

STATE OF MARYLAND  
STATE HIGHWAY SYSTEM  
AND CONNECTIONS  
1987

# SUPER TROOPERS



*How helicopter medevac saves lives in Maryland.*

BY SETH B. GOLBEY

Like an angry porcupine, the map of Maryland bristles with pins, the blunt red and black quills symbolizing nothing less significant than life and death. Each pin denotes an emergency medical evacuation mission performed by a Maryland State Police helicopter in 1990. Each represents the potential of a trauma victim rushed to an appropriate medical facility during that first "golden hour" after an accident, upon which his or her survival greatly depends. The map, mounted on the wall at the MSP Aviation Division headquarters at Martin State Airport, just north of Baltimore, presents a portrait of one aspect of the state's elaborate emergency medical services (EMS) system. There are 2,815 pins on that map, and, at the time of our visit, with two months left

in the year, the number is already up about 25 percent from 1989. And the pins do not depict the 636 interhospital transfers MSP's helicopters performed in the same period.

Every year, those helicopters fly about 10,000 search and rescue (SAR), law enforcement, and EMS missions. Medevac accounts for about 40 percent of the total missions flown but about 70 percent of the total flying hours. About three quarters of the medevac missions are performed by MSP's nine twin-turboshaft Aerospatiale Dauphins (black pins), the largest Dauphin fleet in EMS service nationwide. The remainder are flown by six single-engine Bell JetRangers (red pins). Total flying time amounted to almost 9,000 hours in 1989.

PHOTOGRAPHY BY MIKE FIZER



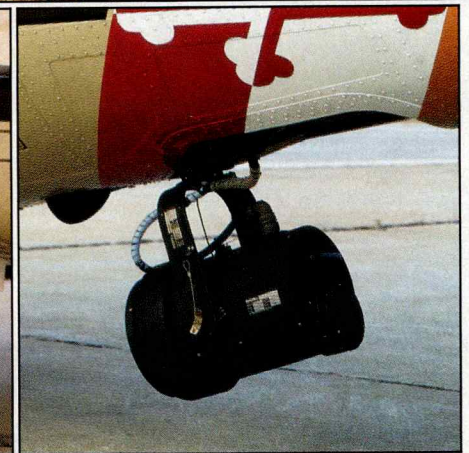








The Dauphin is fitted out with special equipment—including FLIR, hoist, and searchlight—for its search-and-rescue and medevac roles. The fenestron enhances the safety of on-scene personnel and protects the tail rotor from ground strikes.



Calls for help come in primarily from police and fire rescue units—known in EMS idiom as “ground providers”—around the state. The Maryland Institute for Emergency Medical Services Systems (MIEMSS—pronounced “mims”) acts as a central clearinghouse, dispatching helicopters when their unique capabilities are needed and justified.

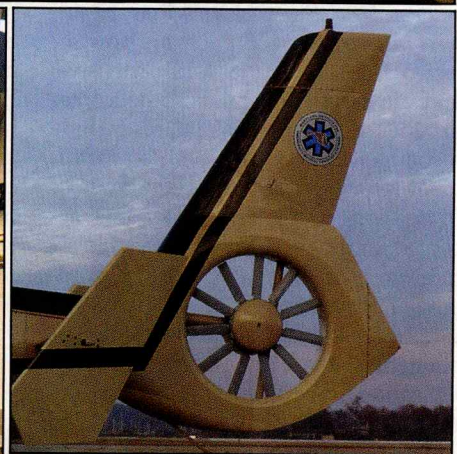
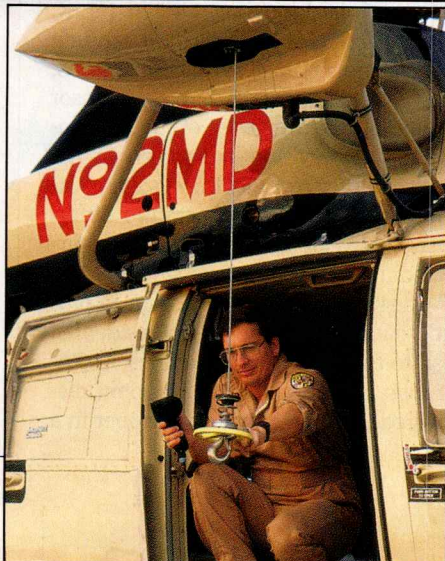
Helicopters are based across the state at Frederick, Cumberland, Salisbury, and Baltimore airports, heliports in Norwood and Centerville, and Andrews Air Force Base and Patuxent River Naval Air Station. All but Centerville and Pax River operate Dauphins. Four of MSP’s eight bases—called “sections”—are manned 24 hours a day; two are manned 20 hours a day, and two 16 hours a day, though one of these is planned to expand to 20 hours. Each section has its own fuel supply. Six pilot/medic crews are assigned to each section. At about half, the supervisor in charge is a pilot; at the other half, a medic. Each section is numbered, and the number, along with the word “Trooper,” forms the helicopter’s call sign: Trooper Three, for example, is the Dauphin based in Frederick.

