DEEP INTERDICTION

... Nothing does the Job Better Than USAFE's F-111s
CONGRATULATIONS PLATTSBURGH!

380th Supply Squadron Wins Daedalian Supply Award

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*Code One is a trademark of General Dynamics Corporation.
Some say the F-111 isn’t pretty. Others complain that she’s getting on in years. But none can deny that this is one grand old lady with **Great Legs**

By FRANK C. BADDER
Editor, Code One
The mission is called “deep interdiction.” If the balloon goes up in Western Europe, the lion’s share of NATO resources will be occupied in preventing a Soviet frontal advance from reaching the English Channel. But another way to stop a frontal advance is to step on its tail. On the modern European battlefield, that type of job requires an all-weather airplane that can get very low, very fast...and go very deep. Think of it as the wide receiver of the Tactical Air Force.

NATO has airplanes with terrain following radar, like the Panavia Tornado, that can get low and fast. The Tornado has an all-weather capability as well. But what it can’t do is go deep. It just ain’t got the legs. The B-52, on the other hand, has the legs — but it can’t get low enough or fast enough and therefore may not survive the trip.

“What the F-111 is asked to do,” said Col. Graham Shirley, commander of the 20th Tactical Fighter Wing, RAF Upper Heyford, “it probably does better than anything else in the world. For long-range, low-level, all-weather operations the F-111 is without peer.”

A 25-year-old airplane? Without peer amongst the technological marvels of the eighties?

“If you take a look at the range charts, the loads that can be carried, the all-weather capability — there’s nothing else in our inventory, or anyone else’s, that can match the F-111 in its element,” Col. Shirley affirmed.

Lt. Col. Dan Lamontagne, commander of the 492nd Tactical Fighter Squadron at RAF Lakenheath, agrees with Col. Shirley.

“Basically our mission — our bread and butter — is battlefield air interdiction. Long-range, low-altitude penetration of enemy defenses to put our bombs on the target way behind the line, deep into the enemy’s heartland,” Col. Lamontagne said.

So why the F-111?

“It’s better suited,” he explained. “It’s the only airplane that has the legs — the range — to go. We’re based here in the UK and we can still go a lot further than, say, the Tornado that’s based in Germany. The fuel that we carry onboard allows us to go a long way. The aircraft design allows us to go quite fast at low altitude because of its heavy wing loading — which some people look at as a design flaw. Or a disadvantage. We can exploit that because the airplane is very stable at low altitude, and that’s where we make our living.”

“Let’s face it — there isn’t another jet in the inventory that can fly 5600 miles, do this kind of job, and come back home. There isn’t one. You can talk all day long about a fleet of B-52s, but what we’re talking about here is a jet (the F-111) that can put a 2,000-pound bomb through somebody’s truck window.”

— Lt. Col. Jerry Wax
Assistant DCM, 48th TFW, RAF Lakenheath
But — at mach 1.2? Two hundred feet off the deck?

"The aircraft is very responsive at that speed. Very stable. It's not jittery at all. At very low altitude and those speeds, the aircraft responds just as well as if it was at 400 knots," Col. Lamontagne said.

There are two wings of F-111s in England — the 20th TFW at RAF Upper Heyford, and the 48th TFW at RAF Lakenheath. While the mission is basically the same for both wings, there are differences. The 20th TFW's F-111Es are older airplanes, with slightly less powerful engines and without the Pave Tack weapons guidance system that characterizes the F-111Fs of the 48th TFW. And the E models, being older, are still saddled with somewhat antiquated avionics. The avionics modernization program will significantly increase the E model's capability — but until then the birds of the 20th will just have to try harder.

"All of our avionics being analog, there's a lot more pilotage and navigation skills required flying this airplane. I guess you could say that on the E we try to make up in aircrew skill what we lack in avionics," Col. Shirley said.
“The Pave Tack is what really makes us a special breed of cat,” said Col. Mike Aarni, assistant director of operations at Lakenheath. “The Pave Tack and our self-designating laser capability allow us to do the PGMs (precision guided munitions) without assistance from anybody else. It requires some sophisticated weaponry to do the surgical-type strikes that you need in low-scale warfare. And if you go back to World War II and look at the mass raids with wall-to-wall bombers — they were very inaccurate, so they had to resort to carpet bombing. Equipped with Pave Tack and PGMs, you can get pin-point accuracy and take out a lot of those targets with just a few F-111s where it took hundreds of bombers to do the job back in World War II. We’ve come a long way.”

“Our capability on pinpoint targets is somewhat less than Lakenheath’s,” Col. Shirley admitted, “but for the kind of targets we’re assigned against we do very well.”

For Lakenheath’s F-111Fs, the problem of acquiring munitions that could keep pace with the aircraft’s capabilities was solved by Pave Tack.

“Up until a few years ago,” Lt. Col. Lamontagne said, “the major constraint on our conventional munitions was that the airplane was a lot more capable than the munition in terms of low-altitude, high-speed ingress and delivery of ordnance. Now, with the (laser-guided) munitions, we’re allowed to release while supersonic. This squadron has done that within the past year. We’ve released several GBU 24s and 10s supersonic. No problems. We’ve had great success with that. Both airplanes (the E and F) have the same awesome low-level penetrability, but with the F model’s Pave Tack you can hit within three-and-a-half feet of a target, using a GBU 24. We can really go after a hardened target.”

The F-111’s low-altitude/high-speed capability is mostly useful for avoiding detection by ground-based threat radar. But a MiG’s radar isn’t generally used on the ground. Detection in the air-to-air arena was considered hazardous to an F-111 crew’s health — until the AIM-9P was added to the F-111’s weapons suite a few years ago. Listen to what Col. Aarni has to say about it:

“In January of ‘84 I led four airplanes to the Tactical Leadership Program — a month-long school where we joined with other NATO aircraft and aviators to practice composite-force tactics and large-scale attacks on various targets. There were some air-to-air guys there who were trying to defeat the attacking force. Heretofore a lot of the air-to-air fellas have thought of the F-111 as easy pickings if they spotted it. If there was a long train in the attack force, they could just go in and start shooting them down. We put those defensive missiles on there and when they blundered out in front of us we simulated shooting them down. There were some embarrassed fellas in the air-to-air arena, shot down by an Aardvark.”

Lt. Col. Lamontagne said Red Flag demonstrated the need for forward-firing ordnance on the F-111.

“If you’ve got a battle box of four airplanes,” Lt. Col. Lamontagne said, “an aggressor could roll in between the two elements, shoot down numbers one and two — with no threat from three and four, except maybe ramming ‘em — and then roll out and shoot down three and four as well. Now, with our forward-firing ordnance, they have to respect our nose. They have to worry about overshooting us — rolling out in front of us. At Nellis we were ingressing at speeds of, like, 600 knots, carrying 12 MK 82s with the F model in mil power, which is pretty good. So their geometry has to be perfect to start with if they’re gonna intercept us.

“[I looked at what they were trying to build for the next generation, and I came to the conclusion that we already had what they were looking for. It was the F-111.”

—Lt. Col. Mike Aarni
Asst. DCO, 48th TFW
At RAF Upper Heyford, an F-111 prepares for a mission in marginal weather conditions. The F-111's all-weather capabilities are appreciated nowhere more than in England, where bad weather often grounds other aircraft.

and they can't miscalculate and roll out in front of us because now we've got AIM-9P."

Lt. Col. Lamontagne said the missile keeps the F-111 from being a soft target.

"Now," he said, "we can sandwich. Before, we used to fly tactical formation only for the express purpose of being able to tell somebody he's about to get shot down, so he could do some evasive maneuvering. Now if an aggressor rolls in on one guy we can sandwich him. Once your tactical partner brings the nose to bear on the aggressor, the aggressor needs to maneuver because now he's thinking about living, too."

But all that air-to-air stuff is a moot point, so long as the F-111 isn't observed. And that's where the F-111's terrain-following radar (TFR) helps a great deal. Within the known threat inventory, only the most sophisticated airborne radars possess a significant look-down capability. And at 200 feet the F-111 is going to be difficult to pick out from the ground clutter.

"The TFR helps because you're not dropping the bombs from 10,000 feet. You're smokin' across Europe at several hundred knots at 200 feet," said Lt. Col. G. Knight Boyer, the 20th TFW's assistant deputy commander for resource management.

Lt. Col Gary Voelliger, Upper Heyford's Asst. DCO, highlighted other advantages to the TFR.

"I've gotten used to the F-111 and knowing that I could be virtually hands off and just monitor the flying of the airplane while I'm doing all the other items. But if I had to spend 60 to 70 percent of my time just flying the airplane, then pretty soon all those other things, like finding the target and avoiding the threat, would get a lower priority. And either I'm gonna get shot down or I'm gonna miss my target — neither of which are very good. Or worse yet, if I spend too much time paying attention to those, I'm gonna hit the ground. And that's a kill too . . . for the enemy."

For the F-111 community, though, the bottom line is still legs. That's its real ace in the hole. Other NATO aircraft can achieve more accurate weapons delivery. And TFR is not unique to the F-111. But the F-111 can reach out and touch just about anyone, anywhere.

"Virtually anyplace is reachable with an F-111," Lt. Col. Voelliger claimed. "We had Operation Ghostrider in October of '85. We went from here to Canada and returned to Upper Heyford — roughly an 11-and-a-half to 12-hour mission. It pointed out the reliability of the F-111E. All 10 aircraft were on time and on target. We're very pleased with that."

"We had 48 hours notice when we were tasked by USAF to go to Canada," Col. Shirley said. Operation Eldorado Canyon was another long-range mission — possibly the longest-range conventional employment of tactical air ever undertaken. Some of the airplanes were airborne for 14 hours.

"We sometimes feel like a stepchild in the tactical air business," Lt. Col. Voelliger said. "We may feel we take a little of the back seat to some of the other fellows. I personally have never felt that way, and I told my guys that they don't have to feel that way at all. And yet some of them do, a little bit. And when they actually get to see their airplane employed the way it's supposed to be employed — and know that nobody else could go there and do that job — it really raises their morale. They walk a little taller around the fighter pilot bars throughout the Air Force. Now they can go in there and say, 'Yeah, I fly F-111s.' I think anyone who's ever flown an F-111 in combat has no doubt about its effectiveness or its ability to get in and survive."

But nothing can survive the march of time. Originally produced in the sixties and seventies, the F-111 will remain in the inventory for some time to come . . . but what then?

