LOCK ON N°22
AIRCRAFT PHOTO FILE

McDonnell Douglas
F-15 E STRIKE EAGLE

Willy PEETERS

VP
the worldwide scale

856

F-15 E STRIKE EAGLE
492nd Sqn, USAFE
Lakenheath, England

VP
the world in scale

Cover : Crewchief and assistant patiently awaiting the pilot's signal to remove the boarding ladder and wheel chocks from this F-15E prior to an afternoon sortie from Lakenheath , formerly an F-111 "Aardvark" base.

Title Page : Part of the preflight checkup is monitoring the infallible operation of flaps, ailerons, tailplanes, all-flying tailplane and the large airbrake on top of the fuselage. The pilot is being informed by the crew chief through the intercom system. In the older days of flying information was passed through pre-coded hand signals.
(Photo by Ronny MEURIS)

Page 3 : Near-perfect side view revealing the F-15E silhouette with large bubble canopy over the tandem seats occupied by the pilot (front) and WSO or Weapon System Officer (rear).
Note the hangar in the background with reinforced side-sliding doors, typical RAF sheltering found on many bases throughout the United Kingdom.

Rear Cover : Head-on view of the F-15E clearly showing the shape of the CFT's and the position of the pylons.
(Photo by Ronny MEURIS)

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At the time the photos for this book were taken the F-15E was still considered "Top Secret" (or at least photosensitive), although some US publications had already covered some of its physical characteristics and had revealed the nature of its sophisticated avionics as used in the Gulf War.
To photograph it in such detail as printed on the next pages could only be accomplished with the assistance of the following :
Colonel Mike GUTH, 48th FW Commander, Lt. Col. Bill CARPENTER, Cpt. Bruce HANESSIAN and Major John CROGHAN of the 492nd Fighter Squadron, RAF Lakenheath for their approval and hospitality during my stay at the base. A word of thanks is also due to MSGT Joseph COTTON of the 48th Public Affairs Office for his assistance.
A very special thanks to Lt. Col. Jim "SLATS" SLATON, 492nd Commander for his assistance during the afternoon shootout and his constant concern to comply with my wishes.
I am also greatly in debt with Major Jim ROTRAMEL, a USAFE pilot who used to be an acquaintance but who, over the years, became a very good and reliable friend. Thanks for introducing me to the wonderful guys of the 492nd and for reshooting the lost footage !
My request for information to McDonnell Douglas was not unanswered, for which I thank Lee J. WHITNEY and Miss Linda SIMMS of the External Communications department.
Finally (and despite his reluctance to be mentioned) a warm thanks to my friend Ronny MEURIS, who again accompanied me on the trip through England in search of more LOCK ON material.

Willy PEETERS

Readers are invited to send in slides and/or clear color photographs on military subjects which may be used in future LOCK ON publications. Additional information on military aircraft of any kind is also welcomed. Material used will be paid for upon publication and unused material will be returned upon request. Original slides and photographs will be handled with extreme care.
Clearly state name and address when sending in your material.

INTRODUCTION

When, in 1982, the Air Force decided for a new long-range interdiction aircraft the F-15C Eagle had already proven its capability in the air-superiority role with several air forces worldwide including Saudi Arabia, Japan and Israel.

The development of the dual-role F-15 E Strike Eagle in 1984 benefitted from the agility of this "world's most capable air-superiority fighter" and experience gained with the F-111 low-level fighter/bomber presently in service.

An array of new avionics and electronics systems was incorporated in an F-15B airframe which had been modified some thirty percent to enable a maximum gross take off weight of 81,000 lbs. and a 9-G maneuver capability throughout the flight envelope.

Reconfigured CFT's (Conformal Fuel Tanks) boost the range of this newly-born air-to-ground interdiction aircraft to 2,400 miles while the LANTIRN navigation and terrain-following system (successfully tested on the F-16) allows operation at night and in adverse weather at altitudes as low as 200 feet and at speeds of nearly 600 miles per hour.

Workload is, like with the F-111, shared by the pilot and his WSO (Weapon System Officer) who is not just the "ballast in the rear bucket" but an indispensable link in this successful combination or to quote Lt.Col. Chuck KILLBERG (a test pilot assigned to the F-15 Combined Test Force at Edwards AFB, Calif.) : "The pilot rows the boat while the WSO shoots the ducks."

Its outstanding performance in the Gulf War underscores the importance of a long-range interdiction aircraft such as the F-15E Strike Eagle which achieved a well-deserved reputation as the "Scud buster"of the war.

492nd Fighter Squadron, RAF LAKENHEATH, UK.
48th Fighter Wing, "Statue of Liberty Wing."

Almost all photos throughout this Lock On were taken with the courtesy of the 492nd Fighter Squadron assigned to the 48th Fighter Wing. The Liberty Wing was the first in USAFE to deploy in support of Operation Desert Shield and Desert Storm. The wing deployed 18 F-111F fighter/bombers on August, 1990. Three more contingents of F-111's, aircrews, maintenance and support personnel were also sent in the months prior to the outbreak of hostilities in Jan. , 1991. By the time the war started the 48th had deployed 66 of 70 F-111F's to Taif, Saudi Arabia, and 1,400 people.

The 48th flew 2,500 combat sorties during the 42-day war with 2,200 confirmed successful missions for an 88 percent success rate.

The first F-15E's reached RAF Lakenheath in February 1992, awaited by air and ground crews who completed full operational training at the 405th Tactical Training Wing at Luke Air Force Base, Arizona.

The 492nd Squadron was activated in January 1941 as a Bombardment Squadron flying the A-18 and A-20 bombers before converting to the P-39, P-40 (1944) to end WWII on the P-47 Thunderbolt. Its first jet aircraft was the F-84 Thunderstreak which was flown from 1952 through 1954, to be replaced by the F-86 Sabre which in turn was phased out for the much faster F-100 Super Sabre (1956-1972). It was during this period that the squadron moved from its former field, Chaumont, France to its current base in RAF Lakenheath, England (Jan. 1960). In 1972, the pilots converted to the F-4D Phantom which they flew until 1977 when the first F-111F's were welcomed.

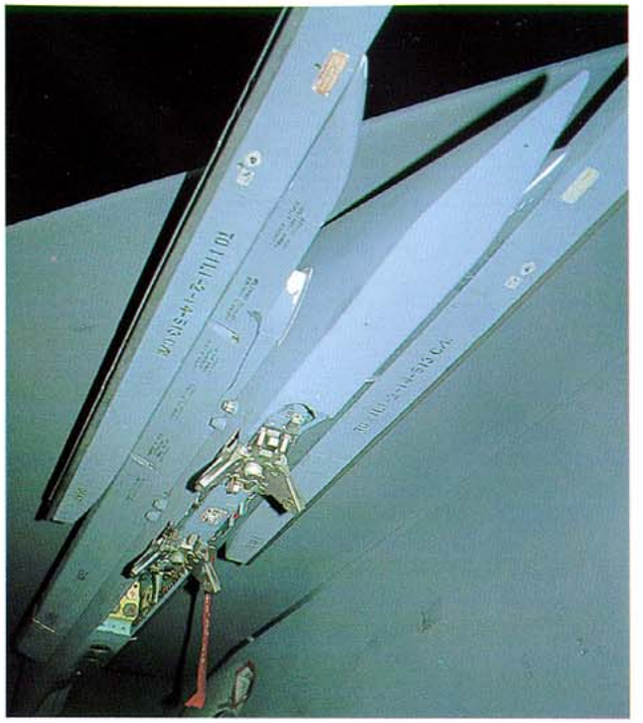
Today, they are among the first to operate the F-15E Strike Eagle from European soil in support of NATO.

At first glance, the F-15E is no different from the F-15B or F-15D 2-seat trainer Eagle but internally it's a completely new aircraft.
External differences are few, but in order to cope with the much heavier payload (up to 24,500 lbs.), the increased fuel capacity of the permanent side-mounted CFT's and extra avionics for the WSO, part of its airframe (some 30 percent) and undercarriage was strengthened. An airframe fatigue test conducted in 1988 simulated 16,000 hours of flight, equivalent to about 40 years of service or twice the Air Force expectancy, and confirmed the F-15E's airframe durability.
The Strike Eagle is capable of carrying most of the weapons in the present Air Force inventory (including the AIM-120 AMRAAM missile) on its nine hardpoints.
Where the F-111 performed remarkably in its air-to-ground role, the F-15E has the big advantage of being able to accomplish the mission alone, without the need for fighter escort, "Wild Weasel" or AWACS aircraft and fight its way back without the support of a backup force. In fact, its secondary role is to fly air-superiority missions, at night and in bad weather, retaining the air-superiority capabilities of previous F-15 models.
For this, it retained the M61A1 20mm gun with 450 rounds of ammo, located in the right forward wing glove.
Note the slightly different color of the nose radome in the picture above.

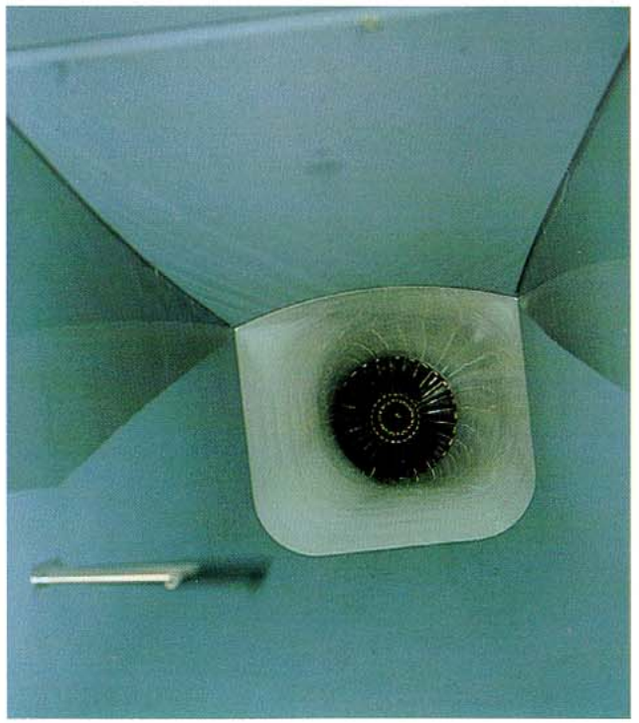
Today's fighter jocks have become so accustomed to wearing the lightweight HGU-55 helmet (almost completely outphasing all other "brain buckets") as demonstrated here by Lt. Col. Jim "SLATS" SLATON, CO of the 492nd Fighter Squadron in the front seat and Cpt. Mark "LAST" CHANCE in the rear WSO station on a late afternoon sortie in June 1992.

Both crewmembers are strapped in the reliable ACES II ejection seats which differ slightly from previous models by having a canopy piercing device on top of the headrest, clearly visible in both views.

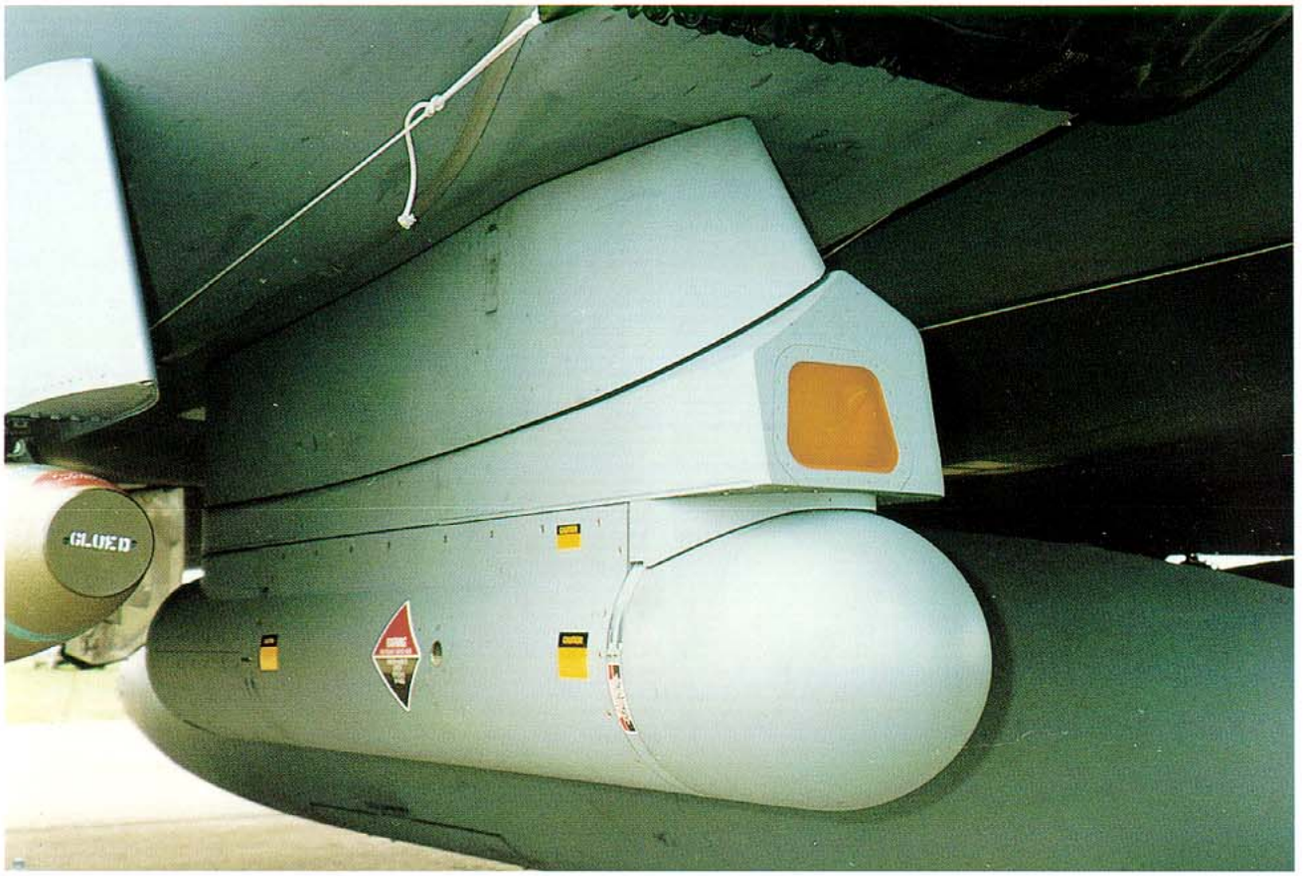
Also apparent are the black/white ejection seat warning triangles along the canopy sill and the overall matt black finish of the inner canopy frame and seats.



