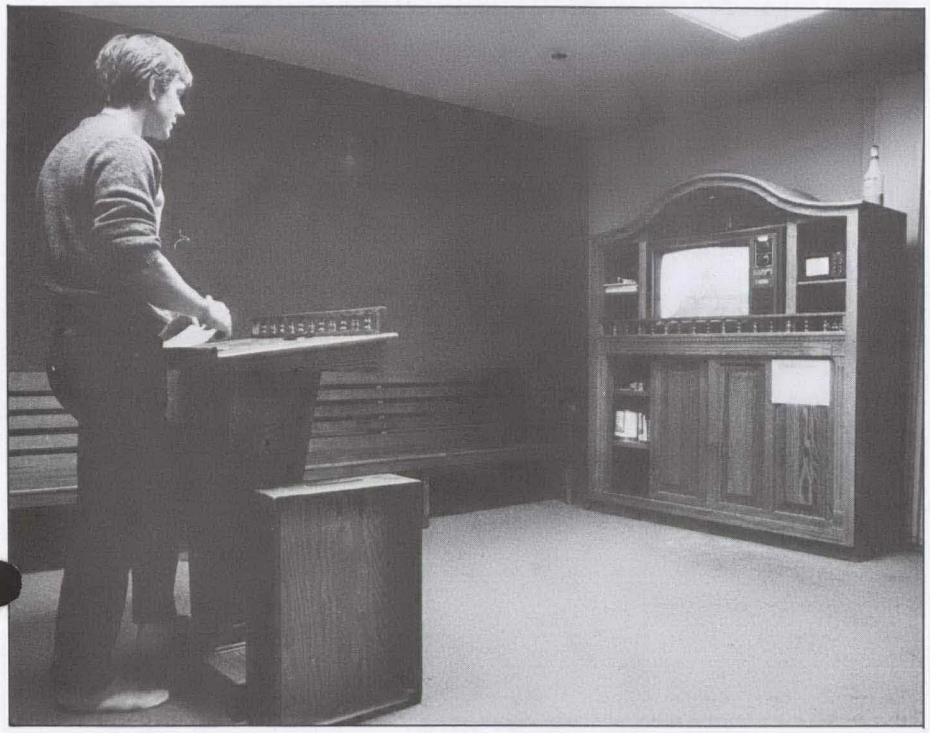
Relatively few challenges to its use have reached State supreme courts, and no cases have been tested in the U.S. Supreme Court. Cases which have addressed the use of television in criminal court proceedings have principally involved the use of videotaped witness testimony in lieu of the live ap-

The courtroom scene showing the entire system in the courtroom, including the counsel table. Note the telephone on the defense counsel's table for attorney-client conferences.





"Depending on local jurisdictional rules and restrictions, the TV system can be used for other legal proceedings...."



The defendant stands at the lectern. The camera is focused for this set distance. The stool is used for "short" defendants; this saves having to re-aim and re-adjust the cameras. Note the 5" TV monitor to the right of the 23" TV monitor. This allows the defendant to see himself as the judge sees him. If he is standing too far to the right or left, he can move himself back to center screen.

This room is a short distance from the "booking" area. Immediately after being arraigned or appearing before the judge on TV, the defendant goes directly to the "booking" area where the court documents are being received on the facsimile machines. Processing begins immediately.

pearance of the witness.[3] No appellate court has apparently been faced with the issue of television used for live proceedings in an arraignment environment.

Three issues seem to be the most commonly raised objections to the television proceedings. The first involves the defendant's right to confront witnesses. Since witnesses are seldom, if ever, a part of the arraignment proceedings, courts have little trouble resolving this issue when it is raised.

The second issue involves effective representation of counsel. This can be a valid argument unless planning provides ways and means for defense counsel to have confidential contact with clients. This can be accomplished by providing a private telephone link between the courtroom and the jail TV room, by allowing defense counsel to be in the TV room at the jail with the defendant, by establishing private TV rooms at both jail and courthouse for private attorney-client conferences, or by use of telephone headsets.

The third issue involves whether the defendant can choose which system under which to be arraigned—in person or by TV. Usually this is resolved by rules of court. Most jurisdictions allow the defendant a choice;[4] some leave that choice to the discretion of the judge.[5] Although some clarification is critical to avoid a later cause for appeal, this really becomes a minor point since a vast majority of prisoners opt for the TV system. Many believe the TV system preserves anonymity, and virtually all prefer the alternative it offers to being seen handcuffed in court before family, children, friends, spouse, etc.

Other Uses

Depending on local jurisdictional rules and restrictions, the TV system can be used for other legal proceedings, such as nonevidentiary hearings, bail hearings, pleas and sentencings, felony first appearances, live testimony, parole hearings, testimony before grand juries, testimony by expert witnesses, appellate proceedings, and civil court cases.

By use of satellite communication, Alaska hopes to someday have this system replace the current need to transport defendants physically from court to court throughout the State to appear at various hearings. Distances are so great in Alaska that one intercity move from Ketchikan to Fairbanks is equivalent to flying from Los Angeles to Dallas or Dallas to New York, practically halfway across the continental United States. Over a 1-year period, tremendous savings could be realized if

"... the investment into television or video can serve as an alternative that will allow the recovery and redeployment of ... resources [committed to transporting and guarding prisoners for arraignments and other court proceedings]."

a defendant placed before a television camera/monitor in Ketchikan can be involved in courtroom proceedings in Fairbanks, thus eliminating not only the direct costs of the airline travel but also the escort hours that would be expended during the round-trip transport.

