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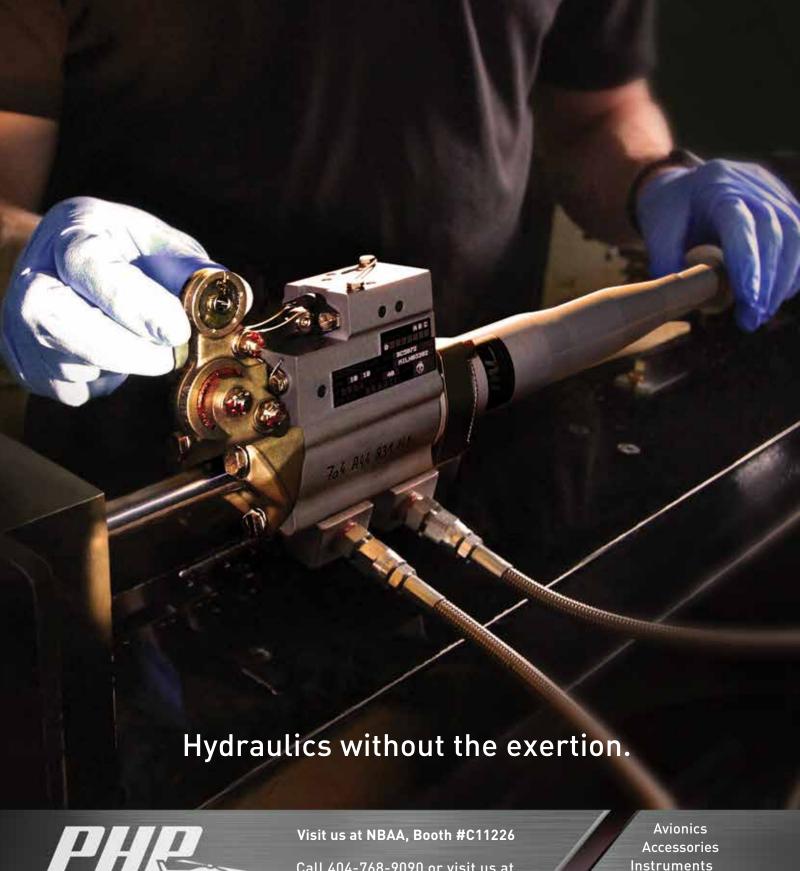
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# **72 HIGH FLYERS**

The OEMs give their

take on the VIP/

corporate sector

**BY HOWARD** 

SLUTSKEN

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# verticalmag.com // oct/nov // volume 18, issue 5



MHM >

IN CANADA:

500 Trillium Dr., Unit 23, Kitchener, ON N2R 1E5

IN THE UNITED STATES:

701 S. Main Street, Fall River, WI 53932

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.

Vertical is proud to be a member of HACO Meteophy Meteophy (1987)









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# COLUMN

# THE EVOLUTION OF SHELTER

FOCUS ON SAFETY // GEOFF GOODYEAR



I know we don't all work in austere environments, and some among us even get to go home every night, but a good lot of us do. These hardy souls get to spend an inordinate amount of time out in the sticks fighting fires, moving drills and chasing moose. Shelter during these operations can often be what you can find or build. Such was my industry experience.

Back in the dark days of flight, I remember numerous nights spent sleeping on the floor of some cabin or other using the aircraft seats for a mattress. Some of us, having been overcome by weather, have memories of a night in "Motel Bell" while we awaited more suitable flying conditions.

I also recall sleeping in cabins that required the door to be braced by 2x4s from the inside to keep the bears outside! Those were exciting, albeit sleepless, times.

But it was tents that most often served as my shelter during remote area operations. These magnificent material structures have provided me with countless hours of protection from the elements — as well as indescribable frustration when erecting and then repackaging them into a bag that somehow grows smaller with each use.

My first tent was a thing of beauty, with alternating light and dark blue nylon panels over fiberglass poles. I thought it had the same space as a 5-star hotel suite until I had lived in it for a day or two, and then realized my spatial perception needed to be adjusted. It was a brand name unit purchased from the big box store Canadian Tire... so it had to be good.

So, off I went to the wilds of Labrador with helicopter and tent in tow. We landed on a beautiful spit of sand edging out into Lac Fonteneau, just on the border between Quebec and Labrador. We wasted no time in setting up our tents and quickly had a tiny community in the middle of nowhere. My fuel cache was

on the other side of our tent city, so it was now time to reposition the helicopter, refuel and go to work.

While I made sure to give all the tents a wide berth, the downwash from the aircraft did cause some activity at the campsite. Through the dust and sand cloud I could see everybody suddenly run to my tent. I wasn't sure why, but after refueling and strolling back to the tents, I noticed mine had a rather unusual shape. Looking inside, I could see all the fiberglass poles had broken. My colleagues had graciously affected temporary repairs, so each pole had a splint of alder bush, and the two were held together with electrical tape. I had started off living in a tent, but I was now living in a casualty on life support. Clearly, while brand name, my tent was not meant for Labrador conditions.



While I have some issues with the emerging flight and duty time regulations in Canada, I do applaud the industry's move towards adequate rest in suitable conditions.



The obvious solution was to upgrade to a larger tent with aluminum poles. As soon as I got back to town, I ordered the best I could afford and waited anxiously for its arrival. It was a quantum leap over what I had started with, and I was justifiably proud of my choice. I used it several times on subsequent jobs with great effect and comfort! Then it came time to do some work in the remote Torngat Mountains in the north of the province. I showed up at base camp with my trusty tent and proudly added it to the dozens of others set up on the shoreline. Sleeping under canvas in the mountains... it does not get any better.

I went to sleep almost instantly the first night, and began to dream as one does when one sleeps in the mountains. I cannot recall the scenario of the dream, but I do recall one part of it where someone was touching my nose. It was completely incongruous with the rest of the dream, and as I slowly awoke and opened my eyes, I was greeted with the vision

of my tent roof bending down towards me and repeatedly hitting my nose. The gusting wind outside had distorted the tent, bending the aluminum poles to breaking point. To their credit, the poles did not break, but they did have a permanent curve in them, and I had to tolerate this before I ordered my next, bigger, stronger tent.

My tent habit was starting to get expensive and embarrassing, and I was accumulating a lot of unusable tents in my garage. The next — and hopefully last — tent in my shelter evolution arrived, and I soon had a chance to put it to the test back in the Torngats. I had the tent set up and the first couple of nights were amazing, providing solid weatherproof protection. Maybe I should have done this in the first place!

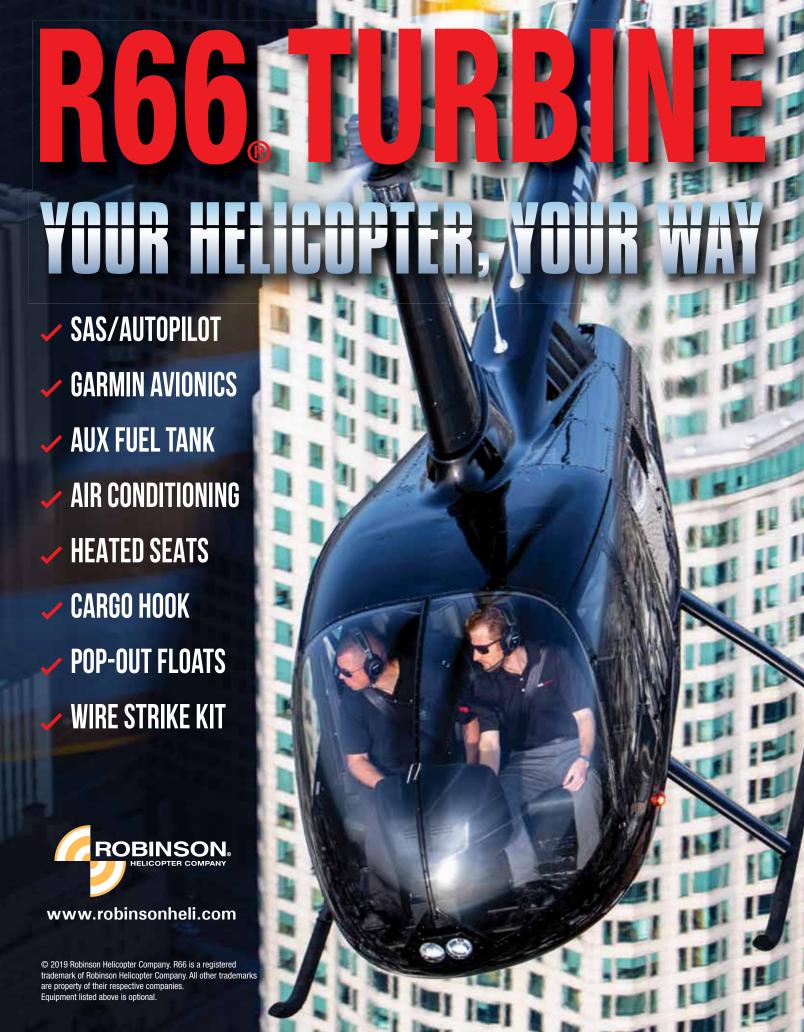
During all these trying times, the managers of the Torngat Mountains National Park had built a state-of-the-art base camp and research station. The park superintendent called me aside to inform me that my room was ready.

"What room? I don't want a room. I like my tent!" Indeed, living in a tent in the mountains has a certain maverick and adventurous appeal. I told him I'd prefer to stay in my tent, if you please. But he was adamant. The room had been prepared, they needed the tent space for incoming guests, and I was to move my kit within the hour. I was indignant.

I accepted my fate and with a long face I carried my kit to my accommodations in the base camp building. I wanted to stay in the tent... but I had to admit that the room looked very comfortable with a desk, closet and soft mattress. A frontal system moved through during the first night, and for three solid days we had driving rain, 30-knot winds and 5 C temperatures. I was trying to view the tents on the beach but could not make them out due to the driving rain on my window. As the furnace cut in, I said to myself, "No... despite my earlier protests, I am now OK with this move. It is the least I can do for the park superintendent."

While I have some issues with the emerging flight and duty time regulations in Canada, I do applaud the industry's move towards adequate rest in suitable conditions. I recognize that "suitable" and "adequate" can sometimes defy definition, but I have noticed that what was acceptable 30 or so years ago is not acceptable today, and I am encouraged by the evolution. Maybe Darwin was right after all.

By the way. Remember my first tent? The very kind folks at Canadian Tire gave me my money back!



## FOCUS ON TRAINING // ANDY ROE



There was a time when almost everyone learned to fly in a Bell 47, but when new, light training helicopters like the Robinson R22 came onto the scene in the 1980s, the Bell 47 began to slide into obscurity. There aren't many of them left now, and parts are expensive — but being heavy and underpowered, they are excellent trainers.

There is an old adage that a Bell 47 is easy to fly, but very hard to fly well. The pilot controls not only the cyclic, collective, and pedals, but two additional ancillary controls as well – carburetor heat and throttle. To fly the normally-aspirated Bell 47G2, carb temperature must be controlled effectively, and the engine rpm kept in the middle-to-upper portion of the green arc for peak power and performance.

To fly a helicopter, the pilot nudges the cyclic forward, back and sideways; applies pressure up and down on the collective; and follows through with the pedals when power is altered or to change direction at the hover. On top of this, Bell 47 pilots must continually twist the throttle — amusingly referred to as a wrist governor — and constantly adjust the carb heat handle up and down, with the wrong hand reaching across the cyclic.

Learning to fly in a G2 is harder than flying an R22 or an R44. Don't bother sending emails, because I have many thousands of hours on each of the three types. Give me the Bell 47 any day for the thrill of being able to fly something that needs to be flown well. Pedals aside, you must accurately manipulate and manage four controls with only two hands. Fortunately the throttle and collective are on the same stick. A unicycle rider juggling five balls at the same time has pretty much the same challenge as a student learning to fly a Bell 47G2.

Manual throttle control is daunting until you get used to it. The idea is to lead slightly with the throttle by twisting it open when raising the collective to keep the rpm stable. Reducing the throttle as you lower collective is easier to manage. Throttle handling needs to be smooth, and if you allow the rpm to decay when raising the collective, and then wind it open abruptly to correct this, the manifold pressure needle will spike and probably go past the red line. To correct low rpm, push down slightly on the collective as you increase throttle, and the rpm will come back without disturbing the manifold pressure setting. High-time pilots who learned on the Bell 47 always cringe when they have a chance to fly one again, because they have been spoiled for many years by the automatic governor control on turbine engines. Mind you, turbines have collective management problems as well - just different ones.



Learning to fly in a G2 is harder than flying an R22 or an R44. Don't bother sending emails, because I have many thousands of hours on each of the three types.



A carb temperature gauge with its green, yellow, and red arcs lets the pilot know when the air running through the carburetor is warm enough to prevent ice build-up on the walls of the venturi. Carb ice can easily stop the engine from running. Unlike the propeller in a light airplane, the rotor system in a helicopter offers no resistance to engine failure from carb ice because a freewheeling unit is

installed to allow the helicopter to autorotate should all power be lost to the rotor system.

Applying carb heat prevents ice from forming, but greatly reduces engine performance. For maximum power during a departure transition into climbing flight, apply full carb heat before lifting off or in the hover, until the temperature rises to the top of the green arc. Be careful, because too much carb heat can cause the engine to detonate. When you are ready to take off, put the carb heat to full cold, and you will have full power for about 30 seconds before the temperature falls below the green into the yellow arc. Moving through translation, you will gain extra lift from forward flight, so when you select carb heat again to keep the carb heat in the green, the loss of power will have minimal effect on performance. Similarly, at the beginning of an approach, select full carb heat and just before you lose all translational lift, move the carb heat handle to cold for full power.

You can get even more creative with carb heat control. For a maximum performance departure, put the carb heat handle down to full hot, and raise the collective until the helicopter is very light on the surface. With the rotor blades close to the ground, the rotor downwash will have the best aerodynamic cushion effect. When you are ready to go, put the carb heat handle right up to cold, and when you feel the weight of the helicopter starting to come up off the surface, apply full power with the collective — and off you go for the most efficient departure you can coax out of the old machine.

Non fuel-injected Robinson helicopters are not as sensitive to carb heat power loss compared to Bell 47s. However, Robinson pilots must remember that the carb temperature reading is not accurate at low power settings. The throttle rigging is much tighter and the throttle is smoother to control with the governor off. There is always something! But if you get a chance to fly an old Bell 47, you should — it's a challenging and rewarding experience.

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# COLUMN

# EVOLUTIONARY BENEFITS

FOCUS ON MAINTENANCE // JOHN CARINHA



Aviation is ripe with OEMs and vendors of a variety of product lines all vying for supremacy in a rather niche market. Government and/or industry mandates can at times become blank checks as it becomes a race to market with the latest and greatest product to satisfy demand — a demand made up of both need and want.

From my perspective, no one vendor has better managed this than Garmin International. You could even argue that they've indirectly monopolized certain sectors within the GPS market through the volume of their products in use. I recently attended a dealer training seminar that spoke of Garmin's product advancements, and we also worked through the various configuration menus, post installation, of a number of systems. This experience opened my eyes and inspired me to dig deeper into the grassroots of a company that has become such a dominant presence in our daily lives.

Garmin was founded by Gary Burrell and Min Kao. Burrell worked for King Radio in the early '80s and, after experiencing many rejections from superiors to his desire to advance technology, he recruited Kao from defense contractor Magnavox in 1983. Together, they founded what was then known as ProNav in 1989, and the company operated out of Lenexa, Kansas. Their first ever GPS was the ProNav GPS 100, which sold thousands of units in its first year. Due to unforeseen naming rights, they dropped the ProNav name, and instead renamed the company Garmin — a portmanteau of the founders two names, Gary and Min.

Garmin's sales surpassed \$100 million by the mid '90s. In 1999, it had more than doubled that revenue and tripled profits. By 2005, it had surpassed the \$1 billion mark in total revenues, and it now operates seemingly debt free, having self-financed a recent expansion. This new 750,000-square-foot facility more than doubles its aviation manufacturing capacity in Olathe, Kansas.

Garmin's reach has grown through a variety of business acquisitions and afforded the company a market share in not just aviation, but in the marine, recreation, sports and fitness markets. Garmin sells technological convenience — something that in this day and age turns heads and is ever-evolving. It was once considered a luxury to own a GPS, but we now wear them on our wrists, carry them when we hike, and even track our fitness goals using the technology.



Consider a newspaper stand or box where one could place any given content and provide a single source from there to access it. Most new avionics interfaces use this concept.



A recent example of the convenience offered in Garmin's products presented itself during a mandated ADS-B installation of a Garmin GTX 345 Transponder. Beyond the user interface and my experience of operating the company's products, from an installation perspective, it has made system integration that much more interesting and unconventional. In the past, installing a new avionics component meant assessing

which existing systems in an aircraft would be "talking" to the new component(s).

Through various pinouts/connections, dedicated pins on the connectors of a given component served a specific function. It was up to the installer to decipher which wires went where to ensure a functional and serviceable installation and system. This usually resulted in a lot more wire used between units to achieve functionality for a specific system attribute. Think of it as disseminating a specific notice to individual people and each notice serves to communicate a specific message. This would create a lot of paper and is very one-dimensional in terms of function. Instead, consider a newspaper stand or box where one could place any given content and provide a single source from there to access it. Most new avionics interfaces use this concept and Garmin very much utilizes this in its hardware design.

In my case, I had used an RS-232 data port on the transponder to communicate with the existing altitude encoder. Mode C altitude information would be transmitted on two wires; one output wire to the encoder and the other input from the encoder. The GTX 345 (like most modern avionics systems) has several data ports, but the key to its functionality comes in the actual configuration of the port itself. Through installer accessed configuration menus and associated pages viewed on the screen of the GTX 345, one can scroll through the various data pages where you select a port and then tell it what it's connected to by way of a menu or list of possible interfaces.

In the old days, you'd wire your components, turn power on and do your functional tests on somewhat of a hope and a prayer that you got it right. Nowadays, built in convenience and a buffet of various interface accommodations means walking through a detailed configuration procedure to ensure a universal language of sorts is being electronically spoken across one's entire avionics suite. Technological evolution can be a marvelous thing.



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# COLUMN

# WORKING THROUGH THE PERSONNEL SHORTAGE

FOCUS ON LEADERSHIP // KIM HUTCHINGS



By now, most people are aware that the aviation industry is headed for a pilot and mechanic shortage. A study commissioned by Helicopter Foundation International (HFI) and conducted by the University of North Dakota projects a pilot shortage of nearly 7,500 between 2018 and 2036 and an even worse shortage for certified aviation mechanics. For mechanics, the shortage was a staggering number of over 41,000 between 2018 and 2036.



As a leader, understanding the needs of each generation will allow you to adopt a positive mindset for all generations in the workforce, and avoid putting labels on them.



And to make matters worse, the airlines are poaching helicopter pilots. So where does that leave us? When it comes to hiring, I know that some companies are feeling the pressure to hire individuals that they may not have necessarily considered in the past, because of the fear of not being able to hire anyone at all.

If we were talking real estate, it would be a "buyers" market, with the pilots and mechanics being the buyers and the operators being the sellers. The pilots and mechanics get more liberty to shop around, because they know conditions are right in the job market. The fear of a shortage gives them the advantage to be more selective on the things

they want, versus what the operators want and need.

Does this mean that companies should be held hostage to focusing only on what employees want? Absolutely not!

Hiring and training new employees is expensive. We don't want to waste time and money on someone who is going to turn around and leave in less than a year or two. Losing an employee who has been with the company for two or more years is also expensive, because that person knew how things worked and had experience with the operation. Once they leave, so does that experience and knowledge of the operation. Now you have to train someone new to get to that level, and that takes time and money.

Here are three ways to help companies remain in control and not be held hostage.

Firstly, know thy culture. When I say this, I am not necessarily referring to your safety culture. Although culture does effect safety, organizational culture and safety culture are not always one and the same. Organizational culture is multifaceted, with safety being embedded within and throughout. That is why it is important to identify what message the organizational culture is sending – more than just in terms of safety.

Generally, when we ask about company culture in the helicopter industry, people either identify it as being a "just culture" (a company focused on safety throughout its entire operation) or not. Usually there is not a whole lot of in between. In this case, safety culture is not what I am referring to. You can have a safety culture but also have an organizational culture. For example, management may have high or unrealistic expectations for how employees should perform. This could be intentional or unintentional. For instance, management may reward employees that work extra hours with better missions and/or additional training. I am not saying that is a bad thing or that employees should not be rewarded for hard work, but it's something you should be aware of in regard to the message you are sending to your other employees — those who are still working their required hours and doing a good job, just not putting in the extra hours. There may be a reason they are not working additional hours or days.

Next, try to adopt a multi-generational mindset. Let's face it, whether you like it or not, there are a mix of generations in the

workforce. As a manager, you may find yourself identifying more with one generation than another, but it does not mean that other generations are "bad." It just means that there may be some differences in the way they personally value work.

According to a 2008 study by Lucy Cennamo and Dianne Gardner, the era in which a certain generation enters the workforce can influence work values for that generation. For example, Baby Boomers grew up in optimistic and positive times. Generation X grew up during rapid technological and social change representing financial, family and social insecurity and entered the workforce without expecting job security. Generation Y (Millennials) have the growth of the internet and technology.

As a leader, understanding the needs of each generation will allow you to adopt a positive mindset for all generations in the workforce, and avoid putting labels on them. It will also help you appeal to them in a way to get the most benefit for them and for the company.

Most importantly, the goal as a leader is to ensure that everyone is able to work together in a positive way.

Finally, select the right people. The saying goes, "hire slow, fire fast." When you are trying to run an operation and meet business demands, hiring slow is not always an option. Having some checks and balances in place ahead of time is important to staying focused on finding the right employee who will fit into the company culture.

In his book *Culture by Design*, David Friedman said he sees two mistakes happen when it comes to hiring. The first mistake is the failure to recognize the signs or to read the signs properly. The second mistake is "we convince ourselves that the person possesses a skill that's important enough to us that we're willing to overlook the rest of the picture."

Although selecting someone based on their experience and requirements is important, it is even more important to consider whether or not they will be a good match with the company culture. It will not do any good to hire someone to fill a spot and then have them leave a few months later because it didn't work out.

Remember, if you aren't happy with the culture that you have today, hire for the culture you want to build for the future.



# For missions accomplished

Whatever the missions, whatever the times, wherever the places, we'll get you where you're going.



# COLUMN

# CONTINUE YOUR APPROACH

FOCUS ON OPERATIONS // COREY TAYLOR



"Alfa seeks bravo alfa bravo, continue your approach," said the control tower.

As a Canadian visual flight rules (VFR) pilot flying in Africa, the challenges of accent differences across countries was an ever-present problem. I was reminded of this last week flying in Northern B.C. I don't know where the guy flying the 355 in the Skeena valley was from, but his voice on the radio was incomprehensible. Without TCAS or ATC, when you're in crappy weather in a valley that is a high traffic area by necessity, the only tool to avoid collision, besides good eyes, is liberal use of radio position reports. If no one can understand what you're saying, isn't this a glaring safety issue?

Back to Africa. My engineer, Al, and I were flying in to Addis Ababa to pick up some Italian construction company guys to go look at dam sites in the south of the country. Hitherto we had been working on a geotechnical drilling program on the Blue Nile, where the Grand Ethiopian Renaissance Dam is being built.

The highlands of Ethiopia are amazing. Beautiful rolling farmland that reminds one of parts of Saskatchewan, yet the elevation is over 10,000 feet in places. Addis is between 7,000 and 8,000 feet, so we had to descend into a sort of cirque to get there. The weather was patchy at best, and the system was widespread. (This was the day that John Garang, the president of the Sudan People's Liberation Army, and the newly minted vice president of Sudan, perished when his Mi-172 plowed into a hill not that far from where I was.)

As we descended into the bowl that was Addis, the rain grew heavier as the ceiling and visibility dropped. I was in constant contact with the control tower, but actual communication was futile. I repeatedly asked for the ceiling and visibility, yet only received

the order to continue my approach in return. At seven miles from the airport (and we only had a GPS coordinate for the VOR, so I didn't know where the airport was in relation to our coordinate), we were flying at about 300 feet and 50 knots. If this was Canada, I would have landed long since, but once you're over a city of millions of people with what seems like all of them looking up at you, you're sort of committed. Or should be.



When we returned to
Addis Ababa the next
day, I knew something
was up right away.
The tower gave us a
succession of radar vectors
that essentially led us
completely around the city.



As we passed over the Mercado, the largest open-air market in Africa, Al suddenly exclaimed, "There's the Sheraton!" I asked if he knew how to get to the airport from the Sheraton and he nodded in the affirmative. I laid the 212 on its side and did a pylon turn around the hotel. Asked later, I did notice the building with the goldish roof and the columns as we flew over it to get to the Sheraton, yet at the time it barely registered — we cleared it by 50 or so feet... plenty of room.

We picked up the right road from the entrance to the Sheraton and landed at the airport within four or five minutes. As luck would have it, the clouds broke within an hour and the blazing blue African sky shone forth. Off we went on our tour of the dams, some still being built, of southern Ethiopia.

When we returned to Addis Ababa the next day, I knew something was up right away.

The tower gave us a succession of radar vectors that essentially led us completely around the city. We never overflew so much as a shack, let alone the city proper. I began to suspect that the previous day's entrance had not gone unnoticed.

On final we were amazed to see a cargo jet off in the weeds with its wings and engines ripped off. It hadn't been there when we left, so Addis had seen some excitement in our absence.

As the blades coasted to a stop, our helicopter was surrounded by military officials and the project management team for the dam we had been working on the past few months. I managed to keep a straight face as Wodaje Abebe, the top guy from the government on the project, walked up to me and said, "Corey... you are very famous in Addis Ababa" in his Amharic accent.

"Oh?" I responded, cocking an eyebrow. "Yes," he said. "Do you remember seeing a large building with columns and a gold colored roof when you arrived?"

"Was it near the Sheraton?" I asked.

"Yes, very near the Sheraton," he responded.

"Well, I might have seen it but don't recall

 I'm guessing it's something important?"
 "It is the National Palace — the residence of the president."

"I see. And was the president at home?"
"Yes — he apparently thought he might be

res — ne apparently thought he might be under attack."

"I see."

Straight face don't fail me now! I further learned that the owner of the Sheraton, a half-Saudi, half-Ethiopian Sheik, often travels in by helicopter, and the sound of a 212 circling the hotel at 300 feet led the staff to believe he was dropping in unannounced!

The moral of the story, I guess, is proper communication has no substitute. Wodaje told me they had quickly enacted new rules for VFR helicopters arriving into Addis and I may have been the first to experience them, hence the vectoring around the whole city. Wodaje said he suggested they name the new rules "Corey's Law." I'm still not sure if he was kidding.





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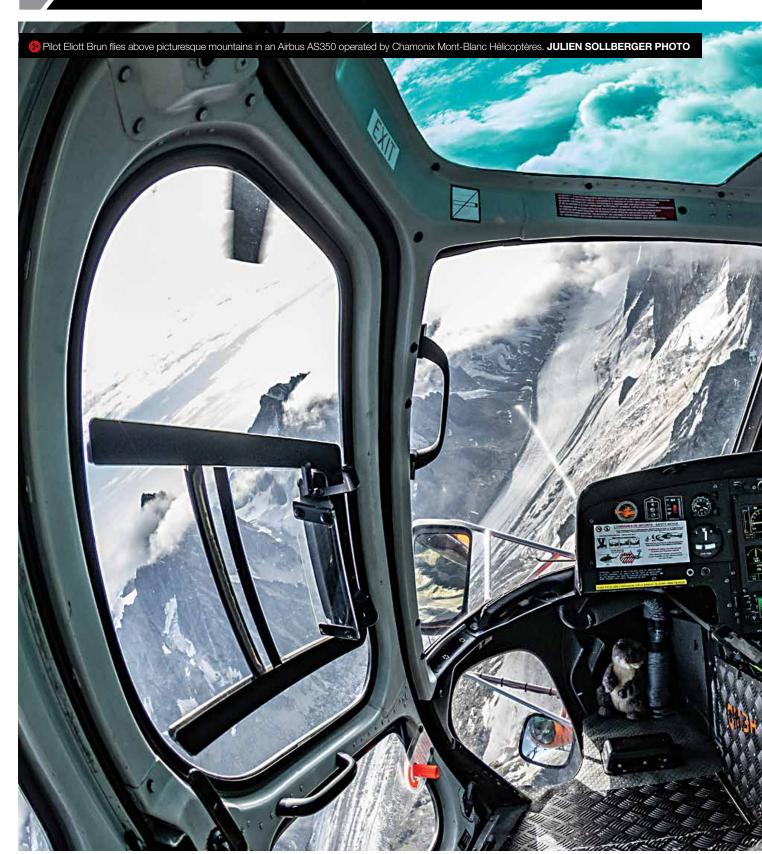
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# Vertical DAILY TOP

Here's a recap of our 10 most popular online stories since our last print edition was published.

