

Rotorbreeze[®]

Bell Helicopter

A Textron Company

October 2007 • Vol. 56 No. 3

First Flight for Ship #2



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ELECTRONIC TECHNICAL PUBLICATIONS WEBSITE AND DVD PROJECT

by Jim Dawson, Supervisor, Technical Publications

In June of 2006, Bell Helicopter initiated an in-house project to develop WEB and DVD Technical Publication products for its Customers. To complement the existing paper copy documents, the primary project objective was to create WEB and DVD products with identical features and functionality that would provide all of the applicable manuals for each model of helicopter, as well as provide timely updates and easy to use information.

The project was a combined effort between Commercial Technical Publications and the IT organization within Bell. In addition to choosing the best suited technologies for the project, multiple tools and applications were developed to greatly shorten the production time to launch the documentation sets for each model.

In March of 2007, five models were launched at HAI and as of August 2007,

14 individual model types are now available on both the WEB and DVD. The remaining models are currently in the production process and will be available by July of 2008.

In regards to current Web usage, statistics for the month of July provided the following results:

- Server uptime - 100%
- Number of visitors - 6155
- Number of pages visited - 516,380
- Number of hits - 1,170,130
- Number of countries served - 71

For Customers who do not yet have "FREE" access to the Electronic Publications on the WEB, please subscribe at www.bellhelicopter.net. Once on the site, select the "New User" option on the right hand side of the page, fill in the registration form, agree to the "Terms and Conditions" and submit. Your request will be reviewed and if accepted, we will provide you with



an auto-generated e-mail which will grant you access and contain your "Username and Password."

In regards to future plans, we are looking at options to reduce file size, improve the speed to access documents and provide automatic updates to Customers' hard drives.

The ultimate goal is to provide our Customers with the best possible documentation in multiple media fashions to ensure access to the latest data in any location Worldwide.

SECOND BELL 429 JOINS FLIGHT TEST PROGRAM

"The 429 development program continues to meet or exceed all the requirements we put in front of it. This second aircraft will allow us to increase the pace of our test program as we progress towards our first deliveries late next year. We completed safety of flight testing and expansion of the flight envelope about one month faster than anticipated and did not encounter unexpected design issues in this testing. The two aircraft will depart in September for hot and high testing in Colorado and Arizona and first flight by pilots from the certification authorities." stated Bill Stromberg, Executive Director of the 429 program.

"This is a strong program and a great helicopter that clearly demonstrates Bell's commitment to the commercial marketplace," added Bob Fitzpatrick, Senior Vice President of business development.

Commenting on other outstanding program issues Stromberg added, "We are rapidly closing in on a final configuration and we are very confident that performance and handling qualities will meet our targets. The flight manual and maintenance manual are over 50% complete and long lead spare parts are on order to support initial deliveries to customers. Preparation of customer training curriculum and a flight training device are also progressing on schedule."

The 429, manufactured at Bell's production facility in Mirabel, Quebec, has generated wide spread appeal in the marketplace and current has an order backlog of over 200 aircraft. The current development schedule has the 429 achieving FAA and Canadian certification simultaneously in 2008.

ROTORBREEZE is a quarterly publication of Bell Helicopter Textron Inc., a subsidiary of Textron Inc., P.O. Box 482, Fort Worth, TX 76101.

Telephone: (817)280-2679

E-mail:

laferry@bellhelicopter.textron.com

This newsletter is distributed free of charge to persons associated with the helicopter industry.

EDITORIAL STAFF

Ross Johnson, Publisher

Leslie Ferry, Editor

ADVISORY COMMITTEE

Jack Denham

Exec. Director - Product Support

Michael Dewey

Product Support Engineering

Mark Medinger

Customer Support Representative

Pat Crippen

Bell Training Academy

Mark Kocurek

Business Development

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BELL HELICOPTER

On the Leading Edge of Customer Service Part II

Bell's development of Performance Based Logistic (PBL) services to the U.S. Military and Commercial operators: A Sustainment Systems Engineering Approach.