Once the dispatch call comes in from MIEMMS, a helicopter is normally in the air in 6 to 9 minutes. The decentralized basing system is designed to assure that, when all sections are active, a helicopter can reach any point in the state within 20 minutes. MSP’s pilots usually do better than that: 15 minutes is average; the Baltimore unit can reach any part of the city in 8 to 10 minutes.

Ground providers are trained to prepare landing zones for the helicopters and to communicate wind, surface, and obstacle information to the pilot. Meanwhile, others are briefing the medic on the patient’s condition via the helicopter’s sophisticated communications suite (capable of transmitting and receiving on 4,500 separate frequencies). The ground providers are trained, by means of a traveling trailer-mounted mock-up of the Dauphin’s medical bay, to assist the medic in loading the patient into the helicopter. If more than one victim is to be transported (the Dauphin can carry two), ground providers are familiar with the medical and communications equipment aboard and can ride along to care for the extra patient. The helicopters have payloads of 500 to 900 pounds, depending on fuel load and density altitude considerations.

While enroute, the helicopters are



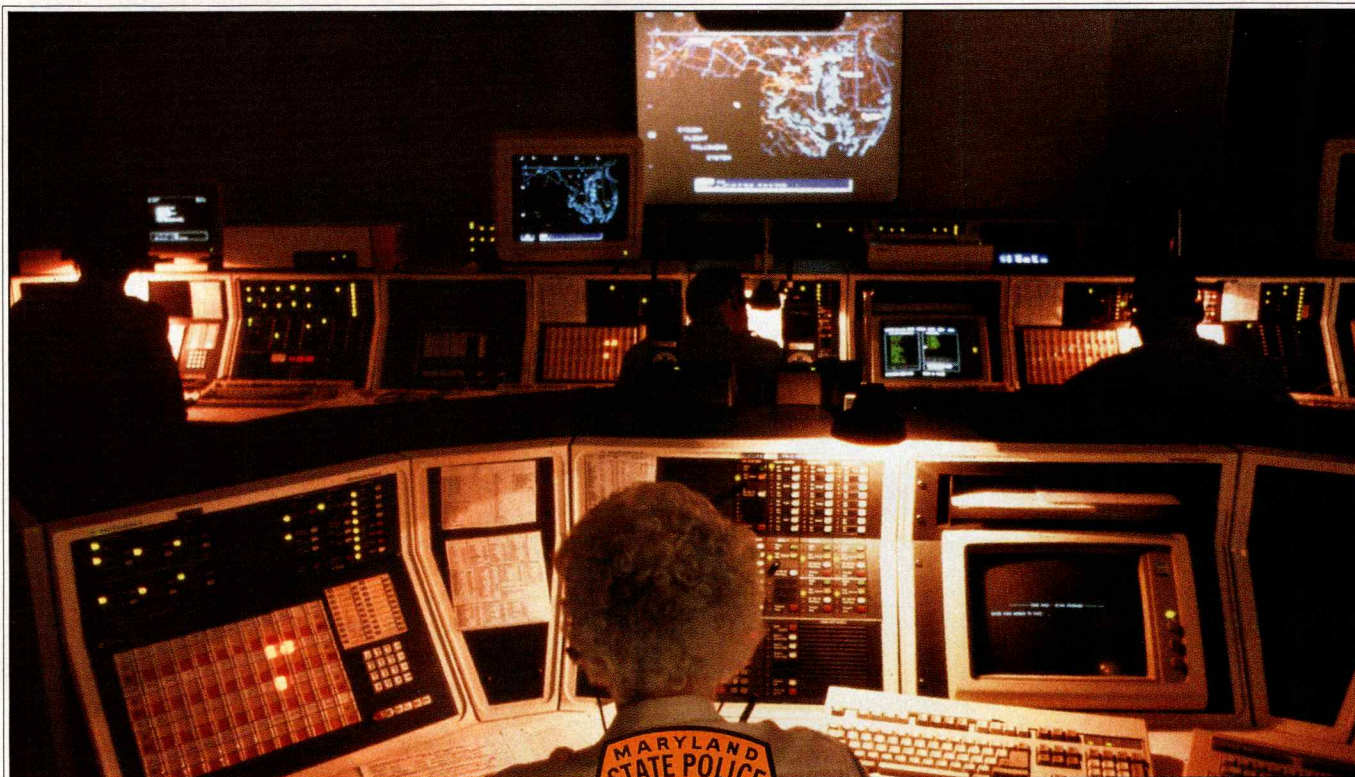


tracked by a flight following system that receives altitude and loran-based position information from each aircraft every 30 seconds through a statewide network of receiving antennas. The system at present can track helicopters down to 200 feet agl. When the planned transition to the satellite-based Global Positioning System is implemented, tracking to ground level will be possible. Helicopters' positions are plotted electronically on large computer display terminals. If a patient should develop a special problem enroute, dispatchers at "syscom" (the system communications center at Baltimore's Memorial Hospital) can offer the pilot a vector to the nearest hospital with the appropriate facilities for dealing with the medical emergency. At the same time, the Dauphin's on-board medical equipment is telemetering the patient's vital signs to the destination hospital, so the staff there can prepare for the patient's arrival. Forty percent of the medevacs head for Baltimore's University Hospital, home of MIEMSS. There are six other trauma centers statewide.

Maryland's system is the most sophisticated and costly state-run EMS program in the nation. The brainchild of the recently retired Dr. R. Adams Cowley, who sought to put into civil practice the lessons learned from airborne evacuation of casualties from the battlefields of Korea and Vietnam (see "Dust Off," April 1987 *Pilot*), MSP's program began in 1970 with a single JetRanger. Since then, more than 140,000 missions have been flown, over 40,000 of them medevacs. Never in that time has a helicopter accident claimed the life of a civilian.