 $\bigcirc$ 1

#### WILSON HELICOPTER CREW FINDS SUSPECT IN FATAL HIT-AND-RUN

Two Wilson Construction helicopters helped locate a driver who fled a fatal hit-and-run scene.



# AIRBUS REPORTS SUSTAINED SUPER PUMA ACTIVITY

Eighty Super Puma family helicopters are to be delivered by the end of 2021.

02

#### TO BRING ON MORE PILOTS, CBP STREAMLINES HIRING PROCESS

U.S. Customs and Border Protection is aiming to bring on new hires in a shorter two-month process.

03

#### TANDEM POWERED: COLUMBIA HELICOPTERS

The tandem-lift specialist is poised for growth under new ownership.

04

# RESTORING THE LEGACY: USATS

The former Bristow Academy is aiming to continue more than 30 years of established excellence in flight training.

05

# BELL 407GXi EARNS IFR CERTIFICATION

Certification is required for the U.S. Navy advanced helicopter training system competition.

06

#### OPPORTUNITY KNOCKS: A LOOK AT THE USED AIRCRAFT MARKET

Savvy operators have found economic opportunities in the used aircraft market.

07

# STEPHEN DICKSON SWORN IN AS FAA ADMINISTRATOR

Dickson was sworn in as the 18<sup>th</sup> administrator of the FAA on Aug. 12.

08

# LEONARDO DELIVERS 1,000<sup>TH</sup> AW139 HELICOPTER

The 1,000<sup>th</sup> machine of this model was delivered to Italy's Guardia di Finanza.

09

# ORNGE POWERS UP FLEET STRETCHER SYSTEM

Ornge has installed HeliMods' Powered Aero Loader across its fleet of 11 AW139s.

10



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# RotorBeat Industry // Operator // OEM // UAS // International

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#### **BY ELAN HEAD**

After going decades without certifying a single-engine helicopter for instrument flight rules (IFR) operations, the U.S. Federal Aviation Administration (FAA) has now certified two models in quick succession.

Leonardo's TH-119, a variant of the AW119 equipped with a Genesys Aerosystems glass cockpit, was the first to gain the approval, on July 17. The Bell 407GXi was a few weeks behind it, gaining IFR certification in mid-August.

Both aircraft were certified for IFR specifically to meet the requirements of the U.S. Navy's lucrative TH-73 training helicopter competition, which aims to replace the Navy's tired fleet of TH-57s. However, as TH-119 campaign manager Andrew Gappy pointed out, "there is nothing from a configuration or certification perspective that doesn't avail [the designs] to the civil market" - creating a new market entry point for operators who want the safety of flying IFR without the cost associated with twin-engine helicopters.

"It's absolutely the safer way to fly," Gappy told Vertical. "Now that there's a single-engine IFR-certified aircraft that the civil market can get their hands on, it enables more IFR flying."

Bell military sales and strategy manager Carl Forsling echoed, "I think that's going to be an incredible safety enhancement for many commercial operators."

Since 1999, IFR certification of single-engine helicopters in the U.S. had been stymied by FAA guidance that requires applicants to demonstrate regulatory compliance using numerical safety analysis methods. As several industry

organizations — including Helicopter Association International (HAI) and Vertical Flight Society (VFS) - explained in a 2015 white paper, the FAA set an extremely high bar when it selected the methodology and numeric values in its original guidance.

Most single-engine helicopters are certified as Federal Aviation Regulations part 27 normal category rotorcraft, which have generally lower safety standards than part 29 transport category rotorcraft. For IFR certification, however, the numerical safety analysis requirements were equivalent — generally necessitating the type of redundant systems that are common on transport category helicopters, but rare on normal category ones.

The authors of the white paper argued for relaxing IFR certification standards for part 27 rotorcraft, pointing to the number of fatal accidents caused by visual flight rules



(VFR) pilots' inadvertent flight into instrument meteorological conditions (IMC). Because IFR flight is demonstrably safer than scud running, increasing the availability of IFR helicopters would yield safety benefits to justify the looser standards, they said. Moreover, they added, the recent availability of modern digital flight displays makes IFR flight easier and more accessible than ever.

"In the last decade or so, with the advent of glass cockpit avionics and the digital architectures in aircraft, it's become much more affordable and much lighter weight to install [these] into small helicopters," noted Gappy. "Glass cockpits really provide an incredible amount of information."

In June 2017, the FAA published a policy statement, PS-ASW-27-15, that eased numerical safety analysis requirements for various classes of part 27 rotorcraft,

although it did not address single-engine IFR requirements directly. Bell said it used PS-ASW-27-15 for aspects of certification related to the avionics and electrical systems in its 407GXi, which is equipped with Garmin's G1000H NXi glass cockpit avionics. To achieve IFR certification, Bell had to demonstrate that its installation of the avionics provides adequate protection from high-intensity radiated fields (HIRF). Bell also added a standby generator, a second pitot-static system, and a three-axis autopilot derived from its existing two-axis autopilot for the VFR Bell 407.

One thing it did not add was a second hydraulic system. Hydraulic boost is particularly important for helicopter IFR flight to enable automatic flight control and reduce pilot workload; consequently, most IFRcertified helicopters have dual hydraulics for redundancy. Bell instead satisfied the FAA's safety requirements through a combination of "supporting the safety analysis with the proven reliability of the 407 hydraulics systems, and getting recognition for the handling qualities and other mitigating factors that allow continued IFR flight after loss of boost."

According to Bell, "the option to prove the capability after a system failure through demonstration has always existed in the IFR rules, but there was no detailed methodology in existing guidance." The 407GXi's IFR certification flight testing included extensive hydraulics-off demonstrations, involving 16 pilots with varying degrees of experience. The company said that most of these pilots flew well over an hour with hydraulics off to complete the necessary procedures, encompassing IFR navigation, changes in flight plan, multiple approach types, and go-arounds.

Certification of the TH-119 was relatively straightforward by comparison. Because the AW119 is based on a twin-engine, IFR-certified helicopter — the AW109 it already incorporated dual hydraulics and other system redundancies required for IFR flight. Leonardo simply added an auxiliary generator, in an installation for which it already had a supplemental type certificate.

At press time, neither Bell nor Leonardo had announced plans for making IFR certification available to the civil market, but "you can expect that will be available in the future," Forsling said. "We think that single-engine IFR capability is going to be desired by a wide range of customers."

# RotorBits



# **ENTROL INSTALLS K-MAX**

#### FTD AT KAMAN

Entrol has designed, manufactured and installed a Level 5 K-Max flight training device (FTD) for Kaman Aerospace.

The K-Max FTD has been installed at Kaman's new helicopter customer service facility in Bloomfield, Connecticut. It will be used for K-Max transition training, and will be incorporated into the K-Max initial and recurrent flight training syllabus. The FTD will allow pilots to practice normal and emergency procedures.

"As we continue to increase our fleet size. and expand the demand for training, the technology that Entrol has been able to incorporate into an FTD provides a complementary and effective tool for enriching our pilot training experience," said Darlene Smith, vice president and general manager of Kaman's Air Vehicles Division.

## **KOPTER GROUP ENTERS**

## **BRAZILIAN MARKET**

Kopter Group is starting the active promotion of its SH09 in Brazil, with the appointment of Gualter Helicopteros as sales representative and distributor.

"With more than 30 years [of] experience in the helicopter business and having introduced several helicopter models in the Brazilian market, Gualter Helicopteros is the right partner to ensure the success of the SH09 in Brazil." said Christian Gras, Kopter's executive vice president of customers. "The team has an impressive track record, having sold over 600 new and used helicopters on the Brazilian and South American markets."

# AHI CELEBRATES 50TH ANNIVERSARY



#### **BY OLIVER JOHNSON**

Airbus Helicopters has celebrated its 50<sup>th</sup> anniversary of activity in the United States, holding a special celebration for employees, customers, and government officials at its North American headquarters in Grand Prairie, Texas.

This year also marks the company's 35<sup>th</sup> anniversary in Canada (with its headquarters in Fort Erie, Ontario), and 15 years of activity at its facility in Columbus, Mississippi.

The manufacturer traces its roots in North America to the signing of a partnership between Aérospatiale and Vought Helicopters, a Texas-based company, in 1969. (Aérospatiale merged with the helicopter division of Deutsche Aerospace to form Airbus Helicopters, then known as Eurocopter, in 1992.) The agreement with Vought saw the company authorized to sell and support Aérospatiale helicopters in the United States and Canada at a time when there were 17 Aérospatiale aircraft flying in North America. The company had just 43 employees.

Aérospatiale took full control of Vought Helicopters in 1974, and changed the company's name to Aérospatiale Helicopters Corp. in 1976.

Today, there are 2,600 Airbus helicopters flying with over 800 civilian operators in North America (and more than 500 of the manufacturer's helicopters in the military), and the company has over 1,000 employees.

Indeed, the U.S. is home to the largest fleet of commercial Airbus helicopters flying in the world, with the second largest fleet belonging in Canada. Eight of Airbus's top 10 customers (in terms of flight hours) are based in the region.

During a media visit ahead of the anniversary celebrations, Romain Trapp, president of Airbus Helicopters, Inc. (the official name of the company's U.S. subsidiary) pointed to the company's win of a U.S. Coast Guard contract for 100 HH-65 Dauphins in 1979 as being a "gamechanger" for its operations in the region.

The contract was the start of a long-term relationship between Airbus and the U.S. Department of Homeland Security; in addition to the Dauphins flying with the Coast Guard, the company has 100 H125s and H120s in operation with U.S. Customs and Border Protection. It also has more than 440 UH-72 Lakotas flying with the U.S. Army.

The win of the contract for the latter — which began as an order for 345 Lakotas in 2006 — was the second gamechanger for the company's North American branch, said Trapp. It resulted in Airbus tripling the size of its recently-opened Columbus facility, and significantly increasing its activities in Grand Prairie.

Trapp said the upcoming certification and first deliveries of Airbus's new-generation medium H160 would be the next landmark event for the company in the region. The type is scheduled for certification from the European Aviation Safety Agency (EASA) by the end of 2019, with the Federal Aviation Administration (FAA) set to follow a few months afterwards. Deliveries will start before the end of 2020, with one of the first customers being in North America.

"In the past, our helicopters have dominated the light helicopter segment of the market . . . but the medium size of the market has been for a long time our weakness," said Trapp, adding that he thought the H160 would fill a need the company has identified for major fleet renewal in the medium-lift sector.

"Just as an example, in the Northeast of the United States you have about 80 medium [private and corporate] helicopters that need to be replaced," he said. "Right now the customers are waiting to replace them with the right aircraft, and we are bringing on the market a gamechanger in that regard. A completely newly-designed aircraft with new technologies, with various innovations which I believe will make this helicopter the aircraft of choice for the medium-size market in North America. I strongly believe it is going to be our bestseller in the years to come."

Those technologies include a fully composite airframe, a biplane horizontal stabilizer, a tilted Fenestron tail rotor, and Airbus's Blue Edge main rotor blades, which feature a swept back blade tip. These various elements combine to provide enhanced performance and a reduction in the aircraft's noise signature — a particularly appealing mix for those in the private and business aviation sector.

Trapp said most of the demand for the type thus far has been in this sector and from those working in emergency medical services, with offshore oil-and-gas likely to be the third main market, once that sector rebounds.

# SITE SPECIALIZATION

A couple of years ago, the company completed a restructuring of its organization in North America, merging its activities and creating specialization at each of its three main sites. Columbus became the center of excellence for aircraft assembly (it contains final assembly lines for the H125 and Lakota) and customization; Fort Erie is a center of excellence for the manufacturing of composite parts (used across the Airbus Group); and Grand Prairie is home to the design office, sales and marketing teams, and the support and services center of excellence.

"Thanks to this site specialization, we have been able to offer better service to our customers, and do the activity . . . in a more efficient way," said Trapp.

He added that the reorganization didn't result in a headcount reduction — as is often the case. "Our workforce in North America actually increased overall," he said. "By creating more efficiencies we have been able to better support our customer, [and] when you better support your customer, actually you win more customers."

So, despite a general industry downturn, Airbus expects to generate just under \$1 billion of revenue in North America in 2019. According to the company's figures, it claimed a market share of 76 percent of all helicopter orders for aircraft of five or more seats in North America in 2018, and delivered 72 percent of helicopters of that size in the region.

"What we have seen is a significant decrease of the overall market, while at the same time our market share . . . has significantly increased," said Trapp.

The company had a global sales peak of 330 aircraft in 2008, and another high point of 300 in 2013. After a drop in the following years, it rebounded to 260 last year. Trapp said the key has been attracting new customers, which have represented 40 percent of sales in North America since 2013. This compares to a "traditional" figure of about 15 percent.

These new customers have largely been from within the private and business aviation sector (which represented 30 percent of the company's overall bookings in 2018), and are mostly people who are entirely new to helicopters. However, Airbus has also succeeded in attracting customers who are simply new to its types.

One of the main reasons for the dip in the overall market has been the downturn in the oil-and-gas sector.

"The [offshore transport] industry has, to a large extent, collapsed in the last few years," said Trapp. "It's definitely facing major headwinds . . . which has impacted the entire industry — all the OEMs."

He added that demand is still very low, with several offshore transport operators either facing a chapter 11 bankruptcy process, undergoing one, or having recently emerged from it.

"We don't expect a recovery in this [offshore] industry actually for the next few years," said Trapp. "This industry still needs some consolidation and needs to become healthy again."

According to Will Fulton, head of marketing in North America, the oil-and-gas downturn is forcing operators to change their focus.

"The way that oil-and-gas used to operate is on just oil-and-gas. Just oil-and-gas isn't working anymore," he said. These operators are increasingly looking at applying their expertise of operating large aircraft in austere environments to government support contracts around the world, he said.

Similary, Airbus has been busily repurposing its H225 heavy for a new life. "We know it's not going directly back into oil-and-gas," said Fulton. "It's not picking up as quickly as everyone said they thought it [would] . . . and therefore, [we're] putting it into other modes."

These new modes include aerial firefighting, said Fulton, which he said had a need for fleet modernization, as well as a growing interest in utilizing larger airframes.

Fulton also revealed that Airbus has "re-engaged" discussions with the FAA for certification of the H175, following renewed interest in the type in North America. The type was certified by EASA in 2014, but its anticipated approval by the FAA wasn't pursued as the offshore market nosedived. The reignited interest has largely been driven by the private/ corporate sector, said Fulton, with operators in the Northeast of the U.S. particularly keen to see the type certified.

In terms of the new five-bladed H145, Airbus has already received an undisclosed number of orders for the retrofit kit from operators in North America. For customers in the region, Airbus will perform the retrofit either at its facility in Columbus, or at one of its service centers.



# LEONARDO DELIVERS 1,000<sup>TH</sup> AW139



The 1,000<sup>th</sup> AW139 was delivered on Sept. 20, 2019, to Italy's Guardia di Finanza during an official celebration, held at Leonardo's plant in Vergiate. **Leonardo Photo** 

On Sept. 20, Leonardo celebrated the delivery of its 1,000<sup>th</sup> AW139. The landmark aircraft was delivered to Italy's Guardia di Finanza (an Italian law enforcement agency) during an official celebration at Leonardo's plant in Vergiate, Italy. The event was attended by representatives from Guardia di Finanza, as well as Leonardo's management and employees, and other customers, partners and suppliers.

"What we celebrate [in the delivery of the 1,000th AW139] is much more than the success of a product or of a company — it is the global affirmation of an asset of our entire country," said Leonardo's CEO, Alessandro Profumo, at the ceremony. "The AW139 is a striking example of the role that Leonardo plays and intends to continue to have in the world. All our values are reflected in the AW139: continuous innovation, internationalization, proximity to the market and to the customer, and the enhancement of human resources."

The AW139 first took flight in 2001, and over the subsequent 18 years Leonardo has received orders for more than 1,100 units from around 280 customers in over 70 countries on all continents. The aircraft has recorded almost 2.5 million flight hours since the first AW139 was delivered at the beginning of 2004.

According to Leonardo's usage data, more than 30 percent of the AW139s in operation

perform public utility tasks, such as searchand-rescue, air ambulance, law enforcement, firefighting, and disaster relief operations; over 30 percent are used for offshore transport; and around 20 percent for military tasks. The remainder are used in VIP, institutional and corporate transport missions.

The AW139 fleet has a global presence: around 30 percent are in Europe; about the same number are in Asia and Australasia; 15 percent are in the Americas; followed by the Middle East. The international success of the AW139 is so important to Leonardo that to meet market demands the helicopter is produced on different assembly lines — in Vergiate and in Philadelphia, Pennsylvania.

Leonardo said the AW139 and its other "new generation models," such as the AW169 and AW189, have "played a significant role in the evolution of the market." The company claimed to have secured a 40 percent share of the world's civil helicopter sector in terms of value of orders in 2018.

Even though it's a relatively new model, the AW139 has evolved significantly since it arrived on the market to adapt to the changing needs of customers. Its maximum takeoff weight has increased from 6.4 to seven tons, and almost 1,000 mission kits and new equipment have been certified.

With advanced protection systems against icing, the AW139 can fly in all weather

conditions, and is uniquely capable of flying for over 60 minutes without oil in the transmission — double the requirement to fly for 30 minutes set by the certification authorities.

The AW139 introduced the concept of Leonardo's "helicopter family," sharing design DNA with the smaller and lighter AW169, and the larger and heavier AW189. As well as the same design philosophy, Leonardo said the types also share the same performance, flight characteristics and certification standards, as well as the same approach to maintenance and training. Leonardo introduced the family concept to allow operators with large diversified fleets, with models ranging from four to nine tons, to create significant synergies in crew training, flight operations, maintenance and logistics support.

"With the AW139, the company has been able to create an extraordinary program with international roots, and with its global success this has allowed us to reach the top of the industry's world helicopter market," said Leonardo Helicopters' managing director, Gian Piero Cutillo. "Without the self-denial, the preparation and the passion of workers from different generations and nationalities who believed in and worked on its development, and who still follow it in its operational path by constantly confronting the market and customers, all this would not have been possible."





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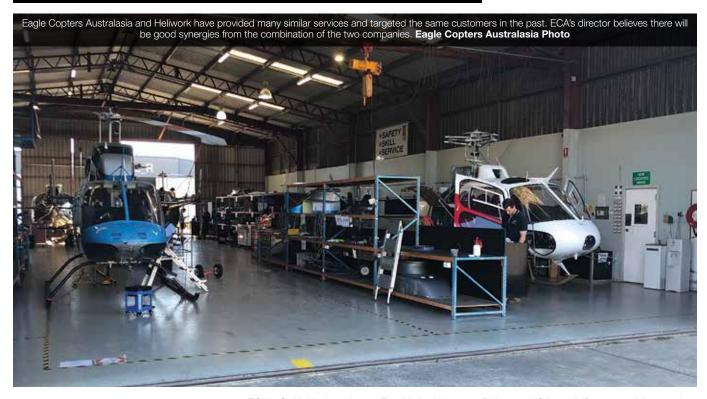
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# EAGLE COPTERS AUSTRALASIA EXPANDS



#### **BY OLIVER JOHNSON**

Eagle Copters Australasia (ECA) has acquired maintenance, repair and overhaul (MRO) specialist Heliwork QLD, doubling its staff count and expanding its presence northward along Australia's east coast.

The move is part of the growth strategy of ECA's parent company, Calgary, Albertabased Eagle Copters. Having established its Australian outpost in 2011 (and subsequently moving it to Coffs Harbour, New South Wales), Eagle Copters is looking to expand its ability to provide fleet management for third parties around the world.

"We want to grow our customer base, we want to grow our footprint, and our overall strategy is to continue our global growth based on our value proposition — which is worldwide fleet management, and doing everything except operating and flying," said Barry Kohler, president and CEO of Eagle Copters. "We saw with Heliwork the opportunity to grow the business with the clear thought that if we consolidate the two customer bases from these companies, the total will end up being greater than the sum of the parts."

Heliwork is based in Redcliffe, Queensland, about 210 miles (340 kilometers) north of

ECA's Coffs Harbour base. Established in 1995, its specialty is heavy maintenance and customization, including component overhaul, non-destructive testing (NDT), composite repair, and paint work in a 50-by 80-foot (15- by 25-meter) paint shop.

"Heliwork has a reputation within the industry of providing high quality work delivered by an experienced and loyal work-force," said Grant Boyter, director of ECA. "Heliwork co-owners John McClymont and Josh Malligan have built a solid and well respected MRO business that will dovetail nicely into the Eagle Group's business model and culture."

Kohler added that Heliwork will also bring an established and loyal customer base. "Hopefully the synergy between the two organizations will help us grow the client base further and provide superior levels of customer service," he said.

The combined facilities now span over 45,000 square feet with over 40 full-time staff.

While ECA typically has had more of a focus on Bell medium airframes, Heliwork is one of the more diverse MRO facilities in Australia, working on types including the Robinson R44; Bell 206 JetRanger, LongRanger, 205, 212, 407 and 412; Airbus AS350, AS355,

BK117 and SA315; MD 500; and Leonardo AW109 and AW119.

Boyter said Heliwork's location on the edge of Brisbane provides easy access to major and regional airports including Brisbane, Gold Coast and Sunshine Coast.

"Southeast Queensland is very active when it comes to helicopters and aviation," he said. "In fact, there's more helicopters registered in Queensland than any other state in Australia."

ECA and Heliwork have often been competitors in the past, providing many similar services and often targeting the same customers. As such, Boyter believes there will be good synergies from the combination of the two companies — as well as benefits to customers.

"Some customers won't have to travel as far from where [many] aircraft are based, in Queensland," said Boyter. "The two facilities will also allow us to balance customer needs with facility capacity and workforce planning, generally providing increased capabilities and capacity."

Kohler said ECA has seen steady growth since its opening and said the Heliwork acquisition would allow the company to grow even faster in the future.

While ECA focuses largely on the Australian market, the company has also had success placing its Eagle 407 HP, in which the Bell 407's existing Rolls-Royce 250-C47B engine is replaced with a 1,021-horsepower Honeywell HTS900-2, beyond the country's borders. Two are now in operation in Indonesia, and one is flying in Papua New

"[Eagle Copters] Australasia is responsible for all of our Asia-Pacific business." said Kohler, "but we have a limited presence right now in Asia just because of where we are geographically."

He added that the company is particularly keen to explore the market in China, and has had "a number of organizations" approach Eagle Copters to partner in the country.

"We just have to find the right business model and the right partner fit," he said.

Eagle Copters already has a subsidiary in South America (near Santiago, Chile) but Kohler said Western Europe is also a potential target for expansion.

Worldwide, Eagle Copters now has a fleet of over 60 leased aircraft, and fleet management is a key growth area for the company.

"We provide a complete support model for those aircraft," said Kohler, "We provide all the component support and all the fleet support for our customers, which differentiates us from other lessors."

The company also offers fleet management for aircraft belonging to third parties, with Kohler estimating that Eagle Copters has about 25 aircraft on site that are either being stored or reconfigured for their owners.

As a part of Eagle Copters' increased focus in providing asset management for customers, it has created a new dedicated customer support team, led by long-term Eagle employee Kelly Labas. The company believes this move will formalize its global approach to customer support.

"Our whole business model in terms of how we get business from anyone is based on our customer intimacy and the customer experience - it's the completeness of our solution," said Kohler. "The customer support team will just add structure and formality as to how customers reach out to us. I think they will see it as a centralized place to get what they need even faster than they do now."



# **GARMIN G1000H NXI IFR CERTIFIED**

Garmin International's G1000H NXi integrated flight deck has received instrument flight rules (IFR) certification from the Federal Aviation Administration.

"In collaboration with Bell, we are excited to bring the first IFR-certified Garmin integrated flight deck to the single-engine rotorcraft market," said Carl Wolf, vice president of aviation sales and marketing at Garmin. "The G1000H NXi gives helicopter owners and operators a modern glass flight deck that boasts an unprecedented level of performance, a superior feature set and a level of innovation and integration beyond what is found on a single-engine IFR certified helicopter today."

The G1000H NXi offers a number of safety enhancing features and optional capabilities that are tailored to helicopter pilots. The helicopter terrain awareness warning system (HTAWS) reduces workload, with vibrant five-color display shading and audible voice callout alerts for powerlines and potential terrain and obstacle hazards along the flight path.

The addition of helicopter synthetic vision technology (HSVT) blends topographic database information to display real-time 3D images. HSVT also alerts pilots of potential ground hazards by displaying terrain, obstacles and powerlines that pose a threat to the aircraft.

WireAware wire-strike avoidance technology aims to further reduce pilot workload by graphically overlaying comprehensive powerline information on the moving map page. WireAware coverage is available in the U.S., as well as some locations in Canada and Mexico.

Wireless connectivity between mobile devices and the G1000H NXi allows flexibility when interfacing with the integrated flight deck. Connext cockpit connectivity with added Database Concierge uploads and syncs aviation databases to the G1000H NXi with a compatible tablet or smartphone. The G1000H NXi also supports wireless flight plan transfer from a compatible mobile device to the integrated flight deck. Additional connectivity features include the sharing of traffic, weather and GPS position information between compatible mobile devices and the integrated flight deck.

The G1000H NXi can display helicopter route charts throughout eight U.S. metropolitan areas, including the Gulf of Mexico. Additional features and capabilities available with the G1000H NXi include: SiriusXM high-resolution animated weather radar imagery, Telligence voice control, global voice/text, and automatic dependent surveillance-broadcast (ADS-B) out. The system is also capable of displaying onboard weather radar, radar altimeter, engine information and video input from compatible camera sources. To support night operations, the G1000H NXi is also compatible with night vision goggles (NVGs).

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## **CHC GROUP MAKES**

### **EXECUTIVE APPOINTMENT**

CHC Group's Miguel Carrasco has been promoted to the role of senior vice president of operations and supply chain. Carrasco will oversee maintenance, supply chain, flight operations and other key operational functions across the company and advance the strategy behind CHC's global processes and standards.

"Miguel is a strong addition to our leadership and has already played a major role in how we have improved our ability to serve our customers in a number of areas," said Dave Balevic, CHC's president and CEO.

#### **MECAER DELIVERS**

## **BELL 505 MAGNIFICENT**



Mecaer Aviation Group, Inc. (MAG) has delivered a Bell 505 in MAGnificent style.

MAG completed the retrofit from a utility-configured Bell 505 to a VIP MAGnificent at its Philadelphia, Pennsylvania, Federal Aviation Administration part 145 repair station. The interior modification included new passenger seat frames configured in MAGnificent style, liners and panels covered in leather, carpet, new thresholds and a passenger service unit (PSU) for air gaspers, lighting and USB ports.

The custom interior was manufactured in Monteprandone, Italy, at MAG's Cabin Comfort Systems headquarters and shipped to Philadelphia where the installation was completed. Production took four months and installation was finished in under one week.



MD Helicopters, Inc. has delivered preferred rotorcraft solutions for airborne law enforcement operations for more than 50 years. With aircraft that are fast, safe and agile, MD Helicopters' airframes are perfectly suited for the most demanding missions; from ground support and SAR, to special operations and hot-high performance.

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# **AIRBUS REPORTS SUSTAINED SUPER PUMA ACTIVITY**



Wolf Benecke, technical director for the German Federal Police's helicopters, talks about his organization's selection of the H215. Thierry Dubois Photo

#### **BY THIERRY DUBOIS**

The Airbus Super Puma program, once in the doldrums because of the downturn in the oil-and-gas sector and a four-monthlong grounding in 2016, is now enjoying sustained activity, the manufacturer has reported.