By Sally Lake, Director, PBL/Integrated Supply Chain – Customer Support & Services (CSS)

The 2007 February edition of Rotorbreeze included an article about one of the roles of CSS Business Development which included the development of a portfolio of services called FlySmart™. Bell FlySmart™ is a customizable set of support and service solutions that delivers cost-effective, optimized operational performance by maximizing system reliability and lowering life cycle cost and at the same time, reducing customer financial risk, lowering administrative costs and meeting or exceeding customer requirements.

Since February, this development has accelerated in the area of Performance Based Logistics (PBL) for Bell Helicopter due to the requirements and immediate need from our customer base, both in the U.S. Military and on the Commercial front.

Recognizing these challenges, Bell has implemented a complete Sustainment Systems Engineering approach for solutions design that will ensure effective execution of PBL type support services for both U.S. Military and Commercial customers/operators. With this approach, Bell will be able to offer a real time fleet management service with a comprehensive single source support solution.

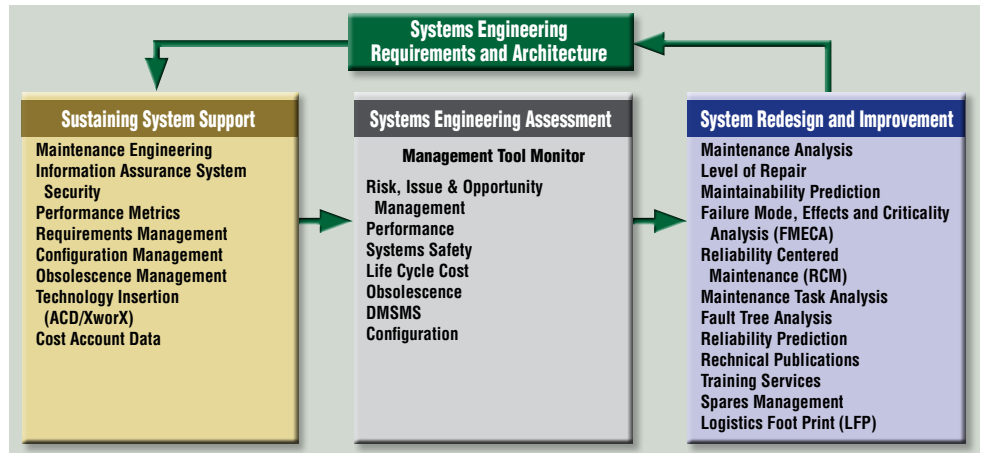
The Sustainment Systems Engineering Approach to PBL includes a focus on:

- Continuous Process Improvement (Six Sigma)
- Forecasting, Modeling and Simulation
- Technology Insertion
- Reliability and Maintainability
- Configuration Management
- Obsolescence Management

This Sustainment Systems Engineering approach also flows down to the design of the Supply Chain, as demand forecasting, inventory planning, warehousing, and logistics footprint requirements are all designed using this constant loop of Sustainment System Support, Systems Engineering Assessment

and System Redesign and Improvement. The PBL Team is constantly monitoring data to track reliability, failure rate analysis, fault tree analysis, life cycle cost, obsolescence, etc...to determine the most effective performance and cost accounting for the operator.

Customer Support and Services has developed from a pure parts provider to a services based solution provider. With FlySmart™, Bell Helicopter is forging a new relationship with the U.S. Military and Commercial customer base to say "We are an active participant in the success of your operations!" Come to us with your requirements and operational challenges and together we will successfully design a solution!



Supporting the *Bell 214 Fleet*



Bell Helicopter's desire to continually improve support and service for our Model 214 operators resulted in an operators' conference last March. The purpose of the meeting was to discuss a new way forward. The turnout was fantastic. Approximately 40% of the 214 B/B1 & 23% of the 214ST operators came to Fort Worth for a one-day meeting.

