LOCK ON N°6

AIRCRAFT PHOTO FILE

AH-1S COBRA

Willy Peeters

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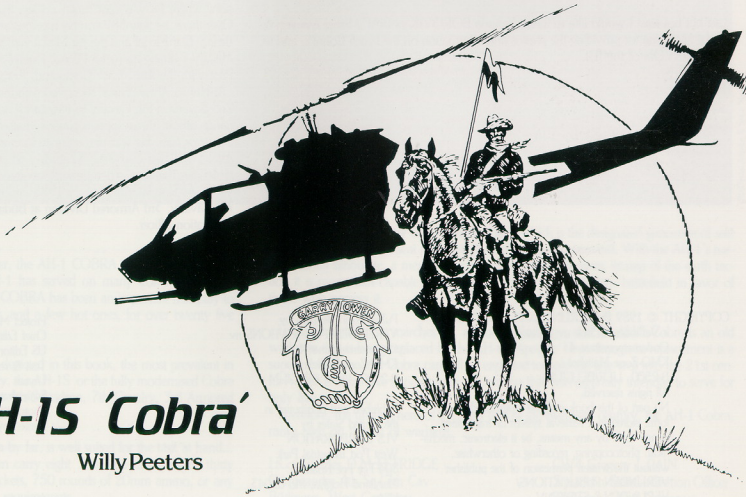
the world in scale

VERLINDEN PUBLICATIONS



The AH-1S 'Cobra'

Willy Peeters

DEDICATION

I would like to dedicate this book to all the men who flew the Cobra in the Vietnam war, to those who were lucky enough to make it back home and, especially, to those who have fallen in action in a war they were not supposed to win.

ACKNOWLEDGEMENTS

My very sincere thanks to the following persons who made this aircraft review possible: Lt. Martin BOGAERT of the Belgian Army who initially introduced me to the 4/7th Cavalry unit in Büdingen; to LtCol. Charles D. McFETRIDGE, Commander of the 4/7th Cavalry unit, a fine man who loves history, arts and modeling as much as I do; for his permission to take the pictures and for his hospitality during my visit.
A word of thanks to the people of the 4/7th Cav, the pilots,the chief of the maintenance unit as well as the mechanics who gave me the opportunity to take my photographs in the best possible circumstances.
A very special thanks to my friend, CW4 Gregory L.CAIN for arranging the photo-sessions and the pilots manuals, and to his spouse Mary for their hospitality on my second tour to Büdingen which I will always remember with great pleasure.

Last but not least I would like to thank Yehuda BOROVIK of BIAF / Israel Aviation & Space Magazine for providing the photos and information on the Israeli Cobra's; and to Yuval NAVON of the IDF.

The author

The man who deserves most of the credit given in the acknowledgement chapter is by far CW4 Gregory L. CAIN of the 4/7th CAV. He not only proved to be a real professional in the way he handled my visits but he also became a very good friend, sharing my interest in arts, aviation and modeling.

CW4 CAIN, Regular Army, Master Aviator, graduated from Rowlesburg High School, West Virginia, in 1966. He attended Potomac State College, Keyser, West Virginia, and graduated from Saint Leo College with a Batchelor of Arts Degree, Summa Cum Laude in history.

Mr. Cain entered the United States Army under the Warrant Officer Flight Program in October 1968. Key assignments include: Vietnam in 1970, with the 1st Cavalry Division, where he was shot down no less than five times, but was fortunate to survive. Over there, he flew 389 combat missions and earned the Distinguished Flying Cross, the Bronze Star Medal and the Air Medal with twenty-six Oak Leaf Clusters. He was Allied Military Training Instructor Pilot at Hunter Army Airfield, Savannah, Georgia; Instructor Pilot with the 4th Missile Command, Korea.

At Hunter Army Airfield he served with the 238th Attack Helicopter Company and the 2nd Squadron 9th Cavalry in various capacities of supply officer, organizational maintenance officer, direct support platoon maintenance officer, lift/recon platoon leader and instructor pilot. He was also assigned to Gun Platoon, 'E' Troop 1st Cavalry, Fairbanks, Alaska and Fort Campbell, Kentucky, where he initially served with the 229th Attack Helicopter Battalion. Then he was appointed Officer-in-Charge of the AH-1 Cobra Flight Weapons Simulator in January 1985 and he is currently assigned to the 4th Squadron 7th Cavalry, 3rd Armored Division at Büdingen, West Germany as the squadron standardization officer.

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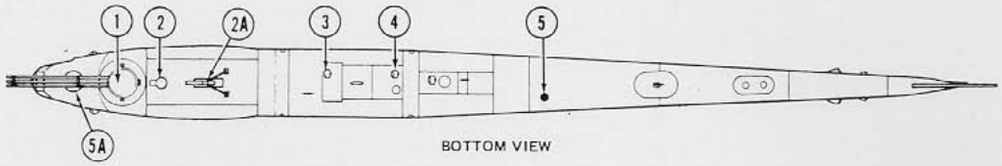
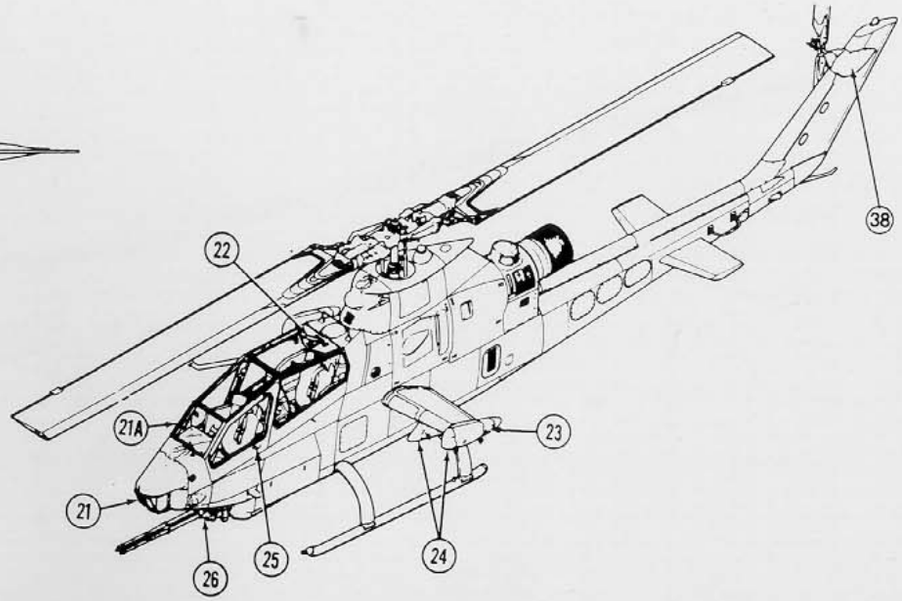
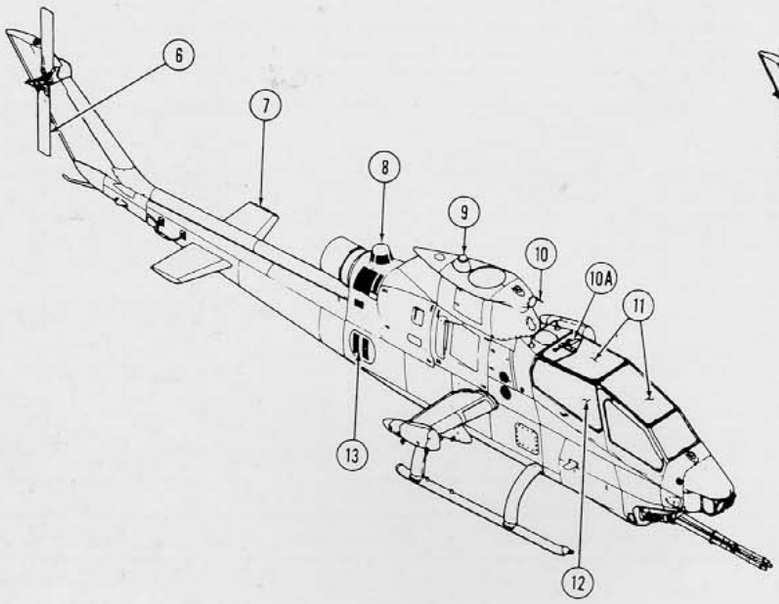
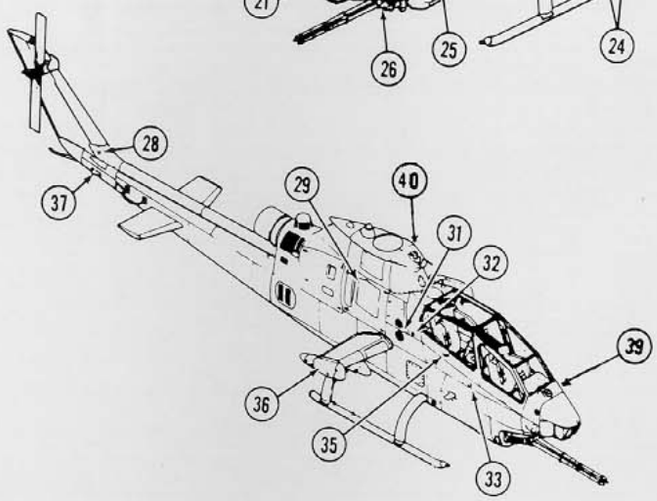
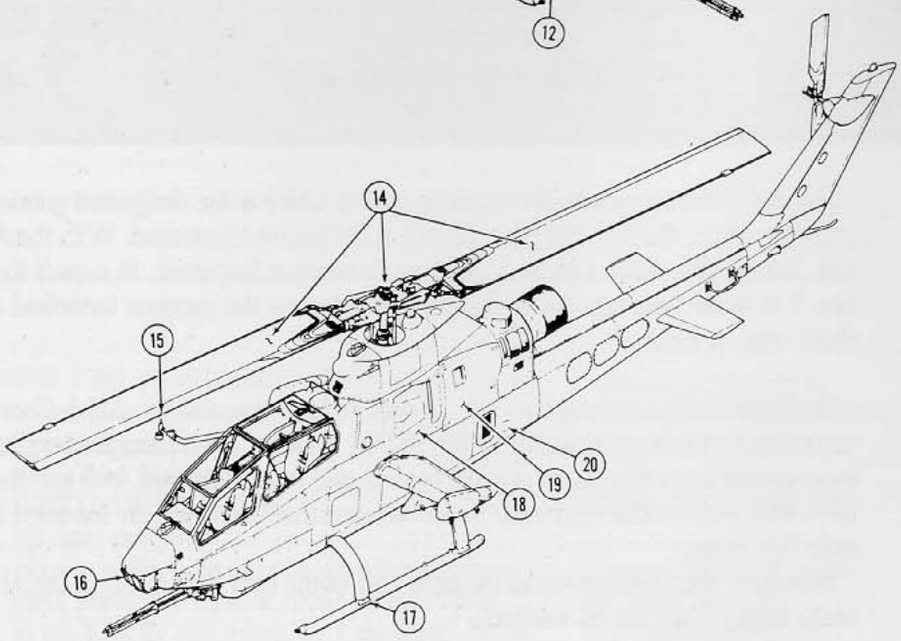