Speaking on the occasion of the 1,000<sup>th</sup> delivery of a Super Puma family helicopter, Michel Macia, head of the program, said 80 examples of the heavy twin (in civil and military versions) are to be delivered by the end of 2021. The total order backlog for the type stands at 100.

The production rate is currently ramping up, although delivery cycles are anticipated to cause it to fluctuate, he said. A third assembly line is being created at the airframer's Marignane, France, factory to accommodate the additional production. Each line can put together both models of the family that are currently in production: the lower-cost H215 and the more sophisticated H225.

Overall, Super Puma operators are flying

"more than ever," Macia said, referring to a 16 percent increase in flying activity over the past 12 months — the majority of the growth coming from the H225. The worldwide fleet has accumulated 5.6 million flight hours since the first delivery four decades ago. The in-service fleet stands at 714, spread over 95 operators.

Recent orders have come notably from the military and parapublic markets. Hungary, for instance, ordered 16 H225Ms in 2018. For the Japan Coast Guard, Airbus has to deliver another five H225s by the end of 2021.

The backlog is said to be balanced between civil and military aircraft. No booking from the oil-and-gas sector can be found in the order book. This is due to the ongoing downturn and the move to super medium rotorcraft, according to Macia.

Super Pumas are operating in the oiland-gas sector in Asia and Latin America. Despite the technical resolution of the H225's and AS332 L2's main gearbox problems, confidence has yet to be

regained with oil-and-gas passengers in the North Sea. In that region, however, some are flying for search-and-rescue missions.

The different versions of the Super Puma are said to be selling in a balanced fashion. Last year, deliveries were almost evenly split between the H215 and the H225. The H215's longer fuselage variant enjoyed slightly more deliveries than the shorter one. As for the H225, the military version sold moderately faster than the civil one.

A major effort has been repurposing the 150-or-so aircraft that found themselves on the ground after the technical and economic crisis in 2015/2016. Airbus's goal has been to limit the number of unused aircraft to avoid a too negative impact on the value of the average Super Puma. Contracts for the repurposing of 51 aircraft have been signed, 15 of which have been delivered. Opportunities for another 40 aircraft have been identified.

Repurposing can be relatively straightforward if the helicopter is to be operated in



aerial work. It can be more complex when the new mission is to be combat searchand-rescue, like in the Ukraine.

The Super Puma program is on a stronger footing than it was three to four years ago, but this is taking place against a backdrop of relatively slow sales in the global helicopter industry. The civil market "is still challenging," Airbus Helicopters CEO Bruno Even said. Meanwhile, the military market is a market of renewal and opportunities, he added. Nevertheless, "I am confident for the medium and long term," he said.

No successor to the Super Puma is in the pipeline. Early in 2018, Airbus Helicopters announced it would not launch the envisaged X6 program, citing insufficient maturity of some technologies and uncertain sales prospects for heavy helicopters in the long term. Even now says he sees the Super Puma selling "beyond 2030."

Upgrades will continue to be integrated. New avionics are being developed in house for the H225M. The standard civil version now comes with cameras to monitor the boarding process, as well as watching the aircraft's environment on the ground from the tailboom. The TCAS 2 system for automated collision avoidance is coupled with the autopilot.

A new 19-seat cabin layout was designed to help passengers move around more easily, while egress was made quicker thanks to new push-out window handles.

The 1,000<sup>th</sup> Super Puma was the last H215 in an order of four from the German Federal Police, which will use it to "manage maritime emergencies off Germany's coast."



# **SIMPLEX INTERNAL FIRE ATTACK**

## **SYSTEM CERTIFIED**

Simplex Aerospace has received a Federal Aviation Administration (FAA) supplemental type certificate (STC) for an internal fire attack system (FAS) for the Sikorsky UH-60A Black Hawk. The Model 370i FAS is certified for installation and operation on the Timberline Helicopters Inc. TC type.

Simplex said it will be working quickly to add additional Black Hawk type certificates to the Model 370i FAS approved model list (AML). The Model 370i FAS is the first FAA-certified internal FAS for the Black Hawk helicopter developed primarily for restricted category civil aerial firefighting operators. Simplex said it requires no modifications to the aircraft structure.

The 900-US gallon (3,400-liter) internal tank system utilizes a single dispersal door that drops water/foam through the cargo hook well. The internal tank system is made from a proprietary lightweight composite matrix that provides superior corrosion and fatigue resistance compared to metal tanks, Simplex said. The tank utilizes a 1,000-US gallon-per-minute (3,785-liter-per-minute) hover refill system and has dual ground fill ports for increased flexibility and safety during ground filling operations.

"We have incorporated several enhancements to create a safe and effective firefighting system for the Black Hawk aircraft," said Mark Zimmerman, Simplex Aerospace president and CEO. "Specifically, the ability to perform aerial firefighting missions at night, and the addition of our patent-pending AFT Hook System with pilot release control for increased safety. The AFT hook allows for faster VNE [never exceed speed] when the pump is stowed and eliminates the need for a person to manually release the hover pump for hover refill operations. Additionally, a camera system replaces conventional mirrors to observe hover refill operation."

Larry Lichtenberger, executive vice president, added: "The Model 370i Fire Attack System can be installed and removed in approximately 15 minutes facilitating rapid response and multi-mission flexibility for our customers."



The internal fire attack system allows the Black Hawk to carry 900 US gallons of water or foam. Simplex Photo

# **METRO GETS FIRST U.S.-MADE EC145e**

Airbus Helicopters Inc. has delivered the first EC145e produced at its U.S. assembly plant in Columbus, Mississippi, to Metro Aviation. The delivery is part of an order for 25 that Metro placed in 2018, and the remaining aircraft will all be delivered from Columbus.

Metro is a Shreveport, Louisiana-based company that operates air medical helicopter services for hospitals and customizes new helicopters for a variety of missions. Metro was the first customer in the world for the EC145e when Airbus Helicopters launched the model in 2015. The twin-engine EC145e was initially introduced for use with visual flight rules (VFR).

"Airbus Helicopters is pleased to deliver this EC145e, now the third Airbus model to be produced in the U.S. by workers in our Columbus plant," said Romain Trapp, president of Airbus Helicopters Inc. and head of the North America region for the manufacturer. "For more than a decade, our workforce has been producing high-quality

aircraft for both the U.S. Army and more recently our commercial operators in North America."

Metro developed its own Federal Aviation Administration-approved avionics package in partnership with Genesys Aerosystems, as well as air medical and utility configurations. The Metro/Genesys upgrades include supplemental type certificates for a single pilot/dual pilot instrument flight rules (IFR) system; a VFR electronic flight instrument system (EFIS); and autopilot and stability augmentation system upgrades.

"Metro is pleased to continue a longterm relationship with Airbus, providing aircraft that meet a wide range of customer needs, and we are especially happy with the EC145e," said Metro president and CEO Mike Stanberry. "The IFR package we received earlier this year provides an upgrade to an extremely dependable and reliable global airframe, making it more cost-effective with a higher payload."



# RotorBits



### **ABLE AEROSPACE SERVICES**

### **OPENS \$9M FACILITY EXPANSION**

Able Aerospace Services has opened a \$9 million building expansion at its headquarters at Phoenix-Mesa Gateway Airport in Mesa, Arizona.

The expansion adds 60,000 square feet to Able's existing 200,000-square-foot, state-of-the-art campus. Able will use the expansion to incorporate new technology into its aircraft component repair and overhaul process and to diversify into new product and service offerings, including aftermarket support for large-scale rotary-wing and commercial fixed-wing components.

To support this growth, Able said it will create up to 100 new skilled aerospace jobs over the next two years, particularly for licensed airframe and powerplant mechanics, machinists and plating and paint specialists, as well as positions in engineering, sales and supply chain.

#### STANDARDAERO ACQUIRES

### **SAFE AVIATION SOLUTIONS**

StandardAero has acquired Safe Aviation Solutions (including Safe Fuel, Accel and B&E ACR), formerly the maintenance, repair, and overhaul (MRO) services subsidiary of the B&E Group. The acquisition continues the expansion of StandardAero's components, helicopters and accessories division and its portfolio of MRO and component repair services.

Safe Aviation Solutions provides comprehensive testing, repair, overhaul and modification of engine fuel system components, pneumatic/hydraulic/actuation systems and aircraft power generation systems for airlines, freight companies, OEMs and other MRO providers. The company operates from two primary locations in South Florida, with nearly 56,000 square feet of operations and approximately 120 employees.



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# **R66 PASSES 1 MILLION FLIGHT HOURS**



The global Robinson R66 Turbine fleet has surpassed one million flight hours, the manufacturer has announced. Powered by a Rolls-Royce RR300 turbine engine, the R66 achieved the landmark without a single reported in-flight engine failure, the company said.

"We believe this milestone is a testament to the R66's outstanding performance and confirms its place as a leader in the helicopter industry," said Kurt Robinson, president of Robinson Helicopter.

Certified in October 2010, the first production R66 was delivered the following month. Over 960 R66s have now been produced, and they're in operation around the globe.

Among the more notable feats performed by pilots in the type include flying to the North Pole and circumnavigating the globe.

# RotorBits



## **AIRBUS FOUNDATION HELPS**

## **AMAZON FIREFIGHT**

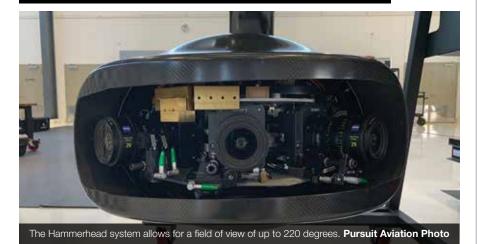
The Airbus Foundation, in collaboration with the French Ministry for Europe and Foreign Affairs' Crisis and Support Centre, has been supporting Bolivia's efforts against the severe fires affecting the country.

In cooperation with HeliAmerica, a Bolivian helicopter operator based in St. Cruz department, the Airbus Foundation has offered 45 helicopter flight hours to assess the affected areas.

From Sept. 3 to 5, two single engine H125s operated in the area of Concepción, in the Eastern part of the country, dropping more than 500 tonnes of water. The operation contributed to limit the fires and prevent them from reaching communities in the area.

# **PURSUIT AVIATION DEVELOPS**

## **HAMMERHEAD CAMERA SYSTEM**



Pursuit Aviation, a leading global aerial cinematography company for movies, television and commercials, has launched a new integration for the Shotover 3-camera array system, known as Hammerhead. The new setup delivers flexibility and enhanced resolution in low-light settings when shooting aerial cinematic scenes. Pursuit Aviation modified the Shotover gimbal to work with Sony Venice cameras and paired them with Zeiss CP.3 lenses to deliver a field of view of up to 220 degrees for use with devices with aspect ratios of 20:9. Also, Pursuit Aviation developed a proprietary control system that allows a three-Sony camera array to sync together and deliver cinematic imagery of up to 16K resolution in post-production.

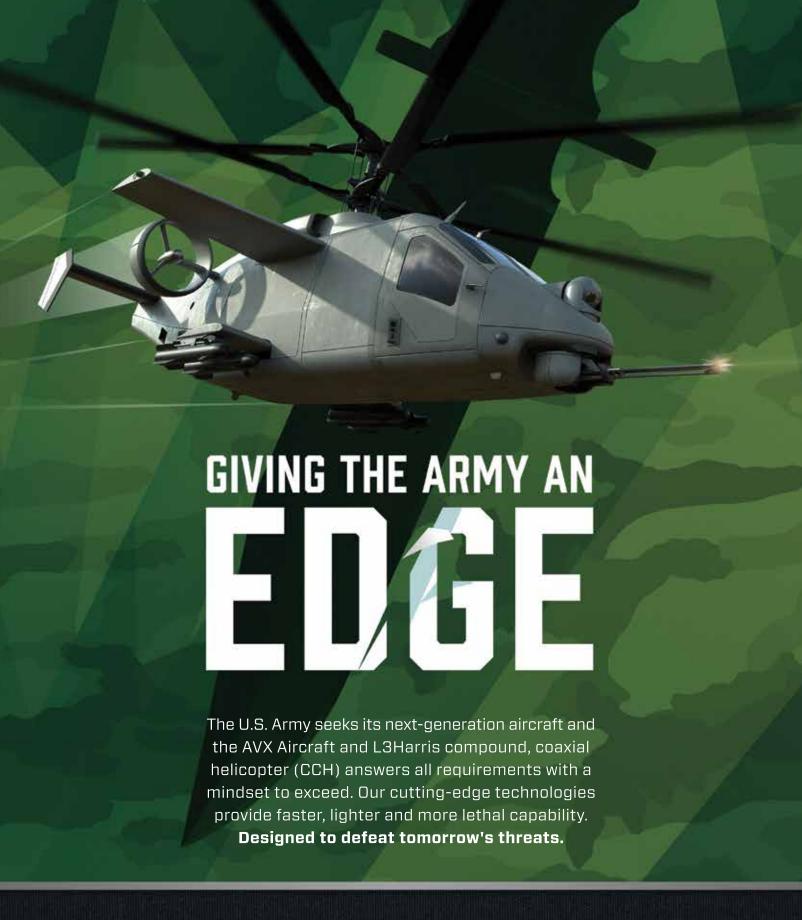
#### **OMNI SIGNS**

#### **CONSTELLATION CONTRACT**



Omni Taxi Aereo has signed a contract with Constellation Oil Services, a leading company in the drilling sector, to transport its offshore passengers. The agreement was signed after Omni was among the winners in a bid launched in October 2018. The agreement covers the use of medium, super medium and large aircraft, and is expected to last 24 months. First flights started in early August.

Omni will support the crew changes of the Amaralina Star vessel, located in the Campos Basin. Constellation Oil Services is one of the largest drilling rigs operators in the country with great growth potential, said Omni.



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## 5-BLADED H145 REACHES NEW HEIGHTS

The new five-bladed Airbus H145 has set its skids down on Aconcagua, the highest mountain in the Southern Hemisphere at 22,840 feet (6,962 meters). According to Airbus, this is the first time a twin-engine helicopter has landed at this altitude.

The aircraft took off from Mendoza, Argentina, and then flew 30 minutes to the foot of Aconcagua, where it began its ascent. After 15 minutes of climbing, the helicopter landed at 1:45 p.m. on the summit, at a temperature of -22 C (-7.6 F).

The H145's crew consisted of experimental test pilot Alexander Neuhaus, and experimental flight test engineer Antoine van Gent.

"We had to stay focused on the mission due to severe winds with gusts up to 30 knots and the low air density," said Neuhaus. "The handling qualities of the new H145 are excellent and combined with Helionix and its four axis autopilot, we reached the summit safely. The aircraft performed outstandingly. We flew over the summit of the Aconcagua and still had power reserves that would have allowed us [to] take two people onboard."

The flight test was supported by the Fuerza Aerea Argentina (the Argentinian Air Force), who provided aerial support with its Lama helicopters; Patrulla de Rescate de Alta Montaña de Policia de Mendoza, who assisted with a contingency plan; Parque Provincial Aconcagua, facilitating operations and logistics; and Helicopters AR, a local operator with over 15 years of experience flying in the Aconcagua area with its Airbus H125.

Prior to the successful high altitude test campaign in South America, the new H145 performed several test campaigns, including one in Spain at medium altitudes, and another in Finland for cold weather.

More than 400 flight hours have already been clocked on two five-bladed H145 prototypes. Airbus is planning for certification of the variant from the European Aviation Safety Agency by early 2020, followed by Federal Aviation Administration certification and first deliveries later that year.

The new version of its best-selling H145 light twin-engine helicopter was unveiled at Heli-Expo 2019 in Atlanta, Georgia, in March. The upgrade adds a new bearingless five-bladed rotor to the H145, increasing the useful load of the helicopter by 330 pounds (150 kilograms). It will be available



Airbus Helicopters plans to have the five-bladed H145 certified in early 2020. Airbus Helicopters Photo

# RotorBits

### **BABCOCK GAINS NEW**

#### **NORTH SEA CONTRACTS**

Babcock Offshore has confirmed two new contracts for helicopter crew change operations out of its Aberdeen, Scotland, base.

The work will see Babcock expand aviation support operations with oil-and-gas operators Total and CNOOC Petroleum Europe Limited, a wholly-owned subsidiary of CNOOC Limited.

Total selected a bid from Babcock to continue operations with the company in its Culzean field for an additional 12 months, adding an extra Sikorsky S-92 helicopter to Total's established flight operations.

Babcock will add an extra S-92 to CNOOC Petroleum Europe Limited's established flight operations until September 2019, in support of activity in the Central North Sea and West of Shetland.

#### **VIP AW119Kx**

### **EXPANDS CHILE'S FLEET**

Leonardo has delivered a VIP AW119Kx with a 24,000-foot altitude kit to an undisclosed private customer in Chile. The unique altitude kit provides enhanced performance for operation in the region's tall Andes mountain peaks.

The delivery adds to over 20 Leonardo helicopters already in service in the country, including the AW119, AW109, AW139 and W-3A Sokol models performing VIP transport, firefighting, law enforcement and utility tasks.

## **505 FLEET PASSES**

#### 20,000 FLIGHT HOURS

The Bell 505 Jet Ranger X has surpassed more than 20,000 flight hours. Bell has delivered 200 aircraft to customers operating the aircraft in six continents.

"Our Bell 505 operators rely on the aircraft to perform from the beginning of each day to when their mission is complete," said LaShan Bonaparte, program director, Bell 505 and Bell 429. "Logging more than 20,000 flight hours is very impressive for an aircraft in service less than three years. This achievement is a testament to the Bell 505's performance and our customer's confidence in the aircraft."

# RotorBits

### **START PAC ANNOUNCES**

#### **GREEN GROUND POWER UNIT**

Start Pac has launched a unique modular battery-powered ground power unit (GPU) to replace diesel- and gas-powered units. The new Start Pac Green has been created with the aim of replacing diesel GPUs, while providing the same service, to create a greener working environment. This GPU is entirely battery powered and does not require an internal combustion engine for power.

### STEPHEN DICKSON SWORN

## IN AS FAA ADMINISTRATOR

Stephen Dickson has been sworn in as the 18<sup>th</sup> administrator of the Federal Aviation Administration (FAA) by U.S. Transportation Secretary Elaine L. Chao. An aviation industry professional with nearly 40 years of experience, Dickson will lead an agency responsible for the safety and efficiency of the largest aerospace system in the world — a system that operates more than 50,000 flights per day.

"Nowhere else in the world sees the volume, complexity and pace of innovation that we have in America," said Dickson. "Maintaining the highest levels of safety while adapting to technological advancements will be a key part of our success. I am honored to be able to help write the next chapter in the history of the FAA."

### **CADORATH GAINS M250**

#### **SERIES IV APPROVAL**



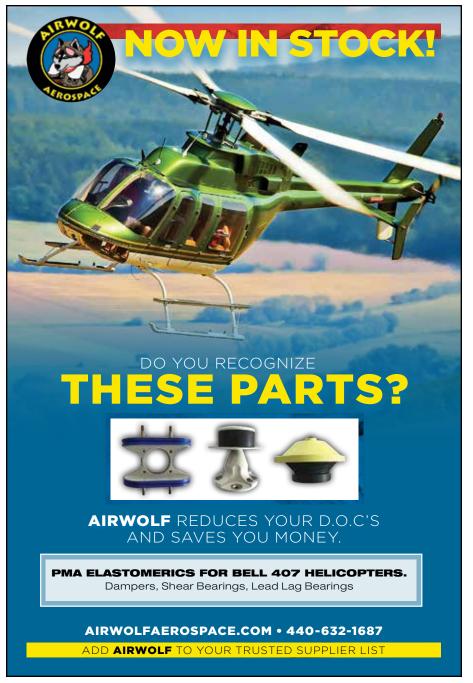
Cadorath, in partnership with Rolls-Royce, has announced the design and approval to provide repairs and overhauls to the M250 Series IV outer combustion case (OCC). Overhauls will include repairs to the fuel boss and replacement of the existing wire mesh patches with new reinforced dual wire mesh patches.

# **LORD TENSION TORSION**

# **STRAP LIFE EXTENDED**

LORD Corporation has obtained Federal Aviation Administration (FAA) approval to extend the life of its Bell 206 tension torsion (TT) strap from a three- to four-year calendar life. There is no change on the limitation of 1,200 flight hours.

"This extension is yet one more way our customers can enjoy all the savings associated with buying direct, while avoiding the risks and uncertainties that often come with supplemental type certificate (STC) parts," said Rodolphe Leroy, manager of global sales, business development and marketing, LORD Corporation. "LORD is the STC holder, designer and manufacturer of the TT strap Bell supplies."



# **FAA CERTIFIES R66 SLIMLINE**

# **AUXILIARY FUEL TANK**

The Federal Aviation Administration (FAA) has certified Robinson Helicopter's Slimline Auxiliary Fuel Tank for its R66 Turbine helicopter. The tank holds 23.2 US gallons (88 liters), roughly half the fuel of the company's larger auxiliary fuel tank, adds approximately one hour to helicopter endurance, and extends its range by as much as 100 nautical miles (115 statute miles). It mounts on a fiberglass tray that installs in the aircraft's baggage compartment, occupies one-third of the space, and leaves room for up to 200 pounds (90 kilograms) of baggage. Both tank and tray can be removed when not in use.

The tank weighs 29 lb. (13 kg) when empty and 189 lb. (85 kg) when full of fuel. It includes a crash-resistant fuel bladder that fits in an aluminum and fiberglass enclosure with an internal fuel pump that transfers fuel to the helicopter's main tank at approximately 40 US gallons per hour.

# **SKYPRO HELICOPTERS**

# **EXPANDS AW139 FLEET**



Skypro Helicopters LLC has increased its Leonardo AW139 helicopter fleet to four aircraft. The helicopter, manufactured in Italy, has a cabin configuration of eight VIP seats. This aircraft joined the existing Skypro Helicopters fleet, which consists of two Russian-built AW139s and another helicopter manufactured in Italy.

Skypro Helicopters LLC provides a range of aviation services in the Russian and European markets, including aircraft sales, charter flights, aviation consulting, operation and maintenance of airplanes and helicopters, aircraft management and ground handling services in the Moscow Aviation Hub (MAH). The company employs over 70 people and has offices in Moscow, St. Petersburg and Riga.

# RotorBits

### **ROTEX ORDERS NEW K-MAX**



Kaman Aerospace has received a new order from Rotex Helicopter AG for the K-Max medium-to-heavy lift helicopter. This brings the total number of firm orders since the relaunch of the K-Max production to 12.

## HAI APPLAUDS UTAH ROTOR

#### **PATHWAY PROGRAM ROLLOUT**

Helicopter Association International (HAI) has applauded Utah Governor Gary Herbert on his administration's official rollout of the Utah Rotor Pathway Program. The program provides rotor-specific aviation classes to high school students by teaming up with industry, high schools, post-secondary schools and other stakeholders.

"This program is working because Utah has leaders in industry, education, and government willing to think outside the box, willing to step up, and get involved," said HAI vice president of government affairs Cade Clark.

## **7 ANSAT HELICOPTERS**

### SET FOR RUSSIA'S FAR NORTH

Russian Helicopters and Polar Airlines have signed a contract for seven modernized Ansat helicopters, starting from 2021. The helicopters will be adapted for operation in the far north of Russia.

Based on the recommendations of Polar Airlines, Russian Helicopters developed the new design of the helicopter, which allows for it to be kept outside a hangar, a longer flight range, an ice protection system and the possibility to perform instrument flights.

Polar Airlines will be a launch customer and an operator of the upgraded Ansat helicopters. In accordance with the contract, all aircraft will be able to carry medical modules, and these modules will be installed on three of the machines.

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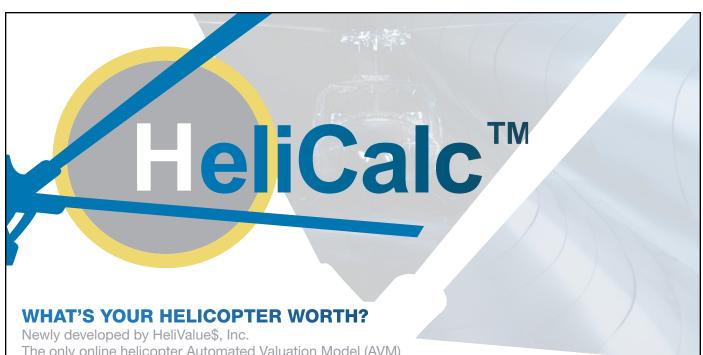
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# **WILSON CREW FINDS HIT-AND-RUN SUSPECT**



On the day of the accident, the company was on a long-term project with Hooper Corporation building a 500-kV power transmission line for Minnesota Power. **Wilson Construction Photo** 

A driver in rural
Minnesota allegedly
fled the scene after
hitting and killing a
two-year-old boy. He
wasn't counting on
the presence of two
Wilson Construction
helicopters that helped
law enforcement with
their search.

### **BY DAN MEGNA**

On the afternoon of Aug. 1, a horrible accident took place along a stretch of rural highway in the Minnesota Northwoods. Reportedly, a pickup truck was being driven south on Highway 65, north of the tiny community of Nashwauk, when it drifted from its lane

and onto the gravel shoulder. The vehicle struck from behind a 16-year-old girl pushing her two-year-old nephew in a stroller. The pickup truck fled the scene, leaving behind the critically injured victims

Ten miles away at a remote job site, Jon Gannon was working as a general foreman for Wilson Construction Company on a large construction project. Based in Canby, Oregon, Wilson specializes in construction of electric utility infrastructure. On this day, the company was on a long-term project with Wisconsin-based Hooper Corporation building a 500-kV power transmission line for Minnesota Power. Due to the remote and heavily wooded setting of the project, Gannon was utilizing two company-owned MD 500E helicopters for support.

Shortly before 1:30 p.m., Gannon received a telephone call from his wife. She was in Nashwauk and had become uneasy after hearing the sirens of emergency vehicles seemingly headed up the highway in the direction of her husband's work site. After Gannon assured

From left, Brian Powers, Jon Gannon, Aaron Peterson, and Dave Durbano are the Wilson Construction employees who were instrumental in helping law enforcement find a hit-and-run suspect. Wilson Construction Photo



his wife that he and the crew were safe, he received another call. This one was from Kyle Larson, construction manager for Minnesota Power, who was one of the first to have come across the awful scene on the highway.

Larson said it appeared to be a hitand-run. He had performed CPR on the young boy and summoned additional help from another member of the Wilson crew: Brian Powers, a retired Oregon State Police officer. Larson asked Gannon if Wilson could provide a helicopter to aid in the search for the suspect vehicle. Without hesitation Gannon replied, "Heck yeah, we'll get 'em going," and then he himself began heading to the scene.

Gannon's initial radio call was to his pilot Cabot Wolford, who was working nearby conducting external load operations. He advised Wolford of the situation and asked him to land, reconfigure, refuel, and get back into the air to begin searching. The only description they had was vague at best — a red pickup last seen southbound on Highway 65.

Wilson pilot Dave Durbano had been working on another portion of the project and just wrapped up when he heard the radio traffic regarding the hit-andrun. When Durbano advised he was landing for fuel. Gannon asked him to also join the search. Durbano enlisted the aid of Wilson apprentice lineman Aaron Peterson as an extra set of eyes in the aircraft. After refueling, the pair launched, heading south from the yard toward the scene.

The Wilson helicopter crews would be at a slight disadvantage. They had no direct communication with law enforcement, which meant that all communications needed to be relayed through Gannon and Larson. They remained at the scene, acting as liaisons between the helicopter crews and law enforcement.

Durbano recalled, "We flew along Highway 65 looking up and down the little back roads. As we were coming up to the scene I called Cabot, who was ahead of me and already searching. He told me he was on the west side [of Highway 65], flying grid patterns. So I said, 'OK, I'll take the east side and begin working south."

As the two helicopters reached the town of Nashwauk, they were provided with a bit more information. Witnesses told police the vehicle was a Dodge pickup and likely sustained damage to the exterior mirror on the right side.

Concluding their search in and around Nashwauk, Wolford chose to continue southwest along Interstate 169 toward the town of Pengilly. Durbano and Peterson went east toward the town of Keewatin.

