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WANTED BY THE FBI

THE COVER This month's cover portrays a helicopter ambulance, provided through the Military Assistance to Safety and Traffic Program (MAST), responding to a law enforcement cdll for emergency medical aid. See related article beginning on page 3.

As a weapon of crime and extremism, the bomb represents a uniquely dangerous and challenging threat that all levels of law enforcement must endeavor to meet more effectively.

> Explosive and incendiary devices are capable of inflicting death, personal injury, and destruction on a massive and viciously indiscriminate scale. Moreover, the relative ease with which these bombing devices may be improvised, concealed, and treacherously activated contributes immeasurably to the seriousness of this terrifying menace. Persons responsible for crimes of this nature range from the mentally deranged to coldly methodical terrorists and hoodlum enforcers who murderously employ sophisticated bombs. Targets of their attacks may include individuals, organizations, the Government, or society at large.

The bomb's appeal to those of violent purpose continues to be demonstrated with increasingly tragic consequences. During 1974, a total of 2,044 actual and attempted bombing incidents in the United States and Puerto Rico was reported to the FBI. Although this annual total was exceeded only slightly in 1975, a shocking rise in resultant fatalities, personal injuries, and extent of property damage was recorded. In 1974, incidents of this nature led to two dozen deaths, over 200 personal injuries, and property damage valued at about \$10 million. During 1975, the number of fatalities almost tripled-totaling 69-and well over 300 persons were injured. In the same period, one bombing incident alone accounted for \$14 million wonth piperty damage.

formidable.

Bombers may strike at any time, in virtually any direction, and with a bewildering array of devices and tactics. To protect themselves and others, police officers must be trained to recognize and react properly to these hazardous situations. "Survival training" at this level is of paramount importance. Quite obviously, the disarming and safe handling of live bombs routinely require a high degree of technical competence and experience, and every effort must be made to develop specialists in this field in adequate numbers.

Bombings are, of course, notoriously difficult to investigate and solve-and understandably so. Witnesses to the clandestine placement of a bomb are obviously rare. Normally, too, considerable time and distance separate the bomber from the explosion which itself acts to destroy any existing physical evidence. Consequently, these cases require highly specialized investigative attention and technical resources.

To more effectively meet these critical and demanding investigative challenges, law enforcement agencies are urged to fully utilize the extensive areas of technical and training assistance offered through the FBI. Major cooperative areas of this type include the many services of the FBI Laboratory in relation to the forensic examination of physical evidence, and other forms of highly advanced technical aid. Also of major importance are the varied forms of training support and technical information concerning

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VO.



From a law enforcement standpoint, the difficulties in dealing with this menace are

MESSAGE

hombing devices provided by the FBI Be mb Data Program. Statistical data and related information pertaining to bombing incidents are compiled and disseminated through the FBI's Uniform Crime Reporting Program to all police agencies.

In a very real sense, the power of knowledge is perhaps law enforcement's most potent weapon in our struggle against the awesome destructiveness of the bombing menace. Let us use this power to maximum effect.

Contelles

CLARENCE M. KELLEY Director







The MAST **Program: A Vital Resource**

By CAPT. LEE T. SMITH **Helicopter Pilot** U.S. Army **283d Medical Detachment** (Helicopter Ambulance) Fort Bliss, Tex.

"The MAST program . . . sponsored jointly by the Departments of Transportation and Defense . . . makes available . . . specially equipped air ambulances to handle extreme medical emergencies involving civilians."

Un the afternoon of March 17, reach the injured person and, later located approximately 35 nautical miles northwest of Socorro, N. Mex. a rock which, being loose, suddenly gave way. As a result, he fell approxisistance and evacuation.

individuals in the climbing party to help.

April 1, 1976

1974, a middle-aged male school- that evening, several succeeded. They teacher was mountain climbing with realized that he was in need of ima group of students. The objective was mediate care and were further con-LaDrones Peak, a mountain summit cerned since night had arrived, and the temperature was dropping rapidly. With no rescue equipment available The climb was proceeding without to the climbing party, they decided incident until the teacher reached for to treat the injured climber as best they could under the circumstances and to attempt to keep him warm mately 70 feet into a ravine, suffering near fires until necessary help could serious injuries requiring medical as- arrive. A mountain rescue team, based in Albuquerque, N. Mex., was noti-Numerous attempts were made by fied and summoned for additional

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Son. C. J. Le Van Sonding Officer Fort Bliss, Tex.

