

Frontiers

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A SEA CHANGE

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WHAT WILL YOU CREATE FOR OUR WORLD?

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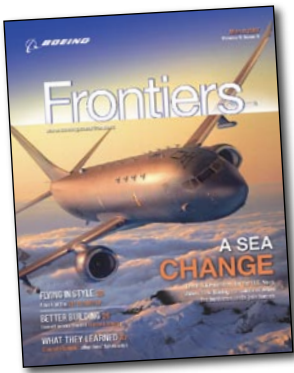
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Boeing is an equal opportunity employer supporting diversity in the workplace.



This image, from the "Epic" recruitment advertising campaign, is part of Boeing's efforts to attract a talented, diverse group of college and experienced professionals, and encourage them to explore a career with Boeing. The skill sets listed demonstrate the breadth and depth of Boeing opportunities. The ad directs candidates to view detailed job descriptions and apply online at: boeing.com/careers.



ON THE COVER: An artist's conception of the P-8A Poseidon
Boeing graphic

Frontiers



BOEING GRAPHIC

COVER STORY

SUB-STANTIAL 12

The P-8I (above) is a long-range maritime-reconnaissance and antisubmarine-warfare aircraft Boeing has proposed to the Indian navy. It's a unique Indian navy configuration of the P-8A Poseidon, an aircraft Boeing is developing for the U.S. Navy. Here's an explanation of what the P-8A means to the customer—and why it shows how Boeing can succeed when its business units join forces.

BUILT TO SUCCEED

28 The Boeing factory in Everett, Wash., is a busy place. But there's no time like the present to undertake the Future Factory initiative. Here's a look at why this activity is important—and what improvements will be created.

FEATURE STORY

COMMERCIAL AIRPLANES

At your service

18 Thanks to its subsidiary partnerships, Boeing is expanding its profile in the aftermarket support business. Here's a look at the services provided by three major subsidiaries—Jeppesen, Alteon Training and Aviall—and how Boeing and these subsidiaries benefit from these relationships.

Flying in style

20 Commercial Airplanes recently opened a new display to showcase the interior of the 747-8 Intercontinental. By using features from the 787 Dreamliner, the 747-8 interior provides passengers an enhanced flying experience.

INTEGRATED DEFENSE SYSTEMS

The view from the other side

24 Under reciprocal agreements, Boeing and the U.K. Ministry of Defence each have loaned an employee to the other entity for an extended assignment. It's the next step in Boeing's efforts to increase understanding of its United Kingdom customer needs and better serve them.

They're back in the fold

26 Astronauts are scheduled to head to the International Space Station this month to install Boeing-built truss segments, unfurl new solar arrays and retract another set of old solar arrays. To help make their tasks easier, they'll apply learnings from previous missions.

Preparing for stuff in space

27 A team of Boeing and NASA engineers is studying the effect of potential space debris impact on the International Space Station. Their goal: to minimize impact damage and determine the spare parts that might be needed to replace ISS components that sustain damage from the growing amount of orbital debris.



32

Angela Hall, from El Segundo, Calif., was at the recent Diversity Summit. Her takeaway from the event: Attendees have "an obligation to go back and share with their organizations what they've learned." On Page 32, read what other attendees said they'd bring back to their worksites.

BOEING PHOTO

COMPANYWIDE

Get with the program

10 Shopping for a new cell phone plan? A computer? Flowers? A new car? You might want to check into what the Boeing Employee Discount Program can offer. This month's New and Notable takes a quick peek at what's available through the program—and tells about a new one-time secure log-in process to ensure user eligibility.

Bringing it back

32 Attendees at this year's Diversity Summit were encouraged to take what they learned from the event back to their teams and leaders and to serve as role models and change agents. Here's what some attendees said they'll bring back to their work sites.

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Reflections on light transfer

By WALTER POLT

In relay races, the winners aren't the swift—they're the swift and steady. Fumble the transfer and it's all over.

Boeing's Aerospace Relay Mirror System in August successfully completed the first-ever dual-line-of-sight (two-mirror) laser relay. Perfectly aligned with a laser, one mirror "handed off" the beam to another mirror focused on a target.

William Browning is ARMS project manager at Boeing-SVS in Albuquerque, N.M., part of Boeing Missile Defense Systems' Directed Energy Systems unit.

"A small team of Boeing folks," he said, "took this new technology from concept through design to demonstration in four years under a \$20 million U.S. Air Force Research Laboratory contract." After relocation to Kirtland Air Force Base, also in Albuquerque, the system was suspended about 100 feet (30 meters) above the ground by a crane for its "graduation" test. This half-scale prototype received a low-power beam from a ground-based laser 2 miles (3 kilometers) away and relayed it to a target board several miles away.

Even the full-scale operational version would weigh a fraction of a high-energy laser and could hang below an airship 70,000 feet above the earth—to capitalize



JOEL MARTIN PHOTO

The lower mirror of this 15-foot (4.6-meter) Aerospace Relay Mirror System at Kirtland Air Force Base, N.M., received a low-power beam from a laser while the upper mirror relayed the beam to a target in August. ARMS is a half-scale demo of a system that will hang from an airship some 13 miles (21 kilometers) high and reach targets hundreds of miles distant.

on and extend laser-weapon strengths: intense power that's adjustable, precise focus (minimizing collateral damage), repeat firing, light speed. With a relay system above it, a laser could remain in a secure area as far away as 30 miles (50 kilometers) in any direction, bypass bad weather and lots of light-bending atmospheric turbulence—and destroy ballistic missiles and other targets hundreds of miles beyond the horizon. And the system realigns the laser beam as needed, sharpening it during the relay process.

"This demonstration is a major step in

the development of relay technology," said Pat Shanahan, vice president and general manager of Boeing Missile Defense Systems, "because it shows that a relay mirror system can receive laser energy and redirect it to a target, extending the laser's range."

Boeing now supports U.S. Air Force use of this ingenious system as a test bed in a technology-development race that includes similar innovations—such as tactical relay mirror systems for shorter-range engagements. ■

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HOW IT WORKS

Boeing's Aerospace Relay Mirror System is a simple concept: two independently gimballed mirrors. (Gimbals are counterweighted mechanisms providing precise balance and multidirectional movement.)

But it's not a simple process. To relay the laser beam, both mirrors simultaneously perform multiple split-second operations: The lower, receiving mirror and the source laser establish and maintain their alignment through an exchange of "beacons" (smaller lasers). To do this, a series of 10 tracker-sensors center the beam and pass it on—from a wide-field-of-view (3-degree-wide) TV camera down to a narrow-field-of-view, high resolution telescope. At the same time, at the top of the rig another set of tracker-sensors finds the target and keeps it in the sending mirror's sights.

So here's the test: How do you keep two 75-centimeter (2.46-foot) mirrors—both of them parts of a hanging 3,000-pound (1,360-kilogram), 15-foot-high (4.6-meter-high) system—perfectly aligned with both laser and target in spite of relentless tracker motions and each mirror's constant corrections?

"Motors driven by information from the trackers command the mirror movements," said William Browning, ARMS project manager. "The trackers have fast-steering mirrors—so you can see the platform jumping at times as they keep the large mirrors absolutely aligned." In one second, the receiving mirror may move 30 degrees, and the sender may shift 500 times.

In repeated tests this not-so-simple process was 100 percent successful.

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A personal thanks

I am currently studying in Taipei, Taiwan. I came here with the sole interest of learning Chinese and getting an MBA so I could get a job for a company that does business in China and Taiwan.

I have been here for one semester, and it has proven to be exceptionally difficult for me, a first-generation college graduate from the Chicago Public Schools. I'm learning Chinese while taking MBA classes at the same time. It's not as difficult academically as it is socially; I'm a black American, and as you can imagine I stand out quite a bit.

Anyhow, in about October, things were really getting tough. My Chinese classmates are very competitive and really diligent at studying, while I tend to take a more "relaxed" approach to education (well, I did). Not only was I struggling to pick up the language but I was also struggling to keep up with the rigorous course work.

I became discouraged and decided to give up. I was headed back to the United States, when I bumped into a man who works for Boeing. I sat down with him and talked for hours about my troubles here: getting stares everywhere I go, not being able to understand the language, not "fitting in" here, and a whole host of other problems. This man, who didn't know me, spent about three hours talking with me, encouraging me to stay here and fight though the difficult times. He made me realize that my spoken Chinese is much better than I thought; that I do have the aptitude to compete with my Asian counterparts; and that if I stuck with the bold decision to attend school in

"I can only imagine what the culture at Boeing is like if your employees stop to offer life-changing advice to students."

—Marlon McWilliams, Taipei, Taiwan



a complete stranger. I can only imagine what the culture at Boeing is like if your employees stop to offer life-changing advice to students around the world.

—Marlon McWilliams
 Taipei, Taiwan

About my best job

Regarding your best job at Boeing article (December 2006/January 2007): I retired in 1981 after 38 Boeing years, but I still believe I had the best Boeing job ever!

For four years starting in 1949, I was assigned to the Strategic Air Command Headquarters in Omaha, Neb. SAC was responsible for the security of the United States. My job was to help SAC's Boeing fleet meet SAC's stringent mission requirements. It was no small task, but I was dedicated to the SAC mission. I worked their schedule seven days a week and was on call 24 hours a day.

Every day was different and exciting. I loved every minute of it.

—Sid Weiner
 Mercer Island, Wash.

Correction

The mountain shown in the background of the NATO AWACS upgrade article on Page 24 of the February 2007 issue was misidentified. The mountain is Mount Adams.

Taiwan, it would pay off in the long run—only the long run was not so long away.

This conversation really changed me. Near the end of 2006, the dean pulled me aside and told me that I am expected to be No. 1 in the department this semester—and it's the first time an American (let alone a black American) had finished a semester ahead of the local students.

I can't begin to express how grateful I am to this man for giving me the confidence to believe in myself. Regrettably, I've lost his business card, so I'm unable to contact him directly. I am hoping that this letter will find its way to this man (he was from Seattle and he had his teenage son with him), and that he will know how much I appreciate him and the time he spent talking with me,

Letters guidelines

Boeing Frontiers provides its letters page for readers to state their opinions. The page is intended to encourage an exchange of ideas and information that stimulates dialogue on issues or events in the company or the aerospace industry.

The opinions may not necessarily reflect those of The Boeing Company. Letters must include name, organization and a telephone number for verification purposes. Letters may be edited for grammar, syntax and size.

SNAPSHOT

HERE'S A (ROTOR) TIP FOR YOU A Boeing-built CH-47F Chinook helicopter is prepared for display at last month's Aero India air show. Also joining the CH-47F at the show were the F/A-18F Super Hornet strike fighter, which conducted daily aerial demonstrations, and the C-17 Globemaster III airlifter.

KEVIN FLYNN PHOTO



QUOTABLE

Boeing is the only U.S. [firm] primed to take advantage of both markets.”

—Richard Aboulafia, an aerospace analyst with Teal Group, a Fairfax, Va.-based market research firm, about Boeing's prospects amid opportunities in both commercial and military aviation, in the Feb. 1 *Chicago Tribune*

We don't expect our competitor to continue to stumble forever. They are very, very formidable.”

—Jim McNerney, Boeing chairman, president and CEO, on Airbus, during a Jan. 31 conference call with financial analysts and reporters

There isn't an Apache that isn't being employed today.”

—U.S. Army Col. Mark Hayes, system manager reconnaissance/attack for the Army Training and Doctrine Command, at a recent symposium, in the Feb. 6 *Helicopter News*

IAM PROMOTIONS

No promotions listed for periods ending Jan. 26 and Feb. 2, 9 and 16.

ETHICS QUESTIONS?

You can reach the Office of Ethics & Business Conduct at 1-888-970-7171; Mail Code: 14-14; Fax: 1-888-970-5330; TDD/TTY: 1-800-617-3384; e-mail: ethicsLine.ethics@boeing.com; Web site: <http://ethics.whq.boeing.com>



This head-on view of the E-3 Sentry shows its distinct rotodome. Measuring 30 feet wide and 6 feet thick (9.1 by 1.8 meters), it scans at six revolutions per minute. When not in operation, it continues to rotate once every four minutes.

How the E-3 Sentry AWACS evolved to meet its mission

By ERIK SIMONSEN

From the original concept of an airborne system to provide command and control data, as well as strategic air defense of North America, the Airborne Warning and Control System has proven itself far beyond initial expectations. AWACS has evolved into the primary airborne battle management command and control aircraft.

Preliminary conceptual thinking for such a system began during the early 1960s, when the requirement arose for beyond-the-horizon surveillance combined with tracking of low-flying targets unhindered by ground clutter. The program was managed by the U.S. Air Force's Electronic Systems Division at Hanscom Air Force Base in Bedford, Mass. By mid-1965, Boeing, Douglas and Lockheed responded to a Request for Proposal from the Air Force. All were awarded study contracts to examine various state-of-the-art technologies for operating an Airborne Early Warning and Control System. The original radar system contenders were Westinghouse Electric and Hughes Aircraft.

In 1966, Lockheed was dropped from the competition as Boeing and Douglas began the Concept Formulation Phase. Commercial derivatives figured prominently, with Boeing offering the 707-320B platform, and McDonnell, which had since merged with Douglas in 1967, proposing a derivative of the commercial DC-8. Both contractors responded to a final Request for Proposal from the Air Force in December 1968, and subsequently Boeing received a go-ahead to continue testing for an additional six months. A full-scale AWACS mockup crew station was built in the Boeing Development Center using actual 707-320 fuselage sections.

Still keeping watch

ERIK SIMONSEN PHOTO



BOEING PHOTO

The U.S. AWACS has a flight crew of four and from 13 to 19 mission specialists aboard. The aircraft has an endurance of more than eight hours unrefueled.

In July 1970, Air Force Secretary Robert Seamans Jr. announced the selection of Boeing as prime contractor to proceed with development of AWACS. However, under the “fly before buy” contract, feasibility of the system and a radar down-select would take place first. If everything worked, then Boeing would receive funding for two prototypes and eventual production.

What’s interesting to note is that if McDonnell Douglas had won, Boeing (as a result of the subsequent 1997 merger) would be supporting the E-3 (DC-8) aircraft type today.

Each of the two Boeing prototypes (designated EC-137D) would test the competing radar systems. First flight of the No. 1 prototype (EC-137D #71-1407) took place on Feb. 9, 1972. After more than 600 hours of in-flight testing, the Westinghouse (today, Northrop Grumman) high-pulse repetition frequency pulsed Doppler radar was declared the winner.

The first production E-3A was delivered to (then) Tactical Air Command in March 1977. Of the 34 aircraft produced for the U.S. Air Force, 33 remain in inventory and have been upgraded to the E-3B and C configuration.

The Air Force and NATO’s 17 aircraft are powered by four Pratt & Whitney TF-33-PW-100/100A turbopfans with 21,000 pounds of thrust each. The French

E-3F, Saudi Arabia’s E-3A and the United Kingdom’s E-3D are powered by the CFM International CFM-56-2A-2/3, each generating 24,000 pounds of thrust. The increased thrust allows for a higher operating altitude, thus extending the horizon for the radar. Additionally, Japan operates four AWACS aircraft based on the Boeing 767-200ER airframe.