By this time, both helicopters were more than 10 miles from the accident scene, and Durbano's instincts from his previous career as a deputy sheriff were talking to him. He suspected they were likely well beyond an appropriate search area. "I told my partner, 'You know, when I was a cop, I was always told suspects [fleeing a scene of a crime] typically don't go far and usually turn to the right." Applying that theory to this particular situation, Durbano decided to fly back to the scene and begin a more concentrated search, working south and west of Highway 65.

Their search pattern took them over a

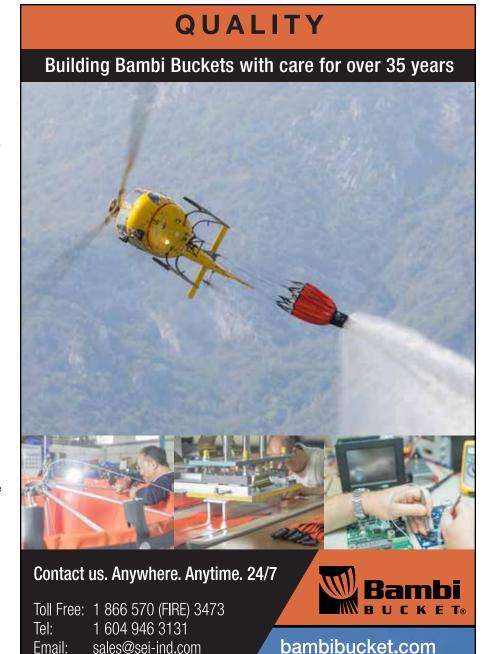
remote property off a small gravel road about five miles southwest of the accident scene. Durbano said it appeared to be a storage yard for scrap lumber. They took note of a handful of old vehicles scattered about, but their attention became focused on two vehicles that seemed out of place: a maroon-colored pickup and a tan van. There were also people standing alongside the vehicles.

Durbano recorded the coordinates and relaved them to Gannon. He and his partner then descended for a closer

look. The crew's suspicions were piqued when the people next to the vehicles appeared to ignore the low flying helicopter. As Durbano noted, "Normally if you're flying at a low altitude people will wave or at least look up. These folks didn't even make eye contact."

As Durbano brought the helicopter into an out-of-ground-effect hover providing a better view of the vehicles, Peterson exclaimed, "Hey, that one truck is a Dodge and it's missing the right mirror!"

Durbano pulled up and turned away from



the vehicles and reported their findings. Hoping not to scare off the individuals, Durbano tried to make it appear as though the helicopter was leaving the area, but Peterson maintained a close watch. As the helicopter moved away from the yard, the people got into the vehicles and began to move.

The van followed the maroon pickup out of the yard, turning east toward Highway 65. Durbano turned the helicopter around and took to following the vehicles. Almost immediately, the vehicles stopped and the occupant of the pickup stepped out to have a brief conversation with the driver of the van.

When the vehicles began moving again, Durbano provided Gannon a turn-by-turn narrative as law enforcement closed in. "He turned south on Highway 65 so we're radioing every turn and everything he was doing," Durbano recalled. "I could see up the road a bit and there was, I think it was a Minnesota State

Trooper, that had an oversized truck pulled over off the side of the road. But about that time I saw a sheriff's vehicle coming northbound."

Durbano's radio report of the vehicle approaching officers was quickly relayed to the Itasca County Sheriff's Office and the Minnesota State Troopers. As the sheriff's vehicle and the pickup passed one another, the deputy sheriff made a U-turn and activated his emergency lights to initiate a stop on the pickup. After it was determined this was indeed the suspect vehicle, the driver was taken into custody.

Tragically, the two-year-old boy was pronounced dead at the scene. His 16-year-old aunt was transported to the hospital with injuries that were significant but believed to be non-life-threatening. The driver of pickup was charged with several felony offenses including criminal vehicular homicide, hit-and-run, and driving under the influence of a controlled substance. Law enforcement officials declined to comment on the episode due to the ongoing investigation.

"I honestly didn't think we'd find the guy," Durbano told *Vertical*. "But once we got confirmation that was the vehicle and the driver, I was pretty ecstatic. It was like, wow, I can't believe we actually found him. He could have been long gone."

"The pilots did an amazing job," said Larson. "Those MD 500s hit the air fast and they covered a lot of ground quick. It really showed who Wilson is as a company because they did it without asking any questions. It was selfless; they just went and did it."

Looking back, Gannon said, "Everybody here was happy we could help. We all have kids and can't imagine losing one regardless of age. But it's nice that we can do something like that with the resources we have, that we can use them in a time of need. It was just kind of bittersweet. You were wanting to be all excited about catching that guy, but at the same time you knew what had happened."

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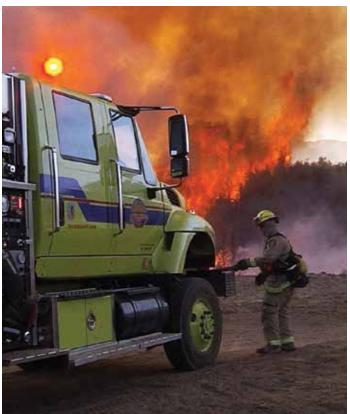


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interviewed by Skin Robinson



# ASHLI BLAIN

Ashli Blain comes from a flying family. Her grandfather established Billings Flying Service, which is now owned by her father and uncle — who are both retired airline pilots. At just 18 years old, she has multiple pilot ratings, and balances her fledgling flying career with school and a job at a veterinary clinic, where she is learning to be a veterinary technician.

# **VERTICAL:** When was your first flight in a helicopter, and what was the type? Did you know you wanted to fly helicopters at the time?

ASHLI BLAIN: I was too young to remember my first helicopter flight. I've been told I was two weeks old and it was in a Bell 205. I figured out that I wanted to fly helicopters when I was around 14. I got to fly a JetRanger while traveling with my dad and I couldn't get enough.

#### V: When did you become a rated helicopter pilot? What was your journey through training?

**A.B.:** It took some convincing to talk my dad into teaching me how to fly helicopters. When I was around 14, I did enough begging that eventually he said that if I could find a good deal on a UH-12C Hiller, he would teach me to fly.

I originally bought an old beater that we were going to fix up, but we soon realized that it

would cost more to fix it than to buy one that was in better shape. I found one in Canada that we then brought home. It needed some work, but we soon had it flying. I flew that for the next few years and soloed when I was 16. I also learned to fly a JetRanger around the same time, and I did my private [pilot certificate] in one when I was 17. Once I turned 18, I got my commercial and my instrument [pilot certificates].

# V: Tell us about your H-60 rating and what you've done in terms of flying over the last year.

A.B.: It's been busy! I got my private single engine airplane, instrument airplane, and private multiengine airplane [pilot certificates], and once I turned 18, I got my commercial helicopter and my instrument helicopter [pilot certificates]. I got my type rating in a CJ [Cessna CitationJet] as well as my commercial multiengine [pilot certificate] at the end of April.

My UH-60 rating went really well. I found the systems on it to be very challenging to understand compared to anything else I've ever flown. When I did my check ride, I actually had an FAA [Federal Aviation Administration] POI [Principal Operations Inspector] onboard observing my examiner. I don't think he expected to be observing an 18-year-old girl's check ride, but he was a good sport!

### V: How have you found flying the Hawk this year? How is your type rating on the Bell 47 coming along?

A.B.: We bought a Bell 47 to replace the UH-12, and progress has been slow with it because I've been gone most of the summer, but it should start moving along once fire season is over. As for the Hawk, I've flown it about 40 hours this year. My dad and I flew it together on a fire in Salmon and it was pretty cool to do it as a father-daughter team. It's been a bit of a learning curve for me in regard to how everything works on fires, as the procedures are all new to me. Fortunately I've been flying with very experienced pilots and they are able to walk me through the process.

# V: Your family operates a number of Chinooks — have you been able to fly it?

**A.B.:** Yes — I'm hoping to get my type rating next spring. Flying the Chinook has definitely been more challenging for me than the Hawk but I'm starting to get a better feel for it. All I've done so far is firefighting, obviously as

a second in command. I love flying it. My dad is actually not the pilot in command — I've been flying with some of our Billings Flying Service pilots. They're fantastic. I think the biggest adjustment is getting used to working on such a large crew.

# V: Are your parents supportive of your flying?

**A.B.:** Completely. My dad and I spend a lot of time together flying, and he is always willing to help me in whatever way he can. It terrifies my mom, but she hasn't tried to stop me. She has been very supportive, and despite flying not being something she's interested in, she does her best to keep up with what I'm up to. My mom actually wouldn't watch when I soloed in the Hiller. She was too nervous.

#### V: What is your favorite aircraft?

**A.B.:** Whichever one I'm flying! One of my favorites would have to be a Ford Trimotor, operated by the EAA [Experimental Aircraft Association]. I ran into one on tour when I was 13 and got 30 minutes of dual [flight time]. It happened to be the first entry in my logbook. It helped spark my interest in aviation.

# V: Your father and uncle are professional airline pilots. Do their skills and experience help you?

**A.B.:** As you said, they are professionals and they expect the same from me. Despite my age and lack of experience, they've both done their best to teach me to be confident and handle myself in a professional manner. During each new step in my training, I've had the two of them to ask questions and walk through any problems I may encounter.

# V: In comparison to fixed-wing, what skill sets do you need to perfect to fly a helicopter?

**A.B.:** I don't think there's anything in particular that I've had to perfect. The most difficult part I would say was getting used to moving three things at once.

#### V: What are your future flying plans?

A.B.: In the near future, I would like to get my CFIs [Certified Flight Instructor Certificates] and upgrade all of my ratings to commercial now that I'm old enough. Over the next few years, I'm planning on flying copilot in our aircraft and working towards getting my A&P [Airframe and Powerplant Certificate]. I'm currently in Austria at a gliding competition, so I might try competitive gliding as well. I don't quite have an answer. I generally just tell people I'm going to be a librarian!



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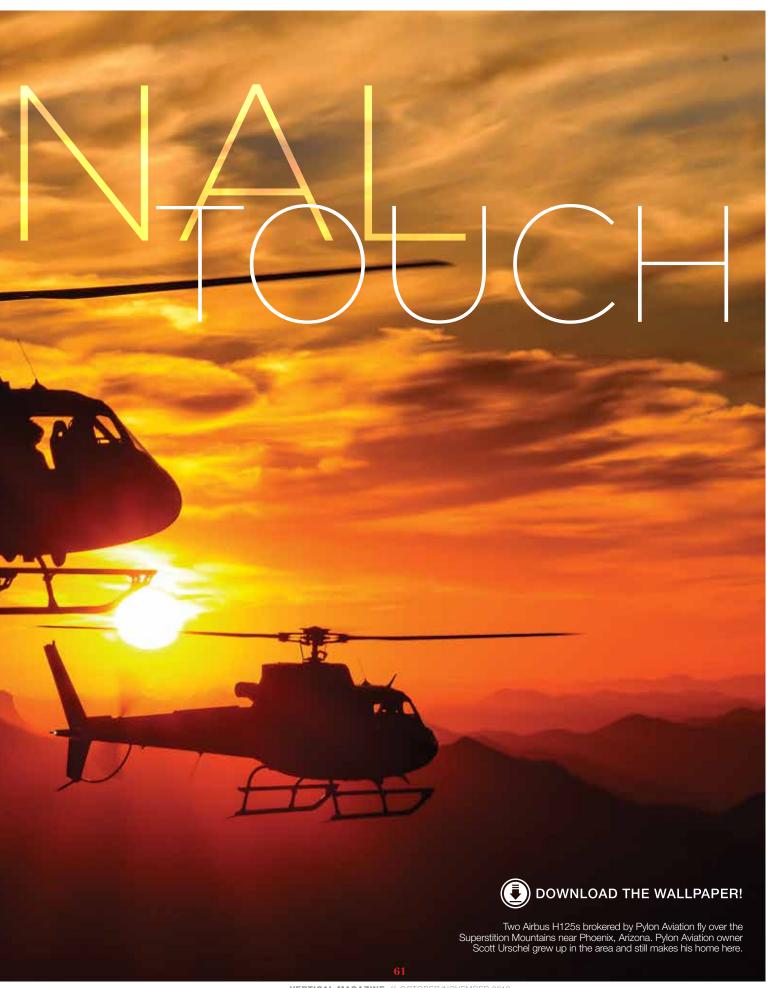
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# Through his company Pylon Aviation, Scott Urschel does more than just buy and sell helicopters — he also serves his customers as an instructor and a mentor. BY ELAN HEAD // PHOTOS BY MIKE REYNO & SKIP ROBINSON





If you are involved in the North American civil helicopter industry, you almost certainly have a connection to Scott Urschel. Perhaps you know him personally, but if you don't, then you probably know someone who does. You might have benefited from his work as a certification test pilot — for Airbus H125 inlet barrier filters and multiple night vision cockpits — or used a StartStick, the emergency start battery he co-developed. And if you've recently enjoyed a helicopter aerobatic display, it's likely that Urschel, as the International Council of Airshows' primary helicopter aerobatic competency evaluator, signed off the pilot.

Urschel has flown scores of aircraft models and an impressive range of missions during his more than 30 years and 10,000 flight hours in the aviation industry. Among other achievements, he is the only non-Bell test pilot to fly one of the company's experimental flight test vehicles, and one of only a handful of pilots to be invited to fly the Airbus X³ high-speed demonstrator over 200 knots. But Urschel spends most of his time these days buying and selling helicopters — an ideal pursuit for someone with his extensive network of connections.

Urschel, however, is no mere broker. Through his Arizona-based company Pylon Aviation, he specializes in pairing high-net-worth clients with the right helicopter for their missions, then providing the training and mentoring they need to operate it safely. It's a business that is very deliberately based on long-term relationships, even when that comes at the expense of short-term gains.









"I lose business to a number of customers when I give them my questionnaire and I ask them all the hard questions," Urschel said, explaining that he starts by asking prospective clients how they plan to use their helicopter — and whether their budget can accommodate their intended missions. "The guy who wants to go to Alpine, Wyoming [elevation 5,637 feet] in a [Robinson] R22, well, it's just not working. It's not going to happen and it's not safe and there's not enough margin."

Urschel's customers are often the type of successful business-people who aren't used to being contradicted, and they will typically react to his bluntness in one of two ways, he said. "Either they will totally respect you . . . or they'll tell you to take a hike." And that's fine by him. Urschel has been in the business long enough to see too many people die in preventable accidents, and giving his customers the right aircraft and the right foundation is more important to him than simply making a sale.

"Helicopters are a wonderful thing, but they will kill you in a heartbeat and you have to have respect for them," he said. As he explains to his clients, "You have personal limitations, and the aircraft has limitations, and then you have weather limitations, and any time you start exceeding any of those, you're really putting yourself at risk. I always try to sell people margin, and the margin is in performance and training."



Helicopters are a wonderful thing, but they will kill you in a heartbeat and you have to have respect for them.







#### A LIFELONG PASSION

Urschel, who grew up in the Phoenix area where he still lives today, has always been fascinated by helicopters. When he was around five years old, an uncle from Ohio who had a road-building company purchased a Hughes 300 and ferried it through Arizona. "My dad took me to Mesa Falcon Field, and I went for a ride," he recollected. "I'll never forget it because we took off and flew across the orchards on the west end of the runway there, and I remember trees going under the chin bubble. And I was hooked."

As a teenager, Urschel befriended Roger Schuster, a sales rep for Hughes Helicopters who further encouraged his passion and introduced him to the business of buying and selling helicopters. Urschel jumped in with both feet. "I was doing real estate when I was 19 or 20 years old, and I made enough money to bamboozle the bank into loaning me money to by an R22," he said. He leased the aircraft to a local flight school, Arizona Wing and Rotor, where in 1986 he learned to fly in it with his certified flight instructor (CFI) Neil Jones (now owner of Quantum Helicopters, and someone who has been a great friend and mentor to Urschel for over 30 years).

But simply flying his helicopter wasn't enough for Urschel — he

also wanted to be able to practice autorotations in it anytime. "Like most flight schools you needed to be a CFI to do autorotations on your own," he recalled. The solution was simple: he became a CFI.

Not long afterwards, Urschel sold his R22 to finance a new business, Urschel Manufacturing, initially focused on making booms for barefoot waterskiing, another one of his pastimes. But he didn't stop flying — or trading helicopters. By that point, Urschel had already become close to many key players in the Phoenix aviation and manufacturing scenes, and their mutual passions naturally led to a number of cooperative ventures.

Rusty Lyon, the founder of the shopping mall development company Westcor and the owner of Westcor Helicopters, had Urschel checked out in the Eurocopter (now Airbus) AS350 AStar, and rented it to him as a way of building turbine time. Soon Urschel had the opportunity to purchase a Hughes (later McDonnell Douglas and MD) 500, which he flew for a while, then sold in order to expand his manufacturing business. But he later bought another 500, which he restored in partnership with the MD mechanic Mike Collins, whom he also taught how to fly. Urschel used the 500 for miscellaneous operations including external load work. He also outfitted it with electronic news gathering





Urschel works closely with his clients ensure that their helicopters include the latest there is to offer, including avionics. In this case, Hangar One Avionics customized an H125 avionics panel with a 10.6-inch Garmin G500H TXi touchscreen flight display, Garmin GTN 750 and TN650 that combines GPS, communication and navigation functions.



equipment, and it was flown for TV15 by one of his early instructors, Scott Bowerbank (who in 2007 was tragically killed in a midair collision over Phoenix while flying for TV3).

Meanwhile, Urschel had also been doing manufacturing work for his friend Mike Dillon, the owner of the ammunition reloading equipment company Dillon Precision and an experienced pilot himself. Dillon decided to buy a Hughes 500 as well, and Urschel taught Dillon's sons, Chris and Steve, how to fly it. Leveraging their professional experience with firearms, they also equipped the helicopter with miniguns, and it was Dillon's ongoing efforts to troubleshoot the unreliable miniguns that led to his development of the enormously successful Dillon M134D, which is today used by armed forces around the world.

An enthusiastic collector, Dillon soon added a Bell UH-1H Huey to his fleet, and some Beechcraft T-34 trainers. Urschel did not yet have his airplane rating, although as a certificated helicopter pilot, he only needed 15 hours of flight time for an add-on. Dillon provided him not only with time in the aircraft, but also an extraordinary instructor — Ralph "Slick" Aguirre, who had flown Hueys in Vietnam before transitioning to the Air Force and becoming a renowned fighter pilot.

"Mike thought it would be entertaining to give me the required 15 hours in the aircraft and send me somewhere to get a checkride," Urschel recalled. "So I show up in this warbird with 15 whopping hours of airplane experience, and the DPE [designated pilot examiner]... goes, 'Man, OK, I'll do it, but I'm not sure about this.' " Urschel passed the checkride, and is now an accomplished warbird pilot, too.

Another key mentor for Urschel was Rich Lee, the Hughes (later McDonnell Douglas, then Boeing) test pilot who is also one of the pioneers of helicopter aerobatics. Lee introduced Urschel to aerobatics in the MD 500, and then trained him in the MD 520N NOTAR helicopter for the United States' first — and so far only — helicopter pylon air race in 1995. That led to Urschel's unique distinction of being the first pilot approved by the Federal Aviation Administration (FAA) for helicopter pylon air racing.

Today, Urschel, who performs aerobatics in his own MBB Bo.105, is one of six FAA aerobatic helicopter pilots and one of only four aerobatic competency evaluators qualified to evaluate helicopter pilots. He is currently developing a flight test instrumentation package specifically for helicopter aerobatic flying to increase knowledge and safety.

Urschel noted that many of his clients use their helicopters not only for business, but also as tour vehicles "for the adventure of seeing different places and finding things that they never saw before."





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## THE IMPORTANCE OF MENTORS

Urschel has a 16-year-old son, Caden, who soloed both a Robinson R44 and an Aeronca 7AC Champ on his birthday earlier this year. Caden would often tag along with his father on ferry flights, laying the groundwork for his own precocious accomplishments.

If Urschel's extraordinarily diverse piloting career can be distilled to a simple philosophy, it is the importance of mentorship. Urschel is quick to credit his own mentors, who provided him with the opportunities and guidance he needed to develop his skillset safely. Now, he is doing his best to impart that philosophy not only to his son, but also to anyone who buys a helicopter from him.

Summing up his advice for private owners, he said, "I think that you need to be really serious about it, and you need to be able to devote the time to training . . . and that needs to be vetted by someone with credentials. [You need to] have a mentor, whoever that may be, someone that is very qualified, that can gradually











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The VIP/corporate sector is one on which all the major OEMs are focusing. We spoke to them to find out how the market is looking today, and what it promises for tomorrow.

#### **BY HOWARD SLUTSKEN**

It's early evening at a major metropolitan airport as an elegant corporate jet rolls up to its home base hangar, at the end of another globe-spanning flight. Moments after the engines spool down, the airstair door opens and the plane's owner, who could be described as having an "ultra-high net worth," walks quickly down the stairs and across the ramp.

Waiting there, with engines running and rotor brake engaged, is a helicopter decked out in the same unique livery as the jet. The owner settles into her seat in the machine's sumptuous interior, the rotor spins up, and the helicopter lifts off into the twilight, heading home to the private helipad at her rural estate.

VIP helicopters like this machine continue to make up a significant percentage of the industry's sales and operations. Airbus, Bell, Leonardo and Sikorsky all recognize the importance of their VIP — and VVIP — customers, some of whom are long-term owners.

To find out more about the rarefied air of the VIP market, *Vertical* talked to the four major manufacturers.



#### **LEONARDO'S ITALIAN STYLE**

With a heritage dating back over 40 years to the delivery of the first Agusta 109, Leonardo has over 830 VIP helicopters flying around the world, and delivers a new VIP machine at an average of one every 10 days.

It's no surprise, then, that the 70-year-old aerospace company is upbeat about the market.

"The VIP helicopter market overall is doing well," said Manuela Barbarossa, Leonardo's head of VVIP/corporate. "It is experiencing a period of growth compared to the last three to five years, which were slower. The signs around the market are positive. We are seeing an increase in ultra-high net worth people seeking out the advantages of helicopter travel."

Leonardo's customers can choose VIP helicopters from the skidequipped AW109 Trekker right up to the super medium AW189. But the company's most popular VIP machine is the AW109 GrandNew, the latest in the long line of twin-engine speedsters.

"It's nearly iconic; people seek out the shape," said Barbarossa. "It is stylish and very safe because all systems are redundant in its light twin category, and it features advanced avionics and navigation systems." She said that the GrandNew is popular in Europe, well-suited to the continent's geography.

Asia is a growing market for Leonardo, with the AW139 leading the charge for both personal and corporate VIP travel. With effective cabin soundproofing, passengers traveling in an AW139 — and in its big brother, the AW189 — can have a conversation without wearing a headset, according to Barbarossa.

Depending on the level of customization, it can take between three and six months for Leonardo to complete a VIP machine. And the company brings its style to bear on every project.

"Leonardo offers customers an incredible range of luxury interior



options," said Barbarossa. "We have our own interior center with hundreds of swatches of paint, carpet, fabrics, leathers — almost anything you could think of. Most clients prefer to have us handle completions because we have a talented team of designers who treat every aircraft interior like a work of art."

With a VIP helicopter market made up of 60 percent private owners, 30 percent operators and 10 percent governments, Leonardo is excited about the prospects of the world's first commercial tiltrotor, the AW609.

Expected to be certified soon, the AW609 will have a nine-seat cabin and a maximum cruise speed of 275 knots, with a pressurized cabin allowing it to fly at between 20,000 and 25,000 feet (6,100 and 7,620 meters).

"It combines the flexibility of a helicopter with the comfort and speed of a fixed-wing airplane," said Barbarossa. "We think it will have a big impact on the VIP market."

#### SIKORSKY'S VIP DYNAMIC DUO

Earlier this year, when Audrey Brady was promoted to vice president of Sikorsky's commercial systems and services, she already had a clear impression of the VIP helicopter market, thanks to her experience running the company's completion center in Coatesville, Pennsylvania.

But that wasn't enough for Brady.

"In order for me to get to know the customers a lot better, I wanted to be able to talk about the product on a whole different level," she said. So Brady started training for her private license in a Schweizer 300, which she describes as "the greatest training helicopter in the world."

Now, as a licensed helicopter pilot, Brady has flown the full series of S-76 machines. It's no surprise that her favorite is "the S-76D, for sure."

"I can talk about the differences, especially for VIP customers who are loyal Sikorsky customers," she said. "If they ask, 'why upgrade now?' I can actually speak from experience."

Over the past 40 years, 20 percent of all S-76 deliveries have been to VIP customers — a total of over 180 helicopters. In the niche VVIP market, Sikorsky's S-92 is outpacing the S-76, with the larger helicopter having been selected to transport 12 heads of state, including the President of the United States.

While Brady acknowledges that the S-92 is "a lot of machine for the corporate market, we've seen additional interest as of late. It has more range and it carries more passengers."

With a cabin height that allows passengers to stand up, the S-92 can be outfitted with a lavatory and showers, which can extend the completion time for the machine to two years.

"Sikorsky has the reputation of customizing the aircraft however the customer desires," said Brady. The company can complete a machine for a VIP customer, or the client can work with an outside company.

VIP customers can have very unique requests that require special development. "A lot of times we will engineer a solution and we can work with completion vendors," said Brady. "We've also worked with very high-end interior decorators."

Brady gave the example of an S-92 client who sought out a custom-designed cup holder.

"You have to think about not only the design, but you have to look at what's necessary to certify it," she said. "It has to be crashworthy – it's about more than making sure you don't spill the drink!"





And although VIP helicopter missions are relatively short, clients are beginning to look for in-flight entertainment connectivity systems (IFEC), to provide Wi-Fi internet access in the air.

"Our in-flight connectivity options available today are focused on offshore communication and connectivity mainly based on satellite," said Brady. "We are working with suppliers to develop 4G LTE and 5G connectivity solutions that have the speed and economics suitable for the VIP market."

According to Brady, Sikorsky is flying more demos of its VIP helicopters. "We're definitely starting to see more interest now. But we know that it really is cyclical, especially with the economy."

#### **BELL'S BESPOKE VIPS**

"Bell's VIP sales are driven primarily by three aircraft models, the Bell 407, the Bell 429, and the Bell 505," said Susan Griffin, executive vice president, commercial business.

The Bell 407's basic design stretches back more than 50 years to the first Bell 206 JetRanger. Although it's primarily thought of as a utility machine, many of the four-blade, single-engine helicopters have been completed as VIP transports.

Equally at home on a rooftop helipad or the aft deck of a luxury yacht, the twin-engine Bell 429 can be equipped with skids or retractable gear. Customers can also choose to configure their new machine with a high-end VIP interior from Italy's Mecaer Aviation Group (MAG).

And while some may look at the Bell 505 as a low-cost entry-level machine, both owner-pilots and operators see the VIP opportunity in Bell's newest helicopter.

"A very high percentage of our Bell 505 orders have been in the corporate/VIP segment," said Griffin.

Bell's VIP orders for the 505, along with the 407 and 429, come primarily from private operators. Overall, more than 2,160 VIP Bell helicopters have been delivered, mostly to North American and Latin American operators, followed by those in Europe and Asia Pacific.

VIP machines can be completed at Bell's facility in Piney Flats, Tennessee, or at a shop of the client's choice. In addition to the MAG interior options for the 505 and 429, Bell can install its standard corporate interior, or create a personalized design.

"We offer various seating configurations, an assortment of leathers for seats and upholsteries, pedestals for storage, ambiance lighting and unique designs that can be customized to anyone's liking," said Griffin.







Up front, Bell continues to improve the capabilities of its helicopters, bringing additional safety features to pilots. The company recently announced IFR certification for the 407 along with a new autopilot for the 505.

With the certification of the super-medium Bell 525 Relentless expected soon, the company will have a new entry in the VIP market. With a large cabin big enough to seat up to 20 passengers in a high-density configuration, one can only imagine the interiors being considered by the future VIP owners of the advanced fly-by-wire helicopter.

"The Bell 525 will be a gamechanger in the VIP/corporate transport segment once it enters the market," said Griffin.