Maintenance

Is the system a police system or a court system? Who is responsible for repairs, maintenance, and replacement of equipment? These are two very important questions that need to be addressed early in the program's design and implementation, as they will have an obvious impact on future budget preparations and personnel allocations.

If the system is well-planned and designed, if the operators are well-trained, and if high-quality equipment, appropriate to jurisdictional needs, is used, maintenance consists only of occasional adjustments and fine-turning.

Advice During System Design

Although the system appears relatively simple to design, install, and operate, it is deceptively complex, especially in the audio component. The two-way communication link is tremendously susceptible to "feedback." Professional expertise is highly recommended to assist with system design, equipment purchase and installation, and operator training. The frustrations and problems avoided will more than offset any additional cost for involving such expertise from the start.

Sentencing Patterns

The Alaska court system was sensitive to whether defendants were being adversely sentenced on TV, or whether the TV was removing the emotion and "feel" the judge can experience when a defendant appears live in a courtroom. The Alaska judicial council studied the sentencing patterns of almost 1,000 cases and determined that defendants sentenced by TV were more likely to receive a sentence that did not include jail time than were the defendants who had been sentenced in court. However, the differences were so slight as to be almost insignificant and may have been due to either random variations or to changes in other factors not related to the TV system (types of defendants, variety of criminal charges, availability of sentencing alternatives, etc.).

Investment Recovery

Investment recovery will vary dramatically from jurisdiction to jurisdiction, depending on existing systems, volume of prisoners, and time commitments. It is not unrealistic to expect that some jurisdictions could recover their entire investment in less than a year's time. The Fairbanks system, which went on-line on November 6, 1984, has paid for itself within the first 2 years of operation, even with additional and unforeseen expenses beyond the original budgetary commitment, by totally eliminating Alaska State Troopers from daily involvement with arraignments. AST and the jail were able to agree to a program whereby the jail assumes the daily "bailiff" responsibility in the jail TV room, thus freeing the previously committed troopers to be used elsewhere.

Conclusion

For administrators currently committing resources to transporting and guarding prisoners for arraignment and other court proceedings, the investment into television or video can serve as an alternative that will allow the recovery and redeployment of those resources. Data collection and extrapolation will, in most instances, show how advantageous these systems can be; however, the greatest advantage is that which data cannot show—those incidents which do *not* occur.

Preventing just one prisoner escape, and perhaps the commission of additional crimes before recapture, can more than justify the investment into a system of this type. The amount of police manpower and time committed to one escape and recapture, all of which could have been used otherwise had the escape been prevented, will usually far exceed the obligations that agencies would have to make to establish these systems. And, preventing the loss of just one officer killed or assaulted while transporting/guarding prisoners speaks for itself.[6]

Avoiding civil litigation from a traffic collision in which a prisoner, being moved between jail and courthouse, is injured or killed will again more than offset the necessary investments to establish technological alternatives to time-honored procedures that leave agencies and administrators open to problems of this nature. The ultimate benefactors, however, from this are the citizen and community who receive increased public safety services through more-practical commitments of public funds and resources.

FBI

Footnotes

[1]G.V. Coleman, *Video Technology in the Courts* (U.S. Department of Justice, 1977), p. 9.

[2]Philadelphia, PA; Phoenix, AZ; Las Vegas, NV, Boise, ID; and Miami, FL.

[3]*Kansas City* v. *McCoy*, 525 S.W. 2d 336 (1975); *Hochheiser* v. *Superior Court*, 208 Cal. Rptr 273 (1984); *Stores* v. *State*, 625 P. 2d 820 (Alaska, 1980); *McBride* v. *State*, 368 P. 2d 925.

[4]Maricopa County, AZ; Clark County, NV; Dade County, FL; Philadelphia, PA; and Ada County, ID.

[5]Idaho Criminal Rule 43.2.

[6]Preliminary FBI Uniform Crime Report figures show that five officers were murdered while handling or transporting prisoners during 1986.

Minimization Requirements in Electronic Surveillance (Part I)

By
ROBERT A. FIATAL, J.D.
Special Agent
FBI Academy
Legal Counsel Division
Federal Bureau of Investigation
Quantico, VA

Law enforcement officers of other than Federal jurisdiction who are interested in any legal issue discussed in this article should consult their legal adviser. Some police procedures ruled permissible under Federal constitutional law are of questionable legality under State law or are not permitted at all.