In all weather conditions, AWACS sensor and computer subsystems of radar, identification friend or foe (IFF) and elec-

tronic support measures collect and correlate detailed battlespace information. These include position, tracking and identification of friendly, neutral and hostile aircraft and ships, as well as location and identification of emitters. The systems also transmit information to major land- or sea-based command centers via tactical digital information links and can continue to perform while remaining resistant to Electronic Attack. With a range of more than 335 miles (540 kilometers), the radar is capable of tracking targets into the stratosphere and can eliminate ground clutter to track low-flying targets.

All AWACS aircraft have undergone several upgrades over the years and now operate using the Block 30/35 mission system. The latest Block 40/45 upgrade now under System Development and Demonstration for U.S. AWACS utilizes a new, fully open-architecture PC-based mission system, upgraded communications/navigation systems/radar equipment and new mission computing capability. This is the largest single modification to the Air Force’s fleet since the first delivery in 1977. TS-3, the first 40/45 upgraded aircraft, began flight testing in July 2006 and will continue through 2007.

In addition, these upgrades ensure AWACS as a centerpiece for network-enabled capability and a potent force multiplier. A veteran of Operations Urgent Fury, Just Cause, Desert Storm, Desert Thunder/Viper/Fox, Allied Force, Noble Eagle, Enduring Freedom and Iraqi Freedom, the E-3 Sentry will continue to improve and serve for many more decades. ■

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BOEING ARCHIVES



These two images show early configurations for a 707-based AWACS aircraft. The illustration on the left shows Boeing’s initial configuration for the AWACS, which featured a tail-mounted rotodome mounted on a forward-swept vertical stabilizer. On the right, the 707 aircraft featured eight efficient turbofan engines. Reduction in required endurance time enabled the standard 707 Pratt & Whitney engines to be retained.

Have we got a deal for you!

A look at some of the Employee Discount Program's bargains

Imagine saving up to 25 percent on a new cell phone plan, a computer, flowers or even a new car. The Boeing Employee Discount Program is helping Boeing employees and retirees stretch their family dollars.

In 2005, the Discount Program documented \$28.8 million in savings for members. The program, which is free for eligible participants, currently features 43 national discounts and 532 regional discounts. In addition, the program leverages some of its national discounts from Boeing suppliers—which increases Boeing's potential buying power while decreasing costs for both Boeing and Discount Program members.

Here are five current national deals:

- Cell phone plans. Discounts are available from Cingular Wireless, T-Mobile, Nextel, Sprint PCS and Verizon Wireless. Three companies offer 25 percent off their monthly plans. If you are signed up with one of these carriers but are not receiving the Boeing discount, most will allow you to migrate to the Boeing plan and start saving.

- Dell computers. The program offers a 16 percent discount off Dell list prices on Dimension desktops and Inspiron notebooks, and a 6 percent discount on electronics and accessories purchased separately.

- Flowers. National retailer 1-800-Flowers offers up to 20 percent off on delivery orders.

- Office supplies. OfficeMax allows Discount Program members to order via phone or online and receive the same discounted price it offers Boeing. Nominal shipping charges will apply; this offer is not available in retail stores.

- Cars. Daimler Chrysler offers a 1 percent discount below the factory invoice on



DAIMLERCHRYSLER PHOTOS

Among the offers available through the Boeing Employee Discount Program are discounts on cars, including Jeep and Dodge vehicles. Shown are a 2007 Jeep Grand Cherokee Limited (top) and a 2007 Dodge Nitro (above).

its Jeep or Dodge vehicles. Mitsubishi Motors of North America has discounts ranging from \$1,500 to \$3,750 below dealer invoices on select cars. Also, members can purchase or lease a new Subaru vehicle at dealer invoice cost, less applicable regional, dealer or customer incentives.

You can access the new Web site from both inside and outside the Boeing intranet. From the Boeing intranet: <http://inside.boeing.com>, click on the Employee Services bar at the left, and click on the Dis-

counts link in the Benefits and Services box. From outside the Boeing intranet (such as from home), visit <https://www.boeingemployeeedisc.com>. Please note that the site has a new security feature to ensure that users are eligible for the program's benefits (see box at right).

Visiting a store that offers a discount? Bring your membership card to make sure you get your savings. To get a wallet-sized card, visit the Discount Program Web site, sign in and select "Point of Purchase Dis-

count Card” from the left column on the Discount Program home page (see sample card below).

Got an idea for a discount? Found a lower price on a discounted item at a different retailer? The Discount Program is always looking for new discount suggestions from its members. Share your idea by using the “Suggest a Discount” feature found at the bottom of the left column of the program’s Web site. ■

Discount Program enacts new secure log-in

The Boeing Employee Discount Program’s Web site, at <https://www.boeingemployeediscount.com>, has added a new security feature to ensure that site users are eligible for the program’s benefits.

The security enhancement requires users to authenticate themselves once. The system now asks for your BEMS ID and the last name that’s associated with your records at Boeing. This one-time process ensures user eligibility.

If you’re a new user of the program, first enter your BEMS ID and last name (if you’re a retiree, you’ll need your BEMS ID). Then create a unique User ID and Password for subsequent visits.

If you’re a program member who hasn’t accessed the site since Nov. 22, 2006, you can keep your User ID and Password if you access the site and authenticate your account by May 1.

Forgot your User ID and/or password? Use the “Forgot your User ID or password” link on the login page and enter the User ID or e-mail address you used when originally registering.

When users (excluding retirees) leave the company, their user accounts become invalid and deleted after 90 days. Spouses and dependents of Boeing employees and retirees may access the site via a registered employee or retiree.

For more information or assistance, contact TotalAccess at 1-866-473-2016.



NEW AND NOTABLE



The 767 took center stage last month, thanks to two developments. UPS and Boeing finalized the carrier’s order for 27 Boeing 767-300ER (Extended Range) Freighters (top). This order pushes the total number of 767s ordered to 1,005 airplanes. Meanwhile, Boeing said it will offer the KC-767 Advanced Tanker (above) for the U.S. Air Force’s KC-X Tanker competition.

Set to serve

Recent announcements show 767’s versatility

Two high-profile developments last month demonstrated the versatility of the Boeing 767 airplane.

- Boeing last month said it will offer the KC-767 Advanced Tanker for the U.S. Air Force’s KC-X Tanker competition.

“The Air Force has made it clear: The mission is refueling aircraft, often in tight, hostile locations. The Boeing KC-767 Advanced Tanker is made for this mission,” said Ron Marcotte, vice president and general manager of Boeing Global Mobility Systems.

With more than \$1 billion already invested in the KC-767, Boeing will blend the latest commercial and military capabilities into the world’s most technologically advanced tanker. Innovations include an advanced fly-by-wire boom, new wing

refueling pods, a centerline hose drum refueling unit, the most advanced 777 commercial digital flight deck and a third-generation remote vision refueling system.

Boeing has 75 years of experience in designing, building, modifying and supporting tankers.

- In an order that represents a milestone for the 767 program, Boeing and UPS, the world’s largest package-delivery company, finalized an order for 27 Boeing 767-300 Freighters. With this order, the total number of 767s ordered to date topped the 1,000 mark, reaching 1,005 airplanes. The 767 joins the 707, 727, 737, 747, 757 and MD-80 models as Boeing airplanes that have surpassed 1,000 total orders.

“The 767 Freighter is a proven airplane that has served UPS well, and this order constitutes a strong vote of confidence for the capabilities of the airplane,” said Ray Conner, vice president, Sales, for Boeing Commercial Airplanes. ■

The P-8A Poseidon is built on the Next-Generation 737-800 commercial jet aircraft platform, with Next-Generation 737-900ER (Extended Range) wings and two jet engines. Designed to replace the aging four-engine turboprop P-3 platform, this aircraft gives the U.S. Navy the capability to go higher, farther and faster than its P-3s can.



The ruler of the sea

Why the P-8A Poseidon is important to the U.S. Navy—and to the way Boeing business units work together

By DEBBY ARKELL

Just as German submarines made significant technological leaps during World War II, so too is the manner in which those submarines are countered. With the Boeing P-8A Poseidon, the U.S. Navy's long-range airborne antisubmarine capability is fully centering on the latest jet-age technology.

The P-8A is a new approach to critical-mission maritime patrol. Launched in June 2004 with a system development and demonstration contract for the Navy, the two-engine turboprop-powered P-8A will replace the fleet's aging P-3 turboprop aircraft with 108 of the state-of-the-art submarine-seeking aircraft.

Boeing Commercial Airplanes and Integrated Defense Systems are working together to design, build and deliver this new, modern aircraft, which is based on the Next-Generation 737-800 airframe. These business units have teamed before on other commercial-to-military programs, such as the C-40 military transport and Wedgetail, an Airborne Early Warning and Control system. But the approach BCA and IDS are undertaking on the P-8A program represents a new and vastly improved business model. Boeing leaders said the new approach was central to the company's winning this business—and that it represents a sterling example of how parts of Boeing can work together as one company to record tremendous achievements.

"The new BCA and IDS business model for producing these aircraft was a key factor in winning the competition to provide a P-3 replacement to the Navy," said Mo Yahyavi, vice president, P-8A Poseidon program, for BCA. "Our new way of doing business from this point forward will produce substantial cost savings, giving us the competitive advantage on cost, and enhance quality. It is now part of our system and processes for military airplanes, and we will never go back."

A NEW BUSINESS MODEL

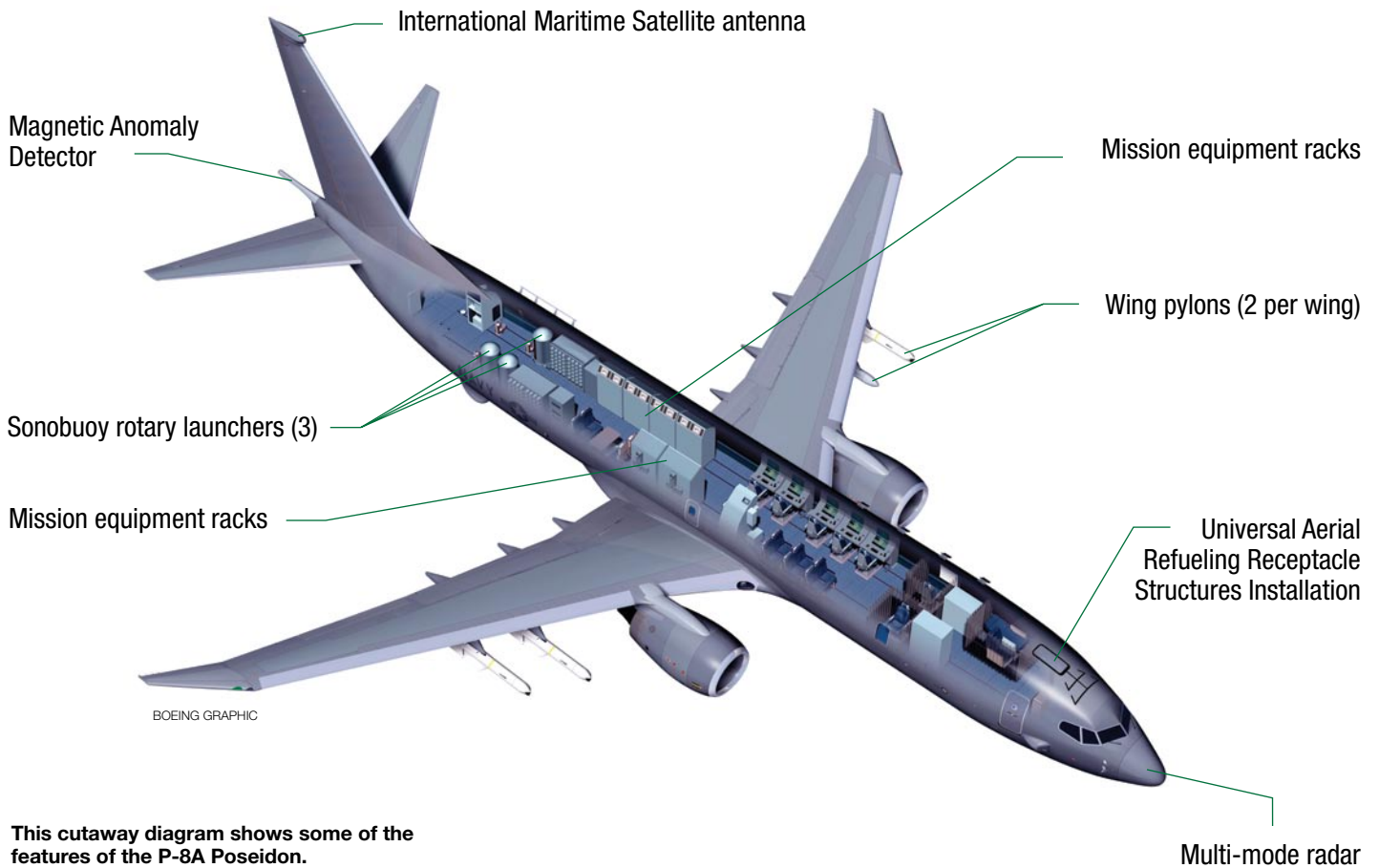
Ever purchased a family car? Think about what you'd feel if the dealer said you had to buy a station wagon first and then have it configured to the model you wanted—and that you'd have to pay for this extra work. Yet until now, that's essentially what Boeing's military customers did for their aircraft based on commercial platforms. The customer bought a commercial aircraft, removed unneeded sections and systems, and replaced them with the needed military components.

The P-8A is changing all that by becoming the first commercial-to-military platform built "in line" on a commercial airplane production line. This new production line in Renton, Wash., will replicate the already efficient 737 production system, with one major difference: the line will comply with International Traffic in Arms Regulation requirements, which are protections to ensure that non-U.S. persons can't gain access to sensitive U.S. military data or products (see box on Page 15).

Continued on Page 15

BOEING GRAPHIC

P-8A Poseidon



This cutaway diagram shows some of the features of the P-8A Poseidon.

Meet the P-8A

U.S. Navy pilots around the world agree: the four-propeller P-3 is a venerable platform—a turboprop aircraft based on the Lockheed L-188 airframe—and has a tremendous safety record. For more than 40 years it's been a Navy workhorse. However, the worldwide fleet of P-3s is aging rapidly, and time has come to upgrade this antisubmarine aircraft.

The Boeing P-8A Poseidon has a lot of advantages over the P-3, said Pat Nash, P-8A Business Development manager for IDS and a former P-3 pilot.

The P-8A is built on the Next-Generation 737-800 commercial jet aircraft platform, with Next-Generation 737-900ER (Extended Range) wings and two jet engines. Above all else, Nash said, this design gives the U.S. Navy the capability to go higher, farther and faster than its P-3s can.

The P-8As is air-refuelable, allowing the aircraft to remain airborne for more than 20 hours. And the aircraft also has a lot more room inside, meaning the P-8A has room for growth and systems upgrade or expansion. That makes the aircraft very versatile. “This is an advantage because you always find other things for the aircraft to do,” Nash said.

The P-8A design also improves upon the antisubmarine-warfare mission capabilities of the P-3. Sonobuoys are one of several mission systems used in antisubmarine warfare. They are transported aboard the aircraft and then deployed to passively or actively “listen” for objects in the water.