Detail of inboard SUU-59C/A wing pylon with missile launcher rails on both sides (above & below).



Starboard side air intake tunnel with airflow sensor probe to the outer intake wall.



(Photo Jim ROTRAMEL)

(Photo Randy JOLLY)

The targeting pod (port side) contains a high-resolution tracking FLIR, a missile boresight correlator and a laser designator which can be integrated with the APG-70 radar.

The biggest asset of the F-15E is the ability to operate at night and in bad weather, made possible by the Martin Marietta developed LANTIRN (Low Altitude Navigation and Targeting Infra-Red for Night) system. It comprises two pods mounted on short pylons below the air intakes in a left-right arrangement opposite of the F-16 configuration. The navigation pod (starboard) contains a FLIR (Forward Looking Infra-Red) sensor producing daylight-quality video images which are projected onto the pilot's HUD.
It also has its own terrain-following radar for low-level, high-speed flying to which the pilot can manually respond or which he can couple to the flight control system for "hands-off" terrain following at altitudes as low as 200 feet.

After obtaining a radar image of the target, the aircrew can designate individual targets by positioning a cursor on the radar display which information is transferred to the LANTIRN system. After tracking has commenced, targeting info is handed off automatically to "smart" weapons which are guided to a small dot of beamed light on the target projected from the laser designator. Aiming air-to-ground weapons can be accomplished from as far as 10 miles away.

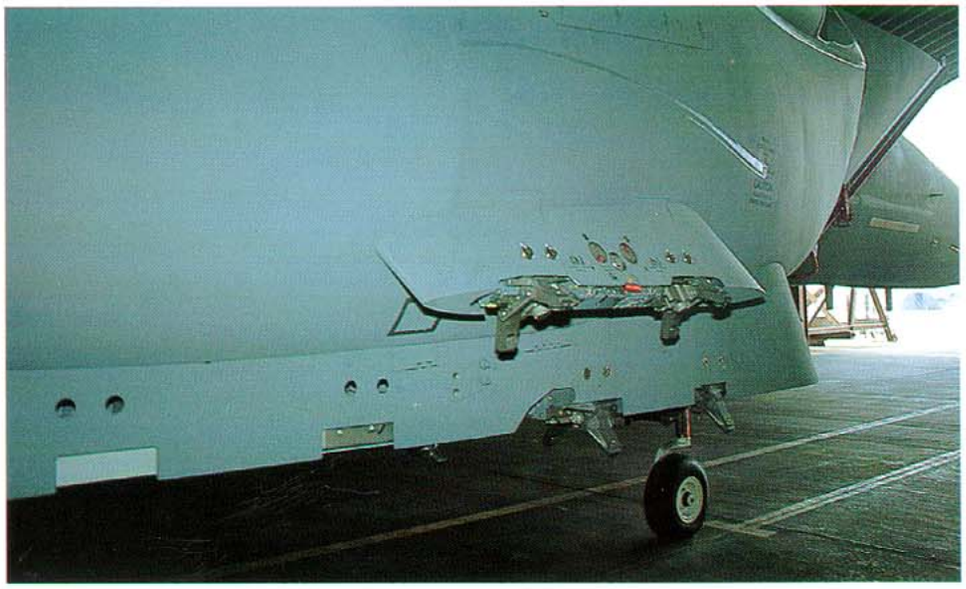
(Photo Jim ROTRAMEL)

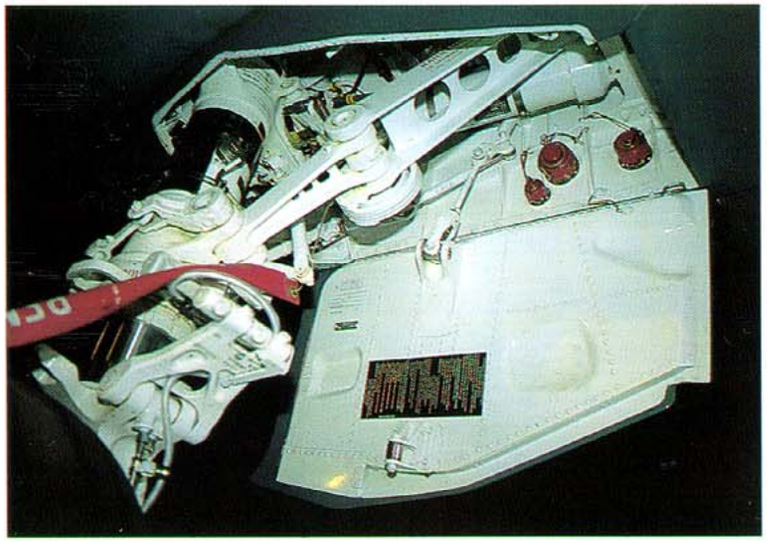
Among the many authorized weapons to be carried by the F-15E is the AIM-9 P/L/M Sidewinder air-to-air missile seen here on the outboard and inboard shoulder stations (on LAU-114/A rails), totaling four. Below the pylon is a GBU-12B/B Paveway II LGB while all 12 CFT stations have been fitted with Mk82 LDGP bombs.
GBU stands for Guided Bomb Unit while PAVEway means Precision Avionics Vectoring Equipment. Paveway II's can be distinguished from the Mark I's by their foldable wings.

(Photo Jim ROTRAMEL)

(Photo Jim ROTRAMEL)

GULF WAR ORDNANCE.
The configuration shown here is not representative for the F-15E's weapon load during the Gulf War. The early MER-200 bomb racks were deleted from production F-15E's in favor of integrally CFT pylons. Desert Storm "Mud Hens" employed up to 12 bombs on the CFT pylons, including Mk82 LDGP bombs, Mk20, SUU-30H/B or TDM cluster bombs. Early in the conflict, an air-to-air configuration of three fuel tanks, outboard AIM-9L/M's, a LANTIRN nav pod, six Mk20's on the right CFT and two AIM-7F/M Sparrows on the left CFT was common. When war progressed F-15E's were assigned to Scud hunting duties in a two-ship formation. The lead aircraft carried 4 GBU-10C/B's on the front and rear "bottom" CFT pylons, two 600-gallon fuel tanks and AIM-9L/M's on the wing pylons, an empty centerline pylon and both LANTIRN pods. The wingman carried a similar load without the targeting pod and carried either 6 CBU-87/B CEM or 12 Mk82 LDGP bombs.

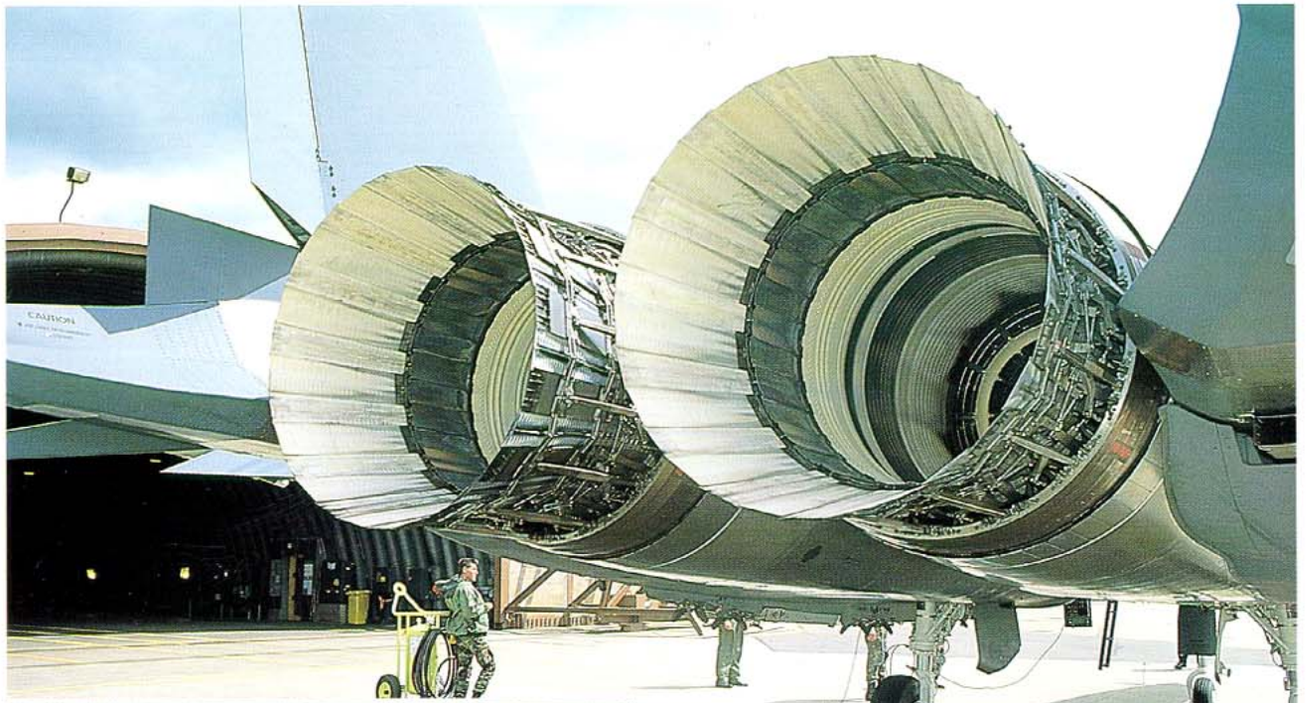


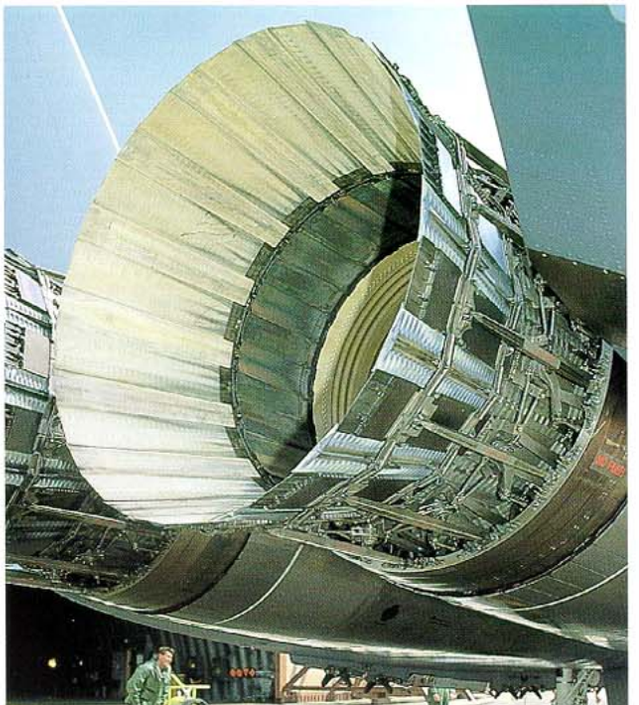


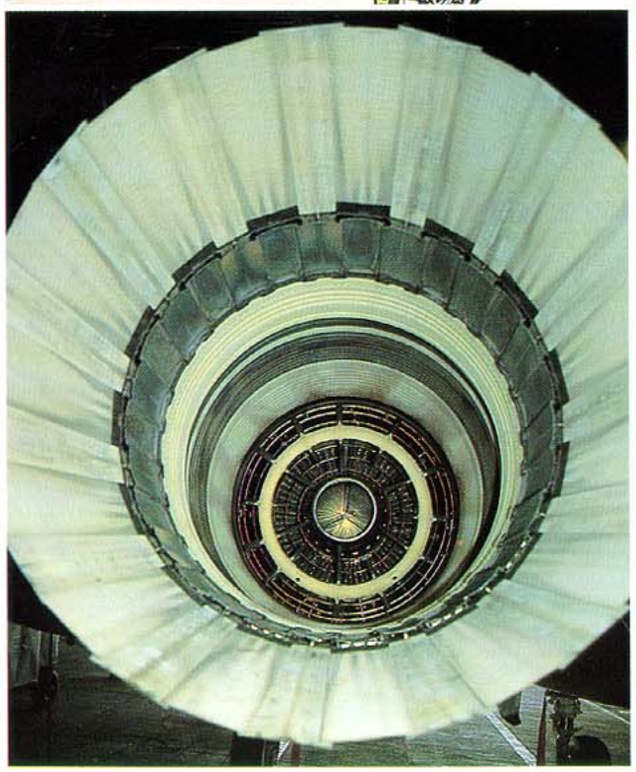
(Previous page) Moving alongside the CFT's from front to rear passing the starboard reinforced landing gear. CFT stations are numbered from the rear starting with number 1 station aft on the inboard weapon row, number 2 in the middle and number 3 the most forward of the inboard row pylons. The same goes for the outboard row with number 4 station at rear, number 5 in the middle and number 6 the most forward pylon. Port side configuration is a mirror image of the one shown here.

The near spotless appearance of this Lakenheath F-15E underscores its limited amount of flying hours absorbed at the time this photo was taken. Dirt and the British weather climate will soon have an adverse effect, fading the Ghost Gray paint to a much lighter shade.

To make the safest fighter in USAF history even safer survivability was significantly improved. A triple-redundant digital flight control system (retaining the proven mechanical backup system) protect it from ground-based threats while fire-retardant void-filler foam is placed below the fuselage-mounted self-sealing fuel tanks. Also taken over from the early F-15 models are three independent hydraulic systems to ensure safe control of the aircraft.





