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Editor's Notebook

2012 Review: Future Vertical Lift Forges Ahead



aparker@accessintel.com

By Andrew Parker, Editor-In-Chief

It's that time of year again where *Rotor & Wing* looks back at the year's events and tries to find some logic to apply to the future. As part of that effort, here is a summary of some of the most interesting stories that I came across during 2012, in no particular order.

The future took center stage during the AHS Forum in May, as CEOs from the major manufacturers led a lively discussion about what it will take for the U.S. military's Future Vertical Lift (FVL) initiative to succeed and how new entrants to the commercial marketplace will change global dynamics moving forward (see "Innovation, Collaboration Essential to Future Success," June issue, page 32). The CEO panel followed a presentation from U.S. Army Maj. Gen. Tim Crosby, who told a group of engineers that a "marriage" between S&T and program management is needed to advance FVL. An unexpected story developed during AHS—the retirement of Sikorsky President Jeff Pino (June issue, page 13).

Other articles that focused on Future Vertical Lift include "Investing in the Future," May issue page 26, "FVL: Have Plan, Need Money," in the July *Military Insider* on page M8, "Science & Technology Roadmap: Q&A with Bill Lewis," on page M12, and "Q&A with Army Aviation PEO Tim Crosby," on page 54 of the July issue.

While *Rotor & Wing* continues to expand its coverage of R&D topics with the 2012 launch of R&D Report, science and technology was just one of many areas that we focused on during 2012. In June we launched *Helicopter Safety & Training*, a monthly e-letter specifically focused on training and how operators are improving their SMS programs. This adds to the stable

of *Rotor & Wing* newsletters, joining *The Collective*, our weekly offering, and the monthly *Military Insider* and *Hot Products*.

Of course a large share of highlights from the past year happened in February during Heli-Expo, which saw the debuts of the Bell 525 Relentless and Eurocopter EC130T2 (see March issue, page 12) as well as the finalization of AgustaWestland's purchase of Bell Helicopter's stake in the BA609 (now AW609) tiltrotor (see March, page 13). The industry's largest tradeshow also saw Sikorsky and CTI open a new whirl tower (March, page 17); Honeywell forecast an increase in the Asian and Latin American markets (March, page 18); and Russian Helicopters teaming with IHST (March, page 26).

During Heli-Expo, Honeywell offered the chance to experience its Sentinel and Observer displays in the air aboard the company's Eurocopter AS350BA. Senior test pilot Ronald Wayman took me up to display the functions of the system during a Feb. 11 test flight (see "Dallas from 500 Feet," April issue, page 4).

Another event that stands out was Quad-A in April, where MD Helicopters CEO Lynn Tilton announced the MD540F for the U.S. Army's AAS competition (see May issue, page 13), EADS enhanced its AAS-72X (May, page 13), and Army leaders focused on Aim Point 2030 (May, page 12).

The Armed Aerial Scout voluntary flight demonstrations (VFDs) grabbed the headlines during the late part of 2012 (see story on page 18), with a number of manufacturers taking part, including AgustaWestland, Bell, Boeing, EADS/Eurocopter and MD. Sikorsky didn't have a flying prototype available, but is offering its S-97

Raider for the OH-58D replacement program (should the Army decide to move forward with a formal competition following the VFDs).

One of my favorite experiences from this year was getting a chance to see the Eurocopter X3 (X-cubed) firsthand at Manassas Regional Airport on July 24 during the experimental aircraft's U.S. demo tour (see September issue, page 4). It gave me the opportunity to talk with the test pilots while walking around the aircraft that one of my non-aviation friends described as "the Nike of helicopters," a month after Editor-at-Large Ernie Stephens became the second person in the U.S. outside company engineers to fly the X3 (see August issue cover story, "Pilot Report: Eurocopter X3" on page 26).

Another recent highlight was travelling in October to Sikorsky's Coatesville plant, where the production of the S-92 and S-76D takes place. There I had a chance to tour the facility (see "FAA Certifies S-76D; Bond S-92 Completions Begin," November issue, page 12) and meet with the new CEO of Bond Aviation Group, Richard Mintern, who was there to inspect the first two S-92s that are part of a 16-ship order.

These are just a few of the biggest stories of 2012, there are many more online that didn't make it to print. Check out our Product Review starting on page 26 and Year in Review section on page 32 for more, and look for additional stories and in-depth analysis at www.rotorandwing.com.

What are your favorite stories from 2012? What is your organization's outlook heading into 2013? Please send your comments to aparker@accessintel.com



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(Above) Beijing Public Service Bureau AgustaWestland AW139. (Below) Mercedes Benz-style Eurocopter EC145. (Right) Boeing AH-64D Apache at the Dubai Helishow. Photo by Douglas Nelms

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Wrap-up of various new product offerings and announcements that ran in the pages of *Rotor & Wing* during 2012.
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Who responds to a major maritime emergency on the edge of a wind farm? *Rotor & Wing's* Military Editor observed one of the largest European offshore exercises in 2012. *By Andrew Drwiega*
- 42 ■ Training News**
FAA certifies CAE Bell 412 sim to Level D. Bristow Target Zero earns Flight Safety recognition. AeroSimulators expands in Brazil.

On the Cover: EADS North America AAS-72X over the mountains of Colorado during the Armed Aerial Scout voluntary flight demonstrations for the U.S. Army. *Photo courtesy EADS North America*

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WHAT DO THE EXPERTS THINK?

- Ask questions to three experts on the topics of helicopter aerodynamics, AS9100 quality management systems audits and night vision goggle (NVG) certification at rotorandwing.com. Che Masters, certification engineer for NSF-ISR, discusses aerospace quality registration. Frank Lombardi, test and evaluation pilot, provides insights about the science behind helicopter flight. NVG certification expert Jessie Kearby fields questions about NVGs for both military and commercial uses.

DIRECT TO YOUR DESKTOP: CHECK YOUR E-MAIL

DECEMBER 1:

- Digital edition of *Rotor & Wing* December 2012. Electronic version with enhanced web links makes navigating through the pages of *Rotor & Wing* easier than ever.

WEEK OF DECEMBER 17:

- *Rotor & Wing's* Military Insider e-letter. Get the latest updates from helicopter defense companies around the world, from Military Editor Andrew Drwiega.

WEEK OF DECEMBER 24:

- HOT PRODUCTS for Helicopter Operators—Latest in equipment upgrades, performance modifications, training devices and other tools for the rotorcraft industry.

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Feedback

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Photo courtesy Roger Huffaker

World Trade Center Photo

We received the following comments to this 1979 photo of a Bell 222 from Roger Huffaker on the R&W Facebook page: [facebook.com/rotorandwing](https://www.facebook.com/rotorandwing)

That picture is amazing!!!

Doy Lee

Awesome paint scheme.

Shannon Harding

Miss 'em a lot with all my heart.

Ricardo Aguado

Super helicopters ... up to today still.

Hugo du Toit

Who's Likely to Win AAS?

We received the following responses to a hypothetical question about which company is most likely to win the U.S. Army's Armed Aerial Scout competition, should the Army move forward following the voluntary flight demonstration (VFD).

With the high level of interoperability, interchangeable avionics, and the fact that it uses Longbow software, the Army would do well to go with Boeing's AH-6i.

Joe Belsha

Bell, Boeing or EADS, because the a/c their concepts are based on are already in service. Makes the logistics side a lot easier. Bell & EADS have the upper

R&W's Question of the Month

Should the U.S. Army decide to launch a formal AAS competition following the voluntary flight demos, which company is most likely to win it?

Let us know, and look for your and others' responses in a future issue. You'll find contact information below.

hand as both of their aircraft are larger, twin engine and bigger fuel tanks for longer range/endurance. I'd have to give it to EADS as its a newer design and new build airframe (as opposed to the recapitalized ones from Bell) that could double as a shooter/trash hauler if need be (if all that space in the rear isn't taken with avionics).

S. Robert Sliger II

Bring back the Comanche. Tested, verified, qualified. Save some tax dollars with a proven ready-to-go aircraft. Instead of throwing money away like the Blue Suit's and the C-27J.

James M. Stanco

Sikorsky X2!

Doug Warwick

AgustaWestland or EADS

Lee Waller

Robinson... LOL. Depends more politically then the design, interoperability and performance. I wish they would leave it to the pilots and keep it U.S. made, and apply some common sense to the criteria and performance.

Nick Mancuso

Competition with current aircraft or is this a competition for new manufacturing? I give it to EADS currently. Otherwise I have to say MD knows how to build a pretty good scout.

Blake R. Malo

None. UAS teaming with AH64D Block 3 makes the AAS concept obsolete.

Cody SS Jackson

Kinda like the Comanche project... But different this time?

Tim Reynolds

Sikorsky.

Josh McWilliams

They need to get whatever they pick out of the FAA's grasp and not require an A&P on whatever they pick next. I personally know its a nightmare.

Andy Sutton

The winner will be whoever can make a helicopter the cheapest, underpowered, and most uncomfortable for pilots.

Felick Vallot

Ford!

Roderick Bertrand

Do you have comments on the rotorcraft industry or recent articles and viewpoints we've published? Send them to Editor, Rotor & Wing, 4 Choke Cherry Road, Second Floor, Rockville, Md. 20850, USA, fax us at 1-301-354-1809 or e-mail us at rotorandwing@accessintel.com. Please include a city and state or province with your name and ratings. We reserve the right to edit all submitted material.

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Meet the Contributors

KEITH CIANFRANI is a retired U.S. Army lieutenant colonel, master aviator and Army instructor pilot, rated in both helicopters and fixed-wing aircraft. He holds a master's degree in aerospace safety from Embry-Riddle Aeronautical University. Keith is a certificated flight instructor and has flown commercial aircraft for more than 20 years in and around the New York City area.



FRANK LOMBARDI, an ATP with both fixed-wing and rotary-wing ratings, began his flying career in 1991 after graduating with a bachelor's of science in aerospace engineering, working on various airplane and helicopter programs as a flight test engineer for Grumman Aerospace Corp. Frank became a police officer for a major East Coast police department in 1995, and has been flying helicopters in the department's aviation section since 2000. He remains active in test and evaluation, and holds a master's degree in aviation systems-flight testing from the University of Tennessee Space Institute.



ANDREW DRWIEGA, Military Editor, is a senior defense journalist with a particular focus on international military rotorcraft. He has reported on attachment from Iraq three times (the latest of which was with a U.S. Marine Corps MV-22 squadron), and three times with British forces in Afghanistan (Kandahar and Camp Bastion), as well as from numerous exercises. He has flown in a wide variety of rotorcraft including the MV-22B Osprey, AH-64D Apache, Rooivalk and many others.



DOUGLAS NELMS has more than 30 years of experience as an aviation journalist and currently works as a freelance writer. He has served as managing editor of *Rotor & Wing*. A former U.S. Army helicopter pilot, Nelms specializes in writing about helicopters.



THIERRY DUBOIS is a long-time contributor to Access Intelligence publications. He has been an aerospace journalist for 12 years, specializing in helicopters since 2006. He writes on technical subjects, both for professional media and a popular science magazine in France. Follow him on Twitter: [@aerodub](https://twitter.com/aerodub)



ERNIE STEPHENS, Editor-at-Large, began flying in the 1980s, earning his commercial pilot's license and starting an aerial photography company as a sideline. In his regular job as a county police officer, he was transferred to the department's newly established aviation unit, where he served as the sergeant in charge and chief pilot until his retirement in 2006. In addition to regular contributions in the pages of *Rotor & Wing*, Ernie (aka "Werewolf") has written for Access Intelligence sister publication *Avionics Magazine*, www.aviationtoday.com/av. He enjoys meeting our readers and flying a variety of helicopters.



PAT GRAY is our "Offshore Notebook" contributor, having flown in Gulf of Mexico helicopter operations for 20-plus years. Prior to that, he was in Vietnam in 1958 as a young paratrooper. He retired from the Army Reserve as a chief warrant officer 4, with more than 30 years active and reserve service. Gray's civil helicopter experience covers crop dusting and Alaska bush, corporate, pipeline and offshore flying.



EMMA KELLY has been an aviation journalist since the late 1980s, starting her career with *Air Cargo News International*. Following a number of years working on regional airline publications and for Inmarsat, Emma served in various editor roles at *Flight International*. In 2003 Emma emigrated to Australia and became a freelance aviation journalist where she contributes regularly to aviation and defense publications around the world.



TERRY TERRELL gained his early aviation experience as a U.S. Navy fixed-wing instructor and U.S. Coast Guard aircraft commander, where his service included SAR in Sikorsky S-61s. Terry served as a cross-qualified captain and safety special projects officer with Houston's Transco Energy, and later with Atlanta's Kennestone AVSTAT Helicopter Ambulance Program and Georgia Baptist LifeFlight. ✈





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■ MILITARY | PROCUREMENT

U.S. Army Continues UH-72A Acquisition Program with 34 Lakotas in FY13

In line with the Department of the Army's FY13 budget of \$271,683 million for the ongoing delivery of the UH-72A Lakota program, EADS North America has confirmed a contract award of \$181.8 million for a further 34 helicopters. These will be delivered from September 2013 and will mean a total contract award of 312 Lakotas out of a total of 347 planned up to 2016.

Currently around five aircraft per month are produced from the American Eurocopter plant in Columbus, Miss. EADS North America suggests that the same facility would be used to build its AAS-72X for the Armed

Aerial Scout acquisition, should its future bid be successful.