BOTTOM VIEW









1. TURRET
2. SEARCHLIGHT
2A. LOWER CUTTER ASSEMBLY
3. FORWARD FUEL CELL DRAIN DOOR
4. AFT FUEL CELL DRAIN DOOR
5. VENT
5A. CHIN CUTTER ASSEMBLY
6. TAIL ROTOR
7. SYNCHRONIZED ELEVATOR
8. IR JAMMER
9. ANTICOLLISION LIGHT
10. PITOT TUBE
10A UPPER CUTTER ASSEMBLY
11. CANOPY
12. PILOT DOOR
13. BATTERY COMPARTMENT
14. MAIN ROTOR BLADES AND HUB
15. ADS
16. TSU
17. SKID
18. TRANSMISSION COMPARTMENT
19. ENGINE COMPARTMENT
20. GPU RECEPTACLE
21. DEFLECTOR
21A CHANNEL
22. UPPER CUTTER ASSEMBLY
23. LEFT WING POSITION LIGHT (RED)
24. PYLONS
25. GUNNER DOOR LATCH
26. GUN TURRET
27. DELETED
28. 42 DEGREE GEARBOX OIL SIGHT GLASS
29. ENGINE AIR INLET/RIGHT
30. DELETED
31. FUEL FILLER CAP
32. GROUND RECEPTACLE
33. RIGHT STATIC PORT (LEFT OPPOSITE)
34. DELETED
35. PILOT DOOR LATCH
36. RIGHT WING POSITION LIGHT (GREEN)
37. RIGHT TAIL POSITION LIGHT (WHITE) (LEFT OPPOSITE)
38. 90 DEGREE GEARBOX OIL SIGHT GLASS
39. COUNTERMEASURES SET, RECEIVER ANTENNA
40. COUNTERMEASURES SET, TRANSMITTER ANTENNA

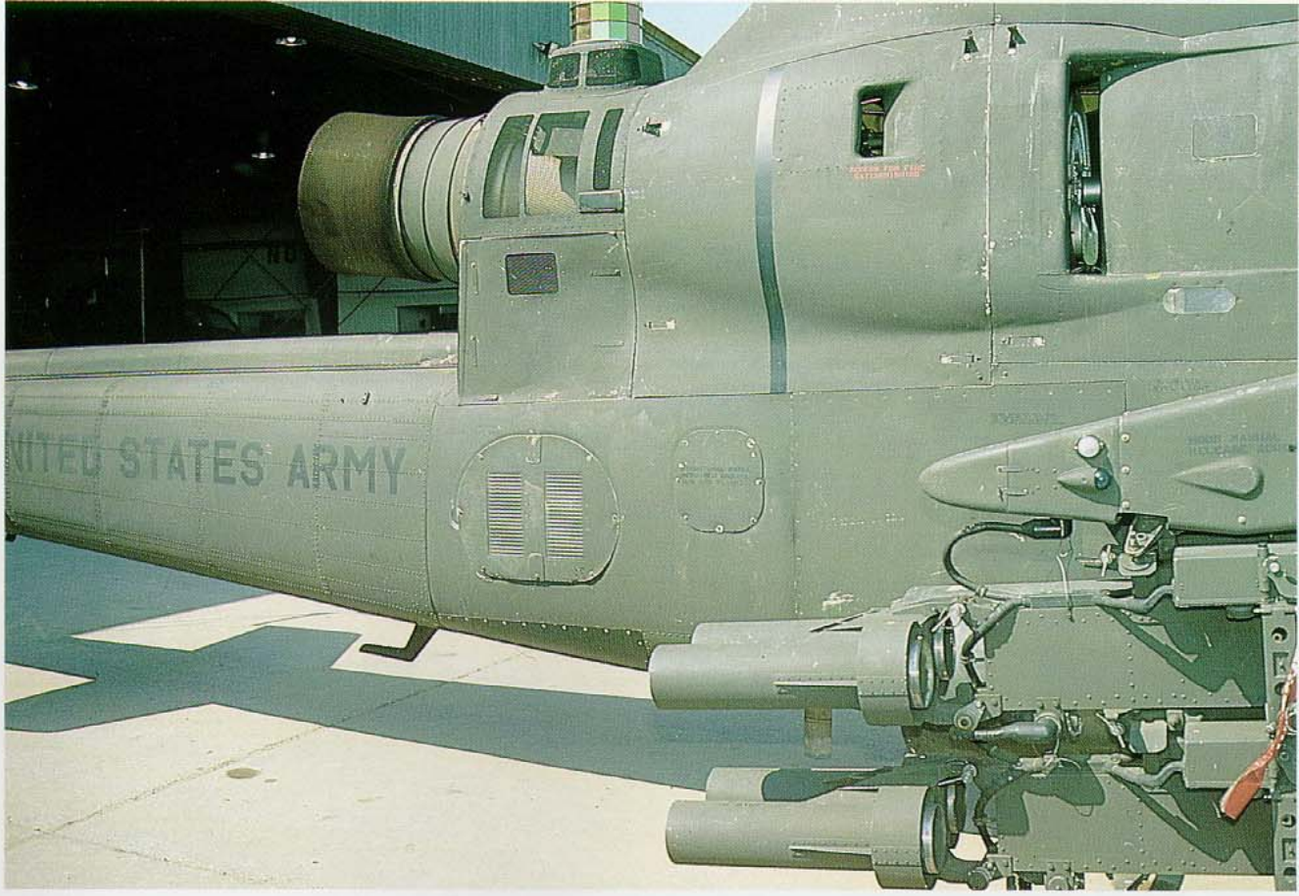
General Arrangement (Typical)

HISTORY OF THE 7th CAVALRY, GARY OWEN.

