Aerospace World

By Peter Grier

F-22 Flight Test Avionics Delivered

The Air Force on June 4 announced that Boeing has delivered the first block of advanced flight test avionics for the F-22 to the airplane's primary contractor, Lockheed Martin.

The package, Block 1.1, represents 80 percent of the final flight test avionics hardware for the Raptor. It contains more than 900,000 lines of code—about half of all the software that will be delivered to the F-22 during engineering and manufacturing development.

Block 1.1 will support "power on" requirements for aircraft 4004, the fourth F-22 model off the assembly line. "Power on" means that the aircraft will be turned on with its integrated avionics and subsystems in place. A follow-on package, Block 1.2, will support 4004 taxi and first-flight testing.

"Delivery of Block 1.1 represents a critical step that demonstrates our ability to deliver the heart of the F-22's avionics on schedule and ahead of need dates," said Gerry Freisthler, deputy director of the F-22 program office. "Getting 4004 in the air will go a long way to proving system maturity."

USAF photo by MSgt. Raymond T. Conway

A combined crew of active and Reserve C-141 loadmasters from McChord AFB, Wash., drop vital medical supplies at the South Pole in mid-July to aid an American woman, working for the National Science Foundation research station there. The woman was diagnosed with cancer and cannot get out until the fall.

Test Squadron Redesigns F-22 Launcher

The 412th Test Squadron, Edwards AFB, Calif., in concert with other members of the F-22 Combined Test Force, has completely redesigned the Raptor's weapons launchers. The new launchers are easier to service and will save the Air Force millions over the life of the program.

"The original launcher failed to meet the requested weight specifications and was not maintenance friendly," said Capt. Don Supon, of the F-22 CTF.

The launchers are located in the weapons bay beneath the F-22. The original model was a horizontal-type launcher that would swing down and then launch the missile. The new version is a vertical-type launcher, meaning missiles are pushed straight down out of the weapons bay.

The new launchers weigh 300 pounds less. "With the weight of the old launcher, it had to be installed using support equipment," said Supon. "The new launcher is light enough that two people can lift it while a third person installs the attaching bolts."

The improved equipment also provides for safer separation of missiles out of the main weapons bays.

Logistics testing of the type that led to this change will continue in the F-22 test program for the next three years.

"Without logistics testing, we would be fielding aircraft which might have simple-to-correct deficiencies," said MSgt. Richard Fournier, 412th Logistics Group test manager. "If you find deficiencies early, then you can fix them during testing and then incorporate the changes into the production model prior to going into full production."

Boeing's JSF Coming Together

On June 13, Boeing announced that it had successfully attached the single-piece wing for the Joint Strike Fighter X-32 concept demonstrator to its fuselage. A small team of mechanics positioned and mated all the attach points between the wing and fuselage within six hours, company officials said.

"The X-32 is meeting its weight targets, meeting its schedule targets, and meeting its cost targets," said Frank Statkus, Boeing vice president and JSF general manager. "Overall fabrication and assembly costs, for example, remain at 30 to 40 percent below projections."

The wing is a single-piece, over-the-fuselage structure. It has one-piece upper and lower composite skins and reduces weight by eliminating heavy wing attachments at the sides of the fuselage. During assembly, laser tracker devices on the factory floor use 3-D design data to move parts into place for nearly tool-less work.

"Innovative techniques are helping Boeing reduce tooling costs by 60 to 70 percent over requirements for other developmental products we have built, such as the YF-22," said Tim Opitz, assembly team leader and program manufacturing manager.

Meanwhile, Boeing has expanded its JSF team, adding 25 subcontractors, including eight firms in Canada,

About the "Powell Doctrine" ...

Politicians, news analysts, and others have gone to some length in explaining what Operation Allied Force in the Balkans proved about the so-called "Powell Doctrine."

Rowan Scarborough of the *Washington Times* said, "The 'Powell Doctrine' became the Pentagon's biggest war casualty. Named after Gen. Colin Powell, the former Joint Chiefs Chairman, the 1980s rule said American troops would never again enter battle without decisive force and clear objectives. In other words, no more Vietnams."

Mortimer B. Zuckerman of *US News & World Report* wrote that Kosovo was a vindication of "the doctrine of limited power for limited ends. The Powell Doctrine ... was right in the Gulf [War] but wrong here: Incremental escalation of precision guided munitions worked when used long enough."

In fact, the Powell Doctrine was actually the Weinberger Doctrine, and the experience in Kosovo may not have done it as much damage as some of the recent interpretations suggest.

Secretary of Defense Caspar Weinberger made major headlines when he presented the concept in a speech at the National Press Club Nov. 28, 1984. The *Washington Post* dubbed it the Weinberger Doctrine. He spoke against the backdrop of not only Vietnam but also the deaths of 241 American servicemen, most of them Marines, killed when a truck bomb blew up their barracks in Beirut in 1983. The Marines, not configured or equipped for combat, were in Lebanon on a fuzzily defined peacekeeping mission as what the State Department called an "interpositional force."

Weinberger said that six tests should be met before US forces are committed to combat abroad. Is a vital US interest at stake? Will we commit sufficient resources to win? Are the objectives clearly defined? Will we sustain the commitment? Is there reasonable expectation that the public and Congress will support the operation? Have we exhausted our other options?

The Gulf War of 1991 met these criteria—in contrast to Vietnam, the Marine disaster in Lebanon, and the use of lethal military force in a series of loosely defined and tentatively prosecuted military actions to come during the Clinton Administration.

In 1984 Powell was Weinberger's military assistant. In his biography, *My American Journey* (Random House, 1995), Powell says he first saw the concept when Weinberger asked him to take a look at a draft document listing the six tests. "Weinberger had applied his formidable lawyerly intellect to an analysis of when and when not to commit United States military forces abroad," Powell said. Powell became further identified with the Weinberger Doctrine because he was Chairman of the Joint Chiefs of Staff during the Gulf War.

Its transformation into the Powell Doctrine, however, happened in the run-up to the 1996 Presidential election. Powell's right wing opponents, seeking to block his nomination as a Republican candidate, misconstrued the Weinberger Doctrine as a weakness and timidity, relabeled it, and then used it as an instrument in a "Stop Powell Movement."