Twenty-four of the aircraft built under this latest contract award will receive the security and support (S&S) battalion mission equipment package (MEP). Aircraft so equipped will be earmarked for missions ranging from disaster response to border security. The MEP includes a moving map, EO/IR sensor, digital video recording capability, digital and analog downlink and a searchlight. The UH-72A is a militarized version of Eurocopter's EC145 and provides the Army with organic support at Corp and Divisional levels. It replaces UH-1 and OH-58 helicopters. —By Andrew Drwiega



EADS North America UH-72A in flight. The Army has ordered another 34 UH-72As.

■ COMMERCIAL | AIRFRAMES

Russian Helicopters Advances 'High-Speed' Project

Moscow-based Russian Helicopters has unveiled more details on its Russian Advanced Commercial Helicopter (Rachel). The Rachel program is meant as an eventual replacement for the Mi-8/17 family. The "high-speed" medium twin will be capable of 194 knots, thanks to "streamlined main rotor blades and fuselage." At 10 to 12 metric tons (22,000 to 26,400 pounds), it will have a seating capacity of 21 to 24 passengers. Also dubbed V-37, Rachel has a conventional configuration with one main rotor and one tail rotor. In the baseline configuration, it will have a convertible passenger/cargo cabin. It will use new—but so far unspecified—turboshaft engines.

Mil, which is part of Russian Helicopters, plans to build a flying testbed in 2013 to assess technologies pitched for the V-37. The results of these tests should be analyzed by 2014. The next phase will be supplier selection. Certification is then slated for 2018, with deliveries to follow in 2020.

The target cruise speed, not as high as the 220-250 knots Eurocopter and Sikorsky are talking about with their respective X3 and X2 demonstrators, was defined after some market analysis.

This enabled the manufacturer to define the future model's technical priorities and specifications. Russian Helicopters also ran a feasibility and risk-assessment study.

Mil and Kamov design bureaus in 2011 and 2012 competed in a contest for the best conceptual design of a high-speed helicopter. The Mil design was found to "better reflect the demands of the market." —By Thierry Dubois

■ PUBLIC SERVICE | EMS

AgustaWestland AW119Kx Sees Debut at Air Medical Conference

In front of attendees at the Air Medical Transport Conference in Seattle, AgustaWestland CEO Bruno Spagnolini celebrated the delivery of the first AW119Kx helicopter to Life Flight Network. The single-engine turbine, an upgraded version of the AW119Ke Koala, is one of 15 ordered by the Aurora, Ore.-based operation for emergency medical transport missions in the western U.S. Life Flight Network's current fleet—which is operated by Air Methods—includes nine Eurocopter AS350B3 AStars, one EC135, one AW109E and one Bell 206.

The new model “differs from the [AW119Ke] due to the newer avionics system that we are installing,” explained Spagnolini. “We are installing a Garmin G1000H avionics system... This is something that will improve the aircraft’s capabilities, will improve the situational awareness of the pilot, [and] will assist in the navigation tasks for the pilot.” He added that plans call for the AW119Kx to retain all of the other basic qualities of the AW119Ke. —*By Ernie Stephens, Editor-at-Large* 📧



The first AgustaWestland AW119Kx has entered service with Life Flight Network, which is based in Aurora, Ore.

■ COMMERCIAL | AIRFRAMES

Sikorsky Sells First S-76D, More S-92s into China

The China Airshow, which ran from November 13-18, has been good for Sikorsky in that it has been announcing contracts for its civil helicopters, namely the S-92 and S-76D.

The Zhuhai Helicopter Company (ZHC), a subsidiary of China Southern Airlines, has acquired two Sikorsky S-92s to be used in offshore operations. ZHC will operate five S-92s and 12 S-76s once the deliveries are complete, targeted for the end of 2013. This means it is the largest Sikorsky fleet operator in Asia and has in fact been operating Sikorsky helicopters for around 28 years.

The acquisition is the fourth that ZHC has negotiated with Sikorsky since 2007. In 2011 the operator also bought two S-92s for the offshore market. Ed Beyer, vice president of Sikorsky Global Helicopters, said that China was the fastest growing market in the world for his company and that “we look forward to expanding this cooperation to aircraft maintenance service, personnel training, and material distribution.”

CITIC Offshore Helicopter, China Southern's Zhuhai Helicopter and Eastern General Aviation are the three largest players in the Chinese national market, according to China Daily. The boom in the offshore sector is predicted to rise from the current 300 helicopters to more than 1,000 within the next decade.

The Ruili Jingcheng Group (RJG) also contracted for one S-92 and one S-76D during the airshow, representing the first S-92 sale to a private Chinese operator and the first sale of a S-76D helicopter into China. Both will be used for passenger transportation. RJG is expanding its business and has established three aviation subsidiaries. Although RJD will be the first operator of the S-76D, there are 31 S-76 helicopters operating in China. The China Airshow organizers announced orders worth \$11.8 billion in 30 contracts signed during the show. They said the orders represented a total of 202 aircraft of all types. —*By Andrew Drwiega* 📧

■ COMMERCIAL | OFFSHORE

NHV Purchases 10 Eurocopter EC175s



Colin Hancy, NHV's UK commercial mgr, with an EC155.

Eurocopter has obtained an order from NHV Helicopters of Ostend, Belgium for 10 EC175s that will operate from the company's UK base in Norwich. The helicopters will conduct a variety of missions, including offshore transport, SAR, air mediac, security/border patrol and crew transfer. The agreement is worth around €150 million (approximately \$191 million), covering a phased handover starting in 2013 and running until 2015. The EC175s will be configured to carry up to 16 passengers 135 nm or 12 passengers up to 190 nm.

Colin Hancy, UK commercial manager for NHV, described the purchase as a "major investment" for the company, which operates in Europe, Africa and South America. He added that NHV plans to expand its offshore services and wind farm support, as well as operations at the Klyne Business Aviation Center in Norwich. "We've also just completed a three-month contract for Shell, flying maintenance crews to various gas production platforms in the UK and Dutch sectors of the Southern North Sea," Hancy said. With the 10 EC175s, NHV's fleet will increase to around 40 helicopters around the globe. ☛

■ MILITARY | PROCUREMENT

Indian Air Force Replaces Mi-26s with Chinooks

Boeing has won a \$1-billion contract with the Indian Air Force (IAF) to supply 15 CH-47D Chinooks. The IAF will use the helicopters for heavy-lift transport of equipment to the northern parts of the country. The Chinooks will replace the IAF's existing fleet of Russian Mi-26s. ☛

■ SERVICES | CERTIFICATION

China Greenlights Bell 429 Weight Increase

Bell Helicopter has obtained approval from the Civil Aviation Administration of China to increase the maximum gross weight of the 429 by 500 lbs. Regulatory agencies in a dozen countries have approved the weight increase, with the notable exception of the U.S. FAA, which ruled against approving the request in August. China joins Argentina, Australia, Brazil, Canada, Ecuador, India, Malaysia, Mexico, New Zealand, Thailand and Vietnam in giving the thumbs-up to the weight increase from 7,000 to 7,500 lbs (3,400 kg). ☛

■ SERVICES | FINANCING

Mexico Receives Financing from Ex-Im for S-76Ds

The Export-Import Bank of the United States has approved a loan of more than \$50 million to Aeroservicios Especializados S.A. (ASESA) of Monterrey, Mexico for a fleet of Sikorsky S-76Ds. ASESA will use the helicopters for transporting oil and gas personnel in the Gulf of Mexico. ASESA's loan is the first for Ex-Im Bank's business aircraft and helicopter qualified adviser program and was advised by AirFinance out of San Francisco. ☛



“FlightSafety shares Sikorsky’s safety-first focus.”

MICK MAURER
President, Sikorsky Aircraft Corporation

Mick Maurer joined UTC in 1989 at the corporation’s Otis Elevator Co. unit, where he worked in positions of increasing responsibility until 2000, when he joined Sikorsky as Vice President, Enterprise Planning and Development. Most recently, he served as President of the Sikorsky Military Systems unit, responsible for the U.S. and international military program and product line management, customer relationships and military aircraft delivery. He was an officer in the U.S. Navy’s nuclear submarine program and served onboard the ballistic missile submarine USS George Washington Carver prior to joining UTC. He is a graduate of the U.S. Naval Academy and holds a master’s degree in engineering from Johns Hopkins University and a master of business administration degree from Stanford University.

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Sikorsky was awarded the development contract for the United States Marine Corps CH-53K heavy-lift helicopter. It will be the U.S. military’s largest and heaviest helicopter with twice the lift and radius of action as its predecessor.

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Maurer adds, “FlightSafety shares Sikorsky’s safety-first focus. As our authorized training provider, FlightSafety’s Level D helicopter simulation helps us to achieve our innovation and safety objectives.”

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PEOPLE



The National EMS Pilots Association has given its Pilot of the Year award to **Jim Glasner**, who flies for Eagle-

Med in Wichita, Kan. Glasner got his start as a U.S. Army helicopter pilot in 1970, becoming an HEMS pilot in 1979. During his career, he has served as a line pilot, instructor pilot, check airman, chief pilot and base manager. Glasner joined EagleMed in 2001, currently flying the Eurocopter AS350B and AS355N. NEMPISA presented the award to Glasner during the AMTC Conference on Oct. 22 in Seattle, Wash.

Victoria, BC-based Latitude Technologies has hired **Brad Head** as its

new vice president of technology. He will lead architectural definition and technical matters for all the company's software and data services. Head previously worked for the British Columbia Ministry of Transportation, where he created the province's architecture and standards group and was responsible for the Ministry's enterprise IT strategy.

Jennifer Hardcastle has joined American Eurocopter as an air medical specialist sales manager. Hardcastle has more than 20 years of experience in the air medical field, most recently as the vice president of business development for Health Services Integration.

Kevin Schitoskey is the new program manager for AirLink CCT in Bend, Ore. He will lead a team of pilots,



medical personnel, mechanics, and administrative staff. Schitoskey comes from the University of New Mexico

Hospital in Albuquerque, where he was director of emergency services. He first started working for the Level 1 trauma center, children's hospital and cancer facility in 1998, working in various leadership roles from 2005 to 2010.

Rockwell Collins has named **Robert K. Ortberg** as its new president. He joins **Clayton M. Jones**, who continues as chairman & CEO. Ortberg was formerly executive vice president and COO of the company's Government Systems business. ☛

coming events

2013:

Feb. 20–21: Avionics Europe 2013, Munich, Germany. Call 1-888-299-8016 or visit www.avionics-event.com

March 4–7: HAI Heli-Expo 2013, Las Vegas, Nev. Contact HAI, 1-703-683-4646 or visit www.rotor.com

March 12–14: ATC Global, Amsterdam RAI Center, Amsterdam, Netherlands. Visit www.atcglobalhub.com

March 18–20: 9th Annual CHC Safety & Safety Summit, Vancouver, Canada. Contact CHC, phone 1-604-232-7424 or visit www.chcsafetyqualitysummit.com

March 25–28: 56th Annual AEA International Convention & Trade Show, Las Vegas, Nev. Contact Aircraft Electronics Assoc., phone 1-816-347-8400 or visit www.aea.net

April 8–10: Navy Lead Sea-Air-Space Exposition, Gaylord National Resort & Convention Center, National Harbor, Md. Visit www.seaairspace.org

April 9–11: Aircraft Interiors Expo, Hamburg Messe, Hamburg, Germany. Visit www.aircraftinteriorsexpo.com

April 10–14: Quad-A Annual Convention, Fort Worth, Texas. Contact Quad-A, phone 1-203-268-2450 or visit www.quad-a.org

April 16–18: Asian Business Aviation Conference & Exhibition (ABACE 2013), Shanghai, China. Contact NBAA, phone 1-202-783-9000 or visit www.abace.aero

May 16–18: 6th International Helicopter Industry Exhibition, Moscow, Russia. Contact HeliRussia, phone +7 (0) 495 958 9490 or visit helirusia.ru/en

May 21–23: AHS International 69th Annual Forum and Technology Display, Phoenix, Ariz. Contact AHS, phone 1-703-684-6777 or visit www.vtol.org

May 21–23: European Business Aviation Convention and Exhibition (EBACE), Geneva PALEXPO and Geneva International Airport, Geneva, Switzerland. Visit www.ebace.aero

June 17–23: Paris Airshow, Le Bourget, Paris, France. Visit www.paris-air-show.com

July 29–Aug. 4: EAA AirVenture, Wittman Regional Airport, Oshkosh, Wis. Visit www.eaa.org

Aug. 12–15: Association of Unmanned Vehicle Systems International (AUUSI) Unmanned Systems 2013, Walter E. Washington Convention Center, Washington, D.C. Visit www.auusi.org

Oct. 21–23: AUSA Annual Meeting and Exposition, Walter E. Washington Convention Center, Washington, D.C. Visit www.ausa.org

Oct. 22–24: NBAA Annual Meeting & Convention, Las Vegas Convention Center, Las Vegas. Visit www.nbaa.org

Nov. 17–21: Dubai Airshow, Dubai World Central, Dubai. Visit www.dubaiairshow.aero. ☛

HOT PRODUCTS

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Armed Aerial Scout: *Reviving a Lost Generation*

As the U.S. Army concludes its discussions and voluntary flight tests with industry, Military Editor Andrew Drwiega asks whether the Armed Aerial Scout could provide a link to the next generation Future Vertical Lift.

By Andrew Drwiega, Military Editor

EADS North America AAS-72X and the Eurocopter EC145T2 over the Colorado mountains near Alamosa.