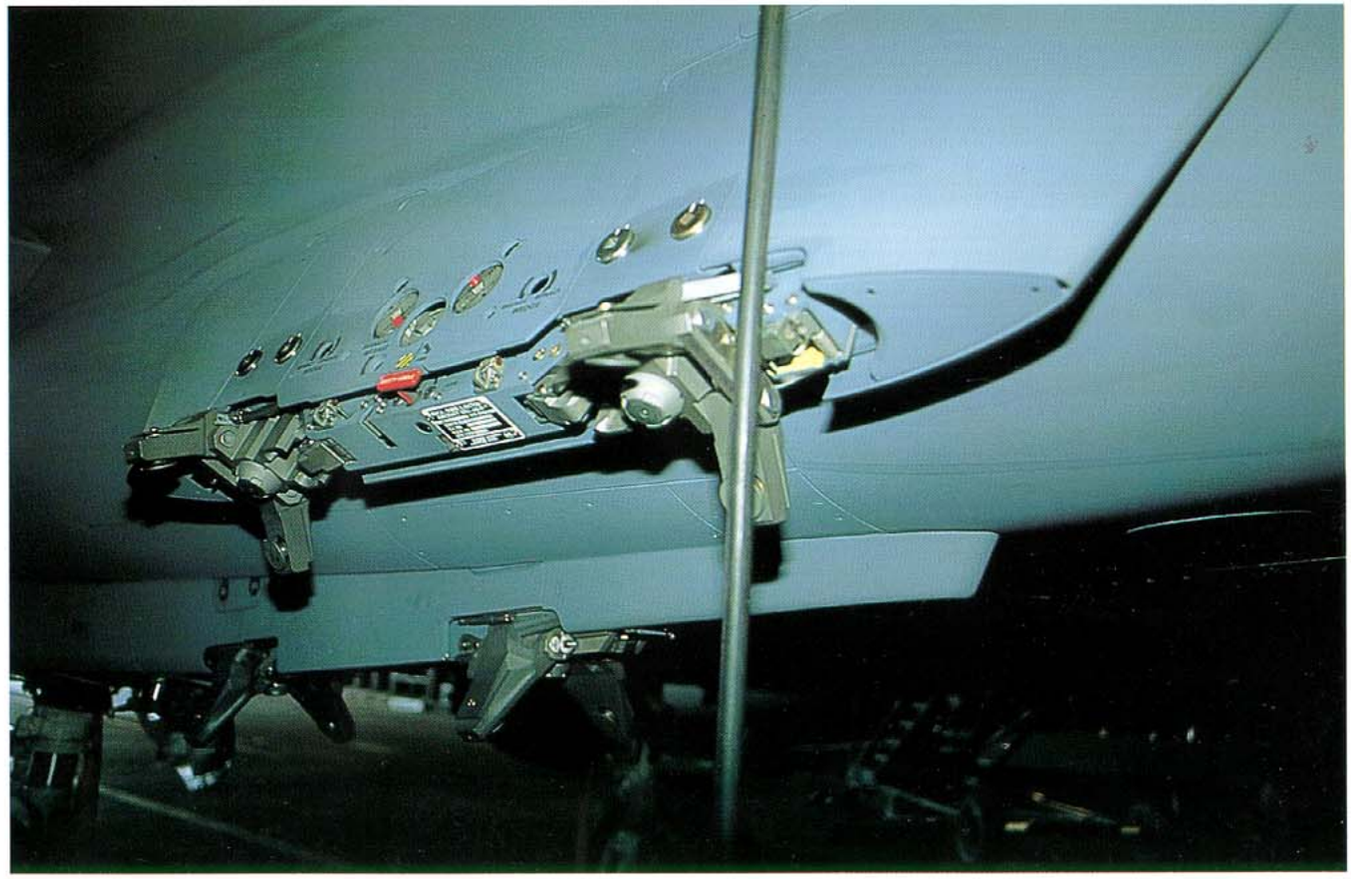


White ceramic outlets of the Pratt & Whitney F100-PW-229 turbofan engines which, together, produce some 58,000 pounds of thrust. A system automatically trims the engine, eliminating costly maintenance runs while a monitoring system records engine data and faults, simplifying engine troubleshooting and repair.
Note the deletion of the tail hook housing between the exhaust nozzles.

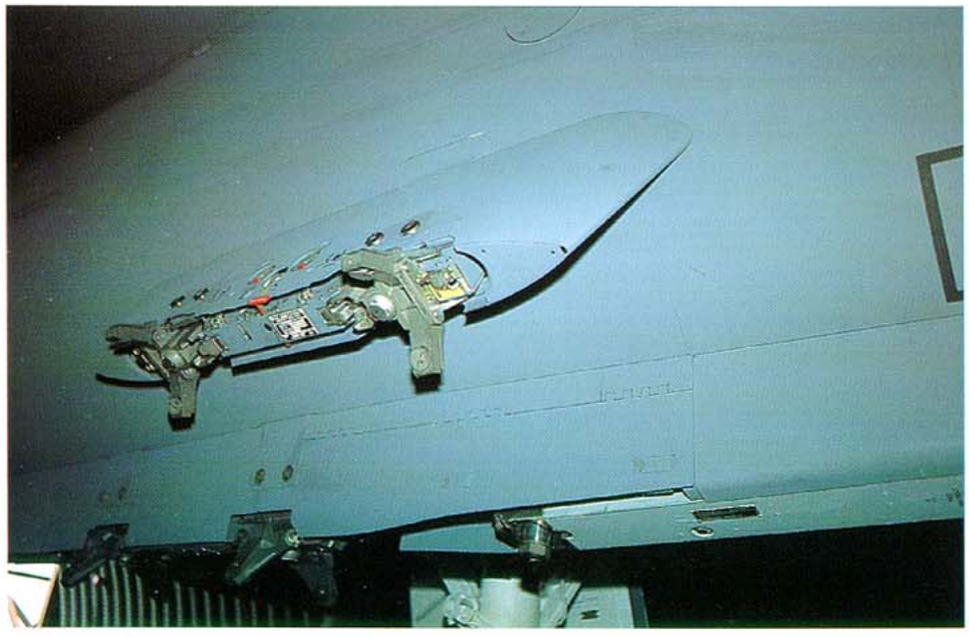
(Left) Crew chiefs monitoring the proper closure of the exhaust nozzles activated by the pilot during preflight engine test. Take-offs are executed with the throttle in maximum afterburner position which, thanks to a digital electronic engine control system, is reached within four seconds from the idle power setting. Both tail chines feature ALQ-119 ECM radar warning antennas at the rear.

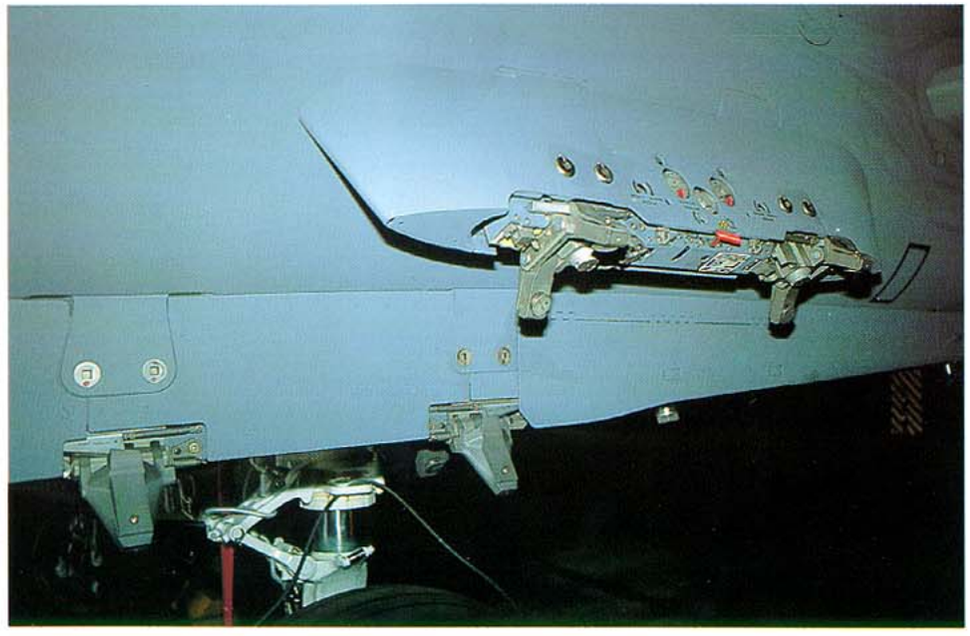
(Far left) Both CFT's have a bare metal duct at the rear, partially enclosed by the CFT itself.

(Below, left and right) Port side CFT pylons viewed from the rear with a very close look at the number 1 station.

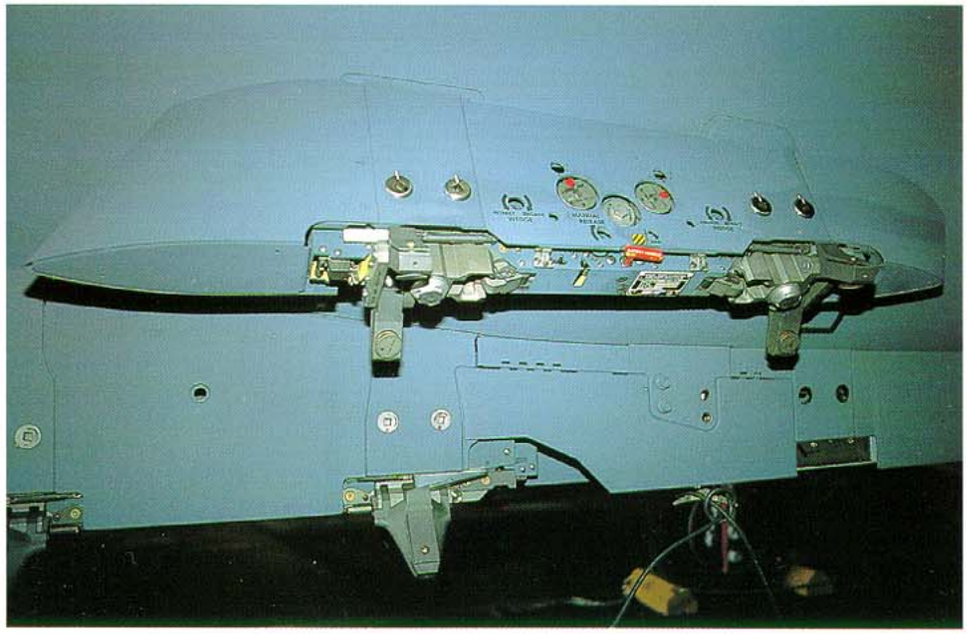


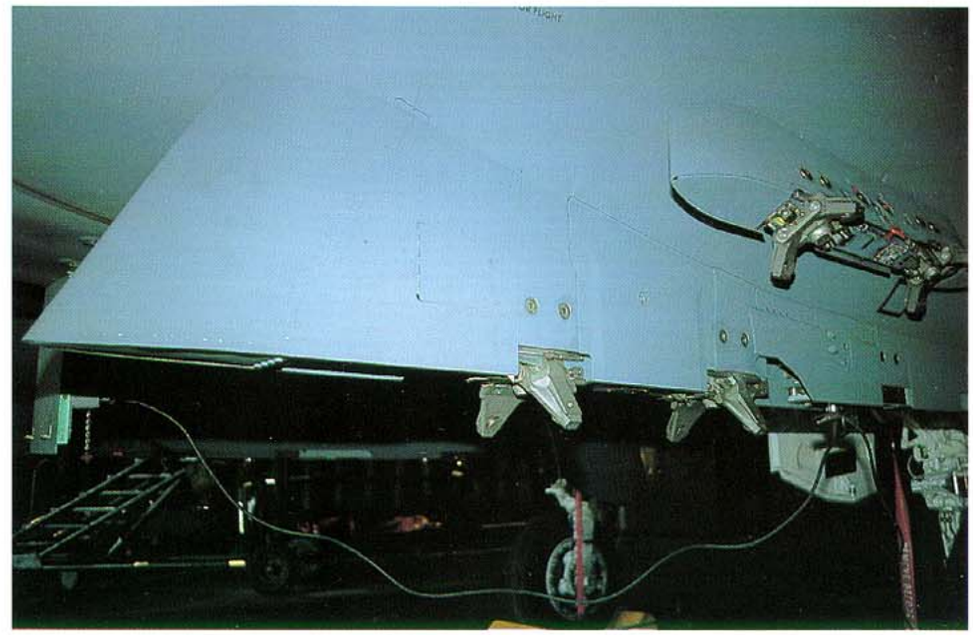
A large intake scoop is mounted some distance from the CFT skin in a position slightly aft and on top of the number 5 station pylon, topped by an exhaust marked in red.
Starboard side features similar air intake/exhaust.
Below are front and rear view of this number 5 station pylon.