"Unfortunately, we're not building the airplane anymore," Col. Aarni lamented. "I just wish we had more of 'em. During my tour at Tactical Air Command I looked at what they were trying to build for the next generation, and I came to the conclusion that we already had what they were looking for. It was the F-111."
EDITOR'S NOTE: The following article first appeared in The Guardian, a newspaper published at RAF Upper Heyford, United Kingdom. It is being reprinted here by permission. Additionally, the photos printed here depict "nose art" renditions on other F-111Es at RAF Upper Heyford. Airplanes throughout USAFE are experiencing a revival of the kind of individual expression that characterized airplanes of the U.S. Army Air Corps during World War II.

Staff Sergeant Larry Casteel in front of "The Other Woman." Casteel's wife, Pat, named the F-111E.

When Staff Sgt. Larry J. Casteel tells his wife he's off to see the other woman in his life, she just smiles and tells him to try to be home in time for dinner.

"The Other Woman" is sleek and curvy, a fast mover, and swings in all the right places. She weighs about 89,000 pounds, is 20 feet tall and 63 feet wide. She travels at twice the speed of sound at a height of about 40,000 feet.

"The Other Woman" is an F-111E fighter-bomber from RAF Upper Heyford's 20th Tactical Fighter Wing. Casteel is its crew chief.

The nickname for jet number 040 came about when Casteel was racking his brain to come up with a snappy name for it.

"All my names were sort of corny, so I asked my wife to help me out," he said.

"I said that he might as well call it "The Other Woman" because he spends so much time with it," Pat Casteel said. "He sees more of that airplane than he does of me."

Pat Casteel's name for the jet — and a rose — are now painted on the side of the airplane. Air Force units throughout USAFE have been adding the schemes to their planes in the World War II tradition of giving nicknames to airplanes.

"I'm real proud to have my wife's idea transferred to reality on this aircraft," Casteel said.

"This makes me feel like I'm part of his work," Pat Casteel said. "Since I can't come out to the flight line to see him, he now has something at work to remind him of me."

"I'll take a back seat to this kind of woman," she said. "At least I don't have to worry about him going out. I'll know where he is."

Staff Sergeant Jerry Smith is "Heartbreaker's" crew chief. Nose art such as this is enjoying a resurgence throughout USAFE.

Tech Sergeant Rodolfo Ledezma is the crew chief for "My Lucky Blonde," named after a World War II airplane.
EDITOR'S NOTE: The following article first appeared in the 13 November 1986 issue of "Defenselkrant" (The Defense Journal), an official publication of the Royal Netherlands Department of Defense. It is reprinted here by permission.

It happened on a cold, dark November night a few months ago. The pier between the villages of Hornhuizen and Westerholland in Noord-Groningen seemed to be abandoned. Only a few cars were moving in the lowlands along the sea. Above the dark water of the Waddenzee, the tell-tale whine of a turbine engine and flashing green, red, and white navigation lights revealed the approach of a jet fighter.

In the cockpit of the two-seat F-16, the pilots peer through strange goggles affixed to their helmets. The front-seat pilot, Captain Binne Roorda, is watching the "green screen" (the radar/electro-optical display, or "REO") as the pier disappears beneath the aircraft. A car also appears on the screen, turning from left to right, like a little green spot on the scenery.

At an altitude of 250 feet, the aircraft flies in the direction of Groningen, following a preplanned route that takes it over a built-up area. When the little village of Munnekezeil appears on the screen, the throttle goes to idle and the F-16 flies silently over the houses.

Trees, electric poles, farms, cows... everything appears on the screen as if on a television set. And the goggles allow the pilots to look to the left or right and still "see" — although it is fully dark. Captain Roorda and his colleague in the back seat, Tom Bakker, agree that this is the most beautiful night flight they've ever performed.

Under the name "Night Falcon," the Royal Netherlands Air Force has conducted a series of special test flights from Volkel Air Base. Beginning last October, the tests have taken place mostly at night, with a few afternoon flights. The aim of this test program was to see whether it is practical and worthwhile to equip Dutch F-16 fighter aircraft with night vision goggles (NVGs) and a forward-looking infrared (FLIR) capability. The test flights were conducted by an "unofficial test team" of four test pilots, trained in Great Britain and the United States, and aided by technicians and technical engineers.

"So far, the F-16 is not equipped to operate ground attack in the darkness," said Captain Tom Bakker, test pilot for the Tactical Fighting Air Force Command. "It is now possible to fly by night, and the aircraft can be equipped for air defense or even as a reconnaissance aircraft during night time. But for ground attack, low altitude and high speed is very important, and this is not recommended when the visibility is low."

The Night Falcon project is supervised by the Division of Operational Research and Evaluation in Den Haag, headed by Lt. Col. Steven Heyboer.

"Three years ago," Lt. Col. Heyboer said, "NATO asked the different Member States to improve the night capability of the conventional fighting air force with a 'ground attack sensor,' under the code name 'Night Window.' There are different possibilities to reach that goal. Great Britain's Royal Air Force, for instance, has been very busy lately with the so-called 'night vision goggles' (NVGs) — an electrically operated light intensifier, built like a pair of glasses. Most helicopter pilots throughout the world already use NVGs. The RAF fighter pilots (in Tornado, Jaguar, and Harrier squadrons) also use goggles. The British encouraged the use of NVG, and the U.S. Navy has also tested them. They found the NVGs very useful, but they suggested it should be equipped with the FLIR. The FLIR produces 'thermal imaging' by feeling the heat differences.

"Our study took the findings of the U.S. Navy into account. The U.S. Air Force is combining FLIR, radar, and laser target detection into a package called LANTIRN, but the cost will certainly be high," said Lt. Col. Heyboer.

The equipment (owned by GEC Avionics of Great Britain) now used for the test flights from Volkel are not particularly cheap, either. One pair of "cats eyes" (weighing 1.25 pounds) cost $36,000.

"The weight of the goggles is the main disadvantage," declared Captain Bakker after 15 night flights. "Mainly with a high-g load, to have such a heavy helmet on your head is a real constraint. With a load of five g's, the helmet weighs five times as much."
“Another problem is that the goggles are not ‘ejection proof’. In other words, if something goes wrong and you have to use the ejection seat, you must first of all take the goggles off your helmet. It can be done in one simple hand movement, it is true, but it still represents one more safety risk.”

The infrared system also presents some disadvantages.

“In order to use the FLIR well,” Capt. Bakker said, “the weather must be perfectly clear. Heavy rain or too many clouds make the temperature differences very small, and thus very difficult to be discerned by the FLIR. The result is that you don’t see well what comes on your screen.”

The combination, however, of the two independent systems (FLIR and NVG) provides a nearly foolproof system.

The test flights in The Netherlands represent the second phase of the Night Falcon project.

“Last year, Captain Bakker and I went to General Dynamics in Texas to perform five flights each with this equipment,” said Volkel test pilot Captain Ed van Kleef. “We have now planned 110 night flights altogether in a West European environment. We fixed a program of five flights for each test pilot.

“Flight One lasts approximately 25 minutes at low speed — and at an altitude where the pilot feels comfortable. The route goes through the northeast Netherlands — a flat environment. Flight two is nearly the same, but in a very undulating environment this time. All the flights must be performed at a minimum altitude of 250 feet. This altitude is especially low for the Netherlands. That is why we really emphasize preventing noise pollution,” said Captain van Kleef.

“At Flight Three, we start to fly at higher speeds and to attack targets,” continued Captain Bakker. “Flying 480 knots, we simulate an attack on a communication satellite station, then fly 550 knots in the direction of the Nieuw Millingen radar installation, along the Veluwe. At that speed, the noise is quite strong. That is why, when we planned the flight, we counted the houses on the map. The Netherlands are so built-up that it is difficult to perform an approach without flying over a house.”

The last two flights are the most difficult. Flight Four involves a high-speed, low-altitude attack on a small air base in an undulating environment. Flight Five is a simulated attack — in complete darkness — on a shooting range in Vlesland, then flying away at low altitude.

Noise pollution remains limited, thanks to good advance planning and to throttling back when flying over built-up areas. Until now, the Air Force received just a few more complaints than usual, whereas the villages along the path of the final test flights did not complain at all. About 160 villages were sent a letter explaining the project.

To perform the test flights, the test pilots always use the same aircraft — an F-16B, registration number J-653. It is one of two F-16s equipped for test flight programs two years ago, within the framework of project “Orange Jumper”.

“The J-653 has special electric wiring to send different test data,” said Sergeant L. Rob Meijer, a crew chief with the Volkel Technical Squadron. Together with Sergeants Peter de Keizer and Marco Weiling, Sgt. Meijer is in charge of Flight Falcon J-653 and J-646.

“J-653 needed many improvements. The cockpit lighting had to be changed because the NVGs are next to the infrared spectrum, and the red lights were very disturbing. The HUD was changed (to accommodate the FLIR imagery), the software of some computers was modified, and a radar altimeter was added,” said Sgt. Meijer.

“The extra altimeter is a real event,” Captain Bakker insisted. “Until now, the Royal Netherlands Air Force F-16s were equipped only with the atmospheric pressure altimeter. The data from the radar altimeter are projected on the HUD, and — when you fly too low — an insistent lady’s voice warns you. The system works so well that when you fly over an electric pole, you can hear the insistent ‘warning, warning’ in your helmet.”

After the test pilots are trained, other squadron pilots perform the five flights.

“These pilots are carefully selected, and include the very experienced as well as the less experienced people,” said Capt. Bakker. “This is where we enter the demonstration phase, allowing some staff officers to get familiar with the night vision equipment.”

By 9 p.m. (the flights are performed four days a week) the J-653 is back in its shelter, and the technicians start working.

“We must be very careful with the aircraft and its equipment,” said Sgt. De Keizer, “if we have the slightest problem, it is a real disaster for the project. This is no reserve aircraft!”

“This test group does not officially exist,” said Lt. Col. Heyboer, “which is quite a heavy constraint for the staff — even for those not directly involved. People working at the Night Falcon project normally have other duties, now assumed by their colleagues. If only we could be sure that this kind of test program would always happen at the same air base — now Volkel — we could hire some extra staff. To fly at night, four times a week, requires much more work from all of us — firemen, doctors, traffic organization . . . everybody must be present.”

Volkel has been the base for several test programs, including Maverick anti-tank rockets, new F-16 software, and fuel tanks.