Sonobuoys can be programmed to control how long they'll sit in the water before they sink and to specify transmission channels and desired depth. The P-3 carries 48 sonobuoys externally in its belly and 36 inside. The P-8A can carry 120 of them inside the aircraft. “On the P-3 you have to select all information for the sonobuoys that go in the belly before flying,” Nash said. “On the P-8A, all of them are internal to the aircraft so information can be selected in real time on the mission.”

Because the P-8A can fly higher, the aircrew will be able to monitor more buoys in the water and cover a greater search area.

The P-8A features various sensors. The P-8A will have dedicated antennas to detect radio signals from the sonobuoys and acoustic processors to translate audio data into visual information to the mission operators. It also features electro-optical/infrared capability; a next-generation radar in the nose of the airplane with multiple maritime search and weather-avoidance modes; and a magnetic anomaly detector. This digitized system detects disturbances in the earth's magnetic field made by metallic objects such as submarines. Electronic surveillance equipment detects radar, and a self-protection suite determines whether the aircraft is in danger, to counter those threats.

The P-8A also has the capability to carry 11 weapons: two on each wing, two in the open air on the fuselage forward of the wing and five in an internal bomb bay aft of the wing.

—Debbly Arkell

Continued from Page 13

“Instead of modifying a completed commercial aircraft into a military one, the P-8A will be built by Commercial Airplanes employees on a new ITAR-compliant production line, using our existing production system,” Yahyavi said. “BCA and IDS designers are working together using common tools to establish manufacturing and design requirements.”

The P-8A is based on a Next-Generation 737-800 commercial jet enhanced with Next-Generation 737-900ER (Extended Range) wings (see Page 14 for more on the P-8A’s physical characteristics and capabilities). Spirit AeroSystems in Wichita, Kan., will deliver the fuselage sections via rail car to Renton, where the sections will be unloaded into tooling on the ITAR-compliant line. There, a small team of Commercial Airplanes employees will assemble the P-8A just as they would a commercial jet—only with elements specific to the Navy customer.

“Two-thirds of the parts for the P-8A are commercial parts,” said Jack Zerr, Boeing vice president and P-8A program manager for IDS. “Yet there also are bomb racks, an aerial refueling port, electrical sensors and more than 100 antennas on the aircraft—allowing a tremendous amount of communications capability—packaged into the platform.”

Once complete, the aircraft will be delivered to IDS. The “green” airplane will fly to an ITAR-compliant facility at Boeing Field in Seattle. There, IDS workers will install the aircraft mission systems and perform functional testing and validation under U.S. Navy regulations prior to delivery.

OPPORTUNITY KNOCKS

This assembly process sounds simple. But the design and production of this aircraft requires a tremendous amount of coordination between the government customer and the Boeing businesses. It also requires bridging what some call “cultural gaps” along the way.

From concept definition to the start of production, BCA and IDS have had to develop ways to ensure both business units were using common processes and tools, such as the design tools CATIA and Enovia. Establishing common approaches to the design process—in a way that accommodates requirements of both businesses and the Navy—also has been a learning process. In the past, IDS has tended toward an ongoing dialog with its military customers to continually enhance its products; BCA tends toward complete up-front definition prior to the production commencing.

Perry Moore, Commercial Airplanes P-8A Manufacturing Operations director, agreed it’s a challenge. But it’s a way of work that holds promise for the future.

Continued on Page 16

A look inside the P-8A demonstration trailer, which last summer played a significant role in demonstrating the capabilities of the new antisubmarine warfare platform to customers and strategic partners.

GAIL HANUSA PHOTO



What is ITAR?

The manufacture of U.S. military products must comply with a U.S. government requirement called International Traffic in Arms Regulations. ITAR constraints include physical protections and data protections to ensure that non-U.S. persons can’t gain access to sensitive U.S. military data or products.

As a result, the new ITAR-compliant production line in Renton, Wash., has fences and badge readers at entrances to ensure that only U.S. people are able to access the areas where P-8A Poseidon work is performed. Non-U.S. persons must be at least 10 feet (three meters) away at all times—unless those people are from approved nations or programs. An example: Australian and Turkish nationals would be allowed near a 737 Airborne Early Warning and Control aircraft manufacturing area, as their nations are customers of the product.

ITAR also requires Boeing to protect data in addition to providing physical protections. This means computer systems must have a firewall so only U.S. people can access the data, and all drawings and documents must be properly marked and controlled.

“The biggest challenge with ITAR compliance was to organize ourselves,” said Mo Yahyavi, vice president, P-8A program, for Commercial Airplanes. “We typically have not had to protect data like this before. Security and training have been a top priority—getting people to understand what it means, what our regulations are, and how to respect the new requirements.”

ITAR compliance applies to international suppliers as well: international suppliers or subtier suppliers must obtain licenses through the U.S. State Department to work on the program. “It’s complicated, but it’s a very exciting program,” said Yahyavi. “It’s challenging for all of us, but we believe our customer will be very pleased with the product they get.”

—Debby Arkell

What's coming next

Here's a look at past and scheduled milestones for the P-8A Poseidon program.



October 2006: First concrete pour for new International Traffic in Arms Regulations-compliant production-line tooling at the Boeing facility in Renton, Wash.

2007: Critical design review complete (firm configuration)
End of 2007: Begin building first small parts

First quarter 2008: Front spar build (wing production) begins; first fuselage on dock from Spirit AeroSystems

Third quarter 2008: First airplane delivered to Integrated Defense Systems

2009: First flight

2013: Initial Operational Capability (first fully equipped P-8A squadron)

Continued from Page 15

“It requires the synergy of two cultures to break new ground and build a military airplane in line. The biggest challenge is to keep the ITAR-compliant production line aligned with the 737 production system and still accommodate the military customer,” he said. “We’re getting there, and once we do, we will be able to apply this business model and lessons learned to the 767 Tanker program, should we win a contract.”

MISSION CRITICAL

With a decision on the tanker program due later this year, the P-8A program is very important to Boeing’s businesses—and to the U.S. Navy customer. A key part of Boeing’s growth strategy is tied to commercial-to-military derivatives and finding ways for BCA and IDS to work together even better to meet military customers’ requirements.

“It goes without saying that from the IDS perspective, we need another big platform. It’s very important for the defense side of our business,” Zerr said. “And Commercial Airplanes’ growth strategy is directly tied to [programs like this] as well. So this program is a big deal for Boeing.”

This year will be a big year for the P-8A program, as production systems are put in place on the new line, drawing releases are

completed, and first parts are produced. Before beginning full production on the U.S. Navy’s 108 units, the program will begin first with building five test aircraft—two for static (ground) tests, and three for flight tests. One will fly airworthiness tests, and the other two will test mission capabilities.

“Together the Navy and Boeing are following the right principles and smart practices to ensure successful delivery of the P-8A aircraft to the warfighter,” said Capt. Joe Rixey, program manager for Naval Air Systems Command’s Maritime Patrol and Reconnaissance Aircraft. “Good planning and an open communication policy between the government-industry team have contributed to our accomplishments so far. We are all aware of the fleet’s undeniable need for the P-8A and are looking forward to first flight in 2009.”

Boeing also is aggressively pursuing additional contracts with international customers that operate P-3s.

“People on both sides are enjoying working on this program, doing new and different things,” Zerr said. “We’ve been able to attract many of the best and brightest in Boeing, and we have tremendous respect for the talent on this program.” ■

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A new way

Although Boeing Commercial Airplanes and Integrated Defense Systems have worked on many derivative military aircraft programs, the P-8A Poseidon features a new and vastly improved business model. Here’s a quick look at some of the streamlined steps of this new model.

| Before the P-8A | On the P-8A |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IDS acquires a new commercial airplane from BCA to modify into a military platform. | BCA builds a military airplane on an International Traffic in Arms Regulation-compliant production line using Boeing Production System processes for delivery to IDS. |
| IDS removes unneeded sections and systems of the commercial jet—and installs the needed military components. | Many military-specific elements are already built into the product by BCA. IDS workers will only need to install the aircraft’s mission systems and perform functional testing and validation. |
| IDS conducts ongoing dialog with its military customers to continually enhance its products; BCA works to define product up-front prior to the production commencing. | BCA and IDS use a working-together approach to understand the military customer’s requirements and product definition. |



In January, the KC-767 Tanker successfully extended its boom and made a series of dry contacts with a B-52 aircraft. The KC-767 is another of many notable derivative aircraft Boeing has produced for military customers.

Derived from excellence

The P-8A Poseidon is the latest among the many derivative aircraft Boeing has produced for military customers. Here's a quick look at some other noteworthy derivative aircraft.

KC-767 Tanker

Mission: In-flight refueling

Customers: Japan Air Self-Defense Force, Italian Air Force

Airframe: 767

The KC-767 continues the refueling heritage that Boeing started with its KC-10 and KC-135 aircraft. The first tankers for Italy and Japan are scheduled for delivery this year. In addition, Boeing is competing for a contract to build next-generation tankers for the U.S. Air Force.

C-40A Clipper Military Transport

Mission: High-priority cargo and passenger airlift

Customer: U.S. Navy

Airframe: 737-700C

The C-40A is certified to operate in three configurations: all passengers (121 passengers), all cargo (up to eight pallets), or a combination configuration (up to three cargo pallets and 70 passengers). Boeing delivered the ninth Clipper to the Navy in May 2006.

C-40B Special-Mission Aircraft

Mission: Airlift with an office-in-the-sky environment

Customer: U.S. Air Force

Airframe: 737-700C (Boeing Business Jet)

The C-40B offers an office-in-the-sky environment for U.S. combatant commanders and other senior government officials. The aircraft provides those aboard with secure, in-flight broadband connectivity to enhance communications, productivity and security.

C-40C Operational Support and Team-Travel Aircraft

Mission: Transportation support for government officials

Customer: U.S. Air Force

Airframe: 737-700C (Boeing Business Jet)

Boeing has already delivered three C-40Cs to the Air National Guard and is scheduled to deliver another three aircraft to the Air Force Reserve Command this year.

C-32A Executive Transport

Mission: Executive transport

Customer: U.S. Air Force

Airframe: 757-200

Boeing has built four C-32As, which are used to carry the U.S. vice president, members of the U.S. Cabinet and Congress, and other government officials traveling on government business. The fleet is based at Andrews Air Force Base, Md., and is operated by the 89th Airlift Wing (see page 30 of the March 2006 *Boeing Frontiers*).

737 Airborne Early Warning & Control (AEW&C)

Mission: Airborne surveillance, communications and battle management

Customer: Australian Defence Force, Republic of Turkey, Republic of Korea Air Force

Airframe: 737-700

The critical sensor on the 737 AEW&C is the Multi-role Electronically Scanned Array radar, built by Northrop Grumman. The radar can track airborne and maritime targets simultaneously and can help the mission crew direct the control of high-performance fighter aircraft while continuously scanning the operational area. The 737 AEW&C aircraft for Australia are for the Project Wedgetail program; the aircraft for Turkey are part of the Peace Eagle program.

707 Airborne Warning and Control System (AWACS)

Mission: Airborne surveillance, communications, battle management

Customer: United States, NATO, United Kingdom, France and Saudi Arabia

Airframe: 707-320B

E-3 707 AWACS represents the world's standard for airborne early warning and control systems. E-3 fills the needs of both command and control (C2) functions for tactical and air defense forces. It provides a highly mobile, survivable surveillance and C2 platform.

767 Airborne Warning and Control System (AWACS)

Mission: Airborne surveillance and command and control functions

Customer: Japan Air Self-Defense Force

Airframe: 767-200

The 767 AWACS continues the tradition of airborne surveillance and command and control functions that began in 1977 with the first 707 AWACS delivery. Boeing delivered a total of four 767 AWACS to Japan in 1998 and 1999.

Thanks for your services



ALTEON PHOTO

Training centers for Alteon Training offer flight-deck simulators such as the one shown here. Alteon is one of many subsidiaries that expand the range of aftermarket services and products Boeing can offer customers.

How subsidiaries help expand Boeing's reach in aftermarket support

BY TOM BRABANT AND JENNIFER PFLEEGER

Thanks to its subsidiary partnerships, Boeing is expanding its profile in the world of aftermarket support. In the past year, Boeing and its major subsidiaries continued to increase its array of products and services that help commercial and military customers operate more efficiently.

Adding to long-standing partnerships with major subsidiaries Jeppesen, based in Denver, and Seattle-based Alteon Training, Boeing acquired Aviall of Dallas last September. Aviall is one of the world's largest providers of new aviation parts and aftermarket services in the industry.

In addition, Jeppesen acquired Carmen Systems of Sweden last June and C-Map of Italy in January. Carmen further enhances Jeppesen's crew, fleet and logistics resources, while C-Map accelerates Jeppesen's expansion in marine services—an example of how Boeing is leveraging its competencies into new markets.

Subsidiary partnerships offer Boeing many benefits. Boeing can team with companies whose people are among the most knowledgeable and experienced in the industry. Also, subsidiaries can increase Boeing's customer base by bringing loyal

“The aviation services market offers us tremendous opportunities to profitably grow our business.”

—Jim McNerney, Boeing chairman, president and CEO, in announcing the acquisition of Aviall

clients into the Boeing fold. The acquired companies, meanwhile, benefit by gaining the expanded talents of the Boeing team, along with access to more resources. Both parties can benefit from mutual brand recognition in the marketplace.

These subsidiaries report to Boeing through Commercial Aviation Services. To expand its portfolio of products and services, CAS continues to look for opportunities to profitably grow its business.

Meet the subsidiaries

Here's a look at three key subsidiaries that report to Boeing through Commercial Aviation Services.

Jeppesen

While Jeppesen's roots are in aviation, it's looking to grow in part by extending into similar transportation markets. This year's acquisition of C-Map did more than propel Jeppesen into marine markets: It moved Jeppesen to the No. 1 spot among providers of digital navigational data solutions. Now, Jeppesen Marine can provide a broader range of solutions, including services considered standard in aviation—such as 24/7 customer support, which hasn't been available in the marine market.

In 2006, Jeppesen acquired Carmen Systems' industry-leading scheduling and optimization capabilities. This move continues Jeppesen's push to invest in technology and tools that enable customers to cut costs and operate more efficiently. Jeppesen provides airline operations services including flight planning, scheduling and resource optimization, and complete navigation services and document logistics management. Carmen's rail and logistics planning business, meanwhile, offers new opportunities consistent with Jeppesen's growth strategy of applying its technology to new markets.

Alteon Training

With a global network of aviation training centers and a history of partnering with the world's airlines for strategic and effective solutions, Alteon is committed to enhancing aviation safety through unparalleled training delivered to rigorous standards. Alteon has more than 80 full flight simulators in over 20 locations worldwide—including its new Singapore site, which opened in January.

Alteon is proactively working to address the future need for additional airline pilots. Working closely with major industry partners, Alteon is leading the industry with a test of a training program for the International Civil Aviation Organization's Multi-Crew Pilot License, an alternative means to train and license airline pilots. This competency-based training program prepares pilots more efficiently through the increased use of simulation and crew-oriented training. Alteon will employ the lessons learned in this test as it continues to look into enhancing training solutions for airlines.

