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## Cover



A U.S. Customs and Border Protection (CBP) Sikorsky UH-60 Black Hawk conducts a fast-rope operation. The UH-60 is one of a number of helicopter types operated by CBP.  
**EDWIN MONTUFAR PHOTO**



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Vertical is proud to be a member of



**PUBLISHED AND PRODUCED BY:** MHM Publishing Inc.

**SUBSCRIPTION INQUIRIES CALL TOLL-FREE:**

866.834.1114

Vertical Magazine (ISSN 1703-8812) is published six times per year (Dec/Jan, Feb/Mar, Apr/May, Jun/Jul, Aug/Sept, Oct/Nov) by MHM Publishing Inc., paid at Fall River, WI. Postmaster please send address changes to: Vertical Magazine, PO Box 8, Fall River, WI, 53932.

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International Serial Number ISSN 1703-8812

Canadian Publication Mail Agreement Number: 40741549

Postmaster: If undeliverable, return mailing label only. Printed in U.S.A.

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COLUMN IN AN  
 FOCUS ON PROFESSIONALISM | TONY KERN  
 COLUMN

THE DAMN FEW

A few years back, I found myself at a bar in San Diego knocking a few back with some Navy SEALs. We began with the required bantering on who had the best service. I pointed out that Chuck Norris was an Air Force veteran, and that shut them down temporarily.

As the evening wore on, they hoisted their glasses with the traditional SEAL toast “Damn Few,” a tribute to how tough it is to become one of their cadre. It got me to thinking about elite organizations and what makes them different.

In my humble opinion, aviation first responders are an elite group with a critical life-and-death mission performed in the toughest of circumstances. There is considerable and justifiable pride within the industry. But I wonder if the critical lessons of elite organizations have found their way into this group?

For the last 20 years, I have studied high performing organizations and learned that there is one critical difference between

them and their lower performing counterparts. They operate from a different mindset that has more to do with *honor* than traditional performance measures.

Elite organizations like the SEALs have a set of shared expectations that drive each individual to not only do their best, but also to support others in doing so. They plan, brief, debrief. They adapt and improvise, but always with an eye towards risk and reward of their intended course of action.

This builds a level of trust and expectation of excellence that makes mere compliance a basement dweller of performance metrics. They perform out of an obligation to their peers and those they serve — it’s about honor and respect for what they do, who they do it with, and who they do it for.

**IN PRAISE OF ELITISM**

Elitism has a place in first response. There is nothing wrong with people who seek to be better than the rest, to stand above the crowd. I’m not talking about

the egocentric jerks who have too much pride and narcissistic, self-inflated egos, but rather the quietly confident expert who has earned the right to be considered in the top one percent of their respective field.

If we hope to reverse the decline of professionalism we are witnessing in many corners of the aviation industry, we will need more, not less, of this type of elitism to lead the way.

The fact that most organizations haven’t (yet) defined the standards to identify this group does not alter the fact that these high performing experts exist. They are not always the ones who are known to the world, or who hold prestigious positions of authority, *but they are known to their peers and the public they serve.*

**HARD OPPOSITION FROM THE ‘COMFORTABLY MEDIOCRE’**

While the elite have intuitively figured out what it is that makes a true expert and have voluntarily followed the path, the comfortably mediocre often despise their refined standards of performance. It doesn’t allow the wiggle room for claiming greatness through the volume of their voice, position, or type rating.

As we seek to improve the safety record and public trust of the first response aviation sector, let’s start with looking to those “damn few” who seek the highest standards — those who are continuously learning from every flight, from every from every experience, and who go the extra steps as a matter of routine.



There is nothing wrong with people who seek to be better than the rest, to stand above the crowd. I’m not talking about the egocentric jerks who have too much pride and narcissistic, self-inflated egos, but rather the quietly confident expert who has earned the right to be considered in the top one percent of their respective field.

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# COLUMN IN AN

HAA CORNER | **BILL WINN**

## CALL OF DUTY: MORE THAN JUST A GAME?

I have watched my two live-in grandsons, now ages 11 and 13, progress from the Nintendo Wii to the Microsoft Xbox and most recently to the Sony PS4. And, while I don't feel warm and fuzzy about the level of graphic violence associated with their favorite urban battle simulations, I am impressed by their facility with the controls as they knock off one bad guy after another while moving toward their ultimate objective.

But I am even more impressed by the graphic detail and reality of the visual environment in which their battles take place. As I stand behind the couch in our basement where they participate in their fast-paced, non-stop assault on evil, sometimes I can't restrain myself from yelling out things like, "Watch out for that guy on your left! He has a hand-grenade!" Only to have my grandson, Anthony, respond, "That's Daryll. He's playing with us in Miami. He's on our side. Stop distracting me, Grandpa."

Oh, right; sterile cockpit. Sorry.

Up one level from flat-screen video games are the new virtual reality simulators in which the user views an animated 3D projection of his immediate surroundings via a motion-sensitive binocular display mounted on his face. The fidelity and reality of these displays are amazing, and commercial virtual reality amusement centers are popping up across the nation.

Along with these technologies, let's consider the features provided by even the more

basic flight data monitoring (FDM) systems. The program that I work for uses a system that records video, audio, and aircraft inertial flight data that we can later review for quality assurance and process improvement purposes. The Federal Aviation Administration has ruled that all U.S. air medical transport providers must have FDM installed in their aircraft by April of next year.

An additional feature of our FDM system is the ability to download terrain data and satellite imagery of the surface of the earth for the routes of flight that are recorded by the FDM system. The playback software is designed to integrate all this data to present a simulation of any flight. The reconstruction of the flight includes cockpit video and audio, along with an accurate graphic simulation of aircraft flight maneuvering portrayed over a satellite view of the actual earth's surface below the aircraft. The playback can be viewed from any desired angle outside the aircraft, or from inside the cockpit.

My real reason for talking about video games, virtual reality systems, and FDM technology is to point to what seems to be a logical solution to the ongoing problems in air medical transport safety. Recent reports of accidents have indicated that loss of control (LOC) or controlled flight into the terrain (CFIT) continue to be factors in these accidents. The bottom line for LOC and CFIT accidents has always been a lack of adequate visual reference for the pilot to use to control the flight

path of the aircraft. This reduced visibility often combines with an aircraft and/or pilot that is not equipped or otherwise prepared to operate in instrument meteorological conditions (IMC).

Think about it. Instead of a direct view of the earth to provide visual reference for aircraft control, the instrument flight rules (IFR) pilot must alternately direct her attention across an arrangement of flight instruments that provide separate, symbolic representations of the aircraft's spatial relationship with the earth below. The pilot also must reconcile these separate and symbolic indications with the often conflicting proprioceptive sensations caused by her control inputs and the movement of the aircraft through the sometimes-unstable air mass. This is not an easy task and a helicopter is not an especially stable aerial platform.

All of the things discussed above suggest how, in the near future, technology could replace this fragmented array of separate instruments with a graphic representation of the real thing. Why must a pilot continuously scan and interpret the symbology of flight instruments rather than reference a real-time panoramic display of the earth below the aircraft? Combine the technology from virtual reality gaming and FDM with helicopter terrain awareness and warning systems, GPS/WAAS, and a sprinkling of ADS-B. Add in a heads-up display and we can turn IMC into *simulated real-time visual meteorological conditions* for both en-route flight segments and IFR approach procedures.

My understanding is that people a lot smarter than I am are already working on concepts like this. I look forward to the day when the technology enjoyed by my grandsons as entertainment can be put to use saving lives in the real world.

*Bill Winn is the general manager of the National EMS Pilots Association.*



The bottom line for loss of control and CFIT accidents has always been a lack of adequate visual reference for the pilot to use to control the flight path of the aircraft.



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Leonardo and its partners in "Team Cormorant" are proposing a modernization project for the CH-149 based on the Norwegian All-Weather Search and Rescue Helicopter program. **Mike Reyno Photo**

## Cormorant, Griffon upgrade projects get new lift

Funding for two Royal Canadian Air Force helicopter programs is looking more promising.

**BY CHRIS THATCHER**

**I**n the weeks before Canada's largest defense and security tradeshow, the Minister of National Defence and a Senate committee gave military helicopter manufacturers, many of whom have seen a sales slump in recent years, reason for optimism.

Midlife upgrade programs for both the CH-146 Griffon transport and tactical helicopter and the CH-149 Cormorant search-and-rescue helicopter have been on the Royal Canadian Air Force (RCAF) project list for several years, but neither have had funding approved to launch into project definition.

In an address on May 3, Defence Minister Harjit Sajjan described the dismal state of military spending and flagged both helicop-

ters as part of a growing list of unfunded equipment and technical capabilities urgently required for the armed forces to meet domestic and international operational demands.

A week later the Senate Standing Committee on National Security and Defence also raised both helicopter projects in a report outlining a plan to reinvest in the military, recommending a Griffon replacement program be prioritized and that the government move forward with a proposal to expand the Cormorant fleet by upgrading the 14 CH-149 aircraft and converting seven VH-71 airframes currently in storage to the same operational capability.

While the RCAF has outlined a limited life-extension project for the CH-146 that would upgrade avionics and some communications systems, it has also assessed whether

it might be better to invest in a new platform, bringing the tactical aviation capability on par with the CH-147F Chinook.

The prospect of a new helicopter acquisition program was clearly welcomed by Airbus Defence & Space. Romain Trapp, president of Airbus Helicopters in Canada, led off the company's corporate press briefing at CANSEC on June 1, highlighting the capability of the H145M as an option for the Griffon replacement.

With the rapid introduction of new technologies in its aircraft, Trapp said Airbus' eventual offering would depend on when a request for proposals is issued. But the company has been pushing for an accelerated program, he said, and has provided the RCAF with a recent white paper and customer analysis as well as cost projections.

“We made the business case by showing [the Air Force] that simply by going to a new platform, the Canadian taxpayers would save more than \$1 billion 10 years from now,” he said.

“Today our current proposal is the H145M, which is a proven platform,” he added, noting that the multirole aircraft is “ideally suited for the Canadian tactical reconnaissance utility helicopter requirements.”

The U.S. Army ordered the UH-72A Lakota, a variant of the H145M, in 2006 as its light utility helicopter and currently operates a fleet of 400. The aircraft is also in service with German special forces, possibly a key consideration in a Canadian procurement given that 427 Special Operations Aviation Squadron also operates the Griffon.

“All deliveries were done on time, on budget, on quality,” said Trapp.

Airbus is now investing heavily in autonomous flight technologies and will soon develop “fully autonomous versions of some of our helicopters,” he added. “This will allow us to respond to the emerging needs of our defense customers all over the world.”

For Leonardo Helicopters (formerly AgustaWestland), increased activity around a Cormorant midlife upgrade program was reason enough to put the band back together. Days before CANSEC, the company announced the reassembly of Team Cormorant, the industry partnership of Leonardo, IMP Aerospace, CAE, Rockwell Collins Canada and GE Canada that delivered the CH-149 in 2000.

Team Cormorant is proposing a modernization project based on the Norwegian All-Weather Search and Rescue Helicopter (NAWSARH) program, which selected the AW101 in 2013 to replace its fleet of Sea King aircraft and is expecting delivery of the first helicopter later this year. The CH-149 is a variant of the AW101 medium-lift helicopter now in service with over a dozen militaries.

The team is also proposing to expand the Cormorant fleet from 14 to 21 aircraft by converting seven VH-71 airframes, airworthy variants of the AW101, that were acquired from the U.S. government in 2011 for spare parts, to the same configuration. The additional aircraft would allow the air force to return the Cormorant to 424 Transport and Rescue Squadron at 8 Wing Trenton, Ontario, which currently operates a fleet of Griffon helicopters.

Leonardo has argued that, with an average of over 5,000 hours on the airframes, all of which are around 16 years of age, and growing concerns about parts obsolescence, an immediate update is required if the RCAF wants to meet its service life target of 2040.

The upgrades would include new cockpit displays, avionics, digital automatic flight control system, aircraft management system, electro-optical surveillance system, and weather radar as well as a new 3,000-horsepower CT7-8E engine.

Leonardo is also offering a new Obstacle Proximity LiDAR System that would provide directional audio and visual warning when the helicopter blades get too close to obstacles, and mobile phone detection technology that would effectively turn the aircraft into a mobile phone cell and allow its onboard system to identify and track a mobile phone within a 25-mile range.

The Cormorant fleet had problems with availability in the early years of the program, but John Ponsonby, managing director of Leonardo Helicopters, said “dispatch availability is over 98 percent with the current fleet. We continue to support IMP and we provide the level of support expected by the customer.”

The Air Force has been supportive of the VH-71 conversion proposal but RCAF commander LGen Mike Hood told *Vertical 911*

in an interview last November that repair and maintenance costs of the extant fleet would need to be reduced before the air force could move ahead with the plan.

“I believe once we get there, the conditions will be set for me to drive forward with a Cormorant midlife update and I want to see the VH-71s included in that,” he said. “But until such time as they can deliver on what the department has asked in the way of reducing cost, I’m a little stuck.”

Ponsonby acknowledged the issue and said large strides have been made in recent years to reduce the cost of ownership. “We have committed to a significant program of cost reduction and we have delivered a significant percentage of cost reduction already . . . we are focused on providing best value, we are taking action, and that action is delivering results.”

As part of its options analysis, the Air Force had considered the possibility of replacing the CH-149, but an upgrade program now appears to be the preferred option. Ponsonby believes it’s the correct decision.

“Our argument is that we can insert the capabilities you are looking for, and the reliability and cost of ownership are reduced,” he said. “You have used this platform for 18 years, it has done absolutely great service, there is nothing better on the market, so a [midlife upgrade] does make sense.”

The CH-146 Griffon could be replaced with a new platform. Airbus Defence & Space is pitching the H145M for the role. **Mike Reyno Photo**





## Army testing potentially lifesaving foam device

**T**he U.S. Army Medical Materiel Agency (USAMMA), a subordinate organization of the U.S. Army Medical Research and Materiel Command (USAMRMC), is supporting a pivotal clinical trial to test the safety and effectiveness of a self-expanding foam device to stop massive intracavitary abdominal bleeding.

The device received an Investigational Device Exemption in early 2017 from the U.S. Food and Drug Administration. Throughout the next year, the device developer will select the clinical trial sites and complete pre-study approvals. The U.S. Army Medical Materiel Development Activity, which is also part of USAMRMC, will provide regulatory support for the project. The anticipated start date of the clinical trial is 2018.

“Right now, we are looking at this device as a potential stop-gap for patients awaiting surgical care,” said Leigh Anne Alexander, USAMMA product manager. “This is not going to repair the injury but it could be a ‘bridge to surgery,’ keeping the patient alive long enough to give them a fighting chance at survival.”

The device resembles a caulk gun that contains expandable foam designed to be injected into a patient by a trauma surgeon. The injector allows two separate chemicals to mix, causing the product’s material to rapidly expand inside the abdomen to about 35 times its original volume. The foam is

designed to expand around the patient’s internal organs to stop bleeding and can be left inside the patient for up to three hours.

Army Medicine is focused on identifying and transitioning solutions currently in research and development that reduce the number of hemorrhage deaths in the military. Exsanguination, or bleeding to death, remains the most common cause of potentially survivable death to wounded warfighters. A study published in the *Journal of Trauma and Acute Care Surgery* in 2012 reviewed nearly 5,000 battlefield fatalities from 2001-2011, categorizing them into two groups — non-survivable and potentially survivable. Of those that were considered potentially survivable deaths, more than 90 percent were related to hemorrhage. Of those deaths, more than 67 percent were related to truncal hemorrhage.

The wound stasis program began in 2010 at the Defense Advanced Research Projects Agency (DARPA). Under that program, DARPA collaborated with a private vendor, along with the Massachusetts General Hospital and the Harvard Medical School, to develop a novel, self-expanding polyurethane foam that rapidly compresses major abdominal bleeding due to trauma. The project transitioned to the Army in 2015 after promising animal study results.

“We are optimistic that this study will provide meaningful data and pave the way for future research,” Alexander said.

## SevenBar Aviation celebrates 70 years of service

When Albert Black and his family built a dirt strip runway on the family ranch in 1947, their intentions were simple. They wanted to build an aviation company from the ground up that focused on safety, quality, and personalized customer service.

Black had recently returned from the Second World War and wanted to channel his love for flying and aviation by building a business that would initially provide flight instruction and fixed base operations (FBOs). Later, his son Rolfe Black joined the company and expanded SevenBar’s services into aircraft sales, charter, maintenance, and eventually air medical services.

This year, SevenBar Aviation is celebrating 70 years of successful aviation business. With nearly 100 employees, SevenBar Aviation has grown its geographic footprint significantly but remains true to its founding mission and core values envisioned by Albert Black.