“The night vision equipment is absolutely worthwhile. Our available time can now be doubled. A 24-hour availability is now possible, in any weather condition,” Captain Bakker concluded. ■
On January 23, 1987, the USAF's Aeronautical Systems Division (ASD) at Wright Patterson AFB declared General Dynamics Fort Worth Division the winner of a competition to develop the advanced F-111 Digital Flight Control System (DFCS). The program will span more than seven years and will upgrade the entire USAF F-111 fleet. USAF's ASD is contracting the development phase and Sacramento Air Logistics Center will manage the production phase. The new flight control system will provide substantial improvements in safety, reliability, and maintainability.

From a safety standpoint, the DFCS will reduce mishaps experienced during terrain-following flight operations. This will be accomplished through improved logic implementation, direct paths to specific/critical signals, and use of a modern, fault-tolerant digital computer design that applies corrective action to aircraft electrical power fluctuations, which now can cause erratic flight control response or loss of aircraft control.

Reliability will be greatly enhanced as well. The majority of line replaceable units (LRUs) in the current flight control system were designed and manufactured in the 1960s and are now considered obsolete. Continuing difficulties inherent in the existing system include low mean time between failure, random or intermittent faults, and poor supportability. The new DFCS is predicted to have a reliability 18 times greater than the existing system; thus, the loss of a critical function necessitating flight abort should occur not more than once in 67,500 three-hour sorties. The new DFCS computer will undergo an in-service warranty performance test which allows no more than eight failures in 8460 flight hours.

The DFCS computer is the heart of the system. It will be developed and supplied by Lear Siegler (LSI) — a firm that is currently producing a similar digital flight computer for the F-15. LSI proposed the highest reliability design among all suppliers bidding for the F-111 DFCS computer.

The new DFCS will improve system maintainability by reducing the maintenance manhours per flight hour by a remarkable 94 percent, from .2731 to .0136. This reduction is principally realized by replacing six older LRUs with a single, low-failure-rate unit. The DFCS computer will incorporate 100 percent fault isolation to the component level by automatic and/or manual means. During ground checkout, the new system will automatically step through a comprehensive test sequence (and monitor the results) in just two minutes. In-flight failure data will be stored in the DFCS computer.

A big plus in the life-cycle cost category is the estimate that eight aircraft will not be lost due to a catastrophic failure because of the advanced safety features in the new digital flight control system over the remaining service life of the F-111 fleet. This factor alone provides a savings that far exceeds the implementation costs of the new system — not to mention the potential savings in human life.

**DESIGN APPROACH**

Needed improvements in flight safety, reliability, maintainability, and supportability will be provided by a design that (1) is more tolerant to first failures and second "like" failures, (2) replaces unreliable components with equipment of high reliability, (3) includes on-board preflight confidence tests and inflight diagnostics, and (4) eliminates outdated, unsupported hardware. Another primary objective is to improve the performance of the flight control system. In doing this, General Dynamics engineers will retain all existing modes and functions of the old, analog flight control system, as well as the system's handling qualities. Autopilot performance on all models of the F-111 will be improved to at least the same level as currently exists on the FB-111A (which has improved transient response and performance characteristics). All modes, functions, cockpit controls, and displays required in the existing system will be retained, but the conversion from analog to digital will enhance the functional capabilities of many of these modes and functions while adding many new capabilities.

The incidence of flight control anomalies during autopilot operation will be reduced through incorpo-
ration of something called “system integrity management” within the DFCS computer. A single failure in the current, non-redundant system can result in an uncommanded maneuver — but a single failure in the DFCS will result only in illumination of the FCS caution light.

Added protection in the low-altitude flight regime is being provided through an aural, ground proximity warning device. The device works anytime the aircraft is within 10,000 feet of the ground and approaching the minimum altitude for safe recovery prior to ground impact. The system considers various factors, such as airspeed, angle of attack, and aircraft performance capabilities within varying segments of the known flight envelope. Whenever the system senses a “danger zone” or a “voice” warns the pilot in time to recover.

AVIONICS INTEGRITY PROGRAM

The USAF’s Aeronautical Systems Division is requiring that the DFCS include an avionics integrity program (AVIP), patterned after the Fort Worth Division’s aircraft structural integrity program (ASIP) and General Electric’s Pratt & Whitney’s engine structural integrity program (ESIP). The objective is to improve system reliability and maintainability through incorporation of integrity principles to avionic components and subassemblies. AVIP is based on the principle that all electronic failures are actually structural failures (e.g., broken wires, bonds, seals, solder joints, etc.) and that proper parts selection, testing, design, and maintenance can result in predicted “failure-free” periods of operation. AVIP addresses the “cradle-to-the-grave” cycle of avionic/electronic systems development, procurement, and life-cycle management to (1) obtain the most cost effective plan that protects both safety and mission critical functions, and (2) provide an economic life equal to or greater than the specified design service life.

F-111 SIMULATOR FACILITY

A key DFCS program element is system software development using the F-111 flight simulator to establish the handling qualities baseline, verify the mechanization, develop and proof the software, and validate the DFCS’s pilot/vehicle interface. The F-111 flight simulator was built with independent research and development funds. Started in 1985, the project provides a “full mission” F-111 simulation system, comprised of a host computer complex, a cockpit, a visual scene projection, plus an extensive interface system which, with the engineering test station, creates a total test environment.

The F-111 flight simulator provides the capability to operate over the full F-111 flight envelope, to include landing gear, flap, and spoiler operation during takeoff and landing. A major strong point of the F-111 flight simulator is its ability to incorporate actual analog/digital flight computers, allowing a progression through design to system validation and verification with only minor changes to simulation.

A major capability of the simulator is the cockpit interface system, which allows operation of the actual aircraft DFCS components. A complete set of tape instruments and associated amplifiers, the ADI, HSI, miscellaneous displays, and related controls have been provided to fully simulate the left seat of the operational aircraft.

DFCS PROGRAM SCHEDULE

The program will involve two major phases — full scale development, and production.

Full scale development (now in progress) will cover flight control system mechanization and design, hardware procurement, installation design, DFCS computer software development, system integration, and installation and flight testing of the modified system in an FB-111A and an EF-111A. October 1991 is the target completion date for the development phase.

The production phase commences after successful flight testing, and will be contracted in four groups of kits at approximate one-year intervals. The first group will be used for kit-proofing of one of six models in the F-111 design series. Four of these kits will be produced. The remaining aircraft modified, group B spares provided, technical orders formalized, and the trainers modified. The production program is slated to begin in February 1990, with completion in October 1994.
EDITOR'S NOTE: This is the final installment in a six-part series on the F-16 Fighting Falcon in which Senior Experimental Test Pilot Joe Bill Dryden has examined the "electric jet" and told us how this remarkable airplane differs from other fighter aircraft. This interesting and informative series has alternately focused on the flight control system, aerodynamics, departure/deep stall characteristics, the cockpit, the HUD, and (in this segment) the engine. It has been the intent of this series to involve operational F-16 pilots in an in-depth discussion of their airplane's capabilities in the hope that broader knowledge will result in better, safer pilots. We hope that you have enjoyed this series, and we invite your comments.

You may have noticed that some of the newer F-16s entering the field are equipped with the F110-GE-100 engine, and a few have the F100-PW-220. Both of these new engines are a tremendous improvement over the present F100-PW-200 (which itself is no slouch). This last installment in the Semper Viper series is about the F-16's powerplant, but since there are presently over 1500 F-16s out there with the older Pratt & Whitney, we'll limit our discussion to that engine.

During the time that the prototypes and Full Scale Development F-16's were being designed, the F100-PW-200 engine was the best one available that provided the required performance. The F100 is different from any engine you've experienced in previous fighters, so a little discussion would be worthwhile here. A few courses of action worked out ahead of time (you do this for all situations you might run across in flight, don't you?) will keep you on the good side of everybody involved. Let's see... where do we start?

How about the BUC? I've really gotten upset with all the misinformation that's going around about the BUC. First of all, it's a simple backup system for the main fuel control, really not much more complicated than a kitchen faucet. Because it is simple, you (the pilot) must make allowances for its simplicity. It's important to remember this. If you treat the BUC the way it's supposed to be treated it's nearly foolproof! But if you insist on being "Joe Cool" and not paying attention to just how the engine control system works (EEC, UFC, or BUC), it'll jump up and bite you so fast your head'll swim. Read the books, ask questions, and when it becomes obvious that the main fuel control is going south, don't be afraid to switch to BUC! It's up to you to know — and know cold — the BUC operating envelope, the rate you can move the throttle, and exactly where the BUC start and BUC idle positions are on the throttle quadrant. If you know this, and make allowances for the fact that it is such a simple system, then it works. And it works well.

Another major place for getting into trouble is in the area of stagnations — one of the unfortunate side effects of pushing the state of the art with afterburning turbofans.

Excuse me. That should read "augmented" turbofan. Every new design engineer wants to become famous, so he/she changes the name of everything, just because it happens to be slightly modified. (Pilots aren't exempt from this disease, either.) As a result, you see "power lever" instead of throttle, "augmentor" instead of A/B, "intermediate" instead of MIL, "crew station" instead of cockpit, etc. Sometimes it's really necessary to read between the lines.

Where was I? Oh yeah! Afterburning turbofans. Since the fan duct now allows almost direct access from the A/B to the compressor, these new engines are much more likely to stall when selecting A/B than are the turbojets you're used to operating. Also, it's possible for these stalls to progress to an even less desirable event called a stagnation. (Don't get the impression that you can expect one of these on every flight, but — once again — forewarned is forearmed.) What happens is that the stall can continue, driving the basic engine down to an RPM from which it will not self-recover (all the while putting out no useful thrust). This is bad with the F100 because if you don't recognize the condition and do something about it, you'll be left with a melted ingot in the engine bay!

So how do you recognize one of these hummers? It's real easy, but more on that in a minute. First, the engine must stall in order to stagnate. Did I mention cues? With the exception of an off-idle stall, there's nearly always some duct rumble that precedes a stall. With an off-idle stall, the energy available to make noise is not there and you might not hear any rumble. It's also possible you might not even hear the
stall. This is certainly not the case with the engine in any other condition. There's almost always a lot of duct rumble, and then a very definite "bang" or "pop" when the engine stalls. The engine control design incorporates an automatic throttle retard if the engine stalls, but I've yet to see the fighter pilot who couldn't beat the automatic system, hands down. If the engine stalls, you're not getting much thrust, so it makes little sense to leave the throttle in the A/B range. Retard the throttle to MIL, allow time for the system to reset, and try it again — cautiously — if you're sure you're not in region three. But don't get carried away. If you know you were at 400 KCAS, one g, and 20,000 feet you are obviously well into region one . . . and an engine stall here indicates a sick engine. Bring it home without further attempts!