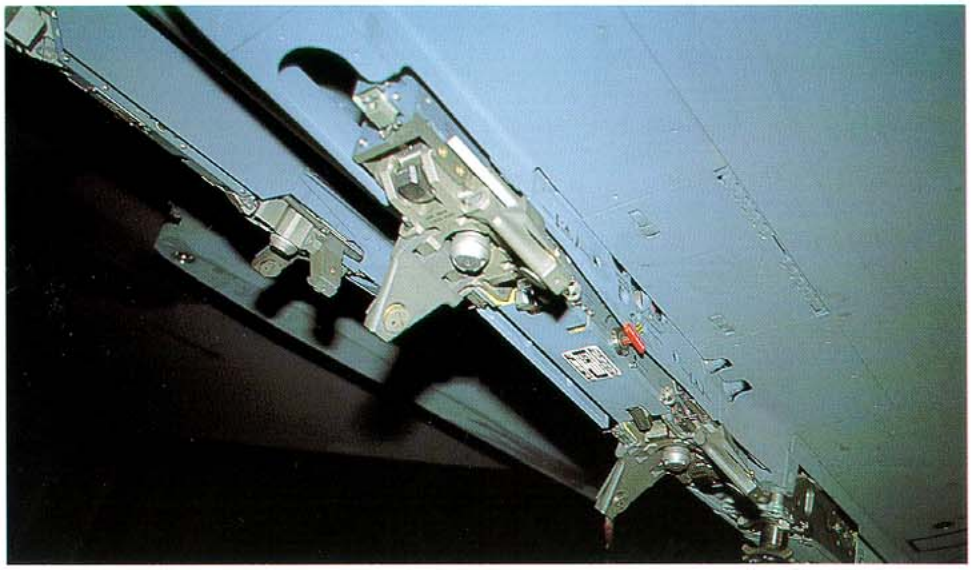


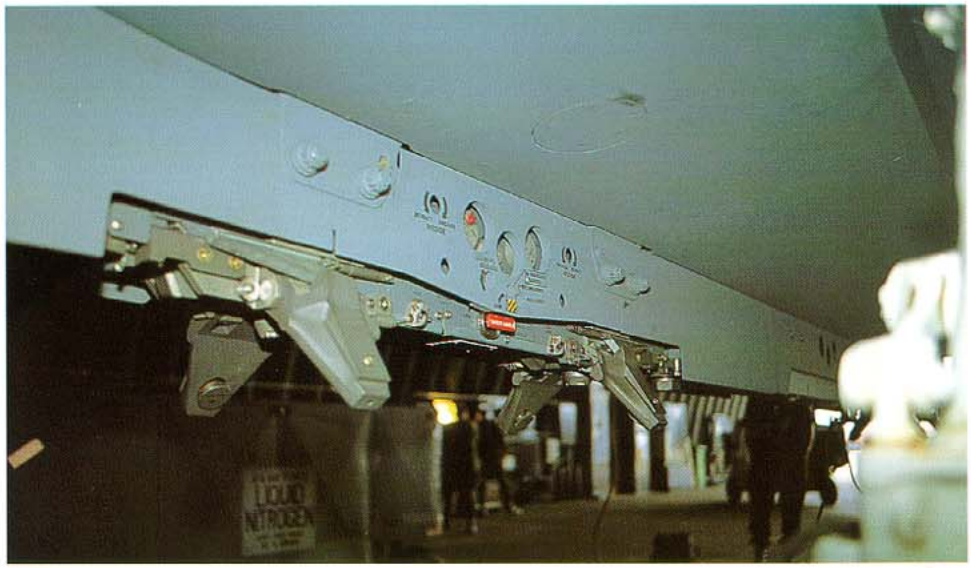
Views of the remaining CFT stations proceeding to the front of the air intake. Bottom detail of the inboard row weapon adapter is not forgotten while inboard detail of the same can be found on page 17.
Note the red safety handle on the pylon in the horizontal or "armed" position.

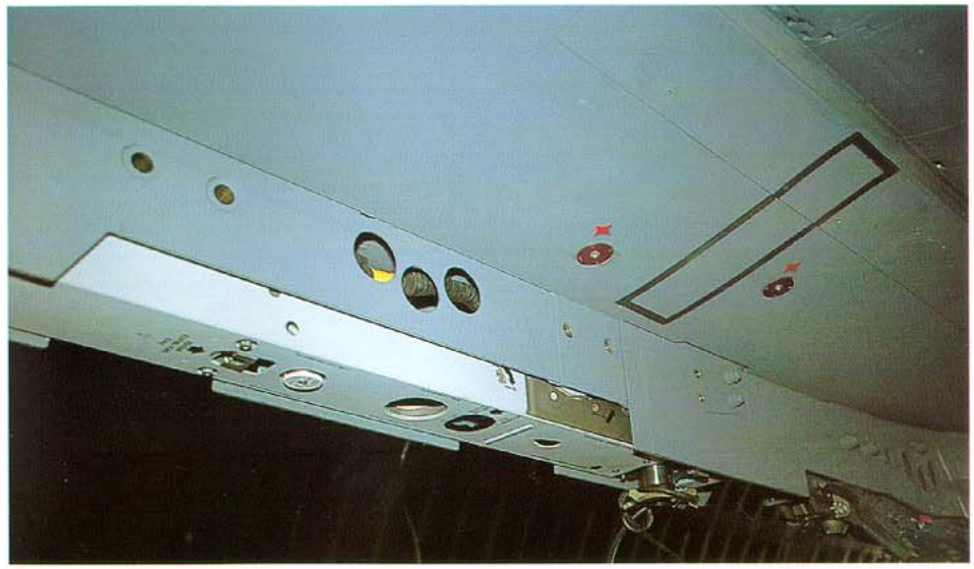




(Photo Jim ROTRAMEL)

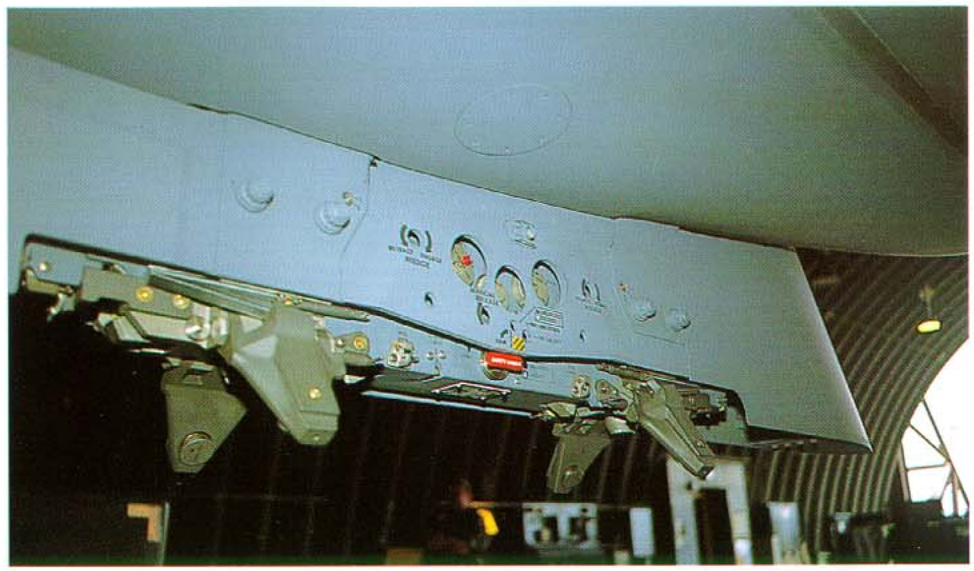






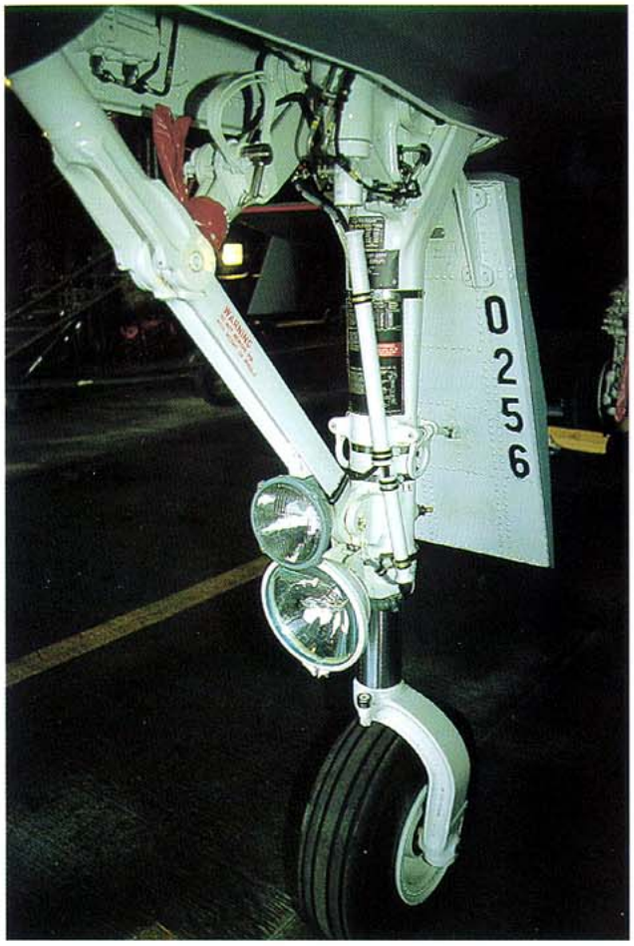
Both these pages conclude the survey of the CFT weapon stations with this page covering the complete inboard detail of the large bottom row pylon. Starboard pylon is similar. Note the various markings on the bottom fuselage and the contour of the CFT where it curves the aft tail chine (bottom right photo on page 16). Also note the slight downward position of the aileron (common on parked F-15E's) and the position of the Mk82 bombs on the CFT dispensers.

The F-15E's fuel capacity totals an impressive 35,550 lbs. of grade JP-4 or JP-8 standard NATO fuel divided as follows: 4,050 lbs. (± 150 lbs. temperature margin) in the main fuselage tank, 1,250 lbs. and 1550 lbs. in the left and right engine feed tank respectively, 3,300 lbs. in each wing tank. This total of 13,450 lbs. can be supplemented by 3 times 4,100 lbs. in external wing and centerline tanks while each CFT holds 4,900 lbs. (± 300 lbs.), thus totaling the above mentioned figure.



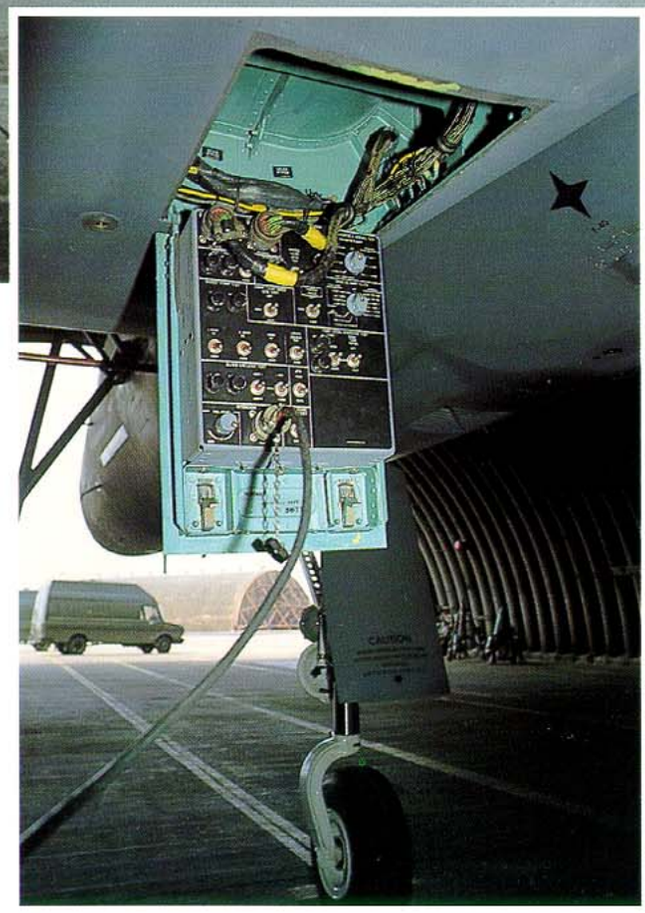
F-15 E STRIKE EAGLE
336 TFS, 4TFW, USAF
Seymour Johnson AFB, NC
(Photo by Joe MICHAELS via Jim ROTRAMEL)

Full scale development of the F-15E began in 1984 at the McDonnell Douglas plant in St. Louis and it took engineers only two years before the first FSD F-15E took to the air on December 11, 1986. It was only in July 1988 that the Air Force activated the first F-15E training unit, the 461st Tactical Fighter Training Squadron of the 405th Tactical Fighter Training Wing based at Luke Air Force Base, Arizona, represented here by the wing commander's aircraft featuring a travel pod on its wing pylon as sole ordnance.



The F-15E nose landing gear differs slightly from the one used on previous F-15 models.

Bottom detail of the F-15E clearly showing the bulky main landing gear doors providing additional space for the wider main wheel tires.



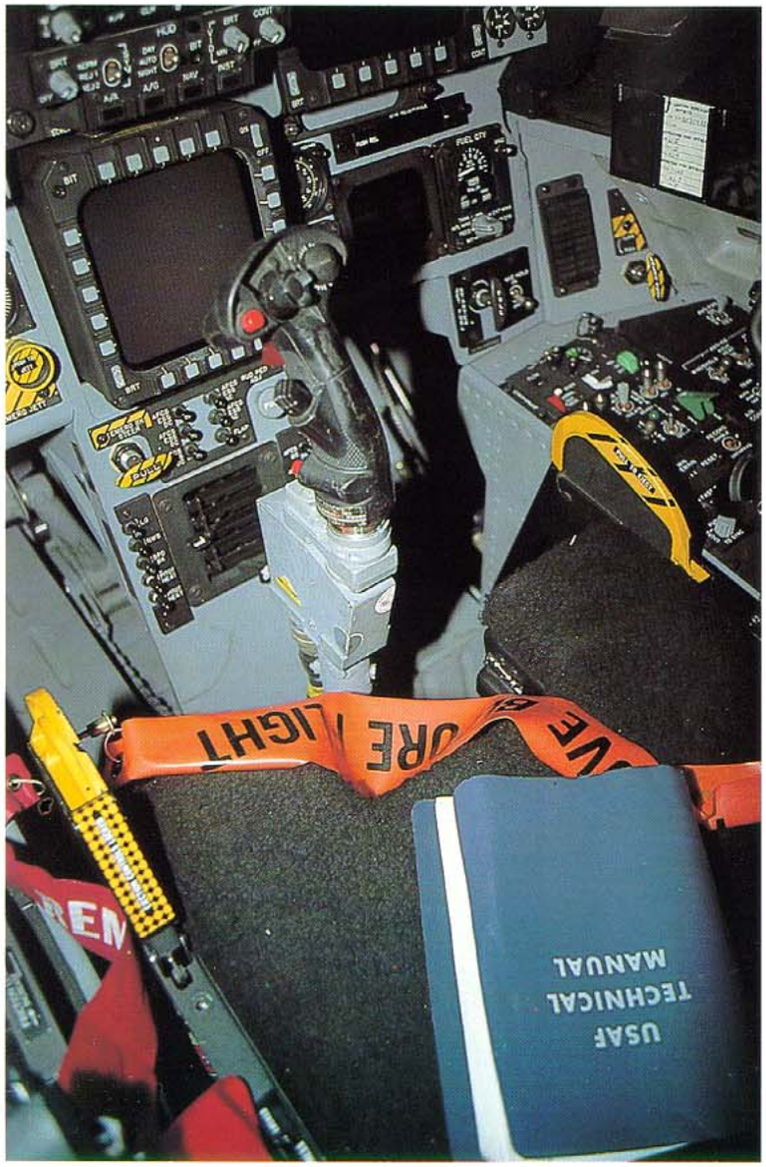
A reflection of true professionalism is shown in the photo above where a Lakenheath F-15E (just returned from a morning mission) is being guided to a parking spot in front of its shelter in pouring (and I mean pouring !) rain. Both ground crewmembers performed their duties without blinking an eye (meanwhile getting soaking wet to the bone), nor did the pilots descending from their cozy cockpit with the customary swagger seen only in the movies.
This scene again proves the ability of the F-15E to perform in weather conditions that would keep other fighters grounded.

