# Time To Fly

The US Air Force Thunderbirds begin their 1997 season.

<table>
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<th>Month</th>
<th>Dates</th>
<th>Location</th>
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<tbody>
<tr>
<td>April</td>
<td>5-6</td>
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</tr>
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<td></td>
<td>12</td>
<td>MCAS Yuma, Arizona</td>
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<td>Fresno, California</td>
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<td></td>
<td>19</td>
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</tr>
<tr>
<td></td>
<td>26</td>
<td>Nellis AFB, Nevada</td>
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<tr>
<td>May</td>
<td>3-4</td>
<td>Fort Lauderdale, Florida</td>
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<td></td>
<td>17-18</td>
<td>Andrews AFB, Maryland</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>RAF Mildenhall, United Kingdom</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>US Air Force Academy, Colorado</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>Broomfield, Colorado</td>
</tr>
<tr>
<td>June</td>
<td>7</td>
<td>Scott AFB, Illinois</td>
</tr>
<tr>
<td></td>
<td>8</td>
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<td>Oklahoma ARB, Oklahoma</td>
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<td>July</td>
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<td>Hickam AFB, Hawaii</td>
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<td>23</td>
<td>Cheyenne, Wyoming</td>
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<td></td>
<td>26-27</td>
<td>NAS Whidby Island, Washington</td>
</tr>
<tr>
<td>August</td>
<td>2-3</td>
<td>Hanscom AFB, Massachusetts</td>
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<tr>
<td></td>
<td>5-11</td>
<td>Mid-Season Break</td>
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<td></td>
<td>16-17</td>
<td>Columbus, Ohio</td>
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<tr>
<td></td>
<td>23-24</td>
<td>Chicago, Illinois</td>
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<tr>
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<td>30</td>
<td>Peterson AFB, Colorado</td>
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<tr>
<td>September</td>
<td>1</td>
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<td>5-6</td>
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<td>Moody AFB, Georgia</td>
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<td>October</td>
<td>4-5</td>
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<td>11-12</td>
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<td>NAS New Orleans, Louisiana</td>
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<td>November</td>
<td>1-2</td>
<td>Eglin AFB, Florida</td>
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<td>8-9</td>
<td>Daytona Beach, Florida</td>
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PHOTO SSgt. JASON WHITE
Aurora, a female gyrfalcon, is the mascot of the US Air Force Academy.

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About Our Covers
This issue features dual covers.
The beautiful three-ship formation cover shows a USAF F-16 with Brazilian F-5 and A-1 AMX aircraft over the Amazon Forest in southern Brazil. The photo was taken by Neville Dawson, an aerial photographer and aviation writer based in Australia.
The USAF Academy cover shows cadets at a recent graduation ceremony held at Falcon Stadium at the academy's campus in Colorado Springs, Colorado.

Correction
The excellent photo of a maintenance technician holding a personal maintenance aid in the wheel well of an F-22 (page 11, January issue) was taken by Rita Nicholas King of LMAS.
Four large concrete paths form a perfect square in the center of the campus of the United States Air Force Academy. F-4, F-15, F-104, and F-16 fighter jets stand at respective corners of the square's grass-covered interior. The square is flanked by several dormitories, a huge dining hall, a library, classroom buildings, and a cadet chapel. The perpendicular angles of most of the campus and its buildings emphasize the chapel's arcing spires that reach like contrails 150 feet into the sky.

Down below, young men and women dressed neatly in blue uniforms cut ninety-degree angles and greet upperclassmen as they hurry to their next classes. As freshmen, or fourth-class cadets, they are required to run along a white terrazzo grid that patterns the campus. Here and there, other fourth-class cadets stop, stand erect, and shout answers to questions of basic Air Force knowledge barked to them by upperclassmen. These and other rituals initiate the newest class of cadets into the military.

The Air Force Academy is nestled on 18,000 scenic acres in the foothills of the Rocky Mountains in Colorado, on the northern edge of Colorado Springs. Its aesthetics as well as its mystique as the most modern of all service academies make it one of the most popular tourist attractions in the state. Its purpose, however, may be well understood by only a portion of visitors. From day one, that purpose is ingrained into those enrolled: to produce officers who have the knowledge, character, and motivation essential to leadership; pride in all they do; and commitment to an Air Force career.

United States Air Force Academy
President Dwight D. Eisenhower signed the bill creating the academy on 1 March 1954. The first class entered in July 1955 at temporary facilities at Lowry Air Force Base in Denver. Cadets moved to the permanent location in 1958, and the first class of graduates was commissioned in 1959. Five years later, President Lyndon B. Johnson signed a bill into law that almost doubled cadet enrollment from 2,529 to 4,417. Women were first admitted to the academy in 1976. The first class with women graduated four years later.

Lt. Gen. Paul Stein, the superintendent, is the senior military commander of the academy. He is responsible for its entire community. He is also an academy graduate. “When I graduated in 1966, the academy was half the size it is now,” recalls Stein. “A lot of the infrastructure has changed since then. We had four or five fields of study or majors when I was a cadet. Now we have twenty-five. Technology has changed. Society has changed. Today we even have cadets from Eastern European countries. But a lot here remains the same. We still attract outstanding men and women who perform well academically, athletically, and militarily.”

A look at the background statistics for the class of 2000 supports Stein’s claim. The academy evaluated over 9,000 applicants for about 1,200 appointments to the current class. Over ninety percent of those appointments were in the top quarter of their high school graduating class. Eighteen percent were recognized as national merit scholars. The average score on the scholastic aptitude test was 1275. Thirteen percent were class presidents. Sixty-nine percent were in the National Honor Society. Over eighty percent earned one or more letters in high school sports. Seventeen percent were involved in scouting; fourteen percent of the males were Eagle Scouts.

The caliber of the cadets entering the academy is due in large part to a highly selective admissions process that requires applicants to be nominated by their Congressional representative. “Each representative can have five cadets at the academy at any point,” explains Rolland Stoneman, the associate director of admissions. “The representative can nominate up to ten candidates for each vacancy. Representatives appoint a panel to choose the candidates. These panels must often consider fifty or sixty students competing for those ten slots. The fact that a candidate gets a nomination does not mean he or she will be appointed.”

Other nominations come from the President, Vice President, and the military. Foreign candidates are nominated through the US State Department by their embassies. About forty foreign cadets now attend the academy from countries that include Bahrain, Colombia, Estonia, Korea, Poland, Turkey, and Ukraine.

Getting a nomination is only one step in an application process that takes a recommended eighteen months. The process begins with a precandidate questionnaire that asks for class rank, college-placement test scores, grade point average, and extra-curricular activities. Organized sports, student government, community service, and work experience are important factors in the initial evaluation.

After sorting through these questionnaires, the admissions office sends notification letters and candidate kits to prospective or “tentative” candidates. To complete the next part of the admissions process, these tentative candidates
must provide official transcripts and test scores, writing samples, and more detailed information on extra-curricular activities. The tentative candidate must also get a congressional nomination at this point and be evaluated by an admissions liaison officer. These officers are usually members of the Air Force Reserve, Guard, and active-duty Air Force located throughout the United States and in most countries where US service people are stationed.

“Liaison officers play a key role in our screening process,” says Stoneman. “They are our eyes and ears in the field. They usually interview applicants about three times during the application process.”

Candidates are judged heavily on their academic performance in high school. “We double-weight the high school record because it is the best predictor of success for a freshman in college,” says Stoneman. “We also double-weight the math scores on college aptitude tests. We consider the strength of the high school, the percentage of its graduates that go on to college. Schools have slightly different methods of grading, so we hand-score virtually every transcript that comes in.”

Extra-curricular activities play an important role in the evaluation process, too. “We are extremely sensitive to character issues,” Stoneman continues. “We look for what they have done in leadership positions. We know that only one person can be a class president, but other students fill other leadership positions in high school. We weight their participation in these activities and assign numerical values accordingly.”

These tentative candidates must also pass a medical examination and a fitness test. In the latter, male candidates must perform a minimum of forty-nine sit-ups in two minutes (sixty-nine are the average), four pull-ups (ten, average), twenty-four pushups in two minutes (forty-one, average), and a 300-yard shuttle run in twenty-five-yard laps in sixty-five seconds (sixty seconds, average). Females must perform forty-six sit-ups in two minutes (sixty-eight are the average), one pull-up (two, average), nine pushups in two minutes (twenty-four, average), and the same shuttle run in seventy-nine seconds (sixty-nine, average).

Academics and extra-curricular activities form a weighted composite score for each application. The application then goes to a selection panel that also considers the evaluations from liaison officers. Those making this final cut receive acceptance letters.