Today, the company is headquartered in Dallas, Texas, and is led by Wade Black, grandson of SevenBar founder Albert Black.

In 2008, SevenBar Aviation exited the FBO business to strategically focus its efforts on providing aviation services to the healthcare industry. The organization has partnered with leading healthcare systems across the country to provide fixed- and rotor-wing air medical services for patients of all ages for four decades.

“Our long-term success over the years is really attributed to our dedicated employees and the amazing relationships we have built with our hospital partners,” said chairman and CEO Wade Black. “We have weathered many industry challenges and celebrated many successes together as an extended family — we will continue to do so as we embrace the future of aviation and healthcare.”

The SevenBar team is currently ramping up for the addition of several new fixed- and rotor-wing aircraft, new aviation and maintenance personnel, new program bases, and new hospital partnerships. “This is an extremely exciting time for SevenBar Aviation. We are truly honored and humbled to share this celebratory milestone with our team and healthcare partners,” said Kimberly Montgomery, president and COO.



# Vanderbilt LifeFlight launches app for emergency responders

**V**anderbilt LifeFlight has developed a new app that allows for emergency responders to request a helicopter at the tap of a button. The app also uses computer-aided software to send the emergency responders' location and other helpful information directly to dispatch personnel at LifeFlight's Communications Center.

The app, developed in partnership with LifeFlight's computer-aided dispatch vendor Flight Vector, has a multitude of features helpful to emergency personnel. Not only can users request a helicopter via the app, they can also receive push notifications from LifeFlight on education and upcoming training events, access to LifeFlight's training event calendar, a hospital directory, and a landing zone guide.

"We have worked for more than a year to develop this app, and its rich interoperability with our dispatching and flight tracking software," said Stephan Russ, M.D., associate professor of emergency medicine and associate chief of staff at Vanderbilt University Adult Hospital.

Russ said discussions for an app had been underway for several years but always concluded with no efficient and reliable way for the communications center to receive requests.

"We considered a variety of ways to receive calls, including text messaging," he explained. "But none of those ways provided an efficient and reliable way to actively receive emergency flight requests."

That dynamic changed when the company performing the computer-aided design agreed to marry the app with its flight-dispatching

software — so that the request became an integrated part of the dispatch process. "It's seamless and a time saver," said Russ.

Simply tapping the "flight call" button on the app sends users' information to Vanderbilt LifeFlight, including their GPS coordinates, name, organization, and other information the user is able to type into a text box. This information pops up as a new "mission strip" on a computer screen at the LifeFlight Communications Center, where personnel are monitoring the computer-aided dispatch software (Flight Vector). A visual and voice alert that a new flight request has been received by a mobile app user is also triggered.

Once the aircraft has been launched, the emergency responder who made the request will receive a notification on the app that shows which aircraft has been dispatched, and a map will display with the estimated flight time and estimated time of arrival. A red line will appear on the map with the projected flight path.

"We've been fortunate to be able to partner with Vanderbilt LifeFlight on this exciting project," said Scot Cromer, president and CEO of Softtech Inc., the software developer of Flight Vector.

Cromer said that his company has been so impressed with the Vanderbilt LifeFlight app and its ability to interface with Flight Vector that it will release a similar version to other Flight Vector customers across the country. Each version can be configured to be specific to the area for each customer's flight program.

The app is available on the Apple App Store and on Google Play.



First responders can easily request a Vanderbilt LifeFlight helicopter through a new app developed in partnership with Flight Vector.

Warne Riker Photo

# Challenging rescue highlights Falklands SAR capabilities

BY ELAN HEAD

**A** dramatic maritime rescue has highlighted the search-and-rescue (SAR) capabilities of the new Leonardo AW189 helicopter and the crews operating it on behalf of the U.K. Ministry of Defense (MoD) in the Falkland Islands.

In the early hours of May 15, 2017, “Rescue 1” was called to evacuate a critically injured fisherman from a vessel located 130 nautical miles northwest of the aircraft’s base at the U.K. MoD Mount Pleasant Complex. The AW189 is one of two being operated by AAR Airlift and its partners, British International Helicopters and Air Rescue Systems, on a 10-year commercial SAR contract in the Falklands.

Launching in total darkness and low clouds, the Rescue 1 crew — consisting of two pilots and two rearcrew — made their way to the vessel. Once on scene, they conducted a technical high-line rescue while contending with gale-force winds and rough seas.

“The vessel carrying the casualty was a fishing squid jigger, which is notoriously dangerous and difficult to conduct this type of winch operation,” explained AAR Airlift Captain Robert Jones via email. “There is extensive fishing equipment, stays, cables, and mast affixed to its hull and superstructures. Gale force winds and sea state 6 conditions meant the crew had multiple attempts with different winching profiles and ships headings until they found a configuration from which it was safe to winch.”

Once the 48-year-old male patient was on board, the rearcrew provided medical attention during the transfer to Stanley Airfield, located on the east coast of East Falkland Island. According to Jones, when the crew delivered the casualty for onward medical care, they had to conduct a full radar letdown and remained in instrument meteorological conditions until they were 130 feet above the sea, after which they conducted a hover taxi to the landing site using night vision goggles. In all, the mission lasted more than four hours.

Team AAR has now performed over 20 successful SAR missions since commencing

operations in the Falklands in March 2016. Jones reported that the AW189 is “performing better than expected in most areas, particularly in terms of range and endurance.” On this mission, he noted, the additional endurance was “a welcome blessing, and despite flying over four hours, the aircraft had an estimated one hour of fuel endurance remaining.”

The technological advantages of the AW189 notwithstanding, the successful execution of this mission owed as much to the capabilities of Team AAR personnel, Jones emphasized.

“All crewmembers have extensive prior SAR experience: military, commercial, or a combination thereof. They regularly create complex training scenarios to ensure readiness for any eventuality; it is this training which allowed them to execute this mission in poor weather approximately 130 nautical miles out to sea. Flawless teamwork is essential for a positive outcome in these situations, including the support our crews receive from a dedicated team of professional engineers, safety equipment technicians, and operational support staff.”



AAR is currently operating two Leonardo AW189 helicopters for search-and-rescue in the Falkland Islands. **AAR Photo**



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The AW101 Norway Training Center features an advanced full flight simulator jointly developed by Leonardo and CAE, which will be available to other AW101 customers. **Leonardo Photo**

# Leonardo AW101 Norway Training Centre now open

**L**eonardo has announced the official opening of its AW101 Norway Training Centre at Stavanger Sola Airport by Per-Willy Amundsen, Minister of Justice and Public Security. The training center includes a new AW101 full-flight simulator (FFS), which will support the training of Norwegian aircrew and will also be available to other AW101 customers.

The first training course at the center, for Royal Norwegian Air Force pilots, started on June 12, prior to delivery of the first two of 16 aircraft ordered by the Norwegian Ministry of Justice and Public Security for search-and-rescue (SAR).

"I'm delighted to officially open the AW101 Norway Training Centre, which enables advanced training courses to be delivered to our search-and-rescue aircrew here in Norway, utilizing the very latest simulation and training technologies," said Amundsen. "This facility will not only help reduce the cost of training, but most importantly will enhance safety and enable aircrew to exploit the new capabilities the AW101 helicopter and its systems will provide in service."

The AW101 FFS, jointly developed by Leonardo and CAE to Level D, the highest qualification for commercial flight simulators, is a CAE Series 3000 device. It combines a Leonardo Helicopters-developed flight dynamic model, avionics, and aircraft software modeling with CAE's core simulation technologies, including the CAE True six degree-of-freedom electric motion system and high-performance

vibration platform; a high-fidelity CAE Medallion-6000 visual system; and a direct projection 210-degree by 80-degree extreme field-of-view dome display system.

This new AW101 FFS also includes important mission systems such as SAR autopilot modes, digital map, radar, aircraft mission management computer, multi-purpose control and display units, cockpit display system, and flotation system.

Located in a new annex to the Thales Flight Training Centre, the simulator is operated and managed by Leonardo Helicopters to deliver its wide range of original equipment manufacturer (OEM) training courses. The center will also house a Royal Norwegian Air Force-owned AW101 SAR console training device that is linked to the FFS to provide rear crew training.

The facility is conveniently located just 800 meters from Stavanger Sola Airport, making it easily accessible for aircrew from around the world to attend type conversion courses, refresher training and specialized operational training for the AW101 helicopter. The new AW101 service in Sola will be a dedicated satellite of Leonardo Helicopters' Yeovil Training Academy, marking a further expansion of its regional training centers.

In December 2013, Leonardo Helicopters signed a contract with the Norwegian Ministry of Justice and Public Security for 16 SAR-configured AW101 helicopters plus support and training services for the initial 15 years.

## ROTOR **BITS**



**CHC Photo**

### CHC HELICOPTER AWARDED SAR CONTRACT WITH AUSTRALIAN NAVY

**C**HC Group announced it has begun operating a 15-month contract to provide aviation emergency response services out of the Australian Navy base at Nowra, on the south coast of New South Wales.

Provision of the interim search-and-rescue (SAR), aeromedical evacuation (AME) and crash response services will be delivered at HMAS Albatross until the proposed commencement of an Australian Defence Force (ADF)-wide contract in 2018.

CHC now provides SAR, AME and crash response services to all three of the ADF services in Australia, covering the Royal Australian Air Force, the Army and now the Navy base.

An auto-hover-capable Leonardo AW139 has been delivered from CHC's global pool of SAR assets and is compliant and certified to the latest standards for crash resistance. The machine has been used to successfully operate similar SAR services in the United Kingdom.

The AW139 aircraft at the Nowra base will provide SAR coverage for all naval helicopter operations in support of aircrew training and Royal Australian Navy Fleet exercises in the local sea training areas.

"CHC is very proud to be awarded this interim contract with the Australian Navy and to be able stand service up quickly for them," said Vince D'Rozario, regional director, CHC Asia Pacific. "I would like to thank the Navy for the opportunity to serve them and recognize our experienced team at CHC who put this service together with speed and professionalism."

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# CHC winchman receives Billy Deacon Memorial Trophy

**C**HC Group has announced that winchman Gary Robertson of CHC Ireland has received the Billy Deacon Search and Rescue Memorial Trophy for his role in a lifesaving mission with the Irish Coast Guard. The trophy was presented at the Air League's Annual Awards Ceremony on May 30 by HRH Prince Philip, Duke of Edinburgh.

Sponsored by Bristow Helicopters and Breitling UK, the trophy has been established to further the memory of Billy Deacon, winchman for Bristow Helicopters, who was tragically lost while carrying out his duty on behalf of the Maritime and Coastguard Agency search-and-rescue (SAR) helicopter based at Sumburgh in the Shetland Isles in 1997.

Robertson was recognized for his courageous actions in a rescue on April 9, 2016, when Rescue 118, a Sikorsky S-92 helicopter, was scrambled to a report of a capsized vessel and a person in the water by Innisiny Bay, Arranmore Island. Upon Rescue 118's arrival, the six-meter fishing vessel had already sunk and the casualty was seen to be clinging to a life buoy in his left arm. Although he had managed to inflate his lifejacket, he had no survival suit.

With waves repeatedly crashing onto the casualty, frequently submerging him and pushing him toward the shore, it was clear that a swift rescue was required to save the fisherman's life. The winchman was deployed to the scene and, as he approached through heavy seas, it quickly became apparent that the rescue would be more complex than anticipated.

As the winchman was in the process of attempting to apply the two strops to effect a critical hydrostatic lift, both the winchman and winch operator noticed that the casualty was embroiled in a sizeable amount of thick rope. Upon closer inspection the rope, estimated to be about 30 feet long and one centimeter thick, was wrapped three to four times around the casualty, attached also to the lifebuoy, which in turn was still tethered to the submerged boat.

As the winchman battled the severe sea conditions and the downwash from Rescue 118, both the winchman and casualty were

consistently submerged. In an attempt to remove the downwash, the winch operator conned the aircraft to a position some 18 yards offset and around 250 feet above where the downwash effect was minimized. This enabled the winch operator to maintain this position, monitoring the winchman at all times as he struggled to attach both strops.

Once ready to recover the winchman and casualty, and acutely aware that both the winchman, casualty, and ultimately Rescue 118 were now all indirectly attached to the submerged vessel by the rope, the winch operator deftly raised the winch, while the co-pilot maintained a steady hover, to a position where the winchman could access his knife and cut the ropes, which were now under tension. Once cut, the combination of an accurate con and steady flying ability enabled the winchman to swing free, raising the casualty clear of the water and swell.

En route to hospital, Robertson, a registered paramedic, realized the severity of the casualty's condition: semi-conscious, frothing at the mouth, and cyanosed. With the assistance of his winch operator, immediate lifesaving medical care was administered. Upon arrival at the hospital, Robertson conducted a comprehensive patient handover to the medical team. Despite the casualty's condition on arrival, the hospital team was able to treat and therapeutically warm him, returning a positive result.

"On behalf of CHC, I want to say how proud I am that Gary has been awarded the prestigious Billy Deacon Trophy," said Mark Abbey, CHC regional director, Europe, Middle East, and Africa. "Gary's lifesaving actions exemplified the professionalism and bravery of our SAR crews, working in the most challenging conditions."

Gary Robertson accepts the Billy Deacon Search and Rescue Memorial Trophy from HRH Prince Philip, Duke of Edinburgh. **CHC Photo**



# Japan Coast Guard orders three more Airbus H225 helicopters

**A**irbus Helicopters has been awarded a contract from the Japan Coast Guard (JCG) for the purchase of three additional H225s. This new order will bring the JCG's total H225 fleet to nine units by February 2020. The JCG already placed an order for a sixth H225 in 2016, which will be delivered in 2018.

Under the agreement, the three H225 helicopters will be used for security enforcement, Japanese territorial coastal activities, as well as disaster relief missions.

"The Japan Coast Guard has been operating helicopters from the Super Puma family for 25 years, and this H225 follow-on order illustrates our customer's confidence in our product and the dedicated support we have provided to the team over the years," said Olivier Tillier, managing director of Airbus Helicopters in Japan. "The H225 is the perfect choice for JCG's missions including search-and-rescue, and coastal and islands protection, given its versatility in all weather conditions. The Airbus Helicopters team in

Japan will continue to render our utmost support to guarantee the continued availability of our customer's H225 fleet."

Currently operating eight helicopters from the Super Puma family, the JCG first introduced Airbus Helicopters' AS332 L1 into its fleet in 1992, and subsequently welcomed its first H225 in 2008. With this latest order, the JCG's Super Puma fleet will eventually grow to 11 units by 2020.



With its latest order, the Japan Coast Guard's H225 fleet will grow to nine units by 2020. **Airbus Helicopters Photo**

# ALEA announces Public Safety Drone Expo 2017

**T**he Airborne Law Enforcement Association (ALEA) has announced that the Public Safety Drone Expo 2017 will take place Oct. 16-19, 2017, at the New Orleans DoubleTree Hotel. This inaugural event will bring together public safety industry leaders, educators, decision makers, and end-users to share the latest in unmanned aircraft systems (UAS) technology, applications, and education.

The public safety drone industry is expanding at a rapid pace. A recent study identified at least 347 state and local police, sheriff, fire, and emergency units across 43 states that have acquired drones, the majority in the last year, with local law enforcement leading the way.

The Federal Aviation Administration (FAA) recently estimated that "the fleet of small hobbyists' unmanned aircraft systems will more than triple" by 2021, increasing from 1.1 million vehicles in 2016 to

3.5 million. It also estimates that commercial UAS operators will increase, growing from 42,000 in 2016 to 442,000 in 2021.

Public Safety Drone Expo 2017 will provide a platform to showcase the industry's latest technology for law enforcement, fire, and search-and-rescue. Public Safety Drone Expo 2017 will offer a combination of interactive public safety specific UAS courses, classes, and general sessions. Attendees will learn from top experts and public safety operators offering their insights into best practices, fundamentals, and integration.

The expo hall will bring together industry service providers, manufacturers, advocates, and thought leaders to highlight cutting-edge technology and applications. Early speaker commitments include John Meehan of the FAA unmanned aerial systems integration team, and Hoot Gibson, FAA senior advisor on UAS integration.



The tactical flight officer (TFO) job is one of the most demanding in law enforcement. Yet according to an ALEA survey, many TFOs are performing their duties without appropriate training. **Skip Robinson Photo**

# ALEA survey identifies top safety concerns

BY HILARY ROMIG

**F**or the second year in a row, the Airborne Law Enforcement Association (ALEA) has surveyed its members to identify their most pressing safety concerns and collect other safety-related information.

According to ALEA safety program manager Bryan Smith, “The top five concerns are IIMC [inadvertent flight into instrument meteorological conditions], fatigue, maintenance issues, complacency [and] training.”