A built-in test panel box is installed below the left air intake and comprises fuel flow and temperature indicators beside a bleed air leak test panel and the intercom connect / control panel, used by the crewchief to establish voice contact with the pilot and WSO.

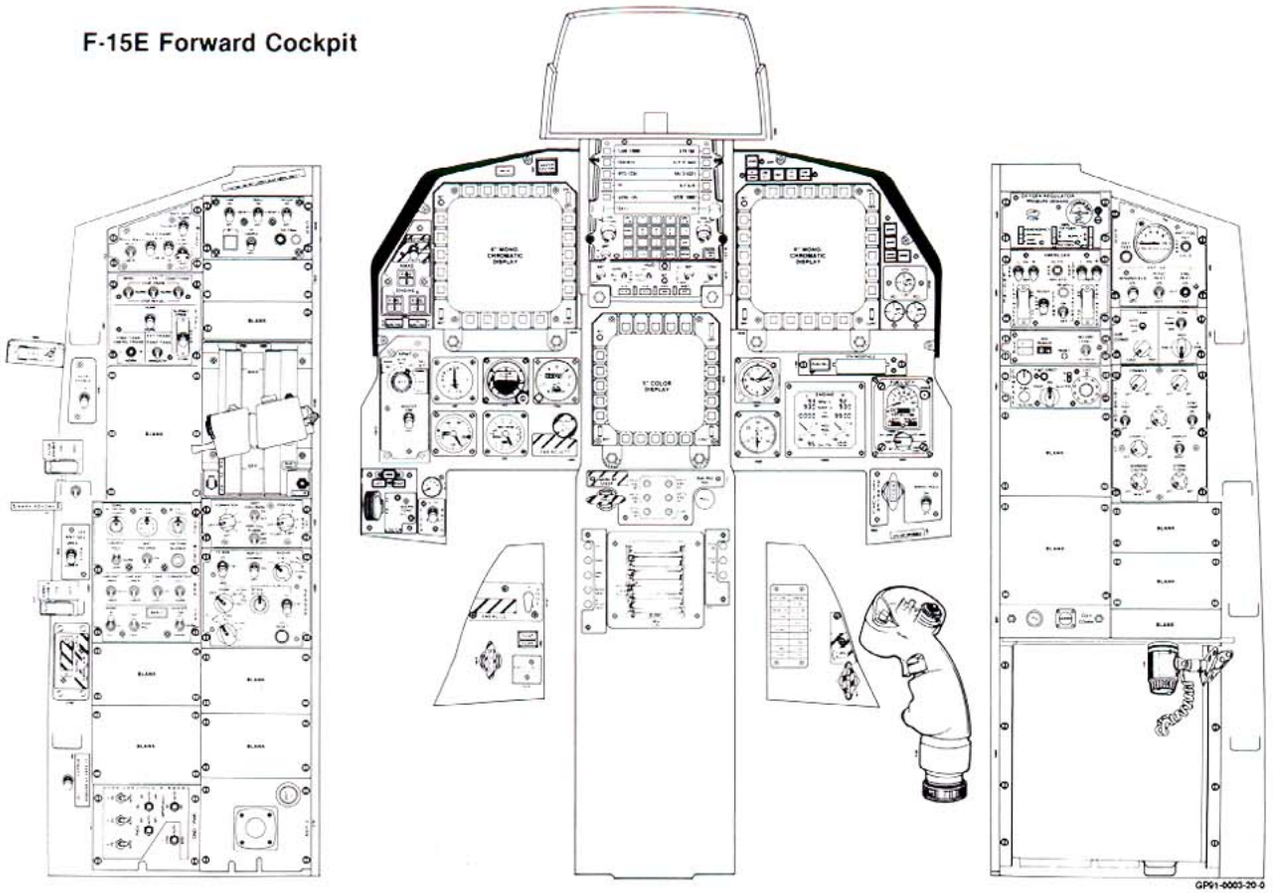
Like the rest of the aircraft, the cockpit is state-of-the-art, incorporating completely new systems. The first visual change is the introduction of two 6" monochrome (side displays) and one 5" color cathode ray tube (CRT) displays on the main instrument panel. Up to 18 different displays can be chosen from a "menu" of options (radar, LANTIRN imagery, moving map) which can be moved from one screen to another and tailored to the preferences of each crewmember.

Second is the new Kaiser holographic wide-field-of-view head-up display (HUD) on which flight data and FLIR imagery is projected.

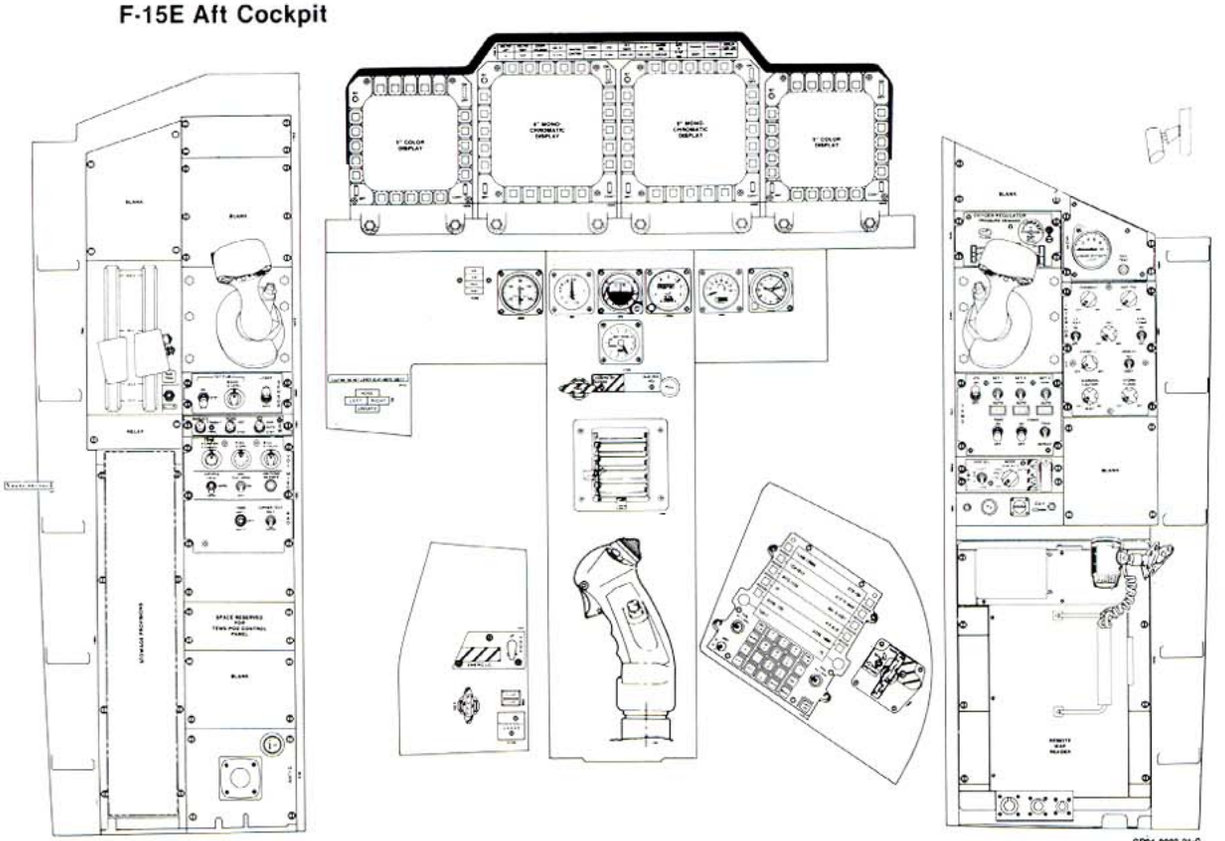
Multiple control switches on stick and split throttle enables the pilot hands-on control of radar, navigation, FLIR, HUD and both air-to-air and air-to-ground weaponry.



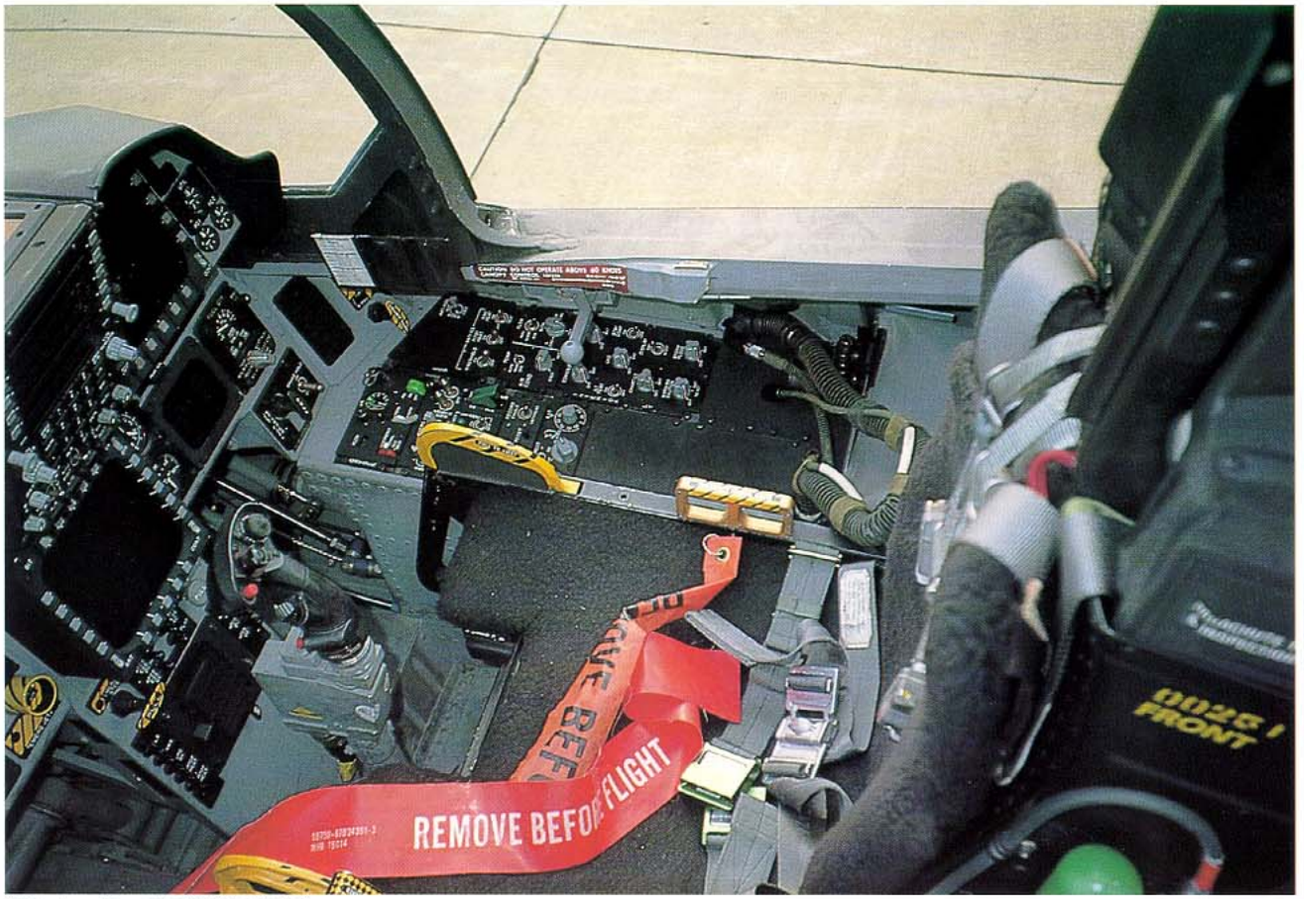
F-15E Forward Cockpit



F-15E Aft Cockpit



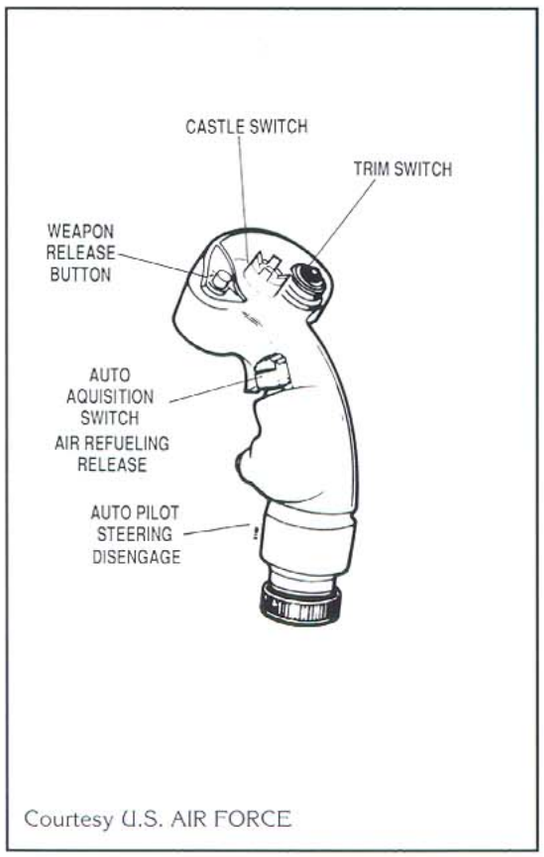
Courtesy U.S. AIR FORCE



(Photo Jim ROTRAMEL)

The pilot's side panel can easily be called conventional with most of the panels left blank. Oxygen regulator panel, engine start panel, VTR panel and compass control panel are inboard (front to rear), anti-ice, cabin temperature control panel and interior lighting panel are to the side wall.