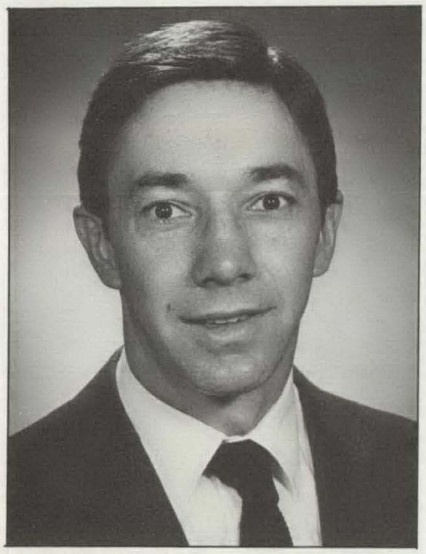
In calendar year 1985, courts issued 784 court orders authorizing the nonconsensual interception of wire or telephonic communications (wiretaps) or oral communications by a concealed microphone or electronic device (bugs).[1] Of these, 243 were issued by Federal judicial officers pursuant to Title III of the Omnibus Crime Control and Safe Streets Act of 1968[2] (title III), while 541 were authorized by State judges pursuant to their respective State laws,[3] which either adopt the provisions of title III or set forth their own statutory scheme for authorizing and using electronic surveillance.[4] Presently, 31 States have enacted such legislation,[5] which must be at least as restrictive as the provisions of title III.[6] Federal, State, and local law enforcement officers in turn made 2,469 arrests in 1985 as a result of this court-ordered electronic eavesdropping.[7]

These statistics are indicative of both the importance and effectiveness of electronic surveillance in law enforcement's arsenal of investigative techniques. Its importance has become increasingly apparent in investigating what is now recognized as this country's most serious social, moral, and legal dilemma, the illegal distribution of narcotics. Four hundred thirty-four, or 55.4 percent, of the wiretap orders issued in 1985 were predicated upon investigations of alleged violations of Federal or State drug laws.[8]

The individual police officer's most frequent contact with the extraordinary investigative technique of electronic eavesdropping will most likely occur when he is assigned to monitor a court-authorized wiretap or bug.[9] In this capacity, the officer's conduct will be regulated by instructions to minimize his listening to and recording of conversations not subject to the interception order, as required by both Federal and State statutes.

The monitoring officer will be assigned to listen to and record conversations between individuals which are intercepted by wiretap or bug pursuant to court order. At that same time, he will be restricted in his monitoring by court-imposed limitations on the individuals, types of conversations, and time periods he may overhear and record. These restrictions on when a monitoring officer may listen and record are the minimization requirements for court-authorized electronic surveillance. In general terms, minimization is designed to restrict monitoring to criminal conversations of those engaged in criminal activity and to preclude the overhearing and recording of personal, private non-criminal discussions. To "minimize," the monitoring officer must reasonably decide when to listen and record, when to turn the equipment off, and when to resume listening and recording.

In this context, the monitoring officer is placed in a sometimes perplexing and confusing position. He carries the burden of making an *ad hoc* decision concerning how to satisfy this minimization requirement, frequently without advance knowledge of what the



Special Agent Fiatal

parties to the overheard conversation are about to say. If the officer minimizes too little by listening and recording when he is not authorized, he bears the ultimate possibility of having intercepted conversations which are incriminating in nature excluded as evidence in a subsequent criminal prosecution. If he minimizes his interception of communications too much by failing to listen and record when he should, he may fail to intercept evidence relevant and crucial to the investigation and may, in some instances, be accused by criminal defendants of intentionally excluding from interception exculpatory statements.

It is the purpose of this article to assist the law enforcement officer in performing the crucial investigative task of lawfully monitoring court-authorized electronic surveillance by complying with minimization requirements. Part one of this two-part article will analyze decisions of the Supreme Court, as well as lower Federal and State courts, to both identify the legal basis for minimization in electronic surveillance and provide an operational definition of that term. Part two of the article will assess the factors courts consider when deciding whether minimization has been lawful and the consequences when it is not. Finally, the article will offer suggestions for best achieving and documenting minimization efforts to assure protection of constitutional rights, compliance with applicable statutes, and admissibility of intercepted and recorded incriminating conversations at subsequent criminal prosecutions.

LEGAL BASIS FOR MINIMIZATION REQUIREMENTS

The Federal eavesdropping statute requires that:

> "Every [eavesdropping] order and extension thereof shall contain a provision that the authorization to intercept shall be executed as soon as practicable, shall be conducted in such a way as to minimize the interception of communications not otherwise subject to interception under this chapter, and must terminate upon attainment of the authorized objective, or in any event in thirty days."[10]

Stated simply, this statutory minimization requirement regulates the conduct of law enforcement officers during the course of monitoring a wiretap or bug. The statute, however, neither defines minimization nor sets forth any specific standards by which to determine if minimization has been properly effectuated. In attempting to determine what minimization means and requires, it is instructive to understand why this requirement exists.

Although the minimization requirement in monitoring wiretaps or bugs is statutory in nature, it is constitutional in origin. Congress specifically included this mandate in title III in direct reaction to two 1967 Supreme Court decisions involving the application of the fourth amendment[11] to electronic surveillance. These two cases provide the background to understand the importance of minimization in monitoring electronic communications.

In the landmark decision of *Katz* v. *United States*,[12] the Supreme Court was presented with the question of whether agents of the Federal Bureau of Investigation had complied with fourth amendment proscriptions in their electronic eavesdropping efforts. The agents had reason to believe Katz was using a certain public telephone booth at certain times to transmit wagering information interstate, in violation of Federal law. Without prior court authori-

"[The] statutory minimization requirement regulates the conduct of law enforcement officers during the course of monitoring a wiretap or bug."

zation, they placed a surreptitious listening and recording device on top of and outside the phone booth, and thereafter, intercepted Katz' end of his telephone calls made from that location.