The 7th Cavalry dates back to 1886, when the regiment was organized at Ft. Riley, Kansas, with the objective of policing the frontier. The regiments duties consisted of scouting, providing escorts and patrolling the plains. The 7th was always on the move, and clashes with the indians ensued. The regimental colors bear campaign streamers from this period to include: Commanches, Little Big Horn, Nez Perces, Pine Ridge, Montana 1873 and Dakota 1874. Some of the more colorful and controversial events during this part of the regiments history includes the battle at Little Big Horn on 26 June, 1876 where Bvt Maj. Gen.George Armstrong Custer, along with 267 of his officers and men where killed and the tragic confrontation with the Sioux at Wounded Knee, S Dakota in 1890.

During the turn of the century the 7th Cavalry served mainly in the region of the Mexican border where it served until WWII.
The regiment was dismounted in 1943 and sent to Australia to fight as infantry with the 1st Cavalry Division. It also took part in several campaigns in the Pacific earning several awards. After the war, the regiment spent the next five years in Japan as part of the occupation force.
In 1950, the 7th Cavalry, as part of the 1st Cavalry Division, deployed to Korea where it fought at Yongdong, Taegu and in the Pusan Perimeter. The 7th earned eight campaign streamers to include: UN Defensive, UN Offensive, CCF Intervention, First UN Counteroffensive, CCF Spring Offensive, UN Summer-Fall Offensive, Second Korean Winter and Third Korean Winter. The regiment earned three Presidential Unit Citations for action in Taegu, Pusan and Yonchon, Korea.
Additionally, the 7th earned two Korean Presidential Unit Citations and the Gold Bravery Medal of Greece.

In 1957, the 7th Cavalry was reorganized as a parent regiment under the Combat Arms Regimental System. The 1st, 2nd and 5th Squadrons fought in Vietnam with the 1st Cavalry Division as airmobile infantry earning 16 campaign streamers including some for the Tet Offensive Campaign. The 3rd Squadron has served as the reconnaissance element for the 10th Infantry Division (1957-1958), the 2nd Infantry Division (1958-1963), the 3rd Infantry Division (1963-1986) and currently serves the 8th Infantry Division in West Germany. The 4th Squadron served in Korea as the 2nd Infantry Divisions reconnaissance element from 1963 until its inactivation in January 1988. However, the 4th Squadron has been reactivated as the reconnaissance unit for the 3rd Armored Division 'Spearhead' in February 1989.



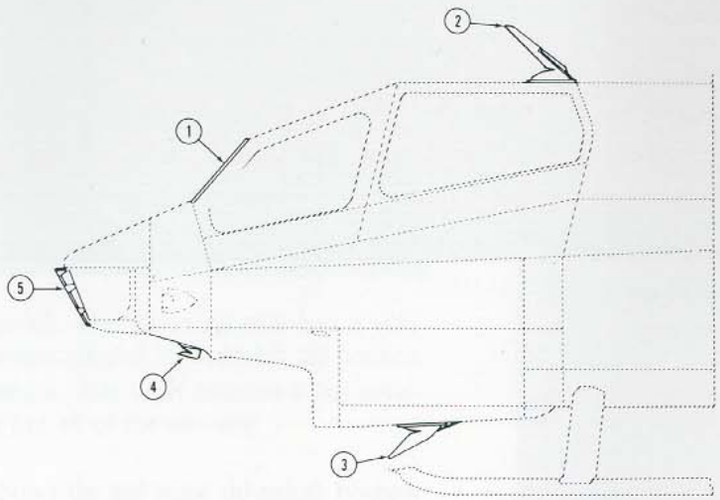
Closeup of the right side of the Cobra. Note the large ventilation door over the battery compartment and the IR jamming device on top of the engine outlet in the picture at left.
Attentive readers already noticed this Cobra carries two TOW launch assemblies (on top of each other) under the right wing pylon.

Closeup of the tail rotor gear box and the counter balance weights on the tail rotor head.

A look at the base of the vertical tail fin. A 42 degree change of direction of the tail rotor driveshaft is provided here. The oil level sight glass of the gearbox and a magnetic chip detector can clearly be seen, as well as the tail position light and the radar warning antenna to the front.

Airframe

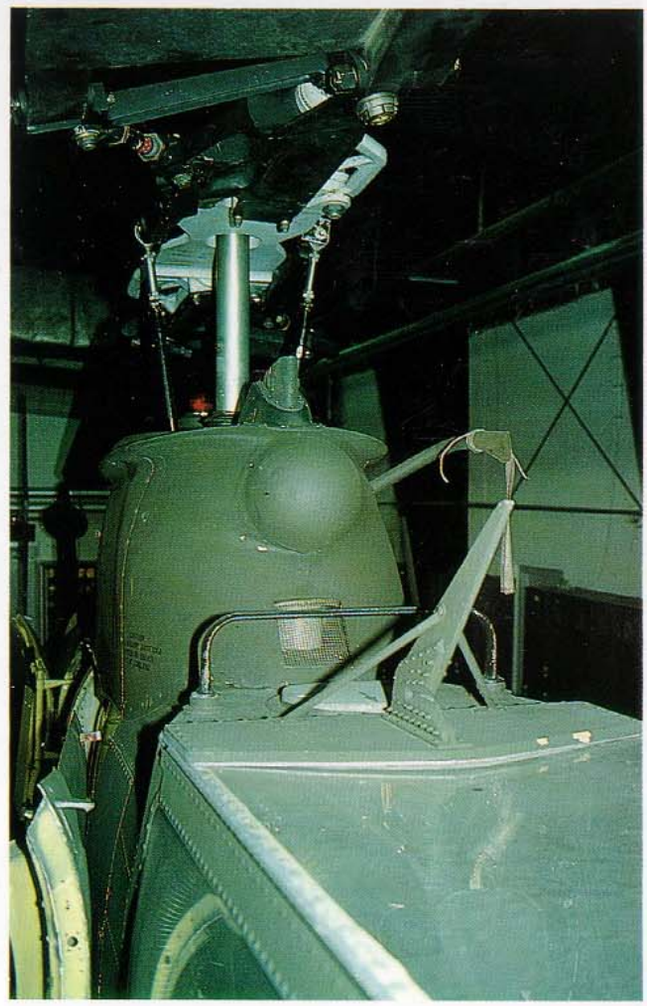
Two shots showing the Air Data System (ADS) sensing head (top), and the pitot tube (bottom, with canvas cover).
Note the countermeasures transmitter antenna on top of the rotor housing, the FM homing antenna and the upper cutter assembly.



1. Window channel (right side)
2. Upper cutter assembly
3. Lower cutter assembly
4. Chin cutter assembly
5. Nose deflector

209

Wire Strike Protection System



Overall view of the Cobra from the rear with the tail rotor as prominent feature. Note the color of the tail rotor differs from the rest of the aircraft. Also note the synchronized elevator has a single pivoting point.