About 240 applicants who don’t make the cut for academic reasons attend a ten-month preparatory school near the academy. The school focuses on three subject areas: math, science, and English. “If students can raise their skills in these subjects, they will do better on the entrance exams,” says Col. Hal Meyer, who heads the preparatory school. “Between August and February, we basically repeat what students should have learned in four years of high school in these subject areas. Then we go into college-level courses. We teach skills that transfer to the coursework in the academy.”

The preparatory school graduates about eighty percent of its students to the academy. “Once our graduates get out in the Air Force, they are very successful,” adds Meyer. “Thirteen general officers, one three-star general, two space shuttle astronauts, and a Rhodes scholar have been through the preparatory school.”

The academy is organized much like an active-duty wing. Four groups of ten squadrons, each squadron with about 100 cadets, comprise the cadet wing. A
commandant of cadets, a brigadier general, oversees all cadet military training and reports directly to the superintendent. A group air officer commanding is in charge of each group. An air officer commanding, or AOC, is in charge of each squadron. AOCs are usually active-duty majors or captains. Each AOC is assigned a military training advisor, or MTA, a noncommissioned officer who assists each squadron with the professional development of every cadet.

The academy began using MTAs in 1994. “We’re still relatively new here,” explains TSgt. Dayton Rogalski, the MTA for Cadet Squadron 18. “So the relationship between MTAs and cadets is evolving. We provide the perspective of that other eighty percent of the service who are not commissioned officers. We get a part in training our newest leaders. We want to produce the kind of officers we can live with. Cadets look to us for advice for dealing with situations. We act as a liaison with their commanding officers.”

The cadets have their own command structure, including a cadet wing staff and four group staffs. The cadet wing staff consists of a group of juniors and seniors who command and direct the cadet wing. The highest ranking cadet in this structure is the cadet wing commander. Cadet staff positions are rotated from semester to semester. Active-duty officer and instructor positions are usually three- or four-year assignments at the academy. Twenty-one permanent professors are appointed by the President of the United States. This permanent professor corps maintains academic excellence and program continuity.

“Even with the permanent professors, we have a higher faculty turnover rate than universities,” explains Col. Mike Smith, a permanent professor and head of the aeronautics department. “We have to take a lot of people from the Air Force and turn them into educators as quickly as we can. The high turnover has some advantages, though. We have fresh blood coming in with new Air Force experiences. Every year we have two sets of graduating classes. We have about 1,000 cadets, but we also graduate about 150 or so young officers going back to the Air Force who are better for being here.”
Four pillars form the foundation of the USAF Academy experience: academics, athletics, military training, and character development.

Academics, the first pillar, is as strong as any top university in the United States. Graduates have won an impressive number of Rhodes scholarships as well as fellowships from the Guggenheim Foundation and the National Science Foundation.

The education is far from strictly technical and military. Cadets receive a broad background in the basic sciences, engineering, humanities, and social sciences. “The curriculum is very similar here to what you would find at a university,” says Smith. “The big difference is our large core program, which consists of about two-thirds of the coursework. A history major leaves here with basic courses in aeronautics and mechanics. Similarly, an aeronautical engineer leaves here with courses in political science, history, biology, and behavioral sciences. Cadets may never go on to serve in a career field that matches their majors. We treat majors as an enrichment experience. The core is the real major.”

Most of the core coursework comes in the first two years. All third- and fourth-class cadets take classes in psychology, chemistry, composition, computer science, economics, foreign language, government, history, literature, mathematics, and physics as part of this core coursework. The core also provides military instruction, including classes in aviation, military history, and glider or parachute training.

Majors are pursued as elective courses in the third and fourth years. The twenty-five majors offered at the academy include basic sciences, behavioral sciences, biology, economics, English, history, humanities, legal studies, management, operations research, philosophy, physics, political science, social sciences, space operations, and a variety of engineering majors (including aeronautical, astronautical, civil, electrical, and mechanical).

“We don’t train Air Force specialties here,” Stein explains. “Our core curriculum defines what it takes to produce an educated professional officer. Academic majors, on the other hand, give cadets the experience of studying a subject in depth. We like to think that our
graduates are prepared to enter any Air Force job. Our chief of staff, Gen. Ronald Fogelman, was a history major at the Air Force Academy. I was a political science and international affairs major."

Unlike most institutions of higher learning, the academy has no graduate students working as teachers or laboratory assistants. Each faculty member must hold at least a master's degree. Forty percent have doctorates.

"The student-teacher ratio is smaller than a typical university," adds Smith, who began instructing in the aeronautics department in 1985. "We have about 4,000 students and 550 faculty members. Our typical class size is about twenty students. My daughter goes to a large state university and some of her freshman classes have 500 or 600 students in them. Faculty members here are teachers first, not researchers. That's another big difference. The help is here if cadets want to succeed."

Even though teaching comes before research, the academy has some impressive research facilities that are used primarily for teaching. The aeronautics lab features four large wind tunnels, three operational jet engines, a rocket test cell, and a wide variety of other instructional and demonstration hardware. The wind tunnels can produce air flows with velocities from thirty miles per hour to Mach 4.5. The academy has flight simulators, an observatory, a planetarium, and an air field with the largest collection of gliders in the world. The academy's research library contains over 500,000 volumes and a large collection of historical aeronautical materials. Two astronautics laboratories have workstations with digital and analog computers, a space shuttle simulator, and laser pointing and tracking equipment.

Athletics forms a strong second pillar of the academy experience. Stringent athletic requirements also distinguish the academy from universities. Every cadet is required to take three physical education courses each year as well as compete in intramural or intercollegiate athletic programs. Cadets must also pass rigorous physical fitness and aerobics fitness tests every semester.

The intercollegiate program has seventeen men's teams and ten women's. The football team, the Fighting Falcons, competes in the Western Athletic Conference and faces non-conference opponents like Notre Dame, Army, and Navy.

The academy has some of the finest athletic facilities in the nation, including a five-level cadet gym that contains three regulation-sized basketball courts, four indoor tennis courts, and an Olympic-size pool. A cadet field house contains a track, a hockey rink with seating for 2,500 spectators, playing fields, and a 6,000-seat basketball arena. The academy's Falcon Stadium can seat over 50,000. Other outdoor facilities include two golf courses, thirty-three tennis courts, six basketball courts, a large track and field facility, and over 150 acres of practice and intramural fields.

Military training, the third pillar of the academy experience, begins the summer before cadets formally enter the academy. Incoming cadets get off the bus and immediately trade their civilian clothes for military uniforms. Their hair is cut to academy standards. They must also take an oath that makes them a member of the armed forces of the United States.

The strict military environment at the academy is new and unfamiliar to most new cadets. Less than a quarter of the class of 2000, for example, have one or more parent with any military background. Only eleven percent were involved in Junior ROTC programs in high school. Sixteen percent have prior military service (regular Air Force and reservists). Only about four percent have a father who

"Cadets can test their wings in a variety of flying programs at the academy."
The academy's soaring program is the largest and most active in the United States, performing more than 30,000 sorties per year.

was a graduate of the USAF Academy. So for most, the military life takes some getting used to.

"When you walk up the ramp, life as you know it is over," explains Cadet First Class Matt Quatrara, the cadet wing commander. "And that is not entirely bad. At the time, though, the transition is a big shock. The shock comes in many different forms and attacks all of your senses. It comes the first time an upperclassman, with his tight haircut and hat, is yelling at you inches from your face. It comes in the form of the smell of issued soap and brand-new uniforms. Every time I get a haircut, the smells take me right back to that first day."

"I thought I was ready for the military lifestyle," says Cadet First Class Kim Reed, "but nothing prepared me for what happened on that first day." Reed got through that first day and eventually became the cadet wing commander for the fall 1996 semester. "The biggest change for me was no longer being in control of my life. I wasn't allowed to decide when to get up or when to eat. Everything I did depended upon someone telling me to do it. That lack of control is hard to deal with."
The cadet field house (above) contains a hockey facility that can seat 2,500. The interior of the cadet chapel (right) is just as beautiful as its exterior.

"My first day was a big shock for me, too," explains Cadet First Class Chris Selleicht, the director of operations for the cadet wing. "I had been forewarned that people would be in my face and telling me what to do. Just going from doing whatever I wanted to do to a total lack of freedom was the biggest shock. It's ironic that we are here to protect people's freedom, but we must completely lose our own to do that. As you slowly gain some of these freedoms back and get more responsibility, you value what you have.

"When you come here, your priorities change entirely," Selleicht continues. "Every day, I have to make sure my uniform looks right. How many high school kids care what they look like when they walk out the door? Not too many. The academy forces you to pay attention to every level of detail."