Requested

An example 9:30, the same example a distress call was placed by the New Device State Police to the 2024 Medical Detachment (Helicopter Aubumant), a Military Assistance to Safety and Traffic (MAST) Unit, located at Fort Bliss, Tex, Special considerations entered into this potential mission because of the altitude involved and precarious location of the injured climber. Prior to takeoff, the aircraft commander on duty made thorough map checks and gathered as much information as possible about weather conditions in the immediate vicinity of LaDrones Peak. Simultaneously, the pilot, crew chief, and flight medic were preparing the aircraft for a hoist mission. All connections and cables involved with the internal rescue hoist were checked and rechecked prior to departure.

The crew departed Biggs Army Air Field at Fort Bliss, and the weather en route to the accident site was excellent. One refueling stop was made along the way at Stallion Army Air Field located 45 nautical miles southeast of LaDrones Peak. After refueling, a stop was made at Socorro to coordinate with the New Mexico State Police. The aircraft commander was thoroughly briefed by

Helicopter ambulance on helipad at William Beaumont Army Medical Center, El Paso, Tex.



Maj. Eldon H. Ideus Commanding Officer 283d Medical Detachment

the State police officer in charge informed that a mountain rescue from Albuquerque was en rout aid in the rescue. A decision was poby the aircraft commander that, cause of the wind currents within mountains and the location of the patient, aircraft rescue could not safely attempted until daylight.

During the waiting period, the specialized mountain rescue tears reached the injured climber. This ground rescue team was equipped with necessary equipment to move the patient and citizens band radio gear to facilitate communications with the other rescue elements.

At daybreak, the aircraft crew departed Socorro and proceeded to the LaDrones Peak rescue operations center which had been established. There after, several attempts by aircraft were made to reach the patient at his position: however, bad wind current in the ravine made helicopter research impossible. The aircraft made sever passes over the mountain trying locate a suitable area where the hold could be utilized. A spot was four approximately 300 yards above t injured climber's site which could used as a point to hoist him into t aircraft. The aircraft returned to rescue operation center located at base of the mountain and passed !



information on to the ground rescue team chief.

Because of the extremely rugged terrain, experts estimated that the 300-yard move up the mountain would take about 3 hours, thus enabling the helicopter ample time to make a short refueling flight to Albuquerque and return. The injured climber was successfully moved to the new site, and when the aircraft returned, the patient was hoisted from the mountainside and promptly transported to Albuquerque for necessary treatment. Mission accomplished!

Mountain Road Crash

In the early evening of April 6, 1975, two young men were driving from Alamogordo, N. Mex., to the nearby mountain resort town of Cloudcroft, N. Mex. The drive up the winding mountain road was uncopter crew was at the scene reconeventful until the driver apparently noitering the location of the accident failed to properly negotiate a sharp for the best flight route in and out of curve. The vehicle slid out of conthe narrow gorge. A steep vertical trol and abruptly left the road, plungdescent by the helicopter would be ing 300 feet into a steep, narrow necessary, allowing only a minimum gorge. The two occupants were clearance of terrain for its high-speed pinned helplessly in the wreckage in a rotating blades. state of shock. The aircraft commander, a Viet-The New Mexico State Police were

the first to arrive at the accident scene. They determined, as in past accidents of this nature, that providing immediate medical attention and evacuation would pose a major problem.

Mountain rescuers were summoned and began a steep rappel to the bottom of the gorge. A call for assistance was also made to the 283d Medical Detachment located approximately 75 air miles away. The response was immediate, and in 35 minutes, the heli-

April 1976

Helicopter ambulance crew (author kneeling at left).

The aircraft commander, a Vietre nam-experienced medical evacuation nt pilot, meticulously maneuvered the st aircraft down the gorge to the twisted o- wreckage.

Simultaneously, the rappelling rescuers reached the battered auto and began cutting away metal in order to extract the pinned-in occupants.

The paramedic present quickly and accurately diagnosed one patient as "critical" and the other as "routine" insofar as injuries sustained. The critical patient had broken bones and deep lacerations complicated by severe



Operations Office of the 283d Medical Detachment.

bleeding. The routine patient suffered minor cuts, bruises, and possible internal injuries. To counteract the large loss of blood by the critical patient, efforts to inject life-saving intravenous fluids into both arms were initiated by the paramedic. The trained crew assisted the medic by applying splints and bandages to the patient's wounded extremities. The patient was then carefully loaded on the aircraft and flown directly to William Beaumont Army Medical Center, El Paso, Tex. Here he spent the next 6 months recovering from the near-fatal accident.