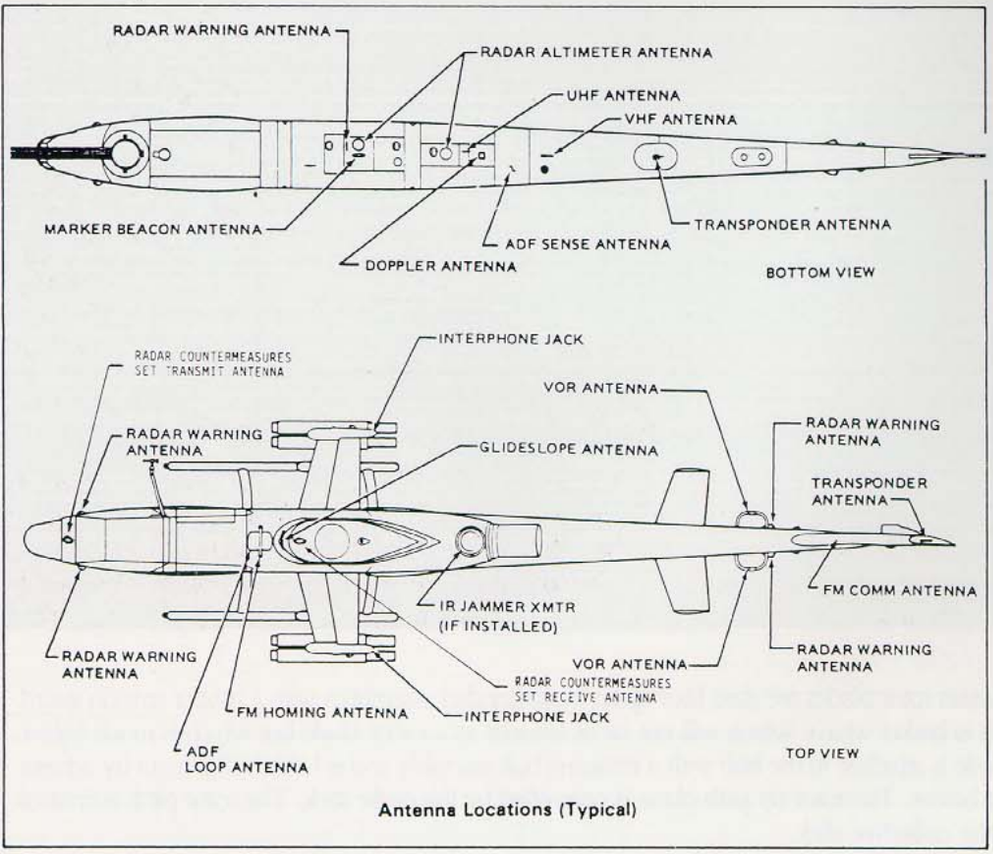
Tail section

A look at the vertical tail from the left. The 90 degree gear box is very distinctive. Note the red warning arrow painted between left tail position light and the left radar warning antenna. The VOR antenna is not installed on this AH-1S as can be seen just aft of the elevator.

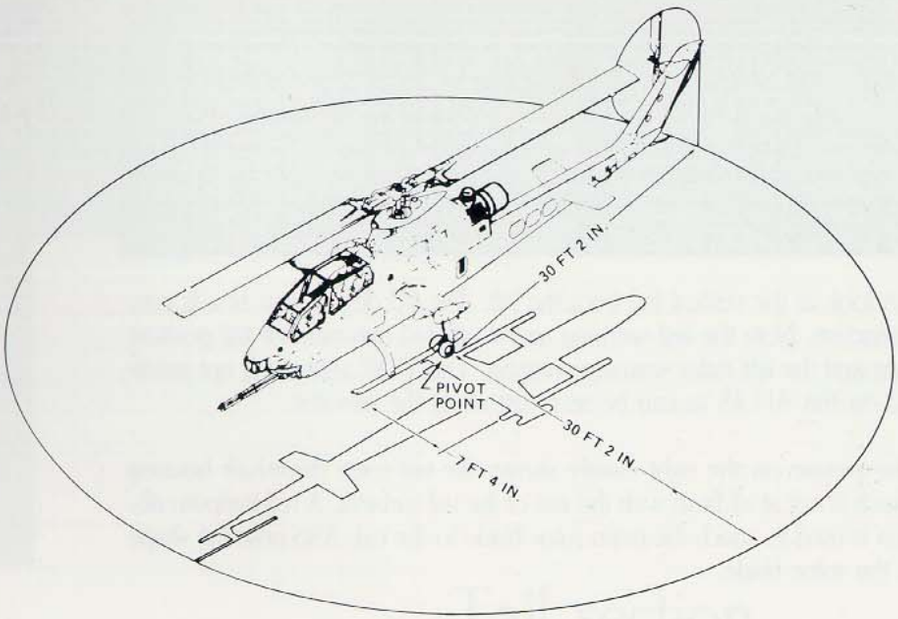
The picture on the right clearly shows the tail rotor driveshaft housing which is not at all flush with the rest of the tail surfaces. A red tiedown ribbon is used to attach the main rotor blade to the tail. Also note the shape of the rotor blade.

The main rotor blades are glass fiber epoxy resin bonded assemblies with a rubber erosion guard. The skin is basket weave which will not be as smooth as a metal blade but which is much lighter. Each blade is attached in the hub with a retaining bolt assembly and is held in alignment by adjustable drag braces. The rotor tip path plane is controlled by the cyclic stick. The rotor pitch is controlled by the collective stick.

Antenna locations



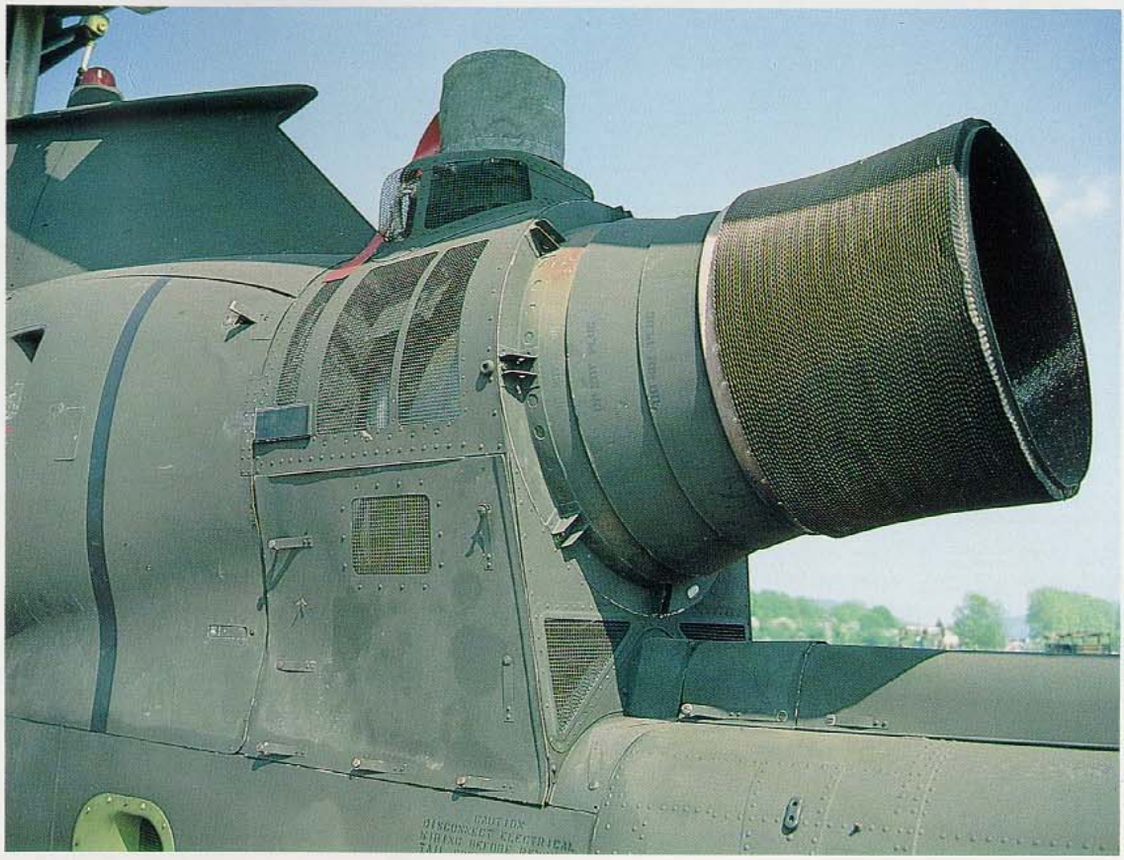
Antenna Locations (Typical)



Turning Radius (Typical)

A beautiful shot of the left side of the Cobra with the single TOW launch system as main attraction. Note the red (left) position light on the outside of the wing holding the launch assembly and the landing light on the front skid support bar.
Further interesting features are the cone on the transmission compartment door just in front of the engine inlet (left side only) and the anticollision light on top of the rotor shaft housing.