"Huge panoramic windows provide stunning views. Modular seating, stowable flatscreen monitors, table options, cabinets, coolers, custom carpet, and window-tint choices provide plenty of versatility for travelers to design their own bespoke environment for traveling."

#### AIRBUS'S ROTARY AND WINGED VIP APPROACH

Airbus Corporate Helicopters (ACH) was created in 2017 to address the overall decline the company was seeing in the personal and business aircraft sector.

Despite not seeing the slight recovery in the global market that he expected the industry to experience this year, Frederic Lemos, head of ACH, remains upbeat about the restructuring decision.

"Airbus held the leading market share for decades, but we felt the need to reinvent our approach to this specific clientele," said Lemos. "We wanted to bring them the ultimate in helicopter experience, not only in flying the product but at every stage of the customer experience path. So far we have seen very positive results from ACH and we have increased our market share."

The creation of ACH mirrors the move by Airbus Commercial Aircraft to split off









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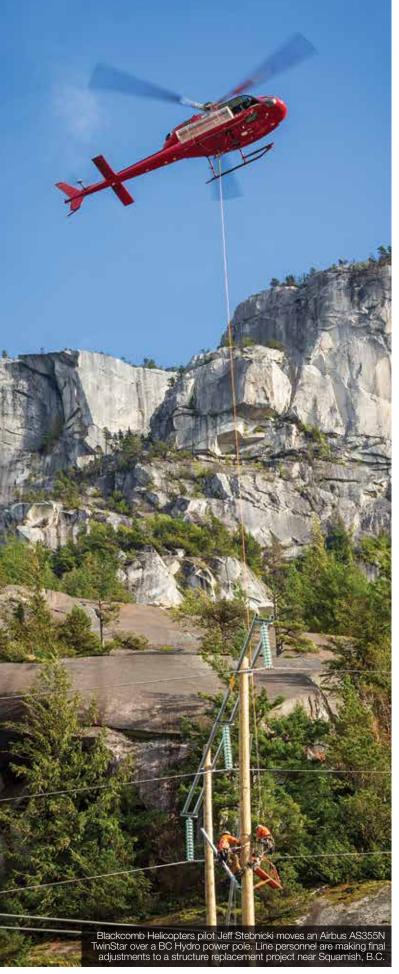
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From dramatic coastal cliffs to ancient rainforests and glacier-topped mountains, British Columbia's Sea-to-Sky Corridor, running inland along Highway 99 from West Vancouver to Pemberton, is well worth its reputation for spectacular scenery and outstanding opportunities for recreation activities.

The region attracts visitors from around the world, with many drawn to the renowned mountain resort village of Whistler, which provides world-class skiing in the winter months, and has a growing reputation as a mountain-biking destination over the summer. And, year-round, visitors and residents take advantage of the many challenging hiking routes that traverse the beautiful mountains that are spread throughout the region.

In such an environment, helicopters play a vital role in enabling mountain access for development, work, and play; providing search-and-rescue (SAR) services for those who get into trouble in remote places; and building and servicing the powerlines that connect the region's settlements. And perhaps the area's most widely recognized helicopter operator is the one that bears the name of one of the mountains accessible from Whistler village. That company is Blackcomb Helicopters.

Now celebrating its 30<sup>th</sup> anniversary, Blackcomb was established in 1989 by Steve Flynn as a relatively small company that specialized in mountain-related operations. It provided SAR services, and worked with the local resort, as well as with the construction, forestry and film industries. In 2006, the company was purchased by its current owners, John Morris and The McLean Group, with brothers Jason and Sacha McLean joining Morris as Blackcomb's directors. At the time, Blackcomb had just four helicopters.

Morris had served as the Whistler Base Manager for Okanagan Helicopters in the early 1980s, and prior to purchasing Blackcomb, had been running his own aviation company — Omega Aviation (which was later rolled into Blackcomb).

The McLean Group was established by David and Brenda McLean in 1975 as a real estate investment and development firm. Over the years, the company has expanded to include businesses in film and television production services (including Vancouver Film Studios), telecommunications, construction, and aviation.

The group's ties to Morris stemmed from the purchase of an aircraft for Vancouver Film Studios, which Morris helped to procure and then manage. The success of the working relationship meant that it was an obvious decision to join forces when Flynn approached Morris about purchasing Blackcomb.

Under the new name of Blackcomb Aviation, the company quickly expanded over the next few years throughout the Sea-to-Sky Corridor, purchasing Goldwing Helicopters in Sechelt, founding a base and heliport in Squamish, acquiring facilities from Pemberton Helicopters, and establishing a base in Lillooet.

As Blackcomb Aviation, the company also offered private jet charter services, but in 2015, it refocused on rotary-wing services, and rebranded as Blackcomb Helicopters.

As the accountable executive and general manager, Morris oversees the day-to-day operations of the company from a relatively high vantage point.

"We are lucky to have a lot depth of field out there and that makes my job pretty easy," he said. "I get to spend most of my time fine tuning or tweaking. The folks employed here are empowered to get things done without my thumb on top of them."

Morris said he was focused on maintaining the culture that had been established at Blackcomb. "We do things safely, we do things right, and we support our employees and our customers,"



he said. "Our ownership group believes in investing in the support structure around dedicated safety management and quality assurance personnel and requisite training in all facets of our operations. We stay engaged in our communities and give back — not because we have to, but because we believe in doing so."

#### A VARIED FLEET

Today, Blackcomb has a fleet of 22 aircraft, including the Bell 206B, 407, and 212HP; and the Airbus AS350 B2, B3, H125, EC130 B4, AS355N TwinStar, and a hoist-equipped EC135 T2+.

Its headquarters are in Whistler, but it also operates bases throughout southern British Columbia — in Squamish, Sechelt, Pemberton, Lillooet and from a facility on the general aviation side of Vancouver International Airport.

Operations in and around the mountains define most of the company's work across its bases, but each tends to have its own area of focus. Vancouver is the setting for much of the company's film work; Squamish provides a lot of mountain access and rescue work; Sechelt typically services the company's contracts with utility company BC Hydro; Pemberton does a lot of mountain access flying for conservation and forestry; and Lillooet is kept busy servicing Fisheries and Oceans Canada, as well as providing mining access.

The headquarters in Whistler performs a wide range of utility operations, but it's also the company's most prominent tourism base, providing flightseeing tours, heli-hiking and heli-skiing.

Andrew Bradley, the company's operations manager, has been with Blackcomb since 2005.

"The weather changes are the biggest challenge of operating in



feet [2,750 meters] — so not too big a deal when it comes to altitude — but weather can come in pretty fast, and you have to make sure you don't get caught out. If you are working in the mountains, you've got to make sure that you've got your valley below you to get back home. But we do a lot of weather checks in the summer and winter."

Given that the Whistler base is located in an area that contains an internationally renowned ski resort, it's no great surprise that inclement weather restricts the number of operating days in the winter — with Bradley estimating about 40 percent of working days are lost due to the conditions.

The company has between 26 to 30 pilots, depending on the season — a very consistent requirement that, in turn, allows Blackcomb to offer pilots consistent employment throughout the year.

In the winter, Blackcomb's workload is boosted by the company's heli-skiing operations, with four or five aircraft (and sometimes as many as eight) dedicated to flying skiers to various locations in the mountains surrounding the Whistler base.

The 407 is "a great heli-ski machine," said Bradley, with the ability to carry five skiers and a guide. The 212 HPs also work well as heli-ski aircraft, having been incorporated into the Blackcomb fleet over the last three years. Typically, two 212s and two 407s will be working on

heli-ski operations in Whistler on any given day over the winter.

If pilots want to transition to heli-skiing operations, it can be three or four years before they're ready to join the ranks, due to the complexity of the work.

"I think it's safe to say that most pilots would say that heli-skiing is probably one of the most challenging things you'll ever do, but I think that's why a lot of pilots like it," said Bradley. "There's the weather, there's low density snow, [and] you're at altitude — so it taps into the skills that you've learned over the years, but it's fun."

#### **WORKING IN THE MOUNTAINS**

Each base has a certain number of pilots assigned to it, who will tackle the variety of operations flown from that facility. Blackcomb also has a number of roaming pilots, particularly in the summer for firefighting work, who will take aircraft into the field for contracts. Wildfires can take the company across the country, with three Blackcomb helicopters fighting fires in Ontario earlier this summer. In addition to serving operations on the mountain through heli-ski flights, Blackcomb provides aerial construction services, having developed a great deal of expertise using a long line. One of the more challenging recent long line projects was the construction of a backcountry hut along the popular Spearhead Traverse in Garibaldi





Provincial Park, which required all workers and equipment to be flown in. This was the third year that Blackcomb has been a part of the construction effort.

"The Spearhead hut has been two summers and falls of construction, pouring concrete on exposed ridges, and precision work," said Geoff Doran, Blackcomb's chief pilot. "There's not a lot of 'beginner' long line work here — we're putting things in challenging places, either construction projects that are on the top of mountains or on high mountain ridges."

One of Blackcomb's biggest customers is BC Hydro, which provides year-round work for the operator. With BC Hydro's requirement for twin-engine aircraft, its contracts with Blackcomb are typically serviced by the operator's AS355N TwinStars, which perform construction and maintenance of powerlines, perform patrols, deal with emergency outages, troubleshoot, or work on special projects. And, having provided Class D Human External Cargo operations for the utility company for several

In terms of SAR operations, Blackcomb has partnerships with several volunteer mountain rescue organizations in the region, and performs Class D rescues with them. It also offers the EC135 for hoist rescues for its industry customers if their workers get hurt in the field.

years, Blackcomb has also now been

um-lift needs for special projects.

Much of the fleet's maintenance work (and all heavy maintenance) is performed at the company's base in Pemberton, where it has two large hangars. There are 14 full-time aircraft maintenance engineers (AMEs) at Blackcomb, as well as four people serving in maintenance management. The maintenance team is supplemented with contractors when needed.

Terry Irvine, Blackcomb's director of maintenance, said the year-round busy season is one of the more challenging aspects of his team's work, as well as the sheer variety of types in the fleet.

"As soon as you finish fires in summer, we have a short maintenance period to get Blackcomb's hoist-equipped EC135 T2 can be used for rescues of workers from industry customers, and the company has also been approved to use the hoist for powerline work by BC Hydro. Blackcomb Photo





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things ready for the heli-ski season, and then the same thing in the spring to get things ready for summer," he said. "And then trying to have people endorsed on all of the types at any given time, spread out between our operating locations — it's definitely a challenge." In terms of capability, Blackcomb's AMEs can perform all required running maintenance, but will outsource specialized work or structural repairs.

#### **FOCUS ON TOURISM**

According to Jordy Norris, Blackcomb's sales and marketing manager, the company has made a conscious effort to grow its tourism business over the last few years — and with a steady supply of tourists from around the globe visiting Whistler village, it has proven a wise move.

"Tourism's always existed, but it hasn't been as much of a driving force for us as it is now," said Norris. "In the summer, the biggest

part of our business is wildfire work, but wildfires can be inconsistent as well. There's just a lot more consistency in tourism. We know what the numbers are in town. We know when the down seasons are going to be. It's not reliant on independent big contracts. It's reliant on the marketing work and using the success of the resort"

An extensive renovation of the company's headquarters is the most visible result of the renewed focus. Designed with the feel of an alpine cabin, it has a bright and spacious reception area to make guests feel right at home as they await their flights. Tiered seating along one wall allows groups to relax and mingle, another wall contains a large graphic chart displaying the company's history and achievements, while outside, picnic tables on a new patio allow visitors to enjoy the sun on warmer days. Blackcomb merchandise — including baseball caps, t-shirts and toques — is on display and available for purchase should guests want to take a memento of



reception desk.



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their time with the company away with them.

Developing and expanding relationships with the major hotels and tourism companies in Whistler has also been key, and the company has partnered with firms to be included as part of customized Whistler vacation packages.

One of the more subtle — but no less impactful — changes is to the company's website. It was redesigned with the consumer in mind, with a primary focus on Blackcomb's tourism work. Previously, upon landing on the home page, a visitor would see an image of a helicopter with a long line and a description of the variety of operations performed by the company — a great representation of its work, but not something likely to encourage someone to book a flightseeing tour.

Now, visitors to blackcombhelicopters.com are greeted with a screen-sized mountain vista with the simple words "Take Flight" and a "Book Your Tour" action button. The navigation bar provides access to landing pages for the company's various other operations, with the assumption being that those interested in such services will still be able to find them.

Blackcomb offers three basic flightseeing packages, ranging from a 12-minute tour through the mountains, to a 30-minute private tour that includes a landing on a 12,000-year-old glacier. It also offers customized packages to elevate the experience, including picnics or mountain-top champagne toasts.

The flightseeing tours are typically flown by the company's EC130. "With the way the seating is and the windows, it's built for tourism," said Norris.

The company can also provide heli-biking on a charter basis, using AeroDesign bike racks on its AS350 (Blackcomb performed the flight-testing on the racks during their development). The company is also consulting with Transport Canada to add dedicated heli-biking to its expansive tenure.

Bradley said he hopes the future will also see an increase in general utility work — whether firefighting or mineral exploration — outside of Blackcomb's homeland.

"There's only so much work inside the [Sea to Sky] corridor that so many aircraft can handle," he said, "so anything else that can go further afield is better for us."

In terms of the fleet, the 212s are set for a substantial avionics upgrade, with Blackcomb working with Alpine Aerotech to have a glass cockpit certified and installed on the three aircraft. The operator hopes to have the first conversion completed by spring 2020, with the other two done by the fall.

#### **INVESTING IN PEOPLE**

As with most of the industry, Blackcomb is having to find ways to adapt to the shortage of experienced pilots.

"Our pilots need to have the full quiver of skills, and where it becomes challenging is when we need to help them develop some of those skills, and then we really start to narrow down the list of those that can be assigned to specific jobs," said Bradley. "If pilots are going to be truly utilitarian for our dispatchers to be able to assign them to anything, we need pilots that have got experience

doing the full range of things — and doing it in a very challenging environment. We need someone that can go and do rescues with the local search-and-rescue groups at the end of a long day of heli-skiing in poor weather conditions, which can be taxing; or do a rescue, then go do a long line project in the middle of a winter."

However, the variety of Blackcomb's operations is allowing it to use certain operations (such as flightseeing) to help less experienced pilots build hours and proficiency, while focusing its experienced pilots on the more challenging work, such as precision long-line operations, or heli-skiing.

As the pad-to-pad tourism flying is quite seasonal, the less experienced pilots who fly those operations take a ground crew role over the winter — both keeping them employed, and building their experience around Blackcomb's various winter operations.

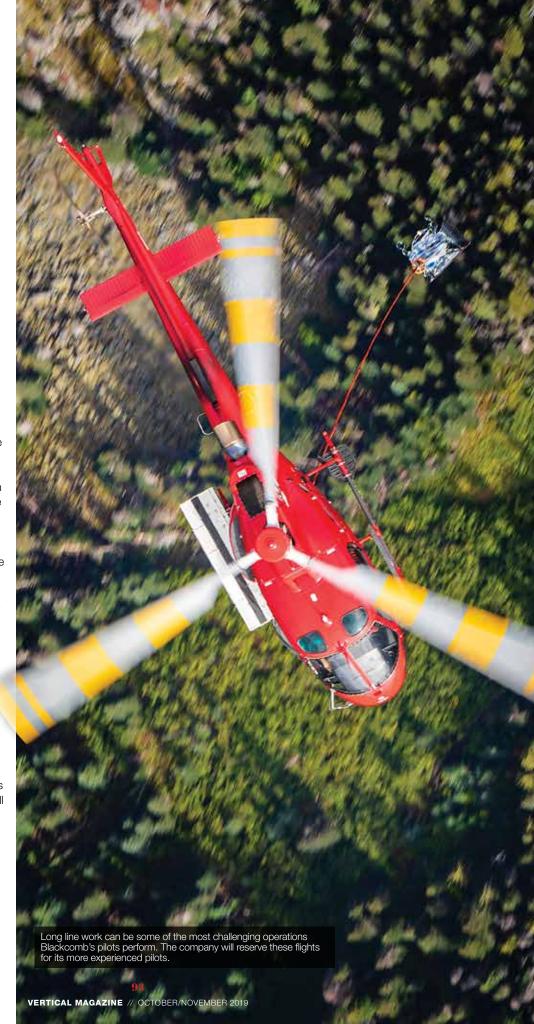
"We've been trying to keep some of these newer pilots within our ranks," said Doran. "We believe in building people up that we know and trust, and we can then use them to fill out our ranks so we don't have to hire a bunch of contract pilots in the summer."

According to Bradley, the attitude a pilot arrives with is the most important thing. "Anybody can fly; we want people to make good decisions when they're in the cockpit," he said. "We always say we hire for attitude and we train for skill, so the mindset needs to be there. We want to get it done, but we want to get it done safely."

Blackcomb's motto is "Safety, respect, and value" — and Bradley said safety was undoubtedly the foremost focus. "You try and engrain it into everybody, and everything people do on a day-to-day basis. We try to set the mindset that it's only heli-skiing or it's only trees for forestry. You can go back there tomorrow when the weather is better. We make sure people know that as management, we've got their back — we'll support them 100 percent."

That support reaches up into the company's ownership group. According to Doran, the willingness of Blackcomb's owners to invest and improve the company is one of the things that sets the company apart.

"They're truly interested in making it a great organization; they're truly interested in how they can help make this a better place and not solely focused on how they make it more profitable," he said.



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We try to set the mindset that it's only heli-skiing or it's only trees for forestry. You can go back there tomorrow when the weather is better.

-ANDREW BRADLEY, OPERATIONS MANAGER AT BLACKCOMB HELICOPTERS

As an example, Doran said they've created a private radio network that covers Blackcomb's core area of operations, allowing crews to remain in easy contact even when they're operating in very remote areas. He also pointed to their willingness to invest in the 212s and upgrade them to the most modern standard; and the company's drive towards a recent announcement that it had become carbon neutral.

"We're a helicopter company, but a lot of what we do is mountain access, so they looked at how we could be better stewards of these environments where we are taking people," he said. "We made a financial commitment to become carbon neutral. That's not being done in other places. The owners are looking at all different sides of our business as to how we can make it a better place for ourselves, for our staff, and for the environment. They're a fantastic group of people to work for."



Oliver Johnson | Editor-in-Chief of Vertical Magazine, Oliver has been covering the helicopter industry since joining MHM Publishing in 2012. He can be reached at at oliver@mhmpub.com
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Blackcomb has made a conscious effort to build up its aerial tourism work, offering a variety of packages to suit visitors from around the world.



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## THE ISSUE OF AUTOMATION

With the topic of automation in aviation under public scrutiny, perhaps it's time to review some fundamental aspects of aircraft handling using the technology.

#### BY KP SANJEEV KUMAR

The high profile crashes of the Lion Air and Ethiopian Airlines Boeing 737 Max airliners have brought the issue of automation in aviation to the public attention like never before. How much automation we are comfortable with, and to what degree we should be reliant on it, are, of course, topics we have been discussing within aviation circles for as long as we have had the technology. And with the ever-increasing capability of rotary-wing automatic flight control systems (AFCS), these questions remain hugely relevant to our industry and future.

When highly automated helicopters are hand-flown into the ground through the wrong buttons being pressed, perhaps it is time to review some fundamental aspects of aircraft handling through automation. To do so, we're going to take a look at some rotary-wing accidents and what can be learnt from them in terms of automation.

Before we proceed, it's worth noting that no accident is ever the result of a single event, and we obviously have the benefit of hind-sight that came too late for these crews. I write with the hope that someone somewhere learns a lesson that helps them live to fly another day.

#### CASE 1: HAL 'DHRUV' ADVANCED LIGHT HELICOPTER (VT-BSH)

On Oct. 19, 2011, a Dhruv Advanced Light Helicopter operated by Pawan Hans Helicopters Limited (PHL) took off from Ranchi airfield in poor visibility during daylight hours. During the climbout, the "TGB Hot" warning was activated, forcing a return to Ranchi.

The Dhruv has a sophisticated AFCS and autopilot with flight director "upper modes." Yet the pilot flying decided to take over manual control as the aircraft continued visual flight into instrument meteorological conditions (IMC). The short flight of about six minutes saw extreme bank and pitch attitudes, speed excursions breaching never exceed speed (VNE), high and low rotor rpm and overtorque







 all consistent with a loss of control in-flight (LOC-I) — culminating in a crash into hilly terrain. All three onboard were killed, and the helicopter was destroyed in the crash and post-impact fire.

Among other probable causes and contributory factors, the accident report includes a grim pointer to the crew's resort to manual control of the helicopter under IMC.

#### CASE 2: LEONARDO AW139 (G-LBAL)

On March 13, 2014, a privately-owned AW139 took off from a ground-level helipad with little ambient lighting in dense fog conditions. The crew were under pressure to fly the owner, who had clearly invested in a modern machine and instrument-rated pilots so he could fly in "all weather." A 40-minute delay imposed by his late arrival pushed the flight into deteriorating weather. No special procedures, briefings, operations manuals or standard calls were in use. The captain briefed for a vertical lift-off from the field without much clarity on the subsequent procedure to be followed, including the most vital aspect for that take-off — the use of automation.

According to the CVR transcript in the report from the Air Accidents Investigation Branch (AAIB), the pilot in command (commander) said: "Right, all I'm going to do [is] take it over to the center of the field, and then just pull the power. We'll go vertically up, I'll go for the strobe—and just make sure the heading bug is central for us, if you can."

The report states that "the cyclic and collective controls were manipulated by the commander throughout the accident flight; the automatic flight modes, which could have maintained pitch and roll, were not active."

During takeoff, the helicopter continued to nose down after the initial vertical climb, reaching 35 degrees below horizon while

descending through 100 feet above ground level. The trim release switches were also found to have been held in throughout the flight. Again, tell-tale marks of an LOC-I event — extreme attitude, speed, descent rates and overtorque — were evident in the short flight. The parabolic flight path of the helicopter lasted less than a minute when it impacted the ground about 400 meters away. All four on board perished in the crash.

"No flight director modes were selected during the flight," the crash investigators noted in the report. Also in use was a "procedure not laid down in the flight manual or recognised as being compliant with the need to achieve Vmini [instrument flight minimum speed] before transition to instrument flight." Once again, limited use of the AFCS was noted as a contributory factor.

#### CASE 3: AIRBUS AS365 N DAUPHIN (G-BLUN)

On Dec. 27, 2006, an AS365 N Dauphin of CHC Scotia Ltd crashed into the Irish Sea while attempting to land at night on the North Morecambe gas platform in poor weather conditions. As per the accident report, "the approach profile flown by the co-pilot suggests a problem in assessing the correct approach descent angle, probably . . . because of the limited visual cues available to him."

The approach was not stabilized as the co-pilot was disoriented. The helicopter crashed into the sea with seven fatalities (two pilots and five passengers). Large oscillations in pitch, roll and yaw consistent with use of force trim release (FTR) rather than the beeper trim or "Chinese hat" were evident in last few seconds of the flight. Use of FTR under IMC is a potentially risky choice unless closely monitored through instrument indications.





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#### CASE 4: AIRBUS AS365 N3 DAUPHIN (VT-PWF)

On Nov. 4, 2015, a PHL N3 Dauphin went into the sea during a night training flight. The aircraft took off from a helipad at an offshore platform and planned to land at the nearby Ron Tappmeyer Rig.

"The helicopter made an approach to land on Ron Tappmeyer, but as the helicopter was high on approach, it made a go around and banked to the left," the accident report stated. "Simultaneously it descended and few seconds later the helicopter crashed into the sea and was destroyed."

The two flight crew members on board were both killed in the accident.

#### LOSS OF SITUATIONAL, SPATIAL OR SYSTEM AWARENESS?

The investigation reports into these accidents brings out the common deathtrap of spatial disorientation that accompanies planned or inadvertent entry into IMC. While the Dhruv crew were marked out for low awareness and unfamiliarity with a new type, the crew of G-LBAL were experienced on the type. The instructor pilot of Dauphin VT-PWF, who was the non-flying pilot during the ill-fated flight, was one of the most experienced pilots flying in India at that time.

Evidently, experience cuts both ways. Wrong habits can sometimes get fortified with experience. It just takes the holes in the metaphorical cheese to align and, alas, we have an accident.

Much has been written about automation and its ills in recent years. While we continue to lament the atrophy of flying skills that automation has brought about, I contend that intelligent and appropriate use of automation may, in fact, have saved the 16 lives lost in these four accidents. And there are countless other examples that abound in literature. For every accident attributed to excessive reliance on automation, you may well find a contrasting example where automation appropriate to that phase of flight was not used even though it was at hand.

To me, that's a bigger irony than having no automation at all; much like carrying a treasure chest of smart boxes that were rendered deadweight. To understand this predicament, we need to go back to basic flight school.

All pilots must, at some stage, have handflown basic aircraft or helicopters without exotic AFCS. Your hands continuously held the stick and controlled the flight path, with or without servos to offload the control forces. In due course, technology such as stability augmentation systems (SAS) for rate damping, spring-feel mechanisms, and force





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trim were added. Then came "attitude" mode for long-term attitude retention, and upper modes such as airspeed, vertical speed and altitude hold, lateral and vertical navigation, and so on. Slowly, the hand of automation took an increasing amount of work off your gloved hands. All that stood between you and the aircraft were a few buttons on the cyclic, collective and AFCS panel.

This technology is there for a reason. Under normal circumstances, mundane, repetitive tasks that require high accuracy are best left to autopilots (also known as "George"). That leaves spare capacity to do things such as monitor and manage systems, and look out for birds or obstacles. It also alleviates crew fatigue to a large extent. Flying over featureless terrain at night or in poor visibility is best left to George, since he doesn't get disoriented.

But even with all the automation, designers still give you "fly-through" modes where you can make short-term changes without disturbing the reference attitudes or rates. If you are cruising at 140 knots and suddenly see a flock of birds half a mile away, you can move the cyclic in the desired direction to avoid them without pressing any buttons, and then restore the cyclic back to its original place. The aircraft continues to chug along on automation. Such a beautiful system, isn't it?

Well, all that changes when you press the force trim release (FTR) button. Pressing FTR allows the pilot to make large changes in attitude while the system stands by in SAS/ATT mode — a potentially disorientating move in marginal visibility or night conditions. A momentary distraction can set up unusual attitudes or leave you predisposed to "overcontrol." Turn off the force trim and you lose the attitude mode. Turn off the AFCS or "stab" and all bets are off. It's just you and the unstable machine — back to the good old days.

#### AIRCRAFT DESIGN AND TEACHING

The design of autopilots usually caters for quick and easy decoupling of flight director modes or the AFCS itself. This is to ensure manual takeover of aircraft should the system misbehave or "feed" energy into unwanted oscillations. Intelligent design should preclude inadvertent operation of the "Stab OFF" or "SAS Release" switch, since some helicopters can quickly go into divergent oscillations without the AFCS. On the AW139, for instance, this switch is placed inside a circular recess on the cyclic and operated by the ring finger.

On the Dhruv, a small trigger-detent sitting under the little finger operates the "Stab OFF." Under duress, our natural tendency is to tighten our grip on controls. We will never know whether the Dhruv crew operated the "Stab OFF" trigger during the tense moments of that flight thanks to gaps in the flight data recording.

The force trim switch on the Bell 412 is hidden under a red guard. Yet, experienced pilots don't think twice before putting it off and moving the controls. While the intent may be noble, it's still potentially risky to do this in a 5.4-ton helicopter unless closely monitored; and then again, only under visual meteorological conditions. There is also an old school of thinking that holds that the first 1,000 hours on the Bell 412 should be flown with force trim off. I reserve comment, but there are too many body bags stacked against this narrative. It is best left to the doyens of training to analyze the pros and cons of this approach in the 21st century.

The report on VT-BSH brings out that the salient aspects of handling automation on the Dhruv were taught to the deceased pilots during their type rating. Both pilots were from a single-engine background — an epithet used to bracket pilots with hardly any exposure to automation. These are pilots who



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traditionally baulk at automation; mostly because they weren't introduced to it early in their careers. Since the pilots are no longer around to defend themselves, we must take the accident investigation board remarks with a pinch of salt. There is such a thing as evidence-based training (EBT). The Dhruv accident is an abject antithesis of EBT, if ever there was one.

