Rockwell Collins

eing is believing Prototypes bring innovation to life. e



Clay Jones Chairman, President and CEO

Providing the right solutions at the right time

This fiscal year, Rockwell Collins will spend more than a billion dollars on research and development activity — a first in our company's history. That's an exciting milestone because it's a testament of our commitment to provide customer value and fuel growth through innovation.

In this issue of Horizons, you'll learn a lot more about how innovative technologies, processes and business models are helping our company provide customers with the right solutions at the right time. This is important because hot new technologies typically have three things in common — good features, good business strategy and good timing.

In an increasingly competitive marketplace, one of the best ways to deal with competition is to be one or more generations ahead — whether it's new products or upgrades in technology. At Rockwell Collins, we're constantly working to nurture an environment where we can make those leaps in technology and bring in new ideas.

At the same time, our company recognizes that not all ideas are created equal; and, to be successful in a business environment, you can't have creativity without discipline. As technology moves from a lab through various stages of maturity, we must continue to ask whether the product will deliver a compelling value proposition to our customers. That way, we know it's the right solution at the right time.

While it's thrilling to be the first to discover something, innovation really occurs when you turn an idea into a valuable solution that others care about. I hope you enjoy reading more about some of our latest technologies and how we're staying at the forefront of innovation

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In a Rockwell Collins microelectronics lab, Senior Mechanical Engineer Nate Wyckoff inspects the diodes attached and wirebonded to a printed circuit board used in an antenna prototype. Wyckoff and Mechanical Engineer Jennet Volden were part of a team that quickly developed prototypes to prove to a customer that a new antenna could handle high data rates over long distances.

This ad — which was designed to emphasize that Rockwell Collins' Pro Line Fusion® represents the very latest in avionics innovation

On the

recently





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Using Lean in market research

The Outcome-Driven Solutions (ODS) methodology, which includes Lean processes and tools, is helping Rockwell Collins employees identify market opportunities more precisely.



The opportunity landscape for Ascend[™] flight information solutions, developed using ODS, helped identify opportunities in the marketplace.

By the numbers

Number of ODS projects held since 2009

Number of ODS projects to date in FY'11

Number of intellectual property disclosures or patent applications filed based on ODS insight

Learn more –

More information about ODS is available on the Pursuit and Order Capture website via "P" in the Rockwell Collins Online Index. You also can email Dave West at djwest@rockwellcollins.com or Amy Newman at alnewman@rockwellcollins.com.



Seeing results

Long before the fall 2010 launch of Ascend[™] flight information solutions, which provides flight, cabin and maintenance services to the business aviation community, the Flight Information Solutions team in Commercial Systems used ODS to identify "under-served" outcomes in the marketplace.

The team gathered volumes of data about business aviation customers' operations through all phases of flight, including areas of dissatisfaction. Once the team understood the data using an opportunity landscape (pictured on the left), they were able to build a business plan that differentiates Rockwell Collins from our competitors.

Lean perspectives

Mark Johnson led the first ODS project for Commercial Systems in 2009. Now, as the director of Soldier and Ground Vehicle Solutions in Government Systems, his team is using ODS to determine opportunities in the public safety business area.

Q Why is ODS beneficial for teams developing business plans?

A ODS is designed to help us better understand the end user's unmet needs. This information is extremely important when determining market strategies and solutions, especially in a new market space like our public safety business.

Q How is ODS different from other market research methods?

A Traditional market research often relies heavily on anecdotal data and jumps straight to potential solutions. ODS provides a structured and repeatable approach to identify and solve the actual problems end users have when doing their jobs. With statistically valid data, you can be more confident that you're focused on the right problems and the right solutions.



Our company's most advanced integrated avionics system – Pro Line Fusion[®] – is nearing entry into service after receiving its final Technical Standard Order (TSO) and first Supplemental Type Certification (STC) from the Federal Aviation Administration (FAA).

Additionally, in early June, Bombardier Aerospace announced that its Global Vision[™] flight deck, which features the Pro Line Fusion avionics system, was granted certification from Transport Canada. The Global Vision flight deck will be installed on the Global 5000[™] and Global 6000[™].

"This initial certification with Bombardier is a watershed event for Rockwell Collins," said Tony Green, programs manager for Bombardier programs.

Embraer selects our advanced avionics system for KC-390 fleet

Embraer Defense and Security has selected Rockwell Collins to provide its Pro Line Fusion® flight deck for the KC-390 tanker/transport aircraft. The Brazilian Air Force has committed to purchasing 28 KC-390 aircraft.

"This award is emblematic of our ability to leverage commercial avionics technology for military applications," said Dave Nieuwsma, vice president and general manager of Mobility and Rotary Wing Solutions. "With advanced technologies including the largest format displays available, enhanced graphic capabilities and available synthetic vision, our Pro Line Fusion flight deck will provide KC-390 pilots with the highest levels of situational awareness while reducing their workload to ensure mission success."

Strategically, this award means a great deal to Rockwell Collins, as it builds upon more than 35 years of serving the rapidly-growing Brazilian military and civil aviation industry, including the relationship our company has built with Embraer.

Rockwell Collins' Challenger 601 experimental test aircraft was used for initial testing and certification of Pro Line Fusion's hardware and software. The aircraft flew with both our Pro Line Fusion (in photo on the right) and Pro Line 21[™] avionics installed.

"Pro Line Fusion is truly a game changer in this marketplace, and it sets the bar for our competition with respect to the broad feature set and ability to be tailored to fit the needs of so many aircraft."

Pro Line Fusion offers new features not currently available in the marketplace, including synthetic vision on a head-up display, networked capability enabling interoperability between onboard and ground systems, and the largest high-resolution displays available.

To date, the Pro Line Fusion avionics system also has been selected for the Bombardier Learjet 85[™], Bombardier CSeries, Embraer Legacy 450/500, Gulfstream G250[®] and the Mitsubishi Regional Jet.

Rockwell Collins is on Facebook

With the recent launch of our company's public profile page on Facebook[®], anyone with a Facebook profile can connect with Rockwell Collins to stay up to date on news and events.

You can view and "like" our company's page at www.facebook.com/ rockwellcollins.

Mentoring participants Bob Brantley and Jennifer Sellers talk in the image generator assembly and test area at our facility in Salt Lake City, Utah.

How can a mentor help you?

Mentoring is key to ongoing career development.

Schedule challenges, geographical distance and time zone differences do not stop Bob Brantley from taking advantage of our company's Enterprise Mentoring Program.

A programs manager in our Simulation and Training Solutions business in Salt Lake City, Utah, Brantley sees the benefits of mentoring individuals while also spending time with his own mentors.

"I mentor others because I love to coach and teach," he said. "Through my own mentors, I've been able to enhance my executive leadership and conflict management skills."

While Brantley's mentors have not been close geographically – one in Binghamton, New York, and the other in Cedar Rapids, Iowa – their relationships have grown through telephone conversations. Yet, whenever business travel takes him or a mentor to the same location, Brantley also tries to meet in person.

"I'm currently working with my mentor to learn more about finance so I can do better forecasting," he said.

Connecting employees

The Enterprise Mentoring Program portal – which is available via the home page of Rockwell Collins University - is structured so employees can easily connect with people outside of their existing network, location and function, as well as find ways to address development needs or gain career guidance. Employees can participate as a mentor, mentee or both.

"Mentoring is about connecting people across organizational and geographic boundaries to enhance personal and professional growth," said Anita Augustine,

director of Rockwell Collins University. "We also see it as a great tool for facilitating knowledge transfer throughout the enterprise."

Last year, Brantley began mentoring Victoria Nicholls, a synthetic environment developer at our Horsham facility in the United Kingdom. She was interested in learning more about program management, an area of expertise for Brantley.

"We talked several times by phone, and even got to meet once face to face," he said.

Currently, Brantley is mentoring Jen Linton, a senior program, planning and control analyst; Rick Fredette, a senior engineering manager; and Jennifer Sellers, an engineering project specialist, all of Salt Lake City.

"As a shared service resource, I was unsure about how to further my career," Sellers said. "Bob guided me through career path options and has been providing excellent coaching to help me improve processes and procedures in my everyday tasks."

Brantley recognizes mentoring requires a time commitment for everyone involved; yet, by scheduling just a half hour per month with each person, he's been able to help others reach personal goals and gain new insights.

"I tell my mentees that we can pace ourselves, since we have a year to work together," he said. "I've seen how successful the program has been for both them and me." -By Cindy Adkins

Employees can learn more about the Enterprise Mentoring Program via Rockwell Collins University or "M" in the Rockwell Collins Online Index

Meeting high standards Certifications prove Rockwell Collins is effectively managing safety and environmental challenges.

When customers consider Rockwell Collins, their decisions are influenced by how our company addresses environmental and safety challenges. That's why Rockwell Collins facilities worldwide are certifying their integrated

safety and environmental management systems sets of interrelated, documented processes that manage risk, reduce the negative effects of our activities, and enable our company to better manage our business.

Currently, 15 Rockwell Collins facilities have received International Standards Organization (ISO) 14001 and Occupational Health and Safety Advisory Services (OHSAS) 18001



In Heidelberg, Germany, apprentice Lisa Geitner follows safety processes as she becomes familiar with the WEILER "Praktikant" turning machine.

certifications for environmental and safety management systems, respectively.

"These certifications assure our customers that we have the robust processes in place to manage our environmental impact and employee health and safety," explained Tom Gentner, director of Environment, Safety and Health. "This reflects positively on the management of Rockwell Collins as a whole."

Evidence of robust processes

This fiscal year, our facilities in Heidelberg, Germany, Reading, U.K., and Toulouse, France, became the first Rockwell Collins facilities outside the U.S. to achieve OHSAS 18001 certifications. Facilities in Heidelberg and Reading also recently received ISO 14001 certification, which our facility in Toulouse first received in 2003.