Another way Alteon is working to meet airlines' needs is by offering customers of the 787 Dreamliner a new and innovative way to access its training resources. Customers who purchase the 787 will be awarded points that can be redeemed for Alteon training services in lieu of a standard training package. This allows each airline to customize a training package that meets its own training requirements.

Aviall

By acquiring Aviall, Boeing has expanded its leadership in integrated materials management. The transaction also positions Boeing for faster growth in the \$25 billion industry of new aviation parts and services.

Aviall provides aftermarket supply-chain management services for the aerospace, defense and marine industries. It offers new aerospace parts and supply-chain management services to the aviation industry. Also, Aviall operates electronic marketplaces for buying and selling parts, equipment and services for the aviation, defense and marine industries.

Aviall's 2006 financial performance reflects its expertise in inventory management and distribution of high-transaction aviation parts. That year, the company recorded its best-ever totals for annual revenues and earnings.

“Our detailed customer knowledge, global operations and dynamic team enable us to provide customers with better reliability and profitability,” said Lou Mancini, vice president and general manager of Commercial Aviation Services.

“The aviation services market offers us tremendous opportunities to profitably grow

our business, internally and externally, to better serve our commercial and military customers,” said Boeing Chairman, President and CEO Jim McNerney in announcing the Aviall acquisition. “It demonstrates our commitment to create a Boeing that is more than just the sum of its parts.” ■

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A whole new way to fly

A look inside the new 747-8 Intercontinental

Boeing Commercial Airplanes showcased the new interior of the 747-8 Intercontinental recently, unveiling the airplane's two-story sales display. The display is housed at the Customer Experience Center in Renton, Wash.

The 747-8 interior applies features from the 787 Dreamliner. It includes a new curved, upswept architecture—giving passengers a greater feeling of space and comfort, while adding more room for personal belongings. The interior architecture is accentuated by new lighting technology that creates a perception of airy brightness and provides smooth lighting transitions to offer a more restful environment.

“By incorporating 787-style interior features, the new 747-8 Intercontinental will provide a significantly enhanced passenger experience,” said Dan Mooney, vice president, 747/747-8 Program. “Passengers will know they are on a brand new airplane the moment they step on board the 747-8—and will experience a whole new way to fly.”

Here's a look at some of the interior features of the 747-8. ■

BOEING PHOTOS



Above: The 747-8 Intercontinental features windows that are larger than those in today's airplanes.





Among the 747-8 Intercontinental's interior features shown in the photo below: an advanced lighting system, designed to contribute to the overall sense of calm and restfulness; sculpted ceilings; and a sweeping staircase that leads to the upper deck.

Top left: The bidirectional latches on the overhead bins open with a push or a pull. Also, the bins are big enough to hold items for every passenger in each row; that makes boarding and deboarding less stressful.

Top right: The smooth ceilings and curved lines in the upper deck are intended to create a sense of soothing calm as well as an intimate atmosphere.



Above: The new 747-8 design features unique "islands"—casual gathering areas intended to give passengers a place to visit when they stretch their legs.



This ad, from Boeing Commercial Airplanes, is one in a series promoting the many revolutionary features of the 787 Dreamliner. When it enters service in 2008, the 787 will provide unprecedented efficiencies for the 37 airlines that have ordered it, as well as an unmatched passenger experience. This ad focuses on aspects of the improved cabin environment, including cleaner air, higher humidity and reduced interior noise. These features are designed to help passengers arrive at their destination feeling more refreshed.



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787
DREAM LINER

Building bridges

Boeing, U.K. customer lend employees to boost knowledge, capabilities

By MARC SKLAR

A bridge across the Atlantic Ocean might seem like something from a science fiction story. But symbolically, such a bridge exists at Boeing in the form of people like Simon Harwood and Matt Vance.

Boeing has spent decades building relationships to increase understanding of its United Kingdom customer needs and better serve them. But through his unique assignment, Harwood is helping deepen the understanding between his employer, the U.K. Ministry of Defence, and Integrated Defense Systems. The MOD loaned Harwood to Boeing for an extendable two-year period. His title is director of studies & analysis in Advanced Systems, Analysis Modeling Simulation & Experimentation (AMSE) element headed by Guy Higgins.

Setting up a “secondment to industry,” as the MOD calls it, is not easy. Numerous hurdles from security to export control to control of proprietary information took more than three years to clear. Boeing Global Trade Controls developed a scope-of-work statement for Harwood and obtained U.S. Department of State approval for the plan. BGT also worked with Harwood to design Web-based, State Department–approved tools that allow Export Control review of data from anywhere in the world.

“This is critical to controlling vast and complicated transfers of technical information,” said Ricardo Barreiro, who oversaw the project for the Office of Internal Governance–Global Trade Controls.

“It can make things a bit difficult, but it is necessary,” said Harwood. “There are



Matt Vance (seated) and Simon Harwood (linked by video conference) are helping Boeing and the United Kingdom Ministry of Defence enhance mutual understanding through exchanges that have the MOD's Harwood working for Boeing and Boeing's Vance going to work for the MOD.

THOM GOERTEL PHOTO

Welcome to our workplace

Though the “loan” of U.K. Ministry of Defence employee Simon Harwood to Boeing is somewhat unique, numerous customers and partners have employees working at Boeing sites.

- The U.S. Department of Defense's Defense Contracts Management Agency has offices at various IDS sites.
- International military customers have liaison representatives at program sites.
- Commercial Airplanes customers have about 90 representatives working at Puget Sound sites.
- To enhance communication and mitigate risk on some programs, supplier representatives work at sites across the Boeing enterprise or at nearby locations.

IDS in the U.K.

Integrated Defense Systems has numerous programs with the U.K. MOD, including

- Apache AH Mk1 aircrew and maintenance training
- C-17
- E-3D Sentry airborne early warning system
- Future Rapid Effect System—Integrated Survivability Programme
- Through Life Customer Support for Royal Air Force Chinooks

rules about everything from access to the Boeing network to even the routes I take through buildings to the restrooms.”

Following on Harwood’s secondment, Boeing has forged a reciprocal agreement with the MOD that will send Matt Vance to London for a two-year assignment. Vance, currently director of IDS’s AMSE Washington Studies & Analysis team, will be heading to the U.K. with his family in March.

With a background in network-centric and network-enabled operations, Harwood dove into his work starting last July. “Working under Advanced Systems President George Muellner, my role reflects his organization,” said Harwood. “I can dip in and out where it’s relevant for me to help out. For instance, I’ve been working with Phantom Works, the Network Centric Operations Industry Consortium and AMSE.”

“Simon has demonstrated a keen sense of the challenges and strategic implications of interoperability between U.S. and U.K. forces,” said John Harms, Harwood’s manager at Boeing. “His insights will be very beneficial as we look to future opportunities not only in the U.K., but other coalition partners as well.”

Whatever area Harwood is working in, however, the goal is the same. “A huge part of this is in terms of education, such as where are the U.K. capabilities needs,” Harwood explained. “People have asked what I think might make Boeing stronger when bringing capabilities to the MOD.” Driving this need, Harwood said, is the requirement that MOD make the best use of its funds.

How that money is spent has also recently changed. The MOD switched its policy of acquiring mostly through open international competition to one of keeping key defense system intellectual prop-

erty in the U.K. Boeing, with 600 teammates in the U.K., is looking at how to respond to the change.

Boeing and the MOD clearly see how exchanges like these can help both sides in the evolving relationship.

“This kind of relationship building is at the heart of the U.K.’s Defence Industrial Strategy and is vital, particularly in the fast-moving world of information systems technology,” said Air Chief Marshal Joe French, Commander-in-Chief, Royal Air Force, Strike Command.

Benefits also flow from that mutual knowledge to support the company’s growth and productivity initiatives. “Better understanding means better decisions in where we invest our time, energy and money, helping drive Development Process Excellence,” Muellner said.

Boeing’s Vance will work with the MOD’s deputy director for science within the Command Control and Information Infrastructure (CCII) directorate. Starting in April, this directorate will have responsibility for all CCII decisions across the MOD.

The participants said they’re excited about their opportunities. “Both the MOD and Boeing benefit when leadership is deployed to help others understand the tactical building blocks of coalition warfare and the larger strategic reasons that those building blocks are valuable,” Vance said.

“I have had the chance to engage with a variety of people throughout Boeing,” Harwood said. He added there was the side benefit of being located in Southern California: “It’s nice having it 70 degrees and the sea at your doorstep in October.” ■

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British Army Air Corps ground-crew members stand by as an Apache AH Mk1 prepares for a training mission in the Arizona desert. The British Army has a fleet of 67 Apaches.

BOB FERGUSON PHOTO



■ INTEGRATED DEFENSE SYSTEMS

Astronaut Robert Curbeam, STS-116 mission specialist, works with the port overhead solar array wing on the International Space Station's P6 truss during the December mission's fourth spacewalk. Curbeam and other astronauts worked to guide the array wing neatly inside its blanket box.

NASA PHOTO

Creativity in space

Shuttle crew to apply past lessons to fold arrays on space station

By AMANDA SMOKE

Who knew the ancient art of paper folding would one day come in handy assembling the International Space Station?

Like origami artists, Space Shuttle *Discovery* astronauts carefully wiggled, nudged and folded the station's delicate, gold-colored solar arrays into position during the STS-116 mission in December. The intricate procedure wasn't an art exhibit: It was meant to retract the station's P6 port-side solar array, to provide enough clearance for the P4 solar array to begin tracking the sun's motion.

This month when Space Shuttle *Atlantis* heads for the ISS, STS-117 mission objectives will feel familiar, since similar maneuvers will be performed. The crew will install the Boeing-built S3 and S4 truss segments, unfurl new solar arrays and retract another set of old solar arrays. This time around, astronauts will apply learnings from the previous mission.

Fully deployed, the array's 32 massive panels extend 120 feet (36.6 meters) along a system of guide wires. They're designed to fold up like an accordion and retract along the wires into large storage boxes at the bottom of the arrays. The process may sound simple. But folding an array that's been extended for six years is similar to folding a well-used road map into its original position.

The first attempt to retract the arrays was automated from inside the ISS. But minutes into the process, hinges between the delicate array panels folded in the wrong direction and had to be redeployed slightly, then retracted again. As the retraction continued, excessive tension caused the guide wires to become snagged, and the arrays draped over the blanket box below.

On the ground, Boeing engineers were troubleshooting the problem and advising NASA's mission control on next steps. Boeing Extra Vehicular Activity (EVA) & Crew Systems Integration team members were also working to verify the tools the space-walking astronauts would use were safe and compatible with the electrically charged elements of the solar arrays.

"On-orbit operation is a 24/7 thing, so we were constantly working with NASA to determine what happened and correct it," said Carter Reznik, Boeing lead for the

ISS Structures and Mechanisms team.

At the end of the first spacewalk, only 17 panels had been retracted. The retraction was not complete, but it was enough to allow the crew to move forward with the second and third spacewalks—during which they reconfigured part of the station's power system and readied the ISS for future additions of laboratory modules.

A fourth spacewalk was added to the mission, giving the astronauts another chance to unstick the arrays manually. The crew inside the ISS used the station's robotic arm to position the spacewalking astronaut close to the array. Seven hours later, the job was done, followed by high-fives and cheers at Mission Control.

This time around, Mission Control will begin the process by automatically retracting the set of arrays one panel at a time while astronauts watch from inside the station. They will be prepared to assist with folding the arrays during the mission's second spacewalk, using tools that proved most effective on STS-116.

"We learned so much from the last EVA and the crew debriefs that confirmed what we saw," said Dan Sweeney, Boeing Solar Array Specialist, ISS Structures and Mechanisms. "The opportunity is there to be much more efficient." ■

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It's getting crowded out there!

Engineers for Boeing, NASA test effects of orbital debris on ISS

By Ed MEMI

Space is getting more cluttered with man-made objects that no longer serve a useful purpose. Numbering in the tens of millions, these objects—called orbital debris—can include things like spent rocket stages, defunct satellites, dust and even paint flakes.

Approximately 11,000 orbital debris objects larger than 10 centimeters (4 inches) are regularly tracked. There are an estimated 100,000 particles between about 1 and 10 cm, and the number of particles smaller than 1 cm probably exceeds tens of millions.

Space debris has become a growing concern in recent years, since collisions at orbital velocities can severely damage functioning spacecraft. Orbital debris is a problem to the International Space Station (ISS) because collisions can occur at speeds of, on average, 6.2 to 6.8 miles (10 to 11 kilometers) per second.

Although the station will have, upon completion, some 20,000 pounds (9,100 kilograms) of debris shields—and although NASA mission controllers periodically maneuver the space station to avoid large debris—it's the smaller pieces that pose the biggest threat to the station. The ISS is routinely struck by cosmic dust and orbital debris smaller than half an inch (1.3 cm); and its components can be damaged by tiny particles as small as a paint chip.

A team of Boeing and NASA engineers is studying the effect of small orbital debris upon impact with the space station to help determine the spare parts that might be needed to replace damaged station parts. Testing began in the 1980s and will continue to at least 2010.

“Test data becomes especially critical when the space shuttle retires in 2010, and we need to determine which spare parts to store on the station to replace damaged parts,” said Russell Graves, a Boeing associate technical fellow and the ISS orbital debris senior engineer. The research could also be used to design future spacecraft that better withstand meteoroid and debris impacts.

To better understand the potential damage, engineers at NASA's White Sands test facility in New Mexico fire special light-gas guns on space station test components that have been designated as having a higher probability of failure upon impact. The debris used for testing ranges from 0.5 to 6 millimeters (0.02 to 0.24 inches), which mimics items like paint flecks and circuit

board components. “I was really surprised how much damage little pieces about the size of a ballpoint-pen tip can cause,” said Mitch Bland, a Boeing spacecraft survivability engineer.

Debris testing allows engineers to modify some hardware designs to make them less susceptible to damage upon impact from orbital debris. “If I can make a minor design modification such as cable routing and increase its survivability from debris by a factor of two, and if it doesn't cost me much or add any weight, it's kind of a free upgrade,” Graves said.

Engineers test a variety of materials and configurations to determine which are less susceptible to damage. They also test active components—such as wiring harnesses—to determine if and by how much impacts by orbital debris cause voltage spikes.

Graves said testing the effect of orbital debris impact will benefit more than the space station. “Testing on wire harnesses, heaters and other components will be useful to anyone who goes into space,” he said. “One of the missions of the space station is to provide this kind of engineering data for future space vehicles, including the Boeing satellite development programs and NASA's Constellation project vehicles and lunar bases.” ■

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BOEING PHOTO



Mitch Bland, a Boeing ISS survivability engineer, opens the chamber of a hydrogen gas gun at NASA's White Sands Test Facility in New Mexico following a recent orbital debris test on a space station component. The debris travels at speeds of more than 17,500 mph (28,200 kilometers per hour).

The future is now



Transformation enables better way of doing business at Everett site

BY DEBBY ARKELL

In a year when assembly of the first 787 will begin, production rates are on the rise, and the 777 program is transitioning to a moving line, one might think undertaking a major factory remodel would be the last thing leaders in Everett, Wash., would want to do.

