

RotorBreeze

Q4 • 2011

One-Stop Shop for Bell Helicopter Training



Bell Helicopter
A Textron Company

Photo by Sheldon Cohen

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Bell Helicopter Training One-Stop Shop

Over its 65 year history, the Bell Helicopter Training Academy has been the source for the best training on Bell Helicopter products anywhere in the industry. Who else can better guide customers on how to employ their products than the company that made them? For years, the primary focus at the Training Academy has been on providing the highest quality education available. In recent years however, the team has taken on a new charge, to continue providing the same levels of quality while expanding the breadth of offerings available both onsite and at alternative locations.

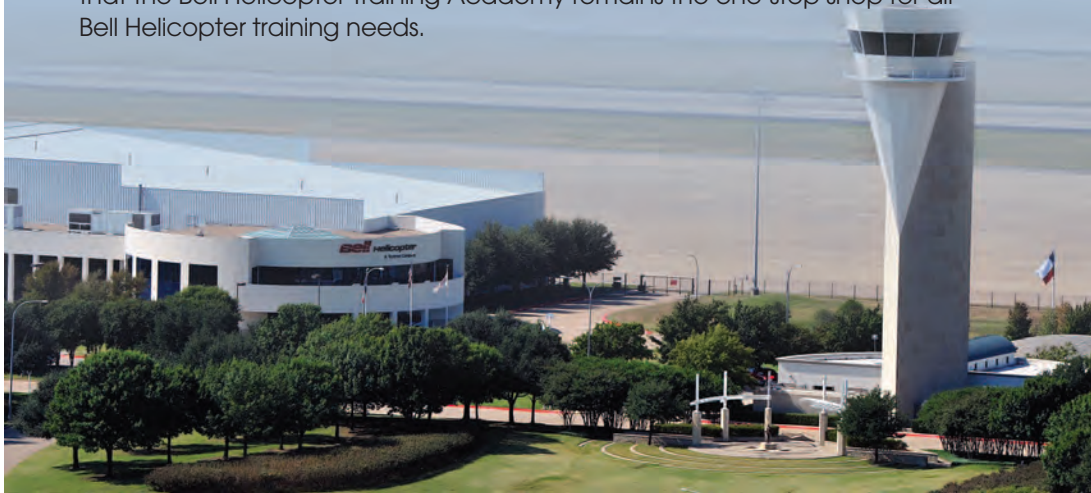
Bell Helicopter is sensitive to the specific needs and requirements of our customers when it comes to training. To respond to those needs, the Training Academy has broadened the scope of its traditional core offerings, such as initial and refresher pilot and maintenance training, to encompass specialty training as well.

Over the past several years the Bell Helicopter Training Academy has been developing additional capabilities with one goal in mind: to be able to conduct all requisite customer training for any standard configuration Bell helicopters currently in production.

In pursuit of this goal, a suite of additional maintenance classes have been developed including line-maintenance Powerplant Training for RR250 and PT6 engines, Non-Destructive Inspection, Composite Repair (structures and blades), Sheet Metal Repair, Vibration Monitoring System, and a variety of avionics maintenance courses including the Garmin G1000 Integrated display system. Specialty pilot training includes Night Vision Goggle (NVG) courses, the Professional Pilot Program (P3), First Responder training, Heliprops Safety Training, Operational Check Flight (OCF) courses, and the recently launched Tactical Flight Officer (TFO) program. Instructor pilots also incorporate customized scenario based training into all initial and refresher type training courses to make the training more relevant to the customer's mission and flight profile.

While progress has been good, there is always more that can be done. The Training Academy is working on additional specialty training that will be available in the near future. Proposed new courses include Maintenance Management, Rotor Smoothing, and an Air Medical Resource Management (AMRM) course. Always looking for suggestions from Bell Helicopter operators, ideas can be sent to the Training Academy. Such feedback is essential to ensure that the Bell Helicopter Training Academy remains the one-stop shop for all Bell Helicopter training needs.

