



Rotorbreeze®

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Twenty Years

of Helicopter Development at MIRABEL

Since its launch in 1986, BHTCL's Mirabel facility has produced several helicopter models and celebrated many milestones. In fact just last summer, the plant commemorated the delivery of its 3,000th helicopter, a Model 412, to Air Logistics. At the beginning, the plant was designed to build Model 400, a four-bladed light twin. When the project was put on hold due to market conditions, the plant started producing Bell Jet Rangers and Long Rangers. Turbo West of Colorado took delivery of the first 206B3 assembled at Mirabel in December 1986 when BHTCL also began production of Models 212 and 412.

Within its first five years the plant delivered 500 helicopters around the world. In fact, Air Logistics took delivery of the 500th helicopter, a 206L3, in May 1991. In August of that same year, we also celebrated the first flight of Model 230. The Mirabel team, in collaboration with their counterparts in Fort Worth, had been working on improving the popular 222 since 1989 and would start working shortly on the next generation, Model 430.

The 430 is a stretch version of the 230; it is outfitted with a larger cabin, a four-bladed bearingless rotor and more powerful Rolls Royce engines. It also incorporates the latest in instrument technologies with a Rogerson Kratos IIDS and Honeywell EFIS. Deliveries for the 430 started in 1996 and in September of that year, Ron Bower and John Williams set an around-the-world speed record of 17 days, 6 hours, 14 minutes and 25 seconds in their Model 430 aircraft.

During the late '80s and early '90s, the Mirabel teams worked on a wide variety of projects: a composite tailboom for the 412, the upgrade of the 206L3 to the L4 configuration we know today, a Dual Digital Automatic Flight Control System (DDAFCS) for the 412, and a twin conversion for the 206L, called the 206LT, based on Tridair's Gemini ST conversion. Then came the contract for 100 CFUTTHs

for the Canadian government and the development of Model 407. A derivative of the 206L4, the 407 is a four-bladed light helicopter powered by a Rolls Royce 250-C47 engine which incorporates several new technologies such as a FADEC (Full Authority Digital Engine Control), composite main rotor blades, and composite sidebodies and doors. Since its maiden flight in June 1995, the model 407 has proved to be one of the most popular light helicopters.

The CFUTTH (Canadian Forces Utility Tactical Transport Helicopter) represented a significant modification to the basic Model 412. It had to incorporate NVG (Night Vision Goggle) instrument and lighting systems, a Health Usage and Monitoring System (HUMS), and the provision for multiple kits allowing for quick reconfiguration based on mission requirements. Renamed the CH-146 Griffon, one hundred helicopters were delivered to the Canadian Forces between 1994 and 1997.

In 1996, Bell started developing its Model 427. A light twin-engine aircraft powered by two Pratt & Whitney 207D engines with FADEC, the 427 has a four-bladed main rotor and can seat up to seven passengers. Designed entirely on CATIA, the use of an electronic mock-up as well as technologies such as stereolithography helped to shorten development time. Model 427 first flew on December 11, 1997 and deliveries began in 2000.

By then the Mirabel team had already started work on their next projects: a version of the 412 for the Royal Saudi Air Force (RSAF) and an improved model 412 called the 412+. The plan for the 412+ was to upgrade the engines and transmission, provide a glass cockpit with Rogerson Kratos IIDS and incorporate a composite tailboom. Although the RSAF took delivery of several 412s, the 412+ project was put on hold.

Then in 2002, work began on the development of another generation of

helicopters: the MAPL family (Modular Affordable Product Line). The first helicopter of this family will be the Model 429. A light twin, the 429 will be powered by two 207D1 Pratt & Whitney engines. Its large open cabin and flat floor make it versatile for a multitude of missions, including EMS. The first prototypes are currently being assembled here and are scheduled to fly later this year.

The development of our latest model, the 417, began in 2004. Based on the ever-popular Model 407, the 417 will provide updated avionics with Chelton displays and be powered by Honeywell's HTS-900 engine. Its first flight took place in Fort Worth on June 1, 2006.

As tumultuous and exciting as have been the last 20 years for the Mirabel facility, the next 20 look even brighter and more challenging!

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Telephone: (817) 280-8779

E-mail:

mdewey@bellhelicopter.textron.com

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EDITORIAL STAFF

Michael Dewey, *Editor*

Ella Maclin

Support Administration

ADVISORY COMMITTEE

Jack Denham

Ex. Director Product Support

Leslie Ferry

Business Development Marketing Mgr.

Mark Kocurek

Manager IPT Customer Support

Andy Kelley

Product Support Engineering

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MODEL 429 CUSTOMER ADVISORY BOARD

Bell has formed a Customer Maintenance Advisory Panel (CMAP) for the all new Single Pilot Instrument Flight Rules (SPIFR) light twin helicopter. The 429's scheduled maintenance inspection programs are being developed using the principles of the ATA Maintenance Steering Group Version 3 (MSG-3). Numerous week-long sessions have already been held with operators, brought in from all over the globe to the commercial manufacturing facility in Mirabel Quebec; this includes aviation authorities from Transport Canada and the FAA. It is our goal through this method to introduce the helicopter with streamlined maintenance requirements to ensure competitive Direct Operating Costs (DOC), low maintenance costs, improved reliability and to maintain overall safety. The team has already generated expanded scheduled inspection intervals. Airworthiness lives are being designed to 10,000 hours, and component overhaul intervals are much greater than the current 427.

CMAP is a team effort involving OEM, helicopter operators and Airworthiness Authorities. The panel has representatives from Bell Helicopter, the aviation industry, with experience in practical helicopter maintenance and operations, and from the North American and European Aviation Authorities.

The objectives of the CMAP team are:

- 1) To ensure aircraft safety and operating economy

- 2) To minimize deterioration of the inherent aircraft reliability and safety
- 3) To minimize on-aircraft failures by preventative maintenance, using proper maintenance through Instructions for Continued Airworthiness (ICA)
- 4) To minimize maintenance costs and DOC's

You may ask why CMAP? The CMAP team will primarily develop an initial maintenance program for the next generation of Bell's SPIFR light twin helicopter. And it assists in the development of Instructions for Continued Airworthiness (ICA), to determine both the maintenance tasks and intervals.