Now about those stagnations. If you allow the engine to continue stalling, it's very likely you'll get a stagnation. How do you recognize one? Very simple. The book says that if RPM is low, FTTT is high, and the engine does not respond to the throttle, then the engine is stagnated. Actually, however, recognizing a stagnation is far simpler than that. Even with the wildest temperature fluctuations (weather-wise), you'll never see ground idle RPM lower than 61-62 percent, and this idle RPM increases with altitude. So it's incredibly simple: if the throttle is in the operating range and the RPM is below 60 percent (especially if you have heard and/or felt the engine stall) chances are extremely good that you have a stagnation on your hands. There is never an excuse to let the FTTT get anywhere near the peg! You should have enough situational awareness to know the stagnation exists almost as soon as it starts. Don't be spring-loaded to the stagnation position — there's always the possibility that you could have a problem with the EEC or even the UFC. But the chances are very good that if you've felt or heard the engine stall and the RPM is below 60 percent (especially if the throttle is above idle) you've very likely inherited a stagnation. Check the FTTT. If it's increasing, you can be sure you have a stagnation. Don't wait! It's not going to get any better. Shut the engine down and prepare for an air start. If you've caught the stagnation early enough, the FTTT will be below 700 degrees almost immediately, and all you're doing now is waiting for the RPM to get within the 25-40 percent range specified in the dash one. Bring the throttle around the horn and you should be well on your way to an air start. Remember that the F100 can take what seems like an eternity to complete a start (sometimes over a minute), so don't abandon a successful start because of impatience. If you didn't catch the stagnation early and the FTTT is on the peg, you're in for a long wait until it falls below 700 degrees. Not catching the stagnation early also means the RPM is lower once you decide to shut the engine down. Lower RPM and higher FTTT will make it much more difficult to arrive at the below-700-degrees FTTT and 25- to 40-percent RPM that you need. You might even have to move the throttle out of cut-off early in order to keep the engine RPM from going below 25 percent. (You should be aware that the RPM will decay very rapidly, especially at the lower altitudes — and you don't get any
As you may have noticed, the word “different” has occurred several times in the course of this article series. I’ve attempted to discuss these differences in such a way that you arrived at the conclusion and meanings I was trying to convey. The F-16 is truly a different approach to building and flying fighter airplanes than you’ve ever seen before. But if you want to see still higher and higher performance, eventually you’re going to have to abandon the steam-powered aircraft of the past and move on to bigger and better principles. The F-16 is a legend in its own time. History will rank it on the same level as the Spad, Sopwith Camel, Fokker Triplane, Spitfire, FW-190D, Mustang, Zero, and Sabre. Consider yourself lucky that you’re a part of aviation history. Learn the differences in the airplane and profit from them. If you do so, I can guarantee that you’ll become a tremendously effective fighter pilot while loving every minute you fly the F-16. I’ve been flying this airplane going on thirteen years now and I still love every second I can get my hands on it.

Years ago, a poet named W.B. Yeats penned words that surely must apply to the F-16 (edited just a little):

I know that I shall meet my fate
Somewhere among the clouds above;
Those that I fight I do not hate,
Those that I guard I do not love... No law nor duty bade me fight,
Nor public men nor cheering crowds;
A lonely impulse of delight
Drove to this tumult in the clouds.

I can think of no more lonely or lovely impulse of delight than the F-16! Treat it right and it will reply with more raw performance than you would ever have thought possible. It really is the best fighter in the world today! Enjoy.

Check six...
He Really Hit Me!

EDITOR'S NOTE: This is the fifth installment in a series of interviews with some of the greatest fighter pilots of all time. This interview, conducted by Codec One Art Director Bob Cunningham, is with Col. Francis S. Gabreski, one of America's top scoring aces in World War II. When war broke out in Europe, Gabreski joined the U.S. Army Air Corps and gained early combat experience while on temporary assignment with the Polish Air Force in exile operating out of England. He was later assigned to the 8th Air Force's 56th Fighter Group, a P-47 unit commanded by Col. Hub Zemke that became famous as "The Wolfpack."

On his 166th mission, he was leading his squadron in a strafing attack on a Luftwaffe airbase. During an exceptionally low pass, he skimmed the top of a knoll, bent the P-47's prop, and was forced to land. He was captured and spent the remainder of the war as a prisoner.

In this interview, "Gabby" tells some of his World War II experiences.

the Interview...

CUNNINGHAM: Col. Gabreski, what was your total score — combat victories?


CUNNINGHAM: You were at Pearl Harbor during the Japanese attack, weren't you?

GABRESKI: Yes, I was . . . unfortunately.
CUNNINGHAM: What were you flying then?

GABRESKI: I was assigned to the 15th Fighter Group, 45th Fighter Squadron, at Wheeler Field. We were flying P-36s and the modern version of the P-40, which was the P-40B.

CUNNINGHAM: Were you able to get into the air during the attack?

GABRESKI: Well, they attacked Wheeler Field practically simultaneously as they attacked Pearl Harbor, and we received our share of bombs and strafing and so forth. To put it all in a nutshell, I mean we lost just about half of our airplanes that were parked on the ramp — the P-36s and P-40s — and, uh, we didn’t get off the ground during the attack. I was fortunate in getting off in about two-and-a-half, three hours later, with a group of about 12 airplanes. But that was after the fact. We didn’t see anything.

CUNNINGHAM: Early in the war you flew the Spit-9 with a Polish squadron in England.

GABRESKI: I went over in the early days from, directly from Hawaii to Europe, with the nucleus of the Eighth Air Force. I flew with the Polish squadron out of Northolt. The Spit-9 was the aircraft that they were using at the time. The Spit-9 was designed principally as a fighter interceptor. It was just a tremendous airplane in that particular role. However, it had its limitations. It didn’t have the range, it didn’t have the endurance. So as an escort airplane all it could do was escort probably to the coast of France and back. That’s about all.

I served with the Polish Air Force from January to about March of 1942. The 56th Fighter Group came to Kings Cliffe from the United States during that period of time. They were actually the first P-47 outfit that was assigned to the European Theater of Operations. And after receiving my indoctrination experience with the Polish Air Force I joined the 56th at Horsham St. Faith.

CUNNINGHAM: How did your P-47s compare to the German fighters?

GABRESKI: Well, Bob, it all depends on what P-47 you’re talking about. The early P-47 — which was the basic airplane — had a very thin propeller, although it was a four-bladed propeller. It didn’t have water injection. It didn’t have all of the niceties of the P-47D20 that came into the theater sometime in the latter part of, uh . . . well, it was actually about March of 1944. So the improvement that we had (was) water injection, which gave you a power increase of from 52 inches of mercury to about 72 inches of mercury, which was a tremendous boost in power and performance. Then you had tremendous visibility with the teardrop canopy. You could cover your tail and look out freely without the crossbars kinda’ restricting your vision. So I would say that the P-47 I finally went down with on July 20, 1944, was one of the finest little airplanes that I have ever flown. It was more than a match for the Focke-Wulf 190. It was more than a match for the 109. I had absolutely no problem as long as I used water injection, and I used it quite frequently. We had water injection that would, with sustained power, keep us there for about three minutes up to five minutes, depending upon how you use it. But it gave us that tremendous edge that we needed against the German Luftwaffe.
"Gabby" taxing one of the P-47Ds he flew in 1944.

CUNNINGHAM: I understand you liked to bore in really close, in combat, to your opponent.

GABRESKI: Well, I wouldn't have much of a choice when it came to, uh, firing in close and destroying the aircraft, or firing out at a distance — because my gunnery wasn't as good as perhaps Gerald Johnson's gunnery. So I kinda' felt that I had to come in very, very close in order to destroy the aircraft.

CUNNINGHAM: Colonel, what German aircraft did you feel was the toughest opponent?

GABRESKI: Well, as you well know, during the early days we encountered more 109s than we did anything else. There were some Me110s, there were some Me210s that were used against the bomber formations. But the Fw190 came at a later date... the latter part of 1943, and then by 1944 they had their full production set up. But, generally speaking, the Fw190 was probably a little bit faster airplane. It had its limitations, though. It had a very bad snap. In other words, if you could get the pilot to pull excessive g's close to the ground and he decelerated at the same time because of the drag of the airplane, why, you could have him spin in. He would snap. And once they snapped close to the ground, there's no way they can recover. So I would say from that point of view the 109 was probably a little bit better airplane. But it's practically six of one and half-a-dozen of the other. I did not fear the 109, and I didn't have any apprehension about the Fw190s.

CUNNINGHAM: Did you ever fly the Hurricane?

GABRESKI: No. I never flew the Hurricane. The only British airplane I flew was the Spit-9. And it was the Cadillac of them all as far as interceptor work. But the Hurricane was really the backbone of the Battle of Britain.

CUNNINGHAM: What about maneuverability of the planes you flew?

GABRESKI: The maneuverability of the P-51 was probably just a little bit better than the P-47. I have never turned, really, with the P-51 versus the P-47. But I would say if I had a choice of the two airplanes... I would say, for the long-range work, the P-51 is probably a better plane, because it had greater range than the P-47. The P-47 had its limitations. And that's the part that the P-51 played in the European Theater. But we had eight machine guns in the P-47, which was tremendous firepower compared to the six machine guns that you had in the P-51. So when you take your paddleblade propeller improvement, you take your water injection improvement, and you take the eight machine guns into consideration versus the six... all in all, I preferred the P-47. And I'm a little bit partial to P-47s, since it was the only thing that I'd flown in combat in World War II, outside of the Spit-9, that really brought me home every time — except once. And it was my own fault.

CUNNINGHAM: That was on your last mission — strafing the German airfield.

GABRESKI: Yes, I got a little too low.

CUNNINGHAM: Did you get any of your kills in the Spitfire?

GABRESKI: No, I didn't. And it was ironical. Of course, you know, in the heat of excitement you're... the first time you see an enemy aircraft, your adrenalin flows and you get all worked up. This particular time, I saw the 190 at a distance and I started firing at him. Naturally he was out of range, so I never did hit him and he finally rolled down. But in the meantime, when I landed and they developed the film, there was another 190 in the frame as big as could be. He was directly in front, below my nose, and I was concentrating on the aircraft that was about fifteen hundred or two thousand feet ahead. So I missed an opportunity.