Unmanned aircraft systems (UAS) were also a significant area of concern this year, with around 20 percent of respondents reporting a close encounter with a UAS. “Ten percent felt a collision with a UAS would lead to the next fatal accident,” noted Smith.

Smith explained that the annual survey helps ALEA pinpoint specific concerns that law enforcement aviation professionals have, so that the association can provide appropriate resources and training opportunities for its members.

“Training is a core value of ALEA,” he said. “If something we have been doing isn’t

working, I want to know about it so we can adjust the program accordingly.”

And the survey indicates that the need for professional training remains significant. As Smith pointed out in a recent safety e-newsletter, in the survey, only 73 percent of ALEA members reported that their agency’s tactical flight officers (TFOs) received training.

“That means 27 percent of our TFOs are trying to do what is arguably the most difficult job in law enforcement and carry out critical flight safety responsibilities as a member of a flight crew, often over the most high-profile situations in public safety... with no training,” he wrote.

Moreover, he added, “It’s not just pilots and TFOs, maintenance personnel are struggling to get the training they need to do their jobs. In the survey, 40 percent of respondents said that maintenance is not given continuing training.”

To help bridge these gaps, ALEA will be offering a number of training opportunities at its upcoming Expo 2017, July 24-29 in Reno, Nevada. These include tuition-free training options for unit managers and safety officers, and, for maintenance professionals,

a free inspection authorization (IA) renewal course. The conference will also feature human factors sessions led by ALEA aeromedical liaison Dr. Dudley Crosson, who has been collaborating with the association to address issues related to fatigue.

For those members who can’t make it to the Expo, ALEA hosts three online meetings every month for personnel involved in safety, maintenance, and UAS operations, and has also made numerous presentations and other safety resources available on the ALEA website. As Smith recently told members, “If you have not been on the website lately, you are missing out.”

Besides helping ALEA evaluate and adjust its training offerings, Smith noted that the annual safety survey has proven helpful for members to audit themselves and their operation standards, as “the questions reflect what we all want from our own operations.” The survey also emphasizes the safety management system (SMS) process, which “can be very effective when it’s done right,” Smith said.

According to Smith, “The plan is to continue conducting a survey every year.”





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# Boeing, Leonardo promoting MH-139 as Huey replacement

BY ELAN HEAD

**W**ith the U.S. Air Force expected to soon issue a final request for proposal (RFP) for the UH-1N Huey Replacement Program, Boeing and partner Leonardo Helicopters have been actively marketing their offering for the competition, the MH-139, a modified version of Leonardo's popular AW139 commercial helicopter.

Boeing and Leonardo unveiled the MH-139 in March at the AFA Air Warfare Symposium 2017 in Orlando, Florida. In May, it was back on display at AHS International's Forum 73 in Fort Worth, Texas, where Boeing capture lead Rick Lemaster gave *Vertical 911* a tour of the aircraft (which was also broadcast live on the *Vertical* page on Facebook).

The helicopter at the forum, which flew into and out of the convention center in Fort Worth, was in fact a production AW139, mocked up with a gunner position, hoist, missile warning system, flare dispensers, and sensor package to reflect what a military version would look like. But because the UH-1N's replacement — which will be used to protect intercontinental ballistic missiles and transport U.S. government and security forces — is not expected to perform a combat mission, the capabilities of the commercial AW139 alone gave Lemaster plenty to talk about.

"We believe it's really right-sized for the mission that the Air Force is looking to go execute," he said. "It's not like you've got a lot of additional weight or capacity that you're bringing along that you don't need. It really gives you just that right mix of agility, of size, and of efficiency as the aircraft is being operated."

The AW139 is commercially certified for a maximum takeoff weight of up to 7,000 kilograms (15,430 pounds), with seating for up to 15 passengers. "The cabin is pretty wide, it's taller than other military cabins so you have a little bit more room in there to be able move around," said Lemaster, noting that the stroking seats could be reconfigured based on customer requirements. He also pointed out that "from the cockpit back through the cabin all the way to the tail, it's one continuous space. That provides a lot of flexibility to our customers."

Meanwhile, he said, "the aircraft itself can cruise at 165 knots, which is considerably faster than most other military helicopters." In the cockpit, he touted the aircraft's modern glass cockpit, based on the Honeywell Primus Epic avionics system, as well as its four-axis digital automatic flight control system with search-and-rescue modes.

"What it really provides is sophisticated autopilot functionality," Lemaster said.

"It has the ability to fly a coupled hover or coupled approach, and really reduce the pilot workload as you're flying the aircraft."

The MH-139 would be produced at Leonardo's manufacturing facilities in Philadelphia, Pennsylvania, which have already assembled more than 250 of the more than 865 AW139s that have been built to date.

"The fact that the AW139 is being built today on an active production line will speed it to meet the time-critical demand following the competition," stated Judy Fedder, director of Global Sales and Marketing, Boeing Integrated Logistics, when the MH-139 was announced in March. The company claims the MH-139 would offer more than US\$1 billion in acquisition and lifecycle expense savings over 30 years when compared to competitor aircraft.

One confirmed competitor is Sikorsky, a Lockheed Martin company, which will be offering its HH-60U Black Hawk. The Air Force is expected to release a final RFP this summer and award a contract in fiscal year 2018, with first deliveries in the fiscal year 2020-2021 timeframe. The Air Force will be acquiring as many as 84 new helicopters to replace its current fleet of UH-1N Twin Hueys, which first entered service in the 1970s.



Boeing has partnered with Leonardo Helicopters to offer the U.S. Air Force the MH-139, based on Leonardo's commercial AW139 helicopter. **Boeing Photo**

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The Sikorsky HH-60W will replace the HH-60G Pave Hawk for the U.S. Air Force's combat search-and-rescue operations. **Lockheed Martin Image**

# USAF combat rescue helicopter reaches milestone

**L**ockheed Martin has announced it successfully reached a key milestone — the Air Vehicle Critical Design Review (CDR) — for the U.S. Air Force's Combat Rescue Helicopter (CRH) program. This event prepares the program to proceed to assembly, test, and evaluation of the HH-60W helicopter.

The joint Sikorsky and U.S. Air Force (USAF) helicopter program team met in May with key partners from government and industry for an in-depth design review. Review participants included leaders from USAF and key suppliers who took part in the technical presentations.

"This milestone is an important achievement and demonstrates Sikorsky and the Air Force are well aligned on the technical requirements of the HH-60W," said Tim Healy, Sikorsky CRH program director. "We got here by conducting several milestones on or ahead of schedule, and we are committed to staying on that track as we build the first HH-60W aircraft."

In preparation for the CDR, the joint team generated more than 300 technical documents, created and reviewed over 50,000 hardware and software requirements, conducted 17 sub-system CDRs, and designed 3,000 new parts.

The USAF awarded Sikorsky the \$1.28 billion engineering, manufacturing and development (EMD) contract in June 2014, which includes development and integration of the next generation combat rescue platform and mission systems, delivery of four HH-60W helicopters, aircrew and maintenance training systems, and support for both. In January 2017, the USAF exercised a \$203 million contract option with Sikorsky to provide five additional aircraft, bringing the total to nine. The training suite includes devices that span full-motion simulators and discrete aircraft systems, such as hoist and landing gear.

The USAF Program of Record calls for 112 helicopters to replace the Air Force's rapidly aging HH-60G Pave Hawk helicopters, which perform critical combat

search-and-rescue and personnel recovery operations for all U.S. military services.

The HH-60W is an advanced variant of the UH-60M Black Hawk helicopter design and features increased internal fuel capability for greater range. The CRH aircraft will feature GE T700-701D engines, composite wide-chord main rotor blades to sustain maneuverability at high density altitudes, and a new fatigue- and corrosion-resistant machined aero-structure to ensure reliability and availability to USAF operational units.

The design includes an advanced tactical mission kit integrating multiple sensors, data links, defensive systems, and other sources of intelligence information for use by combat rescue aircrews. The aircraft is designed with a weapons and cabin configuration specifically optimized for combat rescue and recovery operations.

The CRH and USAF teams will meet again in September for the Training Systems Critical Design Review.

# The New TDAP-611

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# VSR700 demonstrator makes first autonomous flights

Airbus' VRS700 is being developed to meet navies' requirements for a shipborne rotary-wing tactical unmanned aerial vehicle. **J. Deulin/Airbus Helicopters Photo**



Helicopters' flight control system with the aerial vehicle and its specific engine installation," said Bruno Guimbal, president and CEO of Hélicoptères Guimbal.

This phase of flight trials with a safety pilot will focus on refining Airbus Helicopters' automatic flight control system aboard the OPV, eventually leading to fully autonomous flights without a safety pilot. The VSR 700 flight control system is a fully-digital, multi-channel system with a very high level of redundancy. It takes advantage of Airbus Helicopters' unique expertise in digital autopilots.

Sea trials of a manned Cabri G2 have also recently taken place with the support of a French Navy air defense frigate in order to assess the flight envelope of the VSR700 platform for shipborne operations.

The VSR700 will be capable of carrying a wide array of mission equipment with a maximum capacity of up to 250 kilograms (550 pounds). Depending on the mission, its endurance could exceed 10 hours.

**A**irbus Helicopters recently started autonomous flight trials of a VSR700 optionally piloted vehicle (OPV) demonstrator, paving the way for a first flight of the actual VSR700 prototype in 2018. A light military rotary-wing tactical unmanned aerial vehicle, the VSR700 is being developed jointly by Airbus Helicopters and Hélicoptères Guimbal, the original manufacturer of the civil-certified Cabri G2 helicopter from which the VSR700 is derived.

"We are pleased to have achieved this

milestone only eight months after starting work on the OPV," said Regis Antomarchi, head of the VSR700 program at Airbus Helicopters. "The OPV is able to autonomously take off, hover and perform stabilized flight and maneuvers. It will help us mature the technologies associated to autonomous flight and confirm the suitability of the Cabri G2 platform for the VSR700, ahead of the first flight of the prototype next year."

"Passing this first step of autonomous flights with a safety pilot onboard allows us to validate the integration of Airbus

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# ICARUS taking flight

Inventor Nick Sinopoli has partnered with the Australian company elmTEK to develop a wireless controller for ICARUS. **elmTEK Image**

BY ELAN HEAD

**T**wo years ago, Nick Sinopoli, recognizing the shortcomings of the conventional view-limiting devices used for instrument flight training, came up with a better idea.

Taking advantage of the same technology behind the electrochromic windows in the Boeing 787, Sinopoli developed ICARUS (for “Instrument Conditions Awareness Recognition and Understanding System”). Resembling a pair of clear sunglasses, the ICARUS device uses polymer dispersed liquid crystal technology to transform into view-limited “foggles” at the flick of a switch, convincingly simulating inadvertent flight into instrument meteorological conditions (IIMC).

Now, the young entrepreneur has secured a patent for his invention, and is seeking seed funding to bring ICARUS to market. He has also partnered with an Australian company to develop a wireless version of ICARUS for use in a military degraded visual environment (DVE) simulation, and is exploring new versions of the device that would be compatible with flight helmets.

For Sinopoli, the development of ICARUS has always been about safety. “Many have tried to make a better aircraft,” he said, “I’m trying to make a better pilot.” Sinopoli believes his device enables more realistic and valuable instrument flight training than conventional hoods or foggles. Moreover, ICARUS does not restrict the instructor or safety pilot’s visibility in the way that a curtain or paper over the windshield would, and can quickly be turned clear in the event of an in-flight emergency.

These advantages attracted the interest of

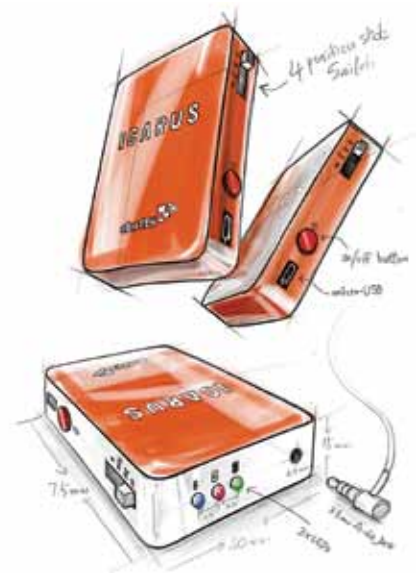
the Australian software engineering company elmTEK, which has partnered with the University of Canberra to demonstrate a tactile cueing system for Australia’s Defence Science and Technology Group later this year. Among other things, the system, which will be demonstrated in a Boeing CH-47 Chinook helicopter, helps pilots control the aircraft in brownout conditions by providing tactile cues for drift.

“The technology is meant to excel in conditions where you’ve got a degraded visual environment,” explained elmTEK general manager Ganen Ganeswaran. “In a trial context, we were thinking, ‘How are we going to introduce DVE?’”

After coming across ICARUS online, elmTEK realized the device’s potential to realistically simulate DVE conditions. The company has been working with Sinopoli to develop, first, a wireless controller for ICARUS, and now a software app that will enable the device to be controlled from a smartphone or tablet.

“The original idea in Nick’s concept was the training instructor holding a controller. . . . The collaboration we have now is to make a wireless device between the instructor and the trainee,” said Ganeswaran. “We don’t tether the instructor to the trainee for one, which is a good thing. And [it will provide] more flexibility for what sort of patterns [of reduced visibility] you can introduce, and the timing.”

Independently, Sinopoli is exploring alternatives to the glasses design that could allow the ICARUS technology to be used more readily with helmets, expanding its appeal for the military, law enforcement, and emergency medical services sectors in which IIMC accidents are of particular concern.



In July, Sinopoli hopes to compete at EAA AirVenture Oshkosh 2017 for the EAA Founder’s Innovation Prize, a contest that aims to reduce fatal loss-of-control accidents in amateur-built aircraft through innovation. He is pitching ICARUS as a training solution that combines the visual realism of a flight simulator with the seat-of-the-pants feeling and pressure of actual flying, helping to prevent loss of control by better preparing pilots for the reality of spatial disorientation.

Sinopoli plans to use exposure at Oshkosh to attract both investors and potential launch customers for ICARUS technology. And Sinopoli isn’t looking for just any investors — he wants partners who understand and share his vision for a safer industry through better training.

“I want somebody that is in aviation and understands the concept and cares about safety,” he said.

ICARUS uses polymer dispersed liquid crystal technology to create a view-limiting flight training device with the flick of a switch. **Photos courtesy of Nick Sinopoli**





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Idaho's governor presented two ASU Valued Partner Awards at this year's Paris Air Show. **ASU Photo**

## HeliAir and LFE receive ASU Valued Partner Awards

**D**uring this year's Paris Air Show, Idaho Governor C.L. "Butch" Otter awarded Aviation Specialties Unlimited (ASU)

Valued Partner Awards to Austria-based Helikopter Air Transport GmbH (HeliAir) and Paris, France-based LFE. The Valued Partner Awards are given out by the State of Idaho in recognition of companies that play a vital role in the support of or partnership with Idaho-based companies.

"ASU continues to grow and expand in Europe and our partners HeliAir and LFE play a vital part in our continued growth in Europe," said ASU president Jim Winkel. "Governor Otter is a strong supporter of not only our business, but every Idaho business that is exporting products to Europe. We appreciate him taking the time to recognize the partners that are helping ASU increase our international market presence."

LFE serves French defense and government agencies with night vision equipment and components, which includes U.S.-manufactured kits. The company is also a preferred source for designators, thermal systems, sights, and other equipment such

as flight instruments and actuators. LFE and ASU co-developed a night vision goggle (NVG) component used by the French combat search-and-rescue to save critical time in the location of downed aircrew for extraction and rescue.

Helikopter Air Transport GmbH is an aviation company specializing in helicopter leasing and maintenance, repair and overhaul, with a focus on Airbus Helicopters EC135/H135 aircraft. It is a main provider for helicopter emergency medical services operators in Austria, Hungary, and the Czech Republic for maintenance, support, engineering, and production organization approvals/design organization approvals activities. With a fully equipped NVG lab, it has been able to service its own NVGs as well as those of other European operators, reducing downtime and helping to ensure that their vital missions are accomplished with maximum safety.

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# ROTOR **BITS**

## NEW WINDSCREEN FILTER TO PROTECT AGAINST LASER STRIKES

**A** new laser protection product developed by Metamaterial Technologies Inc. (MTI) could soon be headed to the commercial aviation market through an agreement with Airbus subsidiary Satair Group.

The product, called metaAIR, is nanofabricated as a flexible metamaterial optical filter that can be applied to any transparent surface — such as the inner surface of an aircraft's cockpit windscreen — to control unwanted light sources while not interfering with visibility. The filter deflects harmful laser beams aimed at aircraft windscreens even at high power levels and from wide angles, preventing the beam from reaching the inside of the aircraft cockpit.