Setting the initial maintenance schedule will determine an effective interval for each maintenance task. This will be

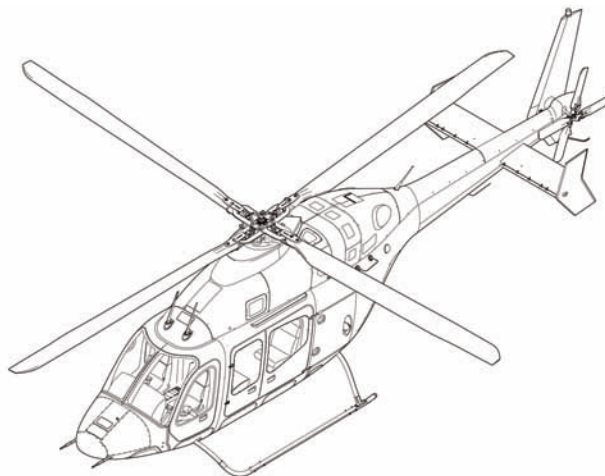
determined by using operating experience from prior knowledge of other aircraft, engineering judgment through design improvements, and OEM and Vendor recommendations.

The current interval goal is set at 200 flight hours and 800 flight hours/12 months. 200 hours being the first scheduled maintenance task says a lot for the CMAP/MSG-3 approach. Having said that, Bell believes this philosophy could also be applied to prior models to help reduce operating costs.

There are numerous benefits of a Customer Advisory Panel, such as improved customer knowledge of the aircraft through familiarization overview and technical review of the airframe and systems during CMAP meetings. The team approach is a great experience between customer and manufacturer and we have certainly found that customer suggestions have been invaluable. The analysis data will also be available for additional requirements such as publications and our Product Support Engineering database for future reference.

For task and schedule development, the CMAP team uses a Reliability Centered Maintenance (RCM) process. RCM and MSG-3 were developed to improve safety and reliability and utilize the

Continued on page 8



ASSEMBLY TAKES OFF AS 429 APPROACHES FIRST FLIGHT



Systems installation for aircraft No. 1, front, is progressing smoothly, and fit checks have been perfect. In the background is aircraft No. 2.

Systems installation is progressing well on the 429 aircraft assembly line, including:

- **WIRING**
- **FIXED CONTROLS**
- **FUEL SYSTEM**
- **HEATING SYSTEM**
- **PITOT/STATIC SYSTEM**
- **POWER DISTRIBUTION**

First flight will occur later this year with certification from Transport Canada Civil Aviation and the United States Federal Aviation Administration in 2007. Initial production is scheduled for late 2007, and European Aviation Safety certification will follow in mid-2008.



The view through an access panel under the pilot station of electrical, heating and control systems.



Harness routing, heating system, control fit check and installation.



Circuit breaker panel and power distribution panel installation.



Several door configurations are available on the 429: A basic aircraft sliding door and forward hinged door, left, an optional larger sliding door and a smaller forward hinged door, center, and an optional larger hinged door hinged on the smaller forward hinged door.

429 doors get into the swing (and slide) of things

The Bell 429 basic aircraft comes with one sliding door that provides 32.5 inches of non-obstructed opening and a forward-hinged door with 29 inches of non-obstructed opening on each side of the aircraft. Opening of both doors on the ground gives an opening 61.5 inches wide.

The basic aircraft sliding doors can be replaced with an optional larger sliding door providing 52 inches of non-obstructed opening (great for a hoisting operation). A large hinged door for corporate use is also available to give 52 inches of non-obstructed opening.

In both cases, the smaller forward hinged door can also be opened on the ground for an additional 9.5-inch opening.

Several seat configurations available

The Bell 429 is equipped with crew seats that are adjustable forward and backward as well as up and down to meet customer requirements and comfort for pilot sizes from fifth percentile female (5 feet, 112 lb.) to 95th percentile male (6 feet 2 inches, 225 lb.).

Several passenger seats configurations are offered in the Bell 429 to satisfy various customers' demands:

The basic aircraft comes with six 15.5-inch-wide passenger seats. Seats can be installed in either club or airline configuration, and changing from one configuration to another is a matter of minutes with the optional quick disconnect feature.

The following optional seats are also offered:

- 18.8 inches wide, standard finish
- 18.8 inches wide, corporate finish
- 18.8 inches wide, corporate finish with fold-down back insert
- 21.5-inch-wide corporate seats with arm rest.

Tail rotor guard

The Bell 429 will have an optional tail-rotor guard to provide enhanced safety against people approaching the tail rotor while an aircraft is on ground with the engines running. The tail-rotor guard also provides enhanced safety as people load from the back and move back toward the tail rotor.

Q&A with BELL HELICOPTER CUSTOMERS

Q: Does the model 429 come with energy attenuating seats? Are the seats a standard aircraft configuration or option?

A: Energy attenuating seats are standard aircraft configuration for the Bell 429. All seats are energy attenuating to meet the latest airworthiness regulations and enhance aircraft safety.

Q: What standards are the Bell 429 airframe and seats designed to?

A: The Bell model 429 airframe has been designed to meet the requirements of AWM (FAR) 527.561 static loading. The seats have been designed by the supplier to meet AWM FAR 527.562 crash loading. The Bell 429 is designed to meet the most recent airworthiness standards in terms of occupant's safety.

Q: Does the 429 come with a crashworthy fuel system?

A: The 429 fuel system and its surrounding structure are designed and tested to meet the latest standards for crashworthiness.

Q: How much impact can the fuel system endure?

A: The 429 airframe structure that supports the fuel cells has been designed in accordance with AWM FAR 527.561; 4g forward and 4g down. The fuel system is designed to comply with AWM FAR 527.952 Fuel System Crash Resistance. As part of the compliance to these FARs, the fuel system and surrounding structure is subjected to a 50-foot airframe drop test to demonstrate that no fuel leakage results from the impact.

Q: Where is the auxiliary fuel tank installed and what is its capacity?