In determining that the agents had conducted an unreasonable search and seizure by electronically listening to and recording Katz' conversations, the Court abandoned the concept of a physical trespass being necessary for fourth amendment protection.[13] Instead, the Court determined that the fourth amendment's prohibition against unreasonable searches and seizures applies when there is governmental intrusion into a person's legitimate, or reasonable, expectation of privacy, since that constitutional amendment "protects people, not places."[14] As this search and seizure was warrantless and did not fit into any of the few specifically established exceptions to the general requirement of a warrant, such as a search incident to arrest or a motor vehicle search, it was deemed unreasonable.

Nonetheless, the Court reserved some praise for the agents, as "[they] confined their surveillance to the brief periods during which [Katz] used the telephone booth, and they took great care to overhear only the conversations of [Katz] himself."[15] The agents were able to accomplish this by visually observing Katz, which allowed them to predict the specific time period Katz used the phone booth each morning. On the single occasion the agents inadvertently overheard the conversations of another person, they refrained from listening.[16] Although the agents refrained from listening to nonrelevant callers and conversations, they were acting at their own instigation in a warrantless electronic surveillance subsequently found to be violative of fourth amendment requirements, rather than on the basis of limitations imposed by a judicial officer.

In *Berger* v. *New York,*[17] police officers had obtained prior judicial authorization to conduct an electronic surveillance of the law office of Berger, the middleman in a bribery scheme, pursuant to the then applicable New York eavesdropping statute. The Supreme Court, however, found this statutory scheme to violate the fourth amendment due to several infirmities.

The Court specifically noted that the New York statute lacked certain protective procedures. These included a failure to require eavesdropping warrants authorized under the statute to particularly describe the place to be searched or the persons or things to be seized, as required by the fourth amendment. Further, the statute set forth no requirement that the warrant particularly describe the specific crime which had been or was being committed, upon which the warrant was predicated.

The Court reasoned that this lack of particularity requirement made electronic surveillance orders issued under the New York statute akin to general warrants, as "the statute's failure to describe with particularity the conversations sought gives the [monitoring] officer a roving commission to 'seize' any and all conversations."[18] The general warrant, which gave unbridled discretion to the executing officer, was a practice abhorred by the framers of the Bill of Rights and the primary reason for including the particularity requirement in the fourth amendment. The New York statute, in effect, allowed seizure of "conversations of any and all persons coming into the area covered by the device ... indiscriminately and without regard with their connection to the crime under investigation."[19]

The Supreme Court determined that to be reasonable an electronic surveillance order must, among other things,[20] particularly describe the types of conversations which are to be seized. This description should include the persons expected to be intercepted and the criminal activity expected to be discussed.

Additionally, when executing or monitoring this eavesdropping order, monitoring law enforcement officers must specifically remain within the authority granted by the order or minimize the interception of communications not authorized by the order. They are to avoid seizure of conversations which bear no relationship to the crimes being investigated or the purpose for which the electronic surveillance was authorized. Minimization requirements in electronic surveillance serve the same purpose as the particularity requirement of a conventional search warrant. Without minimization efforts, execution of an electronic surveillance order becomes a general search, prohibited by constitutional standards.

MINIMIZATION DEFINED

Minimization in electronic surveillance thus requires that monitoring officers make reasonable efforts to avoid seizing (by not listening to and recording) nonpertinent conversations or those which are innocent and lack evidentiary or investigative value. They should instead focus their efforts on the conversations related to the crimes and persons being investigated and the purpose for which the surveillance was authorized. By choosing the word "minimize," Congress acknowledged that screening out all nonpertinent, or per-

"Minimization ... requires that monitoring officers make reasonable efforts to avoid seizing [by not listening to and recording] nonpertinent conversations or those which are innocent and lack evidentiary or investigative value."

sonal, conversations was impossible. As courts have subsequently recognized, a standard requiring that all portions of all nonpertinent communications be entirely free from interception "would be unrealistic and virtually impossible to satisfy."[21] Effective minimization "requires that measures be adopted to reduce the extent of such interception to a practical minimum while allowing the legitimate aims of the Government to be pursued."[22]

As law enforcement officers are human beings and generally incapable of reading minds and predicting the future, they will obviously not be able to avoid the interception of all portions of all communications not relevant to the crimes and individuals being investigated. It is recognized that monitoring officers "will always seize some nonpertinent conversations because of the difficulty in determining whether a conversation is pertinent and the concern that a conversation between named suspects might begin in an innocent manner and later become incriminating."[23]

There must, however, be some reasonable effort to comply with minimization directives. Applicable statutes, whether Federal or State, generally provide no specific guidelines or methods as to what efforts are necessary for minimization compliance. This absence of statutorily predetermined minimization criteria is the cause of the quandary in which the monitoring officer is placed when instructed to effectively minimize his interceptions while monitoring a bug or wiretap. It is therefore instructive to analyze court decisions which have considered the operational aspects of minimization for an understanding of proper minimization criteria and procedure.