According to Claus Kirches, a quality manager in Heidelberg, employee engagement was essential in order to receive the certifications.

"While there was some resistance to change at first, once employees understood the processes and value, that faded," said Kirches. "More and more, customers are asking questions about these issues, so the certifications

> are a bonus for us." For the recentlycertified facilities, addressing environment and safety risks is not new. According to Graham Crook, a business support manager in Reading, the systems formalize practices that have been in place at U.K. facilities for years.

> "The systems include standards we already follow in order to be compliant with local laws," said Crook. "The benefit of certification is that it

defines a common standard throughout Rockwell Collins and demonstrates to our customers that we're doing the right thing."

Facilities use a common structure to build an integrated process that also meets local laws and regulations – an approach stemming from Lean Electronics[™] principles. With a standardized process, materials, tools and documentation only need to be developed once for the enterprise, minimizing rework.

Also, the documentation supports continuous improvement, driving sustainment of the management systems once they are certified.

"These systems were implemented to shape the way we work long term," said Crook. "In order to fully reap the benefits, this has to be a way of life for our business." -

By Katie Shatzer

To learn more about how responsibility is ingrained in our vision and values, view the Rockwell Collins Corporate Responsibility Report under the "Our Company" tab at www.rockwellcollins.com.

Anticipating customer needs

How does innovation help our company maintain market leadership?

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Rockwell Collins Software Engineer Chris Ridgway (right) shows Richard Bozovich of PMA209 the latest ARC-210 Gen5 radio enhancements. The team is currently working to implement new networking waveforms for use in Gen5. In a fast-changing world where the pace of technological advancement is expected to continue to accelerate over the next two decades, few factors influence a company's fate more than innovation.

The ability to anticipate customers' needs, turn new ideas into solutions that can be delivered faster and more cost effectively than in the past, and ensure those solutions provide customer value while generating sustainable profit is a never-ending quest.

At Rockwell Collins, our approach to innovation is embedded in our culture and demonstrated through research and development. This year, we will spend more than \$1 billion on research and development activity in order to provide our customers with smart innovations far into the future.

Innovation also is embedded in our brand. It's one of three brand pillars – personal relationships, innovation and heritage — that serve as a guiding force as we work to maintain a leadership position and distinguish our company from our competitors.

In the third of a series of articles about our brand, we take a closer look at two leading-edge programs: the fifth-generation ARC-210 radio and the Head-up Guidance System (HGS™-3500).

Evolutionary innovation

Delivery of our company's first production ARC-210 RT-1939(C) Gen5 radio to the U.S. Navy in April 2011 marked yet another significant milestone in the evolution of a program that began more than two decades ago, and is expected to continue well into the future. An airborne radio developed initially for line-of-sight communications and installation on the Navy's fleet of F/A-18 fighter jets, the ARC-210 is a prime example of what can be done over time when innovative minds anticipate and listen

closely to customer needs.

"The innovation over the evolution of the ARC-210 radios is mind-boggling," said Thom Grote, programs manager for ARC-210 Communication Products at Rockwell Collins. "Our engineers have continually managed to add new software

architecture and growth capabilities to a radio that looks exactly the same on the outside as it did 20 years ago."

But, as Grote indicated, looks can be deceiving. Today, the fifthgeneration ARC-210 is the first-tomarket radio with software-defined networking capabilities and the latest programmable cryptographic technology for airborne platforms.

According to Curt Moore, a technical project manager in Communications Engineering, the need to maintain the original form, fit and function was a Naval Air Systems Command (NAVAIR) Air Combat Electronics Program Office (PMA209) requirement.

"Because the ARC-210 radio is on more than 180 platforms — including heavy lift and unmanned aircraft, helicopters, ships and ground control stations - changing its size or existing functionality each time a new requirement was issued would have resulted in tremendous integration and installation costs," said Moore. "That's exactly what the Department of Defense didn't want."

Staying close to the customer

According to our recent brand perception study, one of the top drivers of innovation in the minds of our customers

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ARC-210 Gen5

is the ability to understand and anticipate their needs. Mollie Lorenz, a principal program manager for ARC-210 Communications Products, agrees with that finding.

"You have to stay close to your customer, and we've had a relationship with PMA209 that stretches back over 30 years," said Lorenz. "The ARC-210 has grown against the competition because our engineers have successfully anticipated customer needs."

For example, when Moore and his colleagues told PMA209 at the beginning of the Gen5 project that they planned to include elements of the Software Communications Architecture (SCA), which would make it more interoperable with other waveforms, PMA209 was somewhat reluctant.

> "At the time, our customer's perception of SCA was that it brought additional overhead cost and development time," explained Moore. "But, we provided analyses and demonstrations to show that we could reduce overhead and still meet their requirements for the radio. "We ended up with what we call a Multi-Waveform Architecture, but that never would have happened without our positive

relationship with PMA209," he continued. "If we hadn't broached SCA then, we'd be facing a much more difficult technical problem now as we are starting to implement networking waveforms for use in Gen5."

At the recent ARC-210 Gen5 first production delivery ceremony in Cedar Rapids, Iowa, our customer's respect and admiration for the employees responsible for designing, developing and manufacturing what was referred to as the "foundation of the future" was obvious.

"The Gen5 is a whole new radio and it was a major undertaking," said Nick Mirales, deputy program manager for Communication and Airborne Networking with PMA209. "Rockwell Collins managed to stuff 100 pounds of capability into a 12-pound box capable of operating in tough environments. Believe me, the people in uniform completing missions for our country will be very appreciative." >>>

Innovating for the marketplace

The April 2011 unveiling of the Rockwell Collins HGS[™]-3500 marked the introduction of the aerospace industry's first Head-up Guidance System (HGS) for midsize and light business aircraft.

An electronic and optical system that displays flight information in the pilot's forward field-of-view, the HGS provides better terrain and runway situational awareness by eliminating the need for continual transition from head-down instruments to a head-up, out-the-window view during critical phases of flight.

According to Adam Evanschwartz, a principal marketing manager for Commercial Systems Product and Systems Marketing, our newest innovation is designed to fit comfortably and aesthetically into entry-level business aircraft flight decks and will provide operational and safety benefits to a market segment previously underserved in this area. "There have been several companies over the years that have recognized the need for head-up display (HUD) technology in smaller aircraft," said Evanschwartz, a licensed commercial pilot with experience flying a variety of business jets. "They've tried different approaches, and none have taken hold technologically or in the marketplace.

"However, our engineers have done an absolutely remarkable job," he continued. "Now that we're taking this game-changing innovation to the marketplace, our customers are showing tremendous enthusiasm."

Designed for the customer

For the last 10 years, engineers at Rockwell Collins have been experimenting with HGS technology for smaller aircraft. Since the technology adds value in larger business jets and commercial aircraft such as the Boeing 737 and



787, it seemed logical that a HUD also would add value in midsize and light business aircraft.

In order to meet customers' unique flight deck needs, the team knew the current HUD technology couldn't be adapted. Instead, the design had to be smaller, lighter and more cost effective.

Taking an outcome-driven approach, the marketing team began surveying customers and working with pilot advisory groups. The team surveyed about 200 buyers — business jet owner-operators, chief pilots and VIPs — to determine whether having a HUD on board factored into their decision about which airplane to purchase.

"In this case, our team invested more in research because this product is completely new to the marketplace, and we wanted to make sure we hit the mark," said Evanschwartz. "At that point, 86 percent of those we surveyed agreed that having a HUD on board would enhance the safety of their operation."

The team also used a price sensitivity model — a technique used for determining consumer price preferences — to settle on the price point needed to make the HGS-3500 attractive. That meant as program management and engineering teams looked at technological requirements, they also had to take cost into consideration.

"There have never been HUDs in airplanes this size because the requirements are completely different," said Rob Brown, an optical engineering manager in Wilsonville, Ore., who developed the technology used within the HGS-3500. "Yet, we managed to find a way to make this work."

While the marketing team was doing its study, Brown's engineering team was



The HGS-3500 includes a compact optical design that's contained within one 12-pound unit that mounts on the windshield sill beam in front of the pilot. Through the use of synthetic vision, the HGS-3500 will help the pilot maintain situational awareness by supplementing the outside world view.

looking at ways to develop a product with a slightly smaller field of view, lower luminance and lower resolution than the original, larger HGS. With help from a team of optics experts, which included employees from Wilsonville, San Jose, Calif., Ann Arbor, Mich., and Cedar Rapids, the engineers began focusing on an alternative technology known as substrate guided optics.

Ultimately, the team was able to develop a prototype that delivers the features and benefits pilots expect from HGS, at a size and cost that fits midsize and light business aircraft.

"We've come a long way toward narrowing the gap between the needs and expectations of our customers and the performance of our newest HGS product," said Brown. "We're extremely excited about the future." •

By Jill Wojciechowski



Questions about our brand?

If you have questions about our brand or would like to schedule brand training for your area, please contact Joel Milefchik at 319.295.1898 or email jtmilefc@rockwellcollins.com.

Log on to Brand Central

Details about our brand's architecture and tools and templates to help employees express the brand are available via Brand Central. To access Brand Central, visit the Rockwell Collins Online Index and locate "Brand Central" under "B."

Celebrating 10 years after "The Spin"



On Friday, June 29, 2001, Rockwell Collins became a stand-alone publicly traded company when the Rockwell Collins Avionics & Communications business unit officially spun off from Rockwell International. The minute the New York Stock Exchange opened on Monday, July 2, 2001, Rockwell Collins stock sold at \$23.51, and our Chairman, President and CEO Clay Jones was there to ring the opening bell.