A: The auxiliary fuel tank is installed flat in the baggage compartment; its capacity is 40 USG.

Got a question about the Bell 429? E-mail us at 429designed4u@bellhelicopter.textron.com

Bell Listens!

As a follow-up to the article in the previous newsletter and based on customers' input, the Bell 429 flotation system will be designed and certified to meet both requirements of emergency flotation and ditching flotation. Three kits will be offered:

- Emergency flotation system (without life rafts or life vests)
- Joint Aviation Requirements-Operations 3 (JAR-OPS 3) ditching flotation system (with life rafts and vests)
- Structural re-enforcement ditching kit (required when the ditching flotation kit above is used).

ARMED RECONNAISSANCE HELICOPTER FLIES!

Bell Helicopter has announced that the Armed Reconnaissance Helicopter (ARH), the Bell ARH-70A, completed its first two flights.

The aircraft took off from Bell XworX in Arlington and flew multiple handling maneuvers, flew in a hover for both in and out of ground effect and flew in a traffic pattern reaching 80 knots, 500 feet in altitude, with banks up to 30 degrees for a little more than 1.5 hours of flight. The flights delineate the ARH program as one of the fastest “contract to flight” programs ever completed and set a new standard for such acquisitions.

“This is an outstanding day for Bell and our customer, the U.S. Army,” Chief Executive Officer Mike Redenbaugh said. “The ARH-70A is needed for the war on terror that is being fought by our military. This flight begins a new phase in the development of the aircraft and brings it closer to beginning the mission it was designed to execute.”

The first flight also demonstrated the unique ARH teaming relationship between Bell and the U.S. Army with both Bell and Army pilots conducting the operations. Bell test pilot Jim McCollough and Army pilot CW5 Alan Davis performed pilot and co-pilot



operations, proving the Commercial Off-The-Shelf (COTS) platform approach can be successfully applied to military applications.

The ARH-70A is a complete weapons system designed to meet aerial reconnaissance capabilities to operate with the current and future force. It is equipped with lethal weapons capability and net-centric connectivity, and is also equipped for day and night operations. Taken together, these features enable the air-ground maneuver commander to “see-understand-act first.”

“Today’s first flight marks a major milestone for the ARH-70A as the program transitions into the flight test phase,” said Bill Leonard, Bell’s ARH-70A program manager. “Our team’s focus continues to be towards the completion of the build and functional test of the remaining three test aircraft, clearing the path towards a successful Limited Users Test (LUT) and finishing the production design.”

The program schedule has LUT beginning late 2006 to early 2007, in order to complete the production award criteria required to accomplish the first unit equipped in fourth quarter of the 2008 fiscal year (FY) and full-rate production in FY 2009.

TRAINING ACADEMY MILESTONE



The Bell Helicopter Training Academy celebrated a milestone on September 11, 2006 when they recognized Donald “Chip” Wood as their 100,000th student. Mr. Wood is the Principal Operations Inspector with the Federal Aviation Administration. He has been attending the Bell Training Academy since 1995. *“I’ve truly enjoyed my affiliation with Bell Helicopter over the past 20 years. It’s quite an honor to be the 100,000th student at the Bell Training Academy and a part of such a long history of excellence.”*

“Celebrating our 100,000th student is such an awesome event for Bell and the Customer Training Academy. And with Chip being a long-time student of the Training Academy and someone that we work with closely at Alliance Airport, I was so pleased it turned out to be him,” said Launa Barboza, Director of Bell Training Academy.

The Bell Training Academy began in 1947 when Bell Aircraft moved their helicopter operation from Buffalo, New York to Fort Worth, Texas. For over 59 years, the academy has provided world-class, FAA-certified training – both in the Fort Worth area and at customer locations around the world. The Training Academy moved to its current location at Alliance Airport in January 2005. This facility houses over 60 staff and instructors, 7 helicopters, 27 classrooms and laboratories and 3 flight training devices.

AH-1Z/UH-1Y COMPLETE DEVELOPMENTAL TESTING

By John Milliman, H-1 Program Public Affairs

NAVAIR PATUXENT RIVER, MD – The H-1 Upgrades Program, which is replacing aging Marine Corps UH-1N and AH-1W aircraft with upgraded and 84 percent identical UH-1Y and AH-1Z aircraft, completed developmental testing Feb. 17.

Currently, the program is preparing to enter Operational Evaluation as well as to start a third Low-Rate Initial Production lot.

Two of the five developmental test aircraft have already been transferred to the operational test squadron and are being used to train the Marines who will conduct the operational evaluation. Two aircraft are in final preparation to be transferred to the operational test squadron.

The first H-1 to fly in the upgraded configuration, AH-1Z-1, is currently preparing for live-fire testing at the Naval Air Warfare Center, China Lake, California.

Bell Helicopter, the manufacturer of the aircraft, has 16 aircraft on two firm fixed price Low-Rate Initial production contracts worth \$185.6 million and \$111.4 million respectively. Seven aircraft are already in assembly in Amarillo, Texas.

Since the first AH-1Z made its maiden flight Dec. 7, 2000, the five aircraft assigned to the H-1 Upgrades program here, tallied a total of 3,324 flight test hours and 3,048 test sorties in the development test and qualification of the AH-1Z and UH-1Y. The aircraft also have fired more than 2,000 2.75-inch rockets, 13,662 rounds of machine gun and automatic cannon ammunition, 11 Hellfire anti-armor missiles and three AIM-9 Sidewinder air-to-air missiles.

To date, the H-1 Operational Test Team has put a total of 156.6 flight hours on the aircraft in 92 sorties.

The AH-1Z Viper and UH-1Y Venom are slated to replace the current fleet of AH-1W and UH-1N aircraft which have been operating at sea with the Marine

Corps for many years. The H-1 program provides over 80 percent parts commonality for the two aircraft.

A change to the program that will build UH-1Ys completely new, rather than remanufacturing them from aging UH-1Ns, was approved by the Defense Department's acquisition chief in April 2005. The first new build UH-1Ys will start production in 2006 as part of the third lot of low-rate initial production aircraft. First deliveries of the new aircraft are scheduled to begin in 2008.