The major concerns raised at this meeting were the availability of spare parts, communication, & obsolescence management. Bell has agreed to develop a secure website specifically for the transfer of information between the users and Bell – this should greatly enhance Bell's ability to communicate with this select group of operators. The secure website is in the development phase and will be up and running by January 2008.

Different scenarios addressing the availability of spare parts and obsolescence management are being reviewed by Bell management; the results of which will be available at the 2nd Annual 214 User Group Meeting being held in conjunction with Heli-Expo 2008.

We will continue to keep you updated on these issues... please stay tuned!

COMMERCIAL REPAIR AND OVERHAUL MANAGEMENT TRANSFERS

Under the Direction of Bells Newly Established Repair and Overhaul Center

by Mike Gales, Manager, Repair & Overhaul Services



Repair & Overhaul Center

our business into value streams. As a result of this realignment, management of all Repair and Overhaul services will now be the responsibility of our recently established Repair and Overhaul Center.

This transition will not affect the personal service you have grown to expect when dealing with Bell Helicopter for component repair. The same expert Customer Support Specialists that currently assist you will continue to do so. You will, however, notice a different ship to address on your Return Material Authorization (RMA).



Customer repair and overhaul will now come to:

776 Henrietta Creek Rd., Suite 200
Roanoke TX, 76262

Please ensure you verify the ship to and address your parts accordingly.

Parts Returns, Buy Backs, Tool Rentals, and Stock Transfers will not be affected by this transition. These functions will remain the responsibility of Warranty Administration.

The alignment of our repair and overhaul services will enable us to streamline processes and provide improved customer service. Additional change will occur in the management of the business. The restructuring will also improve focus on repair and overhaul

An exciting change is underway within our Customer Support and Services Business. We have recently aligned



material receipt and induction, while reducing process variation in the spares value stream.

As part of this transition we have established a new receipt and induction processing line. Developed utilizing Textron Six Sigma, lean flow, and 5 S, the processing line was designed to meet a receipt and induction target of two days. Two days from the time your failed part is received on our dock it will be on its way to one of our approved repair providers.

Bell Helicopter is committed to providing premier repair and overhaul services through continuous process improvement. This recent transition is one example of that commitment. We appreciate your business and will work to earn it every day.

Meet *Scott Lane* – CSR Mid-Atlantic U.S.



If your operation is in one of the mid-Atlantic United States, you may not have met your new Customer Support Representative, Scott Lane. He will be contacting all the owners, operators and maintainers in the mid-Atlantic US in the near future. Scott replaced Erik Sharp who transferred to Edwards and Associates South in Florida to assume the Director of Maintenance role.

Scott brings a vast helicopter knowledge gained from a career that began

with the US Army as a UH-1H Crew Chief and mechanic. Scott's most recent experience comes from managing all the regional technical activities for a very successful electronic news gathering company operating an all Bell fleet.

Scott's territory will initially cover North Carolina, South Carolina and Georgia. Scott lives in the Atlanta metro area with his wife of 19 years and two daughters. For fun and relaxation, Scott enjoys golf, weightlifting, and building custom V-twin motorcycles. Scott said he also enjoys traveling with his family both domestically and internationally and "of course riding anything with two wheels and a motor."

ROTOR Vibrations

by John Sharski,
Sr. Project Engineer,
Product Support

Excessive vibration levels in helicopters can lead to premature wear and tear in rotating components. Reducing vibration levels is an essential component in extending the longevity and safety of the helicopter.

Types of vibration

Lateral vibrations are the result of an unequal distribution of mass in the main rotor. This imbalance is a heavy spot on the rotor system that can be felt during each rotation. The greater the mass imbalance or the farther the mass imbalance is from the center of rotation, the greater the severity of the vibration.

Vertical vibrations are a result of unequal lift produced by the main rotor blades. This can be a result of blade profile variances from one blade to the next or blades that are not flying the same path during rotation.