Writing in the *New York Times* April 12, 1999, Weinberger said the Kosovo operation, then in its third week, met the guidelines of the doctrine "to some extent," in that "the principal feature of my thinking was that the United States should enter a conflict only if it was vital to our national interest. That is the case here. The Balkans have been at the heart of two world wars in this century, so stability of the region is important." He added that: "As a NATO member, the United States cannot ignore an assault in Europe against all our values by a thug who has directed brutal atrocities in Kosovo and Bosnia." However, he said, the objective in Kosovo had to be victory and that the United States and NATO had to be willing to apply sufficient force to win.

Operation Allied Force began in the classic mold of previous "Limited Force" actions of the 1990s. It opened in March with attacks on a handful of targets and obvious indecision about objectives. The incrementalism and gradualism of the operation were a throwback to the strategies of Vietnam.

"By the time of NATO's summit in Washington—almost a month into the air campaign—it became apparent to NATO that a constrained, phased approach was not effective," Gen. Michael E. Ryan, Air Force Chief of Staff, said in a newspaper column June 4. "At the insistence of US leaders, NATO widened the air campaign to produce the strategic effects in Serbia proper." The operation finally began moving with determination. The Serbian agreement to NATO's terms then followed in early June.

—John T. Correll

Denmark, Netherlands, and UK, to its original complement of six. Those added include Aerosystems of Yeovil, UK, which will provide logistics support; Fokker, of the Netherlands (airframe structural details and wire bundles); Hexcel, Kirkland, Wash. (composite raw materials); and Terma, Grenaa, Denmark (airframe structural parts).

ABL Laser Module Powers Up

On June 10, the Airborne Laser program's flight-weight laser module reached 107 percent of peak power in a test. The power level reached is 30 to 40 percent greater than that required to shoot down a missile target, officials said.

The test was held at TRW's San Juan Capistrano, Calif., facilities. TRW is developing the ABL's chemical oxygen–iodine laser and subsystems, while Lockheed Martin is developing the beam control system and Boeing is working on the battle management system and outfitting a 747 as an ABL platform.

"You never want to be overconfident, but we think the technology is proving itself," Maj. Gen. Bruce A. Carlson, Air Force director of operational requirements, said at a Washington breakfast June 11.

ABL is unlikely to run into the test problems that have plagued the Theater High Altitude Area Defense program, said Carlson. The program plans extensive mitigation tests before an actual flight test.

"We will have fired the laser at full power with full tracking system at least 34 times before we shoot down a [target]," said Carlson. He added that the ABL would boost the capability of other missile defense systems, including THAAD.

Defense Bills Advance

An amendment attached to the Senate defense appropriations bill for FY 2000 just before final floor action would force the Air Force to buy four new F-15E fighters at the expense of spare parts budgets and other O&M accounts.

The provision was sponsored by Missouri and Illinois lawmakers whose constituents would be affected by a shutdown of Boeing's St. Louis F-15 production line. It was inserted at the 11th hour during floor debate on the legislation June 8 and passed by voice vote.

About $70 million of the $220 million needed to purchase the aircraft would come from the Air Force's aircraft spares and repair parts budget, reducing this crucial area of funding by about 16 percent. Another $50 million would come from the Navy spares and repair budget.

Guard and Reserve spares and national missile defense budgets would yield the remainder of the funds.

Other amendments attached to the Senate appropriations measure include one that would fence off $63 million in Air Force research and development funds for C-5 modernization and another that would provide $4 million for supersonic aircraft noise mitigation R&D.

Senate floor action on the FY 2000 defense authorization bill also produced some last minute changes, though none had such profound funding implications as the appropriations changes.

One amendment calls for the Secretary of Defense to ensure that budget plans contain enough money for advanced Ballistic Missile Defense technology development, as well as major BMD acquisition programs. Another directs the Air Force to study its options for meeting mission requirements once its current inventory of Conventional Air Launched Cruise Missiles is exhausted.

The CALCM study, due Jan. 15, 2000, is supposed to weigh the virtues of restarting that CALCM production line, buying an all-new type of weapon, or using current munitions with upgrades.

Congress and Tricare

Tricare reform would get a boost under an amendment attached to the House Fiscal 2000 defense authorization act during final floor action June 10.

The plan—drafted by Rep. Mac Thornberry (R–Texas)—requires the Secretary of Defense to report on the best way to make sure Tricare benefits are portable from region to region. It would also permit third-party payers to reimburse military treatment facilities at Medicare rates or better for treatment provided to their clients.

The amendment also aims to cut red tape by allowing for electronic filing and by requiring that best business practices be implemented on awarded contracts.

Global Hawk Back in Skies

On June 3, Air Force officials announced that Global Hawk Unmanned Aerial Vehicle No. 1 resumed flight testing in mid-May, following reinstatement of its flight certification by a safety review board. The aircraft had been grounded since the March 29 crash of Global Hawk No. 2.

The Air Force investigation into the cause of the March crash is continuing.

"It's good to get back in the air again, after having not flown in a month and a half," said Lt. Col. Pat Bolibrzuch, Global Hawk program manager at Aeronautical Systems Center, Wright–Patterson AFB, Ohio. "This was a short sortie [7.8 hours] in which we wanted to check out the basic aircraft subsystems before the integration of synthetic aperture radar into the aircraft later this month."

The next year or so promises to be a busy one for the remaining UAV airframe. It is supposed to participate in 13 joint exercises through June of 2000 to assess its potential use for US military forces.

A developmental flight vehicle under the Advanced Concept Technology Demonstration Program, Global Hawk is intended to provide commanders high-altitude, long-endurance reconnaissance imagery in near real time.

USAF photo by SrA. Patty Zimmerman

The 820th RED HORSE Squadron, a construction and engineering unit from Nellis AFB, Nev., quickly creates a new taxiway at Rinas Airport in Tirana, Albania. Once a 15-flights-per-week facility, it now hosts 300 weekly to support the inter-national humanitarian mission aiding ethnic–Albanian refugees from Yugoslavia.