"The program has changed significantly since its inception to significantly enhance the performance and operational effectiveness of the aircraft



beyond the original requirement," said Col. Keith Birkholz, the H-1 program manager. "The original program approved by Undersecretary of Defense Kaminski in 1996 provided for upgrades to the aging UH-1N (Huey) and AH-1W (Super Cobra) rotor, transmission, and tail systems, along with an AH-1W cockpit upgrade (the AH-1W suffers from having a very high pilot workload).

"The current program provides for a common cockpit upgrade for both aircraft," he added, "significantly improved reliability, maintainability, and supportability, training systems compatible with the USMC training vision, along with significant improvements to performance/payload/warfighting capability – well beyond original expectations."

The resulting systems provide more

capability and lower lifecycle costs than was expected from the program at its inception in FY96.

"Developing and incorporating these new technologies will ultimately provide the Marines with a more capable, survivable and lethal system that's a vast leap in capability beyond the aging platforms they currently operate, and with greatly reduced total lifecycle costs," said Birkholz.

Among the new technologies adding capability to the aircraft is the Thales-supplied Helmet Mounted Sight and Display system.

"The helmet mounted sight and display is cutting edge technology in the rotary wing environment and we are the first to attempt full integration of it into an attack platform," Birkholz explained. "The Top Owl was an 'off-the-shelf' option chosen by every pilot who participated in the comparison testing/trade study in 2001. We plan to optimize the Top Owl display module system to meet unique requirements of Marine Corps missions and employment without any changes to the aircraft interfaces, helmet tracker or software."

Thales recently received a contract to optimize Top Owl optics and displays for the USMC mission, according to Birkholz. Program officials expect to be ready to field the optimized Top Owl concurrent with the UH-1Y fleet introduction scheduled for FY08.

"Modifications we are making to the helmet will incorporate alternative night vision concepts based on existing and proven technology while retaining the extensive integration of the Top Owl system already completed," Birkholz added.

PMA-276 and the H-1 Integrated Test Team now have more Top Owl time than any other user.

By 2018, the Marine Corps will have procured 100 UH-1Y Venoms and 180 AH-1Z Vipers.

TH-67 Aircraft at Fort Rucker, Alabama

The TH-67 Fleet at Ft. Rucker has been a successful Commercial off the Shelf (COTS) program since 1993. The fleet consists of 182 aircraft in three configurations; VFR or Contact, IFR (Instrument rated) and the TH-67A+ Combat Skills/NVG. The TH-67 is the first aircraft encountered by all Army rotary wing student pilots. They operate these during the first three phases of their training, before transitioning to their “go-to-war aircraft.” The fleet has compiled over 960,000 hours over the past 13 years with only one Class A accident, in 2005.

Fleet averages are over 8,000 flight hours per month, or just over 40 hours per airframe. With an annual total of over 90,000 hours, it is clearly a very active operation. At least one third of the VFR aircraft accomplishes 44 run-on auto-rotations daily to a concrete runway, as part of the syllabus training. Current high time aircraft is N67328, a contact bird more familiar to Bell as ship number 5137, with over 8,050 total hours at last report. The Fleet maintains an operational readiness of near 100% of the maintenance contractor’s requirements, and has done so since fielding.

As an FAA certified commercial 206B3, the TH-67 is modified within FAA Supplemental Type Certificates to meet the needs of the Army. The Army supports the fleet with commercial spares available through OEM and FAA/PMA parts, available worldwide, next-day delivery. At no added cost to the Army, Bell maintains the TH-67 Support Center in Daleville, right outside the main gate to Ft. Rucker.

The TH-67 Support Center provides continuous parts, warranty service, logistics research, commercial publications, and ready access to Bell’s commercial aircraft spares inventory. This round-the-clock effort has been in



place for over 13 years.

“Off the Shelf Orders” have been filled at rates which exceed 85%. Specifically, Bell has delivered 90% of all AOG orders, and 80% of all Routine orders in 24 hours or less since inception. 99% of all orders are filled after 3 and 5 days respectively. The Support Center maintains an inventory of 3,000 line items including dynamic and structural components, valued in excess of \$5 million dollars.

Co-located with Bell are a Bell Aerospace Support Services field service representative, and an Aeromarine support representative for the Rolls-Royce C20J engine. Both supply the technical and logistical support services to the Army. Bell Helicopter Military Product Support provides the in-house support for the technical questions asked from both the BA FSR and the customer at Ft. Rucker. Together, the total Flight Hour Cost using new and overhauled spares has averaged just under \$143 per operating hour.

Bell provides this support, at no cost to the Army for the first five years following delivery, and now under contract to Army Fleet Support (AFS), Fort Rucker’s maintenance contractor, to reduce costs throughout the maintenance activity on over 350 Bell Helicopters supporting the Army’s Aviation Center.



MODEL 429 CUSTOMER ADVISORY BOARD

principle “If it ain’t broke, don’t fix it.” The RCM process is a task oriented program that uses a “top down” approach by analyzing each system to determine failure modes which may cause a functional failure and then develop a maintenance task if necessary. In a traditional manufacturer’s recommended program the manufacturer would set tasks as had typically been applied on prior similar models and overhaul everything at a specified time.

RCM was originally developed for use by the aviation industry and is best known for its use within MSG-3. The process has become so successful that many areas of industry have now

incorporated RCM principles into maintenance task development.

As the 429 program moves forward, direct operating costs are being monitored closely to ensure that the requirements and objectives are being met.

The program has received tremendous “Voice of Customer” (VOC) input, covering everything from maintainability to mission capability in all roles.

Bell Helicopter’s overall objective is to enter the market with this all new SPIFR light twin with very competitive operating rates.

(Continued from page 3)

The Customer Service Facility (CSF) Network is clearly one of the key differentiators for Bell's award-winning customer support. With more than 150 CSF's located in more than 30 countries, Customer Service Facilities truly are the face of Bell Helicopter to the world.