These are merely two examples of the nature of numerous calls for assistance received by the 283d Medical Detachment. None are considered typical calls, as each will undoubtedly present problems of a unique nature. Tuble include varying daytime and might-flight conditions, rugged mounwain and desert terrain, and unusual weather situations such as tricky wind currents and massive blowing dust and sand storms.

Air Ambulances Available

The MAST program is sponsored jointly by the Departments of Transportation and Defense. It makes available, on call, specially equipped air ambulances to handle extreme medical emergencies involving civilians. This service is available to members of civilian communities in proximity to 22 military installations in the United States.

MAST units exist on sites at the following locations:

Fort Rucker, Ala. Fort Ord. Calif. Fort Carson, Colo. McDill Air Force Base, Fla. Fort Benning, Ga. Fort Stewart, Ga. Schofield Barracks, Hawaii Mountain Home Air Force Base, Idaho Fort Riley, Kans. Fort Campbell, Ky. Fort Knox, Ky.

K. I. Sawyer Air Force Base, Mich.

Plattsburgh Air Force Base, N.Y. Fort Bragg, N.C. Fort Sill. Okla. Fort Jackson, S.C. Fort Bliss. Tex. Fort Hood, Tex. Fort Sam Houston, Tex. Fairchild Air Force Base, Wash. Fort Lewis, Wash. F. E. Warren Air Force Base. Wyo.

The MAST helicopter crews respond to emergencies such as heart attacks, premature births, delivery of blood, and transportation of human organs for transplants. The versatility and quick response of helicopters

"The Department of Defense provides the MAST air ambulances, medical personnel, and supplies to help augment any existing medical evacuation system."

make their use in assisting victims at automobile accident sites in remote areas especially valuable.

FBI Law Enforcement Bulletin

Requesting MAST Rescue

Requests for MAST missions may originate from local or State law enforcement agencies, public safety officials. doctors, and also from various Federal officials such as National Park and Forest Rangers. Weather conditions are a prime consideration of an aircraft commander deciding to approve or disapprove a mission; however, circumstances of the accident and the condition of the injured are also factors to be considered.

The MAST program does not enter into any type of competition with civilian air or ground ambulance facilities. The Department of Defense provides the MAST air ambulances. medical personnel, and supplies to help augment any existing medical evacuation system. This is a definite asset to communities where great distances exist between medical facilities.

Fort Bliss MAST Unit

A helicopter ambulance

about to depart Biggs

rescue mission.

The 283d Medical Detachment (Helicopter Ambulance) became an official participant in the MAST program in November 1974. This unit, located at Fort Bliss, Tex., has been flying civilian rescue missions since July 1972, following its return to the United States from Vietnam duty. However, prior to November 1974, all civilian rescue requests were considered by the 283d Medical Detachment on an individual basis and accepted and flown only upon approval of the Commanding General, Fort Bliss.

The 52 members of the 283d Medical Detachment at Fort Bliss are commanded by Maj. Eldon H. Ideus. Each rescue crew consists of an aircraft commander, pilot, crew chief,

"Members of the fourman crew receive extensive medical training in the techniques of emergency medical care."

and flight medic. Members of the fourman crew receive extensive medical training in the techniques of emergency medical care. This includes 80



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hours of classroom work and 40 hours of hospital training. Specific areas of training taught to all crew members include artificial heart massage, techniques of childbirth, treatment of broken limbs, and other aspects of advanced first aid.

Specialized Medical Skills

Prior to a flight medic arriving at the MAST unit, he will have completed an 8-week course of specialized training at Brooke Army Medical Center in San Antonio, Tex. Upon arrival at the 283d Medical Detachment, he will undergo further medical training. Before assuming duties of a paramedic on flight status, he will spend 2 months working in the emergency room at William Beaumont Army Medical Center gaining firsthand experience in treating emergency cases.

Flight medics also complete the Texas Emergency Medical Technicians Course and are certified by the State of Texas as paramedics. They are qualified to utilize special equipment such as incubators and heart monitors, if needed, in connection with situations encountered on a mission. Should a patient's medical predicament require such. all medics are able to start injecting intravenous fluids, perform a tracheal puncture to establish an airway, and administer, upon doctor's orders, certain prescribed drugs.