Since then, a lot has changed. We've doubled our engineering workforce. We've nearly doubled our investments in research and development, and Rockwell

Collins has acquired 14 companies over the last 10 years to provide new capabilities to customers. We've also continued to expand globally. In FY'02, we had three major international facilities, and today, there are seven.

In spite of the challenges that occurred following the terrorist attacks on Sept. 11, 2001, and during the late-2000s recession, Rockwell Collins remains resilient and continues to grow. Since the first day of trading our stock, our total return to shareowners has been about 190 percent, compared to a return of about 3 percent for the S&P 500 over that same period.

Years of success: Some milestones over the last decade

FY'02

- U.S. Army Special Operations selects Rockwell Collins to provide avionics hardware for its Common Avionics Architecture System (CAAS) upgrade program.
- The Joint Tactical Radio System (JTRS)-compliant communications system is a significant win for our Government Systems business.
- Rockwell Collins begins extending our system development and integration leadership from the flight deck to the cabin in business aircraft with the acquisition of Airshow, Inc.
- The Defense Advanced Research Projects Agency (DARPA) selects Rockwell Collins for the Phase 2 contract for the Tactical **Targeting Network** Technology (TTNT) program.

Sept. 18, 2001

FY'03

 Our company reaches \$1 billion in sales for AN/ARC-210 radios.

 Life Cycle Value Stream management is launched to achieve better business decisions across our spectrum of product and system offerings.

 Rockwell Collins introduces our Value Proposition for People (VPP) strategy and updates the Vision Roadmap. The business case for our Diversity strategy is introduced as part of the VPP strategy.

FY'04

 The Green Communities grant program is established.



key positions on the Boeing 787 Dreamliner. representing more content than we have ever had on a Boeing aircraft.

FY'05

• The 100th KC-135 tanker avionics upgrade using open systems architecture is delivered.

 Our Lean Electronics^{5M} philosophy, which was adopted in 1998, continues to help our company achieve improvements in quality, on-time delivery and other key measures of performance.



Rockwell Collins refreshes its brand and introduces a new logo.

- Our Pro Line 21[™] integrated avionics system is delivered to AVIC I Commercial Aircraft Co. (ACAC) Ltd. of China for the ARJ21.
- The FlexNet family of radios for the international market segment is introduced.



Rockwell Collins delivers the 50,000th Defense Advanced GPS Receiver (DAGR).

FY'07

 Engineering Experiences, an initiative that grew out of our K-12 program started in 1990, is launched to support science, technology, engineering

and math education



- Head-up Guidance System positions on Gulfstream and Bombardier aircraft are announced.
- Open architecture solutions for military avionics help win positions on several programs, including the AgustaWestland AW149 and Eurocopter German CH-53G heavy lift helicopter.

- FY'08 Our company unveils Pro Line Fusion[®], the
- next-generation avionics system for business and regional jets.
- Rockwell Collins more than doubles content on an Airbus airplane with the A350 XWB wins.
- At this point, Rockwell **Collins Business and** Regional Systems has won 21 of 22 competitions for new aircraft avionics since the spin-off, a testament to the advantages of our Pro Line 21 and Pro Line Fusion avionics systems.
- Rockwell Collins is selected as a prime contractor to provide the first phase of the Common Range Integrated Instrumentation System (CRIIS), a nextgeneration military test range system. In FY'10, our company wins the contract to develop, integrate and deliver CRIIS.

Oct. 9, 2007 \$75.86

Feb. 10. 2011 \$67.20-

According to Jones, that success rate is tied directly to the inherent strengths of our company: a balanced business model, a high level of integration, an efficient shared services infrastructure, a focus on innovation, and employees who are committed to building trust with our stakeholders.

"I'm most proud of the way we've served our stakeholders over this last decade," said Jones. "Customers have rewarded us with market share gains, investors have seen our stock rise far beyond the equity indexes, and our employee population has grown at home and abroad."

FY'09



- Our Venue™ cabin management system is selected by Hawker Beechcraft for its new King Air 350i.
- Rockwell Collins, as a member of the Raytheon, Rockwell Collins, Northrop Grumman and SAIC team, is selected by the U.S. Navy to execute the **Joint Precision Approach and** Landing System (JPALS) Increment 1 program.
- Our company delivers the first installation of the **Block** I modification to the U.S. Navy's E-6B Mercury aircraft.
- Rockwell Collins is selected by the United Kingdom Ministry of Defence to provide additional FireStorm™ targeting systems.

FY'10

- The EP[®]-8000 advanced image generator is unveiled at the Interservice/Industry Training, Simulation and Education Conference (I/ITSEC).
- Rockwell Collins delivers its first Virtual Avionics Procedure Trainer (VAPT) to the U.S. Air Force.
- Our company demonstrates damage tolerance, a capability that could be applicable to all military aircraft operating in combat environments and to commercial. business and general aviation aircraft for full flight automation and backup.

March 5, 2009 \$27.97

FY'11

- Rockwell Collins is selected by the Commercial Aircraft **Corporation of China** to provide in-flight entertainment systems for the C919 aircraft. We also are providing the cabin core system, communication and navigation systems, and the integrated surveillance system on the C919.
- Ascend[™] flight information **solutions** — a suite of flight support, maintenance operation and cabin services — is introduced as a new way for business aircraft owners and operators to manage their systems.
- Embraer Defense and Security selects Rockwell Collins to provide the Pro Line Fusion flight deck for the KC-390 tanker/ transport aircraft.
- Clay Jones rings the closing bell of the New York Stock Exchange on June 29, 2011 celebrating 10 years after the spin.

Attaining a **better** solution

Strong supplier relationships often are the first step to solving technical challenges.

As a global leader in the design and manufacturing of advanced commercial and military systems, our company is continually faced with a variety of technological and environmental challenges. And quite often decisions that positively impact one element will have negative consequences on the other.

For example, because of health safety issues, the European Union (EU) has mandated that pure lead be eliminated from use in products. To meet that requirement, our component suppliers began using pure tin in place of tin/lead finishes. That solved the health and safety issue but created problems with performance and reliability. "The pure tin finish is subject to a phenomenon called 'whiskering.' Little

hair-like pieces of tin will break off and cause shorts in the circuitry," explained Dave Severson, a component application engineer in Operations. "Because of the critical nature of our systems, this was unacceptable to us and our customers."

Knowing they needed a better solution, Severson, along with other employees in Procurement, began talking with representatives from one of our component suppliers, Maxim Integrated Products. While suppliers openly seek opportunities for increased business, they typically don't want to create new parts without orders, and Rockwell Collins couldn't commit to an order without testing the new product.

"Because of our established relationship, Maxim was confident that if they created the parts we needed, the orders would come," explained Severson. "We had to trust each other to create a win/win situation."

A true test

According to Roger Weiss, vice president of Material and Supply at Rockwell Collins, challenges often are a true test of the strength of a relationship.

"Suppliers are always coming forward with cool solutions," he said. "But when there is a problem, and you need someone to jump in and be there for you, those are the times that really tell you whether or not you have a good relationship."

This was the case when Maxim's military division created a new line of parts at our company's request to solve the whiskering issue.

"The representatives from Maxim worked closely with our team to develop an improved combination tin/lead finish," explained Severson. "Now, we're able to meet the EU's environmental regulations without any of the problems experienced with pure tin."

Severson said the new parts were given a part number suffix, GH9, so employees can easily identify components with the problem-free finish. It's estimated that demand for these components at Rockwell Collins is well into the hundreds of thousands of units per year. The parts currently are in use in all of our GPS systems for the Joint Direct Attack Munitions (JDAM), Integrated GPS Anti-Jam System (IGAS), NavStorm[™]+, NavFire[™] and Defense Advanced GPS Receiver (DAGR) programs. And demand is only expected to increase.



"As these parts are proven out, they will ultimately find their way into many other Rockwell Collins products," he added. "That is important because it solves our problem, while creating additional opportunity for the supplier."

More than just orders

In April, Maxim was recognized for its collaborative work during our company's Annual Supplier Conference when it was presented with the Semiconductor Supplier of the Year award, as well as our prestigious President's Award.

David Stevens, a senior account manager at Maxim Integrated Products, said a key part of the relationship they enjoy with our company is that Maxim does more than just fulfill part orders.

"We're on a joint task force team to look at how Rockwell Collins procures materials to help identify ways to make processes more efficient," he said. "We worked together to make changes to a particular part that enabled the company to stock fewer part numbers. That saved additional inventory and money.

Five tips for stronger supplier relationships

- Work with approved/preferred technology and solutions providers.
- Communicate the good and the bad. It's difficult to form a positive relationship if the supplier only hears about negative circumstances.

12 HORIZONS • 2011



A new line of components was created by Maxim Integrated Products at our company's request to solve the tin whisker phenomenon, a condition where little hair-like pieces of tin break off and cause shorts in circuitry.

SUPPLYCHAIN

Component Application Engineer Dave Severson (middle) shows Rockwell Collins Buyer Colleen Fowler and Maxim Senior Account Manager David Stevens a system circuit board with the improved tin/lead-finish components.

"The relationship goes beyond product development and into procurement and planning," he continued. "It's a cradle-to-grave relationship so to speak. We can't just do one thing really well; we have to do it all well."

Weiss explained that task forces, a supplier advisory council and other forums where suppliers can share ideas help Rockwell Collins form better relationships and become a customer of choice. That way, if there's an unexpected technical challenge or crisis — such as the recent earthquake and tsunami in Japan — it's easier to overcome the issues.