EADS North America



With the U.S. Army now seemingly on a timeline for the acquisition of a new reconnaissance helicopter—the Armed Aerial Scout (AAS)—to replace its existing Bell OH-58 Kiowa Warrior fleet, the main question in these budget wracked times must be: How much “bang for the buck” can the U.S. Army afford? The challenge is one that has been delayed for decades due to the hugely expensive failure of its first replacement program, the Boeing-Sikorsky RAH-66 Comanche, followed by another expensive cancellation, this time of the Bell ARH-70A Arapaho. It should be remembered that the Comanche cancellation in February 2004 was good news for the rest of Army Aviation. At the time Gen. Richard Cody, then Army Deputy Chief of Staff (G-3), promised to use the \$14.6 billion that would have gone to acquiring Comanche helicopters toward buying new aircraft and upgrading others within the Army’s helicopter fleets. Although not all of the money was

reallocated to Army Aviation, there is no doubt that both Boeing and Sikorsky, the original industrial pairing behind the RAH-66, benefited strongly from the deal. Modernization and upgrade has been the key with Boeing’s AH-64 Apache Block III acquiring “blue ribbon” status and the heavy lift CH-47F fleet not far behind. Sikorsky too has a full schedule of work while it continues the transformation of the Army’s Black Hawks into UH-60Ms. Even American Eurocopter benefited, winning the award of a fully funded light utility program which they paid back with a smooth delivery of the full fleet of UH-72 Lakotas on time and on budget.

The negative side of this story can be found in the fact that the Army took the golden opportunity to modernize its existing airframes as a result, rather than keeping the pressure on industry’s development teams to forge ahead and look for new ideas and designs. While there can nearly always be a downside to every story in some ways, it has been nearly a decade of easy money for the rotorcraft

businesses in these organizations. What the \$39-billion Comanche program was intended to do was create a next generation armed reconnaissance helicopter. The modernized Apache Block III is the closest the Army has come to this technologically, but it cannot be described as next generation in design.

So the big dilemma the Army must decide upon is this: Is now the time once again to lift up their eyes ambitiously and look for a new next generation platform, do they perpetuate the traditional designed ethos (even if that is a relatively modern Eurocopter UH-72X), or do they play it safe and replace like-for-like with a modernized Kiowa Warrior Block II?

The budget that the Army leadership says they have to spend on the AAS is between \$13-15 million per copy. This should be seen in terms of what can be understood from the figures (reproduced below) taken from the DoD’s FY13 Budget Request, published by the office of the Under Secretary of Defense (OSD) in February 2012.

Major Weapons Systems Summary

	FY11	FY12	FY13 Base	OCO	Total (US\$)	Quantity
AH64 Apache Longbow Block 3	581.7	758.3	1,109.2	71.0	1,180.2	50
CH47 Chinook	1,430.3	1,409.2	1,231.0	231.3	1,462.3	44
LUH Light Utility Helicopter	303.5	250.4	272.0	-	272.0	34
UH60 Black Hawk	1,808.8	1,706.6	1,305.5	-	1,305.5	59

According to figures from the Army, the Apache Block III costs around \$23.60 million per aircraft fully equipped. The Chinook CH-47F costs around \$30 million per aircraft (\$33.23 million fully equipped). The LUH UH-72 costs around \$6.04 million per aircraft (\$8 million fully equipped). The UH-60 Black Hawk costs around \$16.4 million per aircraft (\$22.12 million fully equipped).

According to DoD's appropriation budget figures, Kiowa Warrior OH-58F Wartime Replacement Aircraft (WRA) will cost \$183,900 for 16 aircraft in FY13, making the unit price around \$11.49 million per aircraft fully equipped. The AAS average procurement unit cost target set at \$13-15 million (base year 2012). On this evidence the AAS appears to be budgeted as the second least expensive combat helicopter in the U.S. Army Aviation portfolio until beyond 2030, being only beaten by the reworked Kiowa WRA [a provision of the UH-72 acquisition was that it is not supposed to operate in

combat areas]. That reveals much about the complexity it will be able to offer as a new start aircraft (and this perhaps gives a clearer idea of where Army decision makers may have to focus their selection criteria). It goes without saying that they will want the best that their money can buy, but at \$13-15 million this is not going to be a next generation aircraft.

Under the RFI/voluntary flight demonstration (VFD) plan, the Army will analyze the results of the flights and discussions with industry to "determine if an achievable, affordable capability exists with moderate risk." But as Program Executive Officer (PEO) Aviation Maj. Gen. William "Tim" Crosby has explained, as have the documents given to industry for this exercise, the VFD and discussions with industry are not part of any down-select process; it is and remains a demonstration of current capability.

This has been a safe line for the U.S. Army to take in laying out what it expects the aircraft to achieve. It

recognizes the enduring shortcomings of UAS systems but emphasizes the importance of manned-unmanned teaming (MUM-T): "a combination of manned and unmanned platforms (teaming) provides an enhanced capability and best meets aerial scout requirements [AAS Project Office]." While an AAS helicopter with all the attributes of increased speed, range, endurance and hover out of ground effect (HOGE) is the ideal, the Project Office concedes that "higher-performing mixes cost significantly more than lower performing mixes and results in extreme risk to aviation portfolio affordability."

The Army's operational expectation, matched against current capabilities then set against the identified budget still appear difficult, if not impossible, to balance. With the Joint Requirement Oversight Council (JROC) beginning to examine the Army's findings from December 2012, an approval from the Defense Acquisition Board (DAB) would not be expected until the middle of 2014



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at the earliest, with a request for proposal (RFP) following that. In other words, the potential competitors in this acquisition competition have at least another 18 months to further develop and refine what they are working on.

This may play into the hands of Sikorsky—the company that currently has nothing to demonstrate. Steve Engebretson, Sikorsky's AAS program director, said during the Army's AUSA annual exposition in October that the manufacturer will have a flying S-97 Raider prototype by mid-to-late 2014. Although the most futuristic looking of all the current proposals, Engebretson stated that in fact the aircraft would represent a combination of much that was possible today: "We have been working a long time to debunk the myth that because this is high-performance aircraft it is going to be very complex and expensive—it's actually just the opposite of that."

He points out that the concept blends capabilities from other platforms as well as some currently

being developed. "Everything that will fly in the S-97 Raider is already performing elsewhere in other products including fly-by-wire [in the CH-53K]. The U.S. Army does not have a lot of fly-by-wire so the USMC program is leading the way for DoD." He added that government analysis into the CH-53K capability would also be useful in proving the S-97's capability. Continuing on the "new but not new" line, Engebretson said that the concept of using rigid rotor blades was not new and that coaxial drive systems have been around forever.

In conclusion, in terms of the overall AAS competition, the longer the DAB takes, the later the RFP is issued, the better position Sikorsky will be in to offer something approaching next-generation capabilities. In contrast, Bell Textron's Kiowa Warrior will keep on aging as a platform design, as will Boeing's AH-6. EADS North America has the drive of Eurocopter behind its AAS-72X and with this summer's displays of its X³ (X-cubed) technol-

ogy demonstrator achieving speeds of 232 knots and more (Sikorsky's X2 achieved 250 knots), these two seem to be nosing ahead with future potential in their flight bag. But at what cost?

Engebretson makes convincing closing remarks bringing in the Army's desire to introduce a Future Vertical Lift aircraft (ex-Joint Multi Role). "The way the Army is going with JMR contracts they are talking about replacing their medium fleets by 2030. Once they start that there won't be any money to address the armed reconnaissance fleet, so they will have to live with their selection to 2050-60 until after they get past the Black Hawk/Apache replacements."

What he is leading to is the assertion that a new generation type aircraft selected for the AAS would allow the Army to assess capabilities before transiting to replacement aircraft for its medium fleet. "Maybe we should try them in a 300-aircraft fleet before we take it into a 3,000 fleet," he suggests. ☐

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The lone competitor of six not to have a flying prototype for the Army's VFDs, Sikorsky plans to have a prototype S-97 Raider available by mid-to-late 2014. Shown here are the various planned X2 offspring at AUSA.

Army Completes VFD Phase of AAS Program

By Douglas Nelms

The U.S. Army has completed the antepenultimate phase of its competition for a new Armed Aerial Scout (AAS) helicopter to replace the venerable OH-58D Kiowa Warrior. Three of the key players in the competition—Bell, Boeing and EADS North America—demonstrated to the Army what their respective aircraft can do in recent weeks during a series of voluntary flight demonstrations (VFDs) designed to show the Army what it can get for the money it can spend. This follows AgustaWestland's participation this summer with the AW139M demonstrator (the manufacturer plans to offer the AW169). MD Helicopters has also proposed its MD540F (see sidebar on page

25). Sikorsky said that it participated through a series of briefings and flights in its S-97 Raider simulator.

A meeting of the Defense Acquisition Board will follow the VFDs to develop a defense acquisition strategy. "That strategy covers a range of alternatives, but principally it is either to continue the course it is on, which is to keep the minimal capability that they have and maintain it for a period to time until the (current) asset can be replaced in its entirety, or (to) select a competitive alternative that in the near term could be ready for production to replace older assets that have been operating as diligently as they have," according to Sean O'Keefe, Chairman and CEO of EADS North America.

Development of that strategy is

expected to lead to the final competition for the new AAS. The idea for flight demonstrations was announced last year, but with emphasis that this was not a competitive fly-off. It was strictly a "show us what we can get for what we can afford" on the part of the U.S. Army.

The Army issued its Request for Information earlier this year, with the manufacturers following up with their responses. Those responses were then followed with meetings between industry and a team of around 30 to 40 representatives from some seven agencies.

Dave Haines, vice president of rotorcraft programs for EADS North America, told reporters prior to the AUSA meeting in Washington that



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they had responded in mid-summer to the Army's RFI with "about 1,100 pages of very detailed data. The Army will tell you that (the RFI) was just a market survey. This was not just a market survey."

The EADS-NA response was followed up by "an oral discussion with the customer," including the Aviation Engineering Directorate (AED), during a visit to American Eurocopter's UH-72A assembly plant in Columbus, Miss., according to Haines. Assembly of the AAS-72X, if selected, will also be done at the Columbus facility alongside the UH-72A.

The purpose of the meetings was to validate the information EADS-NA had provided in its response to the RFI, "and we wanted them to be very comfortable with where we thought we were and understand the detail, the data and our assessment of where we thought we were." The idea of an Army study team sitting down across the table from industry officials to discuss what the Army needed, what it could afford and what industry could provide was "a step outside the traditional mold," Haines noted. Traditionally, the Army simply states its requirements and expects industry to meet those requirements, with the low-cost competitor getting the contract.

The AAS-72X is a joint program with EADS North America as prime contractor and Lockheed Martin as the integrator at the Lockheed Martin Systems Integration Lab in Orlando, Fla. This includes weapon systems and sensors, the navigation/communication package, and mission management computers and software.

These meetings were followed by the VFD, which started this fall. For its VFD, EADS-NA flew two demonstration aircraft out to Alamosa, Colo. For demonstrations held from Sept. 24 to Oct. 3. The two aircraft included the AAS-72X, which is an armed version of the highly successful UH-72A Lakota now being flown by the active Army and Army National Guard units. The UH-72A, in turn, is the militarized version of the EC145. The second aircraft, dubbed the AAS-72X+, was the EC145T2, basically the EC145 with an upgraded Turbomeca Arriel 2E dual FADEC engine and a Fenestron anti-torque system. The Arriel 2E engine increases maximum takeoff weight from 7,903 lbs on the 72X to 8,267 lbs for the 72X+. Turbomeca's Arriel 1E2 powers the 72X.

EADS-NA held its VFD at Alamosa because of the high altitude in order to showcase the hot/high capabilities of the aircraft, Haines said. Elevation

is around 7,500 feet, with mountain peaks reaching to 14,000 feet.

EADS-NA had already taken an EC145 to Alamosa in July 2009, weighted to the anticipated weight of the Army's AAS weapons mission equipment package (MEP), to show that its ability to operate at those altitudes in hot weather. It very easily met the Army's "6K/95" requirement, or the ability to hover out of ground effect (HOGE) at 6,000 feet at 95 degrees F at maximum gross weight. Haines also noted that during the VFD the aircraft hovered out of ground effect at 14,000 feet at just under MGTOW.

The "6K/95" requirement was one all of the competitors were able to prove during their respective VFDs. While the Army has not put out specific requirements for the weapons MEP, the manufacturers are outfitting their AAS entries with weapons such as the M260 Hydra rocket launchers holding seven 2.75-inch folding fin aerial rockets, both GAU-19 50 cal. and 7.62 mm mini-guns, other heavy 50 cal. machine guns such as the M3P and Hellfire missiles. It will also be required to have a highly capable target acquisition and designation system.

The two EADS North America aircraft accumulated more than 20 hours during the two-week period, with American Eurocopter pilots, active Army combat experienced pilots and Army experimental pilots and engineers taking the controls.

Flight tests were done to ADS-33 standards, the performance specification handling qualities requirements for military rotorcraft. "It is a number of helicopter maneuver normally done at sea level, but we did it in a high and hot environment. And the results speak for themselves," Haines said.

Following the VFD, EADS-NA also conducted a tour with the AAS-72X, visiting four U.S. Army facilities—Fort Riley, home of the 1st Infantry



AgustaWestland flew its AW139M this summer for the Army's AAS voluntary flight demonstrations. The manufacturer plans to offer the in-development AW169 should AAS proceed into a formal competition.

MD540F Flight Evaluation

Mesa, Ariz.-based MD Helicopters is looking to increase its presence in the military helicopter market with its MD540F, which can either be categorized as a militarized version of the company's civilian MD500 line,

or the next generation of the Boeing AH-6 Little Bird attack helicopter. (The AH-6 was an MD product until the sale of its design rights to Boeing several years ago.) The end product is a body style that looks very similar to its single-engine

predecessors, but with a variety of upgrades to its powerplant, rotor system, avionics and other select systems.

Although it is still technically under development, MD invited Rotor & Wing for a hands-on evaluation the MD540F, which is being offered for the Army's AAS competition. Editor-at-Large Ernie Stephens took the company up on its offer to learn about the aircraft and put it through its paces. The result is a comprehensive technical briefing provided by the designers, as well as an appraisal of its handling characteristics and flight systems.