Laser strikes on commercial aircraft have risen over the years as laser pointers have increased in power and decreased in price. Over 2,000 laser incidents were recorded in the U.S. in the first four months alone of 2017, according to the Federal Aviation Administration (FAA). In 2015, there were over 10,000 laser incidents reported to the FAA, the U.K. Civil Aviation Authority, and Transport Canada.

Signing a memorandum of understanding with Satair, George Palikaras, MTI founder and CEO said, "Through our partnership with Satair Group we will introduce metaAIR to the commercial aviation market during 2018, offering a solution to the increasing threats of laser strikes in global aviation."

Satair Group will choose an experienced partner for supplemental type certificate (STC) development to ensure metaAIR meets airworthiness and certification requirements for different aircraft types. Certification approval initially from the FAA, European Aviation Safety Agency and Transport Canada Civil Aviation is expected to be granted in early 2018, with other relevant jurisdictions following later.

The metaAIR product will be developed initially for the Airbus A320 family, followed shortly afterwards by all other Airbus and also Boeing types, as well as for other commercial airliners. However, Satair Group also sees demand for this product coming from business and general aviation and rotary-wing customers.

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A Bell 412 operated by the U.S. Park Police as “Eagle 2” departs the Park Police’s Eagle’s Nest heliport in Washington, D.C. **Antonio Gemma More’ Photo**



A Leonardo AW139 operated by Inaer Aviation Italia as “Pegaso 2,” which forms the Regione Toscana rescue fleet along with the helicopters in Firenze (Pegaso 1) and Massa (Pegaso 3). **Lorenzo Barsotti Photo**



**David McGrath** was at UH Galway when this Irish Coast Guard Sikorsky S-92, Rescue 115, landed on a medevac mission from Aran Islands.



**Nigel Wood** captured this shot of a rather hungry-looking Boeing Chinook from the Royal Air Force's 27 Squadron.



Firefighter Jim Foster accepts the flag for his late fiancée Tiffany Urresti at the National EMS Memorial Service earlier this year. **Mark Mennie Photo**

*Editor's Note: Each year in May, the National EMS Memorial Service, the National EMS Memorial Foundation and the National EMS Memorial Bike Ride gather in Arlington, Virginia, to pay tribute to fallen emergency medical services and air medical providers from throughout the United States during the National EMS Weekend of Honor. This story was written by one of the riders of the National EMS Memorial Bike Ride East Coast Route who attended the National EMS Memorial Service for the first time.*

## ALWAYS IN SERVICE: HONORING OUR OWN

On the occasion of the National EMS Memorial Service, some reflections on the sacrifices made by first responders. **By Nicholas Ferrigno**

As I write this, my fiancé Nicki and I are travelling back from Arlington, Virginia, having just completed the National EMS Memorial Bike Ride (the Muddy Angels) and attended the National EMS Memorial Service. I can't think of a better way to lead up to EMS Week 2017.

This year's theme was "EMS Strong: Always in Service." We rode and honored 51 providers, and at the Memorial Service inducted 28 Line of Duty Deaths to the Tree of Life. Some of these providers were recent deaths; others were posthumously honored from decades past in obituaries pieced together from microfilmed news articles. The Muddy Angels and National EMS Memorial Service work together to properly honor the fallen and pay respects to the families of those who have given the ultimate sacrifice.

Over the course of this week, I had the distinct pleasure of knowing what it is to be physically, mentally, and emotionally strained far outside of my comfort zone. The Muddy Angels climbed hill after grueling hill in Connecticut and New York, braved wind and rain, pressed a full 102.3 miles in one day, rolled through heat through the farmlands of Pennsylvania, contended with sore saddles, and continued to push the cranks while ignoring the searing pain in our legs.

We did it, as we are “Always in Service.” When we are not at work trying to prevent one more patient suicide or reverse the damage of a STEMI, we are using what little vacation time we have and taking time away from our own family and friends so that members of our expansive EMS family whom we have lost are not just remembered, but their names emblazoned into the history of our young profession.

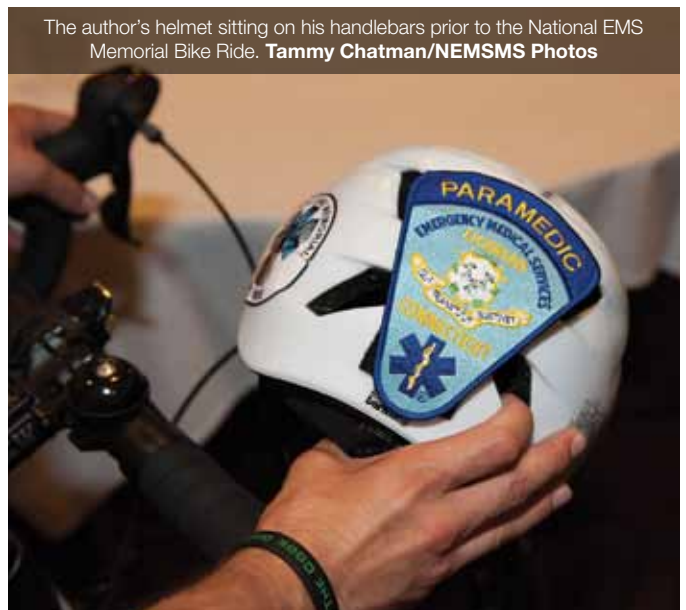
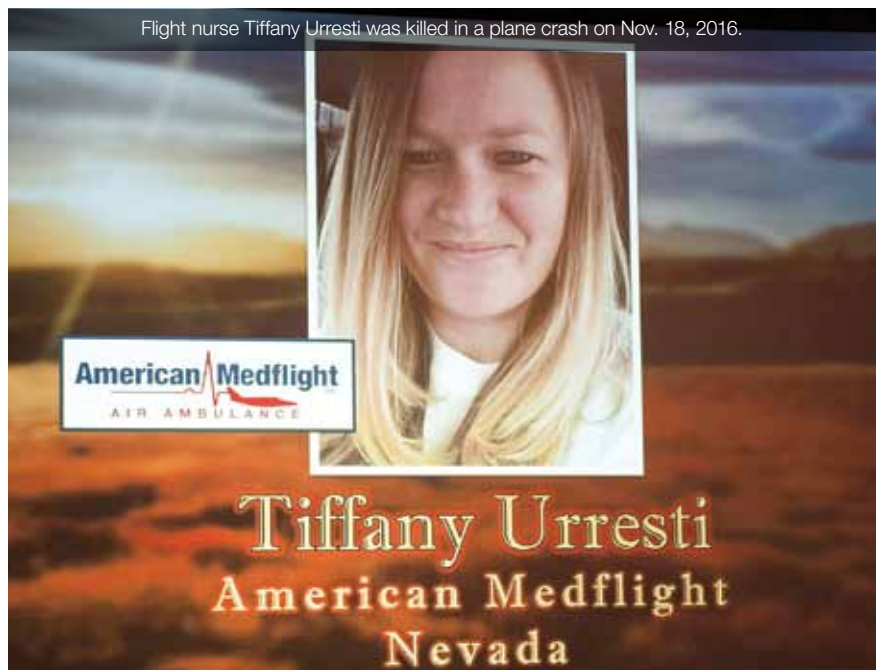
For those of you who have not seen or been a part of the National EMS Memorial Service, I promise you that it is a poignant and powerful ceremony. From the opening statements by long-time leaders of EMS; to the reading of the names, presentation of the white roses and United States flags that have flown over our nation’s Capitol; to the video tributes showcasing joyous life moments of those honored; to the special songs and candlelight vigil; to the pipes and drums that open and dismiss the ceremony, it is befitting of our deserving heroes. Honor Guards from across the country take part in guarding our Tree of Life, escorting honorees’ families and friends, and accepting the white rose and Old Glory on behalf of honorees whose families could not be found or were unable to attend. It was beautiful and moving.

All of our honorees have different backgrounds and circumstances surrounding their deaths — no one story is more important or less mournful than the next. However, the story of Tiffany Urresti was particularly striking. Tiffany held many titles in her career, including emergency department nurse and firefighter, but it was as a flight nurse that she truly found her calling. During her career, she met firefighter Jim Foster, the man of her dreams and love of her life. Jim and Tiffany became engaged and were preparing a life together when her life was cut short months before her 30<sup>th</sup> birthday.

On Nov. 18, 2016, while transporting a critically ill patient, her American MedFlight airplane crashed, killing Tiffany, Captain Yuji Irie, flight paramedic Jacob Shepherd, and the patient,

Edward Clohesy. During the ceremony, Jim Foster strode to the stage in a suit and red bowtie, flanked by young men in similar suits, and young women with matching red dresses and flower bouquets, and family members in celebratory attire. Jim and Tiffany were to be wed May 20, 2017 — instead, they were there to honor her memory in the same fashion as they would have her special day.

I had a chance to meet Jim at the unofficial “afterparty,” where honorees’ families and EMS providers are encouraged to learn and share stories in a much less formal setting, mourning and celebrating simultaneously as a means of healing. Being a firefighter in a family of firefighters and emergency medical technicians, Jim is no stranger to the dangers that he knew his bride-to-be faced every time those wheels left the runway. He was composed, confident, and seemed quite content with how the ceremony had gone. I expressed respect for the level of class that Jim and





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**THE EMS AND PUBLIC SAFETY FAMILIES RUN DEEP. WHEN YOU DEPEND ON THE NEW STRANGER IN THE AMBULANCE, ENGINE, OR CRUISER NEXT TO YOU, THE BOND YOU FORM MEANS MORE THAN CARRYING OUT YOUR DUTIES EFFECTIVELY.**

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Tiffany's family had shown in attending in wedding attire, to which he responded, "This was how she would have wanted to be remembered and this was her special day." To his wife, in her life and passing, Jim is Always in Service.

The Urrestis' story was one of many poignant stories we heard from families over the course of the weekend. Some stories were heart-wrenching, some were funny, and others were a bittersweet combination of the two. All of the stories help us to know each of the honorees better and help to keep their memories alive. We learned not only how each of them died, but also how they lived. Although we may not have known them personally, they are familiar to us, as they were cut from the same cloth as ourselves and those who serve beside us in EMS.

The EMS and public safety families run deep. When you depend on the new stranger in the ambulance, engine, or cruiser next to you, the bond you form means more than carrying out your duties effectively — they are your connection when a split second may mean the difference between life and your own mortality.

They are the eyes that see the knife on the counter a foot from the emotionally disturbed patient who does not want to go to the hospital. They are the ears that hear the car coming from around



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Through the National EMS Memorial Bike Ride and National EMS Memorial Service, lives of service personnel are honored and remembered.  
**Tammy Chatman/NEMSMS Photo**

the corner while you hustle to secure the scene of a crash that happened in front of you. They are your shared nose that can smell and find the gastrointestinal bleed before you find a nurse. They are your mouth that has a taste for just what you like to eat when you have no appetite after working that pediatric code. They are your hands that feel for critical equipment and have it ready before you can ask. And when you finally get a day off together, they are your friend, loved one, shoulder to cry on for when you

just feel you can't bear witness to this anymore. As a partner, you are Always in Service.

I can stand on a street corner and preach this to you, provider — but you already know this, because you live it. The final note I would like to leave you with is a quote by Edith Wharton that National EMS Memorial Service president Jana Williams shared during the ceremony, and echo her statements. “There are two

ways of spreading light: to be the candle or the mirror that reflects it.” You are the candle, the light for someone in their most vulnerable hour of need, be it a patient or a partner. When you cannot be that light, someone will be the light for you to see.

Even though we may not always agree, we are family and we must be kind to one another. If it is a struggle within, please do not suffer in silence. There are organizations that are here to support you, like the Muddy Angels and the Code Green Campaign. Each one of us will have a darkest hour and will need to grieve — please know that you are not alone.

And should the unthinkable happen to you in the line of duty, the Muddy Angels of the National EMS Memorial Bike Ride and the National EMS Memorial Service will help to ensure that your families are not alone in their grief and that your life of service is honored and remembered.

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**Nicholas Ferrigno** | Nicholas Ferrigno, NRP, is from New Haven, Connecticut, and has been in EMS for almost 10 years. He met the Muddy Angels two years ago when they came through New Haven, and he made a commitment to ride with them. This was his first year to complete the entire East Coast route of the National EMS Memorial Bike Ride. He rode for his mentor and one of his best friends, Barry “Bark” Barkinsky, who committed suicide in June 2016.

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# KEEPING THEM FLYING





The Martin County Sheriff's Office (MCSO) Aviation Unit works closely with the agency's Marine Unit to provide public safety and law enforcement along the Atlantic coast and throughout many miles of inland waterways.

The Martin County Sheriff's Office is setting an example for how local governments can sustain law enforcement aviation programs without breaking the bank.

**Story & Photos by Dan Megna**



When originally acquired from the Air National Guard in the mid-1990s, the OH-58A that became known as "Air 2" had just 5,600 hours.

Local governments have long struggled to stretch their budgets to meet ever-increasing demand for all aspects of public services. While a strong emphasis is typically placed on public safety, the costs associated with some programs can make them targets for budget cuts or, in some cases, elimination.

Law enforcement aviation programs are often so targeted. Regardless of the size of an agency, the costs associated with acquiring, operating, and maintaining aircraft require a significant political and financial commitment coupled with competent management of day-to-day operations. Without any one of these elements, a program may be destined for extinction.

But one law enforcement aviation unit, facing uncertain prospects, developed a creative budgetary work-around that not only secured its future, but also helped breathe new life into several other allied aviation units.

A little over two years ago, the Martin County Sheriff's Office (MCSO) Aviation Unit began to realize that its existence was in jeopardy. The unit was operating two military surplus Bell OH-58A helicopters to patrol its small county on Florida's Atlantic coast 80 miles north of Miami. But spare parts for the aging OH-58s were becoming increasingly scarce, and — as is the case for many

The MCSO Aviation Unit is somewhat isolated at the Witham Field Airport but provides a quick response to the county's population centers and busy waterways.



small agencies — funding for new aircraft seemed highly unlikely.

Florida has no state income tax and low sales and property taxes. There's also no estate or inheritance taxes. As a result, smaller counties like Martin have limited tax revenue to invest in relatively high-dollar programs such as law enforcement aviation.

The life ring for the MCSO Aviation Unit came in the form of the federal 1033 program and the Law Enforcement Support Office (LESO). The LESO provides a conduit for the transfer of surplus Department of Defense (DoD) property to law enforcement agencies across the United States. For the MCSO Aviation Unit, it has been a treasure trove for OH-58 parts and additional surplus aircraft.

## TAPPING THE POTENTIAL

MCSO chief pilot Doug Newsom first became acquainted with the LESO during his law enforcement aviation career with another Florida agency. While he had very limited direct involvement in actually utilizing the program, he recognized its incredible potential and quietly went about learning the ins and outs of the program.

Upon joining MCSO just two years ago, Newsom and the unit's aviation technician, Eric Ellington, assessed their meager spares inventory and recognized the unit's grave situation. "I believe we were within three to four years of being out of business, at least with the OH-58s," said Newsom. "And with the budget constraints that existed and still do exist across most of the smaller counties here in Florida, it painted a pretty ominous picture."

They presented the grim news to the department administration and spelled out the potential fate of the aviation unit, due in large part to the unavailability of critical parts. Newsom said, "At that point, the narrowing window was solely driven by rotor blades. I knew that if we were not able to acquire rotor blades, we'd be out of business."

At the same meeting they also outlined the untapped potential of the LESO program and the fiscal impact it could have, not only for the aviation unit, but for the greater department in the form of weapons, equipment, and vehicles. The department administration gave the green light to begin utilizing the program to its fullest potential.

In its basic form, LESO has two procedures pertaining to aviation: one for acquiring aircraft parts and another for surplus flyable and non-flyable aircraft.

Those agencies looking to acquire aircraft apply to LESO to be added to a list of agencies seeking a particular aircraft type. A priority list is established based on several factors. Then, as aircraft come available, notifications are made to these agencies based on their priority ranking. They can then choose to accept or decline the aircraft. Agencies pay a \$1,000 transfer fee for non-flyable aircraft and \$3,000 for a flyable aircraft.

Surplus parts are handled in a different manner. They are listed on the Defense Logistics Agency (DLA) website along with literally thousands of other parts and items. They are listed by the National Stock Number (NSN) and coded to reflect the condition of each part.



Deputy Sheriff Sean Marston preparing for an evening NVG patrol flight.

Agency officials approved by LESO can create a “want list” of specific items and the DLA search engine then “crawls” the listings 24/7 looking for a match. Presently, MCSO has search parameters for over 7,000 parts. But in spite of the web crawler search, Newsom and Ellington continue to manually search the site several times each day. “It’s been a team effort between Eric and me,” said Newsom. “While it takes a diligent effort to go in and search every single day, we’ve discovered items often pop into the system and it [the web crawler] doesn’t always catch them.”