CUNNINGHAM: Did you ever encounter any of the Me.262 jets?

GABRESKI: No, I didn't. That came after my time. I went down July 20, 1944. The Me.262s started coming into, uh, into the combat arena sometime after July and August.

CUNNINGHAM: Your combat experience, Colonel... was there any one action that stands out in your mind, any combat that you particularly remember?

GABRESKI: Well, there were two that kinda' stand out in my mind. The one was on the positive side, where I destroyed four airplanes — three at the time and the fourth one was confirmed later. I went down to tree-top level at this aerodrome where there were 20 or 30 airplanes, Fw190s, taking off, and it was just like putting myself in a bees' nest. There were airplanes, German airplanes, all over the place. And, of course, the fortunate thing was I had a cloud cover of fair-weather cumulus that gave me the opportunity to duck in and out when I got into trouble. Otherwise I probably wouldn't have survived. But anyway, I did the aggressive shooting and downed three airplanes. I was working on the fourth there at that point, and I looked behind and I had one on my tail. He was just about in firing range so I broke into him, went into the clouds, and lost him. When I came out of the clouds, I saw another airplane right beneath me and I went down and started firing at him. Just at that particular point there were airplanes on my tail again. They were firing at me, and I broke into them. So I have no idea... I'd hit the airplane real well and I had no idea what happened to him so I went back into the clouds. And that just about ended my operation for the day. So I had, uh, three destroyed and one probable during that particular episode. And then, finally, the fourth was confirmed later on. So that was on the plus side.
Of course, on the minus side, I recall shooting down two Ml10s on another mission and starting back to England alone. I was lost, everybody was doing a lot of shooting and so forth, and, uh, my wing man shot down a couple of airplanes and he separated from me. So I was going home all alone. And I saw a few airplanes off in the distance — about eight or ten airplanes together — and I thought they were P-47s. So I immediately threw my throttle forward and came in from the rear and went off to the side. And when I went off to the side I saw that they were Fw190s with great big crosses. I didn’t say a word. I turned around gracefully, hoping that they didn’t see me. They didn’t, and I made a 180 and started heading for home.

While I was heading for home, I saw this lone 109 above me going the opposite direction — going into Germany — and I was headed for England. He was about 3000 feet above me and I was hoping that he didn’t see me and wouldn’t see me, because I was practically at the end of my reserve fuel and it was time to go home. So I was running low. As a matter of fact, I was worried about getting home with the amount of fuel I had left. So, as he went by me, I saw a quick flicker and he made one turn and he looked . . . and sure enough, he made a 180 and started after me. I had one decision to make, either to break into him or run that throttle all the way forward and run out of gas or do something before I got home. I wasn’t about to run that throttle forward, so I went up to about 42 inches of mercury, just enough power to have full control of the airplane, and as he came down I was going to run him out of ammunition. That was my decision, and I felt that I was good enough to do that.

So he came down, and I broke into him. And as he went on by me, I fired, I pulled up in sort of a chandelier. As my airspeed was dropping, he came back up again, turned around, and started coming into me. As he was coming up, I gave him a 90-degree deflection shot. Well, the first deflection shot was great. In other words, he fired and I could see the 20-millimeter gun spittin’ smoke, or spittin’ fire. I broke and he lost his airspeed, and I went down into him and he came down after me and we picked up enough speed and went . . . I did that twice, and on the third one I had all the confidence now that I was gonna run him out of ammunition.

So the third time we went ahead and did this same thing and he came up with about a 90-degree deflection shot again, the same shot that I’d been giving him. I was very fortunate the first two times, but that last time he rang the bell. I mean, he really bit me! I heard an explosion in the cockpit and I felt my foot grow numb. I lost power in my engine. I says, “Oh, boy!” So the first thought that came to my mind was that the high explosive blew up as it hit my foot. And the second thought that came to my mind was, “Oh, be hit my engine, so that’s it. I’m out of power and I’ve gotta go down — bail out — whatever.” So I pointed the nose down again, rolled over in kinda a steep dive, pointed the nose down and I was afraid to look at the foot because with the sight of blood, or something like that, I mighta gone into shock and passed out. So I didn’t look. I pulled back on the canopy and was ready to bail out. I looked at my airspeed indicator and I still had plenty of airspeed, but my RPM started coming down and my manifold pressure started coming up. So the thought again occurred to me that, “Well, it must be the turbine supercharger and not the engine.” And then I looked at the foot and at the pedal. The pedal was shot away but the foot was in good shape. I had heavy boots on and the bottom side of the boot was kinda shredded and broken up. But the foot was in good shape.

So then I had to make a decision as to whether or not I was gonna bail out before he came in to pick me up, or whether I was going to go down to the deck where there was a cloud layer. I decided to do that, so I went down as fast as I could, straight down into the overcast, hoping to get there before he could finish me off. He came down with me, but I did get into the overcast, leveled off, and stayed there. Periodically I’d pop up and I could see him behind me, looking around at the overcast. And then it was a question . . . I knew I could stay in the clouds and go home.

But then the fear went through my mind that I didn’t have enough fuel to get home on. So I stayed in the clouds as long as I could and then, once I hit the channel, I decided to get down to the lower levels. I just rolled the RPM back as far as I could — which was about 1700 RPM — and started callin’ in “MAYDAY.” And I called in Mayday all the way across the channel and when I got to the shoreline, I saw an airfield, and I set it down.

Well, I ran out of fuel shortly after that, in a taxi situation. And I soon discovered, after the individuals at that airbase came out and met me on the runway with the engine shut down and so forth . . . they discovered that the oil tank was practically dry. He hit me once in the oil tank and I was losing oil. My turbine supercharger was shot away. He got in three good shots. And my boot was pretty well torn. So I left the airplane there, called the group, and told them where I was. Somebody came up and picked me up and I left the airplane there and went home. So that was the opposite end of my experiences.

When air combat victories were tallied at the conclusion of WWII, Gabreski emerged as America’s top scoring ace to survive that conflict . . . but he wasn’t done yet! This indomitable fighter pilot remained in military service and once more wound up in the thick of things as hostilities broke out in Korea. New flying jets, Gabreski was credited with 6.5 victories to become an ace in two wars. You’ll be able to read about his Korean experiences in a future issue of Code One.

—Bob Cunningham

Like Father, Like Son

Following in the footsteps of his illustrious father is Lt. Col. Don Gabreski, USAF. Like "Gabby", Don is a fighter jock, now flying F-16s out of Ramstein AB, West Germany. Lt. Col. Don Gabreski is a 1970 graduate of the Air Force Academy. He was graduated from flight school in 1971, and served as a T-38 instructor for three years. After transitioning to F-16s he later spent some time in Iceland ushering errant "Bears" to proper airspace.

Don is shown here at General Dynamics, Fort Worth, in the cockpit of an F-16 he recently ferried back to Ramstein. Would Dad like to trade places for a while? Probably not for the long haul from Fort Worth to Germany, but for a quick wriggin' out over the field ... You Bet!
1986
Daedalian
Award
For
Weapon System
Maintenance

Hahn did it again! The 50th Tactical Fighter Wing continued its winning ways recently by being named winner of the Daedalian Award for weapon system maintenance. This coveted prize is awarded annually in a USAF-wide competition to determine the service's best maintenance team. For FY86, that team was deemed to be the 50th TFW — and deservedly so. Just look at their accomplishments over the past year:

- A world record for a one-day sortie surge rate.
- Top active duty team in Gunsmoke '85, with "Top Gun" honors going to Capt. Mark Fredenburgh, while his teammate, Capt. Mitch Dodd, took third place.
- Member squadron (313th TFS) named USAF's most outstanding tactical fighter squadron — for the second year in a row!
- 1986 USAFE Looseo champions.
- Full wing conversion to F-16C/D.
- Major self-help refurbishment program through Operation Creek Maintain.
- NATO briefer calls 50th "the best American base we have ever seen" following NATO Tac Eval 86.
- Rex Riley award for excellence in transient aircraft and aircrew service.
- 17th Air Force Foreign Object Damage (FOD) award, plus a check for $20,000 dollars, for experiencing a full year of operation without a chargeable engine FOD incident.

And those were just the highlights. During the year, the 50th participated in eight major deployments to such far-flung locations as Spain, Turkey, and Nevada, where they underwent training in both air-to-air and air-to-ground environments.
It all began back in October 1985 when the 496th AMU shattered the world surge-rate record during a deployment to Incirlik AB, Spain. In 11 hours and 40 minutes, the unit generated 144 sorties. There would have been more, but all the available pilots had exhausted their day's flying limit. Of the 18 aircraft used in the surge, 15 were still code one when it was all over. The day's activities culminated a deployment in which the unit flew an average of 48 sorties per day for the preceding 16 days.

Meanwhile, on the other side of the world, a hand-picked team from the 50th TFW was attempting to defend its Gunsmoke '83 title and win the coveted crown for the second time in a row. And they almost did it, scoring 9,429.5 points out of a possible 10,000 — but bowing by a mere two-point margin to the Air Force Reserve’s 419th TFW from Hill AFB, Utah. However, some of the sting was taken out of the incredibly narrow loss when the 50th's Capt. Mark Fredenburgh was named the competition’s “Top Gun.” During the competition, the 50th’s maintainers generated 39 sorties — all terminating code one, and all logging a 100 percent effective weapons release rate.

Also in that award-winning month, the 50th received the 17th Air Force FOD Award — plus a check for $20,000 — for having the best FOD-prevention program for 1985, as evidenced by the wing’s statistic of having zero chargeable engine FOD incidents in that year. To achieve such a remarkable FOD record, the wing gives a monthly Golden Broom Award to the individual who most significantly aids the FOD program. Additionally, there is a monthly award for the best FOD poster, and a local video was developed to highlight FOD hazards unique to Hahn Air Base and the F-16. The video is the first of its kind in 17th Air Force.

The Rex Riley award for “excellence in transient aircraft and aircrew service” was presented to the 50th in November 1985. In the year prior to the award, 50th EMS Transient Alert personnel had serviced almost 2,000 aircraft, representing over 50 different types, and hauling from various allied nations. The unit was cited for its consistent “can do” attitude.