Look for a complete report on the MD540F in the January 2013 issue of *Rotor & Wing*, including an inspection of its 50-year bloodline, its recent upgrades, and how it feels in the hands of a pilot. ☞



Photo by Frank Tucker, MD Helicopters

The MD540F is a militarized version of the MD500 with several performance upgrades. A review of its legacy, as well as a flight evaluation, will appear in next month's issue of *Rotor & Wing*.

Division; Fort Hood, home of the 1st Cavalry Division, Fort Campbell, home of the 101st Airborne Division, and Fort Bragg, home of the 82nd Airborne Division and XVIII Airborne Corps. Completion of the tour was timed to coincide with the beginning of this year's AUSA meeting in Washington, D.C.

EADS was the only one of the four competitors to take its demonstration aircraft away from its home facility.

Bell began its VFD on Oct. 22 at its facility in Fort Worth, Texas, using an OH-58 Block II demonstration aircraft. The OH-58 Block II had already achieved the 6K/95 requirement last spring, exceeding its maximum gross weight of 5,500 lbs during flight trials in Colorado. The Block II aircraft was developed in Bell's Xworx research and development facility in Fort Worth, Texas, with first flight on April 14, 2011. The Block II aircraft replaces the 650-shp Rolls-Royce T703-AD-700A engine with the 970-shp Honeywell HTS900. It will also have upgraded transmission and rotor systems taken from the Bell 407,

as well as cockpit and sensor upgrades under the OH-58F CASUP program.

A Bell spokesperson stated that the demonstration aircraft was not flying with any weapons mounted on it, although it did have the sensor ball profile on the nose to represent the weight and dimensions of the real thing. Bell said that since the Army is already flying the OH-58D Kiowa Warrior, the Block II aircraft "will blend seamlessly" into the existing Army supply chain, training and procurement system "without the expensive disruption caused by a completely new airframe." By employing the Block modernization concept, Bell said that it can deliver "a helicopter that meets or exceeds today's requirements while providing a clear roadmap for future upgrades as well."

Boeing conducted its VFD at its production facility in Mesa, Ariz., using a single AH-6. It flew approximately 10 flight hours and accomplished all flight requirements, the company said.

Mike Burke, Boeing's director of attack helicopter business develop-

ment, noted that maximum gross weight of the aircraft is around 4,700 lbs, "and if you put a combination of missiles, rockets, and machine guns, plus the ammunition and fuel, you don't even get close to 4,700 lbs. You're right around 3,900 to 4,000 lbs. And at that weight, the aircraft is very maneuverable and has great endurance.

Sikorsky does not currently have a flying demonstrator, but is offering the S-97 Raider as its entry in the AAS competition. A Sikorsky spokesman said the manufacturer had conducted numerous in-depth briefings with the evaluating agencies, with combat experienced pilots "as well as experimental test pilots and engineers" flying the S-97 simulator.

The S-97 is being built based on technology developed through Sikorsky's experimental X2 program. The X2 is a high-speed rotorcraft that has already flown in excess of 250 kts.

"We believe this next-generation rotorcraft will give Army Aviation a decisive edge on the battlefield through 2060," the spokesman said. ☞

Year in Review: PRODUCTS



2012 turned out to be a far more interesting year than many of us expected it to be in terms of new products and new uses or iterations of existing products. This article began with a simple concept—to provide an overview of all the products and services that industry vendors believed in strongly enough to showcase on the Hot Products pages for you during the past year. After all, the surveys always tell us that keeping up with new products and new technologies are the primary reasons you read this publication. But as we searched the archives and back issues, we kept running across other products and announcements that would have seemed wrong to ignore. The Hot Products pages are just not the place you are going to find an announcement about a new aircraft being rolled-out to market. What the Hot Products pages have instead become are a very effective way for vendors to highlight and showcase some of the less sexy products and services that are nevertheless key components, and integral to running a successful helicopter operation. So while the articles on the following pages are by no means intended to be a comprehensive account or even a rating of the most important announcements of the year, these stories do represent an overview of a few of the shiny things that caught our eye in 2012, as well as those which industry vendors believe would be of significant value to you.

AIRCRAFT

Bell 525 Relentless, Eurocopter EC130T2 Debut at Heli-Expo



Photo by Ernie Stephens

Bell 525 at Heli-Expo 2012.

Two dramatic launches—mood music, helicopters behind screens and clever audio visual presentations—accompanied the launches of the Bell 525 Relentless super medium transport (SMT) and the Eurocopter EC130T2. While you can find the full specifications elsewhere in this news section, Bell President & CEO John Garrison told a packed audience that this was “Bell on a mission to revitalize our commercial business.” A new five-bladed, 10-ton helicopter, the Bell 525 Relentless has been launched with the corner just having been turned from the bad times of the last few years.

The crowd then moved from one end of Heli-Expo to the other to see Eurocopter’s launch. The curtain pulled back the wraps on the EC130T2, a Turbomeca

Arriel D2-powered single engine helicopter. Its improvements were said to include 10 knots higher cruise speed, 2 percent less fuel consumption, better hot and high performance and a higher sling load of 30 percent. Six out of seven new customers lined up to support Eurocopter by saying the company had delivered what they had asked for in this type of machine—among them Maverick, Papillon, Enloe (an EMS provider) and Blue Hawaiian. Read the full story at rotorandwing.com

AgustaWestland Shows Off AW189

AgustaWestland came to Heli-Expo 2012 fresh off the recent first flight of its prototype AW189. AgustaWestland officially uncovered the AW189 program at the 2011 Paris Air Show in response to an increasing demand for a versatile, multi-role helicopter. The prototype took its maiden flight on December 21. Powered by a pair of General Electric CT17-2E1s and equipped with FADEC and built-in particle separators, the 19-passenger AW189 is designed for long-range, offshore transport and SAR applications. Bristow Helicopters, Bel Air and Weststar Aviation Services are among the operators that have placed orders for the AW189.

To help minimize pilot workload and improve safety during VFR/IFR, day/night, all-weather operations, the AW189 will feature a Rockwell Collins digital glass cockpit designed around four 8 x 10-inch liquid crystal displays with synthetic vision and enhanced vision systems. The avionics suite also includes a four-axis dual-duplex digital automatic flight control system and dual flight management system (FMS). According to AgustaWestland, certification is still on track for 2013, with deliveries expected to start in 2014.

MD Helicopters Uncovers ‘Lethal’ 540F

After 15 years without unveiling a new rotorcraft, it only took around three months for MD Helicopters to pull together its latest offering—the 540F. An upgrade to the 530F, the new model will feature a Rolls-Royce engine, avionics from Elbit Systems and a six-blade rotor system. The company plans to enter the 540F into the U.S. Army’s Armed Aerial Scout (AAS) competition, in addition to getting interest from international operators through the DoD’s Foreign Military Sales (FMS) program.

“This is really development at Mach speed,” said CEO Lynn Tilton. “Three months ago, we went over to team up

with Elbit Systems on flight display systems and new weapons systems. Together in three months, we were able to bring this new aircraft to life." Tilton added that certification will occur in the first quarter of 2013. The MD540F represents the first new aircraft the Mesa, Ariz.-based company has launched since Patriarch Partners purchased MD in July 2005. Tilton described the 540F as a "lethal fighting machine."

Read the full story at www.aviation-today.com/rw/airframes

AVIONICS & INSTRUMENTS

The List of Helicopters Certified with G500H Continues to Grow

(From Hot Products) Providing an integrated "glass cockpit" solution for both retrofit and new production installations, Garmin's G500H electronic flight display system has now received supplemental type certification (STC) on a number of today's most popular helicopters. The list includes the Bell 206 and 407 series; Eurocopter's AS350 and EC130; and the Robinson Helicopter R44. Available through Garmin Authorized Service Centers industry-wide, the G500H system combines full WAAS GPS navigation with the latest in situational awareness. Dual 6.5-inch LCD screens, mounted side-by-side in a single bezel, allow primary flight display (PFD) and multifunction display (MFD) capabilities to be positioned right in front of the pilot for easy scanning and interpretation. The PFD shows attitude, airspeed, climb rate, altitude and course/heading information—while the MFD provides highly detailed moving-map graphics depicting the helicopter's current position in relation to ground features, chart data, flight plan routings, and more. Optional Garmin HSVT synthetic vision capability adds a 3-D virtual perspective view of terrain, traffic, airports and obstacles to the pilot's PFD. And on each of the displays, large numbers and graphics make the data even easier to read and interpret

at a glance. Proven AHRS attitude/heading reference replaces old-style, maintenance-intensive mechanical gyros for greater precision and reliability. Plus, a helicopter-specific database, included with the G500H, features more than 7,000 heliports and nearly 30,000 additional low-altitude obstacles in addition to the already extensive database found in Garmin's fixed-wing G500 system. For more information, see your nearby Garmin authorized dealer or check the company website.

Universal Debuts EFI-890H Helicopter Display

Universal Avionics of Tucson, Ariz., has uncovered the EFI-890H, a helicopter flat panel display based on the company's EFI-890R. The display will include a collective cue and X-video night vision imaging system (NVIS). Universal is seeking approval for a number of helicopter types, including the Bell 212/412 and Eurocopter EC155/AS332, and the Sikorsky S-76 and S-61.

Becker Introduces AR6204 Transceiver, BXP6404 Transponder

During a Feb. 13 press conference at the company's Heli-Expo booth, Becker Avionics President Markus Schmitz uncovered two new avionics units—the AR6204 VHF transceiver and the BX6404 Mode S transponder. "The AR6204 is a single-box-mounted VHF transceiver which provides 8.33 or 25-kHz spacing," Schmitz explained. "It has an integrated digital intercommunications system and also provides a dual-channel watch function." The radio incorporates automatic dependent surveillance-broadcast (ADS-B) technology "and provides 10-watt output at 24 volts," he said, adding that the AR6204 features a simple design for retrofit installations. Schmitz went on to unveil the BXP6404, describing it as "the only dismount Mode S transponder with ADS-B Out capabilities on the market." The unit will be available for Class 1 and Class 2 perfor-



Photo by Emie Stephens

Eurocopter EC130T2 at Heli-Expo. See story on page 26.

mance and will work with most major encoders in addition to Becker's encoder, which attaches directly to the BXP6404, according to Schmitz. Read the full story at www.rotorandwing.com

Archangel Systems Introduces AHRS & INS

(From Hot Products) To support cost-sensitive and space-constrained aviation applications, Archangel Systems, Inc. has developed two highly compact embeddable aviation sensor products scheduled for release in 2012. The AHR50, slated for second quarter 2012 release, is an enhanced AHRS (Attitude and Heading Reference System) in a 2.5" x 2.0" x 1.2" form factor. A micro DB9 connector provides two communication ports. A RS422 interface connects to a remote Magnetic Sensing Unit (MSU) for heading data. The second, an RS232 bidirectional port, provides the AHRS output and "enhancement" features. Enhancement: Via the RS232 port, the customer may input either air data or GPS words for blending with IMU data. With air data inputs, the AHR50 is effectively an ADAHRS. With GPS position, velocity and time data (PVT) the AHR50 becomes a loosely coupled INS/GPS system. The latter scenario is ideal for aircraft that already have GPS and the installer chooses not to duplicate that hardware and cost for INS functionality. For installations without GPS, Archangel will offer the INS50 in third quarter 2012. By augmenting the AHR50 with an integrated C/A code GPS, the INS50 is a standalone INS/GPS product. Archangel design teams are available to support OEM, STC and upgrade programs. Contact Archangel Systems at www.archangel.com or 1-334-826-8008 x14.

Photo by Andrew Parker



AgustaWestland AW189 at Heli-Expo. See story on page 26.

Sandel HeliTAWS Chosen for Sikorsky S-70i

Sikorsky Aircraft has contracted Vista, Calif.-based Sandel Avionics to supply a Mil-Std version of the HeliTAWS wire and terrain alerting system for the S-70i, the international version of the Black Hawk. The ST3453H will include Sandel's WireWatch and TruAlert functions allowing pilots to take off, cruise, hover and land at off-airport locations without encountering nuisance alerts, while still being able to receive Class-A terrain and obstacle warnings during the flight.

Becker Delivers 1,000th DVCS

(From Hot Products) Becker Avionics is a privately owned hi-tech avionics company. For more than 50 years, Becker has been an industry pioneer, manufacturing affordable, sophisticated digital intercom systems, communication & navigation radios, transponders, personal locator beacons and air traffic control radios. Becker is recognized by savvy customers for their leading-edge design and quality products made for a variety of market segments including general aviation and rotorcraft (air medical services & airborne law enforcement), along with special mission and military customers. Becker's flagship product is the highly successful Digital Voice Communication System (DVCS). The DVCS was the first commercially certified digital intercom system in the marketplace (ETSO & TSO'd). This current generation DVCS6100 has incorporated a variety of unique and popular 'customer-centric' features. Recently, Becker reached a

significant milestone by delivering its 1,000th DVCS since introducing its Digital Audio System family. For more information, contact Brett Gardner, Director of Sales, at brett@beckerusa.com or visit www.beckerusa.com/dvcs

SATCOM PRODUCTS

WebSentinel iOS App Gets an Upgrade

Latitude Technologies Corporation has released an upgrade for its Latitude WebSentinel iOS App. Now registered users of the SkyNode Satcom product can use their WebSentinel account to view live flight tracking data, modify reporting parameters and send two-way text messages. Flight data from previous flights are also available.