THAAD Finally Hits Target

On June 10, the Theater High Altitude Area Defense missile did something it had never done before—it successfully intercepted a target missile.

This achievement came on the heels of six successive THAAD test failures. The last, in March, cost Lockheed Martin $15 million in penalty fees. The company was on notice to make two successful target intercepts by mid-July or face another $20 million in failure payments. Failure to make three successful hits by mid-October leads to additional penalties, for a total of up to $75 million by the end of 1999.

The successful test came at 5:19 a.m. over the central portion of White Sands Missile Range, N.M. The Hera target simulated an incoming Scud ballistic missile. It was destroyed on impact.

Proponents said the successful test demonstrated that the hit-to-kill concept underlying THAAD is the correct way to approach defense against ballistic missiles. But the system still has doubters within the Pentagon. Hans Mark, Defense Department director of defense research and engineering, recently sent new Ballistic Missile Defense Organization head Lt. Gen. Ronald T. Kadish a letter warning that THAAD may never work as well as its designers hope and that perhaps the requirements for the system should be eased.

Work Starts on Air Force Osprey

On June 7, an MV-22 Marine Corps Osprey arrived at Bell Helicopter Textron's Arlington, Texas, plant. When it leaves sometime next year it will be the first CV-22—the Air Force version of the new tilt-rotor craft.

"They're basically going to strip it down and rebuild it to the CV-22 specifications," said Maj. Scott LeMay, Aeronautical System Center's CV-22 deputy program manager. "It's going to have CV-22 production wiring and all CV-22 unique systems."

The Air Force plans to eventually buy 50 CV-22s to replace its fleet of MH-53J Pave Low helicopters. The aircraft's mission will be to deliver and retrieve special forces units from hostile areas.

The Air Force Osprey model will have integrated radio frequency countermeasures, including an active jammer. It will also have terrain following/terrain avoidance radar, an additional 900 gallons of fuel capacity, rope ladders, a survivor locator

system, and additional radios and upgraded computers.

The first CV-22 is currently scheduled to begin an initial operational test and evaluation at Kirtland AFB, N.M., in spring 2002.

"We'll put it through its paces by basically doing a mock deployment," said LeMay. "This is to make sure that it meets what's required in the operational requirements document and that it is operationally effective and suitable."

CV-22 procurement is scheduled to begin in 2001, with first deliveries in 2003.

Tinker B-2 Experts Keep Stealth in the Air

A major problem was threatening to damage the B-2's mission effectiveness during Operation Allied Force—until the System Engineering Branch of the B-2 System Program Management Division stepped in.

The glitch was the Actuator Remote Terminal, which works the various control surfaces on the airplane. Because of an airflow-cooling problem, the ART was a high-failure item on the bat-winged bomber.

The ART is so sensitive that it has to be set down on a solid granite surface for repairs, to ensure leveling.

Things reached a critical point when a shortage of ART supplies threatened to cause combat mission aborts. The Tinker AFB, Okla.–based System Engineering Branch stepped in and found that the vendor for the part had a limited capacity for repair.

"He was meeting a 23- to 24-day turnaround in some instances, but with the increased flying schedule, he was unable to surge his capacity to the point that he could take care of requirements," said Bob Cotton, avionics armament team lead for Oklahoma City B-2 System Program Office.

Cotton and others worked up repair procedures. A team of engineers traveled from Tinker to Whiteman AFB, Mo., to provide on-the-spot training. They worked a tight schedule around the B-2's continuing bombing mission to implement their solution.

Space Launch Chief Muses About Big Changes in Business

As yet investigators have found no common cause in the spate of recent launch vehicle accidents which have endangered US access to space. But the six launch failures may mean that the US needs to rethink its entire process for hurling payloads aloft, Air Force ICBM and Space Launch Division chief Col. James Puhek said June 9.

The legacy systems in use today—Atlas, Titan, and Delta rockets—all have their roots in 1960s technology, noted Puhek. Yet missions are different today, and program oversight is less, due to budget restrictions.

"Maybe we've gone a bit too far as a nation by treating space access as routine and fully operational with systems not designed to meet today's higher standards," said Puhek. "I don't know the answer, but we're finally looking at such possibilities now, as we should."

Three of the six launch failures were run by the government, and three by private industry. Initial indications were that each was the result of a different problem. A number of overlapping investigations are now probing US launch problems. The Air Force and NASA are both conducting separate reviews, which in turn will feed into a broad government-wide investigation ordered by President Clinton on May 19.

In addition, Boeing has assembled a group of experts to review its processes and procedures in the wake of failures of its Delta III and Inertial Upper Stage. Former Air Force Secretary Sheila E. Widnall will head the effort.

"Because the six incidents were so close in time, it has caused us to scope up and take a bigger look into the whole picture," Puhek said. "Lockheed Martin and Boeing have also started their own investigations, so you've got a lot of people working on the problem at the same time."

With some 25 launches scheduled for Fiscal 2000, answers need to be found quickly if changes are to be made to ensure US access to space.

NASA has already delayed three satellite launches, pending investigations into failures of Lockheed Martin's Centaur upper stage. Affected payloads are a Geostationary Operational Environmental Satellite (GOES-L), a Tracking and Data Relay Satellite (TDRS), and an Earth Observing System (EOS) Am-1.

Lockheed Martin C-130J Claims 50 World Records

On June 13, Lockheed Martin officials announced that a company flight crew piloting an unmodified C-130J Hercules transport had claimed 50 new world aeronautical records.

Four C-130J flights over two days broke 16 existing world marks and established standards in 34 other categories where no previous sanctioned attempts have been made, firm officials said.

"These records are simply a reflection of the capability of the C- 130J," said company pilot Arlen Rens.

Twenty-one of the records were set in the Class C-1.N, Turboprop category for speed over a 1,000- and 2,000-kilometer closed course and for altitude with payload. The airplane's 1,000 km speed of 396.17 mph, for instance, broke the previous mark—set by a Soviet crew flying an Antonov An-12 in 1991—by 8 percent.

The other 29 records were set in the short takeoff and landing, Class N, Turboprop category for similar speed and payload accomplishment, as well as time-to-climb achievement.