Being new to Customer Support at Bell, I have spent a significant amount of time getting to know the people that keep our products flying, the people behind the CSF sign. Through on-site visits, telephone calls, and focus groups, I have now met one-third of the CSF's in the network. Although it is a small sampling of the population, it has most assuredly validated to me what I have heard for years: the people that work our CSF's are among the most experienced, technically proficient, and dedicated in the industry. Indeed, I think it is fair to say they are *fanatical* about supporting Bell customers and products.

The conversations that I've had with Customer Service Facilities have yielded numerous great ideas for improving the quality of support. Many of these ideas are already being implemented. However, one theme is more consistent than any other: CSF's want more information about what is going on at Bell; they want to be more integrated into the Bell family.

In order to strengthen the timeliness and quality of the communications through the network, I am pleased to announce that Bell is launching a new information-sharing website called the

"CSF Portal." The CSF Portal will be your secure, virtual gateway to Bell Helicopter, providing you up to the minute information to help you with your day-to-day administrative operations as well as planning

for your long term success. The CSF Portal will contain a wide spectrum of data from technical updates, increased partnership opportunities, to marketing templates for advertising, business cards, and much more. We will officially roll out the website during the 4th Quarter of 2006, at which time we will provide CSF's with the URL and personalized user IDs and password.

As always, if you have any additional ideas or recommendations for improving the service levels of our CSF network, please do not hesitate to contact me directly.



Trey Wade

Director, Strategic Partnering

Office: (817) 280-2069

Cell: (817) 528-6563

Email: twade@bellhelicopter.textron.com

Bell Manuals for the HUEY

6 Months Away!

By Dick Dodge
Regional Sales Manager
Business Development

Earlier this year we announced that, at the request of many UH-1H operators, Bell would produce a commercial version of UH-1H technical publications. We are happy to report that we are approximately 6 months away from completing this publication release of the Illustrated Parts Book! The other manuals in the pipeline will follow soon after that.

These publications will apply commercial best practices to help users maintain the configuration of their UH-1H Hueys. Benefits of these manuals include:

- Configuration Management to the most recent configuration of the Huey.
- Use of commercial equivalent part numbers, where appropriate.
- Incorporation of USG Safety notices and bulletins.

There will be a nominal subscription service charge for these manuals, which will include the following:

- Operators Manual – BHT-PUB-77-004-10
- Unit & Intermediate Maintenance Manual – BHT-PUB-77-004-23-1, -2, -2-2
- Illustrated Parts Book – BHT-PUB-77-004-23P

- Repair and Overhaul Manual – BHT-PUB-77-004-40
- Phased Maintenance Checklist – BHT-PUB-77-004-PMC

In addition to Bell's upgrade programs, such as the Huey II and the Bell 210, production of these manuals is another facet of Bell's ongoing support effort for the UH-1H. If you are interested in UH-1H manuals or other areas of support, such as spare parts, training, and repair and overhaul services, please contact any of the following CSS Business Development Managers:

- North America - Mark Kocurek at 817-280-3031; mkocurek@bellhelicopter.textron.com
- Europe, Africa, Middle East - Dick Dodge at 817-280-3542; ddodge@bellhelicopter.textron.com
- Central America/Caribbean - Joaquin Allatorre at 817-280-2970; jalatorre@bellhelicopter.textron.com
- South America - James Tripp at 817-280-2236; jtripp@bellhelicopter.textron.com
- Asia/Pacific - Gary Wicks at 817-280-3360; gwicks@bellhelicopter.textron.com

OSPREY UNIT Makes History, crossing ‘The Pond’

Compiled by MCAS New River PAO,
MCAS New River



Courtesy photo by Bell/Boeing. Photo Date:08/08/2006



Photo contributed by Bell/Boeing. Submitting Unit: MCAS New River

The MV-22 “Osprey” is a common sight in the skies of Eastern North Carolina. However, tens of thousands of people recently had an opportunity to observe the aircraft for the first time when two “Ospreys” made the “self-deployment” from MCAS New River to the continent of Europe. The flight covered more than 4,000 miles, much of it over the North Atlantic Ocean, in challenging weather conditions.

MARINE CORPS AIR STATION NEW RIVER, N.C. (Aug. 8, 2006) — Two MV-22B “Ospreys,” belonging to Marine Tiltrotor Test and Evaluation Squadron 22, made history by completing the first-ever Tiltrotor Vertical Assault Aircraft trans-Atlantic flights Saturday, July 29. The “Ospreys” successfully flew from North Carolina to England and back.

“The MV-22’s ability to make two trans-Atlantic flights within a three-week period, and fly every day in Great Britain during that time period, confirms its reliability,” said Col. Glenn M. Walters, VMX-22 commanding officer.

“The aircraft and aircrew performed above my expectations in accomplishing the most arduous portion of a self-deployment. This was the final event that demonstrated the full range of unique capabilities this aircraft will

provide to our war fighters in the near future,” he said.

The flight covered more than 4,000 miles, much of it over the North Atlantic, in challenging weather conditions. Both aircraft were conducting a self-deployment rehearsal in preparation for the “Osprey’s” operational deployment scheduled for next year. Over 40 Marines participated in the exercise, including pilots, aircrew and ground support personnel.

One of the Marines to pilot the trip was Maj. David L. Lane, an “Osprey” pilot since early 2004 and a Paris, Ark., native. Lane said it felt fantastic to pilot the mission and become a small part of history.

“Being a part of this mission was special and it felt great to have the commanding officer’s confidence placed in me to sign for the other aircraft,” said Lane.

An additional purpose of the rehearsal was for the Marine Corps to develop tactics, techniques and procedures for long-range, over-water movements of MV-22s. The “Ospreys” also participated in the Royal International Air Tattoo in Fairford and the Air Show at Farnborough, U.K.

While in England, the “Ospreys” flew a total of 17 flight events, all of which were executed on time. The “Osprey” was one of a handful of aircraft at Farnborough to have made all scheduled flight windows. These flights included distinguished visitor and media orientation flights involving short take-offs, tactical approaches to landing zones, hovering and a “jump” take-off. Additionally, it is estimated that 100,000 people viewed the aircraft on static display.

“The spectators in England were excited to see the ‘Osprey’ fly, and the flights were moved from one of the later slots in the air show to the main event,” said Lane.