The following spring brought additional honors when the wing competed in the USAFE Load/Combat Ammunition Production (CAP) meet, conducted at Sembach AB, Germany. In the CAP competition, the 50th scored a perfect 1,000 points in the tool kit category, and another perfect score of 4,000 points in the munitions breakout BDU-38 category. They also won the flightline competition with 13,770 of a possible 15,000 points, yet dropped to second for the overall CAP title.

But the Loado team took overall honors after winning the air-to-ground competition outright by achieving 5,900 of a possible 6,000 points. The loading team used an innovative new aircraft mover that saved a significant amount of time.

Even still yet more additional honors were heaped upon the 50th TFW when the wing’s 313th Tactical Fighter Squadron — for the second consecutive year — was named winner of the Commander-in-Chief’s Trophy as USAFE’s most outstanding tactical fighter squadron. The 313th AMU achieved the wing’s highest fully mission capable and scheduling effectiveness rates and was named the wing’s outstanding AMU for 1985. In that year, the 313th TFS flew over 4,900 sorties, logged nearly 7,200 accident-free hours, and participated in five deployments.

As if all this weren’t enough to convince you that the 50th TFW is a truly outstanding unit, the wing achieved all these honors while undergoing a conversion to the F-16C/D ... and while base personnel were involved in a massive self-help program to rebuild maintenance facilities through a CINCUSAFE initiative called Operation Creek Maintain. In short, the wing’s personnel saved the American taxpayer an estimated half-million dollars in construction fees by rebuilding maintenance facilities themselves. They expended an estimated 50,000 manhours on the effort — most of these hours being off-duty and/or weekends. CINCUSAFE was so impressed with the efforts at Hahn that the base was awarded an additional $49,000 for materials to build two AMU facilities within hardened shelters.

And while all of the above was going on, the wing underwent Tac Eval ’86, a major NATO inspection. Most NATO units take a break from the inspection business during a major aircraft conversion — but the 50th elected to take on the challenge, then carried it off with flying colors. During the evaluation, the wing maintained a 96 percent mission capable rate on its aircraft while all loads were accomplished well within required times — despite being under alarm red and black conditions and in full chemical ensemble. The camouflage and deception efforts in the DCM complex and throughout the base prompted a NATO briefer to comment that the 50th was “the best American base we have ever seen.” As a result of such efforts, the wing received its best Tac Eval score in recent years.

On a final note, the 50th TFW and maintenance complex hosted a bed-down and activation of the 38th Tactical Missile Wing, thus becoming the first base in USAFE to support two major tactical wings. The event required sharing of facilities and personnel.

As previously mentioned, these were only the major highlights. Certainly no one can say the 50th Tactical Fighter Wing isn’t deserving of the Daedalian Maintenance Award. The only question is, “Where do you go from here?” Congratulations on a job well done! ■
During Hurricane Gloria, the Fuels Management Branch responded quickly and efficiently to the relocation of aircraft from Pease AFB. In just 18 hours, the aircraft were recovered, serviced, and ready for operation.

In the year preceding the Daedalian Award, the branch dispensed over 25 million gallons of jet fuel, more than 60,000 gallons of water, nearly 400,000 gallons of gasoline, 100,000 gallons of diesel fuel, and 70,000 gallons of cryogenics — all done on time and without a single safety incident.

The 380th Supply Squadron was additionally recognized for a self-help program that has thus far resulted in the completion of a remodeling project in the fuels building, creation of an Aircraft Parts Store, construction of office buildings for the Base Support Demand Processing Unit and Records Maintenance Section, a major facelift to the Materiel Storage and Distribution workcenters, and other projects too numerous to mention.

Of particular note in these self-help projects, however, was creation of the Aircraft Parts Store — which was planned, organized, constructed, and completed within six months.

Air Force Chief of Staff Gen. Larry Welch announced that the Daedalian Supply Effectiveness Trophy for 1986 has been awarded to the 380th Supply Squadron, 380th Bomb Wing, Plattsburgh AFB, New York.

Like the Daedalian Maintenance Award (see preceding article) the Supply Effectiveness Trophy results from an annual, USAF-wide competition. The trophy seeks to promote maximum supply effectiveness efficiency. Each year, the USAF selects the organization that achieved the best supply performance record during the preceding year. Eligible organizations include those that support either aircraft or missile wings. The 380th Supply Squadron supports FB-111s in the Strategic Air Command's largest operational aircraft wing.

In part, the trophy was given to the 380th Supply Squadron due to their Excellent rating in the 1986 Operational Readiness Inspection. The IG inspector said the squadron was "unquestionably the finest, most professional unit this inspector saw on base." Four of the squadron's five branches were rated Excellent, with special recognition being given to the Fuels Management Branch which earned its second consecutive Excellent rating.

"Response and support to the aircraft generation and exercises were superb," the inspector said. He cited "strong supervision, high morale, aggressive leadership, professional pride, and a healthy effective quality control and inspection program."

In announcing the award, Gen. Welch noted that this year's competition was "exceptionally keen" and said that selecting a winner was more difficult than ever due to the excellent quality of the nomination packages. Gen. Welch credited their success as "a direct result of the dedication, initiative, and hard work of the outstanding supply professionals assigned."

The Strategic Air Command's Commander-in-Chief, Gen. John T. Chain, Jr., also lauded the 380th Supply Squadron.

"The selection of your unit as the best in SAC and best in the Air Force is testimony to your professionalism, dedication, and pursuit of excellence in everything you do. I am proud of your superb achievement."
The F-16 pilot was number two in a flight of two on the takeoff roll. He observed lead's afterburner, released his own brakes, and selected max A/B as lead started to rotate. Engine instruments were all in the green. Everything looked good as rotation speed approached. He began to apply back pressure on the stick. Then more back pressure. No rotation. Speed building. More back pressure. Still no rotation. Pucker factor gauge approaching red line…

OK gang, now what? Does he keep going, gambling that rotation will occur soon? Or does he attempt to abort with a heavy airplane? If he chooses to abort, how much runway is left? Can he stop in the distance remaining? Quick, now — there's a lot riding on the decision he has to make in just a couple of seconds.

But before we tell you what the pilot's decision was, let's take a look at some possible causes, and what should be done to prevent it from happening again to the same airplane on its next takeoff attempt. It's important to realize two things:

First, failure to rotate is a serious problem, since it may commit the pilot to a high-speed abort situation at takeoff gross weight.
Second, when troubleshooting the problem, maintenance personnel should be aware that a combination of things may be wrong. For example, an under-serviced nose-gear strut will lower the deck angle and significantly increase the rotation speed (a two-degree reduction in deck angle will increase rotation speed by about 14 knots). But a tiny leak in the air data system can compound the problem by giving false airspeed readings to the pilot. So let's suppose you have both problems, but you stop looking when you find and correct the strut problem. You've still got a problem with the air data system leak, and another aborted takeoff could result. Therefore, all possible causes for the failed rotation must be checked out before releasing the aircraft for another flight.

In the event an aircraft fails to rotate (or, as is more often the case, rotation occurs later than computed) the -6 (Scheduled Inspections and Maintenance Requirements) is the place for maintenance personnel to begin their search for a solution. The -6 refers them to the 27FI (flight control fault isolation) and additionally requires a functional check flight following completion of all maintenance checks. The procedures in the 27FI are preceded by a warning:

"By nature of this malfunction, more than one factor may be involved as the cause; therefore, the entire procedure must be performed. Failure to comply may cause aircraft damage and injury to personnel."

It's also important to note that visual, walkthrough inspections cannot take the place of system checks when investigating a failure to rotate write-up. One very good reason for this is because it's possible for an improperly serviced nose-gear strut to show normal outward indications. Here's how it could happen: The nose-gear strut is servoed both hydraulically and pneumatically. Let's say there was not enough hydraulic fluid in the strut, but the problem was improperly "fixed" by charging with more compressed nitrogen until proper strut extension was achieved. On the takeoff roll the afterburner thrust compresses the strut, resulting in a lowered deck angle and an increased rotation speed. The pilot assures you that the strut was "normal" when he visually inspected it. And sure enough, it still appears normal — but it isn't.

Too much hydraulic fluid in the strut is a less common problem, but it's also an area where strut extension may appear normal. In this scenario, the smaller volume of compressed gas would cause the strut to give up most of its energy within the first inch of travel and won't help raise the nose beyond that point — again, adding knots to the rotation speed. (The nose-gear strut servicing procedure in the Job Guide will ensure a proper mix of hydraulic and pneumonic servicing.)

It is imperative, then, that all required checks in the 27FI be performed, rather than relying on what appears to be a normally functioning system.

Meanwhile back at the ranch, our intrepid pilot faces decision time — to abort or not to abort. As mentioned above, several things can delay rotation. By the way, the key word in that last sentence is delay (as opposed to prevent). If the flight control system passed BIT check — and if you're sure the tail didn't fall off during taxi (verified by the before-takeoff flight controls check for tail deflection) — then the airplane will eventually rotate. Even if all possible malfunctions were stacked up against you at the same time, the max you'll add to your rotation speed is 33 knots.

As usual, however, there's an exception to this rule: If you aren't really applying full back-stick pressure, you'll add even more to your rotation speed. For example, if inadequate back-stick pressure is giving you only ten degrees tail deflection, you'll add an additional 31 knots to your rotation speed. But even if this is added to the 33 knots from a full combination of other possible problems the aircraft will still eventually rotate.

If your F-16's pointy end doesn't want to aim high on cue, the important thing to remember is don't panic. Assuming proper control function has been visually verified and you didn't begin your takeoff roll from midfield of a short runway, then you've probably still got plenty of room left. Don't risk bending an airplane because you think it isn't going to rotate. Just keep the back pressure in and the airplane will fly. Complete the takeoff, and later make sure maintenance checks out all the possible problem areas. One or more of them is the culprit.

We recognize, however, that a given situation may dictate an abort as the correct procedure. One recorded incident with a B model involved a flight control malfunction. All "prior to takeoff" checks — including the flight control checks — had been completed without incident. But, while on the runway for takeoff, the student in the front cockpit cycled the flight controls one last time while visually checking for tail movement. He noted that the horizontal tails remained at neutral with full aft stick commanded. The IP verified the problem, took the controls, and achieved normal tail response using his stick in the rear cockpit. Troubleshooting revealed a bad front-cockpit stick transducer assembly. An alert student thus averted what could have developed into a nasty situation.