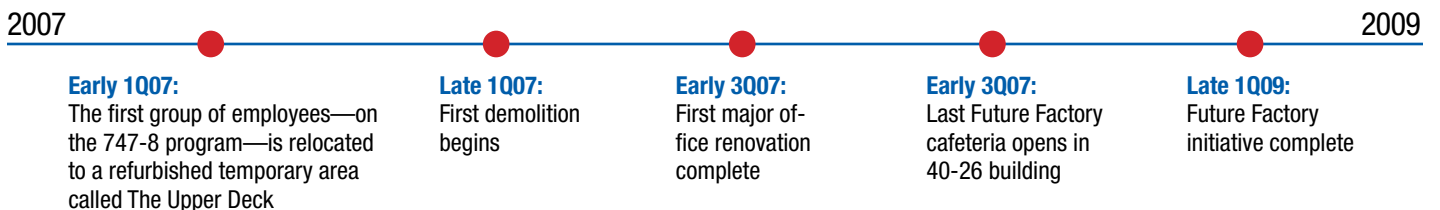
However, to them, there's no time like the present. The Future Factory initiative is under way, with the first group of employees recently relocated to newly created work space and demolition about to begin.

The Future Factory initiative at the Everett, Wash., site calls for skylights in the ceiling, to allow natural light into the facility. Large vertical panels, made of metal mesh, will provide a visual cue to the location of collaboration zones in the office towers.

"Sure, we're busy," said John Akiyama, Future Factory program manager. "But Future Factory is an enabler for implementation of the Boeing Production System. When all is said and done, we'll have vastly improved how we do business."

Future Factory is an Everett site initiative designed to change the culture, teaming relationships and facilities used in building commercial airplanes. It's one of several initiatives under way at the site, and it directly supports Lean+ and Internal Services Pro-

Everett Future Factory milestones



ductivity—two of Boeing’s four companywide initiatives designed to accelerate long-term growth and productivity. Commercial Airplanes leadership sponsored the Future Factory initiative and developed a business plan based on the successful implementation of a similar initiative in Renton, Wash., called Move to the Lake.

“Future Factory is more than a facilities project,” Akiyama said. “Our facilities changes are certainly the most visible, but Future Factory is more than an office upgrade. It streamlines the way we work by fostering a collaborative environment.”

Future Factory entails the renovation of existing office space and the creation of new space with the addition of modular work areas. With spaces designed to help office workers best connect with their network colleagues, including those on the shop floor, teams will be strategically collocated to optimize work flow—and will be encouraged to approach their work collaboratively.

“We’re locating people near the groups they need to work with, with a definite rhyme and reason as to why one group is by another,” said Ken Shirley, Future Factory project manager.

Boeing is teaming on the renovations with design firms NBBJ and DLR, as well as the construction firm General Construction. Open, flexible work areas combined with windows and collaboration zones will provide workers with a visual connection to the products they design and support, to each other, and to nature. Skylights will allow natural light into the factory and, coupled with the new wayfinding graphics, will allow employees to navigate the factory environment more easily.

“A universal message we heard during our early planning workshops was that employees spend so much time inside that they lose connection with what’s going on outside,” Akiyama said. “Natural light and enhanced employee services will help create that connection and improve the employee experience.”

Keeping Boeing successful and increasing employee and customer satisfaction ultimately are at the heart of why the Everett site Leadership Team is pursuing this initiative. “Intuitively, if a mechanic has a problem with a part and the engineer that supports that part works a 15-minute walk away, needed changes will not happen quickly,” Akiyama said. “With Future Factory, engineering support

Learn the lingo

Here are some terms you might hear in discussions about the Future Factory initiative in Everett, Wash.

Collaboration zones: The areas that connect the factory floor and offices. Employees can gather in these spaces to work together.

Onion chart: A chart resembling an archery target. It’s used as a planning tool to determine which teams should work in close physical proximity relative to each other and to airplane assembly activity.

Touchdown zones: Flexible office areas, some equipped with wireless internet access, where employees can take care of short-term work between meetings.

Wayfinding: Tools used to help people navigate an unfamiliar area. These include use of universal symbols for restrooms, elevators and other locations. Color also plays a role. Each bay will be color-coded so workers can tell quickly where they are and which support cell teams support which product.

RENDERINGS COURTESY OF NBBJ



Top: This rendering depicts collaboration zones, which are areas that connect the office towers and the factory floor. They’ll offer support cells, crew break areas and other activities. The zones are intended to facilitate collaboration between factory workers and employees who design and support the products they build.

Above: Future Factory office renovations include building new balcony areas, so office workers will have a visual connection to the airplanes they design and support.

■ FEATURE STORY

will be adjacent or on the factory floor right near the product. The right people will be in the right place at the right time.”

Future Factory also is giving Everett a cohesive approach to facility upgrades, which in turn is making Everett more attractive for current—and future—employees. Amenities already in place include three upgraded employee cafeterias and three Tully’s Coffee cafes in the factory. Three additional cafeteria upgrades are planned for completion by the end of the project.

Also, an Employee Service Center opened in the 40-22 building last July. Its amenities include a laptop service center, The Boeing Store, a BECU (formerly known as the Boeing Employees Credit Union) facility, a sundries store and a dock3 service counter where employees can rent DVDs, drop off dry cleaning and more. Other services aiding employee work-life balance include retirement consulting and assistance with benefits and insurance.

“Future Factory represents a significant investment of funds, and it represents an even greater investment of time and energy to make it happen,” Akiyama said. “Ultimately, by improving the employee experience we’re enhancing production efficiencies through collaboration and connection to the product. We’re creating a culture that today’s employees and the next generation of Boeing employees can thrive in—and keep the company successful.” ■

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● Your services are here

The Future Factory initiative under way at the Everett, Wash., site is designed to change the culture, teaming relationships and facilities used in building commercial airplanes.

Planned upgrades include the renovation and creation of new, flexible work spaces and the addition of employee amenities. Those amenities are being added up front, before work begins in earnest on the renovated office spaces.

In the heart of the Everett factory is an Employee Service Center. It’s a one-stop shop complete with a laptop service center, The Boeing Store, services from BECU (formerly known as the Boeing Employees Credit Union), a sundries store, and a dock3 service counter where employees can rent DVDs, drop off dry cleaning and more. Other services available there include retirement consulting and assistance with benefits and insurance.

Three upgraded employee cafeterias and three Tully’s Coffee cafes also are up and running. Three more cafeteria upgrades are planned for completion by the project’s end.

Directory of services

- Food and Beverage
- Banking
- Shopping

Everett Future Factory: By the numbers

ISTOCK PHOTO



0 Number of hard-walled offices designated for individual employees

98.3 Size, in acres (39.8 hectares), of the footprint of the main assembly building in Everett

3,000 Approximate number of employees relocating

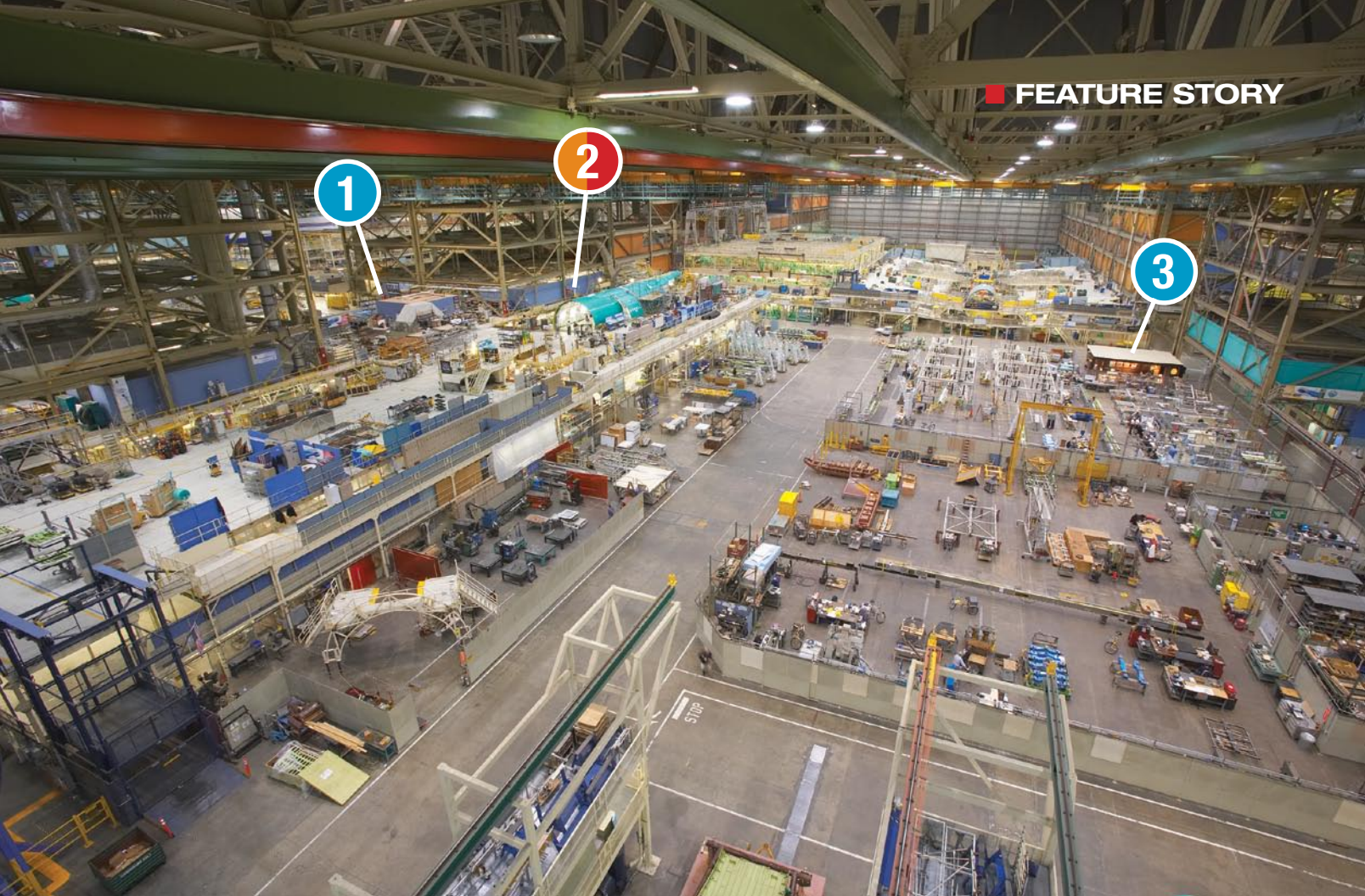
487,000 Square feet of office space (45,200 square meters) being renovated, new space being built, and temporary space added

700,000 Square feet of usable office space (65,000 square meters) in factory



GAIL HANUSA PHOTO

The newly remodeled Queen of the Skies cafeteria, located in the 40-22 building in Everett, Wash., is a popular place for employees to gather. The dining area was named by site employees as a tribute to the 747.



ED TURNER PHOTOS

Employee Service Centers, such as this one in the heart of the Everett, Wash., factory, are designed to aid employee work-life balance. The Everett ESC offers various conveniences, as well as Human Resources–related services.

Commercial Airplanes site leadership partnered with Tully's to have four Tully's Coffee cafes built in and around the Everett, Wash., factory. This Tully's stand is in the 40-23 building in the Everett factory. Employees can purchase coffee and food, as well as gift cards for employee recognition or personal gifts.

ISTOCK GRAPHIC

'Every person has value'



Attendees at this year's Diversity Summit tell what lessons they'll bring back to their worksites

The keynote speeches are done, the breakout sessions wrapped up, and the awards presented. But the ideas exchanged at the fifth annual Global Diversity and Equal Employment Opportunity (EEO) Compliance Summit live on for the nearly 1,000 Boeing employees and managers who participated.

The Diversity Summit, which took place in Irvine, Calif., from Jan. 30 through Feb. 2, was designed to underscore the company's commitment to the leadership attributes and the Boeing value of

"The culture that drives business performance is the same culture that drives diversity, ethics and integrity, all of which work together," said Jim McNerney, Boeing chairman, president and CEO, at the 2007 Diversity Summit.

diversity and inclusion. The Summit's breakout sessions included skills-based training in diversity and EEO compliance.

The event provided an opportunity for interactive learning that included engaging with Boeing's senior leaders and external guest speakers to get their candid thoughts on questions. Attendees were encouraged to take what they learned from the Summit back to their teams and leaders—and to serve as role models and change agents. Here are some thoughts and feelings from a few attendees. ■



Janet Coleman

For Janet Coleman, in Accounting in El Paso, Texas, the way to spread the Summit's message is simple: It's "through my actions—how I treat people. You need to make sure you are treating all people the same, with dignity and respect."



Bud Scott

Bud Scott, an IDS executive in El Segundo, Calif., said he believes diversity has everything to do with good business: "If we're going to attract and retain the best talent for The Boeing Company, we need to be looking at all segments of the work force, including a completely diverse group of people."



Anthony Cartwright

“Embracing diversity is critical because we’re a global company, a global society,” said Anthony Cartwright, who works in Industrial Engineering for Integrated Defense Systems in St. Louis. “We no longer have the borders that we once had in past generations, so it behooves us to be inclusive of everybody.”

Mina Martinez

“Diversity and inclusion are critical,” said Mina Martinez, with IDS in El Segundo, “because of all the business we do globally. We need to share the culture, not only in the business aspect, but in everything that we do. That’s knowing your job, loving your job, and knowing and loving the people you work with.”



Jolene Hunter

Jolene Hunter, a Commercial Airplanes Human Resources representative in Tukwila, Wash., noted that “every person has value and every person has a different set of experiences, and they need to bring all of that to work with them every day. That’s what diversity is all about.”



Taiwo Ross

British-born stress engineer Taiwo Ross joined BCA’s Propulsion Systems Division in Tukwila, Wash., more than a year ago. “We’re no longer in an industry where it’s just the machines and the quality of those machines that matter,” he said. “There is value in the strength of the organization that you achieve by embracing people of all different orientations and backgrounds.”



Robert Brownlow

“It’s the difference between ‘head knowledge’ and ‘heart knowledge,’” said Robert Brownlow, diversity manager in Renton, Wash. “This company cannot function on head knowledge alone. It needs heart knowledge. That’s the insight.”

Helena Nemr

Helena Nemr, an Employee Development Specialist for Alteon Training in Seattle, said the Summit was a good opportunity for everyone to share their strengths: “Everybody brings something different, and you don’t get that if it’s only one gender, type of person or ethnicity. You need a bit from everybody to work together as a team. Nobody is less for being different.”



Annette Ray

“Until we gain the benefits of everyone, we lose a lot,” said Annette Ray, IDS Accounting in People and Processes Group in St. Louis. For her, that includes diversity of age and experience: “I have nearly 42 years with The Boeing Company and McDonnell Douglas, and I think it’s a great asset to the young people because I can then serve as a mentor.”



Raymond Delos Reyes

For Raymond Delos Reyes, an Affirmative Action Specialist in Renton, Wash., the Summit said a lot about Boeing. “I don’t know too many companies that tell their employees ‘empower yourself’ with education about what diversity is and how it applies to the company’s strategy. It speaks volumes for the commitment of the executives.”