When aircraft parts are identified as available, a notification email provides the number available, its condition, and the original military acquisition cost. Agencies must pay one percent of this cost for each item.

As an example, MCSO recently received a notification of the availability of a number of new “-119” main rotor blades. Because the OEM had ceased production several years earlier, if the unit could find new blades on the open market, they would likely pay a premium. Through LESO, however, MCSO’s cost for each blade was only one percent of what the military originally paid for the blades several years earlier.

Ellington said, “I think the only reason I got the email was because everybody else in the country was looking for the NSN of the previous ‘dash number’ blades. They were looking for the older -113 blades and these are the latest and greatest -119 blades. I don’t think anyone was looking for that NSN.”

### **STRICT ACCOUNTABILITY**

The LESO program comes with many accounting and inventory control measures which an agency must follow or risk being banned. Newsom said, “Once a year we have to complete an inventory of all items and parts acquired from the LESO program. They [LESO officials] typically show up and physically do an inventory with us. But you can’t necessarily plan for it. They could come this year and we may not see them again for two years. Or they may show up two years in a row. We never know. They can call right now and tell us they’re coming for a surprise inventory. When they walk in the door, we have to produce.”

MCSO uses two methods for controlling inventory. One is FEPMIS (Federal Excess Property Management Information System), an inventory and property management program adopted by LESO. The unit also uses a separate internal computer

This surplus aircraft was acquired in November 2014 immediately following the official OH-58 retirement ceremony held in Jacksonville. It was flown to the MCSO facility, stripped down and completely rebuilt in-house with overhauled parts. An outside vendor provided the avionics completion and another will be sourced for new paint.





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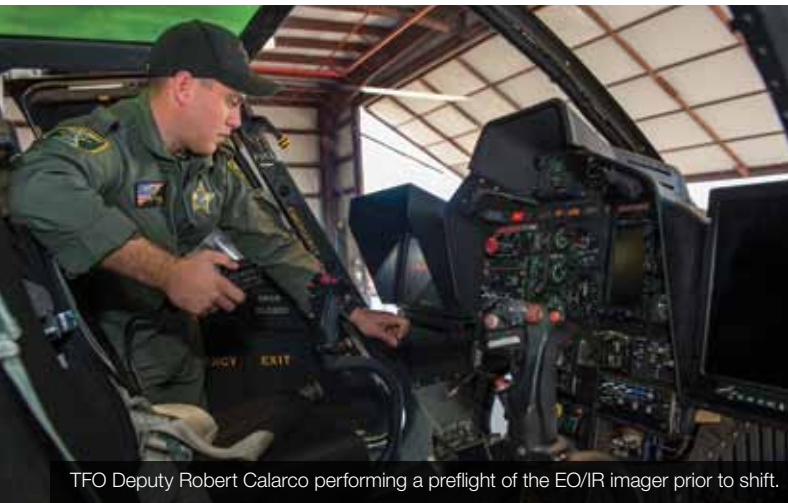
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TFO Deputy Robert Calarco performing a preflight of the EO/IR imager prior to shift.



Eric Ellington has been the sole aircraft maintenance technician (A&P / IA) for the MCSO Aviation Unit for a total of 17 years.



Floor and wall space in the MCSO hangar is utilized in such a way to maximize Eric Ellington's maintenance needs as well as parts and aircraft housing/storage.

program to keep track of the many parts meticulously organized on the shelves in the parts room. Each item, when consumed, is deducted from inventory and a form generated to LESO as to how it was consumed. A permanent record is also maintained.

"I'd like to think LESO sees us as a role model for this program," said Newsom. "We're very, very careful to ensure accountability for those parts. We can tell you, at the drop of a hat, exactly how many of every item we have and on what shelf at any given time."

The MCSO shared its model for working with LESO with several other local Florida law enforcement agencies operating OH-58s. As a result, eight agencies, including MCSO, have organized a network for sharing parts among themselves, following the strict LESO procedures for the transfer of surplus items.

"The LESO program is absolutely critical for us," said Ed Henderson, acting chief pilot for Collier County Sheriff's Office, which operates two OH-58s. "Over the years we have acquired parts through the 1033 program and it's been a huge cost saving measure. If Doug [Newsom] needs a part and I have it to give, he gets it. And then months later, if I need a part, I'll call him or I'll call Brevard County or I'll call Marion County..."

Newsom said, "No one agency or unit can store enough parts for an obsolete aircraft to keep it in service for years to come.

But between all of us working together, we can do just that. All I have to do is submit the request to LESO and say, I would like to transfer these items to this or that agency [which must be in good standing with LESO], and they typically give the approval."

### A PROMISING FUTURE

Today, MCSO's Aviation Unit operates from a small office and hangar facility at the Witham Field Airport in Stuart. From there the unit houses, maintains, and operates three OH-58A helicopters, and recently added a forfeited Beechcraft 58P Baron. The hangar also houses two recently acquired non-flyable OH-58As to be used for spares.

Two pilots and two tactical flight officers (TFOs) make up the full-time staffing. Four field officers and one reserve officer trained as TFOs rotate through on a regular schedule, as does a civilian volunteer pilot. Together, these crews are able to flex their schedules to provide coverage for a day shift and evening shift six days a week until 2 a.m.

The three operational helicopters have night vision goggle (NVG)-compatible cockpits, are configured with Garmin's GTN 650 coupled with Aspen Avionics' Evolution 1000, and are ADS-B Out compliant. The police technology package includes

The Aviation Unit falls under MCSO Special Services Section commanded by Lieutenant Donald Plant.



Chief Pilot, Deputy Sheriff Doug Newsom, inspecting tags and paperwork on some of the unit's extensive parts inventory.

an L3 Wescam MX10 electro-optic/infrared (EO/IR) sensor, dual touchscreen cockpit monitors, and computer mapping via Churchill Navigation's ARS-600 augmented navigation system.

Aircraft maintenance is solely in Ellington's hands. He follows the Airborne Law Enforcement Association (ALEA)-approved Interagency Committee for Aviation Policy maintenance program and has tailored it to fit the agency's needs. Helicopter components are maintained to commercial standards to include time between overhaul (TBO) times, and the airplane is maintained to Federal Aviation Agency and manufacturer standards. Heavy maintenance, overhauls, and avionics repair are sent to established vendors.

With Martin County's proximity to south Florida and the Caribbean, MCSO's mission profile is diverse. In addition to the



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**— MCSO CHIEF PILOT DOUG NEWSOM**

TFO Ed Stagmiller (left) and pilot Sean Marston prior to beginning their evening shift.



This year, the MCSO Aviation Unit was originally budgeted for 600 flight hours, but due in large part to budget savings via the LESO program, they will fly closer to 800 hours.

routine calls for service, drug smuggling and human trafficking, via highway or by water, are a constant threat. With miles of shoreline and waterways on the eastern edge of the county and vast expanses of undeveloped land to the west, the helicopters provide a critical element for supporting the department’s overall proactive enforcement roles.

In recent months, this optimism has generated conversations among unit members of how they one day may bring online a surplus medium helicopter such as a Bell UH-1 to expand their mission capability for hoisting and firefighting operations.

In just the past two years, utilizing the LESO program along with strict unit management, MCSO has gone from teetering on the

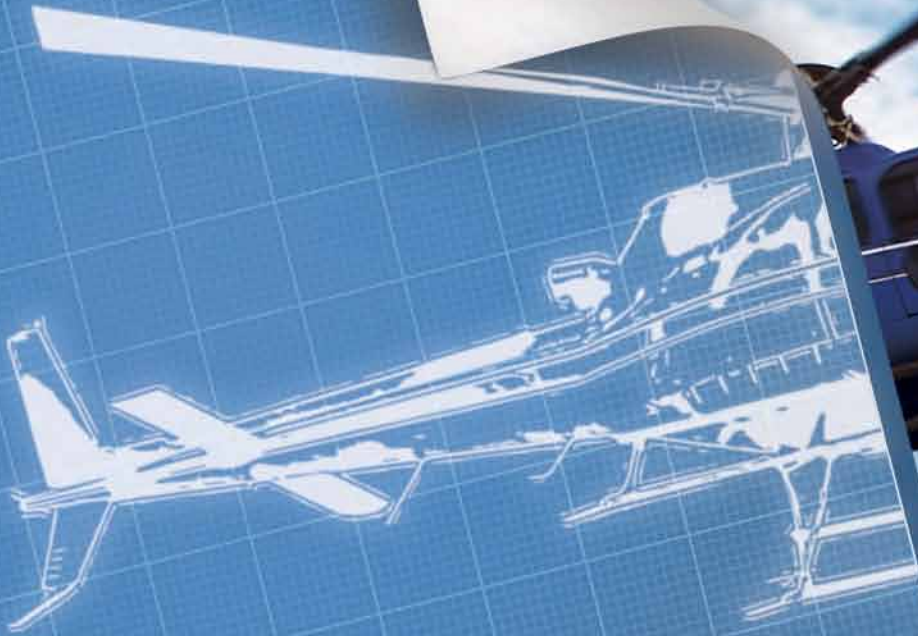
brink of extinction to a very promising future. Said Ellington, “Bell was conducting a survey of law enforcement operators of OH-58s and they wanted to know what our life expectancy was for our OH-58s. They told me a lot of agencies are month-to-month because they’re hurting for parts. But with what we now have in our parts inventory, we can easily go 10 years.”



**Dan Megna |** Dan served nearly 20 years of a 30-year law enforcement career as a helicopter tactical officer, pilot, and flight instructor with a large Southern Californian sheriff’s department. He has been a regular contributor to *Vertical* since 2004.

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Downlink technology can be a powerful tool for law enforcement agencies when used correctly. Step one is selecting technology that is simple to operate and designed for the missions it will be used for.



# THE Do's & Don'ts of Downlink

The ability to downlink live video can be a great tool for law enforcement aviation units, but how do you ensure you're using it efficiently and effectively? Here are a few tips.

**Story by Jack H. Schonely | Photos by Skip Robinson**

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Downlinking live video from an aircraft to a receiver is really still in the early stages when it comes to law enforcement aviation, although the military and the media have been using this technology for many years. More and more law enforcement aviation units have been adding downlink technology to their aircraft because, if used correctly, it is a fantastic way to communicate.

Downlinking sounds like a perfect solution to so many situations, right? Not so fast. Let's consider some "do's and don'ts" of downlinking to ensure that its use is efficient and, most importantly, effective.

## **SELECTING A DOWNLINK SYSTEM**

This is the first of many important decisions that the crews using the technology *must* have input on. The equipment must be simple to operate and be designed for the missions it will be used for. Where will the signal be downlinked to? Who are the people that will be viewing the video feed? How will they view the video? These are questions that should be discussed *before* choosing the technology. There are lots of different approaches to downlinking, and law enforcement aviation units around the world using downlink in a wide variety of ways are your best source of information. Find out what works and what doesn't from their experience.

One of the significant issues that is vital to success of a downlink program is to determine early on who will view the live feed and where the video will be sent. Some agencies' downlink signals can be viewed on any computer, laptop, or even an Apple iPad, provided the viewer has the proper clearance. This is a very effective way to provide situational awareness to a large number of people on the ground. Obviously the live video must be secure and the receivers carefully managed, but this technology is being used across the globe effectively. Some agencies are only able to send a signal to a remote vehicle or to a predetermined command post. That greatly limits the effectiveness of the live feed as well as who is able to watch.

When designing a downlink program, one thing to determine early on is who will view the live feed and where the video will be sent.



Having the proper camera or gimbal for the missions you plan on downlinking is vital. For instance, if your agency has determined they want to use downlink for surveillance or tactical situations, many of those missions are going to require a camera designed for higher altitudes. Don't allow upper managers to believe that adding a downlink system to existing camera equipment will be effective if you do not have the proper camera for those missions. Allowing false expectations of the abilities of downlink to persist will cause numerous issues down the road. When done correctly, this is not an inexpensive endeavor, and that must be explained early and often to the people approving the investment.

### **OPERATING THE SYSTEM**

The downlink system you select should be simple to operate for both the tactical flight officer (TFO) in the aircraft *and* the people receiving the video on the ground. Many systems are as simple as flipping a single switch in the helicopter and you are downlinking video. If it takes a laminated list of 10 steps for the TFO to accom-

plish the same thing, that will only lead to problems starting the live feed and troubleshooting issues that will occur.

I have unfortunately witnessed this firsthand many times, and do you know where the blame will fall? You guessed it, on the TFO. This is completely avoidable by selecting the proper system in the first place. The same goes for receiving the signal. If that requires an engineering degree, you have failed in your choice of equipment. It must be simple to receive and view on the ground and that technology has been around for years. I have been in a remote location with a surveillance supervisor and was able to turn on an iPad, sign in to a secure website, and watch a high priority surveillance that was 100 miles away. This took seconds to do and the picture and audio were clear. That is how it should be done.

### **WHO IS WATCHING?**

Let's assume that you are up and running with your downlink program and you are responding to specific downlink requests. Hopefully your aviation unit or your department did not "sell" the





If a downlink system does not operate reliably, the blame will often fall on the TFO.

downlink equipment as the solution to all problems. If they did, you are going to be requested to downlink a lot of situations where downlink is worthless.

We can all agree that there are numerous law enforcement situations where having real-time video on the ground from a bird's-eye view is incredibly valuable. Natural disaster response, barricaded suspects, large demonstrations, crowd control, and tactical situations are just some that come to mind. But even during those events, *who* is viewing the video? It *must* be the people who are making the tactical decisions on the ground.

For example, consider a special weapons and tactics (SWAT) call for a barricaded suspect inside a location. This is a great opportunity to provide detailed information about that location and its surroundings to the SWAT operators who are eventually going to approach and enter the location. Those operators are the people who need to see the real time video and ask the TFO to zoom in or widen out on a particular window or door. That seems obvious, *but* what if the live video is not available to them where they are

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**AS LAW ENFORCEMENT AGENCIES OBSERVE ALL THE TIME, VIDEO NEVER TELLS THE ENTIRE STORY. WHEN IT COMES TO DOWNLINKING, IT IS VITAL THAT THOSE SAME AGENCIES BEAR IN MIND THAT DOWNLINKED VIDEO HAS GREAT VALUE — AS LONG AS IT IS JUST ONE PART OF THE OVERALL PICTURE.**

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located? Now the downlink is worthless. This gets back to your decision on downlink equipment and receivers. If you know that this is a mission you want to use downlink for, then you must plan for that in terms of how the feed is received. Will the SWAT truck have a receiver? Will SWAT operators have a laptop or iPad to view the video? Again, many departments are using this technology efficiently and effectively, but many are not.

#### **IS ANYBODY OUT THERE?**

While we are on the topic of who is watching, I must ask another question: is *anybody* watching? I have personally spent countless hours providing a very nice downlink picture to a very expensive command post vehicle where nobody was viewing that picture. I know this because my TFO would regularly zoom in on that command post vehicle, and not a single person was there. There were a few reasons for this. Because downlink was sold as the solution to all problems, it became a box to check off on a planning form when an event was being organized. The people on the ground knew they didn't really need it, but they checked the box and called Air Support for a downlink aircraft. That meant a crew was flying for hours, burning jet fuel, and the service they were providing was not being used. "Efficient" and "effective" are two words that do not apply to that scenario.

I could give many examples of this, but I will pick my favorite of all time. One of the retired space shuttles, Endeavour, was going to be moved 12 miles from Los Angeles International Airport (LAX) to a museum near downtown L.A. This was a major event that required many months of planning. The space shuttle would be placed onto a specially designed vehicle and transported on surface streets to its final destination. Wires were moved, streets closed, and 400 trees cut down. Hundreds of police officers would secure the route for the transport. Thousands of spectators would witness this incredible event. Obviously this would require live video downlink to provide situational awareness to those managing this move.

Really? That 12 miles took *two days* to complete. This was the slowest moving parade in history. We started flying in the opening hours providing this vital video. Keep in mind that the entire movement was within the surface area of LAX — it was a little busy. During the first two-hour flight we sent a beautiful picture to a command post vehicle manned by a person from Air Support. During that entire two hours not a single other person viewed that picture. What is the benefit of



With hardware improving all the time, the future is bright for downlinking in airborne law enforcement.



Downlinking can allow supervisors who are miles away to watch situations as they unfold.

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live video for a vehicle that is moving one mile per hour, if it's moving at all?

Needless to say, the idea of continuous video feed quickly went away, but the "box was checked" on the planning form. This was an extreme example of a request that was not reasonable, and the proof was that nobody looked at the video.

### THE FUTURE OF DOWNLINK TECHNOLOGY

I believe the future is very bright for downlink technology. The hardware is improving every day, without a doubt. I have witnessed law enforcement aviation units across the U.S., Canada, Europe, and Australia use live video downlink in a variety of ways. Most of them are using it very effectively.

