February 2004

Leading Edge

Air Force Materiel Command

History's Window

Go Inside the U. S. Air Force Museum

F-117 Nighthawk display (AF photo)

http://www.afmc-pub.wpafb.af.mil/HQ-AFMC/PA/leading_edge/index.htm

February 2004

Volume 46 Number 2

LEADING EDGE

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This funded Air Force magazine is an authorized publication published monthly for the people of the Air Force Materiel Command. Contents of LEADING EDGE are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense or the Department of the Air Force. The editorial content is edited, prepared and provided by the Public Affairs Office of Headquarters Air Force Materiel Command, 4375 Chidlaw Rd., RM N152, Wright-Patterson AFB, Ohio 45433-5006. Photographs are official U.S. Air Force photos unless otherwise indicated. For submission and writers' guidelines, contact the editor at the above address or DSN 787-1203 or (937) 257-1203. Send email to:
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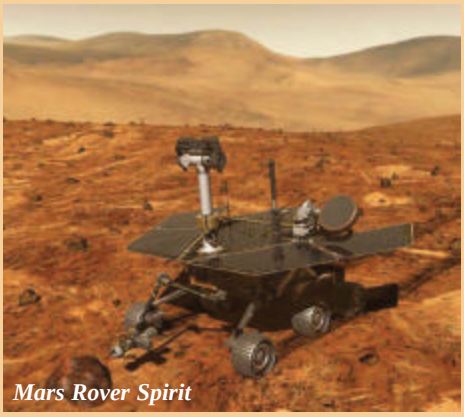
"USAFM Painting" Original Artwork by Staff Sgt. Casey Muntin 2003

Mission to Mars

KIRTLAND AIR FORCE BASE, N.M. — Radiation-resistant computers developed here by the Air Force Research Laboratory helped not only steer one of NASA's Mars Exploration Rovers to the red planet in January, they also guided it to a safe and spectacular landing on Mars' rocky surface.

AFRL's Rad6000 32-bit microprocessors, manufactured for the Air Force by BAE systems, controlled the spacecraft during its flight from Earth. The tiny microchips orchestrate the Rovers as they move about the planet searching for signs that water might once have existed on our neighboring planet.

"NASA chose AFRL microprocessors because they are proven reliable, rugged and fully compatible with their systems," said Creigh Gordon, an engineer assigned to AFRL Space Vehicles Directorate.



Mars Rover Spirit

These computers can withstand the harsh radiation environment of space and operate reliably over long-term missions. They control all data stream telemetry between the spacecraft and controllers on the ground, explained Mr. Gordon.

The Rad6000 was not only the world's first radiation-hardened 32-bit micro processor; it was also the most complex, containing more than one million transistors.

Before AFRL researchers stepped in a few years ago, the Department of Defense and NASA paid from $50 million to $100 million for each processor in development and manufacturing costs, explained Mr. Gordon.

Now, after AFRL involvement, the price of a typical processing module has dropped to between $500 thousand and $2 million and is available as off-the-shelf hardware.

More than 60 Air Force, DoD, NASA and commercial space systems are now using this technology, and better than 90 percent of satellites launched today rely on radiation-hardened processors developed by AFRL's Space Vehicles Directorate.

— AFRL Public Affairs

Pinpointing enemy shooters

ROME, N.Y. — Military people in hotspots around the world could soon tell, within a meter or so, exactly where people shooting at them are located thanks to technology the Department of Defense and Air Force researchers are developing.

Network Embedded Systems Technology uses a system of sensor nodes that can be scattered throughout a given area, checkpoint, building or vehicle convoy, according to Juan Carbonell, who helped develop NEST.

"These nodes track the shock wave the bullet creates as it moves through the air," said Mr. Carbonell. "They detect the time the acoustic shock and muzzle blast arrives when shots are fired within the range of the nodes to determine where the shot comes from."

According to Mr. Carbonell, NEST nodes will be small enough and rugged enough to be seeded in operational environments via aerial drops, robotic emplacement and manual distribution.

Officials from the Defense Advanced Research Projects Agency with support from Air Force Research Laboratory Information Directorate experts recently demonstrated NEST at the McKenna Military Operations in Urban Terrain site at Fort Benning, Ga.

A number of live fire and blank shots were taken from different areas within the McKenna facility and the system accurately located them all, Mr. Carbonell said. For the live-fire shots, the system also provided a visual vector in the direction of the bullet.

During the demonstration, the system was accurate to within one meter and took less than a half second to determine where the shooter was located. Mr. Carbonell said NEST was able to differentiate between a shot fired from a soldier kneeling on the ground versus standing up.

— AFRL Public Affairs

Motor test successful

ARNOLD AIR FORCE BASE, Tenn. — Testing of an upper stage Minuteman rocket motor at Arnold Engineering Development Center confirms build up of lead particles in the motor's propellant has no impact on the missile's performance.

The Minuteman Stage 2 and 3 motors, manufactured by Pratt & Whitney and Thiokol, are the second and third propulsion stages for the Minuteman ICBM — a silo-launched, strategic weapon system used to protect against attack.

During routine pre-test inspections at P&W, engineers discovered small pellet-sized lead particles in the solid propellant of both motors.

An Arnold AFB machinist prepares a Minuteman Stage III rocket motor for testing. (Photo by Gary Barton)

Prior to shipping to AEDC, P&W evaluated the contaminated stages to determine if the contaminants could potentially damage the motor's structure, change thermal and ballistic capacity or propellant chemical composition.

The purpose of the tests was to check the quality of the production lot as part of the Minuteman Propulsion Replacement Program.

The program's mission is to extend the Minuteman motor service life by re-manufacturing its three solid-rocket propulsion stages before age-out occurs and impacts force reliability.

— AEDC Public Affairs

Around the command

☆☆☆☆ Gen. Greg Martin

Reorganizing the headquarters

The men and women of the Air Force Materiel Command can be proud of their accomplishments. In the last dozen years, our Air Force has successfully conducted combat operations in Kuwait, Bosnia, Kosovo, Serbia, Afghanistan and Iraq. None of this would have been possible without the AFMC team. The Air Force Research Laboratory developed low observable technology, allowing stealth fighters to successfully penetrate enemy skies at night. System program offices developed the Predator, Global Hawk and J-STARS, providing commanders unprecedented real-time information. Depots supplied parts to remote bases to keep aircraft flying and continue to repair battle-damaged aircraft in Iraq. These are no small feats. However, we cannot rest upon our laurels. Times are changing and so must AFMC.

AFMC headquarters people have done a great job of standing up and modifying organizations to deal with specific problems. However, once the problem was fixed, the organization seldom returned to its optimal, objective structure. As a result, some overlaps and conflicts with the acquisitions structure developed in the headquarters. Additionally, the headquarters staff is doing some work that belongs to the field, while some work being done at subordinate units belongs to the headquarters. Finally, responsibility and accountability for some processes belong to multiple directorates instead of being focused on one directorate. We needed to address these internal and external conflicts.