Track corrections

Although out-of-track conditions generally manifest themselves as a vertical vibration, they have a large effect on the lateral vibration readings as well. Track corrections are made by adjusting the pitch change links on some aircraft and outboard trim tabs on others. Regardless of the method, the end result is to achieve a flat track prior to making adjustments to correct for mass imbalances. It's always best to get the ground track as close as possible. This increases the degree of success achieved during forward flight. When the ground and hover track is within specifications, the lateral imbalance can be addressed.

Lateral corrections

There are several methods to correct for lateral vibrations. They include placing weight on the main rotor hub, adding tip weights to the blades, adjusting the chordwise balance of the rotor, and sweeping the main rotor blades. Implement lateral corrections until the vibration levels are below the maximum acceptable level. In most cases this is 0.2 IPS. Ideally, lower the levels as close to 0.1 IPS as possible. This makes the in-flight vertical limits easier to achieve, especially on two bladed helicopters.

Vertical corrections

There are two primary adjustments utilized to correct for a vertical vibration. The first is the main rotor pitch change links (PCL). To move a blade up or down, lengthen or shorten the PCL for that blade. This adjustment is typically used to correct out-of-track conditions on the ground and in a hover. The second adjustment available is the main rotor trim tab. To make a blade fly higher or lower, bend the trim tab up or down. The adjustment of trim tabs is generally used to correct out-of-track conditions that increase with airspeed. Trim tabs are very sensitive, so use care and caution when making adjustments.

Adjustment results

Below are some general rules to help determine what to expect from an adjustment type.

- Pitch links change the tip path plane of the blades through all speeds. Changes will affect vertical and lateral vibration levels.
- Tabs change the tip path plane of the blades at higher speeds. Changes primarily affect vertical vibration levels. Sweep changes the mass of the rotor at all air speeds. Changes primarily affect lateral vibration levels.
- Tip weight changes the mass of the rotor at all air speeds. Changes primarily affect lateral vibration levels.

- Hub weight changes the mass of the rotor at all air speeds. Changes primarily affect lateral vibration levels
- Blade chordwise weight changes the tip path plane of the blades. Changes have large effects on vertical vibration levels and on lateral vibration levels at ground and hover.

These rules are a basic guideline for the rotor behavior based on the adjustment that is implemented.

When to "zero" rotor settings

If a flight crew or customer complains of a slight vertical or lateral vibration, there's no need to strip the rotor of weight or zero tabs and pitch links. It's likely that the rotor requires a small adjustment to bring it back to acceptable vibration levels. Rotor systems can even be sensitive to the climate and environment. Aircraft that have elastomeric components in the rotor system, at times, require re-balancing due to changes in outside temperature or seasonal changes.

However, if a new set of blades is installed, all adjustments should be nominalized prior to tracking and balancing. Nominalizing the settings will increase the chances of successfully balancing the rotor in as few flights as possible. It also will help prevent reaching the maximum allowable adjustment for weight, tab, sweep, and pitch change links.

NEED HELP?

Need help with a technical question?

Here's how to contact Product Support Engineering:

Model 47, 206 or 407

Phone: 450.437.2862 or 800.363.8023

FAX: 450.433.0272

E-Mail: pselight@bellhelicopter.textron.com

Model 222/230, 427 or 430

Phone: 450.437.2077 or 800.436.3036

FAX: 450.433.0272

E-Mail: pseinter@bellhelicopter.textron.com

Model 204, 205, 212 or 412

Phone: 450.437.6201 or 800.363.8028

FAX: 450.433.0272

E-Mail: psemedium@bellhelicopter.textron.com

Model 214 or Surplus Military

Phone: 817.280.2481 (Model 214)

Phone: 817.280.8779 (Model OH-58A/C)

Phone: 817.280.7470 (Model UH-1 series military surplus)

Phone: 817.280.4074 (Huey II)

FAX: 817.280.2635

E-Mail: psemil214@bellhelicopter.textron.com

JAR-OPS Bell Provides *Complete Solution*

by Dale Springer,
Director, Commercial Programs

Installation of JAR-OPS kits on a helicopter, combined with following flight procedures and JAR-OPS training, will provide for increased safety for operators in the civil transport industry. While many of the kits are currently available for Bell Helicopters, it is the combination of equipment, flight profiles, and training that will increase helicopter operational safety.