These initial experiences are followed by a rigorous five-week orientation program called basic cadet training or BCT (often pronounced beast). BCT, which comes in two phases, introduces cadets to military life. Both phases are administered by upper-class cadets with commissioned officers and sergeants serving as advisors.

The first phase takes place on campus and is devoted to military orientation programs. Cadets learn basic skills and responsibilities, improve their physical conditioning, and adapt to teamwork through competitive sports. The second phase consists primarily of field training conducted at Jack's Valley encampment site, five miles north of the cadet area. Cadets march to the camp site in battle dress, erect a tent city, and live there for a week for additional training. The activities expand their military orientation, teach them skills associated with weapons use, and develop physical and mental confidence through challenging obstacle courses. The field training demands the utmost in stamina, determination, and resourcefulness.

During BCT, cadets learn what is called the fourth-class system. The system prescribes the manner in which fourth-class cadets behave toward other cadets and officers. The system defines those things they can do within the cadet area and things they cannot. It makes them responsible for memorizing fourth-class knowledge, including information about the academy and the Air Force. This knowledge is contained in a booklet called Contrails. The system teaches cadets to perform delegated tasks in a professional manner and paves the way for them to become Air Force officers.

During the summer of their second year, all cadets receive survival and evasion instruction. This three-week course, conducted at the academy and in the nearby Rocky Mountains, simulates the experience of an aircrew member who is forced down in unfamiliar territory. A mandatory summer course for second-class cadets is a three-week tour of duty with an operational Air Force unit to gain insight into Air Force operations and a feel for the working environment of a real-world unit. First- and second-class cadets also assume at least one leadership position in summer training courses, such as the BCT for
fourth-class cadets or the survival and evasion training for third-class cadets.

Airmanship and aviation courses constitute an important part of military training as well. Cadets receive their first orientation flights in jet aircraft and helicopters as early as BCT. Cadets take a soaring course, where they have a chance to fly sailplanes. They can also take courses in freefall parachuting. Aviation courses range from instruction on fighter and bomber operations to preparation for the Air Force’s undergraduate pilot training program. Selected cadets serve as aviation instructors for the sailplane and parachuting programs.

First-class cadets selected to enter undergraduate pilot training after graduation take a flight screening course run by the 557th Flying Training Squadron of the Air Education and Training Command. In this program, cadets log over twenty hours in eighteen flights in the two-seat T-3A Firefly.

Character development accounts for an essential fourth pillar of the academy experience. From the moment cadets enter the academy, they begin an education process designed to help them understand responsibilities and expectations associated with the academy’s honor code. The code itself is fairly straightforward: “We will not lie, steal, or cheat, nor tolerate among us anyone who does.” Cadets are required to abide by this code when they take an honor oath at the conclusion of BCT. The oath is the formal acceptance of the code as part of their lives while at the academy and as part of their careers in the Air Force.

“The honor code represents a minimum level of behavior,” Stein explains. “What we are really looking for is someone who knows that living an honorable life is more than not lying, cheating, or stealing. Today’s students are better in some ways, but in other ways they have not spent a lot of time thinking about what an honorable life entails.”

While the honor code instruction comes throughout the four-year academy program, the focus changes as cadet responsibilities increase. Formal classroom presentations are given to third- and fourth-class cadets. In the remaining two years, the instruction becomes a bridge to active duty.

“The public expects us to be held to a higher standard than anybody else,” explains Lt. Col. Mark Hyatt, the director of the Center for Character Development at the academy. “Defense contractors face similar scrutiny. But this increased scrutiny is the nature of our business. We control and manage at fairly young ages major projects—aircraft and a variety of other expensive machinery and weapons.

“Cadets come from all over and we get the best that the country has to offer,” Hyatt continues. “But different regions of the country have different prejudices, and cadets often come here with some of them. We teach them how to respect different ethnic groups and cultures. They are going to be working together as a team. If they can’t treat each other with respect and dignity, the team will suffer. We hit the cadets hard when they first get here because we need to let them know that they are going to be held accountable for what they say and do. We can’t send them out to deal with companies and with other cultures unless they meet the highest standards.”

Meeting those highest ethical standards is just one of the many challenges faced by the Air Force Academy. “Our biggest challenge is to respond to what the Air Force needs in a professional officer,” Stein says.

“It’s easy to forget why we are here because we get wrapped up in the day-to-day events,” says Reed who, at the start of her last semester at the academy, is looking forward to active duty. “When I graduate, I am in the Air Force. I have a commitment to service. That is the purpose of the Air Force Academy. It’s not to make us the best academic achievers, or athletes. It is to make us the best Air Force officers.”

Eric Hehs
Rear Admiral Craig Steidle is the director of the Joint Strike Fighter Program. He came to the program in January 1994 after spending four years managing the Navy’s F-18 program, where he directed the development of the F-18E/F. A decorated Naval pilot, the admiral has flown over fifty different types of aircraft, among them the F-18, A-6, F-4, A-3, and H-2. He has accumulated over 3,600 flying hours in his flying career, including nighttime carrier-based missions over North Vietnam.

As the top military official in charge of the Joint Strike Fighter Program, the admiral visited Fort Worth in late January to attend the kickoff meeting of the JSF concept demonstration phase. While in Fort Worth, he shared these thoughts on the JSF with the editor of LMTAS’s Code One Magazine, Eric Hehs.
Rear Admiral Craig Steidle

What is the importance of the JSF program to the US military?

It is vital. It is the most important program. It is our future. The Navy needs a first-day-of-the-war survivable strike fighter to complement the F-18E/F. The Air Force needs a replacement for its F-16s and A-10s. The Marine Corps needs a replacement for its AV-8Bs and F-18s. The Royal Navy needs a replacement for its Sea Harriers. These services have no alternatives to the JSF to fill these roles.

How is this program different from previous military aircraft programs?

An emphasis on affordability is the primary difference. Affordability accounts for the main reason we started the program. With the unit cost of airplanes increasing, we need to do business differently.

We are keeping costs low by getting warfighters and technologists together in the beginning of the program. You are helping us coordinate the cost and operational performance trades where we’re asking questions like, How much does that last twenty percent of capability cost? Do I need it? Where are the knees in the curves for performance and capability? What advances will allow us to affordably achieve our goals? We have never taken this approach with a fighter before. We are doing all of our development up front and taking risk to the lowest level before we go to the next phase of the program, engineering and manufacturing development, or E&MD.

How are the interservice relationships working out?

Outstanding. My staff includes members of the Marines, Navy, Air Force, and UK personnel—civilians and military alike. When we perform the campaign analyses, we often wear civilian clothes. You can’t tell who is in the Navy, Marine Corps, or Air Force. We have a great blend of people. We also have full support from the top down. That support makes a difference. Dr. William Perry [then Secretary of Defense] made the announcement for the downselect for this phase of the program. We received great support from him and from the service chiefs, military secretaries, and all the way down the chain of command.

I work for the assistant secretary of the Air Force. My deputy is an Air Force general. She will take over the program and will work for the assistant secretary of the Navy and then her deputy will be a Naval officer. My third in command is a senior Marine Corps lieutenant colonel. When I get briefings and discuss what is taking place here, everyone listens in—the Marine Corps, Navy, Air Force, and the British Royal Navy. The services are fully integrated across the board.
Is this interservice cooperation peculiar to the JSF program?

Joint-service programs are not completely new. You are seeing more cooperation across the board. JPATS, JDAM, JSOW all represent joint programs or joint ways of doing business. I can get you a long list of joint programs at the weapon level. JSF, however, is on a different scale. It is the largest joint acquisition program in the Department of Defense.

What makes an interservice approach more affordable?

Many of the services have similar requirements. Very simply, the only difference between JSF variants is how they will land and take off. The rest of the stuff in between, as well as the way we support and maintain the airplane, is all the same. Through commonality, we can reduce life-cycle cost, the cost of ownership.

Historically, the services have never fielded a successful interservice aircraft that was designed as such from the start. What circumstances induced the services to take a joint approach?

The cancellation of several other programs drove us to look for a more affordable solution. Unit cost for fighter aircraft continues to rise. This trend applies to every current fighter program, including the Gripen, Rafale, and the Eurofighter 2000. All of these weapon systems are becoming unaffordable to produce, develop, and maintain. We have to start doing things differently.

The most common negative comment I hear is that we tried this before with the F-111. But if you go back and research that program, it was very different. The F-111 was not a joint program. A single service led that program.

How can engineers and factory workers here prepare for, or help implement, some of the innovations required for this program?