The ones that are effective have several things in common. Their downlink systems are very user-friendly for both the TFO and the personnel on the ground. They choose their downlink missions wisely. They have not forgotten that an experienced TFO should not only control the camera and downlink, but also continue to provide tactical insight using their observations and words.

As law enforcement agencies observe all the time, video *never* tells the entire story. When it comes to downlinking, it is vital that those same agencies bear in mind that downlinked video has great value — as long as it is just one part of the overall picture. ❖



**Jack Schonely** | Recently retired after a 31-year career with the Los Angeles Police Department, including 18 years with its Air Support Division as a tactical flight officer and pilot, Jack now teaches tactical classes around the world. He is the author of *Apprehending Fleeting Suspects*. Find more information about his book and professional services at [www.officertactics.com](http://www.officertactics.com).



# FROM DOWNLINKS TO DRONES



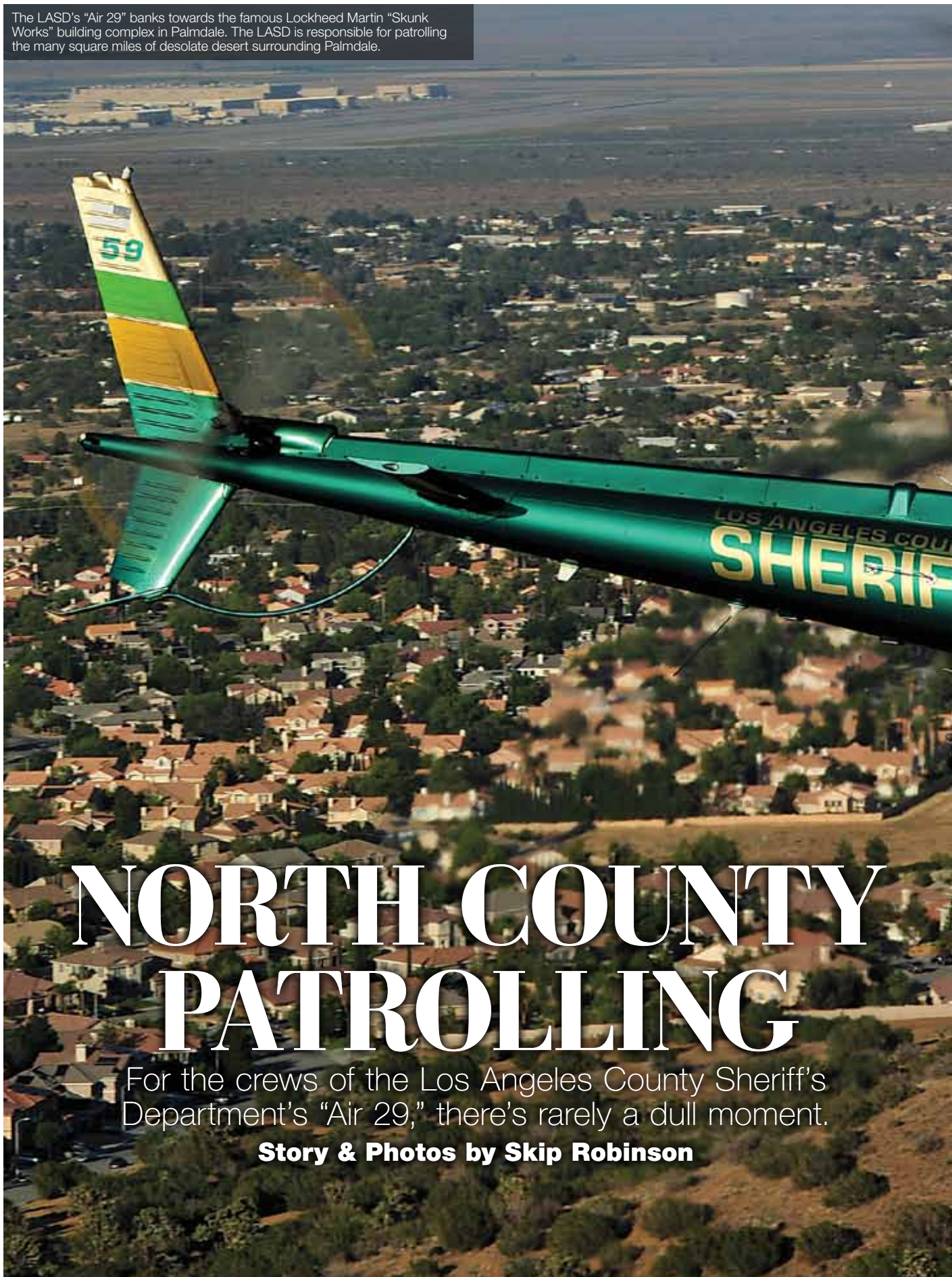
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The LASD's "Air 29" banks towards the famous Lockheed Martin "Skunk Works" building complex in Palmdale. The LASD is responsible for patrolling the many square miles of desolate desert surrounding Palmdale.



# NORTH COUNTY PATROLLING

For the crews of the Los Angeles County Sheriff's Department's "Air 29," there's rarely a dull moment.

**Story & Photos by Skip Robinson**



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During the warm months, Air 29 often comes upon brush fires that it then reports to the fire department.



The many miles of coastline near Malibu fall within Air 29's patrol area.



The primary mission of air support is to protect the officers on the ground. Here, a ground unit poses with an Air 29 flight crew.

The County of Los Angeles consists of 4,700 square miles (1.2 million hectares) of every type of terrain — from the heavily populated L.A. Basin to the Angeles Forest and its 10,000-foot peaks, to the high Mojave Desert, to Catalina Island and San Clemente Islands, more than 20 miles offshore. The Los Angeles County Sheriff's Department (LASD) is tasked with patrolling and providing law enforcement services within this large area.

The LASD Aero Bureau allocates its 15 Airbus AS350 B2 patrol helicopters across three general areas, including the L.A. Basin; the eastern part of the county; and the northern and far western parts of the county — which are particularly diverse.

From the San Bernardino County border all the way west to Interstate 5, the northern/western patrol area encompasses high parts of the Angeles Forest, hundreds of square miles of lightly populated desert, and the desert cities of Palmdale and

Lancaster. It also includes the popular recreational areas of Castaic and Pyramid lakes, the city of Santa Clarita, and coastal Malibu and parts of the Santa Monica Mountains. At an estimated 1,500 square miles (390,000 hectares), this patrol area is roughly the size of Rhode Island.

"Air 29," an LASD AS350 B2 based out of Burbank Airport in the San Fernando Valley, launches daily to patrol this northern area. As Aero Bureau pilot Sergeant Morrie Zager explained, "Air 29 is a very interesting mission within the department. Our operational area, which includes populated cities, also has many square miles of mountains and remote locations where our services might be needed.

"We cover parts of the Angeles National Forest and might be called out day or night to search for lost people, broken-down cars, or criminal activities within the forest. Then when we get



Sgt. Morrie Zager pilots Air 29 on an early Saturday evening.



Air 29 on scene for a shooting in Lancaster.

into the desert, we patrol the cities of Palmdale and Lancaster. We also venture to the outlying areas of the desert which during the day is fine, but at night is extremely dark. . . . We get calls for service in these areas for crimes in progress, suspicious activity, stolen cars, and people who go off the road [and] have other vehicle issues.”

**THE AIRCRAFT AND CREWS**

The LASD’s current AS350 B2s, including Air 29, are its second batch of this model, and the department will soon begin procuring new H125s (the latest AStar variant, previously known as the AS350 B3e). The current B2s perform well overall, but were

acquired with additional mission equipment that added weight over the first batch. The loss of performance has been acceptable within the lower-elevation L.A. Basin, but fuel or payload must sometimes be downloaded when the aircraft venture into the mountains or high desert.

“The B2 is a great helicopter for many departments and has plenty of performance for their requirements,” said Zager. “L.A. County Sheriff’s operates in the Angeles Forest and high desert, where actual altitudes and density altitudes can reach over 10,000 feet on summer days. The high desert starts at 2,500 feet and can routinely go well over 100 degrees during the summer months, and moves into the lower mountains.





Many miles from the high desert are Malibu Beach and Topanga Canyon, which are also part of Air 29's patrol area.

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“Aero Bureau looks forward to finally getting the H125, as it will have the ability to go anywhere in the county without major performance concerns. Sure, we’ll have to look at the performance charts on the H125, but even with its installed mission equipment, it should be quite a performer,” he noted.

Air 29 flies with a crew of two, including a senior deputy pilot signed off for mountain operations and night vision goggle (NVG) use. Said Zager, “To be signed off on NVGs, a pilot needs 1,000 hours PIC [pilot in command] time with a minimum of 400 unaided night hours. Once the pilot reaches 400 unaided hours, they will go out with an LASD CFI [certified flight instructor] for mountain and NVG training to prepare them for flying Air 29.”

The mountain course also teaches flying in the very windy conditions experienced in the desert. While clouds and wet weather are rarely a concern when working the desert, Air 29 crews must contend with heavy winds year-round. “Basically, it’s either cold and windy or hot and windy and not much in between,” said Zager.

Sitting next to the pilot and orchestrating the missions is what LASD calls a tactical flight deputy (TFD). “The TFD monitors and operates the radios with dispatch, and communicates with ground units and, oftentimes, station watch commanders,” explained Deputy Dennis “Woody” Harralson, an Air 29 TFD. “The TFD also operates the forward-looking infrared (FLIR) camera, mapping system, searchlight, and is always a second set of eyes in the aircraft, assisting the pilot by alerting him or her to other observed traffic flying in the area.”

Harralson continued, “For example, during a mission where a vehicle pursuit terminates with suspects running from the abandoned car, the TFD begins





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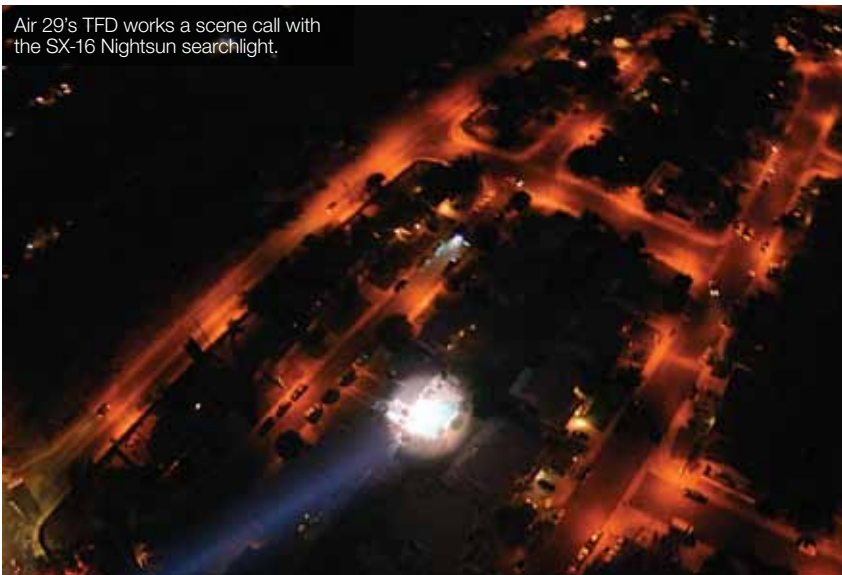
Because of its large operational area, the LASD has strategically located helispots with fuel tankers so its helicopters can refuel efficiently. This spot is at the men's jail in Santa Clarita.



Night operations happen every night of the week for Air 29.



Air 29's TFD works a scene call with the SX-16 Nightsun searchlight.



multi-tasking by setting up a containment around the crime scene and directing ground units into the area and [telling them] where they should position." This aerial view enhances the ground personnel's overall understanding of what's happening, and the TFD's observations and suggestions help the field supervisors make the correct decisions in the deployment of deputies and any responding special units (which might include canine teams, special weapons teams, or bomb squad personnel).

### WORKING THE DESERT

Air 29 spends much of its time patrolling the desert cities of Palmdale and Lancaster. With a combined population of around half a million, both cities have their share of vehicle thefts, burglaries, and other crimes.

However, crews are also frequently called to the outlying areas of the county. In these remote locations, an LASD ground unit with its lights and sirens on can still take 30 minutes or more to arrive at the scene of an emergency. More often than not, Air 29 is the first asset on scene and will begin working the call.

"Depending on the severity of the situation, we will sometimes land to figure out the problem or stay airborne until a ground unit can get to the location," said Harralson. For those occasions when the crew lands to investigate a situation, the aircraft carries an M4 carbine with extra magazines, should the TFD feel the need for this additional security.

"When patrolling the desert we are always looking for things out of the ordinary," Zager noted. "Cars and trucks that are off the beaten path and possibly stolen, people shooting guns in unapproved areas, and people dumping trash like mattresses and construction materials to avoid dumping fees... You'd be surprised at the things we see out there! One other thing we do is check the Los Angeles Aqueduct, a [water system] that runs through our operational area. We search for cars that might have ended up in the aqueduct, either stolen or from an accident, and for trespassers up to no good."

Although Air 29 is not specifically equipped for search-and-rescue, it will assist with searches when required. "Because the mountains throughout our area are used for every kind of recreational use including hiking, mountain biking, and off-roading, we occasionally come upon crashed off-road vehicles, stuck cars, camper vehicles broken down in remote areas, people who are lost and dehydrated," said Zager. "If we come upon people who are uninjured but in distress, we can land and lift them out and bring them to a safe area, possibly to one of our sheriff stations." For people with injuries and more technical rescues, Air 29 calls on a hoist-equipped LASD Airbus AS332 Super Puma, "Air Rescue 5."

### STAYING SAFE

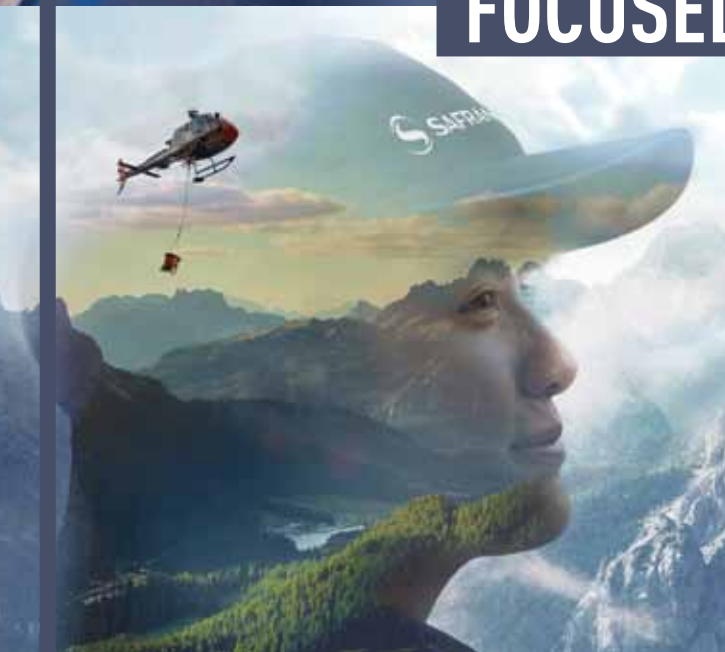
With little to no urban illumination in these remote



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Off-site landings are routine for Air 29 crews. Dusty conditions in the desert require precise maximum performance takeoffs.



The high tempo and diversity of missions make the Air 29 assignment a popular one within the LASD.

areas, Air 29 crews rely on NVGs to enhance safety during night operations. “The NVGs are a game changer,” emphasized Zager. “It can get *really* dark out there, and even though we might be able to transit the area, the NVGs allow us to work the area: they let us search for lost people, find hidden suspects and find cars that might have gone off the road. The personal security they give a crew changes everything and lets us get the job done without fatiguing us to the point where we couldn’t do the job.” The TFD also takes advantage of the capabilities of Air 29’s forward-looking infrared (FLIR) camera as well as NVG’s during desert operations at night and in low light.

As is readily apparent, the Air 29 mission profile can be daunting, but this high-tempo assignment is a popular one at the Aero Bureau. Rarely is a shift boring, and crews return home daily with a great sense of satisfaction. During a single shift, crews might have come upon a fire, found a lost person, helped a stranded motorist in the hot desert, and helped apprehend criminals, making the county a safer place.

“We cover a very large county that presents us with many challenges,” Aero Bureau Captain Anthony Rivera told *Vertical 911*. “The Air 29 desert shift demands a lot of our pilots and TFDs, and that’s how they like it. I’m proud of what they do for the citizens of Los Angeles County.”



**Skip Robinson** | Skip has covered helicopter operations through photography for 25 years and has worked with *Vertical Magazine* for over a decade. His main interests are rescue, parapublic and military operations. Skip is based in Los Angeles, California.