The aircraft reached 3,000 meters in 3 minutes, 49 seconds, while carrying a 10,000 kilogram payload, for instance.

"We didn't just set records for the sake of setting records," said Lyle Schaefer, who served as pilot in command for some of the flights. "We took a payload that represents a militarily usable cargo, flew a distance that is a realistic representation of a typical military mission, and we did it at high speed."

ACC Pursues Mustard Agent

Air Combat Command wants to find and clean up sites where chemical warfare materials may have been disposed on ACC facilities.

The search is focusing on chemical agent identification sets. These kits, which contain four-ounce vials of actual mustard agent, were used for training from the 1920s to the 1960s. Officials decided the search was necessary after some discarded sets were found during routine environmental cleanup at Ellsworth AFB, S.D., in August 1997.

The Army destroyed about 21,000 of the sets in the early 1980s, and Air Force officials believe most of the rest were used up during training. But the Ellsworth discovery alerted them to the fact that some may have been buried, which was an acceptable disposal method for many years.

"There isn't an immediate danger to the base or surrounding communities," said Norm Guenther, the ACC program manager. "The potential for a problem exists primarily during construction activities when digging is taking place."

The search effort, named the Chemical Agent Records Search Initiative, has already turned up records

suggesting that the training kits were used at most ACC bases. But the records did not identify any specific disposal sites.

CARSI is now looking at more specific base and regional documents and conducting confidential interviews with current and former Air Force employees. Officials have completed and distributed a chemical warfare materiel handbook to make sure anyone who turns up the vials will know what to do.

"Part of this initiative is also to make sure our people know how to respond, should they encounter a problem unexpectedly," said Guenther.

Anyone with pertinent information should conduct chemical agent identification sets contractor Mitretek toll free at 1-877-237-8789 or send an e-mail to afsurvey@mitretek.org.

SA Area Gets More F-16 Pilot Training

The military-dependent San Antonio economy has been battered in recent years by base closures and the military drawdown. Now it is seeing a glimmer of good news, with the conversion of the Texas Air National Guard's 149th Fighter Wing from general-purpose unit to a flying training wing.

The change has created 80 full-time jobs within the unit for instructor pilots and support staff. It will also require construction of classroom buildings and the hiring of academic instructors.

Implemented in January, the mission switch is meant to train Air National Guard aviators in an effort to help ease the backlog of flight school students waiting to become full-fledged F-16 fighter pilots.

Attrition has been the main culprit creating the logjam, said wing commander Col. Robert J. Spermo. Airlines are taking some of Air Force's best pilots, notably instructor pilots. That leaves the service in the difficult position of trying to maintain its instructor force in the face of real-world deployments and a steady stream of student pilots waiting for flight training.

In Fiscal 1999, for instance, the National Guard requested 51 slots at the Air Force F-16 training school. It got only nine.

"That leaves 42 students coming out of pilot training and returning to their units without being able to perform the actual mission they signed up for," Spermo said.

Some unit pilots are not overjoyed about the change, which takes away their traditional warfighting role.

"Your average fighter pilot was really not that happy at first," said Maj. Jack Presley, operations officer for the wing's 182nd Fighter Squadron. "It's not that teaching is a bad duty assignment. It's just that the pilots are no longer frontline fighter pilots."

Others recognize that the change does have benefits.

"This will at least give us a chance to leave a mark," said Presley. "This can be very rewarding for all of us."

Allied Force Units Produce Big Numbers

On June 10, the 78th Expeditionary Fighter Squadron passed an amazing combat milestone—1,000 sorties in support of Operation Allied Force.

The unit reached that level only 53 days after the first "Bushmasters" sortie was launched in theater. When weather, higher headquarter's cancellations, and other scrubs are added into the picture, the 78th was prepared to launch 1,300 combat flights during the conflict.

"The folks out here [on the flight line]—my hat's off to them," said Lt. Col. Clyde Bellinger, the F-16CJ pilot who landed the historic flight. "They deserve this honor. I just happened to drive the bus, so to speak."

Maintainers generated an average 20 to 24 F-16CJ sorties every day.

"I think [when you look at] the big picture, it's a total team effort—all the technicians, weapons load crews, crew chiefs, and support staff have done a tremendous job," said Maj. James Ayers, squadron maintenance officer.

Meanwhile, the 92nd Air Expeditionary Wing can boast that its personnel had pumped more than 47 million gallons of fuel to support Allied combat sorties.

One airman in particular had been a workhorse, said Col. Vern M. "Rusty" Findley II, 92nd AEW commander. A1C Mike Rafa had single-handedly pumped more than 3.7 million gallons since Feb. 20.

"He's a hero with a capital 'H'," said Findley.

Stop-Loss Nears End

On June 22, Air Force officials announced the start of a phased termination of the Stop-Loss program. That means some 4,569 airmen in 85 career fields deemed critical to Operation Allied Force were able to resume planning for their post-service lives.

The announcement came two days after NATO Secretary General Javier Solana proclaimed that the Alliance's bombing campaign against Yugoslavia was officially over.

"With the end of hostilities, withdrawal of Yugoslav troops from Kosovo, and the redeployment of our forces home, it is appropriate to begin releasing our people from Stop-Loss," said Col. Lynn Pratt, chief of the Air Force's Military Personnel Policy Division.

The program did not end all at once, said Pratt. Both the Air Force and affected airmen needed some time and flexibility as they resumed peacetime operations.

Stop-Loss was over for affected personnel who were not deployed in the effort to halt ethnic cleansing in Kosovo, USAF officials said. For those who were deployed, Stop-Loss terminates when they return to their home station. Stop-Loss for Air Force reservists ended June 22.

The Air Force announced its decision to implement the program May 26. However, it was not to take effect until June 15, which turned out to be five days after NATO suspended its airstrikes.

For many it was not an absolute bar from leaving the service—the Air Force Personnel Center approved at least 129 waivers for lieutenant colonels and lower ranks, allowing them to retire or separate from active duty on their approved dates.

Air Force Units Wing Back From Europe

Air Force aircraft quickly flooded back to home bases in the weeks following the official end of Operation Allied Force, the NATO bombing campaign against Yugoslavia.