The exercise began July 8 when three MV-22Bs from VMX-22 and three KC-130J “Hercules” aircraft from Marine Aerial Refueler Transport Squadron 252, based at Marine Corps Air Station Cherry Point, N.C., left the U.S. for Farnborough. After a stop in Goose Bay, Newfoundland, two MV-22Bs and two KC-130Js continued on to the U.K., while the other aircraft returned to North Carolina.

On July 25, all aircraft left the U.K. to redeploy back to North Carolina. All aircraft and crew safely returned home July 29.

This achievement helped to illustrate improved vertical lift capability for such concepts as Sea Basing and Distributed Operations, and greatly expands the reach and flexibility of Joint forces. VMX-22 and VMGR-252 also validated the “Osprey’s” long-range fuel system capability with the goal of supporting future “Osprey” deployments.

During VMX-22’s change-of-command ceremony, Lt. Gen. John Castellaw, deputy commandant of Marine Corps aviation, remarked on the success of the historic trans-Atlantic flight and how this brings the “Osprey” one giant step towards deployment sometime next year.

“This was a rehearsal to demonstrate the ‘Osprey’s’ capabilities and to learn lessons so when we do it again, for instance with (Marine Medium Tiltrotor Squadron-263) when it deploys next year, we’ll have already learned the basics to complete a similar flight,” said Castellaw.



A group shot of the VMX-22 team after their completion of the first MV-22 trans-Atlantic flight. More than 40 Marines participated in the exercise, including pilots, aircrew and ground support personnel. The “Ospreys” also participated in two British air shows.

Photo contributed by Bell/Boeing. Submitting Unit: MCAS New River



The flight covered more than 4,000 miles, much of it over the North Atlantic, in challenging weather conditions. Both aircraft were conducting a self-deployment rehearsal in preparation for the “Osprey’s” operational deployment scheduled for next year.

Photo illustration by Lance Cpl. Jonathan A. Tabb. Submitting Unit: MCAS New River

AIRFRAME BASICS FOR MECHANICS

By Alain Laflamme
Product Support Engineering
Medium Helicopters

Although written with the medium-size helicopters in mind, this article applies to most legacy aircraft manufactured by Bell Helicopter.

The fuselage is oftentimes the most neglected part of a helicopter. Every day, the crew looks at it, uses it, the passengers may ride in it many times during that day, but it does not seem to be any different today than it was yesterday. Its apparent inactivity makes us develop complacency, this tendency for people to relieve attention when something appears to always be right. The fuselage, like all parts of the aircraft, needs to be looked at carefully and any discrepancy corrected.

Most of the legacy Bell helicopters have a semi-monocoque type fuselage made of aluminum bonded panels and stiffeners of all shapes and sizes. This was an evolution over the original truss-type fuselage of the Bell 47 (and most airplanes of that era). In the truss-type structure, all members are designed to withstand a certain load (mostly tension or compression) by themselves. It makes a very simple fuselage but each member needs to be somewhat heavy. By having more (and smaller) parts, it makes the monocoque fuselage lighter and safer. Despite the obvious safety advantage, it also means that we tend to be

complacent with the inspection practices.

As part of a regular maintenance schedule, we inspect the fuselage for damage. One of the reasons to have an elaborate schedule is to provide safety to the passengers and by catching a deficiency early, the repair is cheaper and with fewer consequences. To do that, we need to know how to recognize the early signs of wear and tear. When inspecting any part of the airframe, we should look for corrosion, cracks, black powder, chafing marks, delaminations, dents, etc. Any of these symptoms, alone or combined with other pieces of information, is an early warning that should be investigated and corrected.

Any defects and suspected defects should be corrected as soon as discovered because the helicopter was designed to have all parts present and airworthy in order to provide a margin of safety. This margin is affected by any of these defects but Bell Helicopter has not tested how each of them affects the overall serviceability of the aircraft. If the mechanic makes a conscious decision, based on knowledge and experience, to release the aircraft to flight with the known discrepancy, the risk should be evaluated with care and properly mitigated. Who knows how long the part will last in this particular situation? How

long do we have before a more costly or dramatic problem occurs? Everyone is welcome to make a guess but who is willing to push the limit that far?

Inspection of the fuselage will reveal wear and tear but it does not replace proper installation practices. Not all mechanics enjoy doing sheetmetal work. Some feel it is much more rewarding to work on a greasy hub assembly or inspect an engine and they may shortcut critical steps when assembling sheetmetal parts. All rivet holes need to be drilled with a sharp drill of the proper size, parts need to be carefully deburred, edges rounded and rivets properly bucked. These little precautions are worth a lot in the bank account of safety and reliability, in which every penny counts. Failure to take these actions may take a while before they show up and cause problems. If, for example, a burr is left between parts at installation, it could cause stress concentration, which could lead to cracks.

Pay attention to the airframe. If you find something unusual on the aircraft, Bell Helicopter's Product Support Engineering is always available to help you find solutions. However, repair decisions and practices are to be made by a certified mechanic who is responsible for the airworthiness of the aircraft.

Bell 417 achieves first flight

The Bell 417 took off for its first flight from Bell XworX on Thursday, June 8, 2006.

The helicopter flew in a traffic pattern at 70 knots – about 80 mph – for a little more than half an hour at about 1,000 feet. The aircraft and engine performed as expected, Jack Gallagher said.

“The pilot's comments were – the aircraft handled great. Basically, it was a flawless first flight,” he said. “With the effort it took to build the aircraft and get the instruments installed and working properly, getting the aircraft off the ground for the first time is a big event. This accomplishment also reflects the Bell and Textron commitment to bringing new products to our valued customers in both commercial and military applications.”

Flight testing will resume next week. Further testing is designed to deal with stability at various altitudes and speeds. The process helps lead to eventual Federal Aviation Administration certification.

“We keep expanding the flight envelope,” Gallagher said.



V-22 moves into the hangar...

VMX-22 was involved in shipboard compatibility exercises on the USS San Antonio recently. Lt. Commander Matt Rising, U.S. Navy, took these photos of the V-22 as it moved into the hangar.