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# NEONATAL TRANSPORT: *A Different* KIND OF HEMS

Transporting newborns by air is associated with special challenges and considerations. Here, some international perspective on best practices for neonatal transports.

**By Mario Pierobon**



As the U.K.'s first dedicated pediatric helicopter emergency transfer service, the Children's Air Ambulance charity uses a specially equipped Leonardo AW109 to fly critically ill children between hospitals throughout the country, free of charge. **CAA Photo**

“Newborns are not little adults.”

This phrase is canonical in the niche domain of neonatal transportation by air. Neonates have unique characteristics and medical concerns, and to care for them effectively, helicopter emergency medical services (HEMS) operators must develop and implement appropriate procedures, deliver specialized training and have appropriate equipment installed on board.

Too often, HEMS programs transport neonatal patients without the necessary equipment and medical expertise. We consulted several specialized pediatric HEMS programs for some global perspective on best practices for neonatal transports.

### SPECIAL CONSIDERATIONS

The first thing to note is that neonatal transportation by air differs significantly from HEMS broadly speaking. Resources need to be deployed specifically for neonates and their often complex and delicate clinical conditions.

Neonatal transport is typically secondary, or interfacility, transport between hospitals, generally between an outlying facility and a specialty hospital with a neonatal intensive care unit (NICU). According to Jose Manuel Gutierrez Rubio, global head of HEMS and medical director at Babcock Mission Critical Services, continuous communication between the aircraft, the operations control center (OCC) and the hospital is vital to the success of a neonatal transfer.

“The transfer requires an OCC air-ground and good communication between the professionals of the sending center and those of the receiving center,” he observed. “The knowledge of the evolution of the patient during the transfer is very important in order to make therapeutic decisions in the receiving center.”

The composition of the crew can vary from country to country, and may include neonatal nurses, paramedics, neonatologists, and transport physicians specializing in neonatal transport, or physicians with HEMS experience and additional training in neonatal transport.



The Children's Air Ambulance flies with two pilots, which in addition to improving safety in flight, means a spare pair of hands on the ground.

**CAA Photo**



“Staff must have training in newborns and neonatal transport, with sufficient experience to provide adequate neonatal care, both for the stabilization of the neonate at the sending hospital and during transportation,” said Gutierrez Rubio. “The crew must be able to anticipate and treat any problems or emergencies that may arise and have effective communication capacity between the team, the sending hospital, the recipient, the family, and the transportation coordinating center due to the specificity of the neonatal pathology. In addition, they should know the equipment and pharmacology for neonatal transport.”

Richard Clayton, director of operations at the United Kingdom's Children's Air Ambulance charity, and Ian Braithwaite, transport nurse educator at Embrace, one of the clinical partners which works alongside the Children's Air Ambulance, noted that large clinical teams and lengthy transports between hospitals call for

Arkansas Children's Hospital is one of only a handful of institutions in the U.S. to offer air transport of critically ill patients on an ECMO (extracorporeal membrane oxygenation) circuit.





especially capable aircraft.

“Due to the nature of the long-distance transfers, the helicopter needs greater range, instrument flying capabilities and, ideally, weather radar,” they said. “It should be able to carry three clinicians for the most serious cases and have a spare seat for the child’s parent or guardian.

“The Children’s Air Ambulance flies with two pilots because the average mission length is around five hours and the aircraft often flies to parts of the country that the pilots may not be familiar with. This also means that we have a spare pair of hands to help the teams load and unload the patient whilst the other pilot can liaise for refueling, changes of flight plan, etc. We also have a central coordinating air desk that tracks the aircraft in real-time and can book landing sites and refuels ahead of the aircraft, especially if there is a change in weather or destination hospital.”



## THE RIGHT EQUIPMENT

There are particular equipment requirements that must be met in order to safely transport neonatal patients. The Children’s Air Ambulance realized early on that it would have to design its own specialist intensive care transport system, which it did with support of its National Health Service (NHS) clinical partners.

Clayton and Braithwaite told *Vertical 911*, “We have been told by clinical partners that it is the best system yet. Inside the aircraft, it looks very different from a [standard] HEMS aircraft. There is a lot more oxygen and medical air available because these gases must power the ventilators and other specialist therapies for a longer time when compared to a HEMS mission. We also provide more drug pumps than a HEMS aircraft and a comprehensive array of back-up equipment. Currently, we use an intensive care transport system that includes a BabyPod; however, for a neonatal transfer an incubator is also useful, and we will have an incubator system this year as well.”

In North America, Children’s Healthcare of Atlanta (CHOA) recently took delivery of a similarly customized Airbus EC145e for pediatric transport (see p.36, *Vertical 911*, *AMTC 2016*). For the neonatal population below five kilograms (11 pounds), CHOA uses the Airborne Aviator transport incubator with a five-point restraint system for securing the patient, according to CHOA Transport Team manager Nancy Constable.

Generally speaking, must-have equipment for neonatal transport includes a heated incubator or isolette, as the patients must have a warm environment; a vital signs monitor appropriate for the age group; a ventilator able to ventilate very low tidal volumes (down to 2.5mL); up to six infusion pumps able to run precisely at very low rates; a pressure-limited manual ventilation system, since high “bagging” pressures can be harmful to neonates; and a blended gas supply, as high oxygen concentrations can be toxic to premature neonates.

Based on the needs and priorities of the service, nice-to-have features include servo-controlled patient cooling for therapeutic hyperthermia; equipment for advanced ventilation strategies (high frequency, nitric oxide); humidified nasal continuous positive airway pressure (CPAP) or high-flow gas delivery (non-invasive support); and extra-corporeal membrane oxygenation (ECMO).

Newer technologies on the market include ventilators that cover neonates as well as adults; turbine-driven ventilators that can ventilate in air but do not need a compressed air supply; and humidified high flow of blended gas via nasal cannulae as an alternative to CPAP. “Some services who do not move the smallest babies may find that an-air circulating incubator is too heavy and expensive for their needs,” said Clayton and Braithwaite. “There are alternatives available which rely on a chemical gel mattress for warming. Recently, electrically warmed flexible polymer mattresses have improved the performance of the fiberglass incubator alternatives.”

## THE RIGHT TRAINING

The personnel involved in the transportation of neonatal patients need to undergo specialized training including clinical training. According to Constable, clinicians transporting neonates by air need to be particularly knowledgeable about the gases utilized for the neonatal population (such as nitric and heliox) and flight physiology as it relates to newborn infants.

With respect to training, the decentralization of public health that is typical of some European nations makes the situation dependent on each region, with specialized pediatric and neonatal teams in some areas but not others. Gutierrez Rubio noted that neonatal transport staff could include specialist neonatologists who receive training in

helicopter operations, or HEMS clinicians who undertake additional training for neonatal transports.

“If the medical staff is not specialized, both doctors and nurses must be trained specifically in this type of transportation,” he said. “Medical teams should be trained at the hospitals and by the helicopter operator and carry out a minimum number of critical neonatal transports to maintain their certification current. They need to provide adequate neonatal care, when they have to get the baby ready for the transport, during transportation, and must be able to anticipate and deal with potential problems or emergencies that arise during transport.

“Clinical training is vital to improve patient clinical outcomes in transport. The responsibilities of each member of the team will depend on their professional training program. In general, as a team, clinical training is recommended to include neonatal medicine, the particular procedures, reassessment — the discussion of clinical cases, includ-

ing organizational dynamics, transport equipment, and stress management — and common action protocols with receiving and issuing hospital centers.”

**STANDARD OF CARE**

Problems can occur when programs without the necessary medical equipment or training attempt to transport neonatal patients. Said Gutierrez Rubio, “The problems that can happen in the transport of high complexity critical neonates can be catastrophic due to their inherent fragility. So, many times, it is necessary to stabilize the neonate at the patient’s reception place and that is why it is necessary to have a high knowledge of the patient’s pathology. Medical teams might not solve the complications of the patient in flight in case of inadequate training.”

According to Clayton and Braithwaite, “The main problems occur in coordination of all the various elements and in particular the landing sites that may be close to the hospital but not on-site. Along with dedicated aircraft that can stay with the clinical team, the Children’s Air Ambulance provides an air desk that solves a lot of these coordination issues for the clinical teams.

“We work with external specialist teams that are part of the NHS in the U.K. and they have very high standards that ensure clinical care for the patient is second to none. The Children’s Air Ambulance’s role is to ensure requests for a transfer are seamless and that the clinicians can concentrate on providing the best care possible for their patients. Our aim is that the clinicians do not have to think too hard about the logistics of a helicopter transfer compared to what they do every day on the road. If we make it easy for them, it is better for the patient and we can achieve more as a team.”

Even high-quality programs may not significantly specialize in pediatrics or neonatal care, but still be required to transport neonatal



Children’s Healthcare of Atlanta’s new Airbus EC145e has a custom interior designed to accommodate the needs of a wide range of pediatric patients, from the tiniest babies on up.





Personnel involved in the transportation of neonatal patients need to undergo specialized training including clinical training.

patients. For these operators, there is a need to cope with these transports, and modify their aircraft and operations accordingly.

“Most helicopter operators do not have specialists in neonatal transport and the way of solving a demand for this type of transport is firstly to have medical teams capable of performing neonatal transport with adequate training in neonatal transport,” said Gutierrez Rubio. “This staff should be trained in hospitals that have neonatal intensive care units and be recertified from time to time as well as have a minimum of neonatal transports per year. Recertification is essential.”

He also emphasized that aircraft should be modified to accept equipment appropriate for neonatal transports, and have suitable heating and air conditioning systems, and electrical systems that can accommodate specialty equipment. “The key for non-specialized operators to have access to these transfers relies on actual neonatal transport equipment and continuous and intensive training of the medical teams,” he said.

Having liaised with the specialist U.K. teams before it started flying, the Children’s Air Ambulance quickly understood that they needed a specialized and dedicated service. Said Clayton and Braithwaite,

“Any high-quality service could provide the same as we do; however, we found that secondary transfer of seriously ill children under intensive care works a lot better if the aircraft commander is not under pressure to undertake a HEMS mission in their local area.

“It also helps if the helicopter is familiar to the clinicians and has all the specialist equipment in the same place, every time. If the clinicians are very familiar with their working environment, they have the confidence to transfer the most seriously ill patients, which are usually the patients that need a quick transfer over a long distance. Ultimately, that means we help more seriously ill children and in particular the sickest ones.”

Their advice for medical crews who do not have regular exposure to neonates but must occasionally transport them anyway?

“Partner with a neonatal unit to receive the necessary training and support,” they said. “Benchmarking through an organization such as GAMUT (Ground and Air Medical Quality Transport database) also is recommended, and accreditation through a body such as CAMTS (Commission on Accreditation of Medical Transport Systems) assists organizations to meet consensus standards of best practice in this area.”



# *COMMUNITY* *Favorite*

Now the first air medical operator of the Bell 429 in the U.K., Wiltshire Air Ambulance is thriving thanks to strong community support.

**Story by Jon Duke | Photos by Lloyd Horgan**





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Wiltshire Air Ambulance's eye-catching livery is perfectly shown off on the helipad at the Great Western Hospital, Swindon.



In selecting the Bell 429 over competing offerings, Wiltshire became the first U.K. operator of the 429 in the HEMS role.



The United Kingdom's first helicopter air ambulance began in 1987 serving Cornwall, the remote rural southwestern peninsula of England known for the kind of narrow, circuitous roads that are more familiar in Normandy. Able to make use of the direct and unfettered access offered by the sky, the helicopter was a natural solution to get the most seriously unwell casualties to hospital within the "golden hour," that critical time window said to follow traumatic injuries.

Three years later, Wiltshire was among the first areas of the U.K. to opt for a joint helicopter emergency medical services (HEMS) venture between its police and ambulance services, with the adoption first of an MBB Bo.105 and then an MD Helicopters MD 902. Joint funding left the air ambulance operation liable for around £700,000 per year in operating costs that were met by the Wiltshire Air Ambulance charity, in a model typical of the U.K.

Despite being closely integrated with the U.K.'s publicly funded healthcare providers — the National Health Services (NHS), which covers the costs of providing trained medical crewmembers —

the country's HEMS operators are almost all reliant on private fundraising. This is, in common with much about the NHS, a somewhat controversial subject. Many have suggested that air ambulances should be brought under NHS control and publicly funded, citing potential efficiencies to be gained in doing so.

Detractors of this proposal are quick to point out that the monstrous cost of national HEMS coverage is already being met largely by the public, with far more goodwill than typically accompanies the tax increases that might otherwise be necessary. Alongside this are the benefits of "ownership" — there is a strong sense among local communities that they contribute to their own helicopter, and take great pride that they can maintain such an asset.

That pride of ownership is evident in Wiltshire. At the end of 2014, police operations in Wiltshire were absorbed by the expanding National Police Air Service, meaning that the charity would now be on its own. This presented a multitude of problems including basing — the program has been accommodated at



A critical care paramedic and trainee CCP flanked by the charity's Bell 429 at Wiltshire's home base. Thanks to the public's support and generosity, the charity will be moving to its new airbase in Semington in the future.

police headquarters, in an arrangement that will expire at the end of this year — but by far and away the most pressing issue was the lack of an aircraft.

Thanks to an outpouring of public support, Wiltshire Air Ambulance was able to lease, and later purchase, a brand-new Bell 429, as well as sustain the £3.25 million (about US\$4.1 million) in annual operating costs associated with its new dedicated air ambulance. Even more generous donations have allowed it to commence construction on a new £5.1 million (US\$6.5 million) airbase in Semington, as it continues to deliver a cutting-edge service that remains free at the point of use.

### NEW CAPABILITIES

In selecting the Bell 429 over competing offerings such as the Leonardo AW169 and Airbus H135, Wiltshire Air Ambulance became the first U.K. operator of the Bell 429 in the HEMS role. According to chief pilot George Lawrence, the aircraft is more or less the perfect size for the role, with a notable power advantage over the MD 902 that the program operated previously.

"In that aircraft, we started to limit our endurance above 25 C," he said, "but with the 429, we now have greater overall endurance and it's not limited until we reach around 35 C." This additional power reserve also gives a real safety advantage when approaching or departing confined landing areas.

The fitting of the Aerolite medical interior guarantees that medics have head-to-toe access to the casualty from their own crash-worthy seat, should they require. It also allows easy loading of the casualty litter from the starboard side cargo door, which saves the weight associated with the optional rear clamshell doors. There is adequate cabin space and seating for two paramedics and the casualty litter, plus an additional seat for use if the casualty needs to be accompanied, for example by a family member.

The usual crew composition is one pilot and two paramedics, with day-to-day running of the operations room — and the critical task of making the tea — shared between all members on shift. While some HEMS pilots in the U.K. are fully civilian-trained, they are more likely to be drawn from ex-military stock, and this is the case for all five duty pilots at Wiltshire.

One of them Matt Wilcock, is an ex-Army Apache pilot. As a former test pilot with over 30 types in his logbook, he might have had his pick of jobs, but HEMS flying suits him perfectly. "It's very reactive and very varied," he said. With half an eye on his listening colleagues, he added, "We also occasionally have to get involved



Critical care paramedics demonstrating the Lucas cardiopulmonary resuscitation (CPR) device.



A mixture of critical care paramedics and trainee CCPs load a simulated casualty into the Bell 429 as a training exercise.

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with the medical side... you know, fetch this, carry that." There were chuckles, but the closeness of the crews was tangible; familial even.

While they were joking, operations manager Kevin Reed explained the importance of crewmembers understanding each other's working environment. "We treat the paramedics as full aircrew members, with the same access to human factors training and the same fatigue limits," he said. "We are ahead of a lot of other units in that sense. It means we need more paramedics, but with aircraft operation involved we want to be as safe as we can."

Nowhere is that attitude more important than during night operations. Wiltshire is among the first air ambulance units in the U.K. to operate at night to ad-hoc landing sites using night vision goggles (NVGs). Although the program is not able to resource 24-hour operation, this now means it is capable of operating until the early hours of the morning, massively increasing the availability of rapidly delivered critical care.

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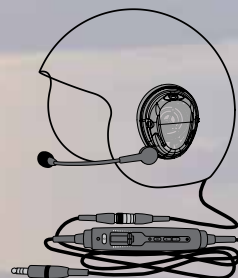
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Wiltshire is among the first air ambulance units in the U.K. to operate at night to ad-hoc landing sites using night vision goggles.



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air ambulance critical care paramedics (CCPs). Employed by the NHS, they are selected from a cadre of paramedics that staff the country's land-based ambulances, and with air ambulance work seen as the pinnacle of their trade, competition is utterly fearsome. (One CCP remarked that former friends had stopped speaking to him after hearing of his successful application to Wiltshire.)