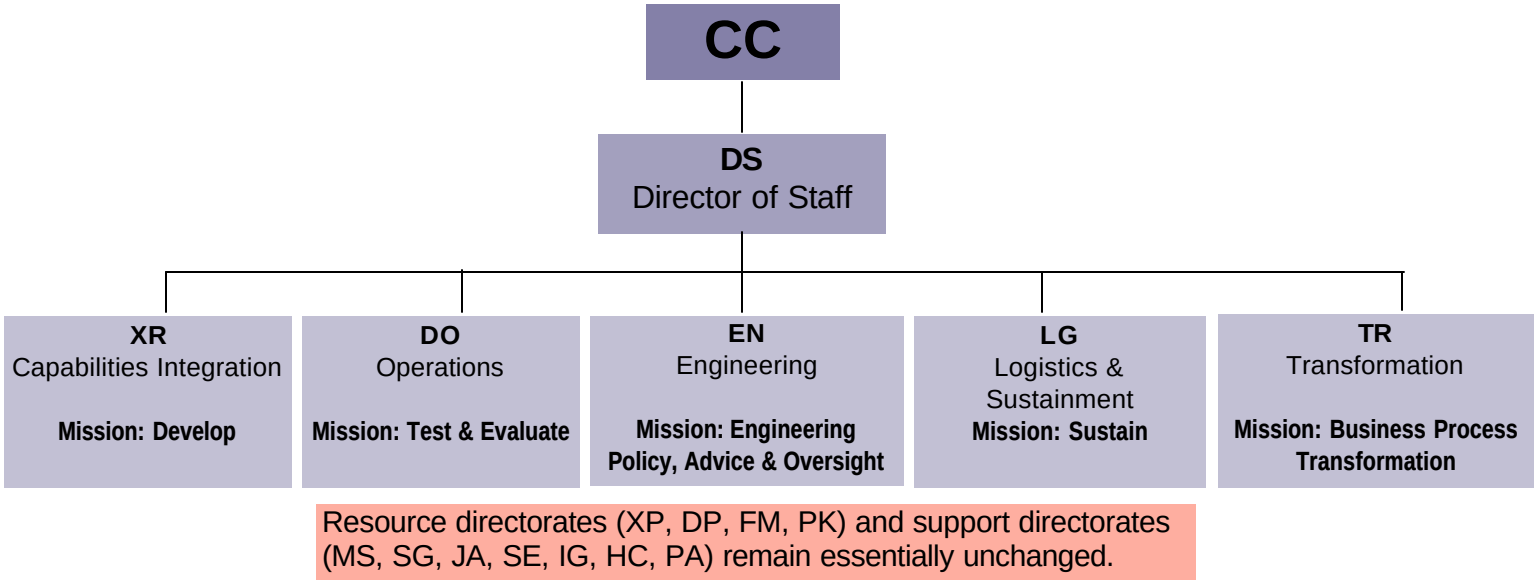
Let me again emphasize that the people of AFMC and this headquarters are still getting the mission accomplished with unprecedented success! I think we can reach even greater heights if the structure of the organization matches the way the work is being done. That's why I assigned a team to the task of taking a hard look at the headquarters, its missions and its structure. We now have a reorganization plan and are working to begin implementing it in May.

WHAT THE REORGANIZATION IS AND IS NOT

The foundation for this restructure is in the fundamental missions of both the command as a whole and the headquarters itself. These two mission statements evolved to a point where they no longer were distinct. The field executes the mission, delivering products and services to the customer. The headquarters supports the field through planning, resource and workforce management, policy and guidance. The headquarters should enable the field.

First and foremost, this restructure is not a radical reorganization, *nor* is it a manpower drill. While we estimate that about 300 headquarters positions will be changed or moved, there won't be any net gain or loss in authorizations for the headquarters. The majority of the directorates will not be changed. The changes will occur in the five directorates illustrated in the graphic below with some minor changes to Mission Support.

This restructure is meant to align the headquarters to shape this command's workforce and infrastructure to develop, field and sustain the U.S. Air Force's warwinning expeditionary capabilities. In addition, the headquarters picks up a new responsibility: business process transformation for the entire Air Force.



A KC-10 Extender from Travis Air Force Base, Calif., refuels an F/A-22 Raptor. Experts in AFMC have overseen the Raptor's development, from ground up, to this point. Under the new headquarters reorganization, the Operations Directorate will support developmental test and evaluation and all aspects of fielding, bringing a capability to full operational readiness. (AF photo by Judson Brohmer)

MISSIONS AND DIRECTORATES

AFMC's development mission now belongs to the new Capabilities Integration Directorate, or XR. XR consolidates the existing Requirements, Acquisition Excellence and Intelligence directorates, picks up the modeling and simulation support mission from the Engineering Directorate, and becomes the focal point for Science and Technology. Further, XR will coordinate AFMC and Air Force Space Command capabilities planning and assessments, and be the AFMC lead to the Air Force capability review and risk assessment processes. By standing up XR, AFMC will have a single office responsible for integrating S&T, intelligence, and M&S, and injecting them into the capabilities produced by our AFMC acquisition process.

Fielding will be a new mission for the Operations Directorate, or DO, and links developing new capabilities with the operational Air Force. The directorate will support developmental test and evaluation and all aspects of bringing a capability to full operational readiness. DO will continue to govern flight operations for the command and gains oversight of the command's Command Center and Battle Staff from the Plans and Programs Directorate.

The Engineering Directorate, or EN, is strategically placed in the middle of the other mission units in the organizational chart. The position is symbolic of its broad mission to provide systems engineering policy, advice and oversight across the command. EN is an independent engineering advisor that serves as the watchdog to ensure the four other mission directorates observe sound engineering practices.

Sustaining current systems is the responsibility of the Logistics and Sustainment Directorate, or LG. The LG mission of managing all AFMC logistics and sustainment activities, including depot operations, purchasing and supply chain management, continues. In addition, the directorate picks up three new tasks: managing sustainment engineering programs, the Air Force Technical Order process and acquisition logistics.

The last mission organization is the Transformation Directorate, or TR. It is a combination of the existing Transformation and Information Technology directorates. The new directorate retains most of the existing missions, such as being the command's focal point for transformation initiatives, IT policy and e-business opportunities, while transferring responsibility for day-to-day management of networks to the Mission Support Directorate. A new mission for the combined TR team will be serving as the executive agent for transforming the business processes for the entire Air Force.

WHAT IT ALL MEANS

What does all this really mean to people in the field and those in the headquarters not directly affected by the changes? In many ways, unless you're in one of the directorates being changed, this reorganization will be transparent. There is no major change to the fundamental AFMC or headquarters mission. What has changed is the focus and structure to remove internal and external gaps and overlaps. Ultimately, this will position our people to perform their jobs more efficiently and enable AFMC to better support the Air Force.

During February and March, the Air Staff will review and approve our Organizational Change Request. During this time the headquarters staff will focus on manpower, position descriptions and office locations. Once we receive the Air Staff's approval, we begin bargaining with the union, which typically takes four to six weeks. Upon completion of the bargaining, we'll implement the changes beginning in May. At the 6, 12- and 18-month points we'll assess whether or not additional gaps and overlaps exist, and determine how to resolve them.

Our journey has begun. I appreciate your support and will keep you informed on our progress.

Please visit https://www.afmc-mil.wpafb.af.mil/reorg, the headquarters reorganization Web site, for the most up-to-date information.

Four men and a B-2

Chris McGee
U.S. Air Force Museum Public Affairs

From left, Don Scott, Dick Daugherty, Ted Beegle and Ron Ruley — the four-man restoration team that reassembled the B-2 Spirit now on display at the U.S. Air Force Museum, Wright-Patterson AFB, Ohio. The B-2 arrived at the museum in pieces in early 2001. It took the restoration team more than two years and hundreds of hours of work to put the B-2 back together. (AF photo by Dave Levingston)

To the untrained eye, the B-2 "Spirit of Freedom" stealth bomber just inducted into the U.S. Air Force Museum's growing collection of aerospace vehicles might look like an active aircraft poised to launch an operational mission.

The grace and elegance of the bomber's airframe conceal the reality of the massive restoration challenge the aircraft posed before finding its permanent home on public display.

Officially dedicated in a December ceremony, the museum's B-2 was never built to fly. Rather, it served originally as a ground-based test article to measure the airframe's integrity in varying degrees of stress. Officials never outfitted the bomber with the complement of avionics that operational B-2 aircraft possess.

Since the aircraft could not fly, it had to be disassembled and component parts flown in seven shipments aboard a C-5 Galaxy to Wright-Patterson Air Force Base, Ohio, in early 2001. The museum's restoration division received the parts and prepared to tackle what seemed to them as mission impossible.

"The first time we went out to Palmdale, California, and saw that aircraft disassembled, my first reaction was 'there's no way we can do this,'" said Mr. Myrl Morris, chief of restoration for the museum. "This was unlike anything we've attempted before."

Considering that the B-2 is a fairly recent addition to the Air Force's operational combat aircraft fleet, re-assembling and restoring a stealth bomber was unprecedented. With no prior experience and no tools specially designed for such a massive project, a four-member crew of museum restoration veterans consisting of Don Scott, Dick Daugherty, Ted Beegle and Ron Ruley set off on what would become the biggest task — and accomplishment — of their careers.

The center section of the B-2 Spirit, prior to restoration, is loaded onto a C-5 Galaxy for transport to the U.S. Air Force Museum at Wright-Patterson AFB, Ohio. (AF photo by Jeff Fisher)

"The aircraft construction isn't like most airplanes, so we didn't have as much working knowledge," said Mr. Beegle. "When I first saw the aircraft, I knew we were going to have to plan each phase before starting it."

Perhaps the biggest challenge the crew faced was reconnecting the aircraft's major sections. Developing work-around solutions is part of the aircraft restoration business, but the crew had never needed to use as much ingenuity as they would on preparing the B-2 for public exhibit.