What is JAR-OPS? JAR-OPS is an acronym for Joint Aviation Regulations Operations and specifically Part 3 for helicopter operations. JAR-OPS 3 outlines requirements applicable for operation of any civil helicopter used for commercial transport for any operator located in the JAA member states. Furthermore JAR-OPS 3 regulations have been harmonized with ICAO (International Civil Aviation Organization) Annex 6, Part III that specifies similar requirements for helicopter transport operations. This means that this set of regulations are applicable not only in JAA Member States, but worldwide where ICAO standards are required. Both JAR-OPS 3 and ICAO Annex 6 Part III requirements can be summarized into three elemental ingredients for helicopter operations:

- 1) Proper safety equipment;
- 2) Proven flight procedures; and
- 3) Trained crew and support staff.

To demonstrate compliance, an operator will need to properly equip and maintain a helicopter, operate the helicopter to proven take-off and landing procedures and show that the crew has obtained proper recurrent training. The combination of the three elements provides for the increased safety and the survival of the passengers and crew.

Safety and Survival Equipment. The mission equipment required in JAR-OPS has many standard kits that operators of Bell have had available for years on their helicopters. Adding to these existing kits, Bell is developing unique kits to monitor key navigational systems to ensure proper environmental awareness for the crew. When these new kits are combined with Bell's Health and Usage Monitoring System (HUMS), the overall system now becomes a proactive tool for both the crew and the maintainer. JAR-OPS kits enable increased passenger and crew survivability upon the unlikely occurrence of a downed helicopter. JAR-OPS requires these kits to be a part of a configured helicopter based upon the mission performed and the environmental conditions. The required kits will vary based upon whether the mission will be for cargo hauling or passenger service; over land or water; day or night; over populated areas or remote; and in what type of weather conditions. Based upon these inputs, a properly equipped helicopter will provide for a safe operation of the helicopter.

Safe Operation. Understanding the capabilities of the helicopter and then deriving proper flight procedures is the second element of the JAR-OPS requirements. Fundamental to operational safety is knowing what mission is to be performed. Useful load, range, take-off and landing sites are many of the variables required to properly identify the appropriate flight procedures needed for a safe mission. Flying these established procedures and remaining within acceptable parameters will ensure safe operation even in the event of a power loss to the helicopter. JAR-OPS defines different performance classes that allow for managing collateral damage. The top performance class, Performance Class 1 (PC1), is defined such that in the event of failure of the critical power unit, the helicopter can be safely landed or continue flight. Performance Class 2 (PC2) states that in the event of critical power unit failure, performance is available to safely continue the flight, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which case a forced landing may be required. Performance Class 3 (PC3) allows a forced landing to take place in the event of a power unit failure at any time during the flight. Following the appropriate Performance Class procedures will provide the safest operation. Awareness of the reliability of the equipment can expand the allowable mission profiles that can be flown and still provide for safe helicopter operations. In many cases, PC2 procedures will provide for more mission flexibility while enhancing the safety of the mission.

Practice Makes Safe. Bell's own safety data shows that recurrent training for the crew statistically improves safety in helicopter operations. JAR-OPS requires that operators maintain a training program for the crew and maintainer. This training includes crew understanding the function and use of the safety and survival equipment and the capability of instructing passengers of these features. Crew training includes simulating the safe take-off and landings as defined by performance procedures and survival procedures in the event of reduced or complete power loss during operations. Recurrent crew training and technical training for maintainers yields a properly performing helicopter that leads to safe helicopter operations for any mission in any condition.