The Bell Helicopter Training Academy has been developing additional capabilities with one goal in mind: to be able to conduct all requisite customer training for any standard configuration Bell helicopters currently in production.



Bell Helicopter Develops Hydraulic System LS3 "BigDog" Legged Robot

by Carlos A. Fenny, Technical Fellow Actuation Systems, Fort Worth, Texas



Bell Helicopter, recognized as an industry leader for "Advanced Hydraulic System Technology", has been working to develop a robot with legs over the past year. In an effort to answer the obvious question, "Why?" this article provides insight into "how" and "why" Bell Helicopter's engineering team accepted the challenge.

Just as the helicopter dramatically changed the landscape of military operations, and unmanned air vehicles (UAVs) revolutionized battlefield surveillance, the introduction of unmanned land vehicles using legs for locomotion will transform future operations. Legged unmanned vehicles, as they are commonly referred to, will be capable of following soldiers in battle, across almost any terrain and through almost any urban environment. Boston Dynamics, with funding from the Defense Advanced Research Projects Agency (DARPA), is developing the Legged Squad Support System (LS3) robot as a means of offloading the burden of carrying heavy pack loads during ground based missions. The LS3 will support dismounted operations in urban and rural terrain wherever it is too rough, rubble, inclined, muddy, or snowy for wheeled and tracked vehicles to travel.

Boston Dynamics had designed a prototype version of LS3 called "BigDog". However, development testing revealed that the hydraulic and propulsion systems on the robot would require critical performance and efficiency enhancements in order to meet the stringent LS3 requirements of carrying a 400 pound payload on a 20 mile/24-hour mission with a quiet power plant.

Boston Dynamics originally con-

tacted Bell Helicopter for consultation on some challenging hydraulic design elements on the BigDog prototype robot. Key Bell Helicopter engineering personnel provided solutions and alternate concepts, which quickly led to a request by Boston Dynamics to join the LS3 DARPA team. Recognizing that the design and development of ground-based robotics did not align with Bell Helicopter's core business plan, the engineering team facilitated the addition of Textron divisions AAI and HRT to the LS3 team to engineer propulsion and actuation systems.

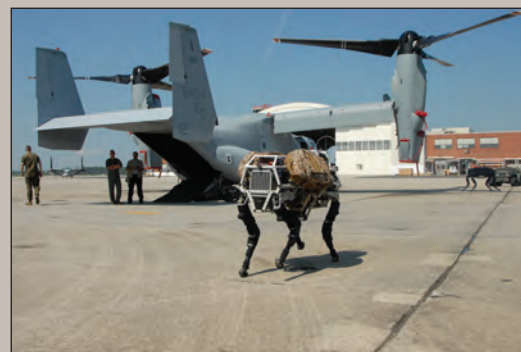
Achieving the ambitious schedule set by Boston Dynamics and DARPA mandated the use of new hydraulic system modeling computer programs, rapid hardware prototyping methods and the development of advanced automated testing solutions. Encouraged by the Boston Dynamics team's enthusiasm to embrace new and novel approaches, Bell Helicopter not only met all schedule and performance objectives, DARPA highlighted Bell Helicopter's performance as a model for how a rapid system development should be performed.

Bell Helicopter Engineering will use these same capabilities (that have been put in place, and proven, as a result of this project) for the development of the next generation of helicopters. Participation in LS3 provided Bell Helicopter a vehicle to advance these capabilities and employ new technologies on future aircraft designs.