Your leadership is very receptive to doing business differently. Everyone here seems willing to listen to how to reduce weight and how to increase reliability and durability. You are looking at new diagnostic methods and innovative ways of doing business. Every idea for improvement will be considered.

What are some of the biggest obstacles the program has to overcome and how are you dealing with them?

This next phase of the program, concept development, is an obstacle in itself. No one has ever built an operational supersonic STOVL strike fighter. We have to develop a propulsion system and fully integrate it in the airplane. Then we have to fly it. We have to negotiate milestones and stick to them. We have to mitigate risks. These are not easy tasks. Everyone’s plate is full.

What are your expectations for the current phase of the program?

I am ecstatic that we’re now past the last phase of the program, which involved getting the funding in the right years, producing a request for proposals, and completing the source selection process. We have defined the processes and systems. Now we have to build the aircraft, which will be the most enjoyable part of the program. Three years from now, you will see this airplane out on the flight line. And we don’t get to build new aircraft very often anymore. We have a lot of milestones between now and a first flight. But the ultimate test will come when we roll those airplanes out and take off.

Will the underlying assumptions justifying the projected cost of each variant be tested or proven during this phase of the program?

They will be tested and proven every day. You have proposed several aircraft affordability initiatives. You have
some unique demonstrations and you have demonstrations peculiar to what we call the preferred weapon system concept or PWSC. These demonstrations will show that you can achieve the cost levels that you have proposed. We are primarily interested in the PWSC, that is the airplane that we will eventually take delivery of in 2008. Everything we do is geared to how that airplane performs, how much it weighs, and what it costs—not just unit cost, but the life-cycle cost of ownership.

Do a lot of these assumptions depend on government actions?

The government sets some of the parameters, like how many airplanes we are going to buy and how we are going to support them. We also share some of the pieces. We have been working together with industry on a joint common cost model. We have been establishing and discussing with industry the basic assumptions for this model.

Some of the pieces that define the requirements for JSF came from a campaign analyses. We used major regional conflicts that come from the Department of Defense. We actually ran campaign analyses and discovered deficiencies—material treatments, payload, range, and all the particular characteristics that define a weapon system. We shared those results with you and you responded with a proposed airplane that would solve the deficiencies. We have worked together.

How do production run and other factors relate to cost?

Cost and quantity curves flatten out at about 1,600 airplanes. You also have to consider a learning curve, which also becomes relatively flat after a period of time. Through affordability initiatives, though, we are lowering the learning curve to bring the initial cost down. Another aspect of overall cost is cost of ownership—that it costs to operate the airplane, the number of maintenance personnel required to support the airplane. These factors determine operation and support costs, and they are equally as important as production cost.

Does the program depend on any major breakthroughs in technology?

No. Since the E&MD phase of the program begins relatively soon, in 2001, the technologies have to be brought down to a low-risk point before the turn of the century. The biggest advances that we will see will come in the area of structures. But no new materials are involved. We are working with and will soon fly integrated subsystems.

In avionics, we are looking at an open system architecture, which has never been applied to a weapon system. As you probably know, companies that produce microprocessors are not going to produce military-specific processors anymore. This situation forces us to design systems that can use off-the-shelf processors. Technology is advancing so fast in this area that doing it the old way would leave us with obsolete systems. Also, the propulsion team is going to do a lot of work. Their efforts will be demonstrated in the next three years.

How do the services plan to reconcile planned procurement of the JSF (2008 timeframe) at over 100 aircraft per year with no assumed increases in military spending combined with other aircraft programs also entering the production phase?

We have to defend the President’s budget every year. We are in a very good position, though. This program has fared very well because of its basic premise. It grew out of the unaffordability of other programs. So this program stands for doing business differently.

We’re addressing requirements across the board, for four services. And we are seeing increased interest from our allies, in addition to the United Kingdom, in the program. In the future, we will see memorandums of understanding signed with Canada, Norway, The Netherlands, and Denmark.

How does the integration of foreign partners benefit them and the program itself?

Foreign military collaboration runs the range from the early integration of collaborative partners, like the United Kingdom, to the involvement of countries that are just interested in doing requirements validation. Having collaborative partners on board now is unique. Those relationships are working very well.

Other countries are interested in having us help them define their operational requirements so they can go to their parliaments and ministries of defense to propose programs for the future. They have to go through the same thought processes we do for acquiring new aircraft. They have to evaluate what they need in the year 2010 and how to justify those requirements. They have to trade off operational requirements and performance capabilities just like we do.

What is the public’s perception of the JSF program?

Those people who are aware of what we are doing are generally very positive. I haven’t received anything other than a positive response to what we are doing. Congressional staffs are positive. If a group gives me an opportunity to talk about what we are doing and why we are doing it, they are very receptive to the program by the end of my talk.
NATO Peacekeepers
JOINT DUTCH-BELGIAN
F-16 OPERATIONS

BY TIM RIPLEY

The distinctive roar of two approaching F-16 Fighting Falcons alerts two
ground crewmen they are required for duty. The weapons technicians
from the Belgian and the Netherlands air forces work together to remove
the 500-pound bomb and the AIM-9 Sidewinder missile arming pins from
the Belgian F-16. Arming complete, the technicians signal thumbs up
to the Belgian F-16 pilots to proceed to the main runway of the Villafranca
Air Base in northern Italy. An Italian domestic airliner from nearby Verona
takes off, making the two fighters wait five minutes before heading out
over the Adriatic. The F-16s are part of the NATO Operation Deliberate
Guard to enforce the precarious peace in Bosnia-Herzegovina.
Dutch and Belgian F-16s line up together on the ramp at Villafranca Air Base in northern Italy. These aircraft and their pilots and maintenance crews play a principal role in peacekeeping missions over the former Yugoslavia.

Since October 1996, Villafranca has been home to the first multinational F-16 detachment ever to conduct a real-world military mission. The unique contingent is part of the new multinational Deployable Air Task Force, or DATF, the two countries formed to make more efficient use of their air assets. Over 250 Belgian and Dutch men and women work together to launch F-16s on patrols in the area of responsibility for the NATO Stabilization Force to protect allied ground forces.
“Last summer, the Belgian and Dutch governments signed the agreement setting up the DATF,” explains Lt. Col. Anton den Drijver, the Dutch commander of the Villafranca detachment. “In October, the phone rang here, so we combined Villafranca into a Dutch-Belgian detachment to start off the DATF.”

Sending four Belgian F-16s to Villafranca to join a Dutch detachment of ten aircraft already supporting NATO peacekeeping missions put flesh on the DATF concept. “It takes a lot of money to run an operation like this,” den Drijver says. “In 1993, the Royal Netherlands Air Force committed eighteen aircraft to NATO’s Operation Deny Flight, as the Bosnia-Herzegovina mission was called then. Eighteen aircraft out of the Dutch F-16 community represent a big effort. The Belgians have wanted to participate in NATO air operations here for a long time, but they did not have radar warning receiver equipment in their aircraft, one of the requirements for NATO aircraft to operate over Bosnia-Herzegovina. They now have the French-made ESD Carapace radar warning receiver system, so they are cleared to come here.”

The DATF is aimed at maximizing the air assets of both countries. The RNLAf boasts air-to-air refueling tankers. The Belgians have five times as many Lockheed Martin C-130 Hercules transports than the Dutch. With increasing demands on allied airpower for UN or NATO peacekeeping missions, the smaller allied countries are looking at innovative ways to make their limited and diminishing defense budgets stretch to the demands of the new world order.

“We have been working together for a long time—at Red Flag exercises, during low flying training at Goose Bay, on Euro-NATO exercises, and at the Euro-Fighter Weapons School,” says Maj. Nathan De Permentier, commander of the Belgian contingent at Villafranca. “Now, for the first time, we have a written agreement. So our way of working was made official in the DATF.”

A DATF project office has been set up in the Dutch capital, The Hague, where officers from both countries work together to coordinate joint air operations. “The project office is evaluating big exercises in which our two air forces may contribute jointly,” says den Drijver. “We are looking at a more common approach for the future.”

At Villafranca, the joint F-16 detachment is working hard to refine the DATF concept and to meet the demanding NATO taskings. The 190 Dutch and seventy Belgians work side-by-side to staff the task force operations room, intelligence cell, maintenance shop, cook house, security patrols, bomb dump, and flight line. The only area not shared is the photo reconnaissance interpretation cell; the Belgians did not bring reconnaissance aircraft. Dutch and Belgian pilots, however, still fly aircraft only from their own respective air forces.

The most public area of cooperation between the two air forces is on the Villafranca flight line, where Dutch ground crews in their gray uniforms can be distinguished from their Belgian counterparts who wear fatigues. Once the Dutch and Belgian pilots remove their name and squadron patches from their flight suits before missions, visitors cannot tell them apart.