Navy officials were specifically testing how the V-22 would fit in the hangar of the new Landing Platform Dock (LPD)-17 class ship.

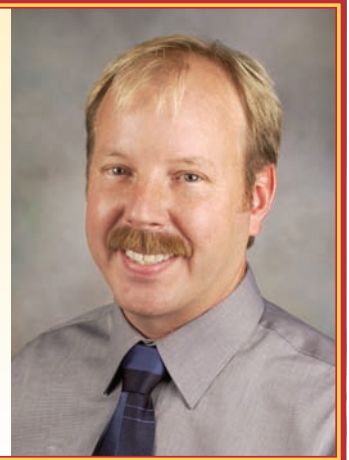


Customer Support

REPRESENTATIVE

Ronald Orndoff has recently joined our group as a Customer Support Representative. He and his wife will reside in Pennsylvania and be responsible for customers in the North Eastern Atlantic region.

Ron comes to us with 23 years of helicopter experience. He has an Airframe and Powerplant License with an Inspection Authorization endorsement. Ron can be contacted at 717-919-9853 or e-mail RROrndoff@bellhelicopter.textron.com.



CITY OF DALLAS BUYS THREE BELL HELICOPTERS

Note: The following information was released to the media on May 16 from the ILA Tradeshow in Berlin, Germany

Bell Helicopter on May 16 announced that the City of Dallas has placed an order for three new Bell helicopters for use by its police department.

The three helicopters will replace the aging existing fleet of aircraft the Police Department has been operating over the past 20 years. The three aircraft will be used for aerial law enforcement missions throughout the City of Dallas, flying an average of 24,000 hours a year.

Commenting on the order, Sgt. Don Crum of the Dallas Police Helicopter Unit said, "Performance, reliability, quality of training and product support are critical elements in selecting an aircraft for airborne law enforcement units. All of these were found in the Bell products and is our reason for choosing them."

Bell Helicopter Director of Homeland Security Paul Pitts, commenting on the order, said, "Orders like this go beyond making a sale. Everyone at Bell Helicopter is proud to be able to provide products like the 206B3 and the 407 to help the professionals in law enforcement like the Dallas Police Department safely complete their missions. Bell Helicopter has a long and rich heritage of providing quality products and customer service to law enforcement and other first responders. We are all committed to this going forward. Supporting these missions is about helping people, and that's the real benefit of vertical-lift aircraft."

The Bell 407 is the fastest selling helicopter in its class, with more than 650 in service today. Introduced in 1996, the Bell 407 has a larger cabin and added power and speed, and offers the department additional capabilities for specialized missions. Selected by law enforcement agencies around the world, the Bell 407 is known for its reliability, agility and speed, all important aspects in the law enforcement mission.

With over 5,000 JetRangers built since its introduction in 1968, the 206 series has proven to be one of the most popular helicopters for use in law enforcement. Operating with police forces around the world, these reliable aircraft have logged over 40 million flying hours over the years, providing airborne police protection 24/7.

Bell Helicopter provided the first helicopter ever used for law enforcement to the City of New York in 1948. Today some of the most sophisticated airborne law enforcement aircraft in the world are produced and equipped by Bell Helicopter.

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Wind Tunnel testing completed on Bell Boeing quad tiltrotor

Wind tunnel testing for the Bell Boeing Quad Tiltrotor model (QTR) was completed Sept. 13 at the NASA Langley Research Center Transonic Dynamics Tunnel (TDT). Installation of the 1/5th scale model into the sophisticated and unique TDT facility began June 27, 2006, with test operations conducted by Bell, NASA and U.S. Army Research Laboratory personnel.



The QTR concept is a four-engine C-130-sized aircraft with the capability of taking off, hovering and landing like a conventional helicopter as well as flying with the high speed

and range of a fixed-wing turboprop airplane by rotating its outboard nacelles from the vertical to the horizontal position.

The model consists of powered forward and aft rotors, pylons, nacelles and dynamically representative wings, representing a configuration that would support a flying demonstrator.

The fuselage of the QTR model used in the wind tunnel testing is 213 inches long with rotors that measure 91 inches across. It is a "semi-span" model, with only half of the aircraft represented. The 1/5th scale QTR aero-elastic model has been designed to replicate the aerodynamics and structural responses of a full-scale aircraft.

This complex testing investigated the interference effects of the forward wing and rotor on the rear wing and rotor, along with substantiating the aero-elastic stability of a rear wing having a 63 percent greater span than the V-22 wing.

Last summer, the model's rear wing, rotor, pylon and nacelle were tested in the wind tunnel to record baseline characteristics without the forward wing. Results of both sets of tests will be correlated to similar wind tunnel and flight tests of the V-22.

This Bell-funded test was conducted in parallel with Bell Boeing efforts under the United States Army-led Joint Heavy Lift Concept Design and Analysis (CDA) program and will provide key substantiating data to support the ongoing conceptual design work.

Bell Boeing received a cost-share contract in September 2005 for an 18-month study to evaluate QTRs sized to meet a variety of range, payload and operating condition combinations. A key result of this study is a road map for continuing company-funded activities in 2007, and a technology development plan and cost estimate for proceeding into the next phases of development beginning in 2008.

BELL TRAINING ACADEMY LAUNCHES PROFESSIONAL PILOT PROGRAM

The Bell Helicopter Training Academy has launched a new training program called the Professional Pilot Program (P3) in support of the IHST (International Helicopter Safety Team) vision of an 80% reduction in accidents by the year 2016. The course modules in this program directly target causal factors of accidents and incidents that affect the helicopter industry today.

The P3 Training is available to professional helicopter pilots operating Bell products. It includes training focused on market-specific training requirements, such as Law Enforcement, EMS, Utility, Electronic News Gathering and Charter. Randy Rowles, P3 Program Manager states, "Each market segment within the helicopter industry is unique. This course is tailored not only to the mission-specific market segment, but the specific pilot. While the P3 provides a generic course outline, the flight training program is tailored to each pilot's experience, operational needs and overall aptitude or ability."