"There were no defined ways for assembling this aircraft," Mr. Ruley said. "No how-to guidelines, no instruction manuals. I've never worked on anything this large, especially with the height of the fixtures and weight of the sections."

It didn't take long for the crew to discover the need to be resourceful and creative. From off-loading the sections from the C-5 for transport to getting the sections positioned for reassembly, the process was fraught with challenges.

Before reassembly could start, the crew had to clear a unique hurdle.

"One of the biggest achievements for us was removing the structure that held the B-2 center section," said Mr. Daugherty. With that task cleared and other preparatory work addressed, the crewmembers turned their attention to the imposing task of reassembly.

"Connecting the sections was especially hard because of their size and weight," said Mr. Ruley. "We didn't have overhead cranes, so we had to use forklifts, air floats and our knowledge of mechanics."

Don Scott and Ted Beegle from the U. S. Air Force Museum's restoration division take their first look at pieces of the B-2 Spirit's wings. (AF photo by Jeff Fisher)

Maneuvering and positioning the wing sections to attach to the main center section required considerable precision and care. Connecting the major parts proved tedious and exhausting; staff had to crawl through and work in ducts throughout the frame's interior to install thousands of fasteners, working in confined spaces for six to seven hours at a time.

"You couldn't turn around or even stretch your arms or legs," said Mr. Ruley. "You crawled in and had to back out, pulling with you your tools, air hose and electrical cord. It was hot and very dark, so we used neon lights to prevent generating heat from bulbs and had small six-inch electrical fans to keep air flowing."

Besides using air hoses to ventilate the narrow ducts, staff not working inside the confined areas served as spotters as an additional safety precaution.

The crew had to contend with removing thousands of stress plates from the airframe's surface, features confirming its original status as a stress test vehicle. The aircraft's surface materials presented a new twist as well.

"The composite material and alloys were new to us," Mr. Scott said. "Various components involved and the control surface were factors we haven't dealt with before."

Eventually, Mr. Morris added four more of his staff to the project before assigning his entire staff and cadre of restoration volunteers to the effort. Doing so helped ensure the B-2's completion in time for the anticipated official rollout in December, on the eve of the 100th

anniversary of the Wright brothers' first manned, powered flight.

Due to security sensitivities associated with certain airframe parts, the crew had to fabricate various components for installation onto the bomber. After patching up a crack that formed under the vehicle during extreme testing, and applying the fixtures, paint job and markings, the staff brought the B-2 to a phase that few who saw the original arrival of the major sections could conceive — an aircraft authentic in appearance and seemingly ready for a mission.

Christened "The Spirit of Freedom" during its induction ceremony, the B-2 bears a show-room splendor, a testament not only to its identity as a major element in the U.S. military's long-range strike capability, but also to its status as perhaps the museum's most grueling and yet finest aircraft restoration achievement.

Having conquered the unconquerable, the museum's restoration staff has further elevated its identity as the "MacGyvers" of museum aircraft restoration, using their wits, available tools and a little elbow grease to surmount obstacles and to accomplish the impossible. During the B-2's dedication ceremony, Museum Director Maj. Gen. (Ret) Charles Metcalf acknowledged their mastery.

"This group did what very few thought could be done; they took a test article aircraft that had come to them in pieces and put together one of the world's largest jigsaw puzzles," said General Metcalf. "They did it without the normal equipment, overcoming monumental obstacles along the way. They are often referred to as the miracle workers among the museum staff, and that's just what they are."

Although the B-2 might be its greatest work yet, producing miracles is everyday business for the museum's restoration staff. From infusing badly corroded aircraft with their former glory and fabricating wings to maintaining and repositioning display aircraft, the restoration division ensures that the museum's vaunted collection of historic aircraft reflects the majesty of the Air Force and military aviation story.

Now that the B-2 is complete, the restoration staff is breathing more easily. Despite the enormity of the project, their enthusiasm and sense of challenge remains undiminished.

"I was both excited and apprehensive about the opportunity and challenge of the project," said Mr. Scott. "The confidence that General Metcalf showed in us to accomplish this task was overwhelming." ❐

The B-2 Spirit stands covered in a restoration hangar at Wright-Patterson AFB, Ohio, awaiting its magical transformation. (AF photo by Jeff Fisher)

The restored B-2 Spirit is unveiled during a recent ceremony at the U.S. Air Force Museum. (AF photo by Jeff Fisher)

Top: Children construct flying objects through hands-on learning at an outdoor workshop with the aid of museum staff and volunteers. Bottom: Children work together to make flying objects at an indoor workshop. Both workshops are part of education programs administered by the U.S. Air Force Museum's education division at Wright-Patterson AFB, Ohio. These educational programs were developed to encourage childrens' interest in aerospace history, science and literature. (AF photos by Jeff Fisher)

U.S. Air Force Museum:

Education in action

Chris McGee
U.S. Air Force Museum Public Affairs

The themes that animate the Air Force story are intertwined with those of U.S. history. Concepts such as honor, duty, sacrifice, vision, innovation and persistence define the traditions of both the service and the nation.

Preserving those ideals and passing them on to today's children — tomorrow's leaders — is a catalyzing purpose of the U.S. Air Force Museum at Wright-Patterson Air Force Base, Ohio.

"The primary reason we try to reach out to students with aerospace history, science and literature is to get them excited about and interested in aviation and all of the surrounding subject matter," said Howard Walker, museum aerospace educator. "It's

our mission and duty to pass on this knowledge in a way that will hopefully stick with a lot of kids and heighten their interest in the Air Force."

A key component of that effort is the museum's educational program, administered by the institution's education division.

Featuring an array of on-site and traveling programs, as well as workshops, hands-on activities, tours and an audiovisual loan program, the reach of the museum's education program is continuing a pattern of dramatic growth. By the end of 2003, the museum had reached nearly 90,000 students, teachers and adults compared to 2002's 82,000 and 2001's nearly 70,000.

Children listen to the reading of a Dr. Seuss book during Read Across America Day at the U.S. Air Force Museum. (AF photo by Jeff Fisher)

According to Judith Wehn, chief of the museum's education division, aerospace education affords a way to study science, mathematics and history and encourages the interests of young people in scientific and mathematical areas essential for life in a democratic system in the 21st century.

The division manages more than 1,300 programs, including Family Day, held the third Saturday of each month. Designed for children 3-13 years old and their families, the program includes a family oriented museum tour, story time for preschoolers, workshops for older children and hands-on demonstration stations throughout the museum.

Self-guided scavenger hunts are available for organized school and youth groups. Participants can tour the museum as they search throughout the museum's various galleries for answers to aviation-related questions.

Special programs include Behind-the-Scenes tours, granting visitors access to the museum's aircraft restoration facilities. Other projects are Read Across America Day in February, featuring active-duty and civilian volunteers from Wright-Patterson AFB reading to elementary-grade children at various stations under aircraft wings throughout the museum; and homeschool days.

"The kids like the hands-on activities and anything we do with action in it during the direct instructional phases," said Mr. Walker. "We're also mindful of the various learning styles and intelligences that kids possess today, so we try to tap into various teaching methods whenever we can."

Hands-on activities include building paper rockets, constructing model hot air balloons, constructing kites and creating airplanes. Such activities engage the imagination of their young participants and reinforce the scientific and mathematical concepts being taught, offering a true "hands-on, minds-on approach" that education staff emphasize.

For museum aerospace educator Erin Craig, there's an additional value to the education outreach — preserving the story itself.

"The greatest value I find in what we do is relating stories of the people and events in Air Force history to younger generations," said Ms. Craig. "We are currently losing World War II veterans and other people who lived the experiences of those times. By relating history to young students now, it's possible for these students to preserve those stories and share them with future generations

Children listen during story time at an activity sponsored by the museum's education division. (AF photo by Jeff Fisher)

themselves."

The museum's education division also offers resources to help educators with instructional ideas. More than 350 teachers have participated in Project SOAR (Science in Ohio through Aerospace Resources), a joint program between the museum and the Dwight D. Eisenhower Professional Development Program of the Ohio Board of Regents.

Through Project SOAR, the museum offers a weeklong in-service training to selected teachers on aerospace topics and concepts. Teachers also can visit the museum's Web site to access a K-8 curriculum guide that features lessons on the principles of flight, balloons and kites, helping support state and national education standards.