High Frequency Demands Higher Quality 50 ohm MicroMATES Assemblies

(From Hot Products) MicroMATES from PIC Wire & Cable are engineered to advance microwave coaxial cable technology and serve Ku and X Band frequencies. Manufactured with minimum 200° C rating on all materials plus Inner Flat Braid or Strip Braid, High Temp Polyimide Foil, Dual Braided Shields and Silver Plated Copper throughout. Military/Defense Applications include SatCom, MUMT, and Command and Control. Two-week lead time on many assemblies. In addition to MicroMATES, the PICMATES Line of Interconnect Solutions for the Civil, Military and Parapublic/First Responder Helicopter Sectors also includes RF MATES, VideoMATES, and DataMATES. Take flight with over 40 years of proven success in recognized aerospace programs worldwide. At Pic Wire & Cable, we aim to: Improve Platform & System Performance; Lower Total Costs; and Reduce Development & Manufacturing Schedules. For all your advanced electronic applications, there's only one PIC. For more information call 1-800-742-3191 or visit the company on the web.

MRO PRODUCTS & SERVICES

CTI Opens Whirl Tower

Sikorsky Aircraft subsidiary Composite Technology Inc. (CTI) invited local officials to its Dallas-Fort Worth rotor blade repair facility on February 14 for the opening of its new whirl tower. The \$15-million "rig" and control room are diagnostic tools used to conduct controlled tests of rotor blades under simulated operational conditions. When damaged or repaired blades need to be tested, CTI technicians can mount them on the whirl tower's high-tech rotor hub, along with a master that is known to be completely flawless. The tower then rotates the blades while sophisticated lasers identify the changes required to make the test blades match the master blade.

HEATCON Provides Positive Pressure Repairs

(From Hot Products) A large number of composite repairs can be accomplished by a Hot Bonder, utilizing vacuum pressure for material compaction. However, there are many instances for which the Structural Repair Manual (SRM) stipulates that a positive pressure, typically up to 50 psi, must be used, as that created by vacuum alone is insufficient for carrying out large area repairs on major components. In such instances, up until recently the only alternative to utilizing an Autoclave was to combine vacuum with a 'Dead Weight,' such as sandbags, in order to achieve the equivalent of the required positive pressure. As it is difficult to achieve pressure uniformity over the repair area, plus the fact that sandbags act as a huge 'heat sink,' most repair stations without an Autoclave would either decline the job, or subcontract the repair to a facility with one. Our patented HCS3100 (Series) Portable Autoclaves are custom built semi-portable pressure vessels. They are designed to provide controlled temperature, vacuum, and pressure during composite and metal bond repair processes. The positive

internal pressure applied to the repair enables operators to achieve the higher pressure when required by aircraft manufacturer repair manuals. Heat is applied only where required using specially constructed silicone rubber heat blankets. This method results in reduced operational costs and fewer problems due to temperature induced part damage. For more information, visit www.heatcon.com

PAA Offers Extended Life Starter Generator Program

(From Hot Products) Professional Aviation Associates' Helicopter Starter Program for starter generators offers a custom designed inspection process to track brush wear. These custom solutions may extend the life of your starter generators, increase reliability, and reduce unscheduled removals and operating expenses. Our alliance partner A.O.G starter/generator overhaul facility is well maintained to provide consistent and quality service. Ultrasonic cleaners are used on all armatures and stators to eliminate carbon shorting. This ensures a more dependable operation and a longer life for the armature and stator. Two high-speed generator stands are available to test the operation of the unit after it has been serviced. Our reputation was built upon providing a high level of quality along with competitive pricing. For more information in the U.S. and Canada, please call 1-800-283-2015 or visit us at www.proaviation.com

3M Gel Tape Helps Protect Against Corrosion

St. Paul, Minn.-based 3M Aerospace has introduced its 3M Removable Gel Tape, which is designed to help protect substrate corrosion in helicopters and fixed-wing aircraft. The tape is available in one-sided and two-sided versions. According to 3M, the Gel Tape is easily removable and does not pill or ball, leaving behind little or no residue. Other features include easy cutting, low roll unwind tension and simple application.

The tape meets FAA 14CFR 25.853 standards.

Optically Superior Windows from Tech-Tool Plastics

(From Hot Products) With a full line of windows available for your MD500 series helicopter, Tech-Tool Plastics offers the finest in replacement and custom windows for your aircraft. Cabin Comfort Windows, provided exclusively by Tech-Tool, are available in clear or tinted, Smoke Gray or Dark Gray options. These wedge-shaped windows allow for more shoulder and elbow room for passengers and give pilots more freedom to maneuver. In addition, their clear-view design improves visibility and provides a custom appearance. Quick Change Windows are another option for those interested in reduced installation time and replacement costs. These are available for all door windows and chin bubbles. They fit better, eliminate rivets and eliminate the need to repaint. Years of experience and a strong focus on innovation have allowed Tech-Tool Plastics to become the leader in replacement and custom windows for rotorcraft. Ensuring durability, ease of installation and an unwavering focus on quality—Tech-Tool customers experience immediate service with little or no down time. Contact Tech-Tool Plastics at 1-800-433-2210 or visit the company on the web at www.tech-tool.com

Tech-Tool Windows for AS350/355s

(From Hot Products) Thanks to Tech-Tool Plastics Cabin Comfort windows, Eurocopter AS350 AStar and AS355 TwinStar operators can enjoy clear views essential for safe flying. Tech-Tool's wedge-style Cabin Comfort windows provide increased crew and passenger shoulder and elbow room throughout the AStar's cabin. In addition to added visibility and comfort, Tech-Tool's Cabin Comfort windows add a customized appearance at an affordable price. Windows are available in standard clear or custom gray tinted acrylic. Vibration-

free slide camera windows are available for aerial photography. The company fills most orders within 24 hours. Tech-Tool offers standard and customized windows for the most popular models from Bell, Eurocopter, MD Helicopters, Robinson and Schweizer. Tech-Tool Plastics has manufactured and supported helicopter replacement windows for nearly 50 years. Tech-Tool's affordable, high-quality windows are FAA, EASA, ANAC and Transport Canada approved. They meet or exceed OEM standards, are easy to install, and fit every time. For more information, please visit www.tech-tool.com



Photo by Andrew Parker

MD Helicopters CEO Lynn Tilton with the MD540F at Quad-A. See page 26.

INSTRUMENT REPAIR/NVG MODIFICATIONS

DAC International's Bell 212/412 Solution for Tarsyn

(From Hot Products) If you have issues with your Tarsyn gyro installation, consider replacing the Tarsyn gyros with the proven Northrop Grumman Litef LCR100 fiber optics AHRS. Installation consists of removal of the existing rate gyro, replacement of the Tarsyn VG/DGs with two AHRS and trays, which mount into the existing Tarsyn position and wiring an additional panel annunciator. Advantages of replacing the Bell 212/412 mechanical gyros with the dual LCR-100 AHRS include Fiber Optic Attitude Heading Reference System—no moving parts; a long MTBF (mean time before failure) equals reduced maintenance and

cost; the LCR100 has increased accuracy and less weight than the gyros it replaces; simplified one-time flux valve calibration—no compass rose required and it comes with a two-year warranty. The installation is simple with a kit that includes two Tarsyn adapter trays, one rate gyro jumper/annunciator harness, one panel annunciator and a flight manual supplement. Downtime for installation is minimal. Give DAC International a call today at 1-512-331-5323 to discuss replacing or upgrading your Bell 212/412. Or for more information connect with us at dacinfo@dacint.com

Aero Dynamix Provides Garmin Avionics Products and Repairs

(From Hot Products) Aero Dynamix, Inc. (ADI) is the industry leader and principle innovator of integrated Night Vision Imaging System (NVIS) solutions for both commercial and military aircraft. ADI is a full-line distributor and certified repair station for Garmin avionics, and offers internal NVG instrument modifications for Garmin products that do not compromise on the Garmin factory warranty. Featured here are the Garmin GTN 650 and GTN 750. The GTN family combines GPS, COM and NAV functions with powerful multifunction display capabilities like high-resolution terrain mapping, graphical flight planning, satellite weather, traffic display and much more. The GTN 750 offers a 6.9-inch diagonal high-resolution display. Contact Aero Dynamix today at sales@aerodynamix.com for more information or to request a quote. Let Aero Dynamix be your one-stop-shop for Night Vision solutions. For more information, visit www.aerodynamix.com

Aspen Avionics and NVG Modifications from Aero Dynamix

(From Hot Products) Aero Dynamix, Inc. is an industry leader and principle innovator of integrated Night Vision Imaging

System (NVIS) solutions for commercial and military aircraft. ADI is a full line distributor and certified repair station for Aspen Avionics and offers internal NVG instrument modifications for Aspen products that do not compromise on the Aspen factory warranty. Featured here is the Evolution 1500H Package, which combines the powerful, award-winning Pro PFD 1000H with the versatile MFD 500H to deliver a full-featured, exceptionally easy-to-use glass panel. The Pro PFD 1000H provides professional-grade EFIS primary flight instruments, with a full-featured electronic HSI with moving map. The MFD 500H adds photo-quality moving maps, terrain awareness, geo-referenced charts and airport diagrams, and (with optional or existing sensors) traffic displays, WX500 Stormscope display, and the full suite of XM WX aviation weather products. Contact Aero Dynamix today at sales@aerodynamix.com for more information or to request a quote. For more information, visit the company's website at www.aerodynamix.com

FIXTURES & GROUND EQUIPMENT

Solar-Powered Heliport Lighting System Supports Night Landing and Lift-Off

(From Hot Products) Avlite Systems solar-powered heliport lighting for emergency, temporary or permanent helipads and helidecks offers helicopter crews a safer place to lift-off and land during night flights or in low-visibility conditions. Meeting ICAO's Annex 14 and CAP437 Offshore Helicopter Landing Areas recommendations, this world-first, solar-powered heliport lighting system is self-contained and easy to install. The radio-controlled solar heliport perimeter lights give over 50 hours of continuous operation at both CAP437 and ICAO Annex 14 Touchdown Lift-Off perimeter light

intensities and come ready for operation straight from the box supplied with the frangible



Photo by Ernie Stephens

Sikorsky/CTI whirl tower. See story on page 28.

mount assembly. The solar flood light (also radio-controlled) provides uniform surface lighting across width of the helipad while the optic's 'hood' prevents potential glare to pilots upon approach. Just one of Avlite's radio controllers can control multiple solar Avlite fixtures including; heliport beacons, taxiway lights, obstruction lights, lighted windsock and other products. The radio controller supports several operational modes including 3-step intensity adjustment and switching the system between visual and IR. The solar Pilot Activated Lighting Control (PALC) can also be integrated with the system for remote operation of an unmanned heliport. Visit the company on the web at www.avlite.com

SOFTWARE

CORRIDOR Aviation Maintenance Software

(From Hot Products) CORRIDOR is industry-proven software developed to streamline the aviation maintenance process. Created by aviation professionals more than 15 years ago, CORRIDOR continues to improve efficiency, reduce errors, increase control and visibility, reduce costs, and elevate customer service levels for rotor and fixed-wing service providers. CORRIDOR handles all functions in real time. CORRIDOR's modular design allows each organization to tailor the application to their specific needs. Modules include those for Inventory Control, Procurement & Logistics, Maintenance & Shop Management, Part Sales & Retail Distribution, Customer & Vendor Management, Aircraft Maintenance Record Keeping, Accounting Integration, and more. CORRIDOR is

backed by an experienced in-house staff to support each business throughout training and implementation and continued user support. Contact us today for more information or to request a demo, call 1-512-918-8900 or visit www.corridoraero

Sikorsky Aerospace Services Launches Helotrak 2X

Sikorsky Aerospace Services (SAS) has unveiled a new software system for Sikorsky's commercial helicopters, Helotrak 2X. The new web-based software is an upgrade of Helotrak RL and allows operators to access compliance information and links to OEM bulletins, FAA airworthiness directives and maintenance tracking records. Monitoring and maintenance reports, including projections, history and archives, are part of Helotrak 2X, along with the ability to interface directly with interactive electronic technical manuals (IETMs). The software is available for the S-70i, S-76, S-92 and S-434, as well as other helicopter types and fixed-wing aircraft.

PARTS & SPARES Professional Aviation Associates Offers a Global Reach

(From Hot Products) Professional Aviation Associates, located in Atlanta, Ga., operates a 30,000-square-foot warehouse just minutes away from Hartsfield International Airport, with sales support staff in Greer, S.C. and London, England. "We are excited to extend our support offering of the EC155 fleet in addition to our Eurocopter support program for AS350/AS355," said Professional Aviation Associates President Glenn MacDonald. "Our sales force spans the United States, Spain, Latin America, Canada and the United Kingdom. It is a continuation of our goal to grow this part of the business and become the largest independent global supplier of parts for the rotor wing

market." For more information in the U.S. and Canada, call 1-800-283-2015 or visit www.proavation.com

SAR PRODUCTS

Direction Finding SAR from Techtest

(From Hot Products) Techtest has introduced a new DF system designed to reduce the time to locate emergency locator beacons. It is compatible with both 121.5MHz swept tone distress beacons and 406MHz COSPAS-SARSAT transmissions on current and future frequencies. The user is able to monitor four frequencies and detect emergency transmissions. Each transmission is allocated a unique identification which can then be selected for more detailed information. For 121.5MHz the system can display relative bearing details. For 406MHz the system will provide all the same information as 121.5MHz but in addition will record and decode the COSPAS-SARSAT message, giving details of the distress beacon and if available the GPS beacon location. Using digital processing and advanced beam forming techniques, the system is able to discriminate between multiple transmitters and direction find on the signals. All the data is processed using intelligent algorithms to reduce system noise and spurious responses. For more information, visit www.hr-smith.com

COMPONENTS & ACCESSORIES

Air Comm: Superior Choice for the AS350

(From Hot Products) Offering high-performance and an easy-to-install system, the Air Comm Eurocopter AS350 Air Conditioner provides dedicated cockpit and cabin cooling in a lightweight design. The condenser features a direct flow air path and only one 6" diameter circular baggage door cutout. This simplifies installation and does not detract from the aesthetics of

the aircraft. Customers can also take advantage of Air Comm's unmatched customer support, featuring five full-time customer support representatives, online technical manuals, and 24/7 phone support. Backed by exceptional engineering and technical capabilities, Air Comm Corporation designs, manufactures and supports more than 20 heating and air conditioning systems for a range of helicopters, including AgustaWestland, Bell, Eurocopter, MD and Sikorsky.