The vision: Now I see it

The Controllers Council has recast its vision statement to make it more aspirational, while remaining connected to the units' and Chief Financial Officer James Bell's goals. The statement reads:

To enhance Boeing's competitive advantage and serve as a catalyst for growth and productivity by providing real-time, decision-quality financial information within an effective control environment.

To achieve this vision, the council wants Controller teammates focused on these fundamental concepts ...

Accuracy – ensure it

- Our primary responsibility

Simplicity – pursue it

- Fuels improving performance by driving efficiency

Excellence – aspire to it

- We always can do better
- We can be a catalyst for growth and productivity
- We should be the gold standard for controller organizations

... and these tactics:

- Maintain a lean, compliant control environment
- Embrace simplicity, for it fuels superior performance
- Act at the speed the business needs
- Anticipate and mitigate risks sooner
- Identify and exploit opportunities faster
- Build a diverse and skilled team
- Communicate clearly so you're persuasive and understood
- Provide more analysis; do less "number crunching"



ISTOCK PHOTO

More than the numbers

Controller group seeks to become more central to Boeing's growth

“We need to realize our responsibilities go beyond the numbers.”

At first that seems an odd thing for Boeing Controller Harry McGee to say, given that he oversees core numbers functions including accounting and cost estimating.

However, it reflects his belief that the Controller group must become more central to Boeing's growth.

“We can enable growth, and productivity, by getting financial information that's sharper and easily understood to our decision makers more quickly,” McGee said.

The notion of becoming an integral element of the company's strategic decisions sprang in part from the Finance Transformation program. This program is establishing common Finance systems and process and increasing functional productivity and quality of work—while reducing costs, cycle time and errors.

As it has progressed, FT has reinforced the notion that Finance can do a lot more than just keep the books. “When we started, commonality seemed to be the end goal,” said Commercial Airplanes Controller Deb Gavin. “What we're realizing is that commonality is simply an important tool we're using to transform how Boeing does Finance.”

Many examples prove this point. BCA has reduced transactions and simplified management reporting by reducing cost allocations. The reduction of Shared Services and Information Technology rates has simplified cost billing by cutting the number of rates. And the company's quarterly financial books are now closed in five days rather than 20.

“The real benefit of such steps is having time to more fully analyze our data for in-

formation the businesses can use in making decisions,” Integrated Defense Systems Controller Bob Verbeck said.

Amid such progress, during the past year the Controllers Council recognized that a more powerful role for their function was coming into reach.

“Few of us thought of a role on the front lines of growth and productivity,” said Rick Baniak, controller for the Engineering, Operations and Technology function. “Once we realized we have that, we had to figure out how to present a new mindset to our employees.”

To that end, the council—working with Jeff Wilson from the Organization Effectiveness group—has been recasting the function's vision statement. It's now more aspirational, while remaining connected to the units' and Chief Financial Officer James Bell's goals.

Late last year the council was settling in on a vision that highlighted controls and compliance, until they recognized they needed more. “We realized that it stated the fundamentals of what we have to do, not what we can do, and it didn't inspire anybody to drive performance,” said Boeing Capital Controller Kevin Murphy.

The final statement adopted in January sets a stretch goal: To enhance Boeing's competitive advantage and serve as a catalyst for growth and productivity by providing real-time, decision-quality financial information within an effective control environment.

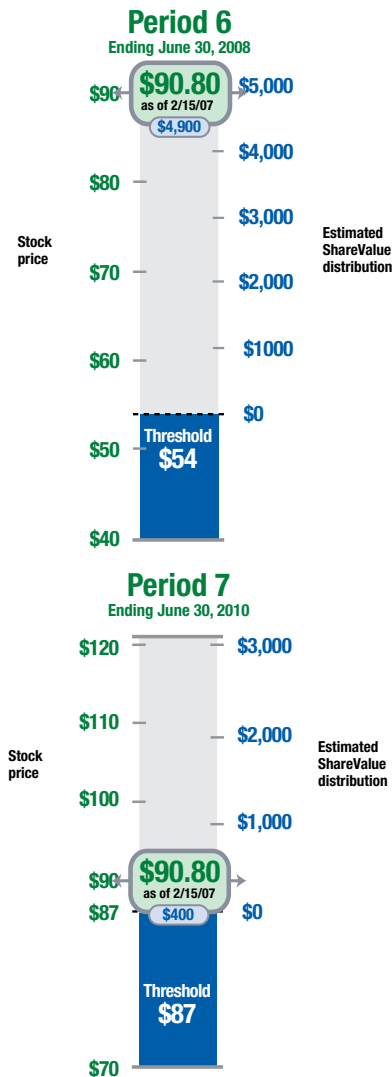
“That says support functions have a bigger role in growth and productivity than reducing spending,” said Controller Ken Sweet of SSG. “They must be providing what the businesses need so Boeing can be faster and smarter than the competition.”

McGee is excited by how far the function has come in a relatively short time. “It will take some time for everybody to process all this, but we're quickly moving forward together,” he said. “We've charted the course and we're making great progress.” ■

Boeing stock, ShareValue Trust performance

ShareValue Trust is an employee incentive plan that allows eligible employees to share in the results of their efforts to increase shareholder value over the long term.

The program—which runs for 14 years and ends in 2010—features seven overlapping investment periods. The program is currently in Periods 6 and 7.



The above graphs show an estimate of what a "full 4-year participant" ShareValue Trust distribution (pretax) would be for Periods 6 and 7 if the end-of-period average share prices were the same as the recent price shown.

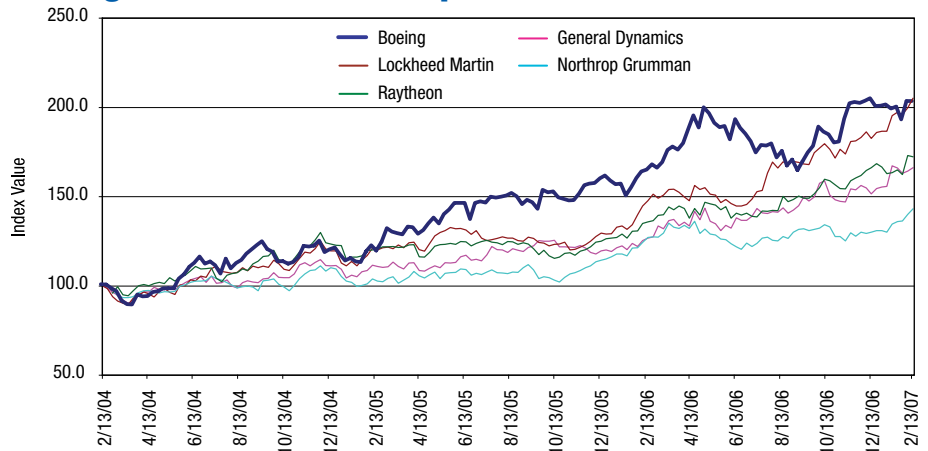
The share price shown is the average of the day's high and low New York Stock Exchange prices. Updates to participant/employment data will be made periodically.

For more information on the ShareValue Trust, visit <http://www.boeing.com/share>.

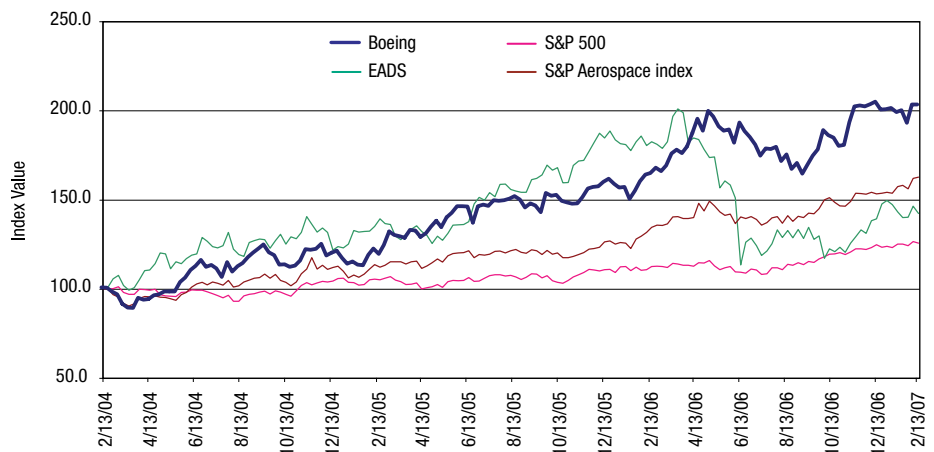
STOCK WATCH

The chart below shows the stock price of Boeing compared to other aerospace companies, the S&P 500 index and the S&P 500 Aerospace and Defense index. Prices/values are plotted as an index number. The base date for these prices/values is Feb. 13, 2004, which generates three years of data. The prices/values on that date equal 100. In other words, an index of 120 represents a 20 percent improvement over the price/value on the base date. Each data point represents the end of a trading week.

Boeing vs. U.S.-based competitors



Boeing vs. stock indexes and international competitors



Comparisons:

| 4-week, 52-week | Price/value as of 2/9/07 | Four-week comparison | | 52-week comparison | |
|-------------------------------------|--------------------------|---------------------------|----------------|---------------------------|----------------|
| | | Price/value as of 1/19/07 | Percent change | Price/value as of 2/10/06 | Percent change |
| BOEING | 90.00 | 88.13 | 2.1% | 72.53 | 24.1% |
| U.S. COMPETITORS | | | | | |
| General Dynamics | 79.56 | 80.09 | -0.7% | 59.95 | 32.7% |
| Lockheed Martin | 101.16 | 96.31 | 5.0% | 71.37 | 41.7% |
| Northrop Grumman | 74.00 | 69.58 | 6.4% | 64.29 | 15.1% |
| Raytheon | 54.63 | 51.78 | 5.5% | 42.79 | 27.7% |
| INT'L COMPETITORS | | | | | |
| EADS * | 24.87 | 25.04 | -0.7% | 31.54 | -21.1% |
| U.S. STOCK INDEXES | | | | | |
| S&P 500 | 1438.06 | 1400.95 | 2.6% | 1266.99 | 13.5% |
| S&P 500 Aerospace and Defense Index | 396.27 | 383.37 | 3.4% | 320.98 | 23.5% |

* Price in Euros

Seeking connections

India's recent air show reflects this market's enormous potential

The activity at last month's Aero India air show reflected India's multibillion dollar potential in both the commercial and defense aviation sectors.

"There is no opportunity or market outside of India that is bigger than India for both commercial aircraft and defense products," said Mark Kronenberg, vice president, International Business Development—Asia-Pacific for Boeing Integrated Defense Systems, in a *New York Times* article.

As an indication of this nation's market potential, executives from various aerospace companies, including Boeing's Kronenberg, projected the defense market in India to be worth up to \$15 billion. On the commercial side, Boeing expects India's carriers to order 856 commercial planes valued at more than \$72 billion at list prices over the next 20 years, said Dinesh Keskar, Commercial Airplanes vice president of Sales, at a news conference during the show.

The five-day event near the city of Bangalore attracted about 500 companies, India's Defense Production Secretary K.P. Singh told reporters. Boeing was among these firms.

Several major aerospace companies announced agreements with Indian companies during the show. Among them:

- Boeing signed a memorandum of understanding with Larsen & Toubro Ltd., India's largest engineering and construction company, for the joint exploration of business opportunities in India's defense sector.

- Raytheon said its space and airborne systems division had signed a memorandum of intent with Tata Power Ltd.'s Strategic Electronics Division to encourage collaboration in areas of complementary expertise and experience.

- Northrop Grumman said it signed a memorandum of understanding with Dynamatic Technologies Ltd. to explore joint opportunities in India's defense sector.



KEVIN FLYNN PHOTO

A C-17 takes to the air as an F/A-18 stands on the tarmac at the site of last month's Aero India air show. These two Boeing-built aircraft were part of Boeing's presence at this event.

Driving India's demand in both the commercial and defense markets is the nation's rapid economic expansion in recent years, said Indian Defense Minister A.K. Anthony in an Associated Press report.

"India has been called upon to play a more decisive and responsible role in world affairs, particularly in the Asian region. This has led us to rethink our priorities," Anthony said, according to the AP. "We are in the process of acquiring fresh capabilities for all three wings of our armed forces."

That expansion has added to India's role in international affairs, which in turn demands that the country also boost its military capabilities, the article added.

This economic growth—along with increased market liberalization, airport privatization, and travel to and within the country—also has fueled demand for air travel. "India was a small blip in the global aviation map. Now it is driving the civilian airplane market," Keskar said, according to an Indo-Asian News Service report.

30-city book tour wraps up in D.C.

The last leg of a Boeing-sponsored tour to promote the book "Operation Homecoming" will take place March 14 at the National Archives in Washington, D.C.

"Operation Homecoming," an anthology published by Random House, is the result of a National Endowment for the Arts (NEA) initiative that preserves the stories and reflections of U.S. military personnel who served in Afghanistan and Iraq. *The Washington Post* named it one of the "Best Books" of 2006.

As part of the 30-city tour, which began in September, Andrew Carroll, the book's editor, visited more than 10 military bases in the United States and overseas, as well as the Museum of Flight in Seattle.

The "Operation Homecoming" effort began in 2004 with the NEA's call for troops who have served since 9/11, along with their spouses and families, to write about their wartime experiences. Distinguished writers—including Tobias Wolff, Tom Clancy, Marilyn Nelson, Jeff Shaara, Bobbie Ann Mason and Mark Bowden—conducted writing workshops at 25 military installations. The workshops resulted in nearly 2,000 individual submissions.

The anthology features nearly 100 of these submissions, including letters, poems and memoirs of service and sacrifice on the front lines and at home. The writings will also be preserved in an open government archive as part of the Library of Congress's Veterans History Project. A TV documentary on "Operation Homecoming" will air on PBS April 16.

"Operation Homecoming" is available in bookstores. Proceeds from the anthology will be used to provide arts and cultural programming to U.S. military communities, schools and libraries.

IN BRIEF

WESTJET'S ANNUAL EARNINGS HIT RECORD IN 2006

WestJet, a Canadian carrier that operates a fleet exclusively of Boeing 737s, reported its best-ever year in 2006.

The airline, Canada's second biggest, reported 114.7 million Canadian dollars in profits in 2006 (about 98 million U.S. dollars), making that year the airline's best ever. The airline's revenues grew 27 percent last year to 1.77 billion Canadian dollars (about 1.52 billion U.S. dollars).

The airline attributed the results to increased passengers loads, contained expenses and expanded capacity.

"To say that I'm pleased—very pleased—by these results would be a serious understatement," WestJet CEO Clive Beddoe told financial analysts in a conference call, according to a Reuters report.

WestJet operates flights to 34 North American cities and Nassau, Bahamas. According to a Reuters report, the airline said it will continue to modify its schedule to meet the seasonal habits of Canadian travelers; this includes serving warm-weather destinations in the United States.

"Flying into the U.S. sun destinations at the right times during the year has become

a key component to our deployment strategy," said WestJet President Sean Durfy during the analysts call, according to Reuters.