"The situation in Japan summed it all up very well," said Weiss. "When the earthquake and tsunami crippled supply chains in Japan, our suppliers worked hard to meet our needs. I believe the relationships we have with suppliers are one of the biggest reasons why we are continuing to receive parts and, in turn, meet our customers' needs." -

By Dale Smith

• Follow intellectual property protection and information-sharing processes to secure competitively differentiated ideas. • Don't make unreasonable demands. Suppliers are less inclined to share scarce resources with difficult customers.

 Identify real opportunities for suppliers and act on supplier suggestions. The opportunity should be a win/win for both companies.

Source: Rockwell Collins Supply Chain Services

Seeing is believing

Prototypes are proving what presentations can't when it comes to game-changing technologies.

Sometimes, you just have to see to believe. When Randy Nelson and his team embarked on a project to achieve data rates high enough to transmit quality video via High Frequency (HF) radio, many people thought it was a far-fetched idea.

"Five or ten years ago, no one thought we could send video over HF," said Nelson, a principal systems engineer in the HF Airborne group in Government Systems at Rockwell Collins. "The computing power and the frequency authorizations simply weren't there yet."

In spite of all the challenges, and after years of research and development, others are now seeing what Nelson's team has always believed in: video via Wideband Over High Frequency (WBHF) radio. During a recent demonstration, the HF Airborne group was able to virtually tour New Mexico State University's (NMSU) Physical Science Laboratory in Las Cruces, N.M., using a WBHF radio prototype.

With the Rocky Mountains and more than 1,000 miles separating the facilities, the near real-time video transmission was an important feat. Until now, it was extremely difficult for Nelson's team to sell its concept. And like many projects at Rockwell Collins, the prototype is helping capture customers' attention.

Prototypes driving sales

While presentations have always been important for briefing customers on capabilities, prototypes are increasingly changing the way buying decisions are made.

"In many cases, one PowerPoint[®] slide and a prototype are worth a lot more to the customer than a well-thought-out 100-page presentation," said Keith Diefenderfer, programs director in the Advanced Technology Center (ATC) at Rockwell Collins. "Things have changed in our industry. No question about it."

Defense budget pressures and the consumer electronics industry are driving most of the change, according to Diefenderfer.

"Consumer electronics business models typically include big splashes for new features every few months. Our competitors are adopting these models in the commercial avionics marketplace," he explained. "That means in order to compete, we have to increase the pace at which we introduce new features and new models.

"Additionally, in the government marketplace, we can't just build to customer specifications; we also have to build to market," he continued. "Many of our government customers have money to buy new solutions, but they don't have funding to write



specifications or create a new program of record. That means they're more apt to buy based on demonstrations."

In markets outside of the United States, especially in Brazil, India and the Middle East, many customers will only buy once they've tested a prototype.

"For example, in India, no cost, no commitment demos are a typical part of the acquisition process," said Jay Little, director of Global Strategy in International and Service Solutions. "Once your proposal is deemed compliant, you must provide technology demonstrations to prove what can be done. After successful demonstrations, the customer makes the buying decision."

Finding funding

Getting to the prototype stage is not always easy, as the HF Airborne group can attest. It often takes passion, vision and networking in order for an idea to come to fruition.

Years ago, when frequency authorizations in the HF band became more open in the U.S., Nelson's group realized the potential for WBHF. They believed it could be a viable replacement in satellite-denied environments

Valencia, researchers at New Mexico State University (NMSU), transmit video of their lab to Rockwell Collins employees in Cedar Rapids, lowa, via Wideband Over HF (WBHF) in May. This transmission lasted approximately 30 minutes at 38.4 kilobits per second, setting a duration record.

Tracy Hooker (left) and David



cord. That monstrations." , especially in omers will only

s easy, as the passion, vision to fruition. ons in the son's group ed it could environments and useful in situations where leasing satellite time was too expensive for users. Their big challenge, however, was that legacy HF transmission rates were never high enough to be a satellite substitute. That meant the team had to prove that higher data transfer rates via WBHF were possible.

"It was hard to build a business case for the WBHF technology before we could demonstrate that it worked," said Nelson, who began working with HF technology 18 years ago. "It was our ATC that helped us get to a point where we could prove it's possible to achieve the data rates customers need with HF."

With support from ATC leaders and employees in Government Systems such as Bill Hess, a principal program manager, who Nelson described as an "early champion" of WBHF, the team began building a prototype. Their funding came from the ATC's Open Innovation program and internal Government Systems funding.

Throughout the prototype process, Nelson worked with a team led by Dwayne Harris, a principal systems engineer in Richardson, Texas, to modify radio platforms. Meanwhile, Mark Jorgenson and Bob Johnson,



Prototype power

Throughout our company, you'll find prototypes that are helping Rockwell Collins turn great ideas into products that sell.

1 MicroTurnstile[™] Cross Domain Solution

This prototype — designed and built in two weeks — led to a contract to develop a new, soldier-worn, cross domain solution to enhance military communications security. The intelligent processor unit enables squadron leaders to exchange information with their soldiers who are not cleared for access to classified information, without the risk of compromising classified data.

Tool to validate Skill Appropriate Training Environment (SKATE) A team comprised of Rockwell Collins, Advanced Infoneering, Inc. (Al²) and The University of Iowa Operator Performance Laboratory (OPL) is developing an initial prototype for a software-based assessment tool to validate a concept called Skill

Appropriate Training Environment (SKATE). SKATE is aimed at ensuring that military aircraft training exercises are tailored to individual skill sets versus a one-size-fits-all approach. This prototype will utilize the **Rockwell Collins Instructor Operator Station** (IOS) currently used in aircraft simulation and training programs for the military.

³ "Smart sleeve" for cell phones

This mockup was created to help potential military customers understand how an iPhone[®] or Android[™]-based phones could be fitted with a device that would provide a secure channel for trusted information sharing from secret to unclassified networks.

New approach for in-flight entertain

A prototype that demonstrated the new approach for loading video and audio

content and validating the network performance in our latest in-flight entertainment systems in commercial aircraft was key in order for the Cabin Systems team to reduce risk and move development forward.

5 MobiLink

MobiLink is a family of Communications On-The-Move (COTM) solutions that provide a continuous, reliable satellite link while moving at high speed. A prototype vehicle called BOSS demonstrates our company's ability to manage broadband SATCOM communications crossbanded with VHF/UHF radio and cellular networks while moving at speeds in excess of 60 MPH. This prototype allows Rockwell Collins to provide live demonstrations to military and government customers and first responders.

Rockwell Collins engineers in Ottawa, Canada, developed the modems required to translate data sent via WBHF into video.

Although Nelson's team

failed twice, the group came back again and found

the right technical combination. "When we hit

that first successful transmission, we were celebrating," said Nelson. "Our very first shot was a record data throughput over HF. The video came through for about 50

The Wideband Over High Frequency radio prototype is significant because the legacy HF band data rates were not designed to support video. The benefit of using HF, however, is that video can be streamed in a satellitedenied environment beyond line of sight.

seconds before we saw any errors."

So far, the highest data transfer rate demonstrated via WBHF is 90 kilobits per second in an 18 kHz HF bandwidth, which is more than 10 times the typical maximum rate of legacy HF technology. And while data rates via satellite communications outshine those achieved with WBHF. the team believes its work is a game changer. WBHF is especially applicable for battlespace connectivity in mountainous areas, as it is the first technology able to stream video in a satellitedenied environment beyond line of sight.

"It's drawing the attention of potential customers that we reached that kind of a data rate," said Jorgenson. "The interest is growing as we develop a product to sell."

Advancing ideas

The way to thrive in our current market environment is by innovating, but technology for the sake of technology generally doesn't lead to successful

COVERSTORY

Radio Frequency Spectrum



time signals, standard frequencies fixed, maritime mobile, navigational, radio broadcasting land, maritime mobile. radio broadcasting fixed, mobile, maritime and aeronautical mobile, radio broadcasting, amateur ixed, mobile, maritime and aeronautical mobile, amateur, radio and televisio broadcasting, radio navigation fixed. mobile. maritime and aeronautical mobile, amateur, television broadcasting, radio location and navigation, meteorological, space communication ixed, mobile, radio location and navigation, space and satellite communicatio

products or solve a customer problem. "By focusing on an unmet need or a known customer problem, the probability of technology transition and commercialization increases," said Nan Mattai, senior vice president of Engineering and Technology (E&T) at Rockwell Collins. "An understanding of what the customer is trying to do and willing to pay for goes a long way in order to provide the right solution at the right price. Bringing a Cadillac to a market that wants a Prius is not the right approach."

Our E&T organization, which includes the ATC, is responsible for identifying, selecting and maturing potential technologies that make sense for Rockwell Collins. Using a disciplined process to analyze customer requirements and create technology roadmaps, E&T employees work closely with the business units to develop and transition leading-edge technology and capabilities.

"This minimizes the risk and uncertainty of introducing new

Advanced Technology Center funding programs

Almost every good idea has the potential to be a game changer. That's why ATC offers unique funding opportunities to employees globally.

10X

- Available to validate new ideas quickly
- Provides up to \$50,000 to prove an idea
- Project must be completed within three months

Open Innovation

- Available when using externally-developed technologies to reduce risk and save time and cost
- Funding must help solve a critical technology need in a business unit

Rapid Prototyping

- Available to develop a proof of concept to engage customers early and obtain feedback
- Prototype must be completed quickly a firm demonstration or delivery date is required
- Developmental risks must be manageable

For more information,

view the Advanced Technology Center TeamSpace via "A" in the Rockwell Collins Online Index.

>>>

COVERSTORY

technologies in the product development phase," said Mattai.

Rockwell Collins' research and development investments are divided between long-term exploration projects that are expected to take more than five years to mature and short-term opportunities.