"By motivating and inspiring these young people now," said Ms. Wehn, "we are doing our part to develop the next generation of Air Force leaders and to ensure that the service's mission continues successfully." ❐

Cindy Henry of the U.S. Air Force Museum's education division gives a briefing to a homeschool group during a homeschool day. (AF photo by Jeff Fisher)

Exhibiting Aviation History

Rob Bardua
U.S. Air Force Museum
Public Affairs

Most people who visit the U.S. Air Force Museum probably know something about at least one of the more than 300 world-class aircraft, but many are pleasantly surprised when they see the thousands of one-of-a-kind exhibits on display.

Together with the aircraft, the exhibits help the museum to put a face on the Air Force story, said Maj. Gen. (Ret.) Charles Metcalf, museum director.

Items on display include military uniforms dating back to 1916 and personal mementos, such as diaries, medals and photographs.

"We try to bring out the human dimension of the Air Force story by illustrating the honor, courage and sacrifice of Air Force men and women, officer, enlisted and civilian, both past and present," General Metcalf said.

According to Doug Campbell, chief of the exhibits division, the detail that goes into each exhibit is substantial and begins with research.

"Research is the first and most critical stage," Mr. Campbell said.

Without researching the geography of where the event took place, the type of clothing they wore, the sounds that you would have heard and exactly what happened, the exhibit can't be built correctly, he said.

A good composite of the people at the scene is often hard to obtain, so exhibit designers combine two different, but related scenes, Mr. Campbell said. An example of this technique is displayed in the A-20 Havoc exhibit, which represents the men of the 312th Bombardment Group who fought their way across the Southwest Pacific from New Guinea to the Philippines during WWII.

"With the A-20 exhibit, they might or might not have cleaned the plane's guns while they were working on the engines, but we combined those scenes and found pictures of what they looked like, along with the type of sand and vegetation in the area, Mr. Campbell said. The designers also added details like the sounds of an approaching thunderstorm to give the exhibit the right feel, he said.

A-20 Havoc exhibit at the U.S. Air Force Museum, Wright-Patterson AFB, Ohio. This exhibit shows the men of the 312th Bombardment Group who fought their way across the Southwest Pacific during WWII. (AF photo by Jeff Fisher)

After research, exhibit designers create a computer simulation. The exhibits are then built in the exhibit shop. Since they must be moved on trailers over to the museum, the exhibits are built efficiently and with multiple parts that can be assembled at the museum.

The use of mannequins is another important element displayed throughout many exhibits and recently the exhibits division began using more life-like latex mannequins.

Posing the mannequins is critical and unlike store mannequins, the ones used in the museum are often required to hold an additional 50-60 pounds. "It isn't always easy to make a rubber form that can hold a backpack, rifle and helmet in the position that you want it to hold it," Mr. Campbell said.

Other items and materials used in exhibits sometimes come from all around the world such as the French railroad car used in the Railroad to the Reich exhibit or the sand used in the Bell P-39 exhibit.

The P-39 exhibit depicts a man standing in front of the aircraft on a snow-covered track with a utility heater. The pierced steel planking is covered with snow, but the black sand below the track is actually from Alaska's Aleutian Islands, Mr. Campbell said.

The exhibit staff, which includes an array of exhibit, lighting and audiovisual technicians and designers, is often given a short suspense for completing a job, but they always find a way to get the job done well and on time.

"The exhibit that I am the most proud of is the Holocaust exhibit because that took us about 18 working days to finish, from design to completion," said Mr. Campbell. "The Berlin Airlift exhibit was one of the longest and took about 5 months to build."

Mr. Campbell said he enjoys designing new exhibits, but it is the visitors who inspire him. "If you're walking around here and someone is seeing the exhibits for the first time, it's great when they come up to you and say, 'you guys do a wonderful job.'"

Aerial view of the U.S. Air Force Museum's newest addition, the Eugene W. Kettering Building, which houses aircraft from the Cold War to the present (AF photo by Jeff Fisher)

Change is in the Air

2nd Lt. Christy Stravolo
AFMC Public Affairs

Preparing to accommodate future generations of aviation enthusiasts, the U.S. Air Force Museum in Dayton, Ohio, — one of the world's largest and oldest military aviation museums — is in the midst of change.

In September, Secretary of the Air Force Dr. James Roche chartered an independent working group to review current museum practices, clarify collection procedures and make informed recommendations.

"From the moment we stepped foot in the museum, we were struck by the size and scope of it," said Lt. Gen. (Ret.) Charles Cunningham, chairman of the working group.

According to the working group report released in November, the panel was also impressed by the progress made during the tenure of the current director, Maj. Gen. (Ret.) Charles Metcalf.

To assist in the Air Force's ongoing efforts to improve the world-class museum, the working group suggested changes including increasing manpower citing a "serious shortage of paid personnel."

Currently there are 96 employees on the museum's payroll with one curator, one conservator, eight full-timers and three part-timers managing the collection of more than 57,000 items. With such a large collection and more than 1.3 million annual visitors, the museum relies heavily on its 400-member volunteer corps.

"Without our volunteers, we couldn't open our doors," said General Metcalf.

"They serve across most every functional area here, working information desks, tours and gallery patrol as well as restoration and other behind the scenes areas. They are absolutely instrumental in our ability to perform our mission."

In addition to manpower, the working group recommended the museum modernize its security. According to Dan Dobbyn, chief of museum operations, the museum upgraded its security system to protect not only access to the buildings, but the collections themselves. The additional security measures involve installing several sensors and alarm devices throughout the galleries and work areas.

Working group members said managing such a large collection is no small task, which is why they also recommended the museum leverage information technology for inventory control.

"We already have new and better computer systems for tracking the inventory," explained General Metcalf, "and we're working to ensure all members of the staff have the professional training it takes to oversee such a vast and valuable collection."

During the past two years, the museum has adopted barcode technology to enhance its cataloging and tracking software, according to Krista Strider, chief of museum collections.

"This added technology has enabled the collections division to maintain an electronic tracking system as well as improve inventory capabilities," Ms. Strider said.

Additional recommendations from the working group include a Board of Directors to evolve from the current Board of Advisors; clarifying the museum's "chain of command;" and formally changing the name of the institution to the National Museum of the Air Force to reinforce the importance of the mission of the museum.

"If approved, the new name would reflect the national responsibility the museum has to preserve Air Force history and continue its storytelling future," said General Metcalf.

"The preservation of our nation's Air Force heritage continues to remain the top priority of the United States Air Force Museum," said General Metcalf.

"With the expansion of the facilities along with improved procedures and safeguards, the museum will be able to protect that heritage and continue to share the Air Force story for years to come."

Naked Planes:

Crews muscle airframes down to the bare metal

Jeanne Grimes
OC-ALC Public Affairs

In a very large hangar at Tinker Air Force Base, Okla., a crew prepares itself for one of the toughest jobs at the base — the chemical stripping of an aircraft.

Nearby stands a B-52 Stratofortress, its coat of military gray hidden beneath a slathering of "Plane Naked" paint release agent and Eldorado One-part — a bright mixture of Pepto-Bismol® pink and sunshine yellow that cooks the aircraft's paint job and coaxes it to turn loose of the metal beneath.

The chemical application just ended, the job of depainting this bomber has entered into the time Billy Walker, work leader, calls "letting the chemicals earn their wages."

Patricia Garcia, the crew's rookie who has just been on the job since August, studies the bubbled patches on the plane's skin and gauges the progress before her eyes. Even after three applications of paint-stripping chemicals, the task of taking this bomber to bare metal is far from over.

"This one is stubborn," she said.

"Sometimes we get an aircraft, we shoot it with stripper and the paint falls right off," Tom Guardiola said. The transplant from Hill AFB, Utah, pauses as he considers the difficulty of depainting airplanes.

"The hardest times for the crew aren't shooting the chemicals

Grover Phillips, a depainter at Tinker AFB, Okla., shoots more depainting chemicals on stubborn areas under the wing of a B-52 Stratofortress. Chemicals sprayed earlier ooze down the shiny masked areas. (AF photo by Margo Wright)

or the constant cleanup," he said, "but occur when the clinging chemicals start to react with the paint. And we have to come with our water hoses and try to get as much of that loose paint off as we can," he continued.

Dusty Shafer has worked the wash rack for 15 months. He no longer notices the challenging working conditions. The temperature in the hangar never falls much below the mid-80s — a result of the heat generated from the chemicals reacting to the paint. The humidity soars as thousands of gallons of water are used to coax the paint away — not the most ideal conditions for a job so physical. Adding to the discomfort is the protective gear, which covers workers from head to toe.