Their level of training is also formidable, and despite the program's undoubtedly advanced technology — such as the Lucas automatic chest compression machine, which delivers automated CPR and looks like a prop from the film *Blade Runner* — it is from these individuals that the real capability of the air ambulance is delivered.

Mark Kinsella is a trainee CCP on secondment with the air ambulance who came to the program following duty on South West Ambulance Service Hazardous Area Response Team: paramedics with advanced clinical training who respond in dangerous environments like those underground, at height, or around hazardous chemicals. Even that, he said, did not prepare him for the unforgiving tempo he experiences with Wiltshire Air Ambulance. "On the trucks [land ambulances] you might see one major trauma a year," he said.



With their sophisticated clinical offerings, the U.K.'s helicopter emergency medical services programs have become far more than just flying ambulances.

“We probably see about one a day.”

Thirty years after the first air ambulance served Cornwall's remote communities, and with three dozen similar services now operating across the country, there is still a sense of heightened drama when one of these aircraft arrives at the scene of a medical emergency — for good reason.

The U.K.'s helicopter emergency medical services programs have become far more than just flying ambulances. With highly trained medical professionals and an ever-increasing suite of equipment on board, they now transport elements of an operating theater to the incident scene. With the aim of immediate casualty stabilization, air ambulances are now providing services that were previously available only in hospitals.

And that capability is in constant demand. On the day that *Vertical 911* visited, the crew had climbed into their aircraft at 8:30 that morning and by mid-afternoon had spent only about 30 minutes on the ground at base. Rarely do you find teams of people that not only perform well at such a tempo, but seem to revel in it. It's easy to understand why the people of Wiltshire see their air ambulance program as a worthy investment. ➤



**Jon Duke & Lloyd Horgan |**  
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The CBP's Air and Marine Operations has a fleet of around 240 aircraft, including six different helicopter types — providing plenty of opportunities for pilots to transition between aircraft if they so choose. **Edwin Montufar Photo**



# PILOTS WANTED

With U.S. Customs and Border Protection now engaged in a major pilot recruitment effort, we asked the agency to tell us more about the job and hiring process.

**By Elan Head**

If you've been looking at helicopter pilot job listings in the United States, you've probably noticed that Customs and Border Protection (CBP) is hiring — in a big way.

"Today, right now, we're short 75 pilots," Edward Young, acting executive assistant commissioner of the agency's Air and Marine Operations (AMO), told *Vertical 911* in early June.

While that may not sound like a lot, he said, it represents nearly 15 percent of the approximately 550 pilot positions authorized for the agency, and doesn't take into account additional positions that may be authorized in coming years.

According to Young, one reason for the shortfall is increased hiring competition from airlines — such as American Airlines' Envoy Air, which recently launched a new program specifically to recruit military helicopter pilots. In response, CBP has stepped up its own recruiting efforts in both the military and civilian pilot communities.

But flying for CBP isn't a typical pilot job, and the application and interview process — which includes a polygraph test — can be daunting. That process is also the subject of much online discussion, not all of which is completely accurate.

To clear up some of the rumors, we asked Young and other supervisors at AMO to tell us more about the available positions, who they're looking for, and what pilots can expect once they submit an application. They also shared some insight into how the agency is adapting its hiring process to make it easier to get the right people through the door.

"We want you on just as bad as you want to be on, and we need to do better at showing that," said Young. "That's the goal of the organization right now: finding ways to get you into this organization, and finding better ways for us to help you make it through that process. And we're making huge strides in that area."

Currently around 70 to 75 percent of CBP pilots have military experience, but the agency is seeking pilots of all backgrounds. Said AMO acting executive assistant commissioner Edward Young, "We have these phenomenal skill sets within our organization from all kinds of pilots that bring experiences and capabilities from their past that help us in executing the mission that we have today." **Edwin Montufar Photo**

## A JOB WITH A MISSION

The border security agency CBP was established under the newly created Department of Homeland Security in 2003, consolidating multiple organizations including the U.S. Customs Service and U.S. Border Patrol. In 2006, those organizations' aviation units were brought together in a new division, AMO.

In simple terms, Young said, the CBP's overarching mission is to "stop the bad things and stop the bad people from getting in this country" — terrorists and drugs being the bad people and things of greatest concern. It routinely partners with other government and military agencies to secure the borders, and leverages a diverse fleet of fixed-wing, rotary-wing, and unmanned aircraft in pursuit of that goal. Helicopters are particularly important to the agency's mission and account for most of its flight hours; models currently in the fleet include the Airbus Helicopters EC120 and AS350, the Bell Huey II and UH-1N, and the Sikorsky S-76 and UH-60 Black Hawk.

Because CBP pilots play an integral role in law enforcement operations, they are required to become law enforcement officers, and although no such previous experience is necessary, an appropriate mindset is critical.

"What sets us apart and what makes us different than, say, an airline pilot or an EMS [emergency medical services] pilot is that we have to be able to function as a law enforcement officer," said Chris Riccardi, a supervisory air interdiction agent with AMO (*read more about Riccardi's career on p.88*).

"Understanding how to apply law enforcement tactics [and] techniques, and being able to communicate and look at a situation from a law enforcement perspective, is what we bring to the table when we're giving overhead coverage for ground operations," he said.



“So part of what we’re looking for is not just the ability to fly an aircraft . . . we’re looking for the right mindset of someone who’s interested in a law enforcement career.”

Pilots must also be willing to embrace dynamic environments and unpredictable schedules — because flying for CBP is not a 9-to-5 job. A specific operation might call for late hours or last-minute travel (contingencies that are provided for with Law Enforcement Availability Pay, equivalent to 25 percent of base salary, which can quickly push a pilot’s total compensation above six figures).

“The one thing that makes this job exciting is the diversity, and not only the diversity of missions and the diversity of people, but the diversity of your day-to-day activity,” said Young. “You don’t know what you’re going to do when you come in every day, and if you’re one of those people that thrives off of that kind of changing and dynamic environment, you’re going to love this.”

### THE HIRING PROCESS

So let’s say you are one of those people — an aviator who is interested in a law enforcement career and prepared to embrace the unpredictability associated with it. How do you sign up?

Your first step should be to confirm that you meet the minimum qualifications for the job (a complete list of requirements is available at [www.cbp.gov](http://www.cbp.gov)). Although recent waivers for certain requirements have expanded the pool of potential candidates, around 25 percent of applicants don’t pass the initial qualifications review, noted director of AMO frontline recruiting Christopher Wiyda.

Generally speaking, the maximum entrant age is 40. Applicants should be Federal Aviation Administration (FAA)-certificated pilots



CBP pilots frequently operate from small offices. Said Edward Young, “In some of these places [you] have to be self-sufficient, you have to be self-motivated, so those are the types of people we’re looking for — people that are willing to go out there and make things happen.” **Alexander Zamora Photo**

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at the commercial or airline transport pilot level, and be able to obtain an FAA first class medical certificate (with at least a second class medical current at the time of application).

Candidates are also required to have at least 1,500 hours of total flight time, although CBP can waive this requirement down to 1,125 hours for current civil service employees, and to 1,000 hours for pilots with military or other specialized experience (including multi-engine, night vision, or overwater flight time, or experience as a flight instructor in complex aircraft).

Wiyda explained that applicants undergo a seven-step process that begins with the submission of an online application at [www.usajobs.gov](http://www.usajobs.gov). Human resources specialists will then review the application and supporting documents to ensure the candidate possesses the necessary qualifications. Recognizing that some qualified candidates may be rejected if their paperwork is not formatted or submitted correctly, CBP aims to provide more support to applicants to avoid unnecessary attrition.

"We're always looking at improving our internal processes, and customer service is a big one for us," said Wiyda. "We want to continually improve and help applicants through the process."

Following a successful qualifications review, applicants must undergo a background investigation, a simple fitness test, and a drug test. Then comes what is for many applicants the most intimidating part of the application process: a four- to six-hour polygraph exam, colloquially known as a "lie detector test."

Young acknowledged there is a widespread perception that many otherwise qualified candidates fail the polygraph — when

in fact most attrition occurs at other stages of the hiring process. Nevertheless, the agency has recently made changes to its polygraph procedures that have improved the pass rate. Most notably, it has switched from a lifetime polygraph examination to one focused on the most recent seven-year period.

For example, when it comes to drug use, "instead of lifetime now, I can only talk about drug use in the last seven years," Young said. "If there's drug use that we find in the seven-year question period, we go back to the rest of the life, but we don't go there unless it leads us there. So that's shortened the test a little bit, it's given us a little better pass rate."

The final part of the process is a three-part flight assessment in Oklahoma City, Oklahoma, consisting of an oral evaluation, flight evaluation, and interview. In addition to performing normal and emergency flight maneuvers, candidates are expected to demonstrate knowledge of the National Airspace System and Federal Aviation Regulations (FAR) parts 61 and 91.

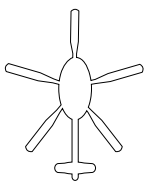
"Absolutely we expect a pilot to be able to come in and operate at commercial standards, understanding and applying part 91 and our Air Operations Handbook, essentially a GOM, in the national airspace," said Riccardi. "If a [pilot] comes out of the military, it's a fantastic springboard to go from there to the civil side, but they must be able to operate anywhere in the country — urban, maritime, or backcountry — day or night, safely and professionally, oftentimes with minimal supervision. Judgment and risk assessment and mitigation are paramount."

Although the CBP hiring process has a reputation for being long



AMO interdicts unlawful people and cargo approaching U.S. borders, investigates criminal networks, and responds to contingencies and national taskings. **Edwin Montufar Photo**





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According to AMO's Edward Young, most CBP pilots are drawn to the job by the mission. "These people are very, very passionate: they're loyal dedicated Americans from all walks of life," he said. "And they all indicate that the most important thing for them that got them to come in the door, for the most part, is mission." **Skip Robinson Photo**



Of AMO's approximately 1,800 federal agents and mission support personnel, around 600 are involved in aviation in some capacity. **Edwin Montufar Photo**

and drawn-out, the agency has been working to shorten it. "We have a goal of six months and I think we're doing better than that; we've been able to [complete the process] in just over two months for some qualified applicants," said Wiyda. "So I think that some of the information that's out there might be a little dated — we have made tremendous strides."

## ON THE JOB

Pilots who accept a position with the CBP can expect to start their careers with a four-month course at the Federal Law Enforcement Training Center in Brunswick, Georgia, where they will qualify as law enforcement officers. That will be followed by AMO-specific flight


and ground courses with an emphasis on tactical operations.

"While you're doing the flying portion of it you're also learning how to operate our sensor packs, because you don't always operate as a pilot, sometimes you're a tactical flight officer or an observer, which is equally important," noted Riccardi.

Although AMO operates from dozens of locations around the U.S., for their first assignments, most pilots are sent to the southern border. "If you're going to walk in the door with us, we're going to put you, to start, in a location where you're going to get a lot of experience," said Young. "We're going to put you in a place like Puerto Rico; we're going to put you in McAllen, Texas; Laredo, Texas. Those are the places where the hotbeds of activity are, [where] you'll get really good experience in a really short period of time."

Granted, many of these locations aren't exactly glamorous. But pilots who stick with the agency will have opportunities to move to different locations and into different missions and aircraft types, if they so desire.

"Someone that shows the aptitude, someone that shows the desire, someone that shows the drive, that wants to take on greater responsibilities in an organization — we're going to give you those opportunities," said Young.

"The cool thing is that the opportunities are there if you want to exploit them," echoed Riccardi. "If you want to come to work every day and just fly, you can do that; you can do that for 25 years. Or if you want to come in and go to school and learn and travel, that is there as well. That's the great thing about this organization." 



**Elan Head** | An award-winning journalist, Elan is also an FAA Gold Seal flight instructor with helicopter and instrument helicopter ratings, and has held commercial helicopter licenses in Canada and Australia as well as the U.S. She can be reached at [elan@mhmpub.com](mailto:elan@mhmpub.com).





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*A supervisory air interdiction agent with U.S. Customs and Border Protection (CBP), Chris Riccardi has been involved with law enforcement aviation for 23 years. Now, Riccardi is helping to lead CBP's pilot recruitment efforts, described on p.76. We asked Riccardi to tell us more about his own career as an example of the opportunities available to pilots within the agency.*

**Vertical 911: How did you get started in aviation, and how did you get to where you are today?**

**Chris Riccardi:** I knew I was going to fly helicopters since I was four years old. Vietnam was in full swing, and on the evening news I used to watch the Hueys bringing in supplies and bringing out wounded, so that kind of put the hook in me as a very young child. I enlisted in the Army right out of high school as a Cobra mechanic, and eventually ended up going to the New York Army National Guard — they sponsored me to go into their unit as a warrant officer and go to flight training. So I left active duty in 1986, and in 1987 I attended U.S. Army flight training at Fort Rucker.

In '94 I moved from Upstate New York to California — where I retired from the California National Guard in 2005 as a CW3 — and took a job with the U.S. Border Patrol. At that time we had our own aviation unit within the U.S. Border Patrol, it was very small, about 120 pilots total. There was a requirement that no matter what ratings you came in with, you still had to do three years as a ground agent, which I did and I absolutely loved. At the end of my three-year tour as a ground agent, I was selected to become a U.S. Border Patrol pilot and started flying in San Diego. In 2005-6, the Department of Homeland Security decided to take aviation assets from the U.S. Customs and the U.S. Border Patrol, and meld them into one organization known as Air and Marine Operations, my current employer. In 2006, I promoted to supervisor and got in on the management side of things.

# COLUIN

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## CHRIS RICCARDI SUPERVISORY AIR INTERDICTION AGENT

**V911: What aircraft have you flown in your career with the agency?**

**CR:** I've flown the OH-6, three different models of UH-1s, MD 500, MD 600, EC120, AS350 B2s and B3s, UH-60s, Cessna 182s, 206s — we've had a variety of airframes throughout the organization. We aren't stuck in one airframe. If you come on as a dual-rated pilot, there's a very good possibility and probability that you're going to be flying rotary-wing and fixed-wing. A lot of organizations put you in one aircraft and that's what you fly. Most of our guys are very proficient in more than one airframe, and more than one mission set.

**V911: What are some of the misconceptions that you think people have about the job or what it entails?**

**CR:** We're not just pilots, we're federal agents as well. We work in all areas of the country, not just the Southwest border. Some people think that this is just a flying job and it absolutely is not — being able to fly an aircraft is only half of the skill set. You have to be able to perform the full gamut of law enforcement duties, you have to be able to do your job from the ground as well as from the air. Everybody that we hire is already an accomplished pilot. So the challenge is taking that good pilot and making him or her a good officer or agent. And that takes a little bit of finagling at times.

**V911: For you, what are some of the things that go into a law enforcement mindset?**

**CR:** Most people meet a law enforcement officer at one of two times in their life: either they're the victim of a crime or they've committed a crime. So a lot of times the interactions they have with law enforcement officers are not favorable on either side of it, because they're having a bad day no matter which side of that coin they're on. I will tell you that for most people that get into the law enforcement side of things, it's altruistic egotism. You derive a sense of well being from helping somebody else. Being on the law enforcement officer side of this, you do get a lot of

chance to take your flying skills and put them in furtherance of helping somebody else, whether it's a rescue situation, whether it's a law enforcement situation. [Hurricane] Katrina, prime example. We were at Katrina for about 28 days, deployed with agency helicopters and airplanes. Initially our mission was search-and-rescue. Once we arrived and saw the scope of the disaster, we assumed a dual role, SAR and law enforcement. This made us unique to other organizations in that we had multiple roles and taskings to sustain that community following that disaster.

**V911: What has kept you in law enforcement aviation for so many years?**

**CR:** I had an epiphany about eight months back. I flew up the coast to Los Angeles from San Diego on a Sunday morning, did some flights around the L.A. area, checked some vessels at the Port of Long Beach. As I was coming back down the beach, out of John Wayne Airport, I had an R44 take off in front of me. I was flying an AStar equipped with all the bells and whistles, cruising down the beach, overtaking that R44. And the lights came on for me; I thought, "Those guys are out there spending their own money to get the \$1,000 hamburger to build time, possibly to qualify for my job. How lucky am I?"

That's when I realized that for me it's not flying the aircraft that I will miss when I stop doing this job, it's taking that aircraft and doing a mission with it. I know that with my personality, if I wasn't doing something — as much as I love waggling the sticks and flying a helicopter — that if I didn't have a mission or a purpose for it, I think it would lose its luster. That light came on for me, and it really put things into perspective as to why I still love to come to work after this much time. It's a sense of purpose; it's taking that helicopter and knowing that it is a tremendous tool that when put to work correctly, really has great benefits. I love having a sense of mission to go with flying.

*This interview has been edited and condensed.*





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