"During the early stages, it's often hard to keep longer-term innovations off the chopping block because the return on investment is not visible yet," said Mattai. "But at the end of the day, we must be open to leaps in technology. I have learned that you have to trust employees, and the rewards will come."

Recognizing potential

It's estimated that 50 to 70 percent of ideas considered at Rockwell Collins never make it through the feasibility stage, according to Diefenderfer. But many times it doesn't matter whether your idea is good or great; what really matters is what you do with it.

"We're always looking for fresh, new ideas and concepts," said Diefenderfer. "But we also want people to connect technology opportunities to areas that will accelerate growth for Rockwell Collins. If employees see value, see the business case for a technology, there are programs that can provide funding to advance ideas. The ATC's role is to help the company see things it might not otherwise see and go in a direction that it might not otherwise go."

A few years ago, Jon Doane, an expert in antenna theory and design, had an idea for an antenna with an electronically configurable surface. While working in the ATC, he applied for funding and eventually was approved for a 10X project.

Even though many parts of his original idea – such as the surface – didn't turn out as expected, his 10X research was valuable.

"My project evolved from a screwball idea to something that became a lot more practical," said Doane, who is currently on an educational leave of absence to finish a Ph.D. at The Ohio State University. "There wasn't a specific application or customer in mind; although, we knew there would be a lot of potential applications that would be appropriate."

At one point, he realized his design had evolved into a parasitic switched array, something that had been designed before, but never for the type of systems used at Rockwell Collins. Instead of having a complicated array, the design included a simple switch network, where directivity could be focused in one area, allowing for longer link ranges.

"The vast majority of information I'd seen about a parasitic switched array was at the academic level, not in industry," said Doane. "But the design provided a more efficient use of power. If the antenna could do more, we knew we could significantly reduce the size, weight, power and cost of other components in the system."

At the end of the 10X program, Doane had a successful prototype and began networking with other engineers at Rockwell Collins to find a good fit for his latest invention.

"When you just have an idea, people are wary, and rightly so," he said. "But when you have a functional prototype, like we did from the 10X program, people are more serious about applications."

Senior Electrical Engineer Lee Paulsen talks with Electrical Engineer Matilda Livadaru about various applications for the parasitic switched array antenna. The antenna can be scaled to meet the needs of a system at one-fifth of the cost of legacy antennas.



The parasitic switched array antenna was tested on the bottom of several aircraft, including this L-29. At one point, the test team watched a streaming Netflix[®] video relayed through the antenna, proving it could handle high data rates over long distances.

Doane quickly found an opportunity, but the program came with a challenge. In a matter of six months, the antenna had to be integrated with the product and working for a customer demonstration.

High power, low cost

While several antenna developers already are entrenched in our industry, Rockwell Collins leaders realized years ago that a high-performing antenna at a low cost could disrupt the marketplace.

"Subsystem requirements have driven complicated and expensive antennas," explained Jim West, principal engineering manager of Antenna Technology in the ATC. "But you can't put an antenna on an unmanned aircraft system that's the same price or more expensive than the aircraft. We knew there was a need for a different solution."

While Doane's parasitic switched array didn't offer the specifications or performance of an expensive antenna, it could be scaled to meet the needs of a system at one-fifth of the cost. The Rockwell Collins team just had to prove to the customer that it fit the requirements.

Using funding from ATC's Rapid Prototyping program, a team — which included five full-time employees and more than 10 domain experts within the company — was formed to quickly mature the technology.

"At that point, we had a very specific purpose for the antenna. We had a very specific system. We had a team that we needed to integrate with," said Doane. "We had to look at the system holistically.

"I needed to make sure the right people got in the room and were talking," he continued. "For example, I don't know a whole lot about digital processor design, but I got the guy working on the antenna processor to

talk to the guy working on the processor in the product. Because we were working on such a compressed time schedule, everything was being fleshed out in parallel."

Final test

Three months before the customer demonstration, Doane left to work on his Ph.D. Lee Paulsen, a senior electrical engineer in the ATC, took over for Doane as the project's leader. While there were a few hectic weeks, Paulsen said many of their initial concerns turned out to be trivial during implementation and final testing. He credits that success to the Rockwell Collins team of experts, which included system engineers, software engineers, mechanical engineers and assembly technicians.

Then came the day of the demonstration. The antenna proved that it could handle high data rates over long distances. This was significant because, without the prototype, the product would have been limited to shorter distances in order to handle high data rates.

"The antenna's performance was impressive, especially given the price point and how small the package was once installed," said Paulsen, who also is an expert in antenna theory and design. "The demonstration really was an opportunity to displace a legacy antenna system that we've never been able to compete with before."

In May 2011, the first 10 units were delivered to the customer. In less than a year, the concept had matured from a 10X project to a product delivery.

"We're implementing, not inventing," said Paulsen. "The technology has already been proven through the prototypes. That gives everyone high confidence." -

By Katie Shatzer and Crystal Hardinger

Why RFID? Why now?

Rockwell Collins is helping advance industry-wide use of radio frequency identification in commercial aviation.

A Radio Frequency Identification (RFID) tag could be the ultimate way for commercial aviation customers to track and record the history of a component, revealing where it was built and any service work done to it. But first, the technology needs to be cost effective and easy to use.

Our company recently took a big step to advance industry-wide use of RFID when the first Rockwell Collins system received a "cradle-to-grave" tag. Placed on an Airbus A350 XWB GLU-925 Multi-mode Receiver, the tag meets the Air Transport Association's Spec 2000 guidelines.

"There's a big advantage to the end customer by having unit information readily available on the aircraft," said Martin Pauly, principal program manager for Airbus Programs. "Until now, that wasn't possible."

Technical challenges

While RFID technology has been around for a long time, it has been slow coming to commercial aviation. According to Todd Boyle, a material and process engineer in Advanced Industrial Engineering at Rockwell Collins, two challenges have made it difficult to implement.

First, the tags had to be rugged enough to withstand extreme environmental conditions while in the air. Secondly, high memory tags were needed in order to record detailed information. Unlike paper RFID tags that typically have 512 bits of memory, Spec 2000 guidelines call for a minimum of four kilobytes of memory.

"The high memory tags that meet industry guidelines are brand-new," explained Boyle. "We needed a cost-effective

Material and Process Engineer Todd Boyle (left) and Principal Program Manager Martin Pauly test a new Radio Frequency Identification (RFID) tag placed on a Rockwell Collins unit for the Airbus A350 XWB.

tag that could manage the power necessary for that much memory. In fact, when we first started, there were a lot of questions about what tags, software and readers would work."

Following specifications

For over a year, a cross-functional team that includes employees from e-Business, Operations, Commercial Systems, and International and Service Solutions has been working to incorporate an enterprise-wide solution for RFID.

The idea is to use standard specifications and offthe-shelf technology so that no matter where you are in the company — whether it's engineering, manufacturing, shipping or services - you can easily record and read RFID data. Customers can, too.

"Every activity will eventually get stored on the tag - whether it's a software upgrade or a calibration at the airport," said Boyle. "That's why following specifications is so important. Everyone in the industry needs to be able to access and write data. That way we can share information." -





Service anniversaries

Rockwell Collins offers congratulations to employees who have marked significant service award milestones in recent months.



Darlene L. Ealy

Start date: July 1966

Original position: 107 Assembly Operator

Current position: 195-C Production Specialist

What do you enjoy about your **position?** There is a variety of work to be done — not just the same thing over and over.

Adele L. Lerma

Howard R. Bentlev

Kenneth F. Blazek

Klaus Bohlmann

Patricia J. Bulten

Deborah J. Heller

Rodney K. Larson

Jon A. Gilbert

Kevin K. Loux

Mary J. McLaren

45 YEARS

Craig E. Barnes Richard G. Brown Garry D. Dyson Marjorie F. McGuire Michael K. Musgrave Robert V. Zaiger

Darlene L. Ealy Patricia L. Kinch

Donna M. Mattson Gary L. Scott

35 YEARS

Charles A.

Harmevei

John C. Harry

Brinson N. Jordan

шү

ΜΔΥ Sandy G. Pacheco

Douglas G. Allemang Denis E. Altheide Nancy J. Becker Robert T. Butler Michael J. Dautremont Keith D. Dearborn Helen E. Flynn Randy S. Graham David H. Halvorson

David W. Meiners Randy E. Moore David O. Morgan Gary A. Pershin Ronald G. Redington Keli J. Walt Randall R. Wilke **30 YEARS** Wayne L. Craft Christine A. Crowe Bernardita P.

De Jesus Sherry L. Freshour Brigitte Hartmann Brian E. Herrington Wolfgang Kretz Carol A. Mc Gowan

Danny J. Murphy

Employees celebrating 20 years of service or less are recognized at www.rockwellcollins.com/horizons.