In an effort to further define the term "minimization," it can be analyzed, as courts have done, in terms of extrinsic minimization and intrinsic minimization. Each provides means for monitoring officers to establish parameters or guidelines for when to listen and record and when to not listen and record. Extrinsic focuses on known time factors when criminal conversations may occur. These time constraints may be set forth in the court order, or they may become known during the course of the electronic surveillance. Intrinsic relies on the experience and judgment of the monitoring officer applied to the facts and circumstances of each conversation and the cumulative knowledge that develops during the electronic surveillance concerning patterns and practices of criminals and involved criminal conduct.

Extrinsic Minimization

In extrinsic minimization, monitoring officers can be guided in the time periods of their interception attempts by those times when pertinent communications are expected to occur. For example, if it is known what time period each day the criminal subjects will use the facilities which are bugged or wiretapped to transmit criminal information, times of listening and recording should be limited accordingly. Additionally, if it is known when the criminal activity which is being investigated is to end, eavesdropping should not extend beyond that date, even if this occurs before the expiration date of the eavesdropping order. [24]

Extrinsic minimization basically limits both the hours and duration of the electronic surveillance. Frequently, these extrinsic minimization requirements will be specifically spelled out in the electronic surveillance order.[25] For example, a wiretap on a business phone may be limited to business hours only.

Monitoring officers should still attempt to extrinsically limit their times of interception, even in the absence of such guidelines in the surveillance order. If, during the course of their monitoring, they determine that the phone which is tapped or the facilities which are bugged are only used to discuss criminal, or pertinent, activity at certain times of the day, interception should be avoided at all other times. For example, in the aforementioned *Katz* case, the monitoring agents, knowing the particular hours that Katz used the telephone under surveillance to transmit gambling information, limited their hours of interception to those times only.[26]

Intrinsic Minimization

Frequently, specific time and duration limits are incapable of being determined in electronic surveillance efforts. This often occurs in investigations of narcotics distribution networks, as narcotics dealers rarely keep regular and predictable hours in their illicit activities. In such instances, 24-hour-a-day electronic surveillance may be and frequently is warranted, particularly where one of the goals of the surveillance is to determine the scope and breadth of the criminal conspiracy being investigated. Even in instances where there are very specific limitations on the hours of allowed electronic surveillance, and extrinsic minimization is possible, intrinsic minimization efforts should still be made. In either situation, intrinsic minimization is of particular importance. The monitoring officer must use his judgment and limited background knowledge of this criminal investigation and its participants, together with facts

and circumstances that develop in the overheard conversations, to refrain from intercepting nonpertinent, innocent conversations as they take place.

Intrinsic minimization provides a most difficult task for the law enforcement officer who is assigned to monitor a wiretap or bug. He must, to the greatest extent possible, avoid listening to and recording conversations which have no relationship to criminal matters, with the realization that it is practically impossible to not overhear some unauthorized (personal, noncriminal) conversations. Conversely, if he is only allowed to seize communications which immediately and obviously appear relevant to the crime being investigated, organized criminals would quickly become aware that they merely had to devote the initial portion of their conversations to trivial and noncriminal discussions in order to escape detection by electronic surveillance.

In 1978, the Supreme Court was presented with the opportunity to construe the statutory and underlying constitutional minimization requirements and determine what the monitoring officer must do to satisfy these requirements by intrinsic minimization. In *Scott* v. *United States*,[27] government agents, pursuant to title III, on January 24, 1970, obtained an order to wiretap a telephone subscribed to by Geneva Jenkins. The affidavits in support of the application for the wiretap order alleged probable cause to believe nine named individuals, to include Bernis Lee Thurman who was living with Jenkins, were participating in a conspiracy to import and distribute narcotics in the Washington, DC, area and that Jenkins' telephone had been used in furtherance of the conspiracy. The order required the monitoring agents to minimize their interceptions of communications not subject to interception and to make progress reports to the authorizing judicial official every 5 days. The interceptions began the same day as the order was obtained and continued, pursuant to an authorized extension, until February 24, 1970.

As a result of the investigation, 14 individuals, including Scott and Thurman, were indicted. At trial, the district court suppressed all the intercepted conversations, holding that the monitoring agents had failed to comply with minimization requirements. The court relied on the fact that while virtually all of the calls made during the course of the wiretap were intercepted, only 40 percent of those calls were related to narcotics activity.

The U.S. Court of Appeals for the D.C. Circuit reversed and directed the district court to not base its decision on the general comparison of the number of narcotics-related calls to the total number of calls intercepted. Rather, the appeals court instructed the district court to assess the reasonableness of the minimization efforts in light of the purpose of the wiretap and the information then known to the monitoring agents.

After reconsideration, the district court again ordered suppression, as it deemed the monitoring agents had made no attempt to minimize their interceptions. The court of appeals again reversed the district court. They ruled that the lower court had yet to apply the correct test to determine if there had been proper minimization, noting that good faith is but one factor in such a decision. They stated that the ultimate determination was to rest upon the objective reasonableness of the monitoring agents' minimization efforts.

The intercepted telephone conversations were ultimately allowed as evidence by the district court, and Scott was thereafter convicted of selling and purchasing narcotics. He appealed his conviction to the court of appeals, which affirmed, and then to the Supreme Court.