With automation levels increasing by the day, upset prevention and recovery training must also be tailored to handle emergencies with the appropriate level of automation. I see a big void here, especially in the Indian context. The tendency to grab controls, push the FTR and take over manual control may not be the best option for all seasons. Type rating and recurrent training must recognize such tendencies and correct it before that rainy day.

Company standard operating procedures and operation manuals may specify what level of automation to use for each phase of

flight. But these can only be generic guidelines. Task saturation can be avoided by delegating mundane tasks to automation, while focusing on handling emergencies or abnormal procedures.

#### TAKE OVER WHEN YOU'VE GOT TO!

Lastly, a word of caution: you should not shy away from taking over manual control when the situation so demands (apart from rotorcraft flight manual procedures that specify "Fly Manually").

On March 14, 2017, Rescue 116, a Sikorsky S-92 operating for the Irish Coast Guard, flew into an outcrop called Black Rock Island that was uncharted on the aircraft's enhanced ground proximity warning system (EGPWS). As per the preliminary report issued by the Irish Air Accident Investigation Unit, a low altitude autopilot mode that reduces warning boundaries and look-ahead distances was in use at the time of accident. This visual flight rules-only mode was used by night in patchy mist and fog, with a cloud base of 300 to 400 feet, occasional light rain/drizzle and gale force winds. The crew reportedly received an "Altitude, Altitude" aural alert 26 seconds before the crash while flying at 200 feet/75 knots on an autopilot-flight management system (FMS) coupled mode.

If the crew had initiated immediate recovery action by stepping down to a lower mode of automation, or manually taking over controls, it probably would have saved the day. Instead, a heading change was initiated using the "Heading" mode even as a rear crewmember interjected with increasing urgency: "Come right now, come right, COME RIGHT."

The helicopter, equipped with a host of new generation devices like EGPWS, FMS, multimission management systems, AFCS, electrooptic/infrared camera system, dual radio altimeters, and weather radar hit the ground and crashed into the sea with loss of four lives.

Automation, like fire, is a great slave, but a bad master. There is no magic pill for all situations. The abiding mantra remains "aviate, navigate, communicate." If you are flying with George, understand his modes and moods. What level of automation is appropriate for a particular situation is best left for you to glean from the examples above, rotorcraft flight manuals and discussion with your peers and instructors. Grabbing the controls and pressing all the wrong buttons is not an option. ع



Capt. KP Sanjeev Kumar | Capt. KP Sanjeev Kumar is a former navy test pilot now flying for offshore oil-and-gas. He has flown over 4,500 hours on 24 different types and holds a dual ATP rating on the Bell 412 and AW139. He blogs at www.kaypius.com and tweets @realkaypius



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a look at some of the unique features that are available for the corporate market.

BY DAYNA FEDY

interior with high-end accents and the latest technology.

With a range of materials available on the market, and technology continuously evolving, the possibilities for corporate helicopter interiors are seemingly endless. Vertical checked in with a few completions companies across North America to see what the latest interior trends look like in the VIP market, and what your money can buy.



#### **AESTHETICALLY PLEASING**

Although every part of a helicopter is important to its function, it's not necessarily the components under the cowlings that create the "wow-factor" upon first look. The aspects that make a big first impression when it comes to VIP helicopters are the exterior paint and the interior of the cabin.

Located in Decatur, Texas, AeroBrigham — a helicopter completions and customization company, which also offers support and maintenance — is familiar with making VIP helicopters look extravagant. Looking specifically at seats and flooring, David Brigham, co-owner of the company, said a big trend in the corporate market lately is Lonseal flooring, which is vinyl flooring that looks like wood planking. With Lonseal flooring, a carpet can snap into place overtop if desired.

"If [owners] are hauling VIPs, they can have the carpet in [the aircraft]," said Brigham. "If they're going out on a beach adventure, they can roll the carpet out and people can get in the aircraft with sandy, wet feet; they can hose the aircraft out really easily."

This type of floor looks modern while offering functionality, and is relatively inexpensive to install; the cost, depending on the aircraft, could range anywhere from US\$9,000 to \$17,000.

If corporate helicopter owners want to up the ante, they have many opportunities to do so with the seats. Brigham said the



If [owners] are hauling VIPs, they can have the carpet in [the aircraft], if they're going out on a beach adventure, they can roll the carpet out and people can get in the aircraft with sandy, wet feet; they can hose the aircraft out really easily.





company has had requests for exotic hides like giraffe, as well as high-quality leather or sheepskin inserts. "We've done seats in buffalo and elephant [hides]," Brigham added, "but those can be really tough to find."

Looking at luxurious options for cabinetry in corporate aircraft, Mecaer Aviation Group, known for its MAGnificent VIP interiors in Bell helicopters, offered some insight. Being an Italian-based company, with locations in the U.S. and Canada, Mecaer designs interior concepts for its customers from its MAG Design Studio in Rome, and also gets a lot of its materials from that area. Cabinetry can feature any material of the customers' choosing, such as Italian-style wood or carbon fiber. Grayson Barrows, director of marketing and sales, said the company has customized cabinetry for all kinds of requirements, including "cup holders or storage; some [cabinets] are used for power . . . and then you get into more complicated ones where you have refrigeration, you could have a coffee maker, [or] a whiskey bar."

Daren Humphries, sales manager for corporate aircraft, added that Mecaer also offers interchangeable cabinetry, which can be included as part of a supplemental type certificate (STC) kit for VIP interiors. "The cabinets install to seat rails," he said, "so, a mechanic can remove the seat and then the cabinet just installs right back in the same way; it could take 10 or 15 minutes."









The cost of cabinetry can vary drastically depending on what materials are used to cover the cabinet, and what functionality is required.

EuroTec Canada believes luxury in the VIP market is often associated with fine products, exotic materials, and custom trim packages. "We create a one-of-a-kind aircraft tailored to our clients' unique personalities and design visions," said Hoss Golanbari of EuroTec Canada. "We begin all our projects with a face-to-face consultation. . . . Most of these first encounters include going through the various material samples, leathers, floor coverings, accent materials... right down to the type of stitching to get that truly unique and tailored look."

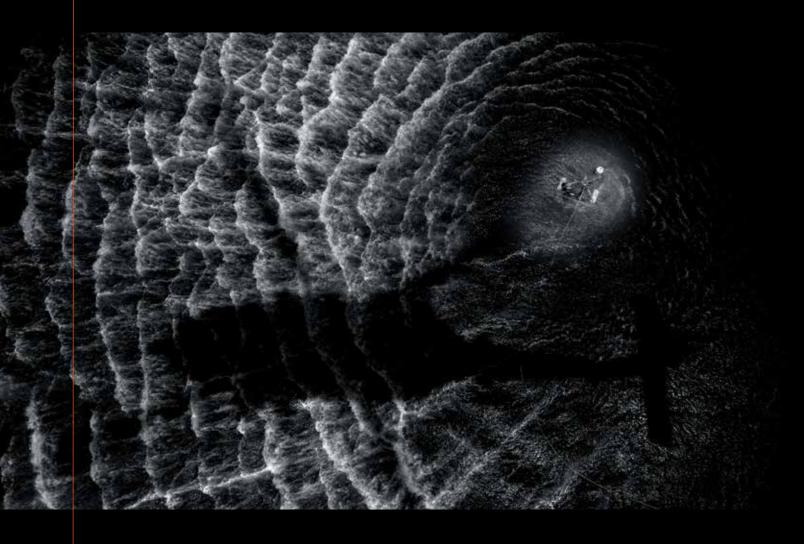
The company recently debuted an Airbus EC130 corporate aircraft at Helicopter Association International Heli-Expo 2019 in Atlanta, Georgia, which featured custom paint, carbon fiber trim, the latest in Garmin TXi avionics, and an Aston Martin DB9-inspired leather interior. "A lot of our customers love the idea of replicating their car's design into the aircraft they also own," said Golanbari. "They appreciate the fact that we can incorporate what they drive into what they fly."

When it comes to exterior paint, there's an overwhelming consensus on the completions side that a quality paint job is key to



Corporate helicopters that have Mecaer's I-Feel interior also have what the company calls near-field communication; a passenger's phone will pair to the system when they get in the aircraft, and it recognizes who they are, what seat they're in and what cabin functions they like to control. **Mecaer Photo** 

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first impressions, but also doesn't come cheap. The cost of custom paint varies based on the airframe as well as the prep work and process to remove the old paint, but can range anywhere from US\$45,000 to \$90,000.

#### **TECH-FOCUSED**

Technology is constantly changing and improving, which not only makes processes easier for helicopter owners, but also allows them to include more features in their aircraft.

Mecaer has developed an in-flight entertainment system and cabin management system combined into one platform, which it calls the I-Feel system. The I-Feel is completely customizable and allows the pilot and passengers to control virtually any feature in the cabin through a smartphone or iPad.

"As an example, we provide the I-Feel in a Bell 429 MAGnificent," said Mecaer's Barrows. "That I-Feel runs the audio and the video, and in the 429 itself, the capabilities are dependent on what function of the interior the customer has selected. If they don't have any monitors in the I-Feel interior, then of course the I-Feel will not provide video functions."



The I-Feel also features what the company calls near-field communication. "When you get in [the aircraft], your phone will pair to the system, and then you can control features from your phone," said Mecaer's Humphries.

The system recognizes who you are, what seat you're in and what functionalities you like to control – which could, for example, be the environmental control system, audio and video functions.

This high-tech system ranges in cost from US\$100,000 to \$150,000, depending on the functions the customer wants to include.

One other feature that can be controlled either with or without the I-Feel system is Mecaer's electro-chromic windows. These windows are popular in VIP helicopters for a few reasons. The electro-chromic windows have two layers of glass to reduce noise in the cabin — a feature that is ideal for business meetings. Also, the windows are customizable; all the windows can be dimmed to different degrees, so, for example, passengers can dim only one side of the aircraft depending on the position of the sun. While the cost of these windows varies based on the size and number of them on the aircraft, it ranges from US\$25,000 to \$90,000.

For those VIP helicopter owners who are also pilots, EuroTec



Lately, iPads being integrated with glass cockpits have become popular with VIPs, as well as the new Garmin TXi touchscreen flight displays. "EuroTec recently installed the new G500H TXi . . . in my personal Airbus H130 helicopter," said Chuck Surack of Sweet Helicopters. "I love the big, bright display and the immediate touch screen access. . . . EuroTec did a wonderful job." **EuroTec Photo** 







All the pilot needs to do, in an FBO [fixed base operation] or at home, is check the weather, look at their routing and put everything into their iPad, and as soon as they get into the aircraft, everything is downloaded into the avionics suite of the aircraft.

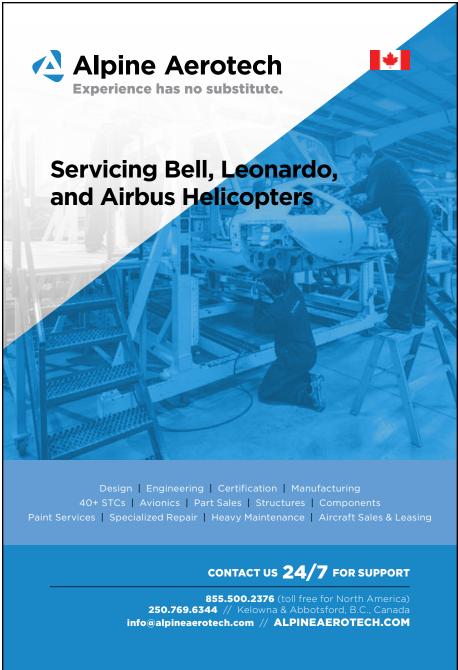


Vertical Flight Solutions president Chad Decker said while they enjoy the paint and the interior of the aircraft, it's often the technology and avionics that "motivate their desire to upgrade an aircraft." Pilots rely on newly developed apps that help them with flight planning, navigation, and weather. Over the past few years, "iPad installations integrated with glass cockpits are becoming more and more popular in corporate helicopters," said Decker.

IPads can be fully integrated into the avionics suite of an aircraft — with the proper mount and charging system — so "all the pilot needs to do, in an FBO [fixed base operation] or at home, is check the weather, look at their routing and put everything into their iPad," said Golanbari. "And as soon as they get into the aircraft, everything is downloaded into the avionics suite of the aircraft."

The new Garmin TXi touchscreen flight displays have also been popular requests for VIPs, according to Golanbari, and EuroTec was the first to install the system in an EC130 B4 helicopter.

"Chuck Surack of Sweet Helicopters in Indiana had the new Garmin G500H TXi



installed in his first H130 at EuroTec, and will upgrade his remaining fleet in 2019 and early 2020," said Golanbari. The TXi designs can include up to four displays in a panel, and as a bonus, give the cockpit a sleek look.

For corporate helicopter owners interested in camera systems, AeroBrigham has completed some unique projects in this area. Brigham said one of the biggest projects the company has done for a corporate customer was installing multiple miniature HD cameras inside and outside the aircraft so the owner could make recordings of the flights for his guests.

"He wanted to be able to control all the cameras from within the aircraft on his iPad," said Brigham. "We had to custom-make a Wi-Fi system and worked with VLC Player to make the system talk to an iPad. He wanted picture control, recording control and to be

able to choose which cameras were on."

Brigham said the cost of this custom camera project came to about US\$40,000 upon completion.

It seems no request is too far-fetched in the VIP helicopter market. Completions centers all over the world are capable of providing extravagant VIP interior upgrades for popular types such as the Airbus H130 and H145, the Bell 429 and 505, and Leonardo A109 and AW139. It's about finding the right provider for your needs; the sky really is the limit. •



Dayna Fedy | Dayna is junior editor of Vertical magazine.

She completed her undergraduate degree in communication studies in June 2017, joining MHM Publishing later in the year to pursue a career as a writer and editor.





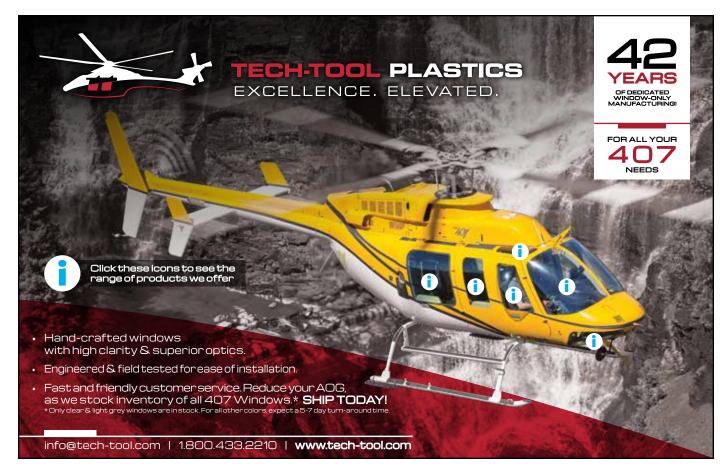
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On Sept. 3, just a day after Hurricane Dorian caused catastrophic damage to the Bahamas as a record-breaking 185-mph (300-km/h) category five storm, U.S. Coast Guard crew chief Ali Dowell lifted off from the largest of the archipelago's islands to begin the search for survivors in her Sikorsky MH-60 Jayhawk.

The Coast Guard wasn't alone above the battered islands. Aside from scores of private pilots who flew to the worst-hit islands without clearance, commercial rescue helicopters were lifting off from Florida, some while the storm's fringes were still whipping that state.

Alex Anduze, a pilot for Brown Helicopters, skirted the southwest edge of Dorian, "basically flying through the outer bands" from Pensacola to pre-stage his UH-60 in Stuart, Florida.

Through Joe Rieger, owner of Blue Marlin Cove Marina in West End, Grand Bahama, Anduze was able to secure written permission from the country's deputy prime minister to provide immediate direct relief to the affected areas. With that letter in hand, Miami Air Route Traffic Control Center issued them the callsign Relief01, and they were off on the 45-minute hop to the Bahamas.





"The storm wasn't even completely gone and we were already on the way down," Anduze told *Vertical*. "We were there as early as the military and the Coast Guard."

It took Matt Lowe a little longer to make the crossing from Sarasota, Florida, in his Airbus H225. Air Center sent his helicopter and an Airbus AS332L1 into Nassau, the capital of the Bahamas, two days after the storm passed. Air Center was flying for Global Medical Response, which secured philanthropy dollars to keep the two helicopters airborne for a week of 14-hour days, Lowe said.

With a contract from the Royal Bahamas Defence Force, Lowe ferried Prime Minister Hubert Minnis and an entourage of 10 to some of the worst hit islands and towns: Great Abaco and Marsh Harbour, Elbow Cay, Green Turtle Cay, Fox Town, Crown Harbor and Freeport.

Dowell and the crews of at least five other U.S. Coast Guard rotorcraft that were pre-staged on Andros – south of the storm's rampaging path – found plenty of Bahamians in need. By Sept. 9, the U.S. Coast Guard alone had rescued and relocated nearly 400 people from the Abaco chain of islands and Grand Bahama. When the storm hit, it pushed the ocean in and over the islands

in its path, with the storm surge reaching the second floor of many buildings. Entire shanty towns where Haitian immigrants had settled were simply swept out to sea. Thousands remain missing.

"We saw everything from amputations to pregnant women very far along who needed to get out to Nassau," Dowell, a Coast Guard avionics electrical technician and flight mechanic, told Vertical. "There were a lot of fracture injuries. In Marsh Harbour, everything is just gone."

What helicopter crews found in the areas pounded the hardest by the storm's 220-mile-per-hour gusts has been described as "hell." Photos from the air show entire houses flipped on their side, boats piled like toys on land, and entire towns reduced to twisted stacks of waterlogged building materials. The bodies of drowning victims lay among the rubble. The salty air coveted by the tourists who are the lifeblood of the islands was thick with the smell of death, Lowe said.

"Elbow Cay broke my heart," Lowe wrote in a text. "We landed on a field near the pool. We could smell the decomposing flesh. I spent 8 combat tours in Iraq/Afghanistan ... [This was] worse than anything I had ever seen."







Elbow Cay is home to the iconic candy-striped Elbow Reef Lighthouse, one of the most photographed lighthouses in the world and the last to run on a hand-lit kerosene Coleman wick. It survived the storm with minimal damage, but stayed unlit for 10 days. It was also one of the first places Dowell and her crew began their search-and-rescue (SAR) operations.

Dowell was speaking in the back of a Coast Guard Lockheed C-130, which had been sent to swap out fatigued helicopter crews so the incoming personnel could continue the work of rescuing Dorian-effected Bahamians from islands that lacked room for airplanes to land or where the tarmacs were wrecked.

She had been flying as an MH-60 crew chief and hoist operator six to eight hours a day for nearly a week when the C-130 picked her and a dozen other helicopter crews up.

#### **NAVIGATING THROUGH PACKED AIRSPACE**

With 700 islands spread throughout 180,000 square miles of bright blue ocean, it's difficult to imagine the airspace over the Bahamas becoming crowded, but so many U.S. military, government, private and other aircraft flew to the rescue following the burricane that airspace became precious.

The hurricane hit the islands with 185-mph winds, representing the worst s to hit the Bahamas. Thousands remain missing. **CBP Kris Grogan Photo** 

Grand Bahama International Airport (MYGF), Treasure Cay

Airport (MYAT), and Leonard M. Thompson International Airport (MYAM) at Marsh Harbour quickly became overwhelmed and were operating with limited or no air traffic control. The Federal Aviation Administration (FAA) assisted and put a temporary flight restriction over Grand Bahama.

In the initial aftermath, the glut of supplies and aircraft kept even military aircraft grounded at times. The Coast Guard's C-130H, packed with food and medical supplies and crews for the MH-60 helicopters stationed on Andros island, was delayed more than an hour in Nassau on the return leg to Florida Sept. 7.

"Probably our biggest problem was airspace deconfliction," Dowell said. "At first there were a lot of folks with private aircraft coming in to help and planes just trying to get footage."

Lowe said the volume of authorized and illegal traffic in the skies was such that it had delayed Air Center's clearance to fly into Nassau from Florida.

"The biggest challenge we had was that civil aviation of the Bahamas was overwhelmed with illegal civilian traffic," Lowe said. "It took us two days to get in there. ... It was like a hotspot for everybody breaking every rule that they possibly could."

Complicating the matter, many of the areas most in need were on small islands with no airport. In some cases, residents had

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to wait more than a week for supplies or evacuation. The international airport in Marsh Harbor was washed over for days. Even boats with supplies couldn't risk pulling into ports clogged with sunken debris. Helicopters were the only way in or out.

Anduze, with his Relief01 callsign and clearance directly from the deputy prime minister was luckier in gaining access. Having launched while Dorian was still licking Florida, he flew 21 round-trip missions from Stuart Jet Center, a total of 50 flight hours, over the next eight days. All told, he moved between 80,000 and 100,000 pounds of relief supplies from Florida to the Bahamas. The flight time was donated by Brown Helicopter, Anduze said, while fuel was donated to the Stuart Jet Center from all over the country.

"We concentrated on locations where nobody else could go, where only a helicopter could get," he said. "A lot of people were going into Freeport on Grand Bahama, but we decided that our efforts were going to be concentrated on the outer islands."

Without working airfields, the various relief and rescue helicopters were landing wherever they could: tennis courts, basketball courts, playgrounds, roads and golf courses. Sometimes they had to hover while tennis nets were cut down or debris was cleared from another impromptu landing pad, but the local residents recognized the helicopters as saviors and often instinctively turned out to help them land, Anduze said.

After obliging the Prime Minister's tour of Dorian's wrath, Lowe's H225 began "freelancing," as he called it, hauling cargo and fuel to wherever it was needed. He hauled 5,000 pounds of food and water at a time, carried 250-pound generators, or more than a dozen passengers. The Super Puma's versatility was key, he said.

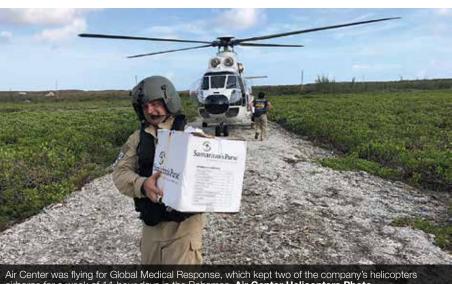
"The big thing is how quickly we could do a configuration change," he said. "We could carry 18 passengers, land, pull the seats out and replace it with eight seats and cargo, or completely empty it out and fill it with large oversize items like water jugs."

In medevac configuration, the H225 could carry three stretchers on each side and have a flight surgeon care for them en route to an operational medical facility, he said. They rescued elderly patients with dementia from one island, and a mentally unstable man at gunpoint — they carried security personnel on some missions - from another.

"Some of those folks hadn't seen any help for 10 days," Lowe said.

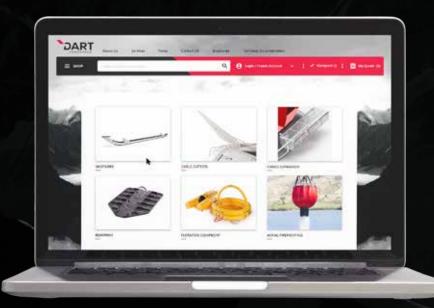






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#### MANAGING IN THE IMMEDIATE AFTERMATH

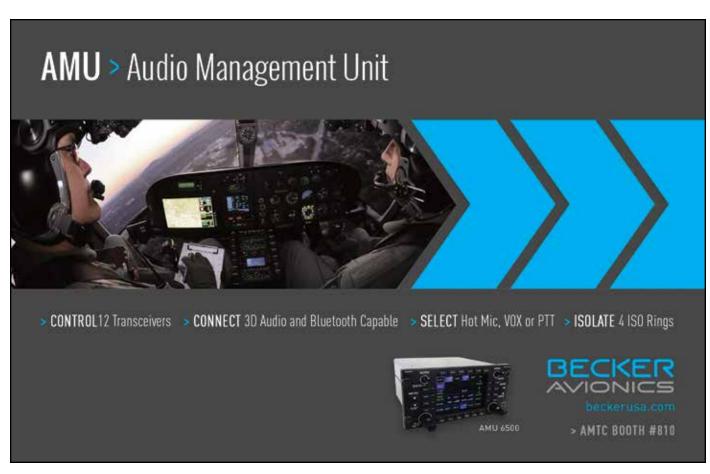
Commander Keith Blair had been chief of Coast Guard air operations for five days when he spoke with Vertical on Sept. 7. The Coast Guard said it had five MH-60s operating from Andros. Blair said another two joined from Mobile, Alabama. Two Customs and Border Patrol helicopters made for nine total operating from the island, he said.

Those forces were operating in concert with the Bahamas National Emergency Management Agency and the Royal Bahamas Defence Force.

"It was pretty impressive because we were sending out two waves a day, taking off at about 6:30 [a.m.] or so, and our folks were going out and they were doing fantastic," Blair said. "Most of our business the first day was going up to find the edge of the storm and then figuring out where we could go and then from there, they started to find concentrations of people."

As vast as the Bahamas territory is, rescue operations focused on two main islands – Great Abaco and Grand Bahama. Freeport on Grand Bahama apparently suffered mainly flooding damage, while Abaco was devastated by both wind and waves.

"We were very surprised to see how intact Freeport was," Blair said. "One of our pilots described it as St. Petersburg, [Florida,] after [Hurricane] Irma. A lot of it







Most of our business the first day was going up to find the edge of the storm and then figuring out where we could go and then from there, they started to find concentrations of people.



was dry – there was definitely flooding – but the hospital over there wasn't too busy. Overall they were in pretty good shape. The farther east you got is where there was a lot more damage in remote areas."

Marsh Harbour's medical clinic provided a lot of work for the SAR crews as they continuously flew a triangular pattern in the hurricane's wake. From Andros, crews would fly to Freeport then to Abaco, which aside from its main island has dozens of remote communities on outlying islands like Man O' War Cay, Elbow Cay, Treasure Cay, and Great Guana Cay.

Flying that triangle quickly became difficult due to the packed skies, which in the immediate aftermath were also filled with dozens of news organizations, in addition to the government, military, and private relief aircraft.

The airspace will open the further the storm recedes into recent memory and philanthropic enthusiasm fades, as it does after any natural disaster, Lowe said. The wounded islands and the Bahamians on them will need help removing debris and rebuilding infrastructure for months, if not years. Helicopters are ideally suited to the work, if funding to operate them is available. Trouble is, that money will almost certainly have to come from outside the Bahamas, he said.

"The Bahamas is not a wealthy country," Lowe said. "There are a lot of wealthy people who live there, but the country itself is not wealthy. You're going to need heavy-lift helicopters in there moving poles and heavy equipment because the harbors are still closed. We're looking at potentially six-month contracts, but we need NGOs and the U.N. and whoever else to throw a bunch of money at it. Unfortunately, I don't see anybody bailing the Bahamas out right now."



**Dan Parsons** | Dan Parsons is a writer living outside Washington, D.C., and has covered aerospace and defense issues as a reporter and editor for several publications since 2011.







## LOGGING HOURS

AN AIRCRAFT WITH A SINGLE PURPOSE AND A COMPANY WITH A SOLE FOCUS, ROTEX HELICOPTERS HAS DEVELOPED AN ENVIABLE REPUTATION FOR THE QUALITY OF ITS WORK WITH ITS HIGHLY SPECIALIZED FLEET OF K-MAX AIRCRAFT.

#### STORY BY JON DUKE // PHOTOS BY LLOYD HORGAN

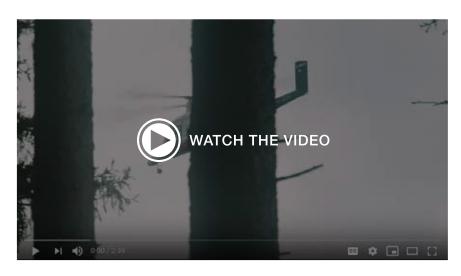
Helicopters aren't cheap, so it stands to reason that they must be as flexible as possible to be able to perform multiple roles. But there's always an exception that proves the rule. The exception in this case is Rotex Helicopters, whose operation exclusively in underslung loads (USL) has been a niche that it has made profitable since it opened for business in 1997. Headquartered in Liechtenstein (for operational, rather than tax reasons),

the company works mostly in Switzerland, and has operated its aircraft all over Europe. But its focus early on was much closer to home.