Medium Helicopter Development Team. Bell has an established customer driven solutions team to ensure that the 412EP meets JAR-OPS 3 (and/or ICAO Annex 6 Part III) prior to the legislation of these requirements. The current 412EP has many existing options and kits that meet these requirements. Bell is in the process of adding several new kits needed to complete a compliant Minimum Mission Equipment List essential for JAR-OPS 3 operations. In addition, Bell is updating the 412EP Flight Manual with new procedures and Training Packages to ensure that any customer that needs to operate under JAR-OPS regulations can safely do so in a Bell 412EP. Our customers will be provided with a complete solution to JAR-OPS. Bell's JAR-OPS compliant customer solution will include new JAR-OPS compliant 412EPs, kits to upgrade their existing 412EPs and training from Bell's Training Academy.

By Trey Wade, Director, Strategic Partnering

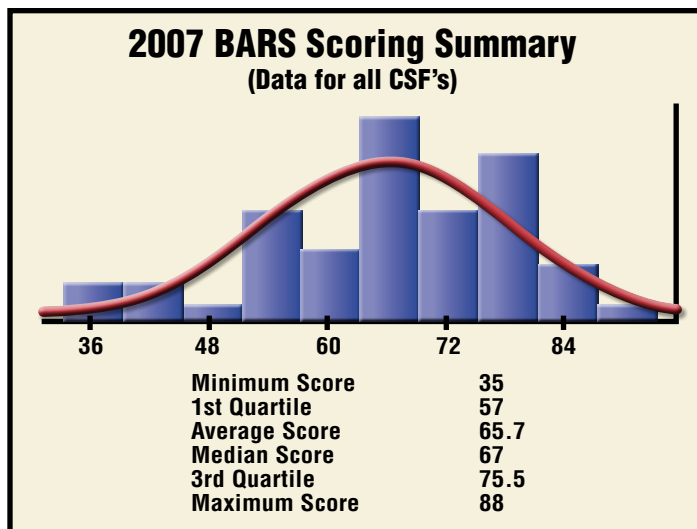
As previously reported in the first "CSF Corner" in Rotorbreeze a little more than a year ago, Bell has been working closely with its Customer Service Facility (CSF) partners all around the globe to raise the level of support for Bell customers everywhere. The central tenet of this improvement strategy is the implementation of a fair and objective CSF monitoring system that will consistently measure each CSF's performance in the eyes of the customer and Bell Helicopter. This new assessment tool, named **Bell's Achievement Rating System (BARS)**, was announced at the 2007 Annual CSF Meeting at Heli-Expo in Orlando.



The BARS program annually measures performance on 8 key areas that impact service experience: customer satisfaction, inventory management, 3rd party maintenance focus, business practices, service comprehensiveness, technical competence, facility quality, and attendance at the annual CSF meeting. Throughout 2007 this process is being piloted with each and every CSF in the network. The pilot phase is a learning opportunity (for both Bell and the CSF) and a data collection exercise that will be used to adjust the performance thresholds of these 8 key focus areas. In the near future, Bell will use the data collected during the BARS assessment to guide CSF appointment and renewal decisions, consideration for additional partnership activities, and drive additional business incentives.

To date, just over 50% of the CSF's have gone through their pilot BARS assessment. Although there are still opportunities to adjust this new process to better meet our needs, the initial feedback from the CSF's and customers alike has been resoundingly positive.

Below is the initial scoring summary for this new initiative. One of the benefits of this program is that every CSF is measured on the exact same criteria. As such, an individual service provider's score is only appropriately considered in comparison to peer CSF's in similar markets.



The success of this cutting edge program ultimately hinges on the ongoing support of the CSF's and customers this program is intended to serve. If you would like to learn more about BARS or make a recommendation to improve the structure or administration, please contact Trey Wade, Director Strategic Partnering, at 817-280-2069 or twade@bellhelicopter.textron.com.