"When I came here, I weighed 175," Mr. Shafer said. "Now I'm down to 150."

Mr. Walker said the wash rack is equipped to depaint three aircraft at a time, or roughly 35 per year. By 2005, he hopes to be doing 60 per year, he said.

Workers are on the clock for "straight 8s," twenty-four hours a day, 52 weeks a year. The work never stops.

Jan Harden joined the crew in January.

"I'm real proud of what the Air Force and military do," she said. "Maybe it's not the most important thing, but I'm doing my part. That makes me proud."

Still, there's no getting used to the work — and the special challenges it entails.

"You just jump in and do it," she said. "Other than the smell, it's a great job."

"I don't think any of us realized how hard it was until we got here," said Tammie Pierson, a blaster in the depaint facility.

There are numerous applications that can remove paint from an aircraft. The one most universally disliked by the people who use it is phenol, a nasty chemical capable of burning skin as easily as paint.

"It burns," Ms. Pierson said, "and it keeps burning until you get water on it."

There are, however, more ways than chemical to remove paint from an aircraft.

"We can media blast an entire airplane," Ms. Pierson said.

The media is a blend of plastics of differing densities and cutting qualities. It feels like sand — gritty, coarse, abrasive — and when they use it, workers must take extra care with protective clothing.

The media is dispersed through hoses by blasts of high-pressure air. Handling the hoses hours on end grates away at the strength of workers just as easily as it abrades the painted surfaces it strikes.

Spent media and flakes of paint become dunes and valleys on the concrete floor. The media is reusable, but it takes brawn, brooms and scoop shovels to move it from where it falls to the collection bins.

The output from the hoses is so intense, Shellie Wiegert said, there's no way for workers to keep up with the cleaning if every hose is in use.

Of the aircraft which undergo programmed depot maintenance, the KC-135 Stratotankers have the reputations as the easiest planes to depaint.

"There's not a lot of paint on them," Ms. Pierson said, comparing the ease of stripping a tanker to the difficulty of the B-52, arguably the worst of the lot. "You have to scrub a ton" on the B-52, she continued.

Aging bombers are weighted down by more paint than other aircraft in the Air Force's arsenal, Jeff Cowley said.

"I think every job contributes to getting the Air Force and our fighters going," Ms. Garcia said. "We strip off paint. The less paint, the more fuel they can have."

Some B-52s arrive carrying six coats of paint, Mr. Shafer said.

Getting an aircraft depainted and out the door demands hard labor, and Mr. Walker thinks his crew does it well.

"We do more aircraft and do it faster than our competition. We set the pace for the rest of the [PDM] line." ❐

“Canned bird” takes flight

Tech. Sgt. Carl Norman
AFMC Public Affairs

For the past 30 years, C-5 Galaxy maintainers at Travis Air Force Base, Calif., have borrowed parts from what they called a “canned bird” while ones they've ordered made their way through the Air Force supply system.

That practice, known as cannibalization, is now a thing of the past at Travis AFB thanks to Air Force Materiel Command experts improving the supply chain and making C-5 parts more readily available. In fact, Al Fatkin, Warner Robins Air Logistics Center strategic airlift directorate deputy director, said many parts that used to take weeks to get are either on the shelf or arrive in a matter of days, making C-5 reliability rates higher than ever before. The Georgia-based ALC is home to all C-5 programmed depot maintenance

Due to AFMC's efforts, operations officials at Travis AFB, Calif., launched their cannibalized jet into operational status more than nine months ago, a first since the aircraft's initial bed down in 1969.

In addition to the Travis AFB success, fleet-wide C-5 fleet Mission Impaired Capability Awaiting Parts, or MICAP, hours — the total time aircraft couldn't fly due to parts or maintenance issues — have declined from 1.8 million in January 2001 to 300,000 as of November 2003, he said.

Additionally, the fleet cannibalization rate, measured by the number of cannibalized items per 100 sorties across the Air Force, has reduced from 55 in fiscal 1998 to 22 in fiscal 2003, he said.

The history of “canned birds”

“For more than 30 years, a dedicated C-5 cannibalization jet was universally accepted as a necessary evil,” said Lt. Col. Dennis Daley, 60th Maintenance Group deputy commander at Travis AFB. “Most people would agree that during the 1990s when spares availability reached some of its lowest points, the possibility of operating a C-5 base without a cannibalization jet was impossible.”

A cannibalized jet is a dedicated aircraft available so maintainers can pull parts to get operational aircraft airborne while they're waiting on ordered parts to arrive.

Colonel Daley said that in 1999, Travis AFB’s annual C-5 fleet cannibalization rate was 59.7 canns per 100 sorties, compared to today's 3.8. The achievement represents a major accomplishment not only for Travis AFB, but for dedicated Air Force logisticians stretching from Corridor Two in the Pentagon to repair benches at Warner Robins Air Logistics Center, Robins Air Force Base, Ga., to the maintainers on the flightline.

AFMC helps solve the unsolvable

Maintainers and their logistic readiness squadron counterparts, adopted an attitude change that fostered innovation and a desire to help themselves instead of just relying on the system to provide parts, Colonel Daley said.

Further, a series of funding, policy and programming initiatives at Air Force headquarters, AFMC and the Defense Logistics Agency provided the foundation for improved spares readiness.

In AFMC's role, Mr. Fatkin said command experts' better understanding of the supply chain for the C-5's 74,000 stocklisted components led to reduced backorders and MICAP targets. For the 2,500 parts C-5 System Program Office experts manage, they've arranged long-term repair and buy contracts for major components.

“We also developed overhaul kits to replace worn components vice repair on demand for 27 flight control components,” Mr. Fatkin said. “And we've initiated an intense effort to increase contractual coverage and supportablility of low-demand items.”

“A lot of people thought this problem was unsolvable,” said Lt. Gen. Richard Reynolds, AFMC vice commander. “That in itself, I think, is a potential outcome of what I call enterprise thinking — that being the unsolvable may be solvable when we get out of our stovepipes. This is a perfect example of people with a common goal going across organizational boundaries, which sometimes means across stovepipe boundaries, to get something done.”

Colonel Daley said officials at Air Force headquarters, DLA and AFMC developed a coordinated strategy to arrest the readiness decline of the 1990s. Air Force officials successfully developed one-time supplemental funding totaling $904 million in spares in fiscal year 1999.

Mission accomplished

With funding and policy changes, spares availability increased, he said. The C-5 fleetwide Total Not Mission Capable for Supply rates improved 34 percent between 1996 and 2003.

With the improved spares posture, the stage was set for a Travis AFB attempt at eliminating their cannibalization jet. While the higher headquarters initiatives got Travis AFB to “third base,” their teamwork and an innovative attitude brought them “across home plate.”

“A close working relationship with Warner Robins ALC further improved the response to potential show-stopper MICAP conditions. And the excellent relationship between the active duty Travis AFB maintenance team and its reserve associate wing greatly improved local repair capabilities,” Colonel Daley said.

“There are probably other problems out there that we can take an example from in how we approach this,” General Reynolds said. “This kind of innovation, this kind of application of enterprise thinking is probably going to be more appropriate as our fleets continue to age, as we find other systems, other MDS and other capabilities that are challenged by aging. Let's take advantage of this and capture the lessons learned and go ahead and apply them.”

Lt. Col. Daley said the cannibalization jet at Dover Air Force Base, Del., is next in the elimination crosshairs.

C-5 Galaxy (AF photo)

The first methane power plant built on an Air Force installation got an official start in November when Air Force, state and federal leaders marked the groundbreaking of the project at Hill AFB, Utah. (AF photo by Todd Cromar)

Hill gets first methane power plant

Airman 1st Class Micah Garbarino
OO-ALC Public Affairs

The first methane power plant to be built on an Air Force installation is slated for construction at Hill Air Force Base, Utah, in March.

The plant will save the base $600,000 a year in energy costs, and the energy produced by the plant will eliminate the burning of 75,000 tons of coal annually.

Funded by the private sector, the plant will use methane gas from the nearby Davis County Landfill marking the first time a landfill will be used for an energy project in Utah.

Davis County, through a grant from the state's Department of Natural Resources, will pipe the garbage-generated methane nearly a mile to the eastern edge of the base using compressors.