Secretary of Defense William S. Cohen authorized two increments of redeployment in late June. On June 21, 124 aircraft were released to return from bases in Europe to the continental United States. Among those affected were 12 F-117s, which flew from Spangdahlem AB, Germany, to Holloman AFB, N.M., and six B-1 bombers, which returned from RAF Fairford, UK, to Ellsworth AFB, S.D.

On June 25, Cohen allowed a further 221 aircraft to return to the US and 60 to return to European home bases. These included 24 F-16CJs which flew from Aviano AB, Italy, to Shaw AFB, S.C., and 18 F-15Cs, which moved from Cervia AB, Italy, to RAF Lakenheath, UK.

Meanwhile, President Clinton visited Whiteman AFB, Mo., to thank the crews of the 509th Bomb Wing for participating from the heartland of America in the conflict—something no

other unit has ever done. The 509th's B-2 Spirit bombers flew less than 1 percent of Operation Allied Force missions but dropped 11 percent of the bomb load.

"The pilots, the crews, ... and everyone who is part of the B-2 team stationed at Whiteman should take special pride in proving what a truly remarkable aircraft can do," said Clinton. "As far as we know, they still don't know you were there."

Allied Aircraft Continue to Pound Iraq

Iraq has kept firing at US and coalition aircraft that are enforcing no-fly zones over its territory—and the aircraft kept responding by pounding Iraqi military sites.

On June 24, for instance, Iraqi antiaircraft artillery fire targeted US and British aircraft patrolling over the south of the country. In response, coalition forces struck four military communications sites about 170 miles southeast of Baghdad near Ash Shatrah and a surface-to-air missile site in the vicinity of Kut Al Hayy, 100 miles southeast of Baghdad.

On June 21 and 22, aircraft patrolling both Iraq's northern and southern no-fly zones came under attack. Responding in self-defense, US Air Force fighters from Operation Northern Watch dropped precision guided munitions on a military command-and-control site southwest of Mosul. Navy aircraft patrolling the southern zone hit two surface-to-air missile sites near As Samawah.

The clashes represented something of a low-level, continuing conflict. Coalition and Iraqi forces have exchanged fire more than 190 times since the end of Operation Desert Fox in December.

Helo, Fighter Crashes Claim Lives

An MH-53J Pave Low helicopter from the 20th Special Operations Squadron, Hurlburt Field, Fla., crashed June 2 near Fayetteville, N.C., while on a routine training mission. One of the six crew members died the next day.

SSgt. Kurt Upton, of Niota, Ill., who was a gunner on the MH-53J and had served in the Air Force for seven years, died June 3 at the Ft. Bragg Medical Center in North Carolina from injuries he received during the crash. The other five were released from the hospital.

On July 1, a pilot with Air Force Reserve Command's 93rd Fighter Squadron, Homestead ARB, Fla., was killed when his F-16 crashed in a remote area near Avon Park Bombing Range in central Florida.

Maj. Samuel D'Angelo III, an American Airlines pilot and resident of Key Largo, Fla., was on a low-level training mission as part of a four-ship formation. The 19-year military veteran had recently returned from helping enforce the no-fly zone over northern Iraq.

Boards of officers are investigating each accident.

Y2K Problems? Call Air Force Fusion Center

The Air Force's Standard Systems Group is setting up a central help point for collection, consolidation, and reporting of the inevitable computer problems the service will encounter at the turn of the year 2000.

The help team will consist of a cross-functional group of SSG experts, bolstered by computer specialists from around the Air Force and a network of service help desks. The centralized Y2K Fusion Center is supposed to be up and running at Maxwell AFB, Ala., by Sept. 1.

The center will be equipped with a variety of specialized and secure—but unclassified—communications systems, including secret Internet protocol router networks and secure fax and video teleconference lines.

Personnel with potential Y2K problems should first go to the help desk

that normally supports their particular system, said Kenneth Heitkamp, SSG technical director. That desk will solve the problem, if it can, and report anomalies to the Fusion Center.

"No Department of Defense caller will be turned away," said Col. Robert Glitz, chief of SSG's Software Factory customer support division. "We have people working now with all other appropriate agencies so we'll know exactly who is responsible for what. So if a customer has a problem and doesn't know who the point of contact is, they can call the Fusion Center and get the name and number of the agency that can help."

Callers can reach the Fusion Center at DSN 596-5771; toll free 877-596-5771; or 334-416-5771.

Total Force Big at USTRANSCOM

The Total Force is a fact of life for everyone in the US military—but it is perhaps uniquely important to US Transportation Command and Air Mobility Command, according to TRANSCOM chief Gen. Charles T. "Tony" Robertson Jr.

"In every mode of transportation at least half of our capacity comes from our commercial partners [in the Civil Reserve Air Fleet]," Robertson said at a recent Air Force Association symposium in St. Louis.

On the military side, a majority of the command's airlift capability rests with the Guard and Reserve.

"Our dependence on the Total Force

Senators: Ground Forces Need More

The Senate Armed Services Committee at a June 8 hearing heard from Gen. Eric K. Shinseki of the Army and Lt. Gen. James L. Jones Jr. of the Marine Corps. The hearing's declared purpose was to confirm appointments of the two to serve as heads of their services. With the chairman, Sen. John W. Warner (R–Va.), in the lead, discussion veered to Kosovo and the relative importance of airpower and land power—in particular, the need to fund a bigger land force. Joining in were Sen. Joseph I. Lieberman (D–Conn.) and Sen. Pat Roberts (R–Kan.).

Here are some excerpts:

Warner: I'd like to have your views, and particularly whether or not, after you're in office for a period of time, that you would feel it would be necessary to petition the President and the Secretary of Defense to raise the overall force levels of your respective branches to meet what I perceive as an increasing worldwide threat to US forces and to those of our allies from an ever growing situation resulting from weapons of mass destruction and other threats, terrorism, and indeed the need—and it is essential—for the United States to participate in peacekeeping operations, ... which is really something that's somewhat new in the past decade for the armed forces of the United States. ...