Videos of the early BigDog prototype and clips of the latest LS3 tests can be found at:

http://www.bostondynamics.com/robot_bigdog.html

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Bell 407 Vision and Lighting Accessory Kits Available through Aeronautical Accessories

Bell Helicopter has received FAA approval for Vision and Lighting Accessory Kits for Bell 407 helicopter models. The lighting kits are available through Bell Helicopter's brand Aeronautical Accessories. The Aeronautical branded Vision and Lighting Kits offer four selections to improve visibility. These include:

- **Preflight Lighting Kit**
- **Courtesy Lighting Kit**
- **Baggage Compartment Lighting Kit**
- **Tail Rotor Camera Kit**

The Preflight Lighting Kit provides illumination for the inspection of the four fluid levels (hydraulic reservoir, oil tank, tail rotor gear box, and transmission) during the pilot walk around inspection or anytime the fluid levels need to be checked. Each light installation contains its own switch and battery so there are no wires to install. To make inspection of the tail rotor gear box fluid level easier, a window is added to the underside of the lower tail rotor gear box fairing.

The Courtesy Lighting Kit allows safe and convenient lighting of the cabin and landing gear/flight step area for entering and exiting the helicopter - activating when doors

are opened. The crew lights include forward landing gear lighting and an interior light which work independently of the passenger lights. The passenger lights include aft landing gear and interface with the original equipment manufacturer (OEM) interior lights. The passenger OEM interior lights are on a time delay to allow passengers ample time to buckle up. If any door is left open for an extended amount of time, the lights will automatically turn off to conserve the ship's battery.

The Baggage Compartment Lighting Kit features an easy solution to illuminating the storage area of the 407. The light kit mounts to

the ceiling of the baggage compartment and is turned on and off by pressing a switch on the light. The Baggage Compartment Light will automatically turn off after approximately three minutes if accidentally left on. The light contains its own battery so there are no wires to install.

To improve visibility behind the helicopter, a **Tail Rotor Camera Kit** is now available. The camera is mounted in the fairing behind the baggage compartment with only the end of the lens exposed. Images from the tail rotor camera are viewable through an existing or new display (not included).

Preflight Lighting Kit:



Courtesy Lighting Kit:



Tail Rotor Camera Kit:



AS9100 Revision C Certification

Bell Helicopter Leads Rotorcraft Parts and Accessories Market

Bell Helicopter continues to demonstrate excellence in rotorcraft aftermarket parts and accessory manufacturing and distribution. Having previously achieved ISO9001 with AS9100 certification, Bell Helicopter's Piney Flats facility responsible for producing Aeronautical Accessories branded parts has now received the distinction of being certified to AS9100 Revision C standards.

AS9100 is the quality management system (QMS) standard for the aviation, space, and defense industries. Revision C is the first significant change to the standard since its initial release. AS9100 quality standards are based on ISO 9001 and add additional requirements that are specific to aviation, space and defense. The primary objectives of Revision C are to:

- Incorporate ISO 9001: 2008 changes
- Expand the scope to include land and sea based systems for defense applications
- Ensure alignment with IAQG strategy (on-time, on-quality performance)
- Adopt new requirements based on stakeholder needs
- Improve existing requirements including documented procedures

"Being certified to AS9100 Revision C is a great accomplishment," said John Friedrichs, Director of Quality for the Aeronautical Accessories brand. "This raises the bar for us as an organization by implementing standards that increase our focus on critical areas such as risk management, supplier quality, and customer focus and satisfaction."

The ASC900C audit was conducted by Eagle Registrations, Incorporated. At the conclusion of the evaluation, the lead auditor, stated: "The audit confirmed the effectiveness of the maturing management system. This demonstrates the implementation of the plan-do-check-act concept. This facility has very strong Six Sigma orientation."

// We are proud to continue this tradition with our newest vision and lighting accessories and believe that the latest kits for the Bell 407 offer increased safety and added convenience for both passengers and crew. //

"The Aeronautical Accessories brand has a long history of innovative and reliable accessory kits," said Jennifer Lunceford, Aeronautical Accessories' Manager, Sales. "We are proud to continue this tradition with our newest vision and lighting accessories and believe that the latest kits for the Bell 407 offer increased safety and added convenience for both passengers and crew."

The STC certified kits are available for immediate shipment.

For more information on the 407 Vision and Lighting Kits, contact the Aeronautical Accessories sales team at 1-800-251-7094 or email your question to sales@aero-access.com.