“Most of the Belgian personnel come from Kleine Brogel Air Base in the Flemish-speaking region of Belgium,” den Drijver explains. “Their language is very similar to Dutch, so that makes it easier for our personnel to work together.”

Once in the air, English is the standard language of all aircrews taking part in NATO operations. Joint technical support for the F-16 is possible because both air forces use essentially similar variants of the aircraft, F-16 Block 15 models. The aircraft still have some minor differences (such as the radar warning receiver systems described earlier). The Dutch also fly the RF-16, which has special cockpit controls for the aircraft’s centerline reconnaissance pod. The
weapon systems also have minor differences. The Dutch use AIM-9L Sidewinders and the Belgians use AIM-9M models. Belgian Mk 82 500-pound bombs also have unique fuses.

Col. den Drijver says the differences are minor. “Our technicians are fully integrated—the Dutch and Belgian guys work together.”

Belgian F-16 pilots also work with their Dutch comrades to adapt to a NATO requirement for the Villafranca detachment aircraft to fly in a swing-role, that is, armed with both air-to-air and air-to-ground ordnance. The Belgian 10th Tactical Wing, which provides the aircraft and crews for Villafranca, used to be a single role unit. “They are now starting the same systems as we are,” den Drijver explains. “Both squadrons fly a primary role and carry an additional capability in the other role.”

Maj. De Permentier said the Dutch and Belgians fly almost every day. “Although the situation has now stabilized and the threat to our aircraft has decreased, the missions are certainly not considered routine sorties. Our pilots must stay alert and on top of the situation,” he said.

The situation in Bosnia is calmer since the arrival of NATO peacekeeping forces brought an end to the war over a year ago. NATO airpower is still in demand if a crisis starts to develop. “As soon as a small conflict arises between the factions,” den Drijver explains, “the NATO ground forces ask us to show a presence. We can be over the conflict in just a few minutes.” In November, for example, NATO peacekeepers were being threatened on the ground. They asked the Belgians to be overhead in the morning and the Dutch in the afternoon.

One mission unique to the Dutch at Villafranca is photographic reconnaissance with their RF-16s, flown by personnel of 306th Squadron from Volkel AB. Since April 1993, the Dutch have maintained three aircraft at Villafranca on NATO duty. A photographic interpretation team, using their Dutch-made Orpheus photographic pods, has also been resident. The RF-16s have flown several thousand missions over Bosnia, providing NATO and UN commanders with intelligence on the country’s warring factions. When not flying missions, the RF-16s are on ground alert in hardened aircraft shelters, ready to fly over Bosnia on short notice from NATO’s combined air operations center at Vicenza in Italy.

“We had no pictures of Bosnia-Herzegovina as late as 1993,” den Drijver recounts. “So we began compiling all the photo information into a big database as we acquired it. Now we are updating our intelligence on cantonment areas. We are watching the weapons of the former warring factions, finding mass graves, and
updating targets damaged in the 1995 Operation Deliberate Force bombing raids to see if they are being rebuilt."

The reconnaissance mission is far from easy for the RF-16 pilots. To avoid antiaircraft artillery fire and portable surface-to-air missile threats, NATO rules of engagement prevent them from flying below 5,000 feet above ground level. But the Orpheus pod was designed for use at 250 feet in the NATO-Warsaw Pact scenario. Aircraft have to fly at forty-five-degree angles because the pod’s four cameras face sideways. Furthermore, the pod’s infrared scanner is not optimized for high-altitude work.

To help ease these problems, the Orpheus pods will soon be replaced by the Danish Per Udsen pod, which is optimized for use at higher altitudes. New mobile film processing units have just been delivered to Villafranca for use by the photographic interpreters. These units allow “wet film” photographs to be developed, printed, studied, and transmitted quickly. The new units are designed to be carried in the RNLAf’s KDC-10 tanker-transport aircraft to enhance the country’s rapid deployment capability.

All RF-16 imagery is sent to Vicenza for analysis by electronic means as well as by other means. But at critical times, helicopters have collected photographs for delivery to the NATO headquarters.

“We have several different reconnaissance assets in the region at the moment, and they give different capabilities to higher level commanders,” den Drijver says. “The commanders often still require old-fashioned photographs to get a complete picture. Unmanned vehicles can provide video imagery, but the imagery is never quite good enough for future planning.”

The bulk of the Villafranca detachment during the last months of 1996 and into 1997 has been provided by the RNLAf’s 322nd Squadron from Leeuwarden. The unit is on its third tour of duty and has supported Bosnia peacekeeping efforts since 1993.

“The first time we were here, no one had flown over a war zone,” recalls the Dutch operations officer of the Villafranca detachment. “For this latest deployment, we have only a very few young members who are here for the first time. Everyone else has been here two or three times. We have plenty of experience. We’re still using the lessons learned in the first and second deployments and passing them on to the Belgians.”

During the 322 Squadron’s last deployment to Italy in 1995, it played a key role in providing close air support to Dutch UN troops trapped in the Srebrenica enclave. The squadron went on to fly sixty-five missions during Operation Deliberate Force, dropping 500- and 2,000-pound bombs on Serb targets. “All the targets tasked were hit,” says an operations officer who flew during the NATO air offensive.

The detachment’s commander at the time, Lt. Col. Jouke Eikelboom, says the Dutch F-16s regularly came under antiaircraft artillery and surface-to-air missile fire during Operation Deliberate Force. “The antiaircraft fire was like big black explosions—just like in the movie, Battle of Britain,” he says. On 10 September 1995, the Dutch F-16s were called into action to provide close air support for Nordic UN troops under Serb artillery fire. “We dropped bombs on an artillery observation bunker directing the fire,” said Eikelboom. “They hit the target and the Danish tactical air control party told the pilots afterwards, ‘That was beautiful.’”

Since allied leaders have agreed to extend NATO’s peacekeeping mandate into 1998, the joint Belgian-Dutch air detachment at Villafranca looks set to be on duty over the former Yugoslavia for many months to come. The lessons learned are likely to be studied by the air forces of the two countries. Other European air forces are looking at the possibilities of joining forces with partners.

“We are directly linked to the presence of Belgian and Dutch military personnel on the ground in the former Yugoslavia,” Maj. De Permentier explains. “If our politicians allow, as long as our troops are on the ground, we will be in the air to support them.”

Tim Ripley is a freelance military author based in England.
Six F-16s roared from the runway at Homestead ARB, Florida, last March on a unique mission. The ten-hour flight took crews from Homestead’s 93rd Fighter Squadron of the Air Force Reserve to Santa Maria Air Base in southern Brazil where they flew and worked with members of the Brazilian Air Force in an exercise called Tiger III.
Several F-16 pilots had a chance to fly from the back seat of the Embraer-built AMX, or A1 ("SC" tail in upper left photo). This small attack aircraft, designed and built jointly in Brazil and Italy, is configured with a modern inertial navigation system and armed with two 30mm cannons in the nose and an array of weapons that includes wingtip AIM-9L Sidewinder missiles.

The unofficial mission statement for the F-16 deployment reads something like a Department of Defense declaration of good will: "Deploy to Santa Maria Air Base to work on joint training missions with the Brazilian Air Force." Missions were organized to share with the Brazilian pilots all aspects of defensive air combat maneuvering, employing both missiles and guns. A variety of tactical setups and intercepts were organized for control visually by pilots and by local radar ground controllers. The final event for the deployment was a defensive counter air mission with F-16s flying against Brazilian F-5s and AMXs in sweep and strike roles.

Tiger III is the second major deployment of US fighters to Brazil since World War II, but the first ever to southern Brazil. In the 1996 Tiger, six F-16A/Bs from the 198th Fighter Squadron of Puerto Rico ANG deployed to Natale in northeastern Brazil. Tiger I consisted of a visit to Puerto Rico by a detachment of Brazilian F-5Es.

Besides encouraging cooperation and building goodwill between the Americas, the deployment carried a historical significance. Fifty years ago, the two air forces operated and manned the 305th Fighter-Bomber Wing of F-4 Thunderbolts in the Mediterranean. As part of the 12th Air Force, the same US command that is today the air component for the US Southern Command, the Brazilian and American pilots of the 305th flew hundreds of combat missions from Italian bases during World War II.

Today, Brazil maintains one of the region's most prestigious and best equipped armed forces. The country's military has undergone profound changes since the acceptance of a 1988 constitution in which the Brazilian people directed their military to conduct only defensive operations. As Brazil approaches the new century, protecting the national sovereignty and securing the integrity of the land and sea borders have become equal in importance to protecting its vast economic and environmental resources. Brazil's environmental recovery program for the Amazon Rain Forest has brought admiration and respect from around the world.