Shinseki: The Army is structured, resourced, and equipped and trains with a focus on executing [a] two-Major-Theater-War scenario. We are currently capable of meeting that strategy requirement, but I would tell you that the Army's ability to handle that second MTW is one that would be done at high risk. ... In terms of force levels, ... end strength, I think that is a legitimate concern. The Army's in the midst right now of a top to bottom scrub, a total Army analysis process that is looking at just that very question. ... It would be a bit premature for me to tell you that raising the end strength right now is the right call, but I think it is a legitimate concern. ...

Warner: Do you think that at some point in time [it] is a valid requirement to go and look at the end strength in terms of possibly raising it?

Jones: I do, sir.

Warner: This has been a most unusual conflict. ... It has been basically an air-only campaign. ... Now your two services ... are both recognized for tremendous sacrifice of life and limb in previous conflicts. There could be a call for a shift to more emphasis, in terms of our resources, ... towards heavier and heavier [use of] air and less and less emphasis on the component which I believe remains essential and always will be—ground forces. ... We should prepare the public to recognize that this was an exceptional conflict, and it does not diminish the need for us to have a total force including significant ground forces. ... A short answer from both of you.

Shinseki: I think we need to keep perspective here on the reason why you have an Army, and that is to fight and win our nation's wars. And to the degree that we do that well, we do that with our cohorts in the Air Force, Navy, and Marine Corps. But resolution of conflict eventually goes to a land battle and I think keeping a trained and ready and strong Army is very much a part of that equation. ...

Jones: I totally agree with General Shinseki. The utility of ground forces is beyond question. ... It's the ultimate employment of our national will, but it's something that must be carefully considered. You have to have the capability and we should do everything to preserve it and enhance it.

Lieberman: [O]ne of the policy questions that people are going to be thinking about ... is whether, in fact, we can achieve objectives on the ground from the air. Now, I'm highly skeptical of that, but one of the advantages, one of the reasons we did it this way, and one of the advantages was that we had ... no casualties, no American casualties. And this was as a result of the enormous leveraging of technology. ...

Shinseki: Can you do it all from the air? I [take] great comfort in the quality of our Air Force, and I wouldn't have it any other way. ... I think Jim and I would both say ... I don't think we've ever been ... on a crowded battlefield. There has always been a requirement for a joint commitment to bringing decisive conclusion to any conflict I've seen or been a part of. And so, can we do it all from the air, I think, is a question that, I would say, no—not because I'm a ground guy but because I think we bring decisive closure to contests when we bring all of our capabilities to bear, and that's ground, air, and naval.

Jones: I would just only add that I think that it's not out of the realm of distinct possibility that the current state of negotiations has something to do with the fact that for weeks now there has been [talk of] possible ground operations. I think the presence of the Army brigade task force and its preparations have not been unnoticed on the Serbian forces. ... And also the presence of the US Army on the ground, the Apaches and the like, had a very strong effect. ... I think the observed naval demonstrations with the proximity of the Marine Expeditionary Unit off the coast of Greece obviously sends a message. I think the presence of the maritime pre-positioned squadrons that are nearby also sends a message of intent. So, I believe that the ground forces did in fact have some contribution in bringing about the current state of negotiations. ...

Warner: I am certain that message got through to Milosevic, that the supreme allied commander of Europe ... was prepared to lead those forces and to put in place such other forces as he deemed necessary.

Roberts: The two leaders of the most powerful ground forces in the world are here at the same time to seek confirmation to lead their services into the 21st century. [It is] ironic in the sense that we are apparently are ending a conflict where the ground forces were only reluctantly considered, if they were seriously considered at all. And the United States and the NATO Alliance relied solely on airpower to seek a military solution to a problem. I sincerely hope that we as a nation have not learned the wrong lesson from this air campaign. ... I think there is always a vital role for the Marines and the Army.

ensures the taxpayer only pays for the additional capability when our nation needs it, during times of war or other major conflict," said the TRANSCOM commander in chief.

CRAF saved the US more than $3 billion during the Gulf War, for instance.

"During Desert Storm, we activated 117 aircraft from CRAF which flew 20 percent of the total strategic airlift missions," said Robertson. "The cost was $1.35 billion vs. maintaining a military fleet [at a cost of] $4 [billion] to $5 billion ... great bargain."

Peters Confident of Access to Space

During a late June visit to Schriever AFB, Colo., acting Secretary of the Air Force F. Whitten Peters said he is confident that there are no major problems with the hardware design of the nation's space launch vehicles, despite a recent string of expensive launch disasters.

Among other investigative efforts, an Air Force broad area review is now studying the failures to see if the service needs to change practice, procedures, or operations to ensure US military access to space.

"Right now, I don't see a systematic problem with our launch capability. Everything looks like separate and distinct problem[s]," Peters told Air Force Space Command's 11th Space Warning Squadron. "The real questions that seem to be coming up are: Have we lost an important experience base, and have we stopped doing some procedures that we once did that would protect us from this?"

There has been a brain drain on both the military and civil space industry, pointed out Peters. There have been retirements and consolidations in both sectors since the military drawdown began in the late 1980s.

"So at least one theory is that we've had a tremendous loss of corporate knowledge," he said. "If this assumption is true, then we need to go back and assess our processes and make sure we meet the standards."

The Air Force's move from direct oversight of quality to insight in the contractors' quality control practices has been a point of concern, Peters acknowleged.

"All insight does is put on the Air Force's shoulder the burden to look at the overall quality procedures, rather than do the quality tests ourselves," he said. "We look to make sure the basic safeguards are in place for the contractor. I still think that is the right way to go. However, the fundamental question is, do we have the right quality procedures today, given the work force today, to assure launch?"

The acting Air Force chief also talked about the need to upgrade the Air Force's two ranges. Both the Eastern Range at Patrick AFB, Fla., and the Western Range at Vandenberg AFB, Calif., are in need of major modernization.

"We have range modernization programs in place, but there's a historically very high risk that they will slip," said Peters, "not because the programs are at fault but because we keep taking the money for more high priority problems."

Rally '99 Tests Airlift Ops

Flames race across dry fields toward the isolated city. As they speed onward, an international airlift task force races against time, landing supplies and people needed to protect the outpost from the flames.