The Supreme Court stated that in assessing effective minimization by constitutional or statutory standards, "an objective assessment of an officer's actions in light of the facts and circumstances then known to him" is determinative.[28] The Court recognized the difficulty in making an always perfect on-the-spot determination of pertinency, and therefore, refrained from expressing an inflexible rule of law to apply to every case. The Court stated:

> "The statute does not forbid the interception of all nonrelevant conversations, but rather instructs the agents to conduct the surveillance in such a manner as to 'minimize' the interception of such conversations. Whether the agents have in fact conducted the wiretap in such a manner will depend on the facts and circumstances of each case."[29]

The Court then looked to the facts and circumstances confronting the monitoring agents and found their minimization efforts to be reasonable. It prefaced this finding with the comment that a reviewing court is not to rely blindly in its determination of sufficient minimization upon the percentage of nonpertinent calls intercepted, as "there are surely cases, such as the one at bar, where the percentage of nonpertinent calls is relatively high and yet their interception was still reasonable."[30] The Court recognized that many of the nonpertinent calls which are intercepted may be short, one-time only, or ambiguous, and therefore, incapable of being characterized as innocent in nature at the moment of interception.

"... 55.4 percent ... of the wiretap orders issued in 1985 were predicated upon investigation of alleged violations of Federal or State drug laws."

Additionally, the Court set forth several factors which should be considered in resolving the issue of proper minimization. The nature and scope of the investigation is one such important factor. When, as in *Scott*, the focus of the investigation is on what is thought to be a widespread conspiracy, more extensive interception may be justified in order to determine the extent and scope of the criminal conspiracy.

The location and use of the telephone which is tapped or the facility which is bugged also was found to have a profound influence on minimization requirements. If the phone is located where one of the believed primary participants in a criminal conspiracy resides, as in *Scott,* less extensive minimization efforts will be necessary than if the phone is located in a publicly accessible area.

Another factor which the Court noted was the time during the course of the surveillance when the conversation is intercepted. The Court recognized that it may be necessary to intercept all communications in their entirety at the beginning of a wiretap or bug in certain instances, in order to establish patterns of innocent or nonpertinent calls or conversations. All communications which thereafter fit such established patterns should not be monitored. The Court recognized that if the conversations are short in duration, it may be difficult to ascertain patterns of innocence which would dictate future minimization.

For example, the Court found that many of the nonpertinent calls which were intercepted in *Scott* were placed to wrong numbers, to persons not available to receive the call, and to a weather message service, all of which were less than 90 seconds in duration. Others were ambiguous or one-time-only conversations. In light of the nature of the investigation, which involved a far-reaching conspiracy with a large number of participants, it would have been impossible to determine at the time of interception if such calls were nonpertinent or to even categorize them into innocent calls necessitating immediate minimization. Seven other nonpertinent calls did not fit into the weather, unavailable, or wrong number category. Four, which were of very short duration, were intercepted at the beginning of the electronic surveillance, and two of these indicated one of the callers may have been involved in the conspiracy. The three remaining calls, although intercepted later in the course of the wiretap, contained statements which could have been interpreted as having some relationship to the conspiracy being investigated. The monitoring agents were found by the Court to have acted reasonably at the time they listened to and recorded these conversations, and therefore, to have complied with minimization requirements.

As post-*Scott* minimization determinations are to be made based upon the facts and circumstances of each particular case, part two of this article will explore the various factors courts have considered in assessing proper minimization efforts. Additionally, it will consider the interception of communications involving unrelated criminal activity and the consequences of a court's finding that inadequate minimization procedures were used. Finally, it will suggest methods and safeguards which may be employed to best assure compliance with this constitutionally based requirement when conducting electronic surveillance.

FBI

(continued next month)

Footnotes

[1]Report of the Director of the Administrative Office of the U.S. Courts on Applications for Orders Authorizing or Approving the Interception of Wire or Oral Communications (Wiretap Report) at 2 (1986).

[2]18 U.S.C. 2510–2520.

[3]*Supra* note 1, at 2.

[4]18 U.S.C. 2516(2) requires States to enact their own specific enabling statute if they desire to implement the authority granted State law enforcement officers by title III to seek and obtain electronic surveillance orders from State judges.

[5]*Supra* note 1, at 2.

[6]*See United States* v. *Geller,* 560 F.Supp. 1309 (E.D. Pa. 1983); *State* v. *Thompson,* 464 A.2d 799 (Conn. Sup. Ct. 1983); *Commonwealth* v. *Vitello,* 327 N.E.2d 819 (Mass. Sup. Ct. 1975); *State* v. *Siegel,* 292 A.2d 86 (Md. Ct. App. 1972).

[7]*Supra* note 1, at 5.

[8]*Id.* at 3.

[9]The Electronic Communications Privacy Act of 1986, amending title III, also allows electronic interceptions to be conducted "by Government personnel, or by an individual operating under contract with the Government, acting under the supervision of an investigative or law enforcement officer authorized to conduct the interception." 18 U.S.C. 2518(5).

[10]18 U.S.C. 2518(5).

[11]U.S. Const. amend. IV provides: "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized."

[12]389 U.S. 347 (1967).

[13]*See, e.g., Olmstead* v. *United States,* 277 U.S. 438 (1928); *Goldman* v. *United States,* 316 U.S. 129 (1942).