Again, the F-16 will eventually rotate in almost every case, but it's up to the pilot to make that critical decision. If time permits, look behind you briefly to ensure tail deflection, and make sure you're commanding full back stick. If an abort still seems like the right move, then do so without delay. The longer you delay this decision, the more you compound the risks already inherent in a high-speed, heavy abort.}

EDITOR'S NOTE: The foregoing article was compiled from information provided by Flight Test Engineering, Aerospace Safety, and Product Support Engineering.
eating crow

Even when it doesn’t involve canopy penetration, a bird strike can be a shattering experience.

By DONALD G. GWYNNE Jr.
Aerospace Safety

True story: The F-16 pilot was zinging along at about 800 feet AGL and pushing the far side of 500 knots when — bam!! — he took a bird right in the chops. There was no penetration, mainly because the F-16’s canopy has no forward bow frame. Instead, the impact created a “deflection wave” that rippled back along the length of the canopy.

So. No penetration, no problem — right?
Wrong! The deflection wave shattered the HUD combining glass, showering the pilot with glass fragments. Everything from big chunks to fine shards were hurled at the pilot’s upper torso and head. Although the bird was pretty smushed, it was believed to have been a red-tailed hawk. The pilot had his oxygen mask on, his visor was down, and he was...
looking down at the time of impact — yet he still got some glass debris in his left eye. There isn't any doubt in his mind as to what the result would have been had he not been using his visor.

Naturally, there followed a real flurry of interest in visors at the base involved. The Flight Manual (T.O. 1F-16A-1) is crystal clear on this point:

"The canopy provides bird strike protection and has successfully withstood test strikes of four-pound birds at 350 knots. Bird strikes of this magnitude on centerline at approximately eye level typically produce enough canopy deflection to shatter the HUD combiner glass and cause rearward propagation of a deflection wave. Deflection of the canopy in the area of the pilot's helmet has been observed to be approximately three-fourths to one-and-one-quarter inches. Impacts off center may not shatter the HUD glass. Higher energy bird strikes may cause canopy penetration or larger deflection waves."

Surprisingly, some F-16 pilots cling to the mistaken notion that the canopy can't be penetrated — not even by a large bird. Or they think that bird strikes are rare enough to disregard. Neither is the case. In 1981, a European F-16 encountered an eight- to 15-pound crane while flying over mountainous terrain at approximately 400 to 450 knots. Portions of the bird penetrated the canopy, shattered the HUD glass, and struck the pilot, damaging his torso harness.

HUD glass fragments penetrated his flight suit and imbedded in his chest. The resulting deflection wave broke out a large portion of the canopy behind the pilot. And as the wave went by, it thumped the pilot on the head, possibly causing what he later described as an electric shock sensation from the stick and throttle, and temporarily incapacitating him.

Fortunately, he was able to eject and lived to tell this story. Happily, his visor was down. In this case, the impact energy was well in excess of the canopy's four-pound/350-knot qualification level. Since that time, three other F-16's have been destroyed following bird strikes (although none of these involved the canopy).

The USAF Bird-Aircraft Strike Hazard (BASH) team has maintained USAF bird strike data since 1975. Their most recent report covers the 1985 calendar year. USAF F-16 pilots reported 136 bird strikes that year, for a rate of 61.9 strikes per 100,000 flight hours. A frontal view of the F-16 fuselage and canopy area reveals that the canopy makes up 22 percent of the exposed area, the inlet 27 percent, while the radome and forward fuselage account for the remainder. Thus, about one-fifth of all F-16 bird strikes can logically be expected to involve the canopy.

When the dual visor helmet was around, it was easy to switch from a tinted "daytime" visor to a clear one for night, dawn, or dusk flights. But now — with the singlevisor, lightweight helmets — it's not so easy. Recent visits to some bases have made it clear that not many F-16 pilots regularly bother with a clear visor for flights in dim light conditions. It requires planning ahead, and maybe a visit to the P.E. shop. And yeah, there isn't any clear-cut place to stow the alternate visor if you try to take it with you. Nothing is simple these days, it seems.

Still, Aerospace Safety urges you to install a clear visor for that dawn, dusk, or night flight. Ducks, geese, and hawks have IFR ratings too, you know. And BASH data shows that approximately 25 percent of all bird strikes occur at dawn, dusk, or night.

We have a three-quarter inch VTR tape of a standard (four-pound bird/350 knot) bird strike test on a production canopy, available for loan to Flight Safety Officers who might be interested in spreading the word. Contact your local Field Service Representative, or call General Dynamics Aerospace Safety at (817) 763-2301.

BASH FLASH:

The USAF's BASH team doesn't live at AFGECC, Tyndall AFB, Fl., anymore. They've relocated to:

HQ USAF/LEEVN
Building 516
Babydoll AFB
Washington, D.C. 20332-5000

The present BASH Team Chief is Major Joe Ward. He can be reached at (202) 767-6243, or Autovon 297-6243.
It Ain’t Necessarily So

Things aren’t always as they seem — especially with landing gear lights.

An unsafe landing gear indication is one of the more common inflight emergencies encountered by F-16 pilots. Fortunately, however, the problem is usually a false alarm, amounting to nothing more than a malfunction within the gear indicating system. Only on rare occasions does a gear actually fail to extend and lock.

But how can you tell if it’s real or not?

To better cope with a problem of this type, it helps to understand how indications of landing gear position are provided to the cockpit. Basically, the job is handled by two electrical circuits — one for green lights (everything’s cool), and one for red lights (Ahh, we maybe got a problem here, ace). Here’s how it works: Each landing gear has its own downlock switch, and each switch contains two contacts — one for the green-light circuit and the other for the red-light circuit (which drives both the gear-handle red light and the TO/LAND CONFIG light). As each gear extends into position, its downlock switch is actuated and the contacts for both circuits move into position. One contact completes the green-light circuit by energizing a downlock relay, thus allowing illumination of the appropriate green light. The other contact opens the red-light circuit, which is interconnected to all three landing gear. The gear handle warning light goes out only after all three downlock switch contacts in the red-light circuit have opened. Illumination of the TO/LAND CONFIG warning light is inhibited in a similar manner — i.e., all three downlock switch contacts in the red-light circuit must open. With that background, let’s look at a couple of scenarios and see how one might use this information.

First, suppose that the “LG Position/NWS Fail” circuit breaker opens in flight when the gear are up. The pilot returns to base after a normal mission and is unaware that this breaker is open. He lowers the gear handle, notes the red light on in the handle, feels the normal gear-lowering sensations, and sees that the gear handle red light is off. But he also notes that none of the red lights are illuminated. A quick light-bulb test reveals that all are working. Cycling the gear handle up, then down, produces the same sequence of events. What now? Alternate gear extension? In this instance, alternate extension won’t do a thing for you. The nose gear is already down and locked, and you know from the visual check that the main gear in question is out of the wheel well. With regard to the main gear, the only thing alternate gear extension does is open the door and unlock the gear. Gravity then takes over and allows the gear to drop into position. Downlocking is mechanically achieved by a spring as the drag brace straightens. You’ll also find that applying g forces won’t remedy this situation. Since the downlock switch bracket is broken, the downlock switch is simply not in the proper position to be actuated. The green light circuit can’t be completed, the red-light circuit can’t be inhibited, and you can expect a TO/LAND CONFIG light to illuminate and the gear warning horn to sound when speed, altitude, and descent rate conditions are met.

So now we’re back to square one. You’re still left with a decision about the landing. If you’re confident that the person making the visual check correctly verified normal gear and door positioning, straight drag braces, and no visible structural damage, then a normal landing may be accomplished. The more conservative move is to make an approach-end arrestment (refer to the flight manual chart labeled “LG Up Landing”).

Many other scenarios are possible, and — depending on the failures involved — other systems may also be affected. But regardless of the reasons for a gear-related inflight emergency, a good working knowledge of the system can be a significant asset in enabling you to expertly cope with the situation.

Your wingman can visually verify whether your landing gear lights are lying to you.
The F-16 Fighting Falcon once again demonstrated its famous weapon delivery accuracy during the Tactical Air Command's Long Rifle II gunnery meet. The six participating F-16 teams captured the top four places — as well as sixth and ninth — from a field of 16 teams.

Long Rifle is a semi-annual gunnery competition involving all active duty wings in TAC's 9th and 12th Air Forces. This second meeting was held at Arizona's Luke AFB on 6 March.

To ensure a representative cross-section of aircrew capability from each wing, the four aircrews that comprise each team are randomly selected just prior to the meet. Missions are flown non-stop from home bases, employ in-flight refuelling if necessary, proceed to the target at low level to meet assigned range times, and recover at the host base.

Four bombing events and one strafing event are performed. No practice runs are allowed, and no alibis (for failure to drop bombs or fire guns) are permitted. Aircraft participating in this meet were the F-16A/C, A-10A, F-4D/E/G, and F-111A/D. Long Rifle II marked the first time F-111s participated. A bomb toss event was substituted for strafing for the F-111s, and the two participating teams were judged separately.

Luke AFB's defending champion 58th Tactical Training Wing retained their Long Rifle title with a record team score of 2853 points, surpassing their previous 2438-point outing at Long Rifle I in 1986. Also beating that previous high score were the 388th TFW from Hill AFB, Utah (2538); the 363rd TFW, Shaw AFB, South Carolina (2528); and the 474th TFW, Nellis AFB, Nevada (2470). The top A-10 team (of three participating) finished fifth with 2102 points, and the top F-4 team (of five) was tenth with 1585 points.

F-16 pilots also dominated the individual standings, taking 14 of the top 15 overall positions. F-16 pilots placed first in three of four bombing events, all achieving perfect scores. In the fourth event (dive bomb) an A-10 pilot and an F-16 pilot both achieved perfect scores with two bullseyes apiece, but the A-10 pilot was named winner of the event based on his higher score in the overall competition. As usual, the A-10s swept the strafing event, averaging 83 percent hits. F-16 pilots accumulated a high percentage (17 percent) of bullseyes in the bombing events, compared to 11 percent for the A-10s, and two percent for the F-4s.

For the second time, the Top Gun award went to a 58th TTW pilot. This time it was Maj. Jim Henderson, who scored a record 721 points overall while taking individual honors in the low-angle bomb event. His average of six bombs was 4.5 meters, yet this was bettered by the third-place pilot (F-16) whose average bomb was only 3.5 meters. A 58th TTW pilot also won the Top Gun award in Long Rifle I.

The two teams flying F-16Cs made excellent showings, placing first and a very close third. In the previous meet, the one team flying F-16Cs finished a close second.