 Brazilians are Americans, too, and very proud of it. Their country is larger than the continental United States with a booming economy and great cities like São Paulo, which numbers over 22 million people. They have escaped chronic inflation and now want to move smartly into the twenty-first century with some sort of a regional economic understanding. As the leader and economic "engine" behind Mercosul—a five-nation common market that includes Argentina, Bolivia,
Brazil, Paraguay, and Uruguay with Chile as an observer—Brazil wants to see a cautious expansion of the NAFTA initiatives, not one that forces them to compete recklessly. As an example, southern Brazil is a thriving shoe producing region seeking North American markets now denied.

All pilots received good training experiences with dissimilar aircraft. Both air forces rotated from the instructor to student role, allowing the full range of maneuvers and tactics to be explored. All pilots from Homestead have flown over 1,500 hours in the F-16, several have over 2,000 hours. For them, the chance to work with new pilots in different aircraft was sheer professional joy.

Early missions in the week-long deployment consisted of local area orientation missions with formations of Brazilian F-5s and AMXs leading single F-16s around the operating area. These were followed by at least eight F-16 sorties a day with various combinations of F-5s and AMXs. At least two F-16D sorties were offered each day for VIPs. Brazilian pilots also had the chance to get to know the D model F-16. Tankers from the 434th Aerial Refueling Wing of Grissom AFB, Indiana, made themselves available on a track above Santa Maria Air Base. The tankers flew each day configured with both the traditional refueling boom for the F-16 and the Navy-style basket for the F-5 and AMX aircraft.

Despite the more obvious training objectives for Tiger III, an underlying goal of the US government and military was to strengthen the relationship between the two countries. An honest and forthright meeting of professionals from both air forces helped set the stage for a flurry of diplomatic activity scheduled for the spring, highlighted by President Bill Clinton’s visit scheduled for later this year.

In addition to the participating pilots, special guests visited the operation. Brig. Gen. Manuel Carlos, the commander of Brazil’s 3rd Air Force, spent two days at Santa Maria. Carlos had the opportunity to fly in the back seat of an F-16D model with Maj. Dennis Daley from Homestead. “The F-16 is a very nice aircraft to fly,” said Carlos when he returned from the flight. “In fact, I would like one of them for myself.”

Maj. Gen. John Campbell, commander of the US 12th Air Force, also paid the deploying forces a visit. “This is a great opportunity for us to strengthen the ties between our two Air Forces,” said Campbell on the flight line. Both he and Carlos discussed possible future exercises involving their respective air forces.


Brazilian crowds line up to see the Fighting Falcon on display at Santa Maria Air Base at the close of Tiger III.
Brazil's Air Defense Command operates two squadrons of Mirage IIIs (not pictured) and the Tactical Air Command operates six squadrons of the AT-26 Xavante (Aermacchi MB-326) and F-5E/F Tiger aircraft. Here, an F-16 from Homestead flies in formation with a Brazilian F-5 (top) and an AMX.

Tiger III was extensively covered by local and international television networks and the press. In addition, CNN from Miami sent a four-person crew to cover the entire week’s events. In a show of regional cooperation with its neighbors, the Brazilian Air Force invited observers from Paraguay, Uruguay, Chile, and Argentina. The last afternoon of the deployment was set aside for a public open house with a large static display of all aircraft. Crowds lined up to get a look at the F-16, which is rarely seen in Brazil.

“I’m hopeful that 1998 will see a Tiger IV exercise hosted at Homestead AFB,” expressed Col. Steve Fulghum, the operations group commander for Homestead’s 482nd FW. “It will be a great opportunity to show the Brazilian Air Force and, perhaps, other air forces from South America, the same type of hospitality, professionalism, and warm feelings that we received here. As far as strengthening international relations between the United States and Brazil, Tiger III was an outstanding success.”
F-22 Emerges From Factory

This was the scene on 6 March when the first assembled Lockheed Martin-Boeing F-22 air dominance fighter made its initial appearance outside a factory. The aircraft was towed out of the final assembly area of the 3.5 million square foot main building at Lockheed Martin Aeronautical Systems in Marietta, Georgia, across the runway to adjoining Dobbins ARB, and over to the newly erected engine test facility (called a hush house), where the aircraft will undergo fueling operations and engine runs. The formal rollout ceremony for the Air Force's newest fighter was held 9 April. Company pilot Paul Metz will make the first flight of the F-22 in May.

F-16 and Eurofighter Make Norwegian Short List

The government of Norway has announced that the Lockheed Martin F-16C/D is one of two candidates on its short list for a new fighter aircraft purchase. Along with the F-16, the Eurofighter 2000 will be further evaluated for the purchase. Norway has eliminated the McDonnell Douglas F/A-18 and Dassault's Rafale from consideration.

"We are pleased that Norway has recognized the capability, versatility, and quality of today's F-16, and we look forward to working with the Royal Norwegian Air Force in the next phase of this competition," said Dain Hancock, president of Lockheed Martin Tactical Aircraft Systems.

"This decision is the result of many months of thorough evaluation within Norway's defense ministry," Hancock said. "It is another important step in the continuing evolution of the F-16 program in Norway. In the coming months, we will be working closely with the Norwegian government and industry to develop mutually beneficial industrial cooperation activities that continue our company's long partnerships in that country."

Norway's air force has been flying earlier versions of the F-16 since the 1980s. Its existing F-16 fleet is currently being modernized as part of a five-nation update program that includes extensive participation by European industry. Lockheed Martin is offering configurations of its advanced F-16C/D aircraft in the current fighter competition.

Hancock said Lockheed Martin welcomes the opportunity to compete the F-16 against the Eurofighter. "The technology of the newest F-16 versions can compete effectively with any multirole fighter in the world," he said.
US Postage Stamp Honors Air Force

The US Postal Service will recognize the contributions of the Department of the Air Force and the fiftieth anniversary of the Air Force as a separate military service by issuing a commemorative postage stamp on 18 September 1997. The stamp was formally unveiled in December at a Pentagon press briefing.

The stamp features the Air Force Thunderbirds, the service's official aerial demonstration team, in a classic four-ship diamond formation. Flying the F-16 Fighting Falcons emblazoned in a special patriotic motif, the team was captured performing this dramatic maneuver by Philip Hundleman, an aviation photographer, author, historian, and pilot. Hundleman’s photograph of the Thunderbirds was selected from among many that were reviewed in a nationwide competition.

“The stamp’s design depicts the Air Force’s air power mission along with the pride and professionalism of its service members,” said Secretary of the Air Force, Dr. Sheila Widnall, at the unveiling. “We are honored to be selected as a stamp subject celebrating America—its heroes, history, and humanity.” Larry M. Speakes, senior vice president of the Postal Service, paid tribute to the people the stamp represents: “It honors the men and women who dedicate their careers, and sometimes give their lives, to protect our country and preserve our freedom.”

Alaska Unit Celebrates Fiftieth

An ice sculpture standing twelve feet tall and ten feet wide was unveiled at Eielson’s front gate in January to kick off the base’s year-long salute to the Air Force’s fiftieth anniversary.

Gen. John L. Lorber, Pacific Air Forces commander, and Brig. Gen. Richard Brown, 354th Fighter Wing commander, lifted the veil off the frozen sculpture in front of an audience of thirty-shivering people. The ice was then lit by red, white, and blue lights that will produce a glow seen from several miles at night.

“This ice sculpture is unique for the Air Force celebration,” said Lorber. “I know in Hawaii, we won’t be able to replicate this.”

Lorber said the ice sculpture reflects the spirit of the people at Eielson and in Alaska and found it most fitting to have the sculpture start out the celebration of the fiftieth anniversary.

The work is composed of four blocks of ice measuring three feet wide, five feet high, and two feet thick. The blocks were delivered by an organization that sponsors the annual World Ice Art Championships each March in Fairbanks. Forklifts stacked the 3,000-pound blocks on top of each other.

The artist, Steve Brice, braved temperatures of forty- and fifty-degrees below zero for five days to carve out the design. He kept warm next to the work under a plastic tent supplied with a heater. The sculpture will remain in place as long as the temperature stays below freezing.

USAF PHOTO MSgt. CHARLES NEWMAN
Luke Pilot Hits 3,000 F-16 Hours

Maj. Kevin Henabray, the director of operations for the 302nd FS of 944th Fighter Wing (AFRES) at Luke Air Force Base, Arizona, passed the milestone during a four-ship air-to-air training mission against Marine F-18 Hornets during an annual “Scorpion Wind” exercise.