Marshall A. Wickman

Steven E. Barltrop Rebecca A. Daniels Terry W. Davis Sol M. Del-Gado Patrick E. Dennis Gary J. Driscoll Janice S. Garrett David L. Hale Richard J. Hall Melinda K. Hatcher Ronald M. Hau Michael D. Herring Donald F. Hovda Raymundo Lopez John F. McMakin IV David A. Moon Hien H. Nguyen Rose M. Noonan June R. Rainbow Teresa D. Ramos Elizabeth M. Rav Robert H. Saffell Teri M. Sealey Hansen Scott A. Taylor Judy P. Thompson

Phillip M. Trebs Allen D. Trofholz Martha Villarreal

Marco A. Baldi Layne D. Brooks David B. Davis Deborah L. Endres Fredric R. Gruendell Dickie E. Hooten Linda A. Lennon Kristine A. Malatek Sheila K. Mathews Tammy E. Mowrer Shirley M. Pasker Bernd Radecke Susan Simmons Kenneth E. Smith Timothy E. Snodgrass Cynthia J. Temple Donna L. Troublefield Kevin D. Walters

25 YEARS

MAY

Tovi E. Armstrong Peter J. Bandfield Krisandra L. Becker Rainer Brecht Matthew L. Burns Wayne D. Button Jeffery D. Carney Douglas T. Castek Michael H. Cisco Jack W. Cowden Edwin J. De Ruiter Vickie L. Fish Susan J. Fitzpatrick Connie M. Garringer William S. Harlan Harald Huber Lester M. Humphreys Ricki M. Kern Gail A. Kester Craig E. Lamansky Dennis H. Leonhardt David C. Marshall Janice H. Mishler

Kathryn A. Olson Paul L. Opsahl Ronald R. Payne Roland Rimmler Michael R. Schmidt Karen A. Shulista Susan G. Solem Christopher W. Steinberg Eric A. Stevens Darwin D. Tecklenburg John R. Terry Shannon L. Utlev Nancy L. Wallander Robert A. Wallis

Linda J. Alexander Scott F. Bauler Alan R. Bechtold Harlan D. Belden Douglas A. Bell Alan P. Boone Robert A. Brus James A. Burge Matthew J. Carrico Yen Chieh Chung Kelly K. Colquhoun John G. Conkling Kimberly K. Draker Marjorie E. Ellis Raymond L. Fitzgerald Scott R. Gerhold Jason J. Hambly Karen F. Ingwersen Michael A. Jergens James G. Klopfenstein Jean-Louis Lair Martin J. Litfin Julie L. Mc Cormick Donald J. McCreary Charles W. McDermed, Jr. Ronald R. Meyer Jane L. Moore Shawn E. Naeve Mark D. Neuwirth Robert A. Ortscheid Gregory D. Pittam Betty L. Satterlee-Mull

A Rockwell Collins solution in action



A pedestrian in Tokyo, Japan, uses his phone to take a picture of the Rockwell Collins SWE-DISH CCT120 Drive-Away satellite terminal mounted on a vehicle. Known as one of the most advanced satellite terminals on the market, the CCT120 Drive-Away does not require a roof cable feed, enabling it to be mounted to almost any vehicle. The metropolitan police in Tokyo are using the technology for mobile surveillance in connection with anticrime efforts.

Steven H. Sawvers Steve A. Schau Paula J. Schnurr Martin J. Shimak Bret W. Tinkey Michael R. Vagher Faye A. Ward Julie K. Whitlatch Steven D. Yoder Benjamin T. Zdan

Cheryl F. Ahlrichs Patricia L. Ashlock David W. Asman Guadalupe Astorga Diaz Mark J. Bartelme Brian S. Bullington Rhonda L. Cahoon Martin S. Frasher Corinne Guibert Harald Heimpel Lee M. Keuter Robert J. Kirby Michael Lundy Alan L. Mahoney Randy D. Narveson Jack Primault Kerry R. Reisen Barry L. Roberts Thomas D. Sanders William J. Schuyler Timothy D. Stepp Robert Wolf Renee L. Woods

20 YEARS

Jayne L. Anderson Daniel K. Bastemeyer Brad A. Birdnow Frederic Bridet Troy D. Brunk Thatcher M. Buckingham Bradley G. Butikofer Alan G. Coats Marlon D. Cooper Russell W. De Hoedt Barbara R. Driscoll Cinthia J. Forbes David J. Gillespie Gregory A. Gravert John W Halverson, Jr. Carson A. Hampton James B. Henricks John L. Hinkel

CELEBRATING **35 YEARS** Doug Allemang Start date:

June 1976

Original position: Industrial Engineer in Manufacturing

Current position: Director of Lean in International & Service Solutions

What advice do you have for new employees? There are more opportunities at Rockwell Collins than you can possibly imagine, so keep an open mind to where your career might lead.

Kurt A. Kaufman Brian L. Heins Cheryl L. Killham William C. Jennings Patrick S. Mc Dowell Mark J. Kilburg Gregory G. Mein Chad A. Kruger Louise A. Neumann Eric A. Landuyt Keith E. Newell Angela M. Montelius Linda S. Nicely Craig S. Rosel David J. Nieuwsma Susan G. Scott Terence O. Perkins Michael L. Stewart Larry J. Pfab Shelly R. Westfall Troy R. Ralfs Donna R. Wilson Randall S. Sanders Kenneth L. York Tod J. Santel Deeann G. Scheib ши Matthew D. Bradley D. Scobee Bamford Julie A. Stull Belinda L. Banks Michael J. Sulek Patrice Bourrier Patrick D. Swain Roxie A. Davis Wanda M. Terry Muriel Deffore Jacalyn L. Thomas Kathy S. Gavin Brian K. Thompsor Anna M. Heiserman Nicholas C. Trent Karen K Susan E. Walker Hendrickson Joel M. Wichgers Richard L. Jenkins Paul J. Williams Rick N. Johannsen Charles D. Williams Edward A. Johnson Blane W Douglas R. Johnson Wollschlager Kerry L. Klein Lu Ann L. Yarbrough Laurent Malliet Octavian I. Popa Mary T. Conley Kirk E. Reynolds Joel A. Conrad David C. Schroeder Craig A. Dains



Kevin D. Sempf Mark S. Shanks Roger K. Shultz Karen M. Spading

15 VEARS ΜΔΥ

Terry J. Anthony Jeanne R. Ashby Christopher M. Avgenackis Emily R. Baker Darlene C. Blackburn Martin J. Borgerding Patricia G. Brooks **Brigitte Burelle** Tatum J. Buse Carlos J. Chavez Guadalupe Chavez Topete Stephen J. Coffin Vincent D. Decker Timothy J. Geels Michael A. Greene Michael R. Guenigault Robert S. Haney Daniel P. Hasse Tammie L. Jackson Markal J. Johnson Stephen T. Jones Frederick C. Kahle Shannon A. Kopf Theodore C. Lockhart Teri L. Lubben Joshua J. Mabern David T. McDonald David A. Miller Thomas Mullarkey, ١r Daniel L. O'Connell Troy D. Page Michael A. Peterson Lisa J. Pitz Carrie A. Powell Michael L. Pownell Melody L. Rasmussen Ramon D. Reyes Jennifer J. Richmond Pablo S. Rodriguez Robert E. Rosenthal Aaron J. Smith Denis C. Sullivan Derek J. Townsend Travis S. Vanderkamp

VanGorder **Rosemary Vercande** Mark S. Webster Matthew J. Wells Jav B. White Peter J. Williams James F. Winfield HINE Robert W. Allen Anita M. Almazan Kevin M. Bayer Julia Boswell James G. Brown Tammy S. Bruner Christopher W. Bruns Shawn D. Bucholz Helen L. Dains Sabine Dassinger Joshua V. Davis Terri L. Engels Debbie S. Fields Richard J. Hanson Gregory A. Happel Mark A. Hohbein William T. Holmes Gregory A. Joel Tamara S. Jones Patricia M. Kieler Todd A. Kratz Edward M. Kuonen Ying Cho J. Lai Robert J. Lange Delores A. Lillie David C. Lufkin Jennifer D. Miller Christopher R. Norris Barbara J. Pospisil Brian L Reicks Christopher M. Richards Jason R. Schares David R. Siefer Mark D. Sluka Eric A. Stephenson Michael D. Toms Shirley A. Voinovich Robert W. Warnock John J. Weger Raymond A. Young Michael E. Zinno Espen C. Anneling Timothy F.

Bartholomew

Kristine N. Bell

Jennifer L.

Mark A. Bobbin Kevin L. Boomgarden James D. Cahoon Lisa M. Coffin Kelly G. Dalton De Etta L. Dickerson James M. Eichstadt Pedro L. Encarnacion Timothy D. Erenberger John E. Ferguson Alma D. Franco Gary B. Green Patti A. Groff Curtis W. Hicks John R. Hill David J. Holtz Rudolph Jara William R. Johnson Evie R. Johnson Carla M. Lankester Thomas N. Larson Choy Wan Lee Gregg R. Lind Daniel E. Martin Kari L. McGregor Martin G. Mills Stephen D. Novey Charles S. Paramore Jill M. Petersen Judy F. Phelps Angela B. Pittman Linda M. Pratt John J. Schroyer Adam A. Schutte Kevin Shoubridge Randv A. Simonsen Andre L. Smith Stephen R. Spitz Serge Trouin Patrick P. Wallace Edward D. Walsh Chad M. Weber Mark W. Weikel Steven M. Whalen Matthew M. Wilding Douglas W. Wolcott **10 YEARS**

George M. Berry

Steven R. Adolphs Hussein F. Akasheh Ger Ching Ang Matthew G. Bader Todd M. Baniak

Beth A. Becker Karen E. Berecz Melissa D. Biesiada Enoch Blackwell Paul F. Bonham Donald F. Burton Andrew Burton-Spearing Allan G. Carbaugh Angelika Dambach Pierre Dubois Janette M. Eberhard Daniel L. Ellis Wajih A. Elsallal Jason D. Fine Kathleen M. Fisher Nicole M. Gaudreau Khalid Hajji Dustin R. Harlow Lois J. Hughes Timothy B. Jones Sarah A. Kleinschnitz Heike Koeppel Stephane Lapeyre Timo Liesenbein Ryan P. Littler Pierig Lorho Nicholas M. Mead Maria Concepcion Mendoza Acosta Colette K. Miller Stefan Mirion Philippe Monnie Traer D. Morgan Nathaniel P. Morris Matthew P. Mulnik Heather L. Neff Tiffany J. Norris Cindy J. Noska Maria De Jesus Perezchica Valadez Heidi J. Perschke Jesse M. Pisarik Jean Christophe Potin Brandon J. Provolt Juan Jose Quirarte Gonzalez Flena M. Ouivers Timothy J. Ray Therese M. Revett Pamela A. Reynolds Owen L. Russell Silke Schmidt Eric J. Schwendinger Leung T. Seu Molly K. Sickels