[14]*Supra* note 12, at 351.

[15]*Id.* at 354.

[16]*Id.* at 354, note 15.

[17]388 U.S. 41 (1967).

[18]*Id.* at 59.

[19]*Id.* at 59.

[20]The Supreme Court also found the New York statute to violate the fourth amendment as it did not require 1) a determination of probable cause that a criminal offense was being committed, 2) the termination of the electronic surveillance when the evidence sought was seized, 3) notice to those whose conversations were seized or intercepted, and 4) return of the warrant to the authorizing judicial officer.

[21]*People* v. *Floyd,* 360 N.E.2d 935 at 940 (N.Y. Ct. App. 1976).

[22]*United States* v. *Turner,* 528 F.2d 143 at 156 (9th Cir. 1975).

[23]*State* v. *Pottle,* 677 P.2d 1 at 9 (Or. Sup. Ct. 1984).

[24]*See, e.g., Commonwealth* v. *Doty,* 498 A.2d 870 (Pa. Sup. Ct. 1985) (monitoring terminated 8 days prior to eavesdropping order's termination date).

[25]*See, e.g., State* v. *Catania,* 427 A.2d 537 (N.J. Sup. Ct. 1981) (order allowed surveillance only between the hours of noon to 2:00 p.m. and 4:00 p.m. to 6:00 p.m.).

[26]*See also, United States* v. *Lilla,* 534 F.Supp. 1247 (N.D.N.Y. 1982) (after first week of wiretap order, monitoring decreased from 24 hours a day to 8:00 a.m. to 12:00 midnight).

[27]436 U.S. 128 (1978).

[28]*Id.* at 137.

[29]*Id.* at 140.

[30]*Id.* at 140.

WANTED BY THE FBI

Any person having information which might assist in locating these fugitives is requested to notify immediately the Director of the Federal Bureau of Investigation, U.S. Department of Justice, Washington, DC 20535, or the Special Agent in Charge of the nearest FBI field office, the telephone number of which appears on the first page of most local directories.

Because of the time factor in printing the FBI Law Enforcement Bulletin, *there is the possibility that these fugitives have already been apprehended. The nearest office of the FBI will have current information on the fugitives' status.*

Photographs taken 1979 and 1980

Frank Wayne Charneco,

also known as "Pope." W; born 4-18-51; Tampa, FL; 5'9"; 170–195 lbs; brn hair; brn eyes; med comp; occ-railroad laborer/engineer trainee, surf shop owner.
Wanted by FBI for INTERSTATE FLIGHT-AGGRAVATED ASSAULT; BATTERY UPON A LAW ENFORCEMENT OFFICER.

NCIC Classification:

2957121817DI66111717

Fingerprint Classification:

29 L 5 R IOO 17
I 1 R OOO

I.O. 4951

Social Security Number Used: 265-96-8892

FBI No. 659 780 N9

Caution

Charneco is being sought by the FBI in connection with the aggravated assault and battery upon a law enforcement officer. In addition, he is wanted by local Florida authorities for armed robbery, armed burglary, aggravated battery, and use of a firearm in the commission of a felony. Consider armed and dangerous.

Right middle fingerprint

Photographs taken 1980

Wardell David Ford,

also known as David Ford, Wardell D. Ford. B; born 5-10-56; Detroit, MI; 5'9"; 150 lbs; med bld; blk hair; brn eyes; med comp; occ-construction laborer; remarks: Wears prescription glasses and may be clean shaven.
Wanted by the FBI for INTERSTATE FLIGHT-MURDER.

NCIC Classification:

150911PO121209101312

Fingerprint Classification:

15 M 9 U IOO 12
M 1 U III

I.O. 5015

Social Security Number Used: 369-64-7878

FBI No. 452 646 R6

Caution

Ford is being sought in connection with robbery and subsequent murder of a Purolator armored car service guard. He may be armed with a .22-caliber revolver and should be considered armed and dangerous.

Right index fingerprint

unknown date *Photograph taken 1980*

Lawrence William Fishman,

also known as Larry Fishman, Lawrence Fishman, Lawrence W. Fishman. W; born 8-29-51; Washington, DC; 5'11–6'; 160–180 lbs; med bld; short curly brn hair; brn eyes; med comp; occ-cab driver, public speaker, public health lobbyist, editor, research student, law clerk, lawyer; remarks: Wears glasses, has been treated for various mental disorders, has been known to frequent university facilities and obtain lodging in YMCA residences or communal housing near universities.
Wanted by FBI for INTERSTATE FLIGHT-MURDER.

NCIC Classification:

AAAAAAAA12PMAAAAAA10

Fingerprint Classification:

5 aA2a 12
1 A2a

I.O. 4967

Social Security Number Used: 214-52-6075

FBI No. 686 036 S5

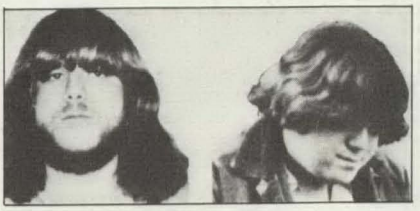
Caution

Fishman is being sought in connection with the murder and wounding of two members of his family where the victims were allegedly shot with a 9mm automatic pistol. Fishman should be considered armed and dangerous.