Henabray began flying the F-16 in 1981 at MacDill Air Force Base, Florida. He has also flown at Kunsan AB, Korea; Nellis AFB, Nevada; and at Hill AFB, Utah. He has logged 1,700 sorties in the F-16. Henabray is only the thirteenth pilot worldwide to surpass the 3,000 hour mark. When informed of his place on the 3,000-hour F-16 roster, Henabray said, “I guess in my case it’s a lucky thirteen!”

Eglin F-16 Test Pilot Reaches 3,000 Hours

Maj. Paul Sullivan of the 39th Flight Test Squadron at Eglin AFB, Florida, reached the 3,000-hour mark in the F-16 in January. His milestone came on a test flight involving the advanced short range air-to-air missile, or ASRAAM.

Sullivan began flying the F-16 at MacDill AFB, Florida, in 1982. He has flown with F-16 units at Kunsan Air Base in South Korea, Hill AFB in Utah, and Moody AFB in Georgia. He graduated from the USAF Fighter Weapons School in 1987. He has been flying F-16s as a test pilot at Eglin since April 1993. He is the chief test pilot for CBU-97 (sensor fuzed weapon), Wind Corrected Munitions Dispenser, and over-water scoring system.

“I’ve been very fortunate to fly everything from Block 5 to Block 50 F-16s,” Sullivan said. “The newer jets have great avionics and monster engines, but there is something to be said for a BFM knife fight in a small-tail Block 10. I agree with the statement that reaching 3,000 hours marks you as being old, but at least I’ll never be older than Brillo [Mike Brill], Lance [Undhjem], or Kanga [Bill Rew]!” Sullivan joins Brill, Undhjem, Rew, and ten other F-16 pilots who have reached the venerable 3,000-hour mark in the Fighting Falcon.

First ROKAF 2,000-Hour F-16 Pilot

Lt. Col. Hong, Wan-Pyo is the first pilot of the Republic of Korea Air Force to surpass 2,000 hours in the F-16. He surpassed the 2,000-hour mark in October. Hong first began flying the F-16 as a captain with the 161st FS in 1986, just four months after the first Peace Bridge F-16 touched down on Korean soil. He surpassed the 1,000-hour mark in 1991. Hong, who also has 1,000 hours in the F-5, most recently served as vice commander of the 161st FS at Jungwon Air Base. He is currently in charge of standardization and evaluation with the soon-to-be-activated 20th Fighter Wing at Sosan Air Base.
F-16 Units Win ROKAF Bombing Competition

The Boramae bombing competition sponsored by the Republic of Korea Air Force took place in late November at ROKAF’s Pilsung Range. The competition consisted of four events with units flying a variety of aircraft, including the F-4D/E, F-5E/F, and F-16 (Block 32 and 52). In the first event, pilots were allowed one pass in a low-altitude attack on a ground target. The second event consisted of one pass at a low angle with a low-drag bomb. The third event was a medium altitude bombing (two passes). The fourth event was three passes in a night bombing scenario.

The 161st FS was the overall winner of this year’s competition. Maj. Yim, Won of the 161 FS was named the overall Top Gun pilot for the competition. The 161st flies Block 32 F-16 aircraft. The 120th FS, which flies Block 52 F-16s, was named the best squadron for radar loft and the best squadron for night bombing. Maj. Cho, Duk-Koo of the 120th was named the individual Top Gun for the night bombing event. Congratulations to all participants.

Top Guns Of Pakistan

The Pakistan Air Force gathers its best fighter pilots every year to compete for the country’s Top Gun award. All fighter squadrons of the PAF are assessed for their efficiency in combat flying training, war preparedness, and weapon systems maintenance. This year, the 11th FS achieved the singular honor of bagging the Top Gun Award for an unprecedented third consecutive year. The squadron was not only crowned with the top award, but proudly won the top position in all three disciplines assessed in the competition. In addition to performing its operational commitments, the 11th squadron also serves as the only unit that trains PAF fighter pilots to fly the F-16.
555th Completes 2,000 Missions Over Bosnia

Aviano’s 555th FS, or “Triple Nickel,” notched an operational milestone in January in the skies over Bosnia-Herzegovina. Capt. Matthew Dana flew the 555th’s 2,000th sortie into the Bosnian area of responsibility and was joined by his wingman, Capt. Steven Giovenella, who pushed the unit’s mark to 2,001.

The occasion also marked Dana’s 105th mission to the area of responsibility—a squadron high. Behind Capt. Peter Gersten of the 510th FS, Dana was the second Aviano pilot to log 100 such sorties. In contrast with Dana’s experience, his wingman, Giovenella, logged his first mission over Bosnia during the flight.

Shortly after returning to Aviano, Dana said he was pleased to be selected to fly the landmark sortie, but added, “It’s important to remember that this is a squadron achievement, not an individual achievement. Overall, I guess it makes me feel kind of old to be the person with the most sorties in the squadron, but also proud of what I’ve been able to do here,” the captain said. “The sortie was significant for what it represents—a kind of marker for three years of continued contingency operations.”

When asked to compare his first Bosnia mission in February 1994 with his latest, Dana responded, “In the beginning, the missions were more air to air in keeping with the mission of Operation Deny Flight. Shortly after we began flying here, the squadron, then the 526th FS, was involved in the shootdown of four Galeb aircraft out of Udbina. This increased the air-to-air nature of the mission,” Dana said. “As time has progressed, the mission has evolved into one of air to ground, supporting the American troops stationed there. Although the air-to-air mission is still there, the focus is now on training for close air support.”

F-16 Units Support Operation Southern Watch

F-16s from South Carolina’s 169th FW from McEntire AFB and 20th FW from Shaw AFB deployed to Qatar in February to support Operation Southern Watch. The units constitute part of the 4th Air Expeditionary Wing, which consists of about thirty aircraft and support personnel from four bases in the United States.

The 169th sent twelve F-16 Block 52 aircraft on 19 February. The pilots flew non-stop and arrived in Doha, Qatar, almost fifteen hours and 7,250 miles later. The 169th is the first Air National Guard unit to deploy with an Air Expeditionary Force overseas. The aircraft flew with live AMRAAMs and AIM-9s, two tanks, and an ECM pod. All twelve F-16s were regenerated and ready to fly again within one hour of landing in Qatar. The 20th FW sent six F-16s similarly equipped from the 77th FS at Shaw. The deployment required support from four tankers from Air Mobility Command and numerous aerial refuelings.

For many pilots, the deployment was their first transoceanic crossing. “The flight really wasn’t as bad as I expected,” said Capt. Jack Daniel of the 77th FS. “The most beautiful sight was the lights on the coast of Spain.”
Air Force Concludes WCMD Testing

Two contracts worth $20.8 million and $9.5 million were awarded in January by the Aeronautical Systems Center system program office for the initial development of the Wind Corrected Munitions Dispenser system.

The WCMD is a tail kit that replaces existing tails on many munitions. The new tail will enable these weapons to be launched from medium to high altitudes and to eliminate the effects of wind, launch transients, and ballistic errors to achieve greatly improved accuracy.

WCMD weapons are currently scheduled to go on the B-1, B-52, F-15, F-16, and F-117 with planning for the B-2. The procurement objective is 40,000 units.

"The WCMD will provide a significant operational improvement over today's tactics," said Lt. Col. Greg Muntzner, WCMD program manager. "It will provide aircrews the sanctuary of both high altitude and distance from the target, avoiding enemy fire and safeguarding the airplane and pilot."

According to Lt. Col. Dave Loewer, air-to-surface munitions chief at Air Combat Command, WCMD-equipped weapons will provide an unparalleled capability against armored targets. "These munitions will be key to stopping a major regional conflict and to providing an all-weather high-altitude capability for the entire family of tactical munitions dispensers currently in the inventory," said Loewer.

The contracts with Alliant Tech Systems of Hopkins, Minnesota, and Lockheed Martin in Orlando, Florida, call for the design, development, fabrication, and initial test of the WCMD units. Both contractor efforts will be highly streamlined; development will be complete in less than twenty-four months.

The WCMD program represents the leading edge of acquisition streamlining. The contract award took just one year from initial program go-ahead, compared to three years for previous programs.

"The WCMD program represents a revolution in the way we're going to acquire systems in the future," said Clark Fiester, assistant secretary of the Air Force for acquisition. "We are demonstrating with this program that we really can deliver needed combat capability to the using commands in a timely manner while saving taxpayer dollars."