(Right) The main rotor hub viewed at close range. One can see the rotor hub is not painted black overall but has some parts painted light grey. The bottom picture shows the distinctive shape of the main engine door on the left side. The light green cooler intake for the battery compartment looks quite out of place, compared to the very dull finish of the fuselage. Aft of the intake can be seen the external power unit (EPU) receptacle.

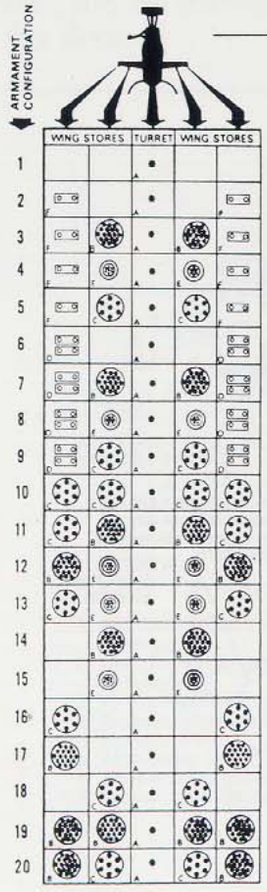


A perfect shot of the main engine outlet housing with a lot of wiring-covered coolant intakes. The engine outlet itself is covered with noise reducing material which also absorbs the heat radiation, which reduces the risk of infrared detection. Most of the doors are locked with special screws which remain attached to the doors even in the unlocked position. No more lost screws, although this locking system sure causes a lot of drag to the aircraft.

Rocket launcher

Two views of the 19 tube rocket launcher, attached under the wing. The picture at left shows the inside of the pylon under the right wing, while the other photo clearly shows the rear end of the tube launcher.

The diagram at the bottom provides adequate information to modelers as far as armament configuration is concerned. Note the weathering on top of the left wing which is used as a working platform during maintenance.



A — UNIVERSAL TURRET (M-197 20MM AUTOMATIC GUN)

B — ROCKET LAUNCHER — 19 TUBE — M200A1, XM227, XM261

CAUTION

The 19 tube rocket launcher is restricted to a maximum of twelve (12) seventeen (17) pound warhead rockets when mounted on outboard pylons. Refer to Chapter 6 for restrictions on other combinations.

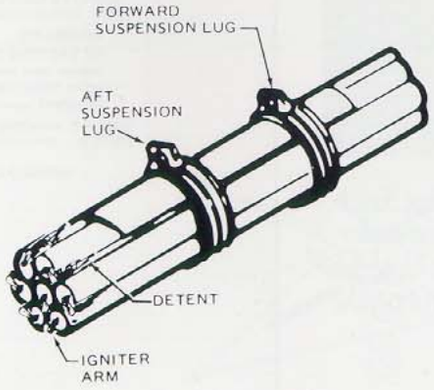
C — ROCKET LAUNCHER — 7 TUBE — M158, XM260

D — TOW MISSILE — M65 — TWO LAUNCHERS (FOUR MISSILES)

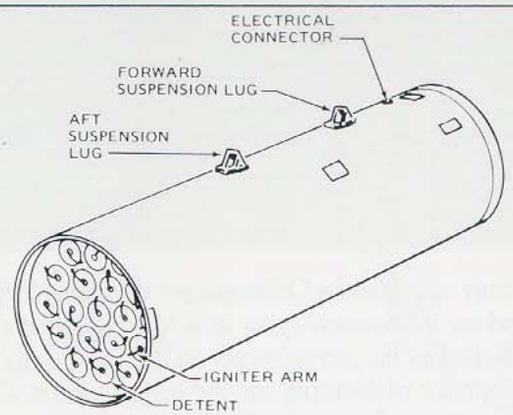
E — WING GUN POD — M18 OR M18A1 (7.62MM GUN)

F — TOW MISSILE M65 — ONE LAUNCHER (TWO MISSILES)