That was the scenario faced by aircrews that took part in Pacific Airlift Rally '99, held at Royal Australian Air Force Base, Darwin, Australia, on June 14 to 18.

The every-other-year rally was meant to test international airlift operations for humanitarian and disaster relief. This year's event included participants from Singapore, Indonesia, Malaysia, New

Caledonia, Mongolia, Thailand, Papua New Guinea, Australia, and the US.

The US team included a C-130 from Yokota AB, Japan, and a C-130 from the Hawaii Air National Guard, Hickam AFB, Hawaii, along with their support personnel.

"The scenario revolved around a bush fire in the gulf country at Normanton in Queensland," said Tony Griffiths, operations officer for the New South Wales Rural Fire Service. "That's a relatively remote area with a small town with a small port nearby. It very quickly built into a situation where the local resources weren't capable of dealing with it."

Rally participants tried to commit about 30 additional fire tankers and 250 firefighters to control the fire in three or four days. Weather—at least in the scenario—got progressively worse.

"It was pretty interesting because we had to be able to interpret what the airlifters' requirements were, as in numbers of flights and what they could fit on particular aircraft with limitations due to weather," said Griffiths.

Participants split into two groups. One worked on turning around flights at two small airfields that could only accommodate one airplane at a time.

"It was challenging in that you got to work with multiple countries to see how they do things," said Capt. Andy McIntyre of the 36th Airlift Squadron. "Your basic airlift is the same, but some of the little nuances like crew duty day would come out and you had to work around that a little bit. You also had to work with the different airlift capabilities of the different platforms."

William R. Lawley Jr., Medal of Honor Recipient, Dies

Retired Air Force Col. William R. Lawley Jr., awarded the Medal of Honor for nursing a crippled B-17 back to base during World War II, died in Montgomery, Ala., on May 30. Cause of death was not reported.

Lawley, then a first lieutenant, was 24 years old on Feb. 20, 1944, the day his B-17 took part in a massive raid on German aircraft centers. With his bombs frustratingly stuck in the bay, Lawley was exiting his Leipzig target area when a 20 mm shell from an attacking German fighter blew away his windscreen, killing his copilot and sending the Flying Fortress earthward in a perilous dive.

Badly cut in the face and neck, Lawley regained control of the aircraft. Refusing to abandon badly wounded crew members, he set out on a flight from hell, extinguishing engine fires, dodging enemy aircraft, and at one point passing out from blood loss and exposure.

Five hours after being hit, with one engine still turning and another on fire, he crash-landed at a small fighter strip south of London. *[See "Valor," June, p. 37.]*

He received his Medal of Honor on Aug. 4, 1944. He remained on active duty until his retirement in 1972.

A second group worked on the logistics of what should and could go on each flight.

"The fact that we could only land one airplane at a time per airfield, on two different airfields, was just a logistical nightmare," said SSgt. Robert McLean, from Yokota's 374th Airlift Wing.

In addition to command post interaction, US crews got valuable experience flying on missions with foreign units.

JEFX '99 Starts in August

Despite the increased operations tempo caused by war in the Balkans, the two-week Joint Expeditionary Force Experiment '99 was scheduled to begin in August at locations nationwide.

The exercise aims to improve tactical or wing level command-and-control procedures using two Air Expeditionary Forces as the basis of the experiment. It entails joint and coalition force participation and integration of space capabilities into operations center activities.

"We've minimized the impact of real-world operations tempo, have kept the experiment on track, and the objectives and initiatives intact," said Col. Stephen Carr, vice commander of the Aerospace Command and Control Training and Innovation Group at Hurlburt Field, Fla. "From our perspective, we have a clear way ahead at this point for a successful experiment."

That does not mean that problems in Kosovo did not affect event planning. Changes had to be made to the experiment schedule because of competing demands on Air Force people and equipment. Communications equipment and manning were the biggest challenges.

"Our communications people had to go out and purchase additional communications equipment that was not available to us because of the [Kosovo] deployments," said Carr.

Planners had scheduled a fully manned aerospace operations center but could count on only a minimal number of operators for a systems and communications connectivity check called Spiral 3.

News Notes

■ Gen. Ralph E. Eberhart became the fourth commander of Air Combat Command June 11, succeeding Gen. Richard E. Hawley, who retired after 35 years of service. Eberhart, a 1968 graduate of the US Air Force Academy, came to ACC following his assignment at the Pentagon as vice chief of staff of the Air Force. He's a command pilot with more than 4,000 hours in fighter and trainer aircraft, including 300 combat missions as a

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forward air controller in Vietnam. As commander of ACC, Eberhart oversees 1,050 aircraft and approximately 103,400 active duty military and civilian people at 27 installations.

■ The Air Force's fifth E-8C Joint STARS aircraft has been refurbished and modified at Northrop Grumman's Lake Charles, La., facility 10 weeks ahead of plan. The aircraft will now have the Joint STARS system itself installed and tested at another company plant in Melbourne, Fla. The airplane should be delivered to the Air Force by the end of October.

■ An Air National Guard KC-135E that crashed Jan. 13 at Geilenkirchen NATO AB, Germany, pitched up to a near vertical attitude because the horizontal stabilizer trim was in a 7.5 nose-up condition. The aircraft then stalled, according to an accident report released June 4. The investigation was unable to determine how the stabilizer trim came to be in that condition. The crash killed the four Air National Guard crewmen. *[See "ANG Tanker Crashes in Germany," March, p. 13.]*

■ The cause of the crash of an F-16 near Kangnung AB, South Korea, last Aug. 24 was the failure of the No. 4 bearing in the engine, according to an accident report, released in June. The failure of an engine specialist to follow applicable technical orders following discovery of debris on the magnetic chip detector was a contributing factor, according to the accident investigation board president.

■ The first operational Marine helicopter unit assigned to Edwards AFB, Calif., is settling in. Marine Aircraft Group 46, Det. B, from MCAS El Toro, Calif., has been working to integrate its 21 helicopters and 400 people at Edwards. The unit's mission is to transport heavy equipment, weapons, and supplies.