In an effort to enhance safety and provide a greater benefit to the Bell customer, P3 will provide a train-the-trainer opportunity to those professionals employed as flight instructors. "This program will provide a flight instructor with techniques and procedures utilized by Bell staff to enhance their level of safety and skill," says Rowles.

To attend P3 training, a pilot must have at least 1000 hours helicopter flight time and have attended a Bell Training Academy Initial and Recurrent training school within two years of acceptance in the program. Upon completion of P3 training, an attendee will receive a Certificate of Completion (aircraft specific recurrent), Flight Instructor Refresher Clinic (FIRC)*, 61.56 Flight Review, 61.57 Instrument Proficiency Check*, and NVG Recurrent* (flight only).

** Requires appropriate FAA certification. Satisfactory completion based on proficiency.*

For more information on the Professional Pilot Program, please contact Randy Rowles at (817)280-4665 or go to the Bell Helicopter website at www.bellhelicopter.com.

BA609 AIRCRAFT NO. 2 POWERS UP for First Time

BA609 Aircraft No. 2 started power-on operation in Italy for the first time recently. The Agusta-led team has been outstanding in bringing Aircraft No. 2 to engine start



ahead of schedule. The 609 will now begin ground run testing in preparation for flight later this year. Aircraft No. 1 will continue to be flown in Texas while the second flies in Italy.

SHOP Talk

Q: What is the part number for the grease seal installed in the lower bearing of the triplex bearing P/N 222-310-476-101 used in the Model 222/230 washplate assembly ?

A: The grease seal of the triplex bearing set is not field replaceable. However, Bell Tennessee has recently been approved for the bearing inspection and seal replacement.

Q: Are there any 204B tailboom left with the original magnesium skins?

A: Tailbooms P/N 204-032-800-007 and later have aluminum skins. In a *Rotorbreeze* issue, back in 1968, Bell Helicopter recommended that skins from older tailbooms be replaced with aluminum skins of the same thickness. We believe this modification was done at the time on most 204B tailbooms, if not all. However, if you need Bell to design a repair for a skin from any of these early 204B tailbooms, we will need you to confirm the material.

Q: What is the recommended cleaning procedure used during the scheduled inspection of the 222/230/430 main driveshaft and tail rotor driveshaft couplings?

A: It is recommended that during the scheduled cleaning, inspection and repacking of 222/230/430 main driveshaft (222-044-006) and the tail rotor driveshaft coupling (222-044-002), that no solvents be used. Solvents have a tendency to wash away the

thin film of surface lubricant which acts as a corrosion preventative when the driveshaft is disassembled. Use a clean dry cloth to remove the grease. During the cleaning, inspection and repack process, it is also recommended that gloves be worn to reduce the likelihood of surface contaminants in the form of the natural oils in our hands being transferred to the couplings. These recommendations, along with a clean work area, have no additional cost and should be beneficial.

Q: On older Model 206A/B helicopters, there is no caution or warning light indicating that the DC Generator is offline. Where can I find the technical information to add such feature?

A: Starting at aircraft S/N 4311, an amber "GEN FAIL" light system has been incorporated to production aircraft. For aircraft prior to S/N 4311, there are three different options:

- Accomplishment of Service Letter 206A-52 for Model 206A
- The "GEN FAIL" light segment installation is also part of the Pop-out Float Kit installation Service Instruction 206-123
- Aeronautical Accessories Incorporated (AAI) has two (2) Kits:
206-960-100 S/N 1658 through 4310
206-960-101 S/N 4 through 1657



Bell Helicopter's Eagle Eye TR918 Unmanned Aircraft System receives first ever FAA certification for testing of a vertical-lift unmanned aircraft

Bell Helicopter, a unit of Textron Inc., announced that its Eagle Eye TR918 Unmanned Aircraft System, or UAS, has received its certificate of airworthiness for experimental flight testing from the Federal Aviation Administration (FAA).

This certification represents the first certificate of airworthiness for experimental flight-testing ever issued by the FAA to a vertical-lift UAS.

"This is a tremendous accomplishment that many people from both Bell Helicopter and the FAA have been working very hard to achieve," explained Kevin Connell, vice president of Bell Helicopter's XworX facility. "Not only are we celebrating the certification of the Eagle Eye TR918, but we are also celebrating the fact that with this first-ever certificate of airworthiness for experimental testing of a vertical-lift unmanned aircraft, Bell Helicopter is once again leading the way in the vertical-lift industry. Flight testing will be conducted at a recently opened Bell XworX facility in West Texas."

"This is another example of Bell Helicopter's leadership in vertical lift technology," said Bell Helicopter Chief Executive Officer Mike Redenbaugh.

The successful experimental flight certification of Bell's Eagle Eye TR918 UAS is the culmination of nearly a year of preparations, coordination and cooperation between Bell Helicopter and the FAA.

"The approval of experimental flight certification by the FAA is an example of government and industry teamwork," explained Bob Ellithorpe, Bell Helicopter's director of Unmanned Systems. "The

FAA and Bell Helicopter executed a detailed plan over the last several months that today yielded the approval of an Experimental Flight Certification for the Eagle Eye TR918 UAS ... we are now cleared to take to the air and begin flight test operations."

During the certification process, an eight-member team made up of representatives from FAA headquarters in Washington, D.C., and the FAA Southwest Region, scrutinized every aspect of the Eagle Eye program from

hardware and software to operational procedures and quality control.

"With this successful certification, we can now demonstrate to the world the remarkable capability of a vertical lift, tiltrotor UAS like the Eagle Eye TR918," Ellithorpe said. "This system will provide military and commercial operators with multiple capabilities ranging from homeland security to pipeline patrol. Ultimately, Bell's objective is to provide a family of unmanned systems that give our customers the means to more effectively accomplish their missions."

According to Redenbaugh, the Bell Helicopter-funded Eagle Eye TR918 program is a great example of Bell Helicopter and Textron's commitment to continue to invest in vertical lift.

"This is a great example of Bell Helicopter continuing to advance the overall strategy of being in both military and commercial business, in both tiltrotors and helicopters and in both manned and unmanned aircraft," Redenbaugh said.



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