Authorized Armament Configuration

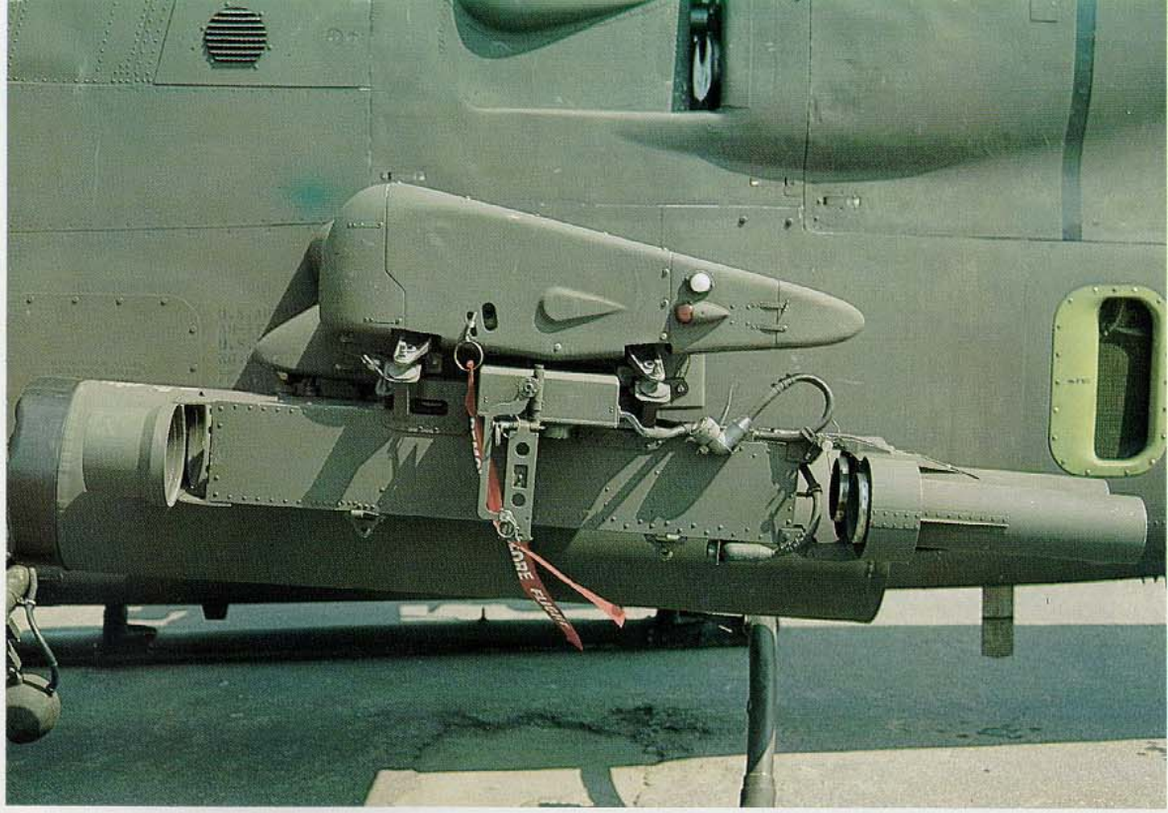


7 TUBE LAUNCHER



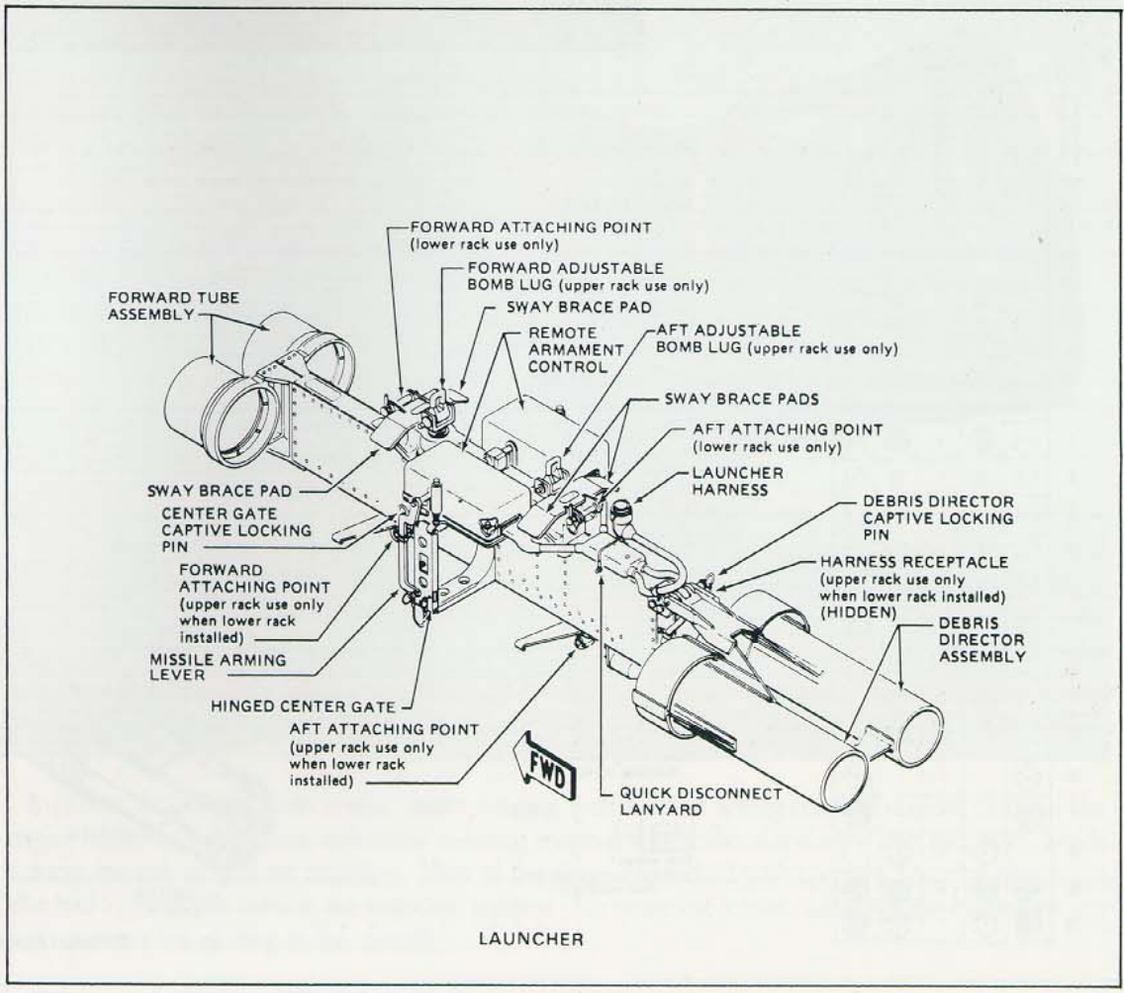
19 TUBE LAUNCHER

TOW Launcher



The difference between these two pictures is one TOW launcher assembly lacking on the AH-1S at right. Note the connector cables which controls the TOW launching. The drawing at the bottom right of the page describes the launcher components in detail. Compare with the picture above it.

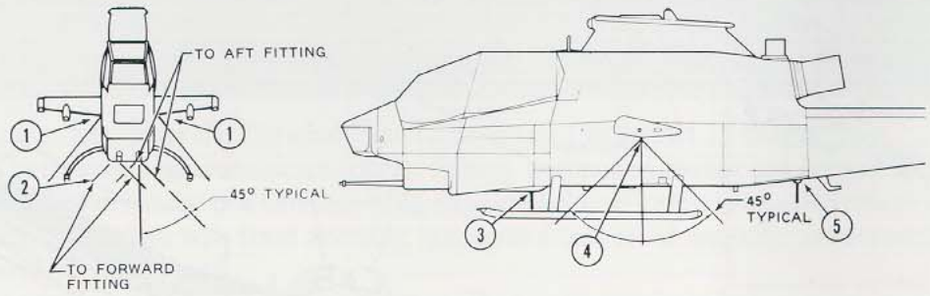
A U.S.Army officer and a Cobra gunner discussing tactics during Reforger somewhere in Germany, prior to a raid in support of the orange forces, as indicated by the orange sticker on the TOW launch tube. Note the difference in color of the tubes and the gunner who is wearing rubberlike overboots to protect his regular flying boots from the mud.

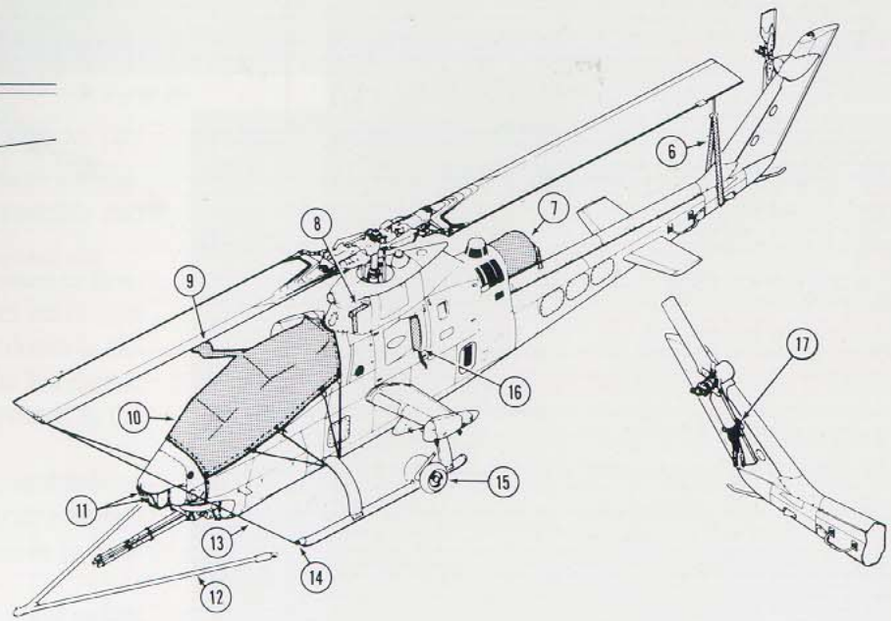


LAUNCHER

Ground handling

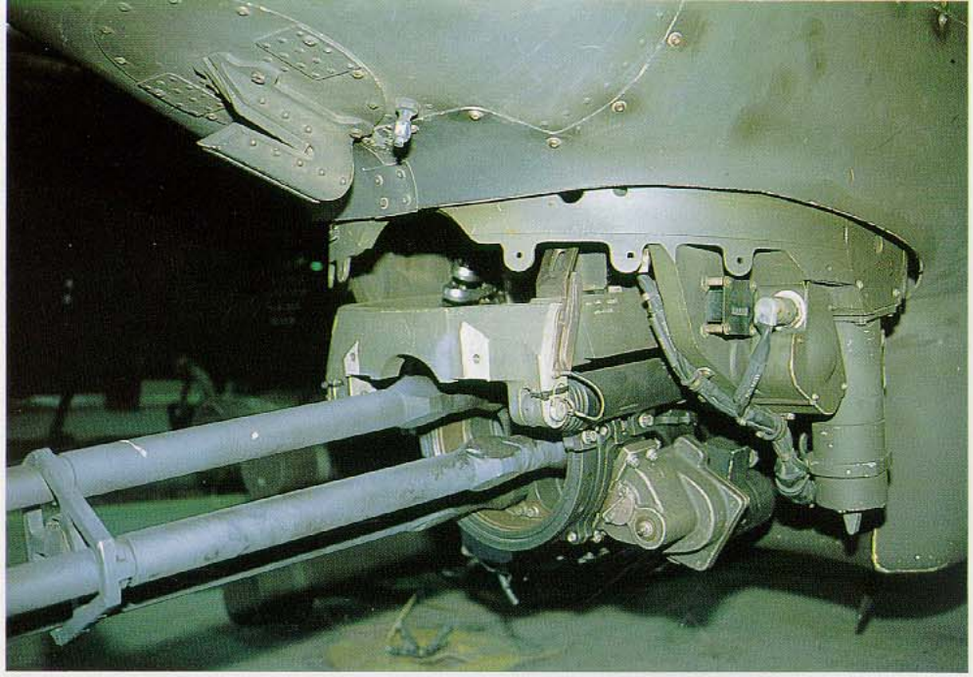
A picture to complete the walkaround of the Cobra, the left nose section with the gun turret and the Telescopic Sight Unit which are covered in detail on the following pages.
Modelers will find the diagram at the bottom of the page very useful. Displaying their model with proper mooring lines and tiedowns will give extra dimension to their dioramas.