F-16 Weapons School Grads To Reunite

The F-16 Division of the USAF Weapons School will be hosting its first Viper reunion from 12 to 15 June 1997 at Nellis Air Force Base, Nevada, and at the Flamingo Hilton in Las Vegas, Nevada. All graduates of the F-16 Weapons School are invited to attend. Past and present F-16 weapon instructors should contact Capt. Dave Meyer or Capt. Mike Fantini at the following address or numbers:

USAFWS/WSF
Attn. Capt. Meyer/Fantini
4269 Tyndall Ave.
Nellis AFB, Nv 89191-6074
DSN: 682-2964 Commercial: (702) 652-2964
e-mail: meyrerd@usafws.nellis.af.mil
Safety First

I enjoy reading Code One very much and look forward to each issue. Thank you for an outstanding magazine. I have worked on the F-16 fuel systems for the past fifteen years of my military career, ten of which were in the active USAF and five in the National Guard as a civilian technician.

I am writing you about the July 1996 issue, page 7, lower left photo of the pilot half under a 2,000-pound guided bomb and a fueled 370-gallon external fuel tank. These loads have a combined weight of over 4,800 pounds.

The picture sends the wrong message. Under no circumstances should maintenance personnel or pilots crawl under tanks or loaded pylons, carted or not. Carted stations can go off, and 4,800 pounds is not forgiving to the human body. It is not okay to crawl under weapon or fuel stations with bombs or tanks installed. You may save a life or two by printing this.

Gregory Roque
Vermont Air National Guard
Burlington, Vermont

A Good Win

Congratulations on the Joint Strike Fighter concept demonstration award. The contract recognizes the superior work of a dedicated team of aircraft design and manufacturing professionals. Now Lockheed Martin gets to compete on the world's biggest military contract: 3,000 next-generation fighters for the Air Force, Navy, and Marines.

According to Defense Daily, Lockheed Martin won in part because of its polished proposal and relatively low-risk design. As a proposal editor on loan from the communications department of a sister company, I helped "polish" the authors' work.

Although the hours were long, as is typical of proposal projects, I enjoyed the professional challenge of editing such an integrated and comprehensive volume of technology solutions. I also got the chance to meet some of the great people at Tactical Aircraft Systems. The JSF Team demonstrates Fort Worth's commitment to mission success through pursuit of customer satisfaction in airframe design, manufacturing efficiency, and logistics support as well as in proposal preparation.

Bill Paskert
Lockheed Martin Electronics & Missiles
Orlando, Florida

F-22 Refueling

Thank you for a very informative magazine. The members of my unit look forward to its arrival each month. The articles are well written and the photography is great. And when a poster-sized illustration is included, I put it in a frame and hang it on the wall of my office.

The article in the January 1997 issue about the F-22 was quite interesting. I hope to be able to see our KC-135E aircraft refuel the F-22 in the near future and be on the flight when it happens.

SSgt. Richard Clark
171st Air Refueling Wing
Pennsylvania Air National Guard
Coraopolis, Pennsylvania

F-22 As Art

I've just finished reading your fascinating article on the upcoming flight of the F-22 in the latest Code One. I am very much looking forward to seeing this aircraft out and about. I have had the opportunity to photograph the F-16 at many of the airshows I attend each year, and I've shot the demo flights and the Thunderbirds. The F-16 is one of the few aircraft that not only performs but also looks beautiful in the sky. Someone said it must have been designed by an artist. I agree. It is almost moving sculpture.

From the photos and illustrations I've seen, I think the F-22 will be on that list of beautiful birds, too! I hope I get a chance to photograph the "Raptor" in the not-too-distant future.

Also, thank you very much for the exquisite fiftieth anniversary USAF calendar. What a wonderful tribute to the USAF and its Lockheed Martin-developed fighter aircraft.

Ray Courtman
Beiseker, Canada

Keeping Up

I am a retired Viper pilot who not only misses flying the F-16 but also misses the Code One Magazine, which used to keep me updated on what was happening in the F-16 community. Enclosed is a check for a one-year subscription. I flew the Viper for thirteen years. As the team leader for the 419th FW, the overall winner in Gunsmoke '85, my aircraft enabled me to achieve a 0.25-meter CEK in the Visual Level Bomb event, which may still be a record. The Viper sets the standard for a great aircraft and Code One continues that standard. I have enjoyed your magazine and look forward to each new issue.

Col. Bane Lyle (USAFR, ret.)
Austin, Texas

Setting Records Straight

As an old Marine Corps aviator, former managing editor of Aviation Week, former editor-in-chief and publisher of Interavia magazine, a contributing editor to a number of other aerospace and defense publications, and an occasional Viper driver, I continue to be thoroughly impressed with every issue of Code One. In terms of editorial quality, subject matter, and presentation, your publication has no peers.

Every issue seems to have something of direct interest and application, even for those of us who are not flying F-16s every day. And the art—whether photos or paintings—is fabulous! I can't bring myself to throw out a single back issue, because every
time I start to do so, I find something worth saving.

Thus it was that, as I perused the October 1995 issue during another attempt to declutter my office, I found something I hadn’t seen before, and it was rather distressing. While admiring Keith Ferris’ Wolfpack F-16 on page 5, I was surprised to read that “In 1980, Ferris was the first civilian to fly in the F-16 outside of the General Dynamics test force.”

I believe that honor belongs to me. I have a log book entry that says I flew an F-16B with Neil Anderson on 14 May 1979, out of Carswell. Furthermore, it was not just “a ride” in the aircraft, but a full-fledged flight evaluation during most of which yours truly was at the controls. Among other things, we engaged adversary aircraft and did some simulated low-level bombing during this flight to look at the F-16’s superb agility and maneuverability. My subsequent write-up of this flight for Aviation Week was full of praise for the revolutionary performance and handling qualities of the F-16.

In the years that followed, I also flew the F-16/79 also at Carswell with Neil Anderson, the F-16XL with General Dynamics test pilot Jim McKinney, the F-16D with the 33rd TFS at Shaw AFB, and the F-16 Falcon Eye with Joe Bill Dryden at Carswell. All of these flights were documented in the pages of Aviation Week over the years except for the Falcon Eye flight, which was reported in Armed Forces Journal International. There can’t be too many other pilots—GD/Lockheed, USAF, NASA or other—who have flown as many different versions of the F-16.

Since the Fort Worth operation is now part of Lockheed Martin, I might also point out that, as far as I know, I was the first civilian (non-company, non-FAA) pilot to fly the Lockheed L-1011 TriStar in 1971; the first civilian (non-government, non-military, non-company) pilot to fly the Lockheed AH-56A Cheyenne attack helicopter in 1972; and the first civilian (non-military, non-govern-

ment, non-company) pilot to fly the SR-71 Blackbird in 1981 at Beale AFB. I won’t bore you with the non-GD, non-Lockheed aircraft I’ve flown.

Sorry to bother you with this fifteen months after the fact. Obviously, I haven’t been reading the captions closely enough in some of my issues of Code One. Just felt like I had to go on the record in this case to defend my title. At any rate, you’ve got a great magazine and I offer my sincerest wishes for continued success in the future. Semper Viper!

Robert R. Ropelowski
McLean, Virginia

**F-16 At Mach 2.1+**

During the F-16 J79 program, test pilot Jim McKinney flew the F-16 J79 to a level flight speed in excess of Mach 2.1. The aircraft did not exhibit any stability and control problems. Mach 2.1+ was achievable because of the inlet design for the J79 engine. The aircraft did, however, experience inlet buzz at the maximum speed condition.

Charlie Powell
Fort Worth, Texas

*Editor’s note: This letter adds to the F-16 at Mach 2+ discussion in the letters section of the January edition.*

**Tails From The Netherlands**

Before I moved to den Haag, I lived near Air Base Leeuwarden where the Dutch Air Force has flown the F-16 since 1979. So I grew up with the noise of the F-16. Still, I’m a very big fan of the airplane. By trading shots with correspondents around the world, I have built up a great collection of 1,500 F-16 photographs. I’ve enclosed a couple of my more interesting shots for your readers. The photos are of F-16s painted to celebrate the forty-fifth anniversary of the RNLAF’s 311th and 312th squadrons.

Jack Bosma
Den Haag
The Netherlands

**A Fine French Reader**

I found your fantastic magazine during a technical visit to Pakistan where I met some fellow members of your Lockheed Martin team.

As an engineer in Thomson CSF Optronique, I specialize in the Atlas laser designation pod and our night and day common laser designation pod. I always keep an eye on your optronic products.

I congratulate your fabulous illustrator Price Randel. When I first open Code One, I look for his work. By the way, I notice with pleasure a painting of Keith Ferris on your letters page. What a great artist!

Hello to all the guys of the contractor team in Pakistan. Keep up the good work.

Vincent Meslet
Montigny le Bretonneux
France