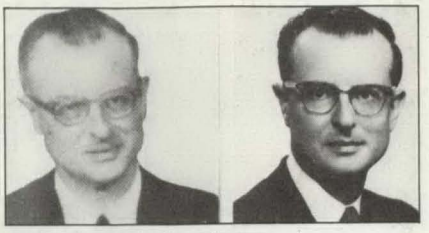
Left middle fingerprint

WANTED BY THE FBI

Photographs taken 1982 and date unknown



Photographs taken 1981



Dates of photographs unknown

Gilbert Winfield Chilton,

also known as Gilbert Winfield Chilton, Jr., Gil Chilton, Louis G. Sandella. W; born 3-15-44; Macon GA; 5′11″; 180 lbs; med bld; brn hair; brn eyes; med comp; occ-loan officer; scars and marks: Small scar under chin, may be wearing mustache and slight beard; remarks: Sometimes has facial rash which is reportedly caused by hypertension, rash may be hidden by beard, has fascination for small handguns and other weapons, active motorcyclist. Chilton may be traveling with Cheryl Ann Ciccarelli, also known as Cheryl Ann Chiccarelli, Cheryl Ann Uhrig, Cheryl Ann Stone, white female, born 7-27-59, 5′4″, 110 lbs, brn hair, blue eyes, Social Security Number Used: 563-29-1848. CICCARELLI IS NOT WANTED BY LAW ENFORCEMENT AUTHORITIES. Wanted by the FBI for INTERSTATE TRANSPORTATION IN AID OF RACKETEERING—BRIBERY.

NCIC Classification:

17541518161709101412

Fingerprint Classification:

17	S	1	R	IOO	16
	L	1	U	IIO	

I.O. 4953

Social Security Numbers Used:
058-36-5679; 058-36-5649; 058-36-6649

FBI No. 959 670 AA9

Caution

Chilton has a permit to carry a concealed weapon and may be armed with handguns, including a Colt .45 automatic and a .380 automatic. Chilton may have possible suicidal tendencies. Consider armed and dangerous.

Right index fingerprint

Steven Girard Tormas,

also known as Steven G. Tormas, "Fat Boy." W; 7-27-59; Bronx, NY; 5′8″; 245 lbs.; hvy bld; brn hair; bl eyes; fair comp; occ-laborer; scars and marks: Tattoo of a "Tiger's Head" on upper left arm; remarks: Reportedly a heavy drinker. May have lost weight and be clean shaven. May have shortened and dyed his hair in an attempt to elude detection. He may be traveling with Dana Meredith Ross, white female, born September 18, 1961, 5′2″, 130 lbs, dark hair, bl eyes, Social Security Number Used: 170-38-4477. ROSS IS NOT WANTED BY LAW ENFORCEMENT AUTHORITIES.
Wanted by FBI for INTERSTATE FLIGHT-RAPE.

NCIC Classification:

23CI0917101809091511

Fingerprint Classification:

23	L	17	W	IIO	10
	L	1	U	IIO	

I.O. 5011

Social Security Numbers Used:
170-56-2689; 170-56-1689

FBI No. 661 546 W1

Caution

Tormas is being sought for rape during which the victim was brutally beaten around the head. Narcotics user.

Right index fingerprint

John Emil List

W; born 9-17-25; Bay City, MI; 6′; 180 lbs; med bld; blk-graying hair; brn eyes; fair comp; occ-accountant, bank vice president, comptroller, insurance salesman; scars and marks: Mastoidectomy scar behind right ear, herniotomy scars both sides of abdomen; remarks. Reportedly a neat dresser.
Wanted by FBI for INTERSTATE FLIGHT-MURDER.

NCIC Classification:

23dI1108141762130914

Fingerprint Classification:

23	L	17	W	IOI	14	Ref:	17
	L	1	R	OOI			3

I.O. 4480

Social Security Number Used: 365-24-4674

FBI No. 215 305 J4

Caution

List, who is charged in New Jersey with multiple murders involving members of his family, may be armed and should be considered very dangerous.

Right ring fingerprint

Unusual Pattern

By virtue of name, the accidental whorl is not the norm. This accidental whorl consists of a combination of two different types of patterns, a loop over a whorl, and possesses three deltas. The tracing is outer.

Change of Address

Not an order form

FBI
Law Enforcement Bulletin

Complete this form and return to:

Director
Federal Bureau of
Investigation
Washington, DC 20535

Name

Title

Address

City State Zip

U.S. Department of Justice
Federal Bureau of Investigation

Second Class Mail
Postage and Fees Paid
Federal Bureau of Investigation
ISSN 0014-5688

Washington, D.C. 20535

Official Business
Penalty for Private Use $300
Address Correction Requested

The Bulletin Notes

Motorcycle Officer Robert C. Shults, Jr., of the Burbank, CA, Police Department, while on patrol in May 1986, recognized a suspicious-looking man loitering at a shopping center bank. When Officer Shults approached him, the suspect crouched and reached behind his back. Officer Shults quickly subdued the suspect after a fierce struggle, averting a possible shootout in a crowded shopping center. The suspect was identified as a Federal bank robbery fugitive.

The Bulletin is pleased to join Officer Shults' superiors in acknowledging this act of bravery.

Officer Shults