Baggage Compartment Kit:



Introducing Bell Helicopter's Newest Customer Support Representative...Chris Brown



Meet the latest addition to the Bell Helicopter Customer Support Representative Team, Chris Brown. Chris will have responsibility for the southern half of California. He joins the Bell Helicopter team with a solid background in helicopter maintenance and supervision. Most recently, Chris spent time at Sam Joaquin Helicopters where he held several different roles of increasing responsibility, including aircraft maintenance supervisor, training, sales and marketing.

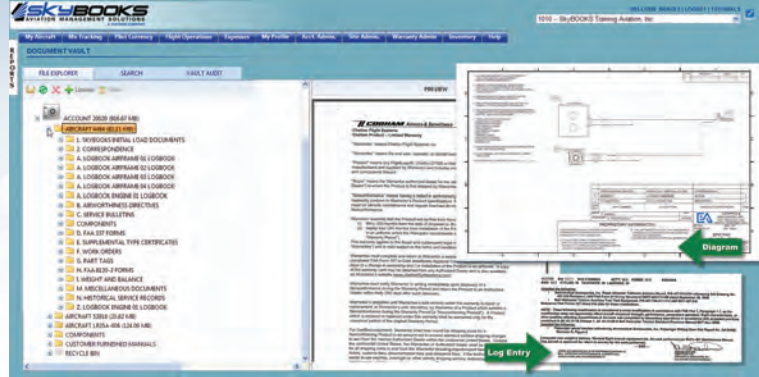


Ensuring Maintenance Spreadsheet Accuracy Saves Time and Money

by Elizabeth Howard, Training Manager – SkyBOOKS

At a glance, maintenance spreadsheets may look organized with logical formulas calculating the next due items on an aircraft. But after a closer look, many spreadsheets indicate the turbine second stage wheel has zero hours but 1,401 cycles accrued. Airframes may have 500 hours total time accrued but has a component showing installed at 505 hours. It's easy to catch component time deviations when they are greater than the airframe time; however, not all deviations are that obvious resulting in errors that are difficult to discover with manual maintenance spreadsheets. Below are a list of the most frequently detected deviations:

- The spreadsheet is not updated to the current Maintenance Manual Revision, causing maintenance intervals to be incorrect
- Outstanding Airworthiness Directives (Ads) and Service Bulletins (SBs) are not added to the spreadsheet
- Spreadsheet hours do not match the hours indicated on the Historical Service Record (HSR) cards
- Hours or serial numbers are not updated on the spreadsheet after a component replacement



What causes the errors?

Spreadsheets allow humans to err. Aircraft maintenance gets performed but not all of the data is recorded to update the spreadsheet. Spreadsheets allow individuals to enter any number or not update the number at all. When the number one priority is quality maintenance, updating spreadsheets can be an inconvenience.

Incorrect formulas can lead to undetectable miscalculations. This is especially true when a formula is unknown; for example, if the formula was copied and pasted from another cell.

What are the effects of errors?

If life limited components indicate more time than they have actually accrued, the cost of replacing the component before it is necessary will be incurred. If the spreadsheet is indicating a component has less than actual time, the potential to overfly maintenance actions is great and fines could result.

Solution

SkyBOOKS helps correct spreadsheet errors by transitioning aircraft from spreadsheets to electronic maintenance tracking. When a component installation date or time deviates from the HSR card, SkyBOOKS account representatives contact the organization and help determine accurate information. SkyBOOKS gives each aircraft an individual deviation report, which identifies abnormalities discovered during the aircraft load process. The deviation report usually includes:

- Maintenance compliance irregularities
- Missing maintenance compliance and overhauls
- Overdue maintenance requirements and overhauls

The Document Verification Enrollment is SkyBOOKS preferred method for enrolling an aircraft. Aircraft will be based off of the original equipment manufacturer's (OEM's) recommended maintenance schedule and the SkyBOOKS Quality Control team will verify the last entry to existing logbooks to ensure the proper meter/date information is entered into SkyBOOKS. In addition SkyBOOKS Account Representatives will include all findings in the deviation report to help stay on top of maintenance actions, save time and money.