(Photo Jim ROTRAMEL)



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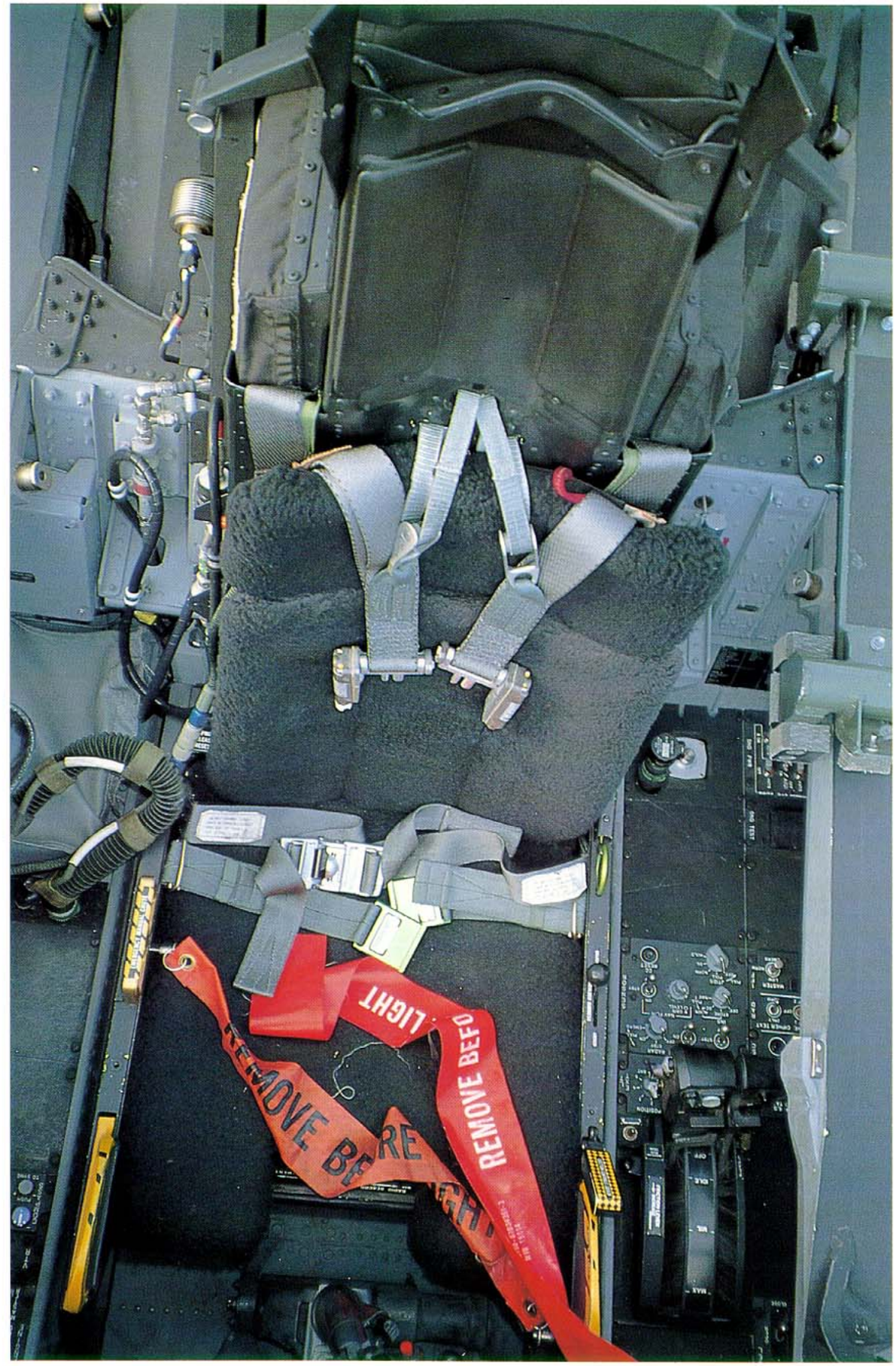
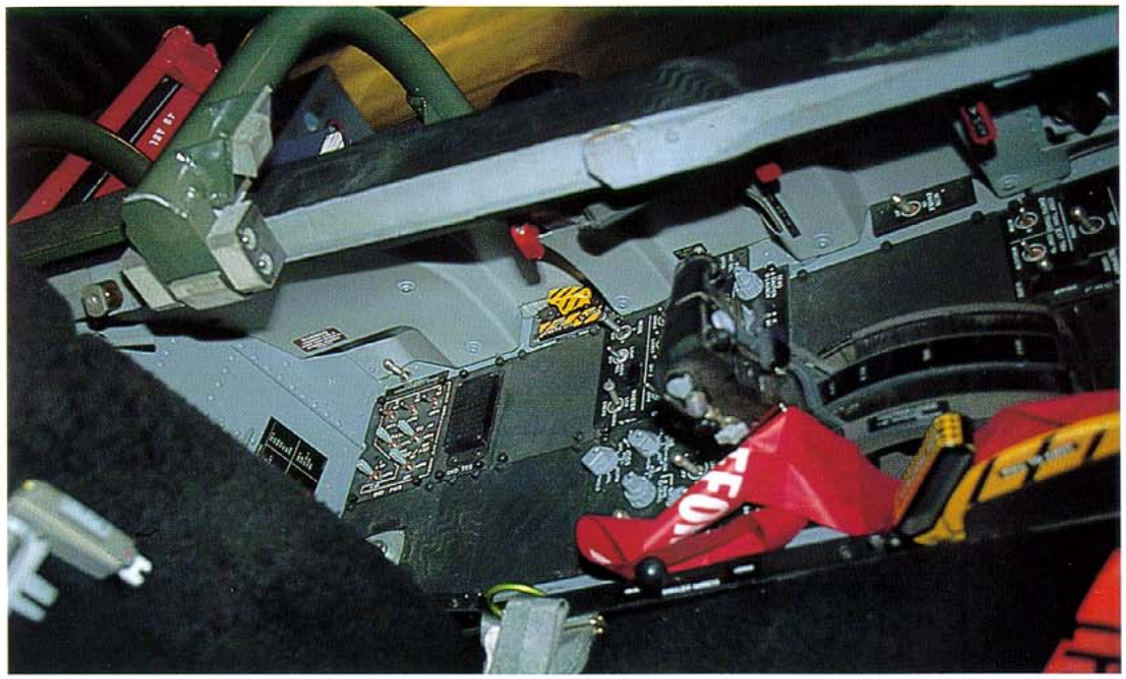


Unconventional is the black fur lining of the ACES II seat and backrest which however matches the black color of the rest of the seat and which contrasts heavily with the silver-gray color of the seat and shoulder belts.
Note the G-suit connector on the left side of the seat and the oxygen supply hose stowed on the right, in front of the map stowage box. Also note the position of the boarding step on the canopy sill and the location of the remove before flight pins.

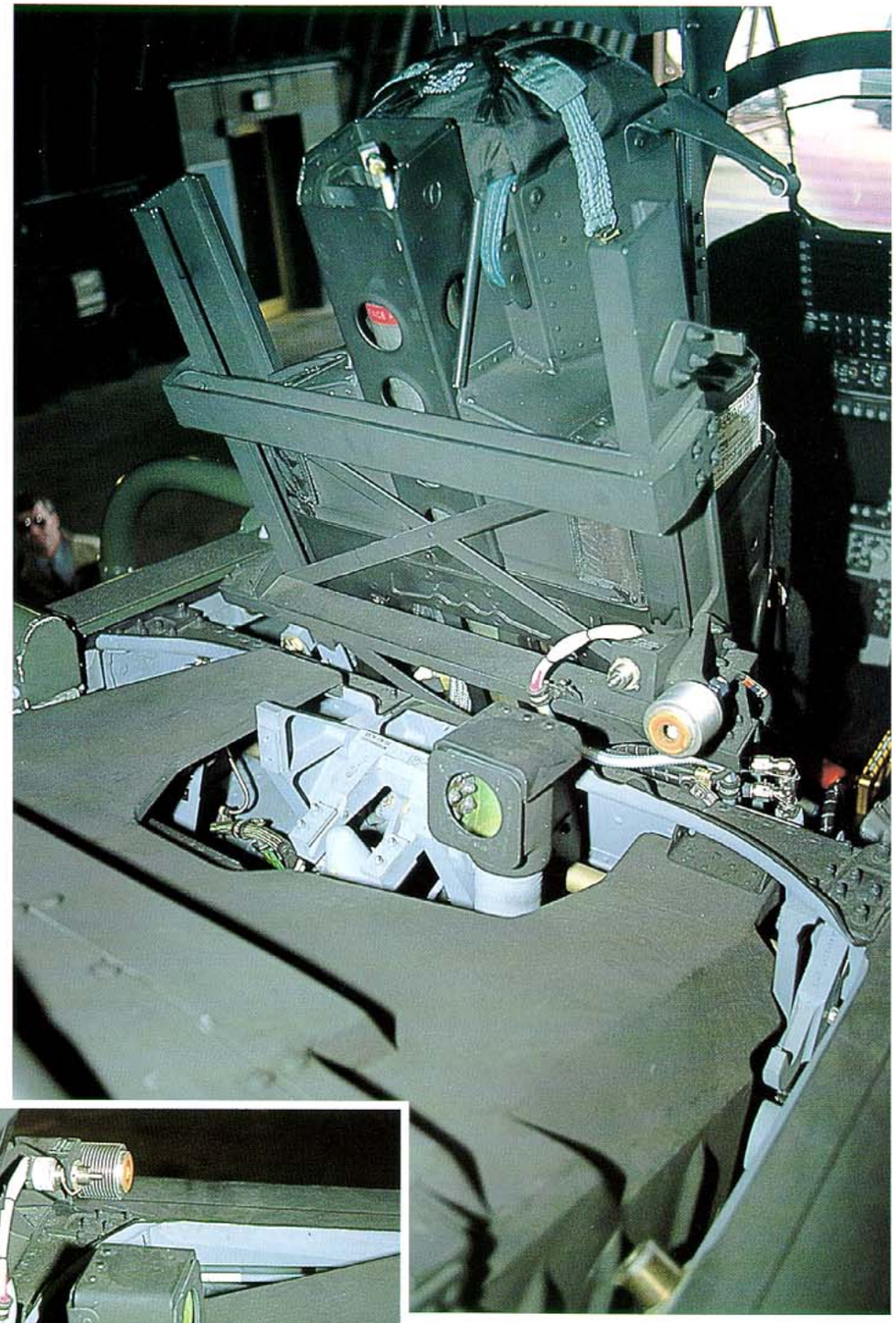
(Photo Jim ROTRAMEL)

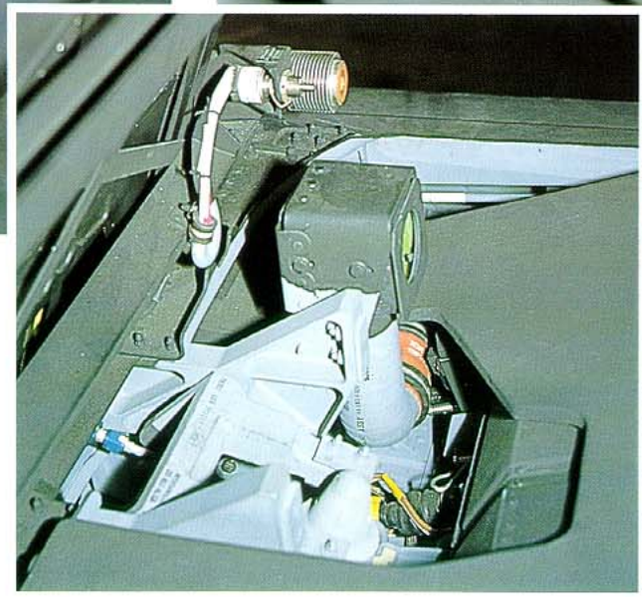


Left side console with ground power control panel at the utmost rear location. Radar, fuel control, external lighting and IFF panel are among miscellaneous panels on this side.

A special feature of the APG-70 synthetic aperture radar is its ability to "freeze" the high-resolution ground maps on the CRT during quick "sweeps" of the target area. Obtaining a photo-clear image of the target area (up to 45 degrees to the side of the aircraft's flight path) is a matter of seconds, making it difficult to be detected by surface-based AA systems.
The yellow/black handle to the side of the windscreen is the canopy emergency jettison handle.