Aircraft and Crews

The 283d Medical Detachment operates six UH-1 (Huey) helicopters that are specially equipped to perform rescue missions. Two crews are maintained on a 24-hour ready status. A primary crew remains on duty at the Detachment Operations Center for a period of 24 hours to provide instant reaction if needed. Members of a secondary crew remain on standby at or near their homes during off-duty hours, and must be within 30 minutes distance of the unit headquarters at all times to serve as a backup crew in case the primary crew must depart on a mission.

Each helicopter ambulance is capable of transporting three litter and four ambulatory patients. The craft can also be adapted to carry an incubator for use in situations involving premature births.

The UH-1 helicopter is capable of top speeds of approximately 135 miles per hour and can cover a distance of 200 miles before refueling is necessary. The operational cost to the U.S. Government is \$76 per flight hour which includes jet fuel, oil, and parts.

Each emergency request is given a classification according to the apparent seriousness of the patient's condition. The first classification is URGENT and indicates there is a possible danger of loss of life or limb. The next classification is **PRIORITY** and includes cases requiring immediate medical assistance of a serious nature. The final category is



Texas Highway Patro? troopers and helicopter ambulance crew provide on-the-scene medical assistance to an accident victim.

ROUTINE and consists of patients with nonserious or minor injuries or conditions. No calls to merely assist patients with injuries in the ROU-TINE category are usually handled by MAST.

Area of Operation

The 283d Medical Detachment has MAST responsibilities for portions of New Mexico and Texas and operates in a 100-nautical-mile radius out of El Paso, Tex. Each helicopter has ample radio equipment to provide direct aircraft-to-car communication with the Texas Highway Patrol, as well as with New Mexico State Police units and most hospitals participating in the program.

At the present time, there are only two hospitals in El Paso that are equipped with helipads; however, this does not mean that patients may only be taken to them. If it is requested that a patient be taken to another hospital, the helicopter will land at either El Paso International Airport or Biggs Army Airfield where a prealerted ambulance will meet the aircraft and

transport the patient to the desired hospital.

Highly Successful Program

From the time the emergency rescue program was initiated at Fort Bliss in July 1972 until the implementation of the MAST program in November 1974, 148 civilian rescue missions had been performed. Since the MAST program started, rescue missions have been flown with over 104 patients, requiring in excess of 2.280 hours of actual flight time.

Because of the dedication, courage, enthusiasm, and professional skill of all personnel of the 283d Medical Detachment, the MAST program concept has been highly successful in El Paso and adjacent areas of the Southwest it serves. It has proven its worth in saving lives, obtaining prompt medical attention for the seriously injured, and reducing suffering. The crews are proud of their mission. They consider their reward to be the knowledge that they are aiding their fellow Americans in times of urgent and often vital need. FB

PHOTOGRAPHING AND CASTING TOOLMARKS

By DET. LT. DAVID G. TOWNSHEND Michigan State Police Scientific Laboratory East Lansing, Mich.

Thach year, an alarming number of C burglaries occur in the United States. The FBI Uniform Crime Reports reveal that an estimated total of 3,020,700 burglaries occurred during 1974, with an estimated loss to victims of \$1.2 billion. Seventy-five percent of the total were forcible entry, 19 percent unlawful entry (without force), and the remainder forcible entry attempts. Of the total burglaries, only 18 percent were cleared by arrest.

According to the State of Michigan Uniform Crime Reports for the year 1974, there were a total of 172.828 burglary offenses in the State. Of this total, 81.2 percent involved forcible entry, a 20-percent increase over the previous year, and 9.4 percent involved attempted forcible entry, a 21.8-percent increase.

These statistics do not reflect other incidents where a tool may have been used, e.g., larcenies of copper wire, pay telephones, gas, etc. The number and types of tools and instruments that will leave an identifiable impressed or striated mark is limited only by one's imagination. Identifica-

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tions have been made in cases involving desk staplers used in gambling operations and bank robberies, pocket and hunting knives used to slash and puncture automobile tires, tree trimmers and pruning shears used in larcenies of copper wire, not to mention the numerous identifications of screwdrivers, pliers, pipe wrenches, tire irons, hammers, and chisels. However, the actual number of toolmark cases that are received by crime laboratories is minimal. Less than 1 percent of the cases received by the six Michigan State Police crime laboratories in the last year were of the toolmark nature.