For more Record-Keeping information contact SkyBOOKS at 866.929.8700 or email sales@skybooks.com.

Q: Why doesn't the 8130 form that I receive with my part have the serial number of the part reflected on it?

A: The FAA Code of Federal Regulations (CFR) 45.15 (c) states that the manufacturer must place a part number and serial number on a Critical Part that has an Airworthiness Limitation or Required Inspection per an Instruction for Continued Airworthiness (i.e. Overhaul Life or Hard Time Inspection). FAA Order 8130.21G gives instructions for completing 8130-3 tag. Therefore, until the FAA changes Order 8130.21 to require any part with a serial number or batch number to be entered in Block 11 of the 8130-3 form, Bell Helicopter will continue to enter only the serial numbers that are required by CFR 45.

Q: The 407 Maintenance Manual paragraph 5-18 of the BHT-407-MM-1 states to perform corrosion inspection in accordance with Corrosion Control Guide CSSD-PSE-87-001. There are no criteria in this guide for the Bell 407, only 206 series and medium helicopters.

A: The Corrosion Control Guide is a basic guide, which provides additional information to the regular scheduled inspections listed in the applicable maintenance manual and when followed, will help prevent or limit corrosion on Bell Helicopter commercial products. This manual was written in 1987 for models that were in production or produced before that year.

Considering the similarity of the basic fuselage structure between the 407 and the 206 series helicopters, operators may refer to the information contained in the 206 manual, which is applicable to the 407.

However, as indicated in the manual, the 100-hour or 90-day inspection schedule can be reduced or extended, based on operational and environment experience. Since Bell Helicopter's latest products come out of the factory with better protection against corrosion, it is possible for a 407 customer to extend this 100-hour inspection program of the 206 series to match the 300-hour scheduled inspection program applicable to a 407. In any case, it is still the responsibility of the operator to re-adjust its corrosion inspection program in the future if found to be inadequate for the type of mission and/or environment into which the aircraft performs.

Q: We have found damage to the isolation mount and main driveshaft while performing pylon whirl inspection on a 206B. Do we have to consider accomplishing either a sudden stoppage and/or a hard landing inspection?

A: Not necessarily, per BHT-206A/B-SERIES-MM-6, Chapter 63-00-00, Figure 63-5, Pylon Whirl Inspection, damage to the main drive shaft and isolation mount will require maintenance to be performed on the main drive shaft and the free-wheeling assembly (subsequently more tasks may be necessary). A Sudden Stoppage Inspection would be required only when the main rotor contacted something of sufficient mass ("inertia") to cause "rapid deceleration" or there was a "seizure within the drive system". The Hard Landing Inspection to some degree parallels the Pylon Whirl Inspection. However, when landing gear and / or structure damage is observed this occurrence becomes a hard landing.

Got Other Technical Questions?

Please contact
Product Support Engineering

Bell 206

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800.363.8023
FAX: 450.433.0272
E-Mail: pselight@bellhelicopter.textron.com

Bell 407

Phone: 450.971.6407 or
800.243.6407
FAX: 450.433.0272
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Bell 222, 230, 427, 429 or 430

Phone: 450.437.2077 or
800.463.3036
FAX: 450.433.0272
E-Mail: pseinter@bellhelicopter.textron.com

Bell 204, 205, 212 or 412

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FAX: 450.433.0272
E-Mail: psemedium@bellhelicopter.textron.com

Bell 210/214B/214ST

Phone: 817.280.3548
E-Mail: MTS-Medium@bellhelicopter.textron.com

Bell TH-57/TH-67/OH-58

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E-Mail: MTS-Light@bellhelicopter.textron.com

Bell UH-1H/UH-1N/Huey II

Phone: 817.280.3548
E-Mail: MTS-Medium@bellhelicopter.textron.com

Bell AH-1W/AH-1Z/UH-1N/UH-1Y

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