(Photo Jim ROTRAMEL)

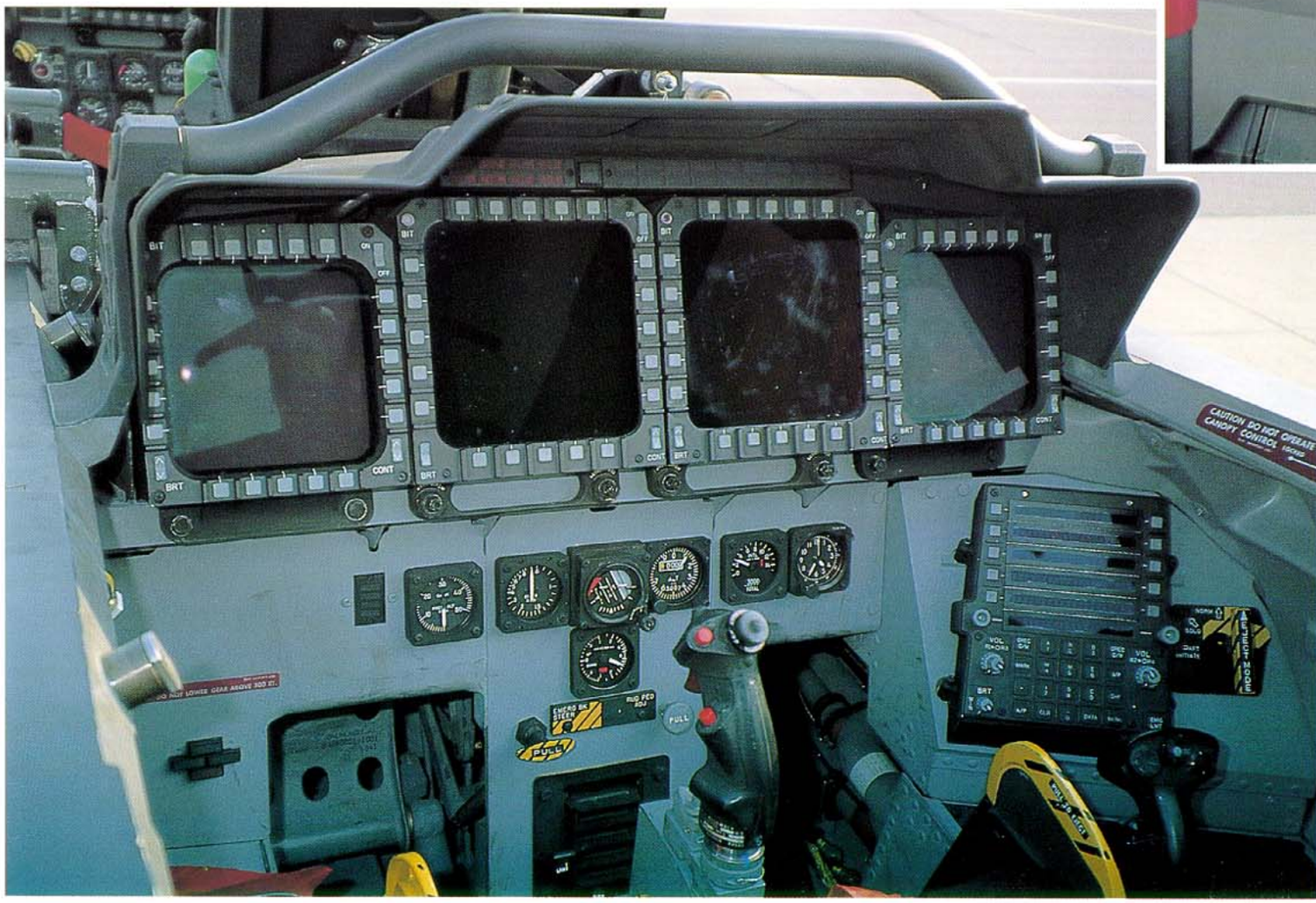




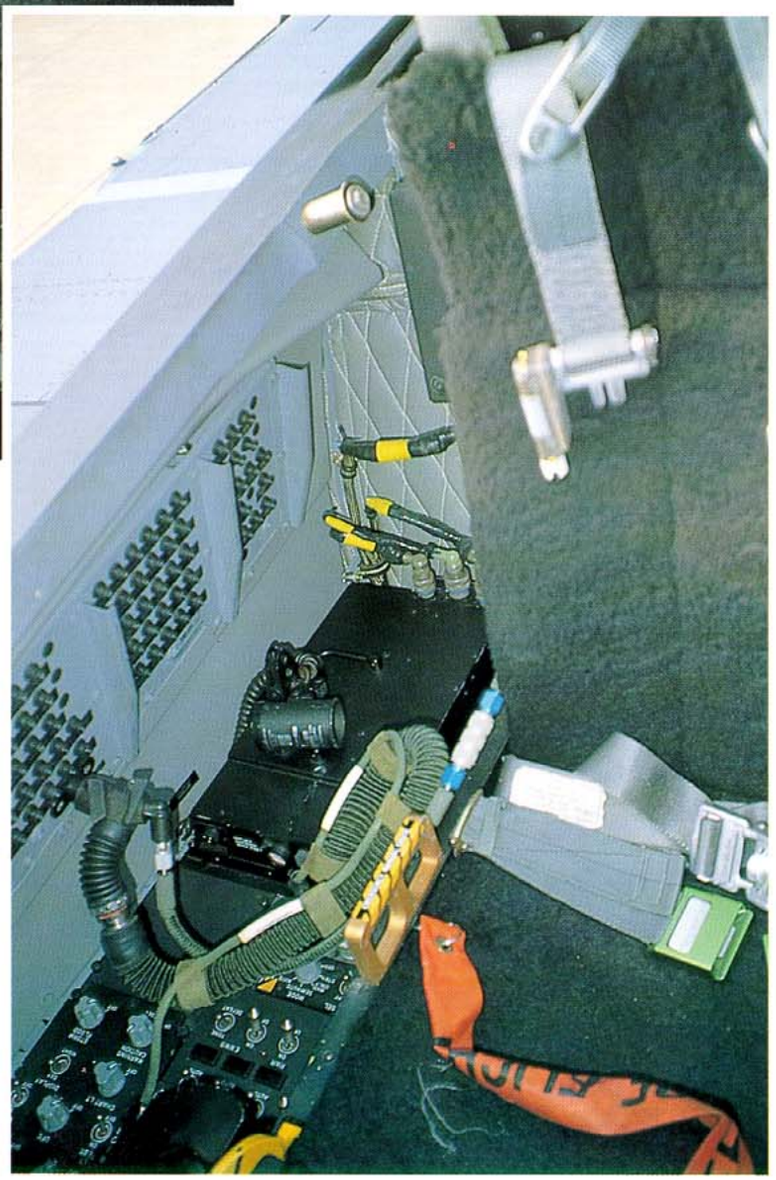
(Photo Jim ROTRAMEL)

The rear of the pilot's ACES II and the area between both cockpits with the canopy support bar connector housing. The device next to the housing is part of the canopy defogging system and hooks up to the center spar of the large canopy (see page 33).

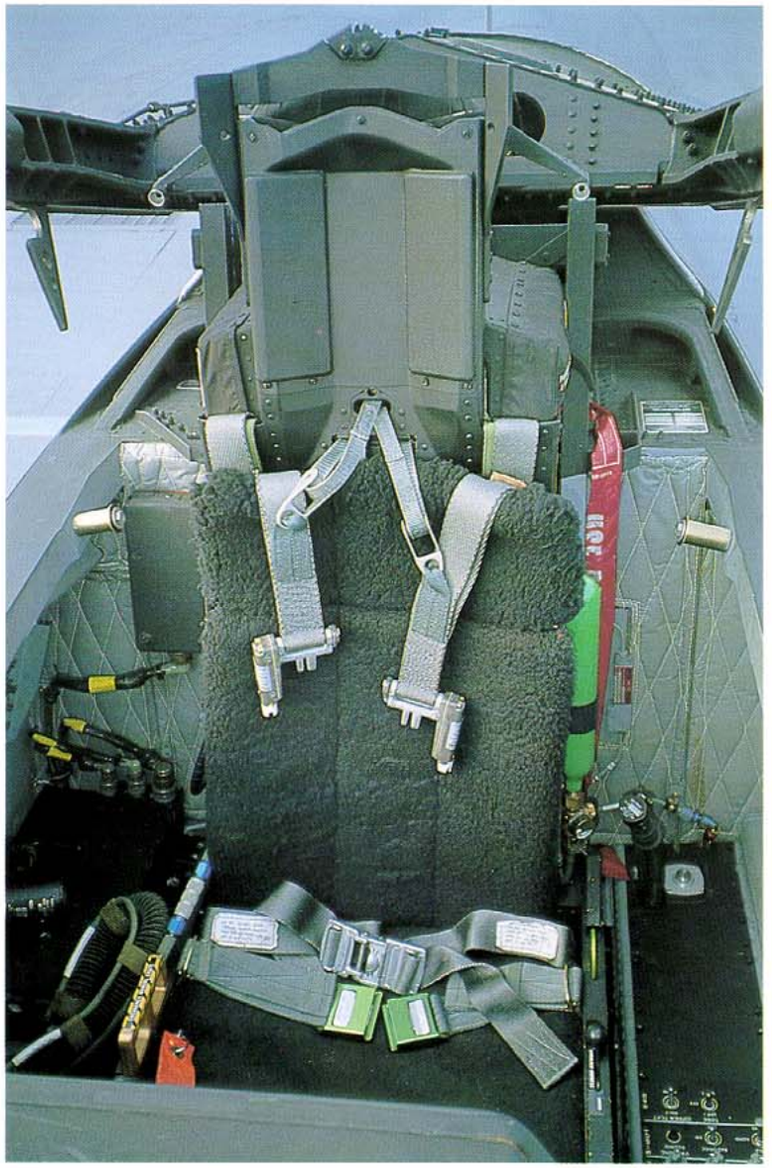
While the pilot is concentrating on flying the aircraft, the WSO in the rear is dividing his attention between two Sperry 5" full-color and two Kaiser 6" single-color CRT's, similar to those in the front cockpit. The weapon system officer has access to the following info: radar, electronic warfare, infrared sensors to monitor aircraft or weapon status and possible threats. Sophisticated sensor systems automatically release countermeasure devices such as flares or chaff. A radar warning receiver and electronic countermeasures system are part of the integrated protective warfare system.
He also can select targets and navigate with the aid of the same "moving map" display available to the pilot.
Each CRT is surrounded by 20 pushbuttons which, operated separately or in combination, selects the information wanted.
However, two side-mounted hand controllers with mirror-image (and easy identifiable by touch) switches allow hands-on operation for the WSO too.
Apart from the seven standby flight instruments and the HUD control panel on the right the main panel is empty.



(Photos Jim ROTRAMEL)

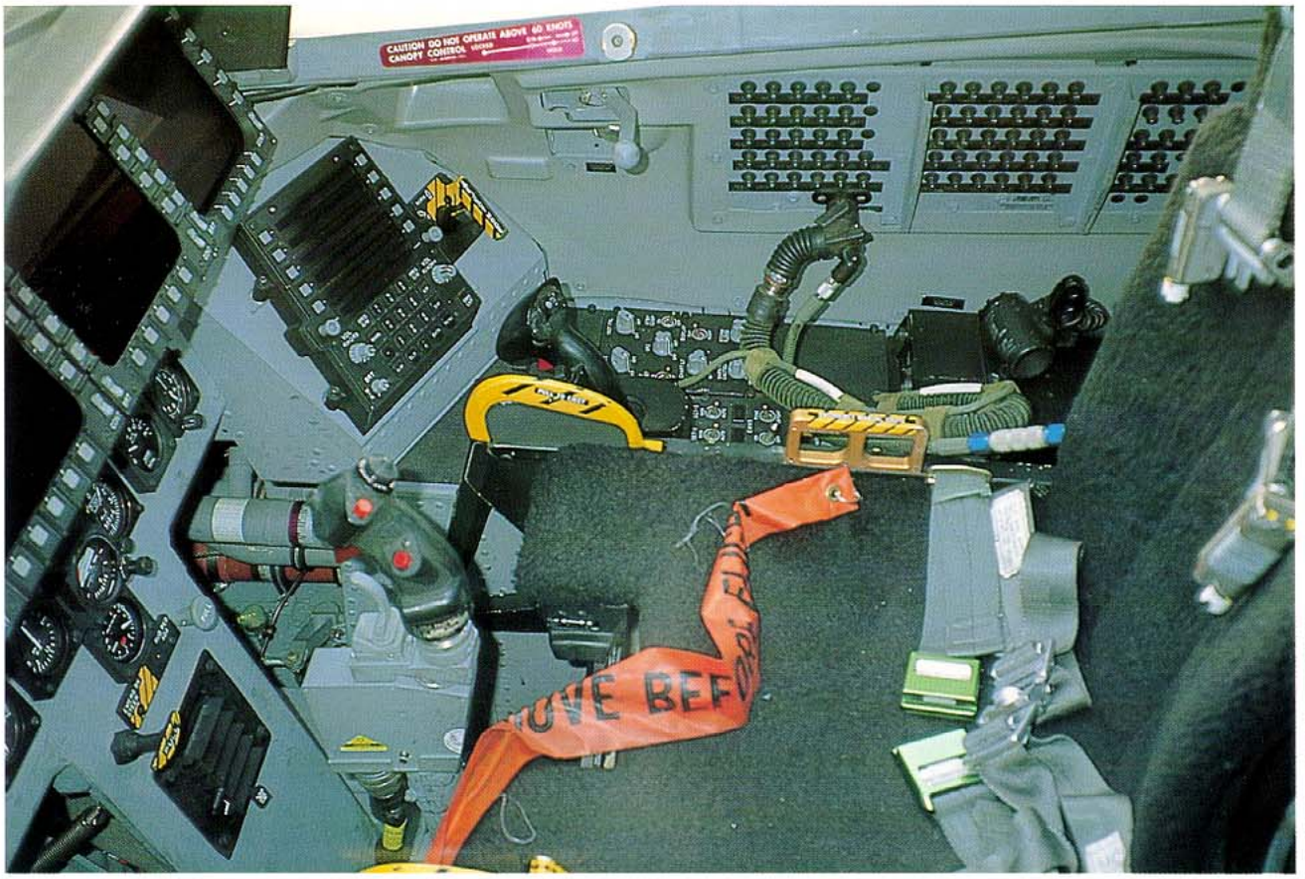


(Photo Jim ROTRAMEL)