The plant contractor, Exelon Services Federal Group of Knoxville, Tenn., will then pipe the gas to the plant, according to Kent Nomura from the base energy management office who helped spearhead the project.

Once inside the plant, the gas will power two 600-kilowatt generators.

"The generated electrons will never leave the base, but in theory we will be selling the electricity to Utah Power for 5 cents a kilowatt, and then buying it back for 2 cents a kilowatt. That is where the money comes from. ... This is how the contractor gets a return on their investment, and why it doesn't cost the government a thing," Mr. Nomura said.

Under the 20-year contract, Exelon will supply the start-up money for the plant and run it for the life of the contract, Mr. Nomura said.

The project is part of the Department of Energy's Super Energy Savings Performance Contract program. The program was put in place to encourage federal agencies to make use of private sector financing for energy improvements at federal facilities, Mr. Nomura said.

"The base is under executive order to reduce our dependence on non-renewable energy sources by 20 percent by 2005. It's a tough challenge, but it is innovative projects like these that will help us get there," said Brig. Gen. Denny Eakle, Ogden Air Logistics Center vice commander.

Plant construction should be completed by August.

Unique Med Training

2nd Lt. Daniel Goldberg
Brooks City-Base Public Affairs

The 311th Human Systems Wing, Brooks City-Base, Texas, recently completed its first field Medical Unit Readiness Training in conjunction with an Ability To Survive and Operate evaluation. The MURT training differed from the usual two-day course medics have to attend, because it allowed students to practice their wartime mission in an ATSO environment. MURT is what medical units go through to practice their wartime missions in a simulated deployed location.

The exercise served a two-fold purpose between base readiness and the 311th Medical Squadron. The 311th MDS needed to accomplish its training and the 311th Plans and Readiness Division needed to test how well members were familiar with the Airman's Manual, the ATSO guide, chemical warfare training and their specific medical training.

"We provided highly customized MURT for medical personnel that was tailored just exclusively for Brooks," said Ron Collins, readiness specialist in charge of exercise logistics for the 311th HSW.

The medics' training consisted of a mass casualty exercise, which included casualty movement, loading and evacuation.

Troops from Brooks City-Base, Texas, practice patient transport during the base's first field Medical Unit Readiness Training in conjunction with an Ability To Survive and Operate evaluation. (AF photo by Staff Sgt. Alfonso Ramirez Jr.)

"We take this training very seriously and are working hard to ensure our Brooks medical unit is the best trained in the operational field," said 311th MDS Noncommissioned Officer In Charge of Medical Readiness Staff Sgt. Linda Weaver. "When lives are on the line, our doctors, nurses and support staff need to know exactly what to do and when to do it."

Computer kids

AFRL gives back to Ohio schools

Sarah Hubbard
AFRL Public Affairs

Air Force Research Laboratory Sensors Directorate personnel at Wright-Patterson Air Force Base, Ohio, are doing their part to encourage students to do well in math and science by donating computer systems to local school districts and private parochial schools.

Ohio schools have received more than 150 pallets of computer components donated by AFRL.

"Every three years, each computer within the sensors directorate is replaced so our scientists and engineers can work on the most up-to-date equipment," said Grace Janiszewski, program coordinator.

The Pentium I and II computers being replaced are given to the school districts to enhance math and science instruction in the classrooms.

"The computer systems donated have allowed us to expand our technology classes," said Jack McIntosh, Northridge Local School District technology director. "They have also expanded the number of opportunities that we can offer students and increased the number of students served."

The directorate started the year-old program as an incentive to encourage students to become more interested in math and science-related fields. The students can use the computers, or they can take them apart and study the parts of the computer, Ms. Janiszewski pointed out.

"We use the computers in our A+ and Cisco classes," said Mr. McIntosh. "In these classes, the students take the computers apart and rebuild them, and if they successfully complete the class, they get to take the computers they have built home with them."

Our Lady of Rosary Computer Lab teacher Cindy Todd looks inside a computer with students Mitchell E. Smith II and Victoria Lynn Smith. (AF photo)

Northridge students build a computer from scratch. (AF photo)

Northridge also has a community outreach program that tutors students. The computers are a great resource for the students being tutored, said Mr. McIntosh.

Also benefiting from this program is Our Lady of the Rosary School, a small private institution located in Old North Dayton that provides instruction for grades K-8.

"The donations of the computer systems and parts will allow us to offer a broader technology base for each of our students" said Cindy Todd, Rosary computer lab teacher.

"We have even been able to form a programming club and some of the students are learning how to build and troubleshoot computers. The students learn what is involved in the assembly of the computer and what is involved in the software installation," Ms. Todd said.

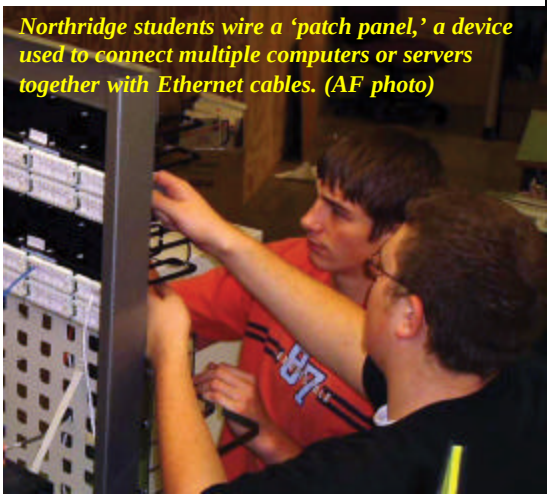
According to Ms. Janiszewski, after the schools are contacted with an offer to participate in the program, they respond if interested and the ball starts rolling. The technology transfer branch in the sensors directorate creates educational partnership agreements with the schools ensuring the computers can be donated directly to them.

"Once we have received a response from the interested districts, I e-mail the inventory list to everyone and it is first come, first served," said Ms. Janiszewski. "It's a fair process which gives all the schools a chance to put in their requests."

Teachers from the participating school districts say their classes benefit greatly from the computers.

"The people at AFRL were extremely about helping us in any way possible," said Mr. McIntosh. "The staff here at Northridge greatly appreciates this opportunity to expand our technology department, as I am sure other schools do as well."

Northridge students wire a 'patch panel,' a device used to connect multiple computers or servers together with Ethernet cables. (AF photo)



The Benefield Anechoic Facility at Edwards AFB, Calif., tested three BMW 2004 models — marking the first-ever automobile tested at the facility. From left to right: the 530i, 645i and 545i were in the chamber in November for electromagnetic interference testing. (AF photo by Phillip Kocurek)

Edwards tests BEAMERS

2nd Lt. Brooke Davis
AFFTC Public Affairs

Benefield Anechoic Facility experts at Edwards Air Force Base, Calif., used the facility as an automobile test bed for the first time as they evaluated 2004, 5- and 6-series models for BMW of North America.

What began as BMW officials' online search for an anechoic test facility resulted in members from the BAF and BMW teaming to test levels of electromagnetic interference on the 530i, 545i and debut model, 645i. Anechoic is being free of echoes or reverberations.

"European standards require vehicles to be certified to meet stringent radio frequency (RF) emissions limits, and we have to test our cars under a variety of conditions," explained Volker Bochen, BMW senior test engineer.

The BAF is the world's largest anechoic chamber for testing airborne electronic warfare systems and testing the BMW cars here seemed a logical choice, according to Lt. Col. Lyn McNeely, 412th Test Wing battlespace operations division electronic warfare operations director.

"Capitalizing on the test techniques and capabilities used to evaluate airborne weapon systems, we were able to transition a unique military asset to the commercial sector," she said.

RF emissions were assessed through electromagnetic interference and electromagnetic compatibility, or EMI/EMC, testing, according to Mr. Colin Young, 412th Test Wing electronics warfare site chief.

BAF testing measured and evaluated the RF emissions surrounding the cars' antennas, while each car was parked with the ignition switch in three distinct configurations — the "on," "start" or "engine running" position, according to Young.

"We were able to set up the test, prepare the associated equipment and complete testing on three vehicles," said Ed Roush, 412th TW EW test engineer. "All three cars were tested in one day."

"Normally, BMW performs anechoic testing in Munich, Germany," said Dr. James Brownlow, 412th TW EW engineering manager. "But BMW read about the BAF, and we were able to accommodate the testing right here."

BMW of North America has several offices in California — the technology office in Palo Alto, designworks in Newbury Park and the engineering and emission test center in Oxnard.