NETHERLANDS IS CH-47F'S FIRST INTERNATIONAL CUSTOMER

Boeing last month said it signed a direct commercial sales agreement with the Defence Materiel Organization of the Dutch Ministry of Defense for six new-build CH-47F (NL) Chinook helicopters. The agreement provides for nonrecurring development, production and post-delivery aircraft support.

The pact represents the first international sale of the CH-47F. Hundreds of previous-model Chinooks have been sold to international customers.

The Netherlands-unique version of the U.S. Army CH-47F will include a next-generation Honeywell Avionics Control and Management System cockpit avionics suite, an integrated forward-looking infrared capability and several other newly developed multimission features.

The agreement calls for aircraft deliveries to take place between July 2009 and January 2010.

CALENDAR OF EVENTS

March 11–13: ISTAT (International Society of Transport Aircraft Trading) 24th Annual Conference. Phoenix. See www.istat.org/conferences.html

March 19–21: SpeedNews 21st Annual Aviation Industry Suppliers Conference. Beverly Hills, Calif. See www.speednews.com/Conference

March 20–25: Australian International Airshow 2007. Victoria, Australia. See www.airshow.net.au

April 11–13: Air Cargo Management Group's 5th Annual Air Cargo, Express & Freighter Aircraft Workshop. Seattle. See www.cargofacts.com

April 17–19: Aircraft Interiors Expo. Hamburg, Germany. See www.aircraftinteriors-expo.com

April 17–19: MRO 2007 Conference & Exhibition. Atlanta. See www.aviationweek.com/conferences/mromain.htm

May 1–3: Lean Enterprise Conference. Costa Mesa, Calif. See http://leo.web.boeing.com/Events/LEC/Spring2007/LEC_Spring2007.cfm on the Boeing intranet

May 7–9: SpeedNews 5th Annual Aerospace & Defense Industry Suppliers Conference. Los Angeles. See www.speednews.com/Conference

June 18–24: Paris Air Show. Paris. See www.paris-air-show.com

June 24–28: 17th Annual Symposium of the International Council on Systems Engineering. San Diego. See www.incose.org/symp2007

Sept. 3–6: Asian Aerospace 2007. Hong Kong. See www.asianaerospace.com

Oct. 15–17: Cargo Facts 2007. Seattle. See www.cargofacts.com

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SERVICE AWARDS:

Boeing recognizes the following employees in March for their years of service.

50 Years

Larry Coffelt
Joe Lewis
Bruce Pilkington
Robert Potthoff
Edward Shark

45 Years

Delano Aspa
Thomas Banks
Sharon Beamer
Corinne Burrell
James Clauss
Arthur Murrell
Gerard Olsen
Seiya Sakurai
Karl Spuhl
Rodney Uglum
Irving Wheeler
George Windes

40 Years

Charles Beatty
Monroe Blackmon
Gerard Bonnar
Laurie Bride
Susan Broaddus
Stuart Buchan
Patrick Carroll
Robert Carteen
Maureen Cauley
James Dahn
Roger Griffin
Ronald Hardy
Dwayne Heckman
Judith Hoye
Larry Hughes
Leigh Kennedy
Robert Krause
Charles Leeming
Ata Mansoori
Marilyn McIntyre
Robert McMullen
Sharon Miles
Otho Oates
Robert Park
Dennis Rainwater
Anthony Scanaliato
Janusz Sierakowski
Michael Spray
Ronald Whited
Edward Williams
Joel Yearout

35 Years

Jann Alexander
William Atwell
Harold Ayers
Chauncey Belcher
James Bell
Teddy Bowman
Eugene Chase
Jerry Denver
Brian Dorge
Micheal Durbin
David Garrett
Gerald Gordon
Dennis Hollander

Emi Isomoto
James Jones
William Kojeszewski
David McKinney
Wayne Miller
Linda Narancic
Luiz Oliveira
Stephen Ormiston
Ronald Owens
Frank Piasecki
Robert Poyneer
Pamela Schwede
Gary Spielman
Walter Tomlinson
Stephen Westover

30 Years

John Baker
Harold Bales
Thomas Ballantyne
Rosalind Banks
Alan Blackstock
Lecia Booker
Paul Boughner
Stephen Burns
Irene Bymers
Kenneth Caley
Mary Cameron
Raymond Carini
Louis Carpinelli
Bill Carrier
John Carron
Michael Chapman
Sharon Clawson
Stephen Clymer
Kim Conder
Joseph Corce
Marcia Croft
Jean Daniels
Terry Deegan
Duane Delcomber
Robert Dickerson
Ralph Dickey
Becky Dobbert
Roger Donnelly
John Dudash
Melvin Eblen
Randy Embry
John Engstrom
James Evans
Michael Ewing
Thomas Farrar
Debbie Felderman
Robert Ferguson
Antonio Ferreira
David Foisy
John Forchione
Kevin Fox
Gary Francis
Thomasina Freeman
Craig Fukuma
Phillip Gablehouse
Gary Geldseth
Toni Gore
Michael Goure
Gary Gray
Mary Guess
David Hagan

Michael Hammock
Micheal Haney
John Hein
Richard Hendel
Russell Hensley
William Hertzfeldt
Raymond Hirano
Pamela Hoffman
Sharon Hopkins
Arlene Hultin
Daniel Hungerford
Marla Jackson
Heide Jettkowski
James Johnson
Robert Johnson
Steven Johnson
Russell Jordan
Joseph Kaver
Arthur Kendall
David King
Wesley Kosai
Debra Kruszona
Kathy Lamkin
Barbara Langver
Brian Leighton
Frank Leo
Bruce Lord
Anthony Loville
Robert Lyell
Marc Manning
Bruce Markham
Jerry Marsh
Mary McAllister
Kevin McRae
Larry Mills
Susan Moretti
Scott Morgan
Gordon Mueller
Anthony Natalie
Rodney Nies
Scott Nishimoto
Wayne Noel
Frederick Olsen
Franklin Otsuka
Paul Pace
Judy Paranal
Gordon Patterson
Mark Perkins
Gary Pfitzner
Mark Pittenger
Michael Prestegard
Ronald Prosser
Janie Ratcliff
Timothy Rath
Dale Reinke
Connie Richards
Bernard Riley
Randy Riley
Allan Risbey
Ronald Ruegg
Ray Rydberg
David Sanders
Mark Sanders
Casey Shearer
David Shelton
Fred Shields
Laurence Simonds
Ronald Smith

Bonnie Soodik
Lee Sorenson
Mark Stern
Mark Stevens
Jeffrey Stone
Kenneth String
Victor Stuhr
Julie Sumner
Fernando Teran
David Thomson
Kirk Thomson
Cathy Treser
Mark Vaughn
Brian Walzel
Susan Wan
Scott Weatherford
Lois Webb
Yvonne Webb
Allan Weber
James Wells
Mahlon Wescott
Rodney Wheeler
Charles Williams
Gary Wilson
Jan Wine
Randy Witt
Lawrence Wong
Sidney Wortman
Daryl Yochum
Kevin Yost
Merita Young
William Zane

25 Years

Ellen Alexander
Christy Allen
Doris Altmann
Karl Anderson
Gerald Andre
Diane Ankney
John Araujo
Rodney Arnhold
James Arrigan
Vincent Aszman
Janet Aubuchon
Emmanuel Balucanag
Dale Baniak
Arthur Barnett
John Barry
Marvin Bartlett
Geronimo Bautista
Kenneth Bayless
Kathleen Bell
Jesus Benavides
Michael Bensing
John Benson
Joseph Bereal
Richard Berger
John Bergeron
Gerald Berumen
Daniel Biddle
Benjamin Bigford
Robert Biornstad
Jimmie Blackmon
Eric Bloemker
Donald Bohn
Henry Boterenbrood
Jackie Brannon

Gerald Bray
David Breece
Michael Brenner
Douglas Bristow
Bill Brock
Charles Brockett
Boyd Brown
Bradford Brown
Nancy Brown
Steven Brown
Lisa Brubaker
William Bucher
Douglas Bunger
Randall Burch
Mario Bustamante
Dean Cameron
Gary Campbell
Joseph Caracci
Steven Carden
Denise Carter
Kerry Carver
Takashi Chacon
Stephen Chan
Wayne Chan
John Clardy
Paul Cloar
Demetris Coachman
Danny Cobb
Mark Colan
Ross Conley
Marcellous Connor
Richard Conwell
Norma Cooper
Audrey Cooper-Bridges
Yvonne Copeland
Christine Corn
Steven Cornish
Michael Corullon
Herbert Cossano
Richard Craig
Stuart Craig
David Cray
Timothy Cross
William Crutsinger
Elizabeth Csillag
Kenneth Curry
Roberta Dagand Gerlach
Vincent Dalessandro
David Daugherty
John Davies
John De Bellis
John Dean
Robert Delivuk
Elmer Dencker
Brian Denson
Steven Dent
Robin Depaul
Robert Deviney
Barton Dias
Art Diaz
Paul Dillard
Martha Dionne-Romeo
David Dixon
Robert Donohoe
Robin Dowd
Lori Downs
Michael Doyle
Paula Duer
Susan Duran
Karl Ekonen
Philip Elena

Jerome Elisha
Camellia Embacher
Kathryn Embly
Cary Eubank
Richard Fairfield
Malcolm Fairington
Michael Farrow
Kim Finch
Charles Fletcher
Douglas Flora
Raymond Fredette
Jeffrey Frericks
Tyrone Friar
James Fuller
Jacqueline Gallatin
Chet Gartner
Karen Geiger
Reza Ghodrati
John Giffel
Micheal Glaser
John Graeler
Debra Graham
Raymond Graham
Judy Gray
Marc Gray
Charles Grund
Jeanette Gruppetta-
Duke
Dennis Gunderson
Rick Gunselman
Victor Gutierrez
Gail Hahn
Mark Hamp
Barry Hanson
Steven Harnish
Frederick Harper
James Harold
Patricia Harvard
Linda Hascall
Mark Hayakawa
Steven Haynes
Phyllis Hearst
Denise Hidano
Virgilio Hilo
John Hines
John Hodges
Thomas Hoeffken
Ernest Hoover
Nicholas Hopkins
Warner Hoskins
Lynda Hounsell
Hernan Hoyos
Akira Hunt
Arlene Hurt
Charles Hynes
Joseph Inman
Steven Irwin
Greg Jeffery
Anita Jensen
Paul Jernigan
Dwyane Johnson
Paul Johnson
Robert Johnson
Victoria Johnson
Thomas Jones
Yunetta Jones
Mary Jordan
Rick Jordan
Simon Kang
William Kelanic
Teresa Kelley

| | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Joseph Kenney Steve Kessler William King Steven Kochmann David Koenig Ronald Kordick Michael Koura Gary Krueger Gary Kunemund Saulius Labutis Vu Lam Douglas Lamoureux Robert Langston Robert Lara William Larsen Rose Laughlin David Lawrence Jane Lawrence Roy Lawson Christina Leslie Paula Leuellen Bill Lile Michael Long Yolande Lubeski Theodore Lumpkin Kevin Lynch Gary Maasen Pamala Machado Francis Malawey Francene Marks James Marks Shirley Mathews | Leif Matson Glenn Matsumoto Steve Mattei Leo Matzeder Kathleen Mazzanti Gregory McCain Cardell McClendon Stephen McCracken Gary McDonald Edward McGinn Duncan McLellan Jeffrey McVey Michael Megee Michael Merrifield Delores Mitchell-Jones Denise Moore Michael Moore Georgianna Morgan Cheryl Moseley Danny Moser Abdelkrim Moubarki Daan Mulder Stuart Murakami Mark Nakamoto Michael Nastase Norbert Naylor Randall Neal Michael Nelson Robert Nelson Terri Neuharth Lawrence Ng Hoan Nguyen | Rachel Norwood Peter O'Donoghue Douglas Oleson Bobby Oliver Raul Ortiz Grazyna Ostrom Antonio Oviedo Thomas Paige Bruce Palmer Richard Palmer Edward Parleman Marco Perez Michael Perez Johnny Pettyjohn Robert Phillips Roger Phillips Sally Poole Andrew Pritchard James Pruett Jeanette Raboteau Jacque Ragsdale Richard Raheer Peter Ramirez Robin Redmond Arlinda Reeves Kevin Reimer Robert Reimer John Remigio Clinton Rempel Toby Rhynehart Bernadette Rice Bettye Richmond | Ronald Ridderbos Mahmood Rifat Gregory Rinehart Steven Ritter Frank Roesch Douglas Rowe Ron Rowlett Edward Russell John Ruth Jose Ruvalcaba George Ruyan Chris Sadowsky Timothy Samsel Raymond Sarchet Gene Satterfield Greer Scarborough James Schaffer Michael Schendel Randall Schimon Susan Schneider Robin Scott David Seeley Joyanto Sen Connie Serafin Gregory Serba Steven Shellum Donald Sheppherd Orest Shepston Dennis Sherman Everett Sherwood Charles Shure Rudy Silva | Robert Simms James Simon Ronald Slider Melinda Sly Earnest Smith Penelope Soda David Sohn Mark Sorce Judith Sparger Eugene Spencer Jeffrey Stahl Robert Stclair Mary Strandt Mark Strehlau Paul Sue Thomas Sullivan Midge Tallman Sudershan Taneja Timothy Taylor Anice Tezak Martin Thomas David Toliver Donald Tong Deidre Trowbridge Carlton Turner Richard Uelhof Bettyann Uematsu Fernando Valdez James Vanavery Mahendra Varma Carmen Vasi James Vaughn | Jacqueline Velez Terrance Veling Gregory Vigen Rhonda Vogel David Voss Allen Walker Garry Ward Ronald Ward Wendell Watanabe Troy Watson George Wedvik Richard White Shellie White Leonard Whitehead Cheryl Wickstrom Penny Wilhelm Frank Williams John Wilson Timothy Winter Mark Woods Rick Wright Ritchie Wright Michael Wunder Jamie Yoshida John Young Linda Yousefivand Yong Yu David Ziegler |
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RETIREMENTS: The following employees retired in January from The Boeing Company.