Brad W. Barvinek

Mark R. Smith Sarah C Theiler James J. Thomson Audrey Tiquet Michael H. Vu Tekang Wang Fabien Willig Chad E. Winterhof Khee Jee Yeo Jeffrey L. Albert Morris H. Anderson Marina Arnaud Frederique Azum Kristy A. Bahl Jamie M. Biedermann Heather D. Bracker Scott M. Britten John C. Broman, Jr. Jeff B. Brown Frances L. Caldwell Tammy J. Carlson Rita K. Carter Dawn L. Carton Brett M. Caspers Joe E. Clark Andrew Coates Daniel S. Collins Martin Cumber Jeffrey J. Debo Randal R. DeKlotz Aaron J. Delaney David J. Dempsey Gary F. Dvorak Michael S. Feenev David J. Felton Gavin P. Fischer James E. Flint Warren L. Gair Christopher M. Gibson Nathan J. Haan Loris D. Hale Judy K. Hansel Thomas R. Harris Dawn L. Heitzman Joanne D. Hodges Benjamin B. Hoffman Vincent Hubert Gregory A. Johnson William S. Jones Inge Kaplan Colleen M. Kelly Janice M. Knief Ryan L. Koupal Severine Lafforgue Christina A. Littler

Michele D. Metivier Fabrice Meynckens Brian M. Munson Lisa M. Nelson Bradley J. Neuville Amy L. Newman Flecia A. Ogert **Rodney Pither** Sarah M. Prouty Neil D. Ouellhorst Brian S. Rach Carlos A. Reynoso Ricky L. Ritchie Sze T. Roderick Rvan C. Roentsch Jonathan C. Rumblev Bradley J. Sa Barreto Chhavi Sadera Jonathan M. Sebast Chyi N. Sheng James E. Sisson William G. Smeed Mike J. Smith Clinton W. Stanek Jay A. Struve Jill K. Thompson Anthony J. Tipolt Martha A. Vitti Robert J. Von Behren Kurt J. Wagner Ryan A. Wheeler Amy M. Wheeler Jerome Wygoda Ronald L. Zozaya, Jr.

Kenneth R. Anderson Barry J. Berg Timothy I. Blevins Rolf Boehler Michael P. Bongiorno Frederic Brun Bruce R. Bullard David P. Carter Gary R. Chadick Craig E. Chambers Daniel J. Clark Olivier Dalla Rosa Christine A. Davis Benjamin De Souza Philip D. Dean Stacy K. Duehr Regis Garau Yannick Garriguenc David I. Han Matthew R. Hubbell

Ravmond E. Kennedy Fabienne Llorens John J. Mccorry Marina Mitrovic Myles E. Mongar Kevin G. Mortensen Lenard E. Noice Susan M. Olson Todd D. Peterson Kathrvn T. Ramsev Alexander D. Reid Michael A. Rigsby Steven J. Robbins Merritt W Robertson Mark V. Ryan Bruce A. Shauger Edward Slaby Chan L. Soeung

Claudia Patricia S. Aguilar Jason A. Alt William H. Anders Dion K. Anderson Joe A. Arca Leslie A. Baker Mark T. Barden Shane D. Barnes Matthew S. Bass Molly K. Baynes Jeffrey M. Beckelheimer Sara S. Bergh Gerhard Bierleutgeb Tarol A. Black Kenneth M. Blair Claudiu Bodrug Steven Bottone Trisha A. Boyse

CELEBRATING 35 YEARS

Keith Dearborn

Start date: June 1976

Original position: Expeditor/Material Support in the Commercial Switching Systems Division

Current position: Manager of Materials and Logistics/Collins Printed Circuits in Operations

What accomplishment are you most proud of? There have been many, but the one that has had the biggest impact was my involvement in the SAP (our enterprise resource planning system) deployment across the enterprise.

Scott W. Stadelmann Clayton C. Stephens Thomas D Wahlstrom Douglas E. Webb Wayne H. Weeks Joon Sang Wong

5 YEARS

MANY Michaela Ackermann-Kunkel

Zachary E. Bruce Sheila K. Bullerman Jared S. Cagley Douglas M. Cavalier Nicole L. Chamberlain William P. Clark Beckv L. Clark John D. Cole Ramon Correa, Jr. **Richard A. Cotten** James F. Crawford

Bret T. Cutshall Todd M. Daman Oanh H. Dang Ashley L. Dardis Justin A. DeGeeter Todd C. Derenne Adriana M D'Onofrio Matthew T. Duff Joseph A. Edmondson Scott R. Elliott John W. Erickson Xavier Esneu Tom M. Faber Katie A. Falck Ahmad Z. Fedai Ericka T. Fernandez Robert A. Fleener Aaron A. Ford Paul A. Frese Dirk A. Fruhling Ryan D. Funke Jose D. Garcia John L. Garrels Ashley R. Goltz Karen M. Graber Michael D. Graves Brady W. Gries Lisa A. Hageman Julie E. Ham Dustin M. Hammersland James J. Hartwig Glynne J. Hawkes Daniel C. Hellerstedt Lesley M. Hellerstedt Benjamin M. Helppi Maria Guadalupe M. Hernandez Gary J. Hines Robert B. Howell Wendi L. Ideker Connie J. Ingraham Rikard Karras Nicholas J. Kertels Eric P. Kirkegaard Andrew P. Knopp Kevin M. Kolasinski Christopher A. Koppel Britta V. Krantz Laura A. Krumbholz David P. Lam Ashim Lamichhane Phu S. Lau Jason H. Lee Victor R. Letavf

Andrew D. Levisav Dustin K. Lincoln Jacob I. Maples Lucy Mares Jessica M. Marion Sarah E. Martin loshua C Matthews Christopher D. McCarley Matthew L. McCurdv Jason R. McMaster Jennifer R. McMillan Michael L. Milford Maria C. Millard Alex S. Moran Juan E. Moreno Sara A. Murphy Heather M. Nees Ernestine Nesby Van T. Nguyen Ryan L. Niehaus Madhu S. Niraula James R. O'Connor Oscar O. Padilla Troy M. Peckosh Erlinda G. Peters Jamie D. Pierson Nicolas Antonio Pineda Ramirez Ryan A. Pipkin Angelita M. Plata Kevin D. Powell Eugenia T. Pressley Heather E. Prichard Anthony L. Pruett Misbah Qidwai Marcia R. Rahe Joseph P. Rardin Mindy S. Rausch Todd H. Rippel Jay J. Robinson Randy M. Robinson Rickey L. Rommann Jennifer M. Roper Guadalupe Miguel R. Sanchez Jodee S. Sanny Keith A. Schmickley Susan T. Schnapp Jonathan R. Seddon Janice M. Sewell Kyle R. Shifflett Brandon W. Sigle Jay R. Simmons Amin Soleimani Sebastian Stanyak

Barbara J. Stone Stephen Van Dyke Jerry G. Varghese Todd A. Vermie Quoc K. Vu Carol A. Wagner Jennifer S. Wasmer Frederick P. Weaver, Jr.

CELEBRATING 35 YEARS

Adele Lerma

Start date: June 1976

Original position: Personnel Clerk at the Rockwell International B-1 Division Current position: Senior Benefits Analyst in Human Resources

John C. Bostwick

Robert N. Bright

Meredith J. Cain

Cardona

Casillas

Isaac Casillas

What do you enjoy about your position? Customer service -I very much enjoy helping employees through their journey of preparing for retirement and by continuing to assist them after they retire.

Philip Clark

Samuel J.

Dominguez

Kevin J. Elder

Ana Bertha R.

John P. Foley

Sylvia Garcia

Estrada

Matthew L. Weber Heather C. Weers Joshua P. Weisskopf Jamie P. White Katrina L. Wickman Pascal Wolfgang Jenney Y. Wong Timothy E. Wyatt Carleen G. Wynn De Yao Steven J. Young ILINE Gregory S. Allen Erika V. Alvarez Shane S. Anderson Irina A. Aristova Calvin Armour Joseph C. Asher Melody K. Barden Karl M. Becker Craig M. Bitler Cathleen L. Blackmon Sean S. Boddicker Marie Bogvist Mark R. Bordignon

Ashley E. Hamlett Brandon A. Calhoun Crystal L. Harms Rosa Maria M. Gregory W. Harvey Gus K. Hibner Randi S. Hicks Lorena R. Catano Jason A. Hochstedler Tracy D. Holman Jesse A. Holtan Nathan C. Homrighausen Jacob M. Hults Scott A. Jacobsen Abhinav Jain Nathaniel L. James Damien B. Jourdan Jean Yves W. Kabore Robert J. Kahng Stephanie A. Keese Sudhanwa J. Kholgade Mitchell D. Klein Brandy L. Knerr Todd M. Kobiela Wendy K. Krall Osman Kutlu Todd M. Lahev Bridget D. Lee Jerry L. Linderman Chad A. Lockwood Hyunsun Chung Alma Consuelo G. Lopez Joseph M. Clark Kimberly P. Love Douglas A. Clemen Mark R. Luebberke Charles E. Clonch Maynard G. Luth Robert C. Courtois David E. Lydon Kathleen J. Cross Shannon R. Lynch Amy J. Dolash Adam P. Martin Shawn M Mattingly Chenda Doung Ryan C. McKean Stephanie M. Duffy Richard J. Gary C. Eckley McTaggart Steven L. Mendoza Lance E. Ernsting Damon R. Meyer Stacey A. Esparza Paul R. Meyer Scott L. Mich Aaron D. Mitchell Leslie R. Fewell Martina R. Miteva Steven Fierstien Nathan A. Mohling Robert M. Moore Karen J. Fountain Sonya K. Moses Craig S. Fullerton Cristina Muro Daniel P. Orris Michael J. Goril Jasen J. Osterberger Tricia J. Grawe Lori L. Pearson Pamela J. Greenlev