Elbit All-in-Small Offers Helicopter Self-Protection System

Elbit Systems EW and SIGINT-Elisra is offering its All-in-Small united self-protection system for both rotary and fixed-wing applications. The electronic warfare suite includes advanced multi-spectral DAS and ESM capabilities in a single line replaceable unit (LRU). The lightweight system has a modular design and open architecture for multiple interfaces. The All-in-Small is made up of an EW controller, digital radar warning receiver, IR missile warning system, advanced laser warning system and chaff/flame dispensing system.

L-3 Wescam Introduces MX-10D, MX-Sim

Burlington, Ontario-based L-3 Wescam has launched its MX-10D electro-optical/infrared (EO/IR) imaging and designating turret for helicopters, tactical UAVs and fixed-wing platforms. The Canadian division of New York City-based L-3 Communications unveiled the turret at the Farnborough International Airshow. L-3 Wescam has also introduced a simulator that will allow operators to train with its MX Series of EO/IR turrets. Designed with German company INSYEN AG, the MX-Sim connects to multiple L-3 Wescam standard control systems to provide various pre-planned scenarios in various weather conditions. ✈



Selection of digital-only covers from 2012, as well as from the Military Insider and R&D Report supplements. Graphic design by Gretchen Saval

YEAR IN REVIEW: 2012



What is the outlook for the helicopter industry in 2013? *Compiled by Rotor & Wing staff*

In an effort to provide a snapshot of the hundreds of stories that we cover each year, *Rotor & Wing* has assembled a list of items published from January to November 2012, with special emphasis this year on stories that you may not have come across in the print edition—stories that appeared online at www.rotorandwing.com or in one of our e-letters, including *The Collective*, *Military Insider*, *Hot*

Products and *Helicopter Safety & Training*, a new training-focused newsletter launched during 2012. This list does not cover the entire spectrum of *Rotor & Wing's* various offerings—it is just a sampling of our coverage, as there are many additional news stories and in-depth features available online and through our other distribution channels. One reason we undertake this annual exercise is to gather feedback

about what readers would like to see and open the door of communication with those companies that warrant additional coverage. What are your favorite stories of 2012? What would you like to see in the pages of *Rotor & Wing* in 2013? What areas should we focus on, and what topics, events, markets and companies do we need to cover more? Please send your suggestions to: editor@rotorandwing.com

The Collective

Story of the Week Headline	Date	Story of the Week Headline	Date
Unmanned K-Max Operational in Afghanistan	Jan. 4	Research Helicopter	July 11
Helicopter Industry Struggles to Improve Ditching Survivability	Jan. 18	Australia Plans Aerial Firefighting Future	July 18
NTSB: Pilot Tried to Outrun Storm	Feb. 1	Skeptics to Smiles: Eurocopter Woos DC Military Operators	July 25
Countdown to Heli-Expo 2012	Feb. 6	Russian Medium Twin KA-62 to Fly in One Year	Aug. 1
Open for Business at Heli-Expo	Feb. 8	CAE 3000 Series S-76C++ Simulator	Aug. 8
Two Debutantes Take Stage at Heli-Expo	Feb. 15	Heads to China	Aug. 8
Sikorsky CEO Jeff Pino's View from the Top	Feb. 23	Milestone Orders 19 S-92s, Bell 407GX	Aug. 15
Russian Helicopters Eyes China Civil Market	March 1	Enters Africa	Aug. 15
Operator Profile: Oil & Gas Operators in Brazil	March 8	Exxon Valdez Disaster Recovery, Boeing Tests Unmanned Little Bird	Aug. 22
Japan to Replace Earthquake-Lost EC225	March 14	FAA Announces SMS Requirement, PAG Increases Space	Aug. 29
Russian Helicopters to Squeeze Out UUAP Shareholders	March 23	PZL Takes Wraps Off Optionally Piloted SW-4 Solo	Sept. 5
Turbomeca Gives Operators a Boost	March 28	Russian Helicopters Secures Large Fleet Order from China	Sept. 12
Watch and Wait: Leadership Won't Race into the Breach	April 4	Northrop-AgustaWestland Enters Marine One Round Two	Sept. 19
Brooks: Debt Biggest Threat to National Security	April 11	Designer of Electric Helo Reflects on 2011 Flight Tests	Sept. 26
Lightning Detection: Stormscope and Strikefinder	April 18	FAA Declines Bell 429 Weight Increase, Approves R66 Police Variant	Oct. 3
IHST: 30% Lower Accident Rate 'Step in the Right Direction'	April 25	MSP Receives First AW139 as Part of Fleet Upgrade	Oct. 10
Crosby Calls for 'Marriage' of S&T, Program Management	May 16	Sikorsky Strengthens Bond with Offshore, HEMS Operator	Oct. 17
Eurocopter Preps for First Upgraded EC130T2 Delivery	May 31	Bell, EADS Detail AAS Proposals; AgustaWestland Secures UK Funding	Oct. 24
Russian Helicopters Continues Latin Expansion	June 6	Countdown to Dubai Helishow: 2,000-Plus Visitors, 100 Exhibitors Expected	Nov. 1
A2D Deliveries Start as Army Replenishes OH-58 Fleet	June 13	Experts Discuss High-Rise Aerial Firefighting at Dubai Helishow	Nov. 7
Eurocopter to Push Speed Envelope with X3	June 21	Russian Helicopters Rachel Concept Advances; NHV Buys 10 EC175s	Nov. 15
DoD Stresses Need for Previously Unseen Cooperation if Future Vertical Lift Ambition is to Take Off	June 27		
NASA Seeks Electronics Fix for Rascal			

Military Insider

Hold the Front Page/Insider's Notebook	Month	Hold the Front Page/Insider's Notebook	Month
Industry, Working With or Against U.S. Army: a Toe-to-Toe Discussion at AUSA	January	Money for Old Rope: Demise of the Manned Helicopter?	June
Boeing Hosts Annual Review	January	Cassidian Displays Tanon Rotary UAS at Eurosatory	June
UK Apaches Confirm Littoral Capability Over Libya but Center Stage Reserved for Typhoons	February	Spagnolini Bonds with Russian Helicopters as the Bear Looks Over His Shoulder	July
Finmeccanica 2011 Results: Helicopter Orders Take a Hit from 'On Hold' Government Contracts	February	Bell-Boeing Continues Push to Sell V-22 to International Militaries	July
'Gray Hairs' With Nothing to Prove Strive for Future Vertical Lift Solution	March	USMC Looks at K-Max in Afghanistan to September 2013; Wider Mission Profile Possible	August
ARSOAC Commander Mangum Talks of Transformation in Special Forces Aviation	March	Why the Chinook Still Sells at 50	August
Armed Aerial Scout Comes Second to Future Vertical Lift Development	April	Apache Pilot With a Difference; He's Been a JTAC as Well	September
NATO-Russian Project Kicks Off Afghan Air Force Maintainer Training in Russia	April	Eurocopter Delivers First of 40 Upgraded CH-53GAs to Germany	September
UK Ab-initio Crewman Add Virtual Gunnery to CRM Skills	May	Apache Block III now AH-64E; DAB Approves Full-rate Production	October
A Day at the (Motor) Races Beats the Recession	May	Industry Gives Army AAS Testers Thumbs-Up	October

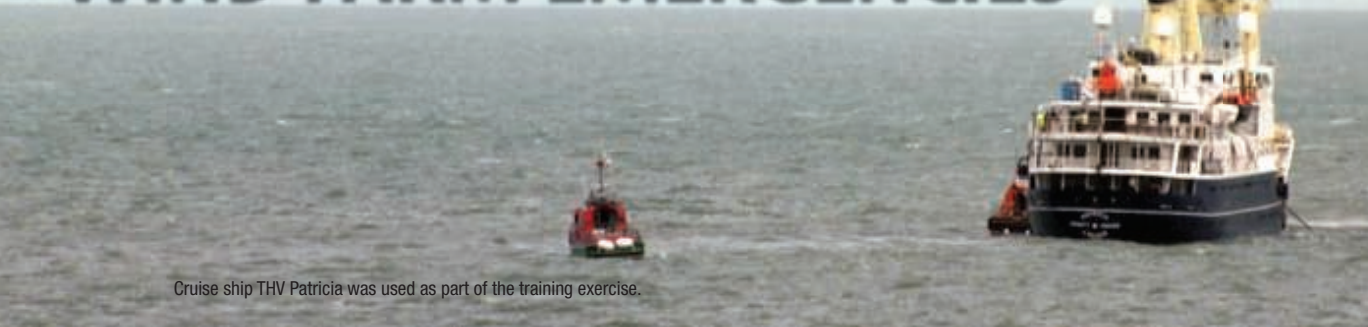
Helicopter Safety & Training

Headlines	Month	Headlines	Month
Russians to Develop 'Intelligent' Flight Safety System, Heli-Union Receives Eurocopter Sim	June	Approval, Enstrom Hands Over Last Thai 480B Trainer	September
Plan Annual Training with Safety in Mind, NTSB to Host Search and Rescue Forum	July	TSI Plans Moral Courage Award, AgustaWestland Delivers 1st AW119Kx, AMTC Expects Record Attendance	October
UTair Training Center Profile, CAE 3000 Series S-76 Sim Heads to China, Rotorcraft Training Guide	August	Bristow Target Zero Earns Safety Award, Bell Teams with SAIT on Canadian Maintenance Training	November
Era Training Center Receives AW139			

Highlights from the Print Magazine

Headline	Page #	Headline	Page #
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GUARDEX 2012: RESPONDING TO OFFSHORE WIND FARM EMERGENCIES



Cruise ship THV Patricia was used as part of the training exercise.

Who responds to a major maritime emergency on the edge of a wind farm? *Rotor & Wing's* Military Editor observed one of Europe's biggest offshore emergency exercises this year.

By Andrew Drwiega, Military Editor

A maritime emergency is developing early at day-break in the waters immediately surrounding the London Array offshore wind farm. Sited at the extremes of the Thames Estuary around the southeast coast of the United Kingdom, the London Array contains 175 Siemens wind turbines covering an area of 100 km². It has recently become the world's largest offshore wind farm.

The cruise ship THV Patricia carrying 61 passengers and crew has lost power and collided with the London Array accommodation ship Wind

Ambition, which houses another 119 service engineers and personnel. As a result of the collision, both ships have fires below decks and there are reports of people overboard, as well as casualties on one or both of the vessels. Furthermore, the Patricia now looks set to drift into one of the wind turbines on the edge of the farm.

Welcome to Guardex 2012, a multi-agency, international search and rescue (SAR) exercise held on Oct. 2, 2012 and coordinated by the UK's Maritime Coastguard Agency (MCA). It involved more than 500 emergency personnel, helicopters, rescue ships

and necessitated the establishment of a temporary casualty/survivor support structure on land including a "survival landing point" at the port of Ramsgate and a "survival reception center" at the Winder Gardens on the sea front at Margate. Civilian and military rescue agencies were all involved in planning, which starts around one year before the exercise.

The rescue would be coordinated from the MCA's Maritime Rescue Coordination Center (MRCC) at Dover, a modern building high on the cliffs above the port with sweeping views of the English Channel. The



(Above) Marine helicopter preparing to land. (Below) Sikorsky S-61 Sea King flies past a wind farm.



brief for Guardex was to test emergency responders over four phases of the exercise.

The first phase comprised the initiation of the maritime emergency, as well as the alerting and coordination of emergency responders. Phase 2 saw the allocation and deployment of the various responders. This then moved into the recovery (Phase 3) where critically injured survivors were the first to be brought ashore by either helicopter or lifeboat and assessed, followed

gone, medically treated (if required) and formally identified.

Role of Helicopters

For reasons of brevity, this report will focus mainly of the role and participation of the helicopters involved. The reason that helicopters can play such a vital role in an emergency scenario of this nature is that, whatever the age of the aircraft—and the RAF Sea Kings are now fairly old—they are still one of the quickest and most ubiquitous methods

of transporting rescue teams into such a hazardous environment and evacuation the injured and those who remain in danger.

The three helicopters that were on call and that responded during Guardex were a British RAF Sikorsky S-61 Sea King from 22 Squadron based at Wattensham airfield, a Belgian Sea King out of Koksijde airbase on the Belgian coast and a French Navy Eurocopter AS365 Dauphin from its base at Le Touquet.

This scenario is not new to the RAF's SAR Force as they have been developing and updating their rescue techniques in this area for at least the last five years, with papers presented and regularly at its annual SAR Conference.

Agencies Taking Part in Guardex 2012

- Maritime Coastguard Agency (MCA)
- Kent Police
- Kent Fire and Rescue
- Royal Air Force (RAF)
- Royal National Lifeboat Institution (RNLI)
- French Coastguard (including the Calais and Dunkirk lifeboats)
- Belgian Navy (warship BSN Stern)
- Ship's Agents
- South East Coast Ambulance Service (SECAMB)
- Kent Emergency Planners
- Ramsgate Harbour authorities
- UK National Health Service



Control center at MRCC Dover.