Together these offices make the California Innovation Triangle, according to the BMW Group's Web site, www.bmw.com.

With its proximity to Edwards AFB, BMW may return to the BAF in the future, stated Dr. Brownlow.

"They'll probably come back again," said Dr. Brownlow. "The results from the BAF were comparable to the anechoic chamber in Munich, and we provided a quick turn-around for testing as well."

Tinker Security Forces adopt Headstart class

Jeanne Grimes
OC-ALC Public Affairs

On any given weekday, members of 72nd Security Forces Squadron's Saber Flight, Tinker Air Force Base, Okla., come off the midnight shift in predawn darkness and chase the sunrise east to Shawnee and the Central Tribes of the Shawnee Area Headstart at the Absentee Shawnee Tribal Complex.

The flight adopted the Headstart and its 83 preschoolers last summer following a July 4 parade at Tecumseh. That's where Tech. Sgt. Don Kennedy, a flight chief, met Deidra Smith, CTSA supervisor. She asked Sergeant Kennedy if he'd visit the school and talk to the children.

"She said, 'We could use some volunteer help down here,'" Sergeant Kennedy recalled. "And I said, 'I've got 40 volunteers at my disposal every day.' I saw it as a win-win situation."

Sergeant Kennedy, Airmen 1st Class Ramon Hernandez, Cody Jaeger and Drew Freeberg, and Airmen Daniel Sheffield and Cynthia Hammond made the first three trips to the tribal complex.

"With all the grown-up day-to-day business we attend to, you have to get away and be a child again for a couple of hours," Airman Jaeger said. "We go to the grocery store with them, sit around and read books to them and ride their bus routes. We just have fun."

Airman 1st Class Drew Freeberg of Tinker AFB's 72nd Security Forces Squadron's Saber Flight shares a story with 3-year-olds Chelsea Watkins and Sampson Patty. (AF photo by Jeanne Grimes)

Airman 1st Class Ramon Hernandez of the 72nd Security Forces Squadron's Saber Flight, Tinker AFB, Okla., helps Caitlin Wheatly, 5, and Toni Smith, 4, make crafts at the Central Tribes of the Shawnee Area Headstart. (AF photo by Jeanne Grimes)

There's work, too. When Ms. Smith remarked that the Headstart was out of storage space, the flight responded with 10 volunteers who toiled six hours one day to clear out several sheds adjacent to the school.

"Anytime we're able, we like to come down here," Airman Jaeger said. "As far as community involvement goes, security forces has any other squadron beat. We're constantly looking for ways we can help the community."

"I like to be a good role model … and it keeps me out of trouble. I love doing this. You can act like yourself in front of kids," Airman Hernandez said.

Airman Freeberg frequently volunteered to help with young children when he was in high school also. Then and now, the one thing that hasn't changed is the smiles of the children.

The reaction when Tinker AFB personnel walk through the door isn't lost on Airman Hammond either. It sends her back to Shawnee time after time.

"Just the joy we bring to the kids when we walk in," she said.

"It's a chance to give back," Airman Sheffield said.

Like Airman Hernandez, Airman Sheffield tries to be a role model.

Volunteers from the flight try to be there any time special activities or outings are planned for the children. They go with them to a children's museum in Seminole or to the library. They took the youngsters trick-or-treating throughout the complex for Halloween and joined them Dec. 4 for Shawnee's annual Christmas parade. Sergeant Kennedy is hoping to bring the children to Tinker AFB for a picnic sometime in the spring.

Airman Jaeger, who is from Iowa, said working with the children keeps him in mind of "about 10 little cousins that I don't get to see anymore."

"I see this going on quite a few years, as long as we've got young airmen dedicated to it," Sergeant Kennedy said.

In October, the flight's members dug into their pockets to buy a warm winter coat for every child at CTSA Headstart. In December, they shopped for toys and clothing, which they handed out to the kids during a Christmas party.

"It's just warmth," Ms. Smith said, "a pleasure to see … that there's still some good somewhere."

Volunteer at AF Museum puts love of airplanes into restoration

Mike Wallace
ASC Public Affairs

Jim Sendelbach installs a lamp at operator station 17 inside the Air Force Museum's EC-121 Warning Star, a Boeing Super Constellation variant that supported tactical air operations and surveillance from the mid-1950s to the late 1970s. Mr. Sendelbach has volunteered at the museum for the past five years — six days a month in restoration and two days a month on patrol in the museum galleries. (AF photo by Spencer P. Lane)

Jim Sendelbach has been interested in airplanes all his life. Not only has he lived near Wright-Patterson Air Force Base, Ohio, most of his life, he also worked directly on airplanes at the base for five years in the 1950s right after the Korean War.

Nowadays he volunteers approximately eight days a month at the Air Force Museum working on aircraft on public display or in restoration, or just keeping watch over the displays.

Mr. Sendelbach, a Dayton, Ohio, native, served during the Korean War on antiaircraft crews. "I defended Pittsburgh against communist aircraft," he commented. "I also defended Fort Hood, Texas. I never went overseas to the war."

In 1953, he returned to his hometown and got a job at Wright-Patterson AFB working in flight test instrumentation. "I worked three years as a contractor and two years as a civil servant," he said. "The secretary of defense back then decided he didn't need so many civil servants, so out I went."

During that period, he worked on several tests. One involved taking pictures of ejection tests. Another saw him and several other technicians flying from here to Minnesota in a C-47 Skytrain in the winter to test jet assisted take-off systems for the Air Rescue Service. The testers fitted the C-47 with skis and took off from a frozen lake.

"The biggest thing we tested was the automatic landing system," said Mr. Sendelbach. He added that this system was on display in the Air Force Museum.

Mr. Sendelbach became a model maker and later a production manager for a local company. He retired in 1997.

"I was always interested in airplanes," he said. "When I was at flight test, I was intimately involved with them. When I was working, I traveled a lot on them. I don't remember how it occurred that I became a volunteer."

Now living near Vandalia, Ohio, Mr. Sendelbach works one day each month in the museum's Presidential Hangar, one day patrolling the museum's main halls and six days a month in restoration. "I like restoration the best," he said. "When I volunteer there, it's six hours a day or longer."

> **"I was always interested in airplanes."**
>
> **Jim Sendelbach**

One of the projects Mr. Sendelbach worked on was the B-47 Stratojet. "I spent two years polishing the B-47," he said. "It was in pieces. Someone put a notice in the bulletin that every museum volunteer receives, so I talked to Mr. Bob Spaulding, volunteer coordinator for restoration. One thing I really liked about it is that I could come and go any time I wanted to.

"They completely restored the inside of that airplane. I polished the outside. I used a metal polish with a buffer. It was so rough in places you had to sand it first. I didn't have to do the wings, though. The staff did that with a floor buffer.

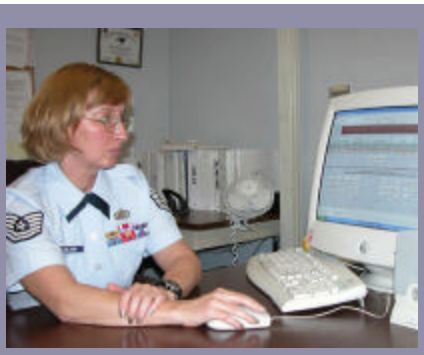
"This airplane sat outside at Salinas, Kansas, for 32 years with nobody doing anything to it for restoration," he said.

"I also worked on the RF-86 Sabre reconnaissance aircraft that's in restoration, and now I'm working on the EC-121 Warning Star in the Modern Flight Hangar. I'm cleaning the inside, and patching and repairing as I go."

While on patrol, Mr. Sendelbach gets a lot of questions. The most usual ones are, "Where are the restrooms?" and "Where's the cafeteria?" He added, "It's fun when you get the guys who actually flew the types of airplanes that are here. Most of them will actually start the conversation. You ask, 'Did you fly that one?' and the answer will be, 'No, but I flew one just like it.' Then they'll talk about their experiences.

"Also, some of the volunteers were crewmembers during World War II, and it's interesting to talk to them."

Both Mr. Sendelbach and his wife, Joan, are museum volunteers and have worked there for the past five years.