Helen R. Perkins Richard W. Gronemeyer Alan E. Hagemeier

Dung A. Pham Vineeth V. Philip Dustin E. Poe William B. Popadych Kevin R. Priest Jared R. Prink Janelle A. Purdy Estelle Querquelin Chrisophe Ratti Eric T. Reich Eric D. Riederer Kyle M. Riley Rachel A. Rivera James R. Roberts Alex Safavi Malik M. Saleh Sandra G. Schweer Antony Sebastian Tarang N. Shah Janet Smith Shelley A. Smothers Dawn R. Strader Chia Wei Su John S. Swift Tara J. Taylor Jerry W. Tibbs James R. Townsend HongNhung T. Tran Laurie A. Valentine Hemanarasimha Kumar Veluguleti Ram Ashok Viswanath John M. Walker Duane J. Watson Randolph C. Weidler Steven R. Wilhelm Eric D. Williams William R Williams Tina M. Wolf Dustin G. Wunder Michael M. Yang Derek J. Zahari Nicholas A. Zakrasek Ximing T. Zhang Gregory T. Zugay Vedran Alagic Charlene L. Anstett Richard C. Atkins Aaron B. Austin Karmen C. Baker Sophie Beaujan Fawn L. Beckham Carol A. Beeh

Leticia Bello Valdivia Denise M. Billings Hocine Boumaza Sherin J. Brunker Scott D. Butler Stefanie A. Cannon Elizabeth M. Cazares Maggie I. Chen John H. Collins Andre Colmant Carmen M. Colon Clare E. Davis Catherine O. Demps Mollie S. Dunn Brent A. England Lu Z. Fields Roberto Filocamo John W. Finfrock Marcela V. Garcia Brent J. Gassman Peter K. Gitau David A. Goldberg Christian M. Griffith Inez L. Gronewold Simon A. Grosvenor Stephen F. Guillot Keith W. Hartnell Lee A. Hauser Yonah Her Aaron R. Holland Jodi M. Holtz Kaly Hong Michelle M. Howe Jason Y. Ishibashi Julie K. Issa Muhammad Fadli Bin Jaafar Kathryn A. Janda Bonnie J. Jessen Wade T. Johnson Christopher D. Johnson Elisha A. Jones Ronald G. Junge Christopher A. Kammar Tristan J. Kendall Faraz H. Khan Arnold F. Kinney Carl A. Kirkpatrick Robert J. Klaus James H. Knupp Olaf Koepke Allen J. Kopp Kim D. Laub Jill M. Lawniczak

Ya-Shan Lei April S. Little Hsien Chiang Lue Miguel A. Lugardo Melissa L. Lynas Silvia D. Maass Stephane Malepart Edna Aide Sacnite Marguez Ordan Christopher M. McGuan Jeremy S. Miller

Claudia M. Murillo Muhs

Miramontes Julia L. Mogle James H. Morash Matthew J. Mueller Anwer Muhammad Bernard D. Mungal Lourdes Yanett C. Raymond A. Narlock Vladimir O. Negron Bren M. O'Connor Jason C. Olmstead

Retirees

Columbus Junction.

Lake Oswego, Ore.

Margaret A. Bishop

Norman W. Blades

Louis Appel

Robins, lowa

Joan L. Arps

Ali D. Barkal

Phid Q. Barrera

Milpitas, Calif.

Anamosa, Iowa

Roger K. Bowers

Shirley K. Brooks

Goddard, Kan.

Melbourne, Fla.

Roberta K. Cady

Center Point, lowa

Wilmington, N.C.

Arnold G. Calhoun, Jr.

B. Brvan

San Jose, Calif.

Orange, Calif.

lowa

Rockwell Collins offers congratulations and best wishes to the following employees, who have recently announced their retirements.

William A. Collins Conroe, Texas)]
Bruce W. Dean Farmersville, Texas	J F
Marsha L. Delay Cedar Rapids, Iowa	۱ F
Sylvia Demorgandie Ontario, Calif.	F N
Colleen C. Dennis Campbell, Calif.	N (
Brian D. Draeger Marion, Iowa	S
Elvie G. Escalera San Jose, Calif.	N
Trudy T. Gambrel Leesburg, Va.	J T
Betty L. Garthwaite Marion, Iowa	J N
Jorge E. Gonzalez San Jose, Calif.	5
Sandra D. Groat San Jose, Calif.	E N

In memoriam

recently reported.

Ronald G. Achey* Marion, Iowa Feb 8, 2011	Reta C. Costa* El Paso, Texas April 26, 2011	
Margaret Babak* Springville, Iowa April 16, 2011	Theresa A. Fuller Cedar Rapids, Iowa April 9, 2011	
John L. Breyfogle Cedar Rapids, Iowa May 11, 2011	Patrick M. Gendro* Kent, Wash. Jan. 20, 2011	
Ronald L. Butler* Newark, Ohio March 29, 2011	Richard E. Gobrecht* Forest, Ohio Jan. 26, 2011	

Elizabeth A. Otting Anthony P. Overmann BichHa T. Phan Francois Pineda Willis D. Potter Kurt M. Pulczinski Carlos C. Ramos Richard A. Riness Angela R. Roberts Jose A. Rodriguez Aaron L. Runge Jeffrey D. Sadowitz

Kristine A. Sargent Charles S. Scarbrough David E. Schauer Joshua J. Schmitt Christopher M. Schubert Laura J. Seav Lokesh Shivanna Karun Siddana Dwayne M. Simpson Cristina Soriano

Sarah A. Tavlor-Falcioni Andre B. Theobalds John V. Thommana DeShaun A. Thompson Terry L. Thompson Kent R. Turpin John J. Uberbacher Adam Uribe Sandra Monica V. Valdez Nancy L. Vargason

Cecile Vinges Matthew J. Volk Kathleen F. Voss Lisa A. Webb Amanda J. Westhoff Aaron C. Williams Carrie A. Wilson Liza M. Wilson Edward T. Wood Shingo Yonezawa Lisa R. Young

ay G. Hall Cedar Rapids, Iowa

ohn W. Harris Palo, Iowa

Nilliam E. Hart Fullerton. Calif

Paul A. Ishman Melbourne, Fla

Mary L. Johnston Cedar Rapids, Iowa Sergio Kerbis

Marion, Iowa

Nancy L. Knight Duarte, Calif.

oseph F. Kowalewski Tustin, Calif.

erry E. Lambrecht Marion, Iowa

andra L. Langton Cedar Rapids, Iowa

Brian W. Little Marion, Iowa

Donna S. Long Lisbon, Iowa

Terry L. Markwitz Atkins, Iowa

Diane J. Maulding Plano, Texas

Dennis C. McCormick Sandy, Utah

Monica S. Meade Cedar Rapids, Iowa

Gregory K. Nelson Poway, Calif.

Nhut V. Nguyen San Jose, Calif.

Vuong T. Nguyen San Jose, Calif.

Phyllis S. Norby Márion, Iowa Thomas W. Olsson

Seattle, Wash

Louis S. Ortiz Garden Grove, Calif. Antoinette M. Perumean Tustin, Calif.

Steven E. Pfeifer Center Point Jowa

Katherine E. Plander Marion, Iowa

Marsha I. Robertson Columbus Junction, lowa

Dolores I. Roman Cedar Rapids, Iowa

Stephanie L. Ronald Cedar Rapids, Iowa

Gaudencio L. Sanchez Elk Grove, Calif.

Clarence J. Schaftlein, Jr. Amana, Iowa

Jeffrey L. Schmitz Hiawatha, Iowa

Clayton D. Schouten Shellsburg, Iowa

John L. Schulte Cedar Rapids, Iowa

Renna A. Scott Center Point, Iowa

Carl G. Shaffer. Jr. Plano, Texas

Kathleen A. Sharp Cedar Rapids, Iowa

Johnny Y. Sun Cupertino, Calif.

Harris W. Swan III McKinney, Texas

Girma Tegegne Tustin, Calif.

James D. Thomsen Fairfax, Iowa

James R. Wilson Cedar Rapids, Iowa

James J. Woodhouse III Rowlett, Texas

Daniel C. Zillman Marion, Iowa

Rockwell Collins offers condolences to the families and friends of the following employees and retirees, whose deaths were

Norbert J. Hanzelka* Salt Lake Cty, Utah Jan. 14, 2011

Wendell E. Holder* Allen, Texas Feb. 23, 2011

Franklin D. Jarvis* airfield. Iowa Feb. 22, 2011

Boris Kheyfets* Bronx, N.Y. Feb. 9, 2011

Ronald D. Madoerin Williamsburg, Iowa April 28, 2011

> Michael D. Morgan* Oshkosh, Wis April 22, 2011

George E. Morton, Jr.* Rancho Cucamonga, Calif Jan. 17, 2011

Thomas A. Nabuda* Costa Mesa, Calif. March 10, 2011

Bobby J. Pope* Hebron, Ohio March 27, 2011

Bernard J. Schmidt* Fullerton, Calif. April 10, 2011

Palmer L. Schroeder* Chino, Calif. March 16, 2011

Joe C. Stone* Nashport, Ohio Feb. 12, 2011

Annie Y. Suen* Palo Alto, Calif. March 30, 2011

Lynn L. Zebuhr* Manchester Iowa April 17, 2011

*retiree



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