"A couple of employees [from another operator] built their own company," explained Renato Giezendanner, an Airbus H125 type-rated pilot and the project manager at Rotex. "They decided to focus on the timber market in Switzerland because they knew how to do it the right way."

Timber logging is an important industry in Europe and the forested area of the continent is actually increasing. In Switzerland, forests not only have economic value, but also perform an important civic function; providing protection from avalanches for towns, villages, and roads. One third of the country is covered with woods and forests; and two thirds is mountainous. This makes helicopter logging an essential part of the industry.

"Rotex had one aircraft at the start," said Giezendanner. "They did a lot with it. They averaged 1,800 flying hours per year, but only bought their second 10 years later."



While logging was the company's focus at its inception, Rotex has steadily expanded its portfolio, and its coverage, to incorporate underslung lifting of components for the construction and dismantling of large civil engineering projects, as well as firefighting. But it is in forestry that it maintains its core focus. For this, it has teams of specialist logging experts; a fleet of purpose-built "Helitrac" lifting vehicles to streamline the groundwork involved in organizing harvested timber for onward dispatch; and a hydraulic timber grabber — a log-lifting grappling claw that can exert a force of 2.3 tons. Controlled directly by the pilot, it enables logs to be lifted in remote sites unreachable by ground support parties.

The single aircraft per decade tempo that the company established was upheld with its third helicopter delivery in 2017.

All three aircraft are K-Max, Kaman's synchropter that is so specifically designed for underslung load carriage that it has a crew of only one pilot and no internal cargo area. A pair of twinblade rotors mounted on laterally outward-canted pylons above the fuselage are designed to intermesh perfectly. This arrangement was pioneered by German aero-engineer Anton Flettner, who arrived in the U.S. after the Second World War, courtesy of Operation Paperclip.

The setup maximizes the power available for lifting from the single Honeywell T53-17 engine, with none required for an antitorque tail rotor. This means that the aircraft is tremendously powerful for its weight; at just 5,100 pounds (2,330 kilograms), it can lift over 6,000 pounds (2,720 kilograms) externally, and yet has a low downwash and noise footprint.









"It was an easy decision to procure the K-Max because there were plenty of other companies operating other aircraft in other business areas, but our niche perfectly suited operation of this aircraft," said Urs Riebli, the CEO and one of the original company founders.

Not satisfied with the unusual intermeshing rotor design, Kaman designed the K-Max with another Flettner innovation; servo tab controls on the main rotors. This reduces control loads without complex and heavy hydraulic systems.

Production of the K-Max ended in 2003, but was restarted in 2017 after an unmanned version was produced in cooperation with Lockheed Martin for service with the U.S. Marine Corps in Afghanistan.

#### THE RIGHT TOOL FOR THE JOB

Rotex pilot Andi Redolfi explained that the aircraft was a perfect fit for the company's work.

"We operate at over 6,000 feet above sea level and we want to have the maximum weight [in the load]," he said.

Formerly a helicopter mechanic, Redolfi trained to fly helicopters in the United States before moving back to Austria and cutting his teeth in utility work.

"I flew pretty much everything you can do with a helicopter," he said. "Instruction, HEMS [helicopter emergency medical services) and heli-skiing. But this is very different."











Flying the K-Max had been Redolfi's ambition for a long time. Rotex typically requires its pilots to have 2,000 hours and 10,000 sling-load cycles, preferably in the Alps. The company invests 1.5 to two years training their pilots, so the job opportunity was too good to miss for Redolfi. His type rating was conducted at Kaman Aerosystems in Connecticut, with initial familiarization for the synchropter design being carried out on the manufacturer's HH-43 Huskie.

"The K-Max is a very different aircraft in a lot of ways, and it behaves in slightly different ways to other helicopters," said Redolfi. "But it is perfectly suited for this job, the 'V' shape of the aircraft means that the pilot's view is perfect. There's no blind spot. It's made to fly vertical reference."

Flying sling loads in the Alpine regions of Europe, particularly when undertaking logging operations, is far from an individual effort on the part of the pilot. It's a team sport, played on a field that sprawls across a mountainside and in which the competitors drive loaders, fly helicopters and climb trees in an effort to deliver 2.5-ton timber poles to their destination. Communication isn't easy, and thorough planning and coordination is essential.

"The crews have to do everything by themselves, but the operation manager briefs everybody on the task, which actually means less work for the pilots than at other companies," Redolfi explained. "The loadmasters have a tough job trying to get the load right to maximize the weight lifted, and of course the pilots have to check the weather and plan the flight thoroughly. But it's got to be one of the best flying jobs in the world."

Rewarding it might be, but it has its demands as well. "Because of the Flettner [servo tab] blade control, the K-Max doesn't have hydraulics, so the controls are heavy," said Redolfi. "The branches [of the logs] often get snagged so you have to be a little rough on the aircraft sometimes, you know. But the K-Max can handle it. It's built for it."



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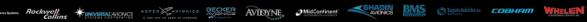




























This is good news for the pilots, but you might expect this kind of behavior to have serious maintenance repercussions. On the contrary, explained Hans Fässler, "The aircraft is very efficient and does not require a lot of maintenance. If you get the schedule right, most of the maintenance can be done overnight."

Fässler is the continuous airworthiness post-holder at Rotex, with overall responsibility for the aircraft maintenance schedule. He also holds a position with Swiss Helicopter Maintenance, which provide maintenance services for the K-Max. "100-hour inspections take a day, and 600-hourlies take two days to complete," he said. "Everything up to 100-hour inspections is done in the field, the rest is done here at the headquarters."

With such a well-integrated maintenance operation, aircraft availability is good, despite two of the aircraft having logged over 20,000 hours. But with such a unique aircraft, there is not a global abundance of spares. The rotor blades, with their esoteric design, are particularly difficult to get hold of. Rotex keeps a running stock of spare parts to avoid any need to wait and suffer long periods with aircraft on the ground (AOG).

"We have almost enough spare parts ourselves for another aircraft," joked Renato Giezendanner. "Kaman are a good partner, but it is expensive for them to produce spares."

There is no appetite in the company to look elsewhere, though. The pilots' passion for the K-Max is shared by nearly everyone, including those responsible for ensuring the aircraft are profitable.

"In 2004 we did a lot of research into other helicopters but in this operation and this market the only competitive aircraft is the K-Max." explained Urs Riebli.

#### **FUTURE PLANS**

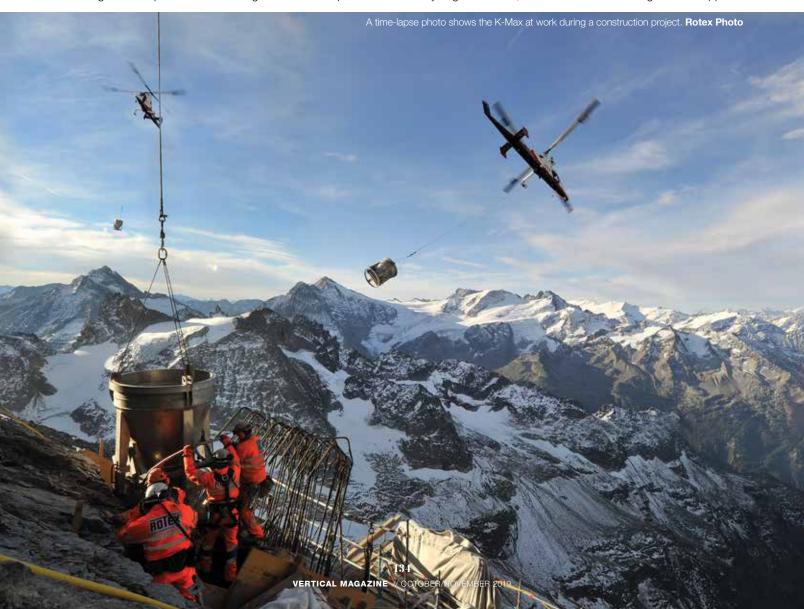
While Rotex remains committed to the K-Max, it has embarked on a modernization program.

Conventional gauges are becoming more expensive to replace, and the company wanted to provide modern capabilities such as terrain and obstacle warning. A modernized cockpit incorporating Garmin G500H Txi primary flight displays and multi-function flight displays, alongside a raft of other glass cockpit instruments, is being submitted to the European Aviation Safety Agency (EASA) for approval.

"When you have one type of aircraft you can focus on that type and put all your effort into support that machine," said Riebli. "It is possible to be very clear in everybody's mind that they will be working with K-Max and that's it, otherwise you risk losing focus."

This approach allows the company to customize its equipment, training and capability solely to support their current type and scale of operation, and Riebli doesn't predict much change to this focus in the future.

"At the moment we have no plans for further aircraft, but we wish to invest in those helicopters and our capability," he said. "It is risky to grow too fast, but we need incremental growth to support







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stability. We would like to do more with the aircraft and develop additional markets for work between the main timber seasons. With the efficiency of the K-Max and the experience of our crew, Rotex is ideally suited to build power lines or help fight forest fires."

The aircraft are certainly not resting on their laurels, but there is undoubtedly potential for additional work in the quieter months. Firefighting in particular is area in which the company hopes to grow, and it has proven the potential of the K-Max in this role. It can lift a 2,500-liter (560-US gallon) SEI Industries Bambi Bucket, and Rotex has already fulfilled several contracts using this. However, there are few long-term firefighting contracts in Europe, and they are not easy to secure. Moreover, the capability to fly passengers is widely seen as essential.

Convincing those accustomed to more conventional helicopters is likely to be a long road, but Rotex doesn't appear to be in a hurry. What modest growth objectives it has are based purely around greater utilization of its existing fleet, rather than expansion.

There is a complete focus about Rotex that is demonstrated in almost every facet not only of the company itself, but in those who support and serve it. Its pilots fly only sling-load operations in an aircraft designed exclusively for that role, built by a manufacturer that offers only that single type for civilian sale. While it is capable of wider utility, the majority of Rotex's effort is centered around logging, with fleets of ground vehicles and specially trained support personnel.

Rotex would, of course, be threatened by any new entrant into its market. Its position makes this unlikely, but not for the obvious

reason. The K-Max, although unique, is not the company's selling point. While expensive, the aircraft is affordable if the flight hours are guaranteed – and the work is clearly there.

But in order to reach those flight hours, a newcomer would need 15 to 20 highly trained specialists on the ground to support each helicopter during operation. Pilots with the necessary skill are not plentiful, and the family ethos in Rotex would make it difficult for a new company to poach that talent. The experience of the maintenance crews to fine-tune the aircraft to make them more efficient and reliable is itself priceless.

Without this human tapestry of complex skills and experience, a newcomer would quickly founder, even before they tried to pry clients away from a company with Rotex's enviable reputation. Little wonder then, that their mantra appears to be assured stability rather than rapid growth.

Very often it is the flexibility and broad range of capabilities of a helicopter type that allow profitability. In the case of the K-Max it is the opposite; total specialization.





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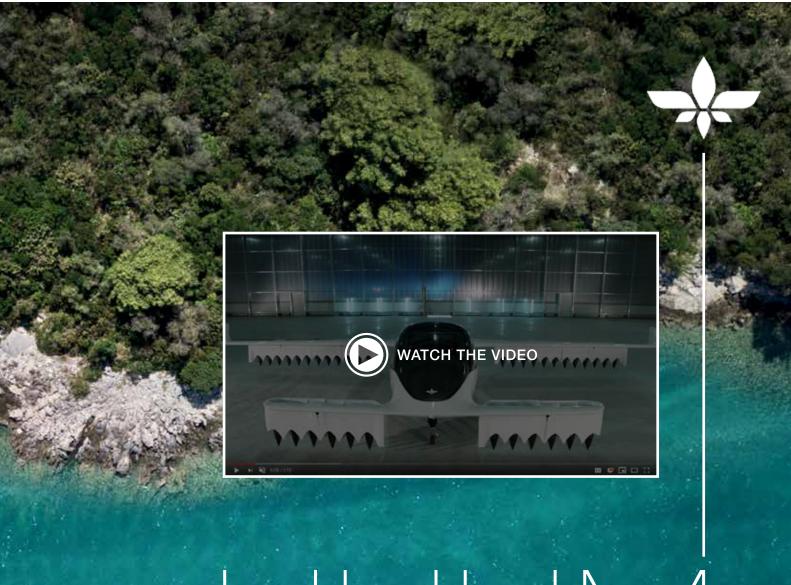
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### **BETS ON REGIONAL MOBILITY**

We paid a visit to Lilium's headquarters in Munich, Germany, to learn why the eVTOL air taxi developer is looking well beyond inner-city missions.

BY ELAN HEAD | IMAGES COURTESY OF LILIUM

Editor's note: This story originally appeared on eVTOL.com, a new online publication dedicated to the emergence of a new class of electric and hybrid electric VTOL aircraft. eVTOL.com is a sister publication to Skies and Vertical magazines, and is brought to you by MHM Publishing.



Before joining Lilium as head of flight test in 2017, Leandro Bigarella spent almost 16 years in the flight test department at Embraer, working on certification programs including the Phenom 300 business jet and the KC-390 military transport plane. That meant he had been involved with first flights before, but none of them quite as momentous as the one that took place on May 4, 2019, when the full-scale prototype of the Lilium Jet spun up its 36 electric ducted fans and lifted vertically into the air.

"The first flight was a remarkable day," Bigarella recalled. Unlike a

conventional airplane or helicopter — most new models of which are simply variations on well proven designs — the Lilium Jet was something completely new: "new concepts, new flight test approaches, new tests, new technologies," he said. To see it actually flying was "really intense. . . . Everybody was super excited and very proud, too."

When that first flight was revealed to the world two weeks later, it marked the re-emergence of the German company, which had been relatively quiet since debuting an early prototype of its electric vertical

takeoff and landing (eVTOL) aircraft in 2017. The urban air mobility industry has grown by leaps and bounds since then, and behind the scenes, Lilium has, too. Buoyed by \$100 million in investment, the company now employs more than 300 people at its headquarters near Munich, with another 150 positions currently open. Although Lilium doesn't expect to continue growing quite as aggressively as it has in the past year — when its team nearly tripled in size — "we still have to grow a lot," said CEO Daniel Wiegand.

Like many companies in the competitive and secretive eVTOL space, Lilium is still playing most of its cards close to the vest. Access to its aircraft and engineering facilities is tightly controlled, and the company has yet to pub-

licly disclose its latest flight testing progress (suffice to say, the Lilium Jet can do more than a tentative vertical take-off and landing).

In late August, however, Lilium hosted eVTOL.com at its Munich headquarters to discuss its approach to engineering and flight test and its vision for the future of the company. In contrast to many other eVTOL players, Lilium isn't focused on intra-urban missions, skeptical that the time savings for a short hop across town will justify taking an air taxi. Instead, the company is placing its bets on regional air mobility, looking at using the Lilium Jet to create cost-effective transportation links between cities, or from cities to the countryside.

"Taking the car for a 300-kilometer trip in many cases takes four hours, in some cases five or six hours if there's a mountain range in between — we can fly this in one hour," Wiegand said. "And equally taking a commercial aircraft typically also takes three to four hours for the whole trip. So the sweet spot is really below the commercial aircraft, but above the typical inner-city trip."



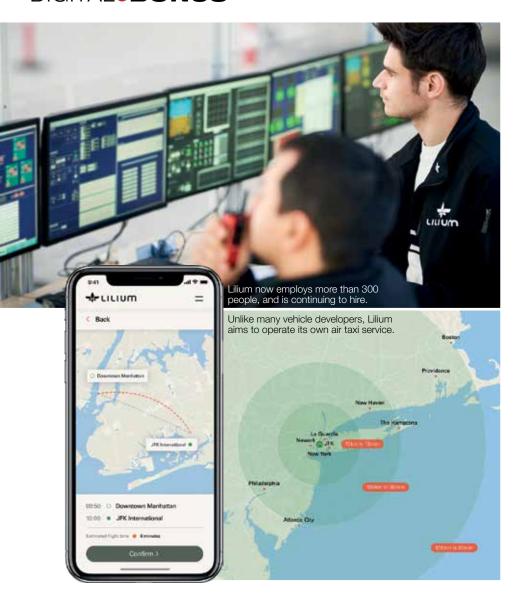
#### THE LILIUM JET FOR THE JOB

Achieving Lilium's ambitious performance targets for its five-seat, fully electric vehicle — a range of 300 kilometers (186 miles) at a speed of 300 km/h — is a tall order using today's battery technology. And the Lilium Jet's design has some vocal critics, notably Uber director of aviation engineering Mark Moore, who earlier this year contended that the aircraft has impractically high disc loading in a hover. Yet Lilium has shrugged off this criticism, previously telling eVTOL.com, "We're confident that the progress we're making 'behind the scenes' will enable us to deliver our stated goals and we look forward to proving that in due course."

The Lilium Jet is a fly-by-wire, vectored thrust aircraft that features 36 ducted fans distributed across its main wing and forward canard (Lilium describes these ducted fans as "jet engines" because they move air much as does a conventional jet engine, albeit using a different power source.) The ducted fans are divided evenly across 12 independently articulating flaps, with flight control achieved through



#### DIGITAL®BONUS



software that varies the position of individual flaps and RPM of individual fans. The current prototype is remotely piloted only, but a future version, which will undergo certification, will have a human pilot on board, and autonomous capabilities are targeted for some point in the future.

For Bigarella, the idea of designing a flight test program for this wholly novel aircraft was what attracted him to Lilium. "I heard about this new VTOL market coming and I said, wow, this is pretty challenging because it's something that no one has ever tested before from a flight test perspective," he said. "Lilium came to my attention because of the design, and they were quite advanced in terms of flight testing."

Bigarella said his biggest challenge "was to find the means of mixing both rotary-wing and fixed-wing disciplines into one single project." Not surprisingly, his flight test team — encompassing flight test and instrumentation engineers, test pilots, and maintenance technicians — reflects a mix of both fixed- and rotary-wing experience. One particular hurdle was finding test pilots who were proficient not only in airplanes and helicopters, but also with remote-controlled aircraft for the early testing phases. "This was something really different for us — planning flights with this kind of mindset," he said.

Despite the novelty of the aircraft configuration, Bigarella said

that Lilium has followed a fairly traditional. iterative approach to flight testing, starting with extensive flight simulation and systems testing on the ground prior to first flight. Now that the aircraft is flying, the flight test team is expanding the envelope gradually. "So it's starting to add some maneuvers - some turns on spots, some lateral displacement, some forward and backwards movement and then start exploring until we are able to fly the whole envelope [out to] 300 kilometers per hour," he said. While the focus of this testing phase is on aerodynamic and handling qualities, the team is also collecting data on battery discharge rates that will inform optimization activities at future stages of the program.

Bigarella remarked that he has been happily surprised by the stability of the aircraft, which has progressed well beyond its somewhat wobbly first flight.

"It's amazing how stable the aircraft is," he said. "[This is] something that caught our attention as flight test, because usually when you see this kind of new development [there are] some instabilities. . . . So the design is really something that is surprising us positively."

According to Wiegand, Lilium is designing the aircraft systems to transport category levels of reliability: a 10-9 likelihood of catastrophic failure, consistent with the European Union Safety Agency's recent Special Condition for Small-Category VTOL Aircraft. "It's pretty clear that if you want thousands, maybe hundreds of thousands of eVTOLs flying around at some point, you need to achieve a similar safety track record like commercial aviation does today," he said. "So we took the same approach which is standard in commercial aircraft, that you have no single point of failure on the whole plane. Be it on

the flight controls and fly-by-wire, on the actuators, on the engines, on the battery, the power circuits — everything [has redundancy]."

Additionally, Lilium has made the decision to install a ballistic parachute on the aircraft, despite the associated weight penalty. At 10-9 levels of reliability, "classic aviation says you don't need a parachute," Wiegand said. "But at the same time we can see there are still things against which we can't design . . . and for these cases, we want to have something on board that gives us a good night's sleep."

Another priority for Lilium's design team is noise, which has been perhaps the greatest obstacle to the wider use of helicopters in urban environments. Through careful attention to ducting and fan speeds, the company is engineering the Lilium Jet to be at or below the noise targets identified by Uber in its Elevate white paper — roughly one-fourth as loud as small helicopters, and significantly less annoving.

"I love the sound of jet engines and helicopters and all these things when I'm excited about the tech, but when I'm on a Sunday afternoon lying in my garden, it's different, right?" Wiegand said. "This is an area where Lilium is putting a lot of focus — to create something that is low noise enough so we can actually use this in a widespread way in communities, and bring this close to where we live."



#### **DIGITAL®BONUS**

#### A TRANSPORTATION SYSTEM FOR EVERYONE

Wiegand has always been passionate about aviation. He began flying gliders when he was 14, "so long before I was allowed to drive a car," he recalled. "And I was excited about everything that can fly. I had to have a parrot at home, took lots of slow motion movies from the bird to find out how it was staying in the air, how it was propelling forward, etc."

Wiegand studied aerospace engineering at the Technical University of Munich (TUM), with an emphasis on flight propulsion. In 2013, he was living in a shared flat in Glasgow, Scotland, when he began sketching the first designs for the aircraft that would eventually become the Lilium Jet. As he recounts it, after seeing what he was up to, his flatmate told him, "If you think this is technically feasible, you should found a company and do this" — and so he did, along with his TUM classmates Sebastian Born, Patrick Nathen, and Matthias Meiner. Today, \$100 million in investment later, the advice seems sound, but it was not an obviously wise idea at the time. Since those early days, the design of the Lilium Jet has undergone

remarkably few changes. "There was initially [around] 20 different concepts, but we evaluated [them] and converged quite early on the aircraft," Wiegand said. However, Lilium's concept of operations has evolved considerably. The original goal was to create an affordable two-seat vehicle for personal transportation, but the founders quickly realized that the limited market of private pilots wouldn't sustain the volumes necessary to drive down manufacturing costs. So instead, the company now plans to use the Lilium Jet as the basis for an air taxi service — one it will operate itself.

"I see the Lilium Jet very much in regional mobility, and by regional we are talking about things like inter-city, or city to countryside, or very large metropolitan areas with a diameter of maybe 100 kilometers or so," Wiegand said. Although the company has yet to announce its launch markets, he said Lilium is seeing interest from local governments around the globe (such as Miami-Dade County, Florida, whose mayor, Carlos Giménez, has disclosed "preliminary talks" with the company).

Wiegand said that Lilium is advocating an open system of VTOL



landing pads, similar to public roads or airports today. Under such a framework, any city could build VTOL landing pads for immediate connectivity with all of the other landing pads within range. "They can be served by any service that is compatible [with] these landing pads, so it could be a Lilium service; it could be some other service," he said. He believes this investment will be attractive to cities because it will connect them with neighboring municipalities "at a speed which is unique in history" — and at a fraction of the cost of ground infrastructure projects like highways and rail.

For similar reasons, Wiegand thinks the Lilium Jet could play a transformative role in emerging markets, too. In places like Africa,





Although this rendering shows what a dedicated Lilium skyport might look like, the company is also advocating an open system of VTOL landing pads, similar to public roads or airports today.



for example, there's "a huge need for infrastructure and transportation in general. And with an eVTOL solution like the Lilium Jet, they can basically leapfrog billions in investment and 20 years of waiting time for a high-speed rail network or for a highway network."

What will it take to persuade the rest of the world to embrace this vision? For Lilium, "our view on this is we should convince customers with facts," Wiegand said. "Our idea is we offer a solution to the world that is safe, that is robust, that is reliable, and does what we promise." He thinks that if the company delivers on those goals, early adopters will flock to the aircraft, followed eventually by more reluctant flyers.

Lilium's rollout will be correspondingly gradual. The company is aiming to be operational in several locations by 2025, likely launching with scheduled service along limited fixed routes. But Wiegand envisions a not-too-distant future in which "you can pick up your smartphone and say, OK, I need a flight from here to a city 200 kilometers away, and I'm getting that flight within three minutes or five minutes on the landing pad next door." Who wouldn't want to live in a world like that?



## ENGINEER, BUILD, FLY



Specializing in engineering designs for aircraft parts or repairs, **ICARUS Aero Inc.** is passionate about providing operators with products and services that are not otherwise available in the market.

**BY DAYNA FEDY** 

In the world of aviation, time is of the essence. The faster a helicopter component can be designed, modified or repaired, the faster the aircraft can get in the air. For this process to be as efficient as possible, a few key factors need to be in place. The proper equipment must be available, as well as a team of experts, and the ability to swiftly approve designs in accordance with national aviation authorities is also hugely important.

Based in the small Canadian town of Acton, Ontario, ICARUS Aero Inc. has all of these things, and more. Founded in 2013 by Ryan Hader, a Transport Canada design approval representative (DAR), ICARUS is a design approval organization (DAO) for Transport Canada, which Hader said gives the company the ability to "modify and design for anything with wings — whether it be rotor or fixed."

With a team of five design engineers, ICARUS provides the engineering drawing, design and certification — including supplemental type certificates (STCs) — for specialized aircraft products, modifications, repairs or installations.

"My interest has always been in aircraft as well as design . . . and I have always loved creating something from nothing," said Hader, who is a private pilot.

PHOTOS COURTESY OF ICARUS AERO INC.



"Growing up I had several jobs. . . . I was always thinking about trying to improve processes. And even when I was working for delegates doing certifications, I felt that I could potentially do things more seamlessly or offer different services that weren't necessarily being offered to the market."

Now, Hader believes he is fulfilling that goal every day.

ICARUS specializes in developing repair designs or modifications for aircraft, developing and certifying special mission products and kits, as well as producing airframe parts and components. And with its DAO status, the company has a significant advantage in its aerospace approval process, Hader said.

"I love seeing the end result and hearing about the successes of our customers," he added, "or where they have challenges that aren't being met, and where we can help."

### **DESIGN SPECIALISTS**

Although ICARUS has the ability to repair aircraft parts or components, the company focuses mainly on the engineering design aspect of repairs. Once the design work is complete, customers may opt to take the information and complete the repair themselves, which comes with the added benefit of saving money.

"We provide the engineering drawing, the design and the certification — being Transport Canada certifications — and then nine times out of 10, the customer has their own services to be able to accommodate the work, so they opt to do the repairs themselves," said Hader.

However, for customers who don't have such repair capabilities, ICARUS offers to send technicians out to a facility to complete the repair, or to have the part shipped to its facility where the repair can be accommodated.

While the engineering design division keeps the company busy, ICARUS's engineers also manufacture products and parts for the aviation market. The company uses the latest in 3D scanning and rapid prototyping technology to allow this part of the business to run as efficiently as possible.

Hader said the company operates a number of 3D printers in-house to assist in manufacturing products. But most of all, the 3D printers come in handy to create prototypes for customers quickly and cost-effectively.

"[The 3D printers] allow us to present a product to a customer largely before most competitors would be able to," he said. "And we use 3D scanning to allow us to scan contours and complex portions of an aircraft to make sure we get the fit and function correct."

Expanding on these capabilities, ICARUS also uses this technology, along with its engineering design skills, to create custom, sector-specific products that are not readily available to the market.

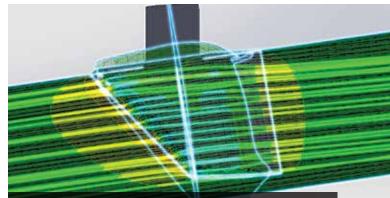
### FOR THE MISSION-SPECIFIC

Helicopters are workhorses used for many different jobs around the world every day. Many of these jobs require specific equipment in order to be done right — something Hader and his team understand well.

A large part of the company's business is engineering special mission systems for aircraft, as well as offering STC kits for aircraft modifications that allow such equipment to be installed.

"We have a number of search-and-rescue [SAR] products that we offer, a number of medical products, [and] military," said Hader. "And then over and above that, we provide a service for developing specific custom products. In many instances we have customers that have a need for something that no one else has any need for, and they have no way of getting it done. So, we fill that void."

In particular, ICARUS specializes in airborne surveillance equipment like multi-sensor turret cameras, searchlights, and moving map systems. If, for instance, a SAR operator had a need to mount a camera



The company's engineers are capable of developing repair designs or modifications for fixed- and rotary-wing aircraft.