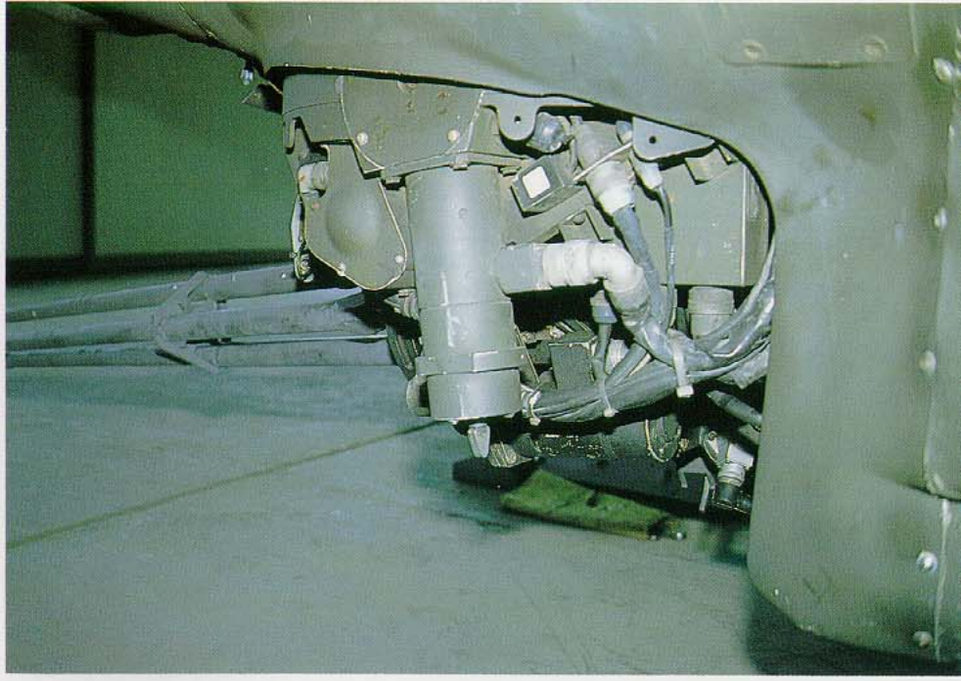




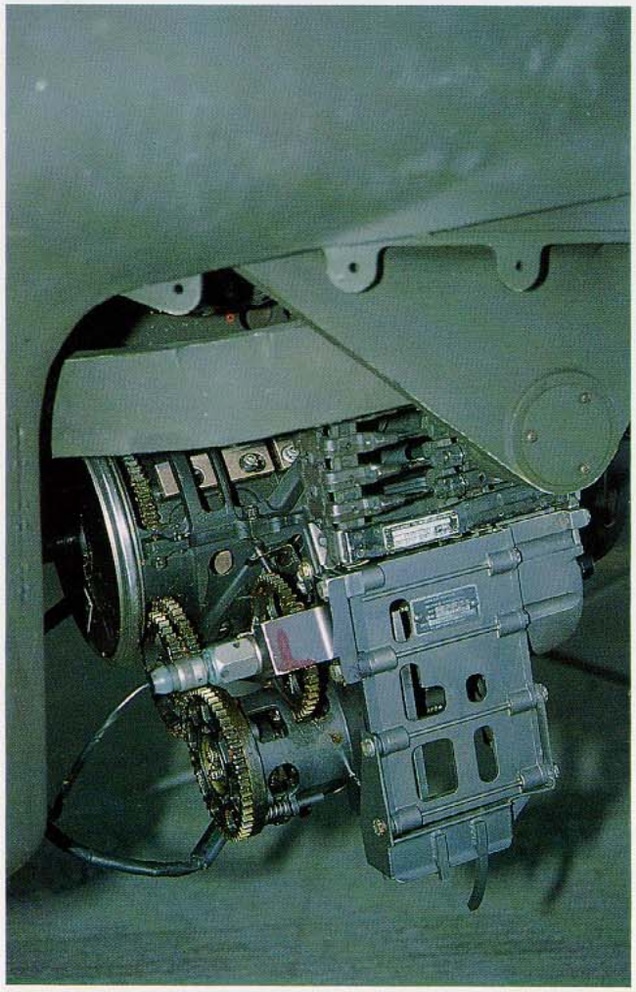
1. Additional tiedown rings at wing root
2. One inch rope or one-fourth inch cable
3. Forward mooring fitting
4. Outboard pylon mooring fitting (LH/RH)
5. Aft mooring fitting
6. Aft main rotor tiedown
7. Exhaust cover/IR duct cover
8. Pitot tube cover
9. ADS cover
10. Canopy cover
11. TSU covers
12. Tow bar
13. Forward main rotor tiedown
14. Tow ring
15. Ground handling gear
16. Engine air inlet shield
17. Tail rotor tiedown

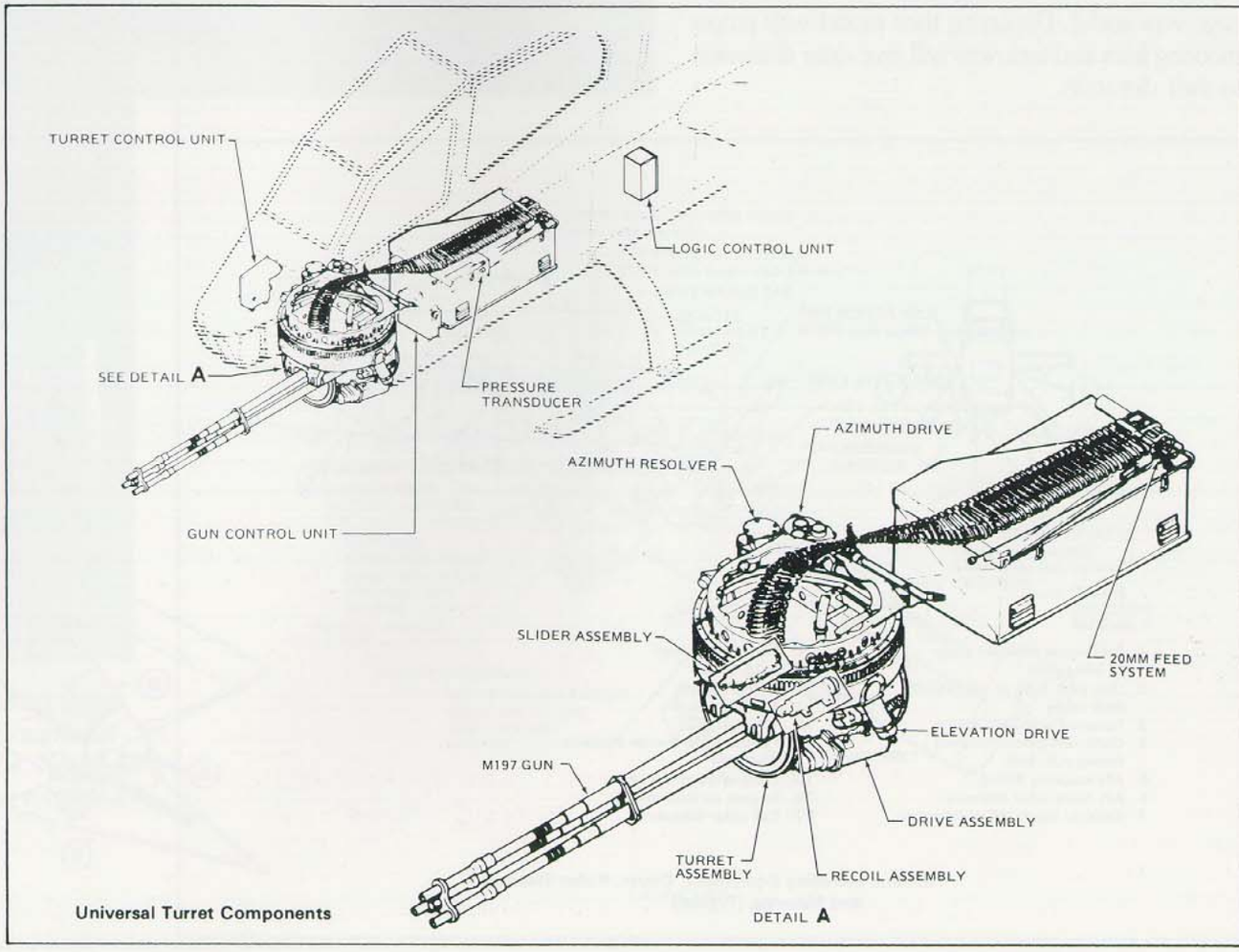
Ground Handling Equipment, Cover, Rotor Tiedowns and Mooring (Typical)