Despite a safety record outstanding in the EMS field, three MSP helicopters have crashed, killing their crews. Two of the three accidents were weather-related, resulting from inadvertent VFR flight into instrument meteorological conditions. After the most recent accident, in 1986, it was decided that the JetRangers, which are not approved or equipped for instrument flight, would be replaced with instrument-capable helicopters and that pilots would not only be instrument rated, but current and proficient. After a long and sometimes controversial evaluation period, the state settled on the Aerospatiale Dauphin, which, thanks to a dual-channel autopilot, is approved for single-pilot IFR operations. Safety is the hallmark of the MSP program; for example, the agency developed the first minimum





**Dispatchers track rescue flights (above). Major Charles R. Hutchins (below) is commander of MSP's Aviation Division.**



equipment list for EMS Dauphins, even though public-service helicopters are not required to operate with one.

EMS missions are not flown under IFR conditions, however. After all, it would be impossible to shoot an instrument approach to an accident site in IMC. In fact, conservative weather minimums—an 800-foot ceiling and 2-mile visibility for daytime and 1,000-foot ceiling and 3-mile visibility for nighttime operations—are strictly observed. And pilots are encouraged to use discretion even when the weather is nominally above minimums. But should a flight inadvertently encounter IMC, the aircraft and the pilot are equipped to climb to a safe cruising altitude, obtain an IFR clearance, and proceed to the nearest airport with an appropriate instrument approach. MSP's pilots receive an initial 25 hours of actual instrument experience in the Dauphin and are expected to log eight hours of instrument time in addition to six instrument approaches in each six-month period. They are also encouraged to practice regularly in the ATC 112H helicopter simulator located at Martin State; the simulator is programmed with all the instrument approaches in Maryland.

Whereas at one time state troopers volunteered for aviation duty and were trained to be pilots, sophisticated aircraft

such as the Dauphin demand higher skill and experience levels than beginners possess, so MSP pilots are now selected from applicants with extensive, and almost always military, helicopter experience. Minimum standards include a commercial certificate with an instrument rating and at least 2,000 hours of rotary-wing time. The select few accepted for the program then undergo six months of training at the police academy and two months of field work before beginning their duties with the Aviation Division. (In addition to the helicopters, two fixed-wing aircraft are based at the Baltimore section: a 1976

Piper Navajo used for interstate extraditions and a 1979 Cessna 182 equipped with a Vascor+ unit and used primarily for highway speed enforcement.)