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FORENSIC SCIENCE

One area where available toolmark evidence is not effectively utilized relates to those instances where it is impossible, impractical, or costly to remove an item containing a toolmark. Faced with this problem, investigators often overlook the possibility of casting the toolmark. It is not necessary for an investigator to examine a toolmark to determine if it contains sufficient individual characteristics for a positive identification. This can only be determined by

Col. George L. Halverson Director, Michigan State Police





Michigan State Police Scientific Laboratory

TATTOENCE SUBFRODINGED

Evidence screwdriver found in possession of suspects.





Photomicrograph of cast impressions of evidence mark (left of centerline) with cast impressions of test marks made with sides 1 and 2 of tip of evidence screwdriver right of centerline),

FBI Law Enforcement Bulletin

means of a microscopic examination in a laboratory.

Photographing

Photographs of the toolmark should be taken in all cases prior to casting. A fingerprint camera produces a good workable image on both impressed and striated toolmarks. Best results have been obtained by using only one bank of bulbs. The use of a single bank provides an oblique crosslighting required to highlight fine-line detail.

Tests with the fingerprint camera have shown that each case will vary in regard to f-stop and exposure time. Excellent results have been obtained using a setting of 1/8 and an exposure time of 2, 4, and 6 seconds. In instances where the evidence toolmark is exceptionally deep, it may be necessary to use f-stops f/11 or f/22 for greater depth of field. However, if the f-stop is increased, the exposure time must also be increased.

The fingerprint camera should be situated so that a series of photographs are taken first with the bank of lights that are nearest the toolmark and perpendicular to the striae in the toolmark. The camera should then be rotated 180 degrees so that the bank the mark is ready for casting. Much has been written on various media for use in casting toolmarks. The substance that has met with best results in the Michigan State Police laboratories is cellulose acetate butvrate. which is readily available at various chemical companies. It has shown to be effective in the reproduction of fine-line striae in toolmarks, and it remains in a solid form until heated. For best results in casting, cut a piece of the substance with a knife, larger in area than the toolmark to be cast, apply a flame to the end which

> "There have been numerous cases where suspects have been apprehended, and the tools in their possession were identified with a prior burglary."

will be used for the cast, and heat until it begins to flow. Place the liquid portion in contact with the mark to be cast, allow it to cool for approximately 2 minutes, and then remove it from the toolmark. If a mistake is made, simply reheat the substance and reuse it.

If possible, three casts should be taken of each evidence mark. The investigator should mark on the opposite end of the cast his initials, the

"A fingerprint camera produces a good workable image on both impressed and striated toolmarks."

of lights is furtherest away from the toolmark still perpendicular to the mark and exposure time bracketed at 2, 4, and 6 seconds. It is not necessary to use a scale when photographing with the fingerprint camera because the camera photographs at a one-to-one scale. The film pack should then he sent to the laboratory for processing.

Casting

After the photographing of the evidence toolmark has been completed,

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date, time, and the complaint number. The cast should then be placed in an individual evidence container marked with the location where the cast was taken, e.g., upper portion of safe door, lower right window casing, etc. The evidence container should also be marked with the initials of the investigator, the date, time, and the complaint number. This will aid the investigator in identifying the cast and evidence container in court.

Practice on the part of the investigator in casting will instill confidence

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in this technique. An investigator should not feel that if he does not have the evidence tool or a suspect in custody photographing and casting of toolmarks are insignificant. There have been numerous cases where suspects have been apprehended, and the tools in their possession were identified with a prior burglary.

Excellent results can be obtained in the laboratory if, prior to microscopic examination, the laboratory technician ignites a small strip of magnesium ribbon and passes the cast through the smoke of the burning rib-

bon. This will eliminate the translucent effect of the cast. The use of gray fingerprint powder lightly dusted onto the cast has also met with great success.

Conclusion

In a recent case, a detective from one of our State police posts contacted the laboratory and requested assistance in photographing and casting toolmarks at the scene of a motel burglary. The author went to the scene where photographs and casts were taken of the evidence toolmarks. Subsequently, a positive identification was made with the evidence cast and test marks from a screwdriver recovered from a suspect and submitted to the laboratory for comparison purposes. This case met with success because the investigator possessed the knowledge and ability to realize the value of toolmarks as evidence.

As in this instance, a familiarization with techniques involved in photographing and casting evidence toolmarks could result in an increase

in burglary convictions and a reduction in losses suffered by property owners.