Tech. Sgt. Tamie Calton, Non-Commissioned Officer In Charge Personnel Employment, Eglin AFB, Fla., reviews a flow chart she designed, part of her office's award-winning computerized system. Sergeant Calton's office was one of two offices within the 96th Mission Support Squadron that received Best Practice designations by the recent Unit Compliance Inspection at Eglin, AFB. Sergeant Calton received the Personnel Manager of the Year Award. (AF photo by Sheila Vaughen)

Eglin gets 100% inspection rating

EGLIN AIR FORCE BASE, Fla. — In five days of thorough inspections and evaluations, Air Force Materiel Command inspectors found everything in order during the Air Armament Center's Unit Compliance Inspection, yielding them a 100 percent rating.

"This is the first time since 1998 that an AFMC installation has scored 100 percent," said Maj. Gen. Robert Chedister, AAC commander.

The inspection team checked to see if AAC's process, procedure and paperwork complied with applicable public law as well as Air Force and AFMC instructions, and they did, according to Col. Marv Cook, AFMC's inspections and assessments division chief.

Many people were acknowledged for their performance on individual and team levels. "Best practices" were awarded to those who developed ways to save time, money or improve processes for the unit. "Superior performers or teams" or "outstanding performers or teams" were identified for being the best of the best in their field of expertise.

— AAC Public Affairs

Robins chaplain earns Bronze Star

ROBINS AIR FORCE BASE, Ga. — Robins' Wing Chaplain, who worked alongside Special Operations Forces in an intensely perilous desert, received the Air Force Bronze Star Medal.

Chaplain (Lt. Col.) Dan Nigolian spent five months based in a camp in a classified location in the Middle East where windstorms blew dust through canvas tents and the threat of attack was as real from the human enemy as it was from the aggressive camel spiders that flourished there. Throughout what others would see as an ordeal, he said faith and "the incredible richness of the ministry" kept him going.

Chaplain Nigolian was the senior chaplain of the 444th Air Expeditionary Group, engaged in ground operations against Operation Iraqi Freedom enemies from January through May this year. As senior chaplain, he headed a team of four Air Force, two Army and two coalition chaplains assigned to three bases in the country. His team logged more than 19,000 visits monthly during what were described as "dangerous air and ground combat support operations."

— 78th ABW Public Affairs

AFRL director elected IEEE fellow

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The director of the Air Force Research Laboratory Sensors Directorate has been elected a Fellow of the Institute of Electrical and Electronic Engineers.

Dr. Donald W. Hanson was recognized for his technical leadership in the development and realization of sensors science and technology.

He is responsible for planning, directing and evaluating sensor and countermeasures science and technology programs. Dr. Hanson serves as the Air Force principal for the Department of Defense Sensors, Electronics and Electronic Warfare Panel, coordinating all DOD activities within these areas with peers from the Army and Navy.

— ASC Public Affairs

AFMC bases win three environmental awards

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Air Force Materiel Command installations won three Air Force General Thomas D. White environmental awards for fiscal year 2003.

Tinker AFB, Okla., received the restoration award; Robins AFB, Ga., received the pollution prevention award industrial category; and the AFMC Acquisition P2 team at Wright-Patterson AFB, Ohio, won the pollution prevention acquisition team award.

All of the award winners go forward as nominees of the Secretary of Defense Environmental Security Awards.

A ceremony and reception to recognize the winners will be held May 5 at the Pentagon.

— AFMC Public Affairs

Edwards team snags safety award

EDWARDS AIR FORCE BASE, Calif. — The Automatic Air Collision Avoidance System test team received the Tony LeVier Flight Test Safety Award for their exceptional contribution to flight test safety during 2003.

The team, made up of 32 core flight test members and more than nine different organizations, was presented the award at the Society of Experimental Test Pilots conference in Los Angeles.

Auto ACAS is a computer program to detect potential airborne collision and send an avoidance command to the aircraft's autopilot.

Currently, the program is in data reduction, with the final report scheduled for publication in the first quarter of 2004, said Mark Skoog, NASA Dryden Auto ACAS technical advisor and flight test director. From observation alone, Mr. Skoog stated, it was obvious the algorithm can sort out collision information with unequaled precision and speed.

— AFFTC Public Affairs

WWII vet gets Purple Heart

ROBINS AIR FORCE BASE, Ga. — Fifty-nine years after a tragic incident that took away his 21-year-old innocence and his best friend, Staff Sgt. (Ret.) Curtis Burgess finally got what he deserved — the Purple Heart medal.

Speaking of the ill-fated day that earned him the medal, Mr. Burgess said it had to be the worst day he served in the military.

Then a staff sergeant serving as an aircraft mechanic in the 421st Night Fighter Squadron, Mr. Burgess recounted how the Japanese attacked the squadron's P-61 aircraft. While he and his best friend were on their way to the mess tent, a bomb dropped 30 to 35 feet to their right, killing his friend instantly.

Sustaining a concussion and suffering from shell shock, Mr. Burgess was put in for the medal but only made a conscious effort to retrieve it two or three years ago.

Calling the day a very important occasion, Maj. Gen. Don Wetekam, center commander, said it was his personal honor to award Mr. Burgess the medal — albeit 59 years late.

"Ten million strong, men like Mr. Burgess went off to war and essentially saved the world," he said. "It's like we are presenting this medal in some small way to an entire generation who did their duty without any fanfare and came home to lead their lives."

— WR-ALC Public Affairs

Eglin Master Sgt. receives Bronze Star

EGLIN AIR FORCE BASE, Fla. — With expressions of humility and credit to his team, Master Sgt. Mitchell Bolin was awarded the Bronze Star by Col. Francis Hendricks, the 96th Air Base Wing commander.

Sergeant Bolin, who works as an Air Armament Center weapons safety supervisor, earned the honor for his work as explosive ordnance disposal chief while deployed with the 320th Expeditionary Civil Engineering Squadron at Camp Seeb in the Sultanate of Oman during the first half of 2003.

Noting that "it's not rank that brings influence, it's expertise," Colonel Hendricks said he was honored to present the award to a senior non-commissioned officer.

The Bronze Star presentation was the fifth in recent months earned by members of the 96th Air Base Wing.

Colonel Hendricks said Sergeant Bolin was truly a hero, as was his wife, Lanie, who served as a hero at home with their three children and her own career. In the citation, Sergeant Bolin was credited for his contributions to 4,700 successful sorties that delivered 15,000 tons of cargo and humanitarian supplies. He was additionally acknowledged for his volunteer work on the base's 24-hour surveillance of the Joint Warning and Reporting Network System managed by the U.S. Central Command.

Sergeant Bolin, now close to retirement eligibility, upholds the mindset of "one team, one fight" when he credits his team for their contributions.

— 96th ABW Public Affairs

Test pilot school wins international award

EDWARDS AIR FORCE BASE, Calif. — Air Force Test Pilot School experts at Edwards received the 2003 Richard G. Cross Award from the International Test and Evaluation Association during a recent ceremony in Lihue, Hawaii.

The award recognizes the contributions TPS short courses have made to training and educating test and evaluation professionals.

"This is a true honor for the entire TPS staff and the school to be recognized by this prestigious organization," said Col. Ernie Haendschke, TSP commandant.

Colonel Haendschk said TPS instructors partnered with test squadrons from the 412th Test Wing, 53rd Electronic Warfare Wing, Air Force Materiel Command, Air Force Research Lab, Air Force Space Command, Air Force Operational Test and Evaluation Center, Space and Missile Center and the National Aeronautics and Space Administration to address shortfalls in required training for their respective fields. In response, TPS developed and refined 12 unique courses to address the deficits.

"The 12 courses produced 169 graduates in fiscal year 2003 alone," he said.

"This past year," said Dr. George Ka'iliwai, Air Force Flight Test Center technical advisor, "TPS accomplished more in developing its specialized test and evaluation short courses and meeting customer requirements than it has in its almost 60-year history."

— AFFTC Public Affairs

1st Lt. Amy Rongey, 16th Airborne Command and Control Squadron air battle manager, Robins AFB, Ga., sinks a putt at Pine Oaks Golf Course. (AF photo by Airman 1st Class Tim Beckham)

Robins LT wins gold medal at golf tourney

ROBINS AIR FORCE BASE, Ga. — From the flight line to the fairway, 1st Lt. Amy Rongey is right on course.

The air battle manager for the 16th Airborne Command and Control Squadron won first place in the women's individual play at the Conseil International du Sport Militaire World Military Golf Championship in Jacksonville, Fla.

The October tournament was exciting to the very end when Lieutenant Rongey won the sudden death playoff and walked away with the gold medal.

— 116th ACW Public Affairs

Wright Flyer display (AF photo)