■ Lt. Gen. Joseph E. Hurd, 7th Air Force commander, was recently recognized for his outstanding contributions to maintaining peace on the Korean peninsula. Hurd was awarded the 1998 Eugene M. Zuckert Management Award,which was awarded in a Washington, D.C., ceremony Aug. 4.

■ On June 15, two USAF F-15C/D aircraft from the 53rd Wing, Nellis AFB, Nev., crashed 60 miles east of the town of Tonopah while on a routine mission. Both pilots survived the incident.

■ Two Hurlburt Field, Fla., sergeants recently saved the Air Force hundreds of thousands of dollars when they retrieved a broken drill bit from an MH-53J engine. TSgt. Clayton Solberg and SSgt. Robert Sausman, 16th Component Repair Squadron propulsion branch, used ingenuity and a 24-inch-long wire to keep a T64-100 turboshaft power plant from having to be removed for costly repairs.

■ Six Air Force employees have won the Environmental Protection Agency Bronze Medal for significant contributions to streamlining environmental cleanup and closeout activities at federal facilities. The recipients are John Smith, Mario Ierardi, Shirley Curry, and Art Ditto, of the Air Force Base Conversion Agency, and Thomas McCall and Marilyn Null of the Office of the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health.

■ Operation Walking Shield is continuing to transfer excess Air Force housing units to American Indian reservations, giving low-income residents a chance to improve their lives. The program began in 1996 when Congress passed legislation allowing Grand Forks AFB, N.D., to convey 463 units to the Rosebud Sioux, Turtle Mountain Chippewa, and other nearby tribes. Transfer will be completed over the next two years. Malmstrom AFB, Mont., will transfer 29 units in 1999 to the Northern Cheyenne, Chippewa, Cree, and Gros Ventre tribes, among others.

■ On June 11, Air Force officials announced that shopping for military uniforms is now as easy as browsing the Internet. Catalogs from the Army and Air Force Exchange Service are now available on the World Wide Web at www.aafes.com.

■ AFRC C-130 units deploying for Coronet Oak duty will no longer be landing in Panama. Their new destination will be Luis Munoz Marin IAP, P.R., where the rotational mission was moved in May to comply with the terms of the Panama Canal Treaty of 1979.

■ On June 29, the Administration nominated Carol DiBattiste, a retired Air Force lawyer, to replace F. Whitten Peters as undersecretary of the Air Force. Peters has been nominated to become Secretary of the Air Force. DiBattiste enlisted in the service in 1971, was commissioned in 1976, and retired as a major in 1991. She is currently a deputy US attorney at the Department of Justice. ■

Senior Staff Changes

PROMOTIONS: To ANG **Major General:** Archie J. **Berberian II,** Verna D. **Fairchild,** Daniel J. **Gibson.** To ANG **Brigadier General:** George C. **Allen II,** Ronald J. **Bath,** Roger E. **Combs,** Michael A. **Cushman,** Thomas N. **Edmonds,** Jared P. **Kennish,** Paul S. **Kimmel,** Virgil W. **Lloyd,** Alexander T. **Mahon,** Marvin S. **Mayes,** David E. **McCutchin,** Calvin L. **Moreland,** Mark R. **Musick,** John D. **Rice,** Robert O **Seifert,** Lawrence A. **Sittig,** James M. **Skiff.** To AFRES **Major General:** John A. **Bradley,** Gerald P. **Fitzgerald,** Edward J. **Mechenbier,** Allan R. **Poulin,** Larry L. **Twitchell.** To AFRES **Brigadier General:** Ronald J. **Bath,** Thomas L. **Carter,** Richard C. **Collins,** John M. **Fabry,** Hugh H. **Forsythe,** Michael F. **Gjede,** Leon A. **Johnson,** Howard A. **McMahan,** Douglas S. **Metcalf,** Jose M. **Portela,** Peter K. **Sullivan,** David H. **Webb.**

CHANGES: Brig. Gen. (sel.) John D.W. **Corley,** from Cmdr., 355th Wg, ACC, Davis–Monthan AFB, Ariz., to Dir., Studies & Analyses, USAFE, Ramstein AB, Germany ... Brig. Gen. (sel.) Frank R. **Faykes,** from Comptroller, USAFE, Ramstein AB, Germany, to Dir., Budget Ops & Personnel, OSAF, Pentagon ... Brig. Gen. (sel.) John H. **Folkerts,** from Cmdr., 58th SOW, AETC, Kirtland AFB, N.M., to DASD, Policy & Missions, Spec. Ops./Low Intensity Conflict, Pentagon ... Brig. Gen. Edward L. **LaFountaine,** from Vice Cmdr., AFSOC, Hurlburt Field, Fla., to Dir., AEF Management Team, ACC, Langley AFB, Va. ... Maj. Gen. Everett G. **Odgers,** from Dir., Budget Ops. & Personnel, OSAF, Pentagon, to Dir., Financial Mgmt., AFMC, Wright–Patterson AFB, Ohio ... Brig. Gen. (sel.) Kevin J. **Sullivan,** from Prgm. Dir., Recon Mission Area Gp., ASC, AFMC, Wright–Patterson AFB, Ohio, to Vice Cmdr., Air Armament Center, Eglin AFB, Fla.

COMMAND CHIEF MASTER SERGEANT CHANGE: CMSgt. Kevin **Estrem,** to CCMS, ACC, Langley AFB, Va.

SENIOR EXECUTIVE SERVICE RETIREMENT: Helmut **Hellwig.**

SES CHANGES: Robert J. **Arnold,** to Technical Advisor, 46th Test Wg, Air Armament Center, Eglin AFB, Fla. ...William U. **Borger,** to Associate Dir., Air Platforms, AFRL, Air Vehicles Dir., Wright–Patterson AFB, Ohio ... Gerald B. **Kauvar,** to Principal Dep. Asst. Secy., Instl. & Environment, OSAF, Pentagon ... Hendrick W. **Ruck,** to Associate Dir., Investment Strategy, Plans, AFRL, Wright–Patterson AFB, Ohio ... Lyle H. **Schwartz,** to Dir., Aerospace & Materials Sciences, AFOSR, Arlington, Va. ... ■