Upgrade to the *Bell 412SP*

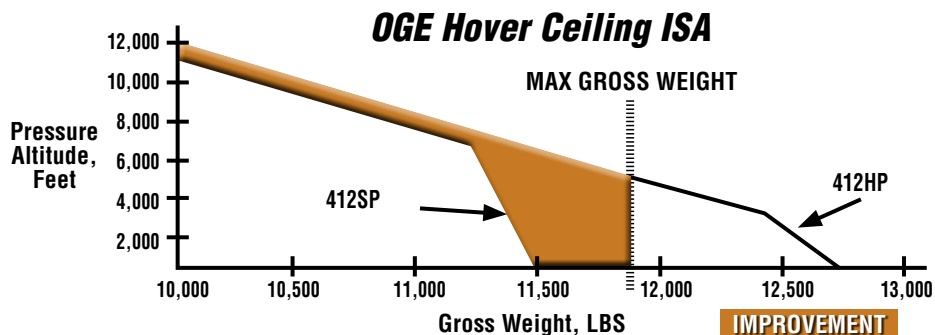
Bell Helicopter's commitment to improved performance of fielded aircraft continues with the introduction of an "SP to HP" upgrade kit for the Bell 412. Bell recently announced an upgrade program for the Bell 206L series helicopter to extend its life and enhance the Long Ranger's performance. Continuing in that line Bell is also developing a Service Instruction (SI) for release in late-2008 which will allow Bell 412SP operators to upgrade to the Bell 412HP configuration.

Benefits of this upgrade will be higher ratings for the transmission, as well as a pilot controlled engine trim system. Results of these changes will be increased horsepower available for hover and climb.

- Transmission Output Horse Power increases from 1205hp to 1370hp
- Gross Weight OGE increase from 11,500 pounds at sea level to 11,900 pounds at 5200 feet (ISA).

Bell has performed this upgrade in the past but never formalized the upgrade until now. By late 2008 Bell plans to have a service instruction available allowing this upgrade to be performed by qualified maintenance facilities throughout the world.

As progress is made on this upgrade we will provide updates. For information about this upgrade, please contact at Dick Dodge at ddodge@bellhelicopter.textron.com.



Bell Manuals for the *Huey*

Bell Helicopter has extended the production date of the UH-1H commercial technical publications for an additional 60 days. As mentioned in the October 2006 issue of Rotorbreeze, the first manual will be the Illustrated Parts Book.

The benefits of these manuals include:

- Configuration Management (baseline configuration)
- 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
- 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

If you are interested in the UH-1H manuals or other areas of support, such as spare parts, training, and repair and overhaul services, please contact any of the CSS Business Development Managers.

CSS BUSINESS DEVELOPMENT MANAGERS

North America

Mark Kocurek – 817-280-3031
mkocurek@bellhelicopter.textron.com

Europe, Africa, Middle East

Dick Dodge at 817-280-2970
ddodge@bellhelicopter.textron.com

Mexico, Central America / Caribbean

Joaquin Alatorre 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



A Bell 429 flies past a Bell 47 while in Alamosa, Colo., for high-altitude testing as part of the ongoing development flight testing of the 429. Current testing includes hover performance at high altitude; concluding investigation of the empennage (optimal fin, horizontal stabilizer and auxiliary fins) configuration for best handling qualities; and runway work with close-to-ground rearwards and sideways flights at various aircraft weight and center-of-gravity points. Photo by Edward Lambert

Fly Smart. Fly Bell.



G.I. BILL APPROVED
BELL HELICOPTER
TRAINING ACADEMY
APPROVED
206B3 • 206L4
407
TRANSITION TRAINING

TRANSITION TRAINING

The Bell Helicopter Training Academy is now approved to train eligible persons under the provision of the United States Code 38, for transition training in the Bell 206B3, 206L4 and 407

For more information, please contact Patrick Crippen at (817)280-8053 or PACrippen@bellhelicopter.textron.com

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