The air operations would be coordinated out of the RAF's Aeronautical Rescue Coordination Center (ARCC) based at RAF Kinloss in Scotland. One RAF representative would be present for the duration of the exercise in the Silver Cell command group that rapidly formed at the MRCC in Dover (a gold-silver-bronze command structure is used by the UK's emergency services to establish a hierarchical command structure to coordinated command and control during major incidents).

Once the Silver Cell had assembled

tasking for both the Belgian Air Force and French Navy helicopters.

One of the main advantages that helicopter support brings is its speed over vessels, even emergency boats such as lifeboats, which take longer to arrive unless flying becomes impossible generally due to extreme bad weather.

For the purpose of the Guardex Exercise, incidents would include potential burns victims from onboard fires, people lost overboard, a badly injured wind farm engineer located inside a wind turbine, the need to insert

and began its first meeting just two hours after the emergency was received at 0700, enough information had been received regarding the scale of the incident that the cell quickly escalated it to a major maritime incident.

The role of the ARCC was now to task and assist in the coordination of all air assets with the on-scene aerial command being delegated to the RAF Sea King (Air 126). It would command and prioritize

fire teams onto ships with fires and eventually the evacuation of casualties.

During the early stages of the emergency, two RNLI lifeboats from Margate and Ramsgate in Kent were called out, as were two from the French Coastguard stations at Calais and Dunkirk.

The brief for the rescue helicopters covered simulated and potential situations that may be encountered during such a call:

- Rescue Helicopter Tasking
- Rescue persons from water
- Rescue persons from vessel(s) and/or life rafts
- Rescue persons from wind turbines
- Multiple aircraft SAR procedures
- Air Coordination Officer (ACO) manages procedures around wind farms
- Handover of SAR duties between aircraft
- Capture of airborne imagery for debriefs

With two fires now reported onboard both of the vessels it became imperative to deliver specialist fire crews to supplement each vessel's own firefighting team, who were judged not to be able to control the fires. These teams were collected from both the UK and French mainland and winched onboard both ships.

The exercise had also called for the search and rescue of people who had fallen overboard as a result of the collision. Unfortunately, the MRCC had not called the ARCC early in the emergency, which would have got them onto a standby footing earlier than occurred. As a result the eight overboard victims

London Array wind turbines.



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Sikorsky Sea King circles a wind turbine.

(in fact numbered dummies) were all found and recovered by lifeboats and ships in the area before the helicopters reached the exercise area.

There were actually around 40 vessels of all types around the exercise area, some of which London Array boats, and these were very quick in pulling the dummies out of the water—so fast in fact that the plan to have several dummies drift into the area of the wind farm to allow the helicopters to practice their pick-ups in this restricted area never happened. However, the first responding helicopters' declared priority from the MRCC became the collection and insertion of the firefighting teams which in itself was a vital part of the exercise.

Subsequently the MRCC learned that there was also a serious casualty on one of the wind turbines at the edge

of the wind farm. The ship Patricia, still without the power to steer, had caused the casualty, colliding with the turbine after its first collision with the accommodation ship Wind Ambition.

In order for the helicopter crew to conduct a safe and successful winching from wind farm turbines, the RAF has developed the following operating procedure:

- Nacelle should be turned 90 degrees to the wind and locked
- Blades should be feathered and locked—normally in a Y-configuration
- Nacelle doors should be opened and locked in position
- Hover should be as low as possible while maintaining a good escape route and safe separation with the nacelle in the 3 o'clock position.

However, as each rescue is dependent on external

factors such as wind, visibility and light levels, each rescue will be considered on its own merits.

Entering the final couple of stages of the exercise saw the helicopters joining principally with the lifeboats in evacuating the

two main ships. All rescued people were transferred to the landing point at Ramsgate then taken by road transport to the reception point.

In summary, from a negative point of view the helicopters were called in later than planned due to a slight delay in the MRCC contacting the ARCC, and none of the bodies floated into the wind farm area as they were rescued too quickly.

Positives included the successful collection and insertion of two onshore firefighting crews by different helicopters of different nationalities. Arrangements were also made for one of the foreign rescue helicopters to be vectored to refuel at Manston airfield in Kent, UK, thereby allowing it the shortest possible break in availability before re-engaging with the exercise.

Very much on the plus side was the fact that an international multi-agency, multi-asset real-time SAR exercise had been staged close to one of the busiest shipping lanes in the world—the English Channel.

Agencies of all descriptions worked together to overcome a situation that rapidly developed and required the assistance of a wide variety of specialist responders. Lessons learned are never wasted when the real thing happens. ☺



London Array map.

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EXPERTS: TRAINING FOR HIGH-RISE AERIAL FIREFIGHTING BECOMING A MAJOR ISSUE

By Douglas Nelms

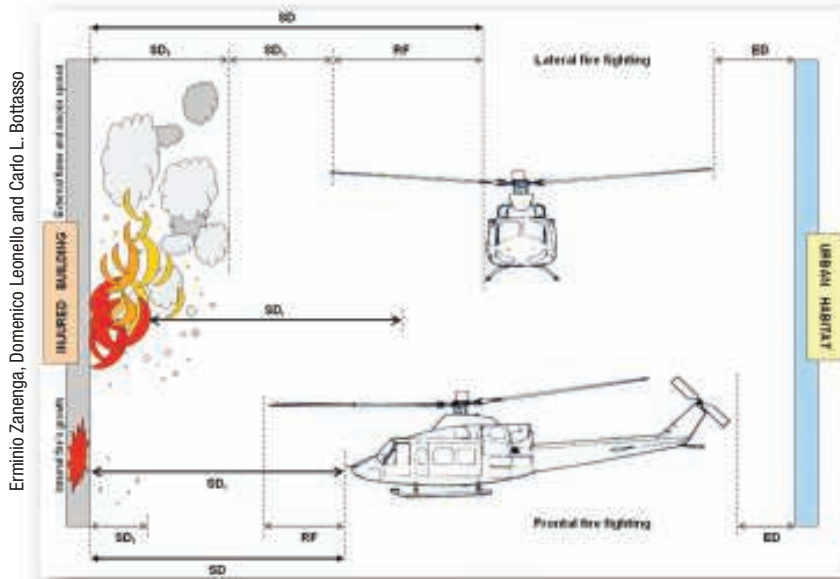
The use of helicopters to fight high-rise fires, defined as being over seven stories, can cause more harm than good if operators are not properly trained, according to Glenn Daley of the New York Police Department. Daley was one of several speakers at the “High-Rise Aerial Firefighting and Rescue” conference held during the fifth biennial Dubai Helishow on November 6. For example, he noted, the spraying with a water impulse cannon into a building bellowing heavy smoke could, in fact, accelerate a fire that had just be smoldering, rather than extinguishing it. Fighting fires at that level is not something that should be done on an “ad hoc” basis, but rather requires significant advance training.

Speakers at the day-long session covered areas including training and procedures, special equipment needed to fight fires, the need for better cooperation between jurisdictions and requirements for the construction and design of high-rise buildings.

The conference was developed by Tangent Link, which sought to “bring together users, operators and suppliers ... everybody within the chain,” according to Rear Admiral and Tangent Link Chairman, Terry Loughran, UK Royal Navy (Ret.), who hosted the meeting. The site of the conference was particularly significant being in Dubai, home of the 163-floor, 2,722-foot Burj Khalifa office building, he pointed out. But while Dubai houses the world’s tallest building, it only ranks 41st in world in total number of high-rise buildings, with 568. The record goes to Hong Kong, with over 7,000 high-risers.

“Given that fires above the seventh floor can not be tackled by ground ladders, you can see the scale of the problem,” he said. With many millions of people now living in dense areas of High Rise buildings, the issues cannot be left to chance. It is hoped that authorities would respond to the opportunities presented to minimize the very real dangers to their communities, he added. Loughran cited two major high-rise fires—the 32-floor Windsor Building in Madrid, Spain in 2005 that took

Graphic shows safe distances during firefighting, from “Feasibility Study of Rotorcraft Firefighting for High-Rise Buildings,” by Erminio Zanenga, Domenico Leonello and Carlo L. Bottasso, who presented at the conference.



Erminio Zanenga, Domenico Leonello and Carlo L. Bottasso

almost 24 hours to extinguish, and the 2009 fire in the 520-foot tall Hotel Mandarin Oriental in Beijing that was engulfed with 20 minutes and burned for three hours.

Fortunately, he said, the Windsor Building fire started at night when there were few people inside, while the Hotel Mandarin Oriental was still in the completion process and not yet occupied. Representatives from several Dubai hotels, as well as security representatives from the Burj Khalifa, were in attendance at the conference.

One of the critical needs for effective fighting of high-rise fires is cooperation, and carefully coordination between the helicopter operators and firefighters on the ground, he explained. Without the two forces working in conjunction, there is serious danger of the helicopter operators doing the wrong thing and making the situation worse.

Effective high-rise firefighting "doesn't happen without careful planning and training," Loughran said. "There is also the need for increased research going into high-rise firefighting, particularly in the development of better equipment and fire suppression mediums."

As far as preventing potential disasters, it starts with the construction of buildings, such as building stairwells around the interior edges of the building rather than down the center, so people have a better chance to get out. Also roofs need to be kept clear of obstructions such as towers or air conditioning units to prevent helicopters from landing to rescue people. There should also be teams trained to access building rooftops to clear obstacles, he said.

Moscow-based Russian Helicopters, the conglomerate established in 2007 to combine five helicopter production

facilities and two design bureaus as well as assorted support organizations, sponsored the conference. Speakers included Lebedev Aleksander, chief engineer for the Ministry of Russian Federation for civil defense, emergencies and elimination of natural disasters, who presented as a case study a Moscow high-rise fire; and Dmitry Zuykov, marketing director for medium class helicopters at the marketing department for JSC Russian Helicopters, who discussed the product range of helicopters for firefighting and rescue operations.

Other speakers included Frieder Kircher, high-rise firefighting expert from the Berlin Fire Brigade, discussing the problem of older high-rise buildings, and Bruce Gullingsrud, vice president of sales for Rotorcraft Services Group, discussing the Medevac Foundation International program. 🚁



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Bristow Target Zero Program Earns Top Flight Safety Foundation Award

Alexandria, Va.-based Flight Safety Foundation (FSF) has given its 2012 Presidential Citation to Bristow Group's Target Zero program. The award recognizes organizations that have exhibited "outstanding service on behalf of safety, whether it be valor, professionalism or service above and beyond normal expectations," according to FSF. The organization presented the award to Bristow Group's Jonathan Stripling, director of global quality, safety and standards, during the International Air Safety Seminar in Santiago, Chile. During the event in late October, FSF also granted its Laura Taber Barbour Air Safety award to Robert Sheffield, a member of the International Helicopter Safety Team who is a former employee of Shell Aviation.

FAA Certifies CAE Bell 412 Full Flight Simulator to Level D

Canadian training and simulation provider CAE's Bell training center in Toluca, Mexico has obtained FAA Level D qualification for its Bell 412 full-flight simulator (FFS). The helicopter simulator already has Level D approval from Direccion General de Aeronautica Civil (DGAC) of Mexico. CAE's Toluca facility opened in January 2012 and is the country's first helicopter training center with an advanced simulator.

MedFlight of Ohio Earns Safety Award

American Eurocopter presented its 2012 Vision Zero Safety Award to MedFlight of Ohio during the 2012 Air Medical Transport Conference in Seattle, Wash. MedFlight was selected from a group of 25 nominees, all of which were members of the Association of Air Medical Service (AAMS). The award comes with a \$10,000 check, which MedFlight plans to use toward its safety management system (SMS) program. Metro Aviation operates MedFlight's fleet of eight Eurocopter EC130s.

Colorado Heli-Ops Expands Training Space at Rocky Mountain Metro

Denver-based Colorado Heli-Ops has expanded its office by moving across the runway at Rocky Mountain Metropolitan Airport (KBJC). The more than 1,000-square-foot addition gives Colorado Heli-Ops room for classrooms, flight training devices and offices. The company's utility division also underwent a 1,300-square-foot upgrade to its space. Colorado Heli-Ops specializes in training on the Robinson R44 and the Schweizer 300C.

AAG Receives IS-BAO Certification

Sikorsky subsidiary Associated Aircraft Group (AAG) has obtained International Standard for Business Aircraft Operations (IS-BAO) Stage 1 certification. The International Business Aviation Council (IBAC) recognized AAG for its safety management system (SMS). AAG "went to great lengths to develop a framework for our SMS manual, safety risk profiles, risk assessments, operational alerts and a database for use across our operation and maintenance departments," according to President Scott Ashton. The company operates one of the largest fleets in the northeastern U.S., with nine S-76Cs.

AeroSimulators Expands Web-Based Services in Brazil

To meet the needs of the growing Latin American helicopter market, AeroSimulators has unveiled a new website focused on Brazilian helicopter simulators. The site compares infrared footage from police aviation units with the visuals from AeroSimulators' Gimbal Imaging Systems Trainer (GIST). AeroSimulators previously launched a website dedicated to Latin American helicopter training.

Bell, SAIT Polytechnic to Expand Canadian MRO Training

Canada's SAIT Polytechnic has strengthened its partnership with Bell Helicopter to include maintenance training, repair training and certification courses at the Art Smith Aero Center in Calgary. Under the agreement, Bell Training Academy (BTA) instructors will be able to carry out factory-approved type certificate maintenance training at the SAIT classrooms and labs, including mechanical, electrical and avionics training, as well as pilot safety courses. According to Brian Moukperian, dean of SAIT's School of Transportation, the partnership with BTA is a "natural expansion of [our] hands-on approach to education."