Medics, too, are troopers (yes, both pilots and medics carry semiautomatic pistols in shoulder holsters when on duty) and also face stiff entrance requirements, including national and Maryland certification as an emergency medical technician—paramedic. Proficiency and recurrent training are stressed as highly for medics as for pilots. In furtherance of this policy, a MIEMSS doctor, who reports directly to the state's EMS director, is attached to the Aviation Division as consultant and trainer; he frequently flies missions with the regular crews.

Medics are trained to operate the Dauphin's forward-looking infrared (FLIR) equipment, used primarily for landing zone reconnaissance and SAR missions. The FLIR comprises a movable sensor mounted under the nose of the helicopter and a television-like screen in the cockpit center console; the system is capable of discerning temperature differences between an object and its surrounding environment as small as 1/600 of a degree. On a recent mission to provide backup security for a Presidential visit to the U.S. Naval Academy in Annapolis, a FLIR-equipped Dauphin discovered an unauthorized interloper in a



boat under a dock.

The medic also operates the Dauphin's 30-million-candlepower searchlight, which retracts into the aft belly of the helicopter when not in use, and the 600-pound-capacity hoist, mounted on the right side of the aircraft. The hoist is used for "vertical rescue" work. Crews are trained to use the hoist with a Billy Pugh net for water rescues, and they can also use the hoist for HEAT insertion. HEAT is Maryland's High-rise Emergency Aerial Team, a cadre of specially trained firefighters who can be lowered onto the roof of a burning building.

In case the helicopter cannot land adjacent to an accident site, the medic is equipped with a Thomas bag, a backpack containing a complete set of emergency medical gear. Much of the helicopter's lifesaving equipment, too, such as an electrocardiograph/defibrillator, is portable and can be slid out of its mounting brackets for use in the field.

According to Major Charles R. Hutchins, commanding officer of the Aviation Division, the Dauphin is the perfect helicopter for the "scene work" required of it in Maryland. Because its landing gear comprises wheels instead of skids, it can be landed far enough from an accident site to avoid raising a duststorm or hampering ground personnel with its downwash and then taxied closer as conditions warrant. The wheels do not hamper soft-field operations, however; the wheel struts have a 12-inch stroke, and the Dauphin needs just 8 inches of ground clearance, and this only to protect its belly-mounted antennas. The



**Highly trained crews and advanced lifesaving equipment offer trauma victims their single best hope for survival—time.**

Dauphin's unique shrouded "fenestron" tail rotor enhances the safety of personnel working near the helicopter, which is typically kept running during a rescue. (The pilot remains in the cockpit during such "hot loading.") For nighttime work, the Dauphin is a veritable light show. The fenestron is lighted. A squat switch on the landing gear automatically turns on a fan of low-angle lights around the loading doors. And a set of lights illuminates the main rotor so that rescue workers can clearly see the spinning disk, which in any case is normally high above their heads.

The first of the Dauphins was delivered in May 1989; six were delivered that year at a cost of \$4.3 million apiece and three in 1990 at \$4.5 million a copy. All MSP pilots, mechanics, and avionics technicians go through a factory training program at Aerospatiale's U.S. headquarters in Grand Prairie, Texas. For the pilots, this amounts to two weeks of ground school and two weeks of flight training. Maryland has an option to purchase three more Dauphins, which would bring the program up to its full planned complement of 1.5 Dauphins per section, but no negotiations are un-

der way for those machines. Given Maryland's current fiscal woes, it is unlikely any action will be taken soon.

The helicopters are serviced on a progressive 25-hour maintenance schedule at the Baltimore section at Martin State, which is an FAA-approved repair station. Maintenance is conducted 16 hours a day. The high-time Dauphin has now reached 1,000 hours (in comparison, the high-time JetRanger has about 8,300 hours). According to Major Hutchins, the Dauphins have not been in service long enough for any firm projections to be made regarding long-term maintenance requirements, but he says their reliability has been "outstanding" and that maintenance demands have been "better than expected." Optimum utilization for the Dauphins is projected at around 600 hours per aircraft per year, and flight time is carefully monitored so that a minimum number of machines is down for maintenance at any time.

Hutchins is clearly proud of his 58 pilots and 51 medics and of the Aviation Division's role in the state's EMS system. As a public servant, he considers his position "unique in that you have highly motivated personnel, the best equipment, and money adequate to do the job." Indeed, accident victims are not charged for helicopter medevac services. That cost is borne, with little complaint, by the taxpayers. It is something to be proud of. When time itself may be the only weapon in the fight for life, one look at 2,815 pins on a map reminds us of the narrow, but critical, advantage we are sometimes accorded. □