Pictured is ICARUS's 3-axis computer numerical control (CNC) machine, which assists with production and manufacturing of airframe parts and components.



An ICARUS design engineer at work at













onto a helicopter, ICARUS's team would design the mount and the full structural modification provisions needed to do so. On top of that, the company would take care of ground and flight testing, as well as the STC for the mount.

As a Transport Canada DAO, ICARUS has affiliations with the Federal Aviation Administration and European Aviation Safety Agency offices, and in many cases, the company's STCs get familiarized by the latter two authorities, Hader told *Vertical*. This also allows the company to expand its customer base beyond Canada's borders. ICARUS currently works with customers in the Canadian Department of National Defence and U.S. Department of Defense markets, as well as large air medical and SAR operators in North America.

As far as modifications and aircraft types go, ICARUS has no limitations — which can also be attributed to its DAO status. The company has worked with all types of helicopters, but Hader said the most common are the Airbus AS350/H125/AS355, the Bell 206, the Leonardo AW139, and due to the company's work in the SAR and





military fields, the Sikorsky S-92 and UH-60 Black Hawk.

ICARUS offers numerous STC kits for various aircraft types, such as its STC kit for a forward mounted side arm for the provision of Wescam, FLIR or other camera systems on the AW139. However, Hader said the company's ability to "tailor products to very specific needs" is what sets it apart.

"We're close to the customers in that we are developing something for them specifically for their needs," he said. "And we are an all-in-one company. There are engineering competitors that offer just the drawings and just the certification. Whereas we then offer the full manufactured kit, and we'll offer installation services." He added that all modifications and installations are certified by a Transport Canada DAR.

### THE NEXT PHASE

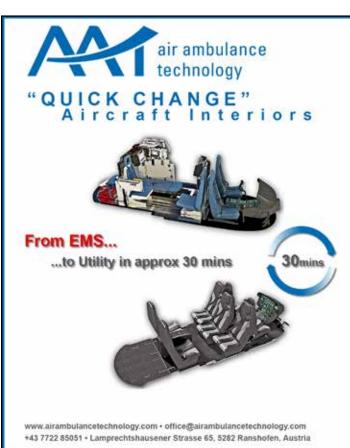
As ICARUS continues to gain traction in the industry, its need for additional hangar space has become more of a necessity. While it has been based in Acton since its inception, ICARUS is in the process of transitioning into a new, and larger home in Muskoka, Ontario — known by many Ontarians as "cottage country."

The company's new 5,000-square-foot hangar is based at Muskoka Airport, and is three times the size of its Acton facility. While Hader wants to keep the team at ICARUS relatively tight-knit, he foresees the need to bring additional experienced personnel onboard over the next few years due to the company's growth.

But as ICARUS moves forward, Hader is focused on maintaining the same goals he had when he started the company.

"The goal is always to market to customers that need a service that really isn't being offered," he said. "We really try to go above and beyond for our customers. Providing them with a solution, quickly, for products that they're trying to operate . . . and keeping their aircraft flying is what we do."

ICARUS has held the same mantra for the six years the company has been in operation: "Engineer, Build, Fly." And Hader and his team anticipate that mantra will live on at the company for many years to come.







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Pilots training with Leading Edge Aviation (LEA) at Bend Municipal Airport in Central Oregon have a good thing going. First, there's the unique topography of the Cascade Mountain range, and then there's the weather — more than 300 days of sunshine each year. This adds to the enjoyment of the high desert landscape, 10,000-foot (3,050-meter) mountains and changing seasons.

LEA trains pilots in a multitude of conditions across the region, and students utilize multiple airports every day. Within minutes of LEA's home base at the Bend airport, students are introduced to real-world landing sites on pinnacles, ridgelines, helipads and in confined areas with log decks. Beyond the airport's traffic pattern and practice areas, the surrounding landscape includes mountains, beaches, and plenty of challenging environments in which helicopters can operate and pilots can train. Not only does Bend have a great training environment, Central Oregon is well known for its great quality of life. Many pilots, mechanics, administrative staff and students who train there decide to make Bend their permanent home.

"Our staff members love what they do, and the Bend, Oregon, lifestyle makes for an unbeatable working, living and training

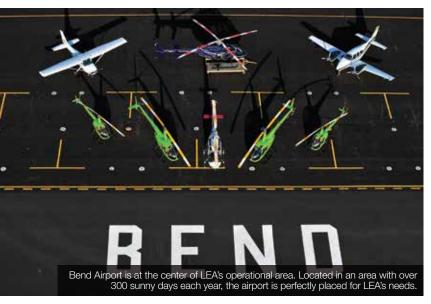
environment," Chris Jordan, director of operations and chief flight instructor at LEA, told *Vertical*. "The Cascade Mountains provide Central Oregon with a rain shadow effect, yielding plenty of sunny days throughout the year."

LEA started operations in 2005 with an avionics shop and just four employees. The company entered the Robinson overhaul market and later became a Robinson-certified sales, service and overhaul facility, before advancing to Robinson component overhauls.

After purchasing high-time Robinson R22 and R44 aircraft on the open market, LEA used the airframes' remaining flight hours for a flight school and, within a week of hiring its first flight instructor, had nine rotary-wing students. That quick success led to it hiring more instructors, purchasing additional aircraft, and expanding its maintenance division.

The synergy between avionics and maintenance departments, combined with the central Pacific Northwest location, provided opportunities to attract custom configuration work for specialized helicopter operations. In 2006, LEA acquired its Federal Aviation Administration (FAA) part 133 and 135 operating certificates,







completed the government carding process, and began flying call-when-needed firefighting contracts for state and federal agencies.

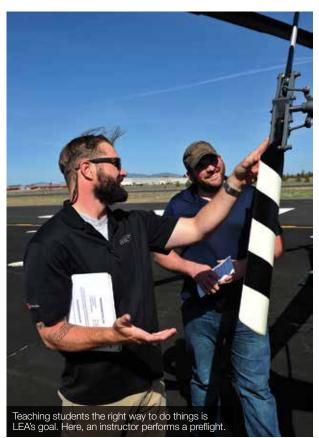
That same year, LEA partnered with Central Oregon Community College (COCC) to provide flight training for students in its aviation degree program. Enrollment climbed to a new high during the recession in 2008-2009 and then, when the post-9/11 Gl bill came into effect in 2009, enrollment doubled.

### **BUILDING A TRAINING PROGRAM**

Together, LEA's management team has more than 25,000 hours of flight time and decades of experience in the aviation industry. The company employees 85 people, operates 38 aircraft and multiple facilities, and holds FAA part 133, 135, 137, 141 and 145 certificates. Its pilots fly more than 18,000 hours annually, and its operations include helicopter and fixed-wing flight schools, and a maintenance and paint shop.

LEA's heliport currently offers 18 helipads for light helicopters and three for medium-to-heavy helicopters, and is used by transient and firefighting helicopters during the summer months. In addition, LEA plans to add a 15,600-square-foot (1,450-square-meter) helicopter-specific facility to the \$10 million state-of-the-art heliport at Bend airport, which was funded by the FAA.

The flight school fleet is composed of R22s and R44s, with the R22 being the primary training airframe for private, commercial, and certified flight instructor courses. Students



transition to the R44 for instrument and certified flight instructor instrument courses, and specialized training such as night vision goggle ratings. In addition, Bell 206 B and L-3 aircraft are used for turbine transition, long line and mountain flying courses.

The long line course is popular with new and seasoned pilots wanting to expand their marketable skills in the utility and firefighting sectors. Long line students choose between the R44 and 206 series to complete their training, and most reach a level of proficiency to pass a forest service check ride for cargo and Bambi bucket operations.

Students trained at LEA have graduated to fly with operators around the globe, in all sectors of the industry. However, they are encouraged to stay with LEA after their training is complete to build up their experience as flight instructors.

"We strive to prepare our students and instructors for successful careers in the helicopter industry," said Jordan. "We aren't a pilot mill turning out cookie-cutter pilots. We train professional aviators; that's our goal and that's what we do. For some students, the goal is to become a Leading Edge instructor, and then be promoted through the company ranks to become tour, charter, and fire pilots for us. After reaching a 1,000 hours PIC [pilot in command], LEA has placement opportunities for our instructors with operators from Alaska to New York to the Grand Canyon."

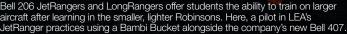
In addition to the busy training operation at Bend, LEA has been supplying aircraft to the aviation program at COCC for the past 12 years.

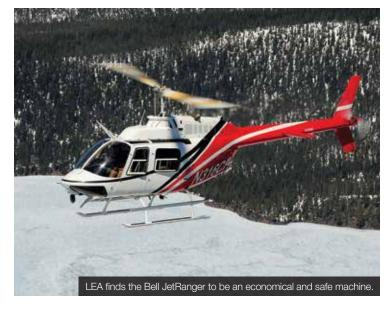


We strive to prepare our students and instructors for successful careers in the helicopter industry. We aren't a pilot mill turning out cookie-cutter pilots. We train professional aviators.













"The advantage of partnering with a college aviation degree program is evident in the individual performance and collective career success of our pilots," said Karl Baldessari, program director at the college. COCC provides aviation degree programs for both helicopter and fixed-wing pilots.

### **MORE THAN A FLIGHT SCHOOL**

Bend airport sits at a 3,460-foot (1,055-meter) field elevation — optimal high density altitude and mountain training conditions. The Cascade mountain range, with local altitudes up to 10,500 feet (3,200 meters), is a short flight away and provides excellent training conditions in summer and winter. However, the company's location also allows it to quickly react to call-when-needed contract and charter operations in Oregon, Washington, Idaho, Nevada, and California.

In addition to these operations, it also offers aerial tours, charters, aerial photography and filming, lidar, wildlife survey and long line operations, working with private and government sectors. A balanced fleet mix allows LEA's charter department to match customer needs with the appropriate aircraft, ensuring customers receive value for money.

For utility operations and light lift jobs (up to 800 pounds/360 kilograms),







LEA uses the R44 and 206B. For operations requiring lifts of over 1,000-pounds (450-kilograms), it offers the 206L-3 and Bell 407GX.

The company acquired the 407GX in 2019, specifically to meet the need for high performance Type III helicopters in aerial firefighting. The 206L-3 and Bell 407GX exceed U.S. Forest Service requirements for fire operations at 86 F (30 C) at 6,000 feet (1,830 meters) density altitude. In addition to firefighting, LEA uses the 407GX for executive transport, lifts and jobs requiring the airframe's level of performance.

In terms of aerial tourism, LEA also performs flights for Central Oregon tourism, a market that attracts about four million visitors annually. One of the company's more unique offerings was a solar eclipse viewing package, which saw 60 passengers flown to catered base camps in the high desert during the 2017 eclipse.

LEA's fixed-wing fleet consists of single-engine Cessna 172 Skyhawks, a Beechcraft Bonanza and a twin-engine Beechcraft Baron. The fixed-wing training program rounds out the flight school and provides "add-ons" if pilots want to diversify their resume.

"We utilize the Bonanza and Baron to do crew swaps and provide maintenance support to any of our aircraft while on out on contract," Jordan said. As a part 145 repair station, LEA employs 11 mechanics and providing a range of services from simple engine oil changes to full overhauls of Robinson helicopters. The company also works on piston, twin-engine, and turboprop aircraft, and specializes in the Bell 206B, 206L and 407, overhauling and configuring helicopters for government contracts. LEA is constantly seeking qualified airframe and powerplant mechanics to meet the needs of its growing operation.

"We utilize an aviation software system that interconnects maintenance with dispatch and back office functions," said Chad Eck, director of maintenance. "This ensures an efficient, reliable, and safe scheduling system for flight school internal maintenance, as well as external maintenance requirements."

The extensive in-house maintenance team gives LEA the ability to keep its fleet flying as much as possible, and with the highest possible standards.

### **SAFETY FOCUS**

There are inherent risks to training helicopter pilots, and LEA has











The flight school's night vision goggle training program prepares students for commercial missions that rely on these valuable tools.

worked to build a culture that maintains its reputation and commitment to safety, through risk mitigation.

"Creating this culture has led to better understanding at all levels, increased student production and reduced aircraft mechanical downtime," said Dan Bahlman, LEA's director of safety.

"LEA instills safety in all employees and students, whether they are an instructor pilot, mechanic, line service or customer service representative," he continued. "Everyone plays a role in reporting hazards around the aircraft and flight line and developing solutions to mitigate those hazards. This might be as simple as picking up foreign objects on the flight line to making sure anything tied down is untied before a flight."

An annual "safety stand-down day" restarts the clock on safety at the beginning of each year. All employees attend this off-site event, which focuses on lessons learned during the previous year, and serves to prepare staff for safety challenges in the coming

year. Sessions focus on helicopter and fixed-wing safety, with notable guest speakers. The famous helicopter aerobatics pilot Chuck Aaron was a guest at last year's event.

Looking ahead, Brad Fraley, LEA's president, said the company is focused on steady growth, with the new facility and heliport as its immediate focus. "At all times, hiring the very best talent in the industry is a strategic goal and [the] best for LEA," he said. "[We aim] to align with strategic partners to advance our company, its employees, and our students for successful careers in all aspects of aviation."



**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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written by Bob Petite



# AN ORIGINAL MYSTERY



Some believe a Bell Model 47 in a private collection in Cohocton, New York, could be the first registered commercial helicopter. We look at the mystery surrounding NC-1H.

During the 1970s, an early pre-production Bell Model 47 helicopter showed up at Larry Camphaug's Viking Helicopters facilities near Ottawa, Ontario. Those who discovered it believed it to be the legendary Model 47 "NC-1H" — which represented the first registration number for the world's first commercial helicopter. There are still those today who believe that it is. The true fate of this momentous aircraft, however, remains something of a mystery — one that has its roots at the type's launch almost 30 years earlier.

In late 1945, the Bell Aircraft Corporation in Niagara Falls, New York, had become the first company to manufacture and produce a commercial helicopter for the new rotary-wing industry that was expected to revolutionize transport.

The very first Model 47 (ship 1) left the production line in December 1945. The aircraft's designer, Arthur M. Young, became the first person to fly it on Dec. 27, followed by Bell pilot Floyd Carlson the following day. Carlson oversaw the testing of ship 1 throughout the flight testing and certification program.

Company president Larry Bell authorized the manufacture of another 10 pre-production Model 47s to be built by mid-June 1946. The aircraft were to be used for research and development, marketing applications, pilot training, and demonstration flights.

"No two of the first 10 Bell 47s were anything like each other," recalled Bell engineer Bart Kelley, in a Bell public affairs booklet. Bell originally planned to manufacture 500 Model 47s for commercial use once the type certificate was received from the Civil

Aeronautics Administration (CAA). Ship 1 became NC-1H when it was licensed by the CAA on March 8, 1946. A month later, the

CAA approved the Bell 47's type certificate (H-1).



As with many new aircraft, there were accidents as the new type built air time. On April 3, 1946, NC-1H was involved in a training flight accident following a mechanical failure in the main rotor hub. Bell instructor Ed Hensley and student Gerald "Jay" Demming were injured in the crash, and the aircraft was scrapped, with damaged parts returned to the engineering department for structural analysis and metal fatigue testing. (The original data plate for ship 1 was saved and is on display at the Bell plant in Hurst, Texas)

Carlson suggested to Larry Bell that another of the Bell 47s be re-designated as NC-1H, so the company could continue with its marketing program, which was based around having the first commercially certified helicopter. Bell approved the idea, and ship 11 was selected as the new NC-1H. The CAA approved the switch on June 14, 1946. Over the following years, this helicopter was used experimentally, in demonstrations, and for pilot training.

### **BUILDING A TRAINING PROGRAM**

Not long after NC-1H was certified, Bell had started a pilot flight training and mechanics school at the Wheatfield Plant in Niagara Falls. Steven Yuhasz, a mechanic and flight engineer for over 44 years at Bell, was one of the first instructors in the mechanics school.

"[NC-1H] was used a lot in the helicopter pilot training school, and we were ordered to keep it in pristine condition, as we had a lot of VIPs, military, CAA, and foreign visitors who wanted their pictures next to [it]," said Yuhasz.

Another Bell 47 was assembled from spare parts to be used to teach blade tracking, flight control rigging, and electrical and fuel

system troubleshooting. The aircraft never flew, but it was complete and could be started. A further aircraft was built for training, using a complete center frame on landing gear, with an engine, transmission, mast and cabin.

Around 1950, the Bell Aircraft pilot and mechanic school upgraded to the latest Model 47D. All the Bell 47 spare parts, un-airworthy parts, cutaways, and small mockups were gathered and given to a local high school for its aviation training program; while the full Bell 47 mockup and the center frame on wheels, along with additional spare parts, were boxed up for shipping to an aviation school in Canada.

The destination of the latter remains a mystery, as there is no evidence that the helicopter went to an aviation school or a commercial company. In 1950, there were only a few Bell 47s flying in Canada — with Okanagan Helicopters in British Columbia, Ontario Hydro and De Havilland Canada in Ontario, and Associated Helicopters in Alberta.

Around the same time, Bell decided to permanently retire NC-1H, sending a letter to the CAA requesting the registration be cancelled. Larry Bell planned to donate it to the National Air and Space Museum of the Smithsonian Institution in Washington, D.C., and over several months it was completely upgraded and repainted for future display.

On April 8, 1951, a Bell pilot flew the restored helicopter on an unauthorized flight, which culminated in it crashing near Lake Ontario. The aircraft was destroyed. Larry Bell was furious, and had mechanics Ernie Panepinto, Ray Myers and Steven Yuhasz remove the helicopter from the crash site and secretly hide the remains in the old paint hangar. No one was to say a word.



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It was then cut up and scrapped into small pieces, and hauled to a company-approved scrapyard nearby. The wheels, instrument panel, radio and a control stick were the only pieces salvaged. The data plate for the ship was removed by Myers, who etched on the back of it "Crashed 04-08-51" along with his initials, "RM." He kept the data plate in his toolbox for many years, and in 2001, the Meyers family gave it to the Niagara Aerospace Museum in Niagara Falls, New York.

### A HAPPY DISCOVERY

During the mid-1970s, several Viking Helicopters employees happened upon the remains of an early Bell 47 helicopter in a junkyard in Pennsylvania. There was a tag identifying it as NC-1H, serial number 11. The helicopter was not in very good shape, but, believing they had stumbled across an historically important helicopter, the employees purchased the aircraft and hauled it across the border to Ottawa. They planned to refurbish the helicopter.

Journalist and helicopter historian Kenneth Swartz became aware of the Viking Bell Model 47 from an article he read in the late 1970s. He asked about it at the Bell Helicopter office in downtown Ottawa, and found out that Bell had tried and failed to determine if the helicopter was NC-1H, serial 11.

Unfortunately, the Viking Helicopters hangar was later destroyed in a fire, resulting in the disappearance of the major clue — the tag that appeared to show the aircraft was NC-1H. Luckily, the Bell 47 was not in the hangar at the time.

Viking later entered bankruptcy, and its early-model Bell 47 assets ultimately ended up with Dennis Clarcq of D.C. Helicopters in Cohocton, New York. There were no records or data plate with the helicopter sale, but Clarcq believed it was NC-1H. Through his lawyer, Clarcq attempted to piece together the chain of title from Bell to Viking, but was unsuccessful. The lawyer also contacted Bell in Texas about early records on the pre-production Model 47 helicopters, but the records were no longer available. Despite this, on Jan. 25, 1990, Clarcq's Bell 47 was registered by the Federal Aviation Administration (FAA) as N1HQ, serial number 11.

Canadian G.S. (Mac) Maguire, a helicopter engineer/mechanic,

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had worked for Viking during the time it owned the early Bell 47. He kept a photocopy of the aircraft's tag — but all it said was "NC-1H Bell 47 No. 11." According to Ned Gilliand Jr., a Bell production test pilot and helicopter historian in Texas, the photocopy does not show a true data plate, as official data plates don't show an aircraft's "N" number — just the manufacturer's model number, the manufacturer's serial number, type certificate number and possibly, the customer's model number, customer's serial number, and contract number.

In May 2004, Gilliand conducted a telephone interview with early Bell mechanic Yuhasz, and they discussed the fate of NC-1H, serial 11.

"I do not know how anyone can claim that they have the real ship number 11, NC-1H, as it was scrapped," Yuhasz told him. "I saw Ray Myers put the data plate . . . in his pocket, after it was removed and handed to him."

He added that a photo taken of the Viking Bell 47 certainly looked like one of the early pre-production helicopters, and may have been the complete unit built for the mechanic school, or a composite of the various parts and mockups sent to Canada. "[But] the mockups never had data plates or serial numbers assigned to them," he said.

Today, the mystery aircraft still resides at Clarcq's private

museum in Cohocton. There are a lot of questions about this Model 47 that we may never have answered, simply due to the amount of time that has now passed since the type's formative days, and the lack of surviving documentation. Is it the "real" NC-1H, ship 11? If not, is it the mockup that came to Canada in the early 1950s? If so, how did it end up in a junkyard in Pennsylvania? Who made the tag found on it?

After many years of following this aircraft's story and much diligent research, I believe there's a good chance the Bell 47 in Cohocton is the original full size mock-up built for the mechanics' training school in 1946. If anyone can bring new insight into the mystery, I'd be happy to hear from them!

Of all the original 11 pre-production Bell Model 47 helicopters manufactured by the Bell Aircraft Company, only one is certain to have survived the test of time: Model 47, ship 5 (NC-3H) is on display at the Niagara Aerospace Museum.



**Bob Petite** | Bob is a member of the Twirly Birds, The Vertical Flight Society, the Canadian Aviation Historical Society, the American Aviation Historical Society and the Bell 47 Helicopter Association, Inc. He is the author of *The Bell 47 Helicopter Story*.

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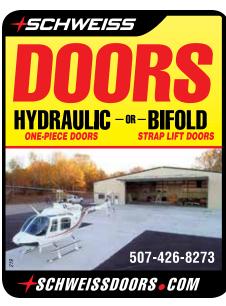
















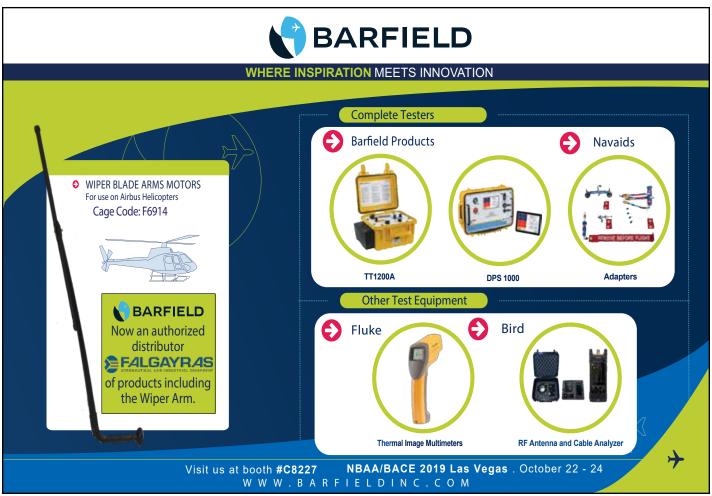






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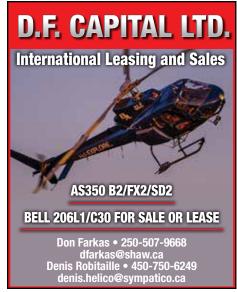


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### IN HOLLYWOOD'S SHADOW

### THERE I WAS... // DORCEY WINGO

When I learned that "Hollywood" would be relieving me on my Onion Creek logging shift, I did my best to up my production so I wouldn't look bad after he pulled his 14-day hitch. Paul "Hollywood" Bryant was the company's premier Huey logging pilot, based on weight averages and customer reviews. During job briefings in his warm new Chevy pickup, Bryant always made heli-logging sound simple — child's play.

"These logs weigh around 1,700 pounds, so take a couple of 'em. Might have to 'rip and tear' 'em out of the slash." He paused to turn up a Seal CD playing in his dash. With long hair to his shoulders, Bryant was a handsome pilot. "Too light to haul just one, too heavy to haul three. Eight flight hours a day. Have fun!"

Bryant had been around. His father owned a bowling alley in the big city, and Bryant could bowl like a pro. But he somehow got interested in driving big rigs, which lead to log trucks. Then came helicopter logging, and his long hauls to and from the mountains gave him the helicopter itch. Bryant decided that choppers had to be more fun. Cashing in his trucking enterprise, he signed up for flight training and never looked back.

The thing about Hollywood was he was a natural. A quick study, he learned to fly in a snap, impressing everyone that came into contact with him. Moving up the ladder, he made long-lining a balky remote hook look effortless - he was one of those guys.

Before long, Bryant was flying logs all around the northwest, making his hardworking hookers happy with his amazing hook shots and easygoing manner. Having a cold case of beer waiting for them at the end of the workday that was Bryant's signature.

So everywhere I flew, I was in Hollywood's shadow, like it or not. I began preparing those around me: my talented replacement was going to make me look like an amateur. They scoffed at the idea.

These loggers hadn't experienced the exhilaration of seeing Hollywood come thundering into view 200 feet overhead, stopping on a dime. His heavy steel remote hook would quickly sail into the picture as though it had eyes, coming to an abrupt stop, two feet in front of your nose. This pilot had the eyes of an eagle and the hands of a surgeon.

One of our impoverished landing rats was trying to put the make on me in front of her jealous boyfriend during this cycle. I assured her she should save her love for Hollywood. He was single - me, not so much. Her eyes lit up

when I mentioned Bryant's new Chevy pickup. Her former suitor frowned, fidgeted.

As for my helicopter mechanic... I did my best. He was green. New to heli-logging, he had recently taken a crash-course in Huey maintenance. Fortunately, he brought a good attitude to work every day I was there.

To help out my mechanic, I went as easy as I could on his Huey and flew it back to "service" in one piece every night. From there, the mechanic would refuel and slave on his machine for hours, stopping only to consume the dinner I cooked for us on the BBQ grill. He really appreciated my old-fashioned cooking.

Then I went on break. It was two weeks before I rejoined the crew on a burn-salvage timber sale near Omak, Washington. The mechanic on duty was from our outfit's home base, filling in for my previous mechanic. Apparently, mechanic "A" did not take well to Hollywood or his flying style, coming to the conclusion that his pilot was a showboat who cared more for the landing-rat lady than his helicopter.

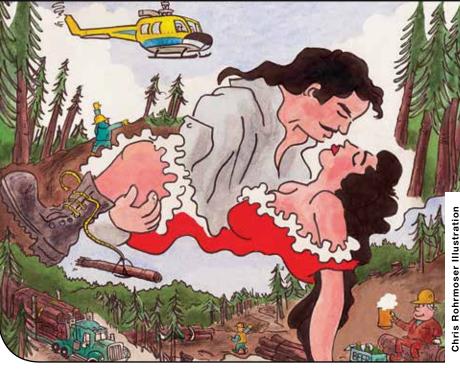
Bryant didn't make his mechanic dinner, either. And he didn't always let him know when the ship was coming in to refuel, often catching the mechanic off-guard. Observing Hollywood's heavy-handed style of ripping jack-strawed logs out of heavy slash, frustrations grew.

When the last day of logging came around, the landing-rat lady had her bags packed, ready to leave that night with Hollywood. Her jilted boyfriend gave her the traditional logger's hate-message, a dusty pair of corked work boots, maliciously thrown in her direction.

The last straw for mechanic "A" was when he climbed atop the Jet-A tanker and opened the inspection hatch to check his fuel level. Hollywood radioed him about that time, advising that the Huey was inbound for fuel.

Not having the hands of a surgeon, the mechanic picked up the radio to respond, only to fumble that expensive multi-channel King FM into the open manway, where it was warmly received by the fancy kerosene therein. It's hard to participate in a logging show if you don't have a radio, so he quit.

Bryant went on to log in western Montana. His luck ran out early one warm June morning in 2003, when he was hauling his fifth turn of the day. A component in his tail rotor failed, sending him crashing into tall, unforgiving timber. Word quickly spread throughout the northwest that fateful day; Hollywood had pulled his last turn. Logging not far away, I was crushed to learn of his demise. Though I may have been luckier in love, I knew that if I lived to be a hundred, I would never be the logging pilot Paul Bryant was. 🚱





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