Brazilian EC725s to Receive Cassidian/Atech TDMS

EADS division Cassidian has partnered with Atech of Sao Paulo, Brazil to supply a tactical data management system (TDMS) for the Eurocopter EC725s that will enter service with the Brazilian Navy. The companies will work with Helibras, Eurocopter's representative in Brazil, to integrate the mission system into eight of the helicopters as part of an agreement worth more than €40 million (approximately \$51.2-million). Work is scheduled for completion in 2017. The Brazilian Navy has ordered 50 EC725s as part of a fleet upgrade program. ✈

Coming Up

in rotor & wing

January 2013:

Annual Reports—As we approach the start of the new year, *Rotor & Wing* surveys its advertisers, key vendors and suppliers in the helicopter marketplace, and asks them to tell us what important changes they have made in the past year, as well as provide an update on what new products, initiatives or innovations we might expect to see from them in the coming months.

Executive Outlook—*Rotor & Wing* asks the top executives from each of the Annual Report companies to provide a brief answer to simple questions regarding what they see on the horizon for the rotorcraft marketplace in 2013. The compilation of these answers produces an insightful prediction of what to expect. The Executive Outlook provides valuable insight and an indispensable planning tool for the coming year.

We Fly the MD540F—Editor-at-Large Ernie Stephens took the controls of the MD540F during a recent visit to Mesa, Ariz. Although it is technically still under development, MD offered *R&W* an exclusive hands-on evaluation to learn about the aircraft MD assembled and demo'd for the U.S. Army, and put it through the paces ourselves. The result is a comprehensive technical briefing from the designers, and an appraisal of its handling characteristics and flight systems.

Q&A with Marc Paganini—The American Eurocopter President & CEO spoke with Editor-in-Chief Andrew Parker on a wide range of topics during an exclusive interview in November, including the outlook for North American markets and his organization's involvement with the Army AAS voluntary flight demonstrations and X³ (X-cubed) U.S. demo tour. 🛩

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Safety Watch

By Terry Terrell



Good Radio

Even with today's advancing technology, good radio communications, absolutely vital to safe operations, sometimes seem to have become a lost set of arts. Radio traffic in all helicopter communities, to include operationally ancillary activities, should be made consistently effective through both precision and concision, taking advantage of at least a moderate degree of standardization among users. Countless procedural refinements aimed at maximizing radio effectiveness have been developed since Marconi's first transmitted words, but the following short list of radio use "tips," taken as specifically pertinent to helicopter users, has developed:

1). **Always begin initial radio calls, and all subsequent radio transmissions, with the recipient's identity, followed by the sender's (YOUR) identity.** This procedure is fundamental to correct radio use, despite the reverse order of radio party identification commonly heard in some helicopter utility radio environments, to specifically include medical radio networks familiar in EMS operations. Correct order, beginning with the recipient's identity, serves to alert the recipient at the beginning of the transmission, so that what follows is most reliably heard by the recipient. Having the recipient's identity called first, before the caller's identity, will maximize the chances that the recipient will be alerted when he hears his "name," and then pay attention to the identity of the sender, and to the rest of the message.

2). **Always acknowledge transmissions.** Human communication, via radio or otherwise, always requires a transmission and a reception. A transmission alone does not constitute communication. So always get a read back, or a "Roger," after you have made a transmis-

sion. Otherwise, you can't be certain that your transmission has been received. Conversely, always return a Roger, or a read back, after receiving a transmission.

3). **Use effective radio vocabulary.** Correct radio use language and phrasing conventions exist for a set of very specific reasons, partially growing out of the reality that radios in the early days were subject to being plagued by excessive static, signal strength variability and assorted other impediments to clear transmission quality. Operators, accordingly, quickly learned to keep their transmissions short, and delivered with exaggerated pronunciation clarity. Even today, our best radios and systems cannot always guarantee perfect transmission fidelity. And with many radio networks, getting a word in edgewise can sometimes be difficult, so completing a transmission without interference can be a challenge, and brevity can become a vital asset. All radio communications should be as brief and as simple as possible, so that radio transmission time can be minimized and so that misunderstandings, and the necessity for repeat transmissions, can be curtailed. Phonetically clear and distinct lingo should be consistently used whenever possible, so that transmission content accuracy can be maximized even if radio reception and clarity are poor. Within EMS helicopter communities, as an example of radio communication necessary as an indirect but crucial component in helicopter operations, medical radio messages cannot always be short and simple, but certain fundamental radio vocabulary terms can be used on behalf of minimizing wasted radio time. The best radio vocabularies take advantage of very distinctive phonetic sounds, not easily confusable, and understandable with minimal misinterpretation, even if transmissions are garbled.

Useful Radio Lingo:

ROGER: "I hear you clearly, and I understand you."

WILCO: "I hear you, I understand, and I will comply with your request."

REQUEST YOU: This preface is used when you are asking that the recipient of your transmission accomplish something at your request.

AFFIRMATIVE: Even though it may seem unhandy, it is the least misunderstood way of answering yes.

NEGATIVE: As above, but for no.

ONE FIVE FIVE POUNDS, ONE TWO MINUTES, or MINUTE THREE THREE: Meaning "a hundred and fifty five pounds," "12 minutes," and "33 minutes after the hour." This method and style of verbalizing numerical values has proven to be the most understandable alternative, and it's obviously axiomatic that accurate communication of numbers can often be operationally critical.

4). **Break up long radio transmissions.** If they are necessary, as when conveying medical information via utility networks, transmissions can be broken into several shorter segments. This will allow assurance that transmissions are being received and understood, and, in case otherwise, will minimize wasted time caused by having to start over later. (Also, it will give the recipient an opportunity to speak.) A useful lingo device for breaking up long reports is the phrase "HOW COPY SO FAR?," which can be inserted after a moderate portion of your report, and periodically, if necessary, thereafter.

These tips are tried and true. Good radio technique not only enhances effectiveness (and, ultimately, safety) of all operational participants, but can breed more of the same, since others often tend to imitate good technique and improve their own radio skills. 🛩

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Leading Edge

By Frank Lombardi



Ground Effect Revisited

There will always be aviation incidents or accidents due to circumstances beyond the control of the pilot. Unforeseen component failure has terminated many a flight prematurely. But some of the hardest accident reports for me to read are the ones that involve true pilot error—the type of error that can come from years of incident-free flying bringing insidious complacency or oversight.

Student pilots go to great lengths to learn lessons involving physics and aerodynamics for their checkride, and then something happens. They pass the ride, and some of them never revisit those lessons again.

To a great extent, staying airborne comes down to this: power required versus power available. It is a concept that should not be overlooked in recurrent training. Unfortunately too often, not being mindful of this ends up as a causal factor in many helicopter accidents, when the former exceeds the latter.

To a similar extent, the environment that hovering helicopters operate in comes down to this: out of ground effect (OGE), versus in ground effect (IGE). “Ground effect” is an aerodynamic condition that reduces the power requirements of the main rotor when it is operating in close proximity to the ground. It is a physics lesson in action as it can readily, and sometimes acutely demonstrate the power required versus power available concept.

The benefits of ground effect begin at the surface, are greatest when the helicopter is closest to it, and are completely gone by about 1.5 rotor diameters above it. Its strength and height

is variable, depending on atmospheric conditions, surface conditions, disk loading, and rotor-to-ground distance. Smooth flat surfaces provide the most benefit, while tall grass or bodies of water rob you of it.

For any helicopter to hover it must produce enough vertical lift to equal its weight no matter what the condition. How hard the engine must work to turn the rotor and create that lift force is measured as power required.

Consider this: most of the power required to hover comes from overcoming induced drag (drag due to lift). At subsonic speeds, air molecules behave nicely with one another, telegraphing their intent to their surrounding peers. As a result, when the rotor approaches to within 1.5 rotor disks of the surface, the air hitting the ground has an effect on the air above it by slowing the induced flow. Slowing the induced flow lessens the rearward tilt of the resulting lift vector, which lessens induced drag. This means that for a given condition, less power is required to produce the same amount of lift IGE, as would be required OGE. Realize that this does NOT mean there is more power available for the pilot to use!

This may seem obvious to most, but I wonder how apparent it was to the pilots that have successfully picked up into a hover on a pier or elevated helipad, nearly at or slightly over gross weight, only to find out that the very same helicopter required more power to hover, beyond what was available, once they moved off the platform?! Sadly, some are no longer here to explain their thoughts.

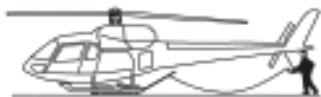
It can take over 10 percent more power to hover OGE than IGE. As

an exercise, on a day with little or no wind, you can make what flight testers call a “hover ladder” and see this effect for yourself (please realize that you will be in the shaded area of height-velocity diagram). Get the helicopter steadied after just breaking ground and note the power setting. Now increase power by a couple percent. The helicopter will begin climbing but will stop at a slightly higher altitude. Note this increased power setting and altitude. Continue adding power incrementally, wait for the helicopter to come to a stop, and each time note the increase in power required versus the increase in altitude. At some point, the power required to hold a new altitude will become a constant. Any additional power will cause the helicopter to continue upward at constant rate. The altitude at which you first reached this constant power setting marks the transition from IGE to OGE.

It is entirely possible to obtain a combination of hot, high, or heavy conditions where you have IGE power available, but your OGE capability is nonexistent. In that case, it’s not hard to imagine the rapid evolution of events. A “routine” flight with many successful takeoffs in the past might preempt a weight and balance check, or reference to any hover ceiling chart. But on the day the scales literally tip in the wrong direction, a power requirement that critically exceeds the power available will ultimately be answered with a drooping rotor, loss of lift, and possible catastrophe. To every extent possible, remember to revisit the basics and make it your business to know the limits of your aircraft. Everyone is depending on it. ☞

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Military Insider

By Andrew Drwiega

Affection is One Thing; Its Capability That Matters



Approaching the beginning of my fifth decade, I look back to those old western movies with high regard, remembering as a boy being thrilled by the arrival (just in the nick of time naturally) of the cavalry with their white hats, yellow neckerchiefs, white gloves and blue uniforms with the distinctive yellow stripe down the trousers. The image was one that endured, from Randolph Scott in 7th Cavalry to John Wayne in Fort Apache. This romanticized view of the cavalry was a stretch away from the true life and times of the Army during the wars with the native North Americans. Things can often seem better than they are in reality in the present too. During discussions over the potential of an Armed Aerial Scout acquisition program at AUSA, there are still many serving crewmen and ex-crewmen who hold the Bell OH-58D Kiowa Warrior in high regard. This includes ground-pounders who have been thankful for its close air support over the decades, with many a pilot flying into harm's way to relieve a bad situation on the battlefield.

As with virtually all helicopters, operations first in Iraq and then Afghanistan laid their operational shortfalls bare. Helicopters primarily designed for European land warfare during the Cold War with the Soviet Union were exposed by the heat in Iraq, then the combination of heat and altitude in Afghanistan. The UK's AgustaWestland Lynx helicopter was virtually out of the operational mix during the hot summer months in both war zones until it was up-engined and given a rotor blade (main and tail) upgrade. Talking at AUSA with James Moentmann, a 28-year Army veteran now working for WBB and an independent advisor

to EADS North America, I got more of an appreciation of the real day-to-day problems faced by those operating the Kiowa in combat. Moentmann retired at the rank of Colonel and commanded at the company, battalion and combat aviation brigade levels, flying among others the OH-58D and Bell Cobra AH-1. His career also includes Chief of Staff for Combined Forces Command-Afghanistan, as well as Chief of strategic plans, concepts and doctrine for the Army Staff and Commander of the 2nd Infantry Division Aviation Brigade.

He has watched in frustration with many others at the failure to replace the aircraft. He explains that crew and maintainers (including private contractors) have done great things in keeping the aircraft doing a job. "There's a lot of affection for the old aircraft in the same way you would have for your old horse," he said, which also included the "manly" connotations of being an aerial scout "no doors, no air conditioning, not much power and alone and unafraid with a few .50-cal rounds." When in Afghanistan, he continued, "we hardly deployed OH-58s around Regional Command East because it just couldn't operate in high/hot. As an aviation brigade commander, you have a choice to overwork your Apaches to fill in the gaps. But that is not what they are there for, and cost benefit wise it doesn't make sense either. But you need the smaller cabin on the Kiowa Warriors for other duties including insertion/extraction, taking local leaders to meetings, etc." In such an environment, he says, power is such a big deal. "If the crew have to make a sudden evasive maneuver and put the aircraft into a bank, they run the risk of over-torquing the aircraft—that translates badly for survivability and mission

effectiveness. Aircraft have needed major components to be replaced because they came under fire and had to bank hard and so doing overtorqued the engine."

"The max gross weight of 5,200 lbs was also an issue," states Moentmann. "I did analysis on the OH-58D aircraft with all the equipment. The empty weight of the aircraft as is being deployed, sitting with no fuel but ammunition and the crew came to 4,878 lbs. That gives you 300 lbs and change in gas. They burn around 280 lbs of fuel an hour when they are flying, so they have around an hour's worth of fuel." The battlefield solution is to place forward aerial refueling points (FARPs) when the aircraft are going to be needed. That is manageable for a planned operation, but not good in an emergency. "Talking to friends returning from Afghanistan they have to put FARPs out for almost every mission. Locating FARPs at outposts increases vulnerability of the mission as well as direct and indirect costs. The post has to be manned and fuel transported (perhaps by road)—increasing the opportunity for physical or IED attack, then maintained at that location.

"I had an engagement with the 82nd recently when they came out of Afghanistan. There were missions that they had to refuse because they didn't have the legs to get there and back. They didn't have time to put a FARP out. So they had to apply Apaches to make up the shortfall of the Scout mission. Now that means they take risk in the attack mission. But they did everything they could to maximize their capability with the aircraft they had."

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