Don Albrecht, 11 Years
Maria Altschul, 21 Years
Roberto Altschul, 27 Years
Mary Anderson, 31 Years
Theodore Anderson, 20 Years
Dennis Andrie, 18 Years
Pearlie Andrus, 19 Years
Donna Ankrom, 26 Years
Jesse Asay, 38 Years
Sydney Austin, 27 Years
Daryl Axelson, 33 Years
David Babcock, 33 Years
Billy Baldwin, 10 Years
Marvin Banks, 27 Years
Steve Baronsky, 19 Years
David Bechard, 29 Years
John Becker, 21 Years
Lawrence Becker, 15 Years
James Benet, 31 Years
Frank Bent, 28 Years
Melvin Bentz, 19 Years
Gary Bernard, 17 Years
Dennis Berry, 39 Years
Henry Blocker, 41 Years
Pierina Boscolo, 34 Years
Roger Bovee, 35 Years
Phillip Breece, 28 Years
Sharon Brance, 27 Years
Brian Brown, 18 Years
Michael Browne, 27 Years
Glen Burns, 34 Years
John Campbell, 24 Years
Barbara Carlson, 19 Years

James Carr, 10 Years
Donald Castle, 37 Years
Rudolfo Catbagan, 44 Years
Andre Chapdelaine, 40 Years
Diane Chastain, 24 Years
David Chatlain, 26 Years
Yongja Chen, 25 Years
Rachel Cherman, 25 Years
Don Choi, 21 Years
John Clark, 20 Years
Douglas Colbary, 14 Years
Daniel Cook, 31 Years
Connie Cooper, 24 Years
John Cox, 21 Years
Rodney Crawford, 20 Years
Donald Cress, 20 Years
Carl Crow, 14 Years
Charles Darby, 5 Years
George De Haas, 25 Years
Anita Decambra, 17 Years
Sagrado Deleon, 32 Years
Donald Depree, 8 Years
Dorothy Dickinson, 38 Years
John Donald, 27 Years
William Donaldson, 21 Years
Edward Dong, 32 Years
James Doombos, 17 Years
Michael Ducay, 28 Years
Marie Duncan, 29 Years
Barbara Dunson, 29 Years
Lynn Dyr Dahl, 30 Years
John Eklund, 21 Years
Robert Emerick, 15 Years

Sandra Evans, 20 Years
Lynda Farmer, 18 Years
John Fenchel, 40 Years
Delbert Ferro, 41 Years
Timothy Filipiak, 26 Years
Connie Flores, 24 Years
Henry Florez, 40 Years
Maceo Foster, 23 Years
Janette Gallo, 27 Years
Charles Giennau, 27 Years
Nancy Gilbertson, 21 Years
Thomas Gill, 21 Years
Andrea Giorgianni, 21 Years
Ronald Glossup, 20 Years
Richard Gordon, 44 Years
John Gorney, 36 Years
Shirley Gorney, 28 Years
Robert Grasso, 39 Years
David Griffin, 38 Years
Michael Griffin, 25 Years
John Grinnan, 33 Years
Richard Haines, 7 Years
Billy Haley, 15 Years
Bruce Hall, 19 Years
Frederick Haller, 17 Years
Gary Hampton, 28 Years
Richard Hargreaves, 22 Years
Gary Hartley, 18 Years
John Hemmer, 21 Years
Joyce Heyman, 38 Years
William Hinrichs, 21 Years
Irving Hirsch, 41 Years
Paul Hofto, 28 Years

Wayne Hollingsworth, 41 Years
Carole Holt, 25 Years
Stanley Houlberg, 30 Years
Curtis Huffman, 28 Years
Lenore Huffman, 3 Years
Thurman Hummel, 27 Years
Brad Isham, 28 Years
Norman Iverson, 46 Years
Beulah James, 32 Years
Maxie Jarvis, 40 Years
Dennis Jerome, 38 Years
Georgia Johnson, 22 Years
Gayle Joinette, 28 Years
George Jorgenson, 26 Years
Kenneth Juell, 27 Years
Jimmy Kelly, 20 Years
Dennis Kidder, 39 Years
William Kipper, 33 Years
Michael Knight, 39 Years
Christopher Lachall, 23 Years
Elmer Lafferty, 38 Years
Thomas Lally, 17 Years
James Lambke, 26 Years
Pamalua Langford, 25 Years
Dale Laschkewitsch, 21 Years
Hermilo Layug, 23 Years
Stanley Lee, 28 Years
Robert Levine, 23 Years
Richard Lewis, 25 Years
Royal Lewis, 33 Years
Leonard Lisanti, 41 Years
Susan Lochner, 17 Years
Ronald Lunday, 26 Years
Robert MacDuff, 28 Years
Robert MacGregor, 41 Years
Ronald Machisen, 27 Years

Susan Madrid, 18 Years
Kurian Mani, 18 Years
Gail Masonholder, 29 Years
Larry Matlock, 7 Years
Eugene May, 22 Years
Joseph McClary, 43 Years
James McCoy, 38 Years
Tommy McCullah, 24 Years
Rodney McEachern, 21 Years
Robert McGee, 38 Years
Fred McGregor, 9 Years
Richard McKeever, 22 Years
Martin Melewski, 19 Years
Leonard Messeri, 26 Years
Jerrell Mills, 36 Years
Eugene Moenning, 41 Years
Mohamed Moolji, 16 Years
William Moose, 31 Years
Aubrey Morris, 26 Years
Peg Morris, 16 Years
Jean Morton, 22 Years
Brian Norman, 27 Years
Curtis Oberg, 41 Years
Don Ong, 27 Years
Robert Parrott, 12 Years
Bernd Pesler, 35 Years
John Peterson, 26 Years
Allie Pfeifer, 33 Years
Terry Pierce, 29 Years
Jerry Piro, 33 Years
Raymond Plattner, 21 Years
John Presley, 27 Years
Peter Quist, 3 Years
Yeddula Reddy, 18 Years
Ilmars Reichmanis, 41 Years
Donald Rice, 21 Years

Anthony Richter, 21 Years
 James Robin, 22 Years
 Johnny Rodgers, 18 Years
 William Roix, 18 Years
 Ann Rose, 27 Years
 Stephen Rundell, 31 Years
 M.J. Sanker, 20 Years
 Gary Saugstad, 10 Years
 John Schramm, 25 Years
 Rocco Serena, 28 Years
 Arthur Serrano, 30 Years
 Ronald Shaffer, 40 Years
 Rodney Sherbahn, 11 Years
 Gerald Shields, 30 Years
 Dave Shipp, 22 Years
 Larry Shirk, 41 Years
 Deborah Shoemaker, 26 Years
 Thomas Silkett, 33 Years
 Harry Smith, 20 Years
 Patricia Smith, 26 Years
 Stephen Smith, 26 Years
 Peter Snyder, 31 Years
 Jerry Soltow, 16 Years
 Andrew Sosnicky, 7 Years
 Kathy Sroufe, 31 Years
 Philip Sroufe, 31 Years
 Sharon Stauffer, 24 Years
 Mark Stelzer, 37 Years
 Elaine Stephenson, 17 Years
 Donald Stoullil, 22 Years
 Albert Strain, 40 Years
 Sherry Straker, 27 Years
 Ruth Striby, 7 Years

Pamela Strong, 21 Years
 John Suermann, 5 Years
 Dominick Szechenyi, 34 Years
 Gerald Taylor, 40 Years
 Victor Teyechea, 24 Years
 Hue Thai, 17 Years
 Richard Thomasson, 24 Years
 Neil Thorene, 33 Years
 Patricia Tomlinson, 18 Years
 Marilyn Traupmann, 13 Years
 Phyllis Trump, 16 Years
 Thomas Turrentine, 17 Years
 David Tyner, 32 Years
 Charles Underwood, 40 Years
 Cristina Vegas, 30 Years
 Clifford Viter, 37 Years
 Sharon Vote, 25 Years
 Cuong Vu, 15 Years
 Thomas Waddell, 39 Years
 Joseph Wallin, 40 Years
 Jerald Warren, 38 Years
 Robert Webb, 20 Years
 David Webster, 30 Years
 Larry Whalen, 14 Years
 Bruce Wheeler, 26 Years
 Joe Whitney, 33 Years
 John Williams, 16 Years
 Otis Wilson, 20 Years
 Theodore Wilson, 41 Years
 Steven Wood, 28 Years
 Terry Woods, 20 Years
 Roberta Wright, 25 Years
 Randall Zahnow, 19 Years

AROUND BOEING

BOEING BOOSTS PRESENCE IN INDIA AND POLAND

Boeing last month opened an office in Poland and relocated its New Delhi office to larger facilities.

“Boeing is expanding its regional presence in recognition of emerging business opportunities and to strengthen relationships with potential customers and suppliers,” said Laurette Koellner, president of Boeing International.

The new facilities are in

- **New Delhi.** The new facility in this city in India marks an expansion of Boeing’s previous office, which first opened in December 2003. The team at the new site includes personnel from Commercial Airplanes, Integrated Defense Systems, Boeing International and Shared Services Group. “The strong, enterprisewide group based in New Delhi will be working closely together as one team under one roof to shape the market, win new business and make our customers successful,” said Ian Thomas, president of Boeing India.

- **Warsaw, Poland.** This regional office represents Boeing interests in Central and Eastern Europe. It’s headed by Henryka Bochniarz, who was appointed president of Boeing Central and Eastern Europe in July.

Working with the New Delhi and Warsaw teams, SSG designed efficient spaces that can adjust to meet changing market demands.

IN MEMORIAM

The Boeing Company offers condolences to the families and friends of the following employees, whose deaths recently have been reported.

Donald Boespflug, test & evaluation engineering manager; service date April 30, 1978; died Feb. 8

William Bright Sr., sheet metal assembly & riveter; service date Aug. 3, 1987; died Jan. 16

Michael Davis, carpenter/millwright/maintenance; service date Jan. 8, 1976; died Jan. 14

David de Guise, software engineer; service date March 7, 1993; died Jan. 18

Michael Epstein, compensation specialist; service date May 14, 1979; died Jan. 23

Alan Gherardini, test & evaluation lab technician; service date Aug. 21, 1989; died Jan. 30

Abraham Gutierrez, facility maintenance specialist; service date Feb. 25, 2005; died Jan. 28

Donna Harvey, administrative assistant; service date May 13, 1996; died Jan. 25

Brett Humphrys, software engineer; service date April 16, 1988; died Feb. 3

Allen Hurinenko, assembly installer structure mechanic; service date Sept. 17, 1986; died Jan. 23

Paul Meier, engineer; service date Feb. 20, 1985; died Feb. 8

Ahmad Qazi, engineer/scientist; service date May 11, 1990; died Jan. 30

Azad Rahman, guidance navigation & control engineer; service date Feb. 18, 1980; died Jan. 13

Timothy Smith, shipping & receiving inspector; service date Aug. 4, 1988; died Jan. 14

Kevin Swanke, engineer/scientist/manager; service date April 9, 1979; died Jan. 21

John Trent, programmer/analyst/engineer/scientist; service date June 21, 1989; died Jan. 14

Walter Visinsky, systems engineer; service date July 1, 1997; died Feb. 3

Daniel Westcott, technical data designer; service date May 8, 1989; died Jan. 13

Rebecca Wilson, network designer; service date May 4, 1988; died Feb. 1

Austrian Airlines gets another 777

Boeing delivered the fourth 777-200ER (Extended Range) jetliner to Austrian Airlines in late January. The delivery is the latest step in Austrian Airlines’ initiative to simplify its fleet and reduce the costs of its long-haul fleet. In the future, Austrian Airlines will operate an all-Boeing long-haul fleet of 777s and 767s.



TIM STAKE PHOTO



Aerospace subsystems technician Wayne Woodard inspects a piece of electronic hardware for visible irregularities in the satellite factory in El Segundo, Calif. As part of a Lean manufacturing improvement effort, the Form and Tin team streamlined the system and significantly reduced cycle time.

DAVID MOORE PHOTO

S&IS strikes gold

N&SS division earns Calif. excellence award

By MICHELLE ROBY

“We won the Gold!” announced Jim Schultz, when he heard the news that Boeing Space and Intelligence Systems became the fourth-ever organization to receive a California Award for Performance Excellence Gold Level award for large manufacturing. S&IS, a 12,000-employee division of IDS’ Network & Space Systems, is Boeing’s center for all intelligence and government/commercial space systems. The award announcement took place in January.

“For a moment, I was shocked that we had exceeded our goals,” said Schultz, S&IS director of Quality & Program Management/Business Excellence, and

who led the award effort. “We hoped to reach Silver. I was willing with pride for my team, for myself, and, most of all, for S&IS that we achieved Gold.”

The prestigious award, sponsored by the California Council for Excellence, recognizes organizations in California based on the Malcolm Baldrige National Quality Program criteria for performance excellence.

“The award—which is about results—is shared by every person in S&IS,” said Howard Chambers, vice president and general manager of S&IS. “Not just in one area, but across all operations, everyone helped improve our growth and profitability. I’m proud to see this division being recognized outside of Boeing for what I see every day.”

Among the initiatives leveraged by S&IS was Lean+ manufacturing.

“We achieved AS9100 and CMMI Level 5 (two internationally accepted quality

challenges and issues.

“This journey forced us to work outside our normal functional boundaries,” said Schultz. “For me, the best part was seeing groups that traditionally haven’t teamed with each other work jointly to develop strategies and approaches that bring various segments of S&IS closer together.”

“When I looked more closely at how we add value for our customers, I was reminded of what this division does for the United States,” said Chambers.

Chambers added that Boeing executives are continuing to recognize the significant improvements S&IS has achieved over the past five years.

“Five years ago, S&IS probably would not have been in a position to win such an award. The turnaround of this business, the improvements we’ve made, and the spirit of our people are extraordinary,” he said. ■

michelle.robby@boeing.com



JIM ANDERSON PHOTO

Boeing Portland Fabrication Finance Estimating Team

How do we provide accurate estimations of the cost to develop and set up tooling and manufacture a part in a short timeframe while requirements keep changing? That's what we on the Boeing Portland Fabrication Finance estimating team faced when we became suppliers to the 787 Dreamliner program. It was quickly apparent that we could not meet our customer's expectations using our old processes, so we turned to Lean+.

Because of the complexity of our estimating process, we held two Accelerated Improvement Workshops. Employees from the 787 program, Fabrication Finance and Boeing Portland Finance worked together to apply Lean tools to our processes and identify improvements. One of our immediate improvements was to create a single source of data; now both customers and suppliers of that data work from the same source documents. We are also aligning our estimating processes with those used for business planning, to provide more timely and accurate information. As a result of these improvements, we expect to complete our quarterly estimating process in five work days rather than 20.

Our improvements supported the Lean+ and Internal Services Productivity initiatives. They also proved that Lean tools work in an office environment.

Foreground, left (from left)

Brian Klippert
Auburn Finance
Estimator

Gwynn Perry
Lean Promotion
Office Consultant

Middle row (from left)

Chris Walbridge
Auburn Finance
Estimator

Paul Lantz
Portland Finance
Estimator

Don Hendrickson
Portland Finance
Manager

Becky Loofburrow
Portland Finance
Estimator

Background right (from left)

Elena Sanchez
Portland Finance
Analyst

Doug Lindsay
Portland Lean
Consultant

Margie Linn
Portland Finance
Analyst

Stuart Christensen
Portland Lean
Consultant

Lisa Bui
Portland Finance
Analyst

Pam Caldwell
Portland Business &
Planning Analyst

IN THE ARTS, WE FIND OUR WINGS.



BOEING

This ad, the fifth in a new series from the company's portfolio of community ads, reinforces Boeing's support of the arts, which help enrich and enlighten the lives of people worldwide. These ads are published in support of arts-related events.



JTRS GMR. SEE IT, HEAR IT, BELIEVE IT.

The capability of the Joint Tactical Radio System Ground Mobile Radio to provide unprecedented situational awareness can be seen today in live demonstrations across the country. This transformational program enables warfighters to share simultaneous voice, video and data communications on the move in real-time. The result is more effective missions—now.



This Integrated Defense Systems ad for the Joint Tactical Radio System Ground Mobile Radio was designed to showcase the product's transformational capability. The ad also captures the tremendous progress the program has made, including live customer demonstrations. The ad will appear in targeted publications including Army Magazine, Defense News and National Journal.