This is the fifth major bombing competition in which the F-16 has participated — and each time the results have been the same, with F-16 teams and pilots excelling. It has been said that the F-16 has greatly improved the IQ of the "dumb bomb", and that the F-16 — with an unguided bomb — is a precision weapon system.

Long Rifle III will be held at MacDill AFB, Florida. An exact date hasn't yet been announced, but it is expected to take place sometime in the summer. In addition, the USAF's biennial, worldwide air-to-ground gunnery competition (Gunsmoke) is scheduled for 3-17 October at Nellis AFB.
50,000 HOURS without a Class A

By CAPT. CHUCK ROQUE
Public Affairs Office, 8th TFW

KUNSAN, KOREA — Aviators and maintenance technicians of the 8th Tactical Fighter Wing’s “Wolf Pack” accomplished two USAF milestones recently by becoming the first single-engine fighter wing and the first F-16 wing to fly more than 50,000 hours without a Class A mishap.

The 8th TFW safety office verified the accomplishment with the Air Force Inspection and Safety Center at Norton AFB, Calif.

“This achievement is due to a longstanding history of doing things right the first time,” said Maj. Stephen Kniffin, the 8th TFW chief of safety. “The safety office compiles these statistics, but it’s other people who set them. There’s a lot of people who made this possible, especially in the maintenance and operations areas.”

The wing’s last Class A mishap occurred in January 1984, when a pilot was forced to eject following an engine failure. Since then, the wing has participated in several deployments, including Gunsmoke ’85.

A Class A mishap is any accident resulting in $500,000 or more in property damage, and/or involves a fatality or permanent disability to a person. Class B and C mishaps are accidents of declining severity.

The Wolf Pack has seen a steady drop in all types of flight mishaps since 1984, according to TSgt. James Marx of the flight safety branch. “The rate per 10,000 flight hours has dropped from 17.63 in 1984, to 12.77 in 1985, to 11.6 last year,” Marx said.

Col. Sidney J. Wise, the 8th TFW’s commander, made the record-setting flight.

USAF’s Safest Single-Engine Fighter

Zaragoza Sortie Record Is Broken

The 10th Tactical Fighter Squadron broke a five-year-old Zaragoza AB record during a weapons training deployment to Spain in February.

The 10th TFS flew 953 sorties in 16 days with only four ground aborts and one non-effective mission. This marks the highest number of sorties ever flown at Zaragoza AB in one month. The previous record was 912 sorties in 22 days, flown by the 480th TFS from Spangdahlem AB, Germany, in 1982.

“This record is a great credit to the fantastic ‘Sabre’ maintenance troops in Blue Section,” said Lt. Col. Sergio A. DelHoyo, 10th TFS commander. DelHoyo last year became the first pilot to log 2,000 hours in an F-16.

“The 10th Aircraft Maintenance Unit did a fantastic job in keeping us mission ready,” said DelHoyo, noting that in one day the squadron generated 89 sorties.

“Our maintenance folks did a super job,” said Lt. Col. Paul R. Dordal, 10th TFS operations officer. “We weren’t trying to set any record, but the combination of maintenance, good weather, and the quality of sorties made the record possible.”

“Our maintenance people make it happen daily,” DelHoyo added.

—Official USAF News Release
TUSAS Plant Passes Milestone

Turkish factory gears up for full production.

By JOE STOUT
Public Affairs

The forward, center, and aft fuselage sections of the first F-16C to be manufactured in Turkey recently were joined together, or mated, in a ceremony at the TUSAS Aerospace Industries (TAI) factory in Murted.

Jerry R. Jones, General Manager and Deputy Chairman of TAI, told the company’s employees, members of its Board of Directors, General Dynamics Resident Office employees, and representatives of the press who attended the ceremony that TAI had met its first major milestone by beginning F-16 mating according to schedule.

"Today we are witnessing an historical event," he said. "This is a development of historical significance as far as the aircraft industry of Turkey is concerned, and it is a proud moment for the American and Turkish shareholders, as well as employees of TAI and General Dynamics." TAI was established less than three years ago as a joint venture in Turkey. Fifty-one percent of the company is Turkish-owned, and 49 percent is American-owned. The joint venture calls for General Dynamics to manage the company during its first seven years of operation. The Turkish investment includes the land and buildings, while General Dynamics is providing equipment and services.

In addition to Jones, who is also Fort Worth Vice President-Turkey Joint Venture, the other General Dynamics personnel on TAI’s staff are the firm’s Director of Operations, its Director of Finance, Contracts, and Estimating; and its Director of Quality Assurance. Each of these positions has a Turkish deputy who will assume the full responsibility of the post in 1991. All other positions in TAI are held by Turkish nationals.

General Dynamics agreed to establish the joint venture, which will develop a modern aircraft industry in Turkey, as part of the country’s purchase of 160 F-16 aircraft. Under a coproduction contract, TAI will assemble 152 F-16C/D Fighting Falcons and deliver them to the Turkish Air Force. Eight aircraft will be built at Fort Worth.

The coproduction agreement also specifies that 112 aft fuselages, 100 center fuselages and 88 sets of wings will be fabricated and assembled by TAI, said Jones. "This work is progressing on plan. The work has been scheduled to allow progressive start-up. TAI has allowed time to familiarize its work force with one type of work before beginning the next type," he said.

TAI currently has about 570 employees on its payroll, including 170 who have been sent to Fort Worth for several months of training. By 1989, more than 300 Turkish employees will have been trained at Fort Worth, and more than 300 additional workers will have been trained at TAI, Jones said. "The training program is on schedule also," he added.

"Overall, TAI feels that the combination of American and Turkish management has worked very successfully, allowing the company to meet schedules and stay within cost," Jones said. "TAI sees no major difficulties in meeting its objective, which is to develop the capability to produce high technology aircraft in Turkey."

Construction of the TAI factory is approximately 80 percent complete. The first F-16 to be delivered from the factory is scheduled to make its initial flight next October.
A MILESTONE HAS BEEN ACHIEVED IN TURKEY with the joining of the forward, center, and aft fuselage sections of an F-16C. The event occurred at the TUSAS Aerospace Industries (TAI) factory in Murted, Turkey, where 152 of the high-performance aircraft will eventually be produced for the Turkish Air Force. The manufacturing project is a joint effort between the Turkish government and General Dynamics. Initially, the Murted facility will be managed by General Dynamics, but Turkish managers will assume control after seven years. Turkish technicians are currently undergoing extensive training at the Fort Worth Division.

PEACE ONYX
Instructor Pilots Are Selected

The Turkish Air Force, following a one-year evaluation program, has selected six pilots to undergo F-16 conversion and instructor-pilot training at Arizona’s Luke AFB, beginning in May. The six pilots were selected from a group of 36 pilots that participated in an in-country program established at Eskisehir Air Base, Turkey. Using the F-16 “dash one” and other basic training aids, the pilots underwent academic as well as physiological training. Murted AB will receive its first F-16 in October. Turkish F-16 coproduction began in February, and the first Turkish-produced airplane is scheduled for delivery in January, 1988. Pictured, left to right, are Squadron Commander Sirri Tahmaz, Senior Captain Oguz Ozupek, Captain Alpaslan Kiper, Brig. Gen. Kadri Sonmur (Murted AB’s Commander), First Lieutenant Sule Senkal, Staff Captain Aydin Tuzun, Senior Captain Naci Karagoz, and Senior Captain Mehmet Kayandan.
End of an Era

The Belgian Air Force marked the end of an era in February upon the retirement of the service's last two NCO pilots.

Jan van Haesendonck and Guido Neyens retired after 26 years service as non-commissioned pilots. They were the last remaining NCO pilots in the Belgian Air Force, which now recruits officer aircrew members only.

Neyens was an F-16 instructor-pilot with the 23rd Squadron, 10th Fighter-Bomber Wing, at Klecine Brogel, while van Haesendonck flew a Swearingen Merlin for the 15th Wing at Melsbroek.

Guido Neyens with his Swearingen Merlin

Jan van Haesendonck in front of his F-16

The Belgian Air Force's last two non-commissioned pilots performed a two-ship formation flight before retiring after 26 years service.

In 1986, the USAF enjoyed a remarkable mission-capable rate for its worldwide fleet of F-16s.

91.3 Percent!

The U.S. Air Force recently announced that its F-16 fleet achieved a 91.3 percent mission-capable rate for 1986. This percentage means that, on the average, about nine out of every 10 USAF F-16s are ready at any time to fly and meet demanding mission requirements.

Maj. Gen. Robert D. Eaglet, Deputy Commander for the F-16 at the USAF's Aeronautical Systems Division (ASD), Wright-Patterson AFB, Ohio, said, “This high mission-capable rate reflects not only the dedication of Air Force maintenance personnel, but also the quality of the aircraft's basic design. The bottom line is that the F-16 is a fighter we can all count on to be ready to do its job when it's needed.”

ASD manages the development, test, production, and acquisition of all F-16s.

F-16A/B aircraft achieved an 87.9 percent mission-capable rate during 1986, while F-16C/D models were rated at 93 percent.

General Eaglet noted that, “In the past, many critics claimed that complexities associated with increased performance inevitably will result in poorer reliability for our front-line weapons systems. The improved mission capability rates for the C/D fleet, relative to the earlier, less capable A/B aircraft, provide visible proof that when proper attention is given up front to reliability and maintainability, the readiness and availability of improved systems can be made to exceed their predecessors.”

General Dynamics and the other F-16 contractors share the credit for the high rates of readiness, the USAF announcement said. The USAF also recognized the quality efforts of F-16 coproducers.
SSgt. Cody USAF

WHEN YOU TOW AN AIRCRAFT, DO YOU GO BY TH' JOB GUIDE?

SOME PEOPLE DON'T, AN' TH' RESULT HAS SOMETIMES BEEN AWFUL!

"CAUSE IT'S HAPPENED BEFORE THAT SOMEONE HOOKED UP TH' TOW BAR WITHOUT REMOVIN' TH' QUICK-RELEASE PIN AN' PLACIN' IT THRU TH' AXLE. FAILURE TO DO THIS CAN DAMAGE TH' TORQUE ARMS AN' TH' NOSEWHEEL STEERIN' MECHANISM."

AN'... ER... BEFORE YOU REMOVE TH' TOW BAR...

...DON'T FORGET TO CHOCK TH' AIRCRAFT!
Daedalian Maintenance Award
Goes to Hahn's 50th TFW

(story on page 20)