Gun turret





Universal Turret Components

These two pages fully cover the Universal Gun Turret installed in the AH-1S Cobra.
The universal turret system provides for positioning, sighting, ammunition feeding and firing of the M-197 20MM gun. The system consists of a turret assembly, turret control unit, logic control unit, pressure transducer, ammunition feed system with boost assembly, gun control unit, recoil assembly, slider assembly and gun drive assembly.
The turret is powered by the helicopter electrical system. The turret weapon can be fired in the fixed or flexible mode by the pilot, and in the flexible mode by the gunner. The turret can travel 110 degrees left or right in azimuth and 13 to 21 degrees up (varying with the turret azimuth position) and 50 degrees down in elevation. The turret fires a burst of 16 $\pm$4 rounds when the cyclic trigger switch is pressed to the first detent, and fires a continuous burst at 730 $\pm$50 rounds per minute when the cyclic trigger switch is pressed to the second detent.
When the turret is slewed more than five degrees in azimuth and an action switch is pressed to enable firing rockets or TOW missiles, the wing stores lockput circuitry is activated and the turret will stow to zero degrees azimuth and elevation to preclude the possibility of a turret round detonating the rockets or missile in close proximity to the helicopter.
If the turret is slewed less than five degrees in azimuth, and an action switch is pressed to enable firing rockets or TOW missiles, the wing stores lockout circuitry becomes activated which stops the gun from firing, but the turret will not stow to zero degrees azimuth or elevation.

A frontal view of the Cobra and a closeup of the Telescopic Sight Unit (TSU) with both window covers removed. The way this unit is handled by the gunner is described in the upcoming chapter on the cockpit.
This TSU fires laser pulses at the target for range finding and range distance measuring.
The cable nose deflector should prevent encountering power lines from smashing the TSU unit itself.
Note the way the three rotating gun barrels are linked together.

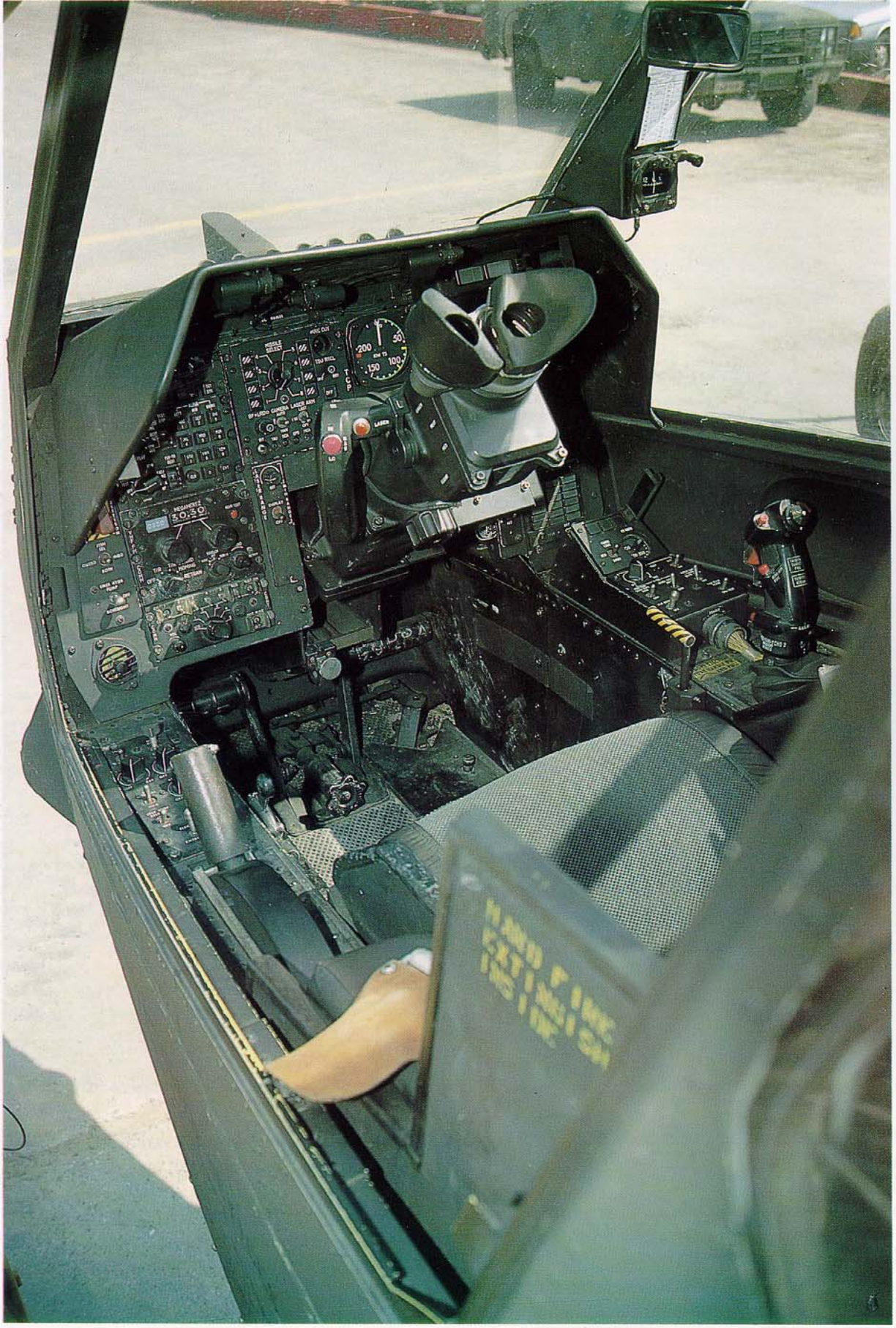
Telescopic Sight Unit

(IIAF/Israel Aviation & Space Magazine)

An Israeli AH-1S Cobra in action on the shooting range. Back in 1975, the IAF purchased 6 AH-1G (Q) helicopters from the U.S.Army surplus. After four years of familiarization they received their first AH-1S Cobra's in 1979. According to foreign sources, the IAF has 36 Cobra's plus the six AH-1G's which are also converted to AH-1S standards.

The Israeli Cobra's took a noticable part in the operation 'Peace for Galilee' in 1982, as anti-tank, close support and reconnaissance aircraft in independent missions against ground targets. In tasks such as destroying PLO tanks on the 'Beaufort' fortress, the Cobra demonstrated its power, agility and survival capability. In the second stage of the operations, the Cobra's, together with the MD500 Defenders, attacked Syrian tanks and A.P.C.'s. The IAF lost 2 Cobra's during the 1982 war, one of it on June 11, 1982.

Israeli Cobra's are equipped with TOW launchers (2 or 4 on each wing), 70 MM rockets and a 3 barrel gun. Since the war in 1982, all helicopters in IAF service are marked with a yellow V on both sides of the fuselage for recognition, and with a very small, low visibility national insignia. Some Israeli Cobra's, like the one on page 3, have chaff and flare dispensers mounted on the tail just aft of the engine exhaust.



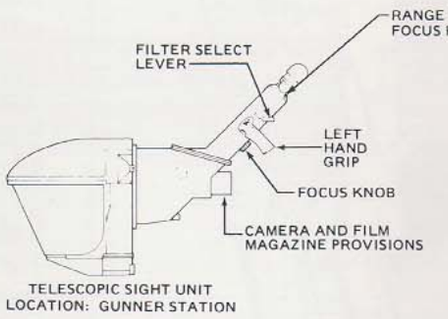
Gunners station