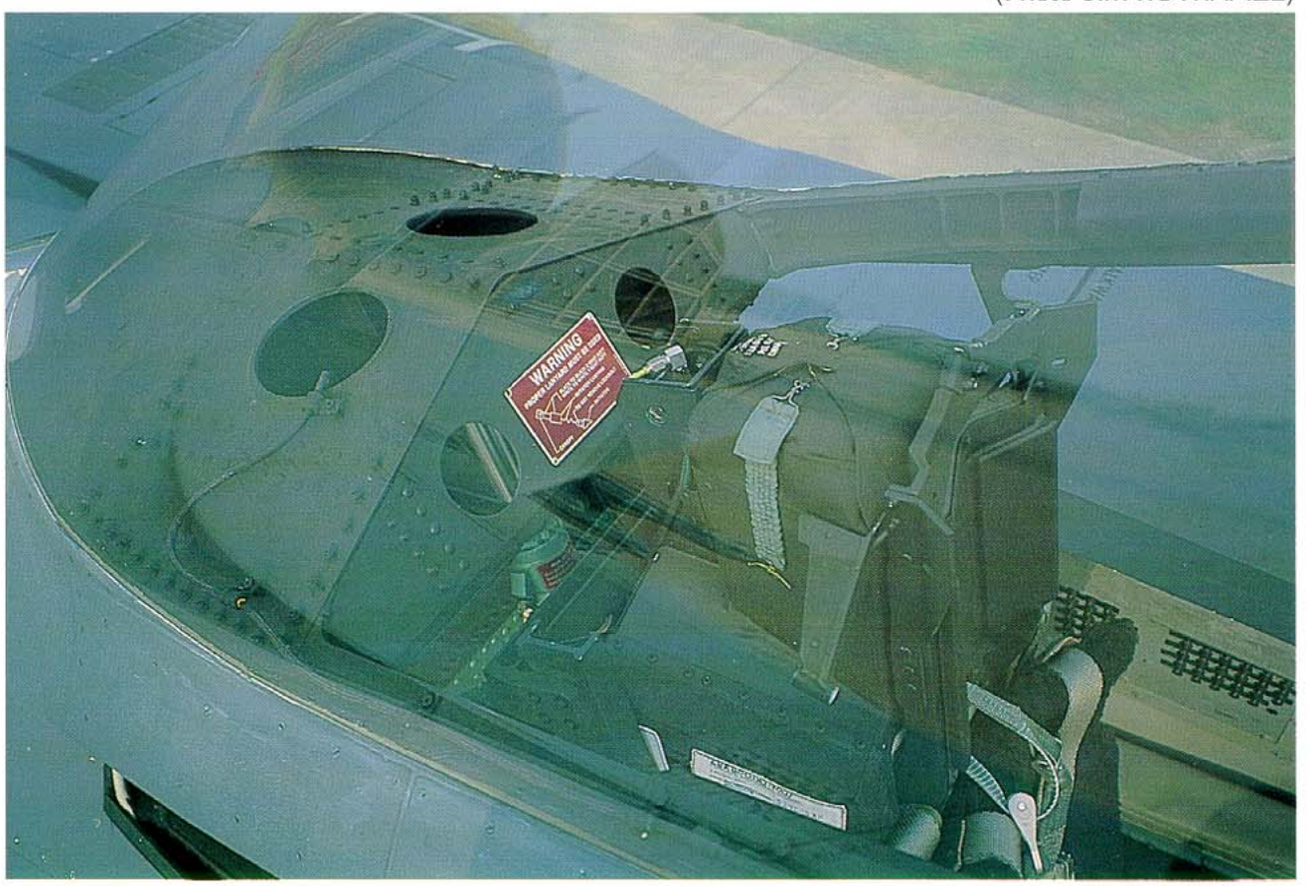
(Photo Jim ROTRAMEL)

Unlike the seat launcher bulkhead in the front, the rear bulkhead in the aft cockpit is padded, with a black box at right of the seat. Both left and right side walls feature circuit breaker panels. The same fancy ACES II seat is installed in the rear cockpit albeit that both seats are marked with their proper stations and are installed accordingly.

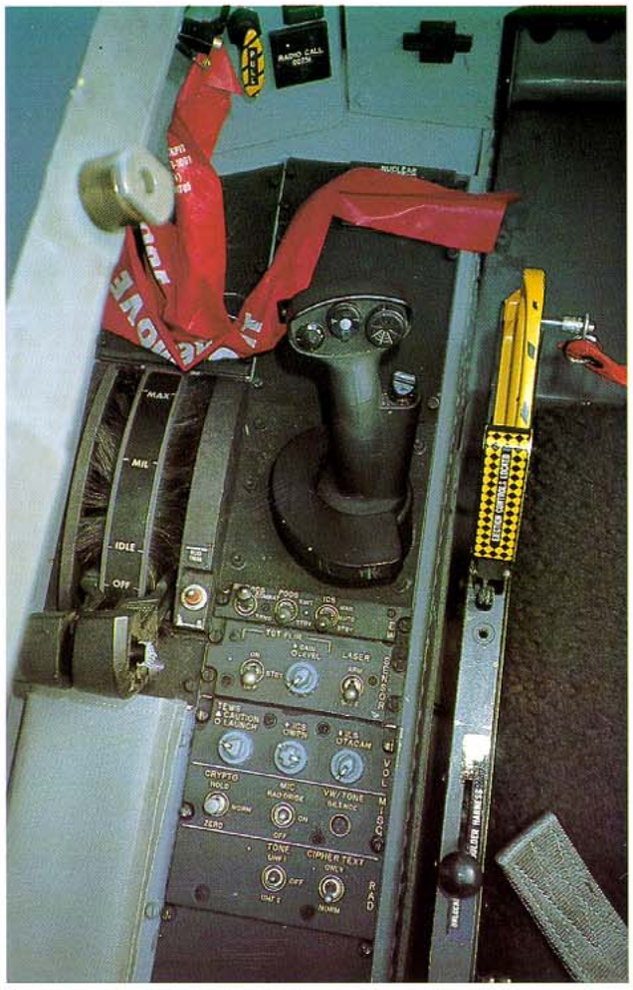


(Photo Jim ROTRAMEL)

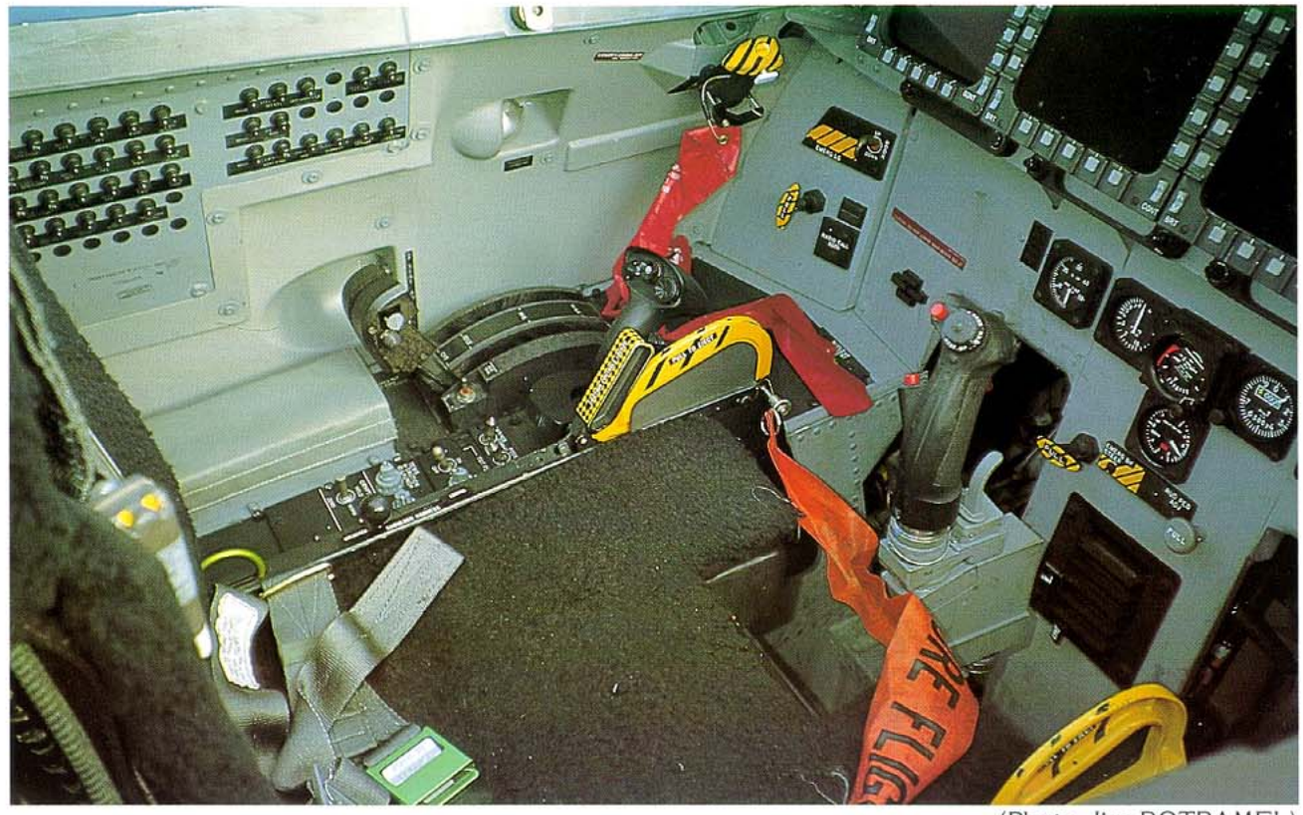
(Photo Jim ROTRAMEL)



The WSO has limited flight controls at his disposal and is able to fly the aircraft in case of emergency. The Air Force had no trouble convincing McDonnell engineers to retain the option of rear cockpit flight controls on the F-15E and not loose a $ 37 million (1992 dollars) aircraft because of the pilot's inability to land the aircraft safely (i.e., when a birdstrike occurs knocking the pilot unconscious).
A view through the immaculately clean canopy reveals behind-the-seat detail of the canopy framing, also painted black. The wine-red warning panel calls for the proper lanyard to be used on the canopy operating strut that is seen in detail in the top right picture.



(Photo Jim ROTRAMEL)

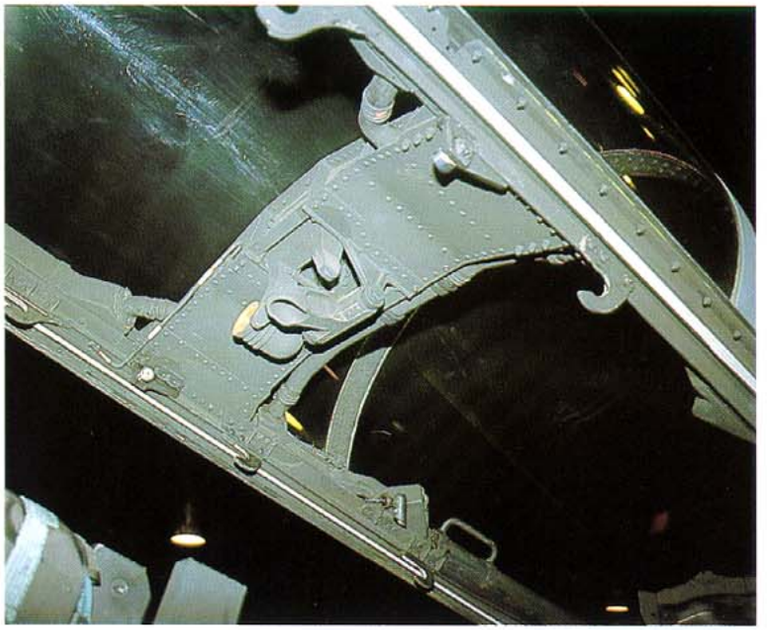


(Photo Jim ROTRAMEL)

The left side console in the rear cockpit features a single panel divided in sub panels for the operation of the radar and FLIR, and early warning system. The same split-throttle furnished on the pilot's console is installed on the WSO's side console. Just aft of the throttle is a long but narrow stowage box with cover.

(Photo Jim ROTRAMEL)

The canopy support strut displayed on the tarmac featuring a brandnew remove before flight flag.



Two views of the canopy center spar with (below) and without (above) the support strut installed.

(Photo Jim ROTRAMEL)

The aft cockpit of the F-15E viewed from the starboard side clearly showing the WSO's control stick and the lack of a protective side cover behind the main panel.

RAF Lakenheath F-15E 900255 of the 492nd Fighter Squadron performing a standard full-AB (after burner) take off scorching the tarmac behind. The WSO must have wondered about the presence of yours truly, almost twisting his back in an attempt to get a better view. The wheel retraction sequence has already been started indicated by the open nose gear door and main wheel doors that are usually shut when the aircraft is on the ground (unless manually opened for inspection).
F-15E pilots are among the happy few still flying morning, afternoon and nighttime missions on a regular basis, envied by most European NATO pilots who fly strict minimum hours due to massive defense cutbacks.

(Photo Mc Donnell Douglas Corporation)

Luke Air Force Base, Arizona, is the home for this dual-role F-15E seen here soaring above a desert landscape. It carries a load of Mk82 LDGP bombs and an AIM-9 Sidewinder on the shoulder rail. A LANTIRN navigation pod is carried but the targeting pod is not installed.

(Photo Jim ROTRAMEL)

Captured in the lens of Jim ROTRAMEL on the Nellis flightline is this F-15E of the 57th FW carrying an SUU-20 bomb dispenser on its pylon as well as an AIM-9 Sidewinder. No further ordnance is carried as it rolls out for a practice bomb run on the Nellis range.

F-15E STRIKE EAGLE
CURRENTLY AUTHORIZED WEAPONS

AGM-65 A/B/B/D MAVERICK
AIM-9 P/L/M SIDEWINDER
AIM-7 F/M SPARROW
A15 PODS
MXU-648 (TRAVEL POD)
Mk82 LDGP,AIR,SE
Mk84 LDGP,AIR
GBU-10 PAVEWAY II
GBU-24/B PAVEWAY III
SUU-20 ROCKET DISPENSER
SUU-30H (CBU-52,58,71) CLUSTER
SUU-64 (CBU-89 GATOR)
SUU-65 (CBU-87 CEM)
Mk20 ROCKEYE II
BLU-107 DURANDEL
B-61 NUCLEAR BOMB
GBU-15(V)-21,22,31,32

CHEMICAL WEAPONS
TMU-28 SPRAYTANK
MC-1 (w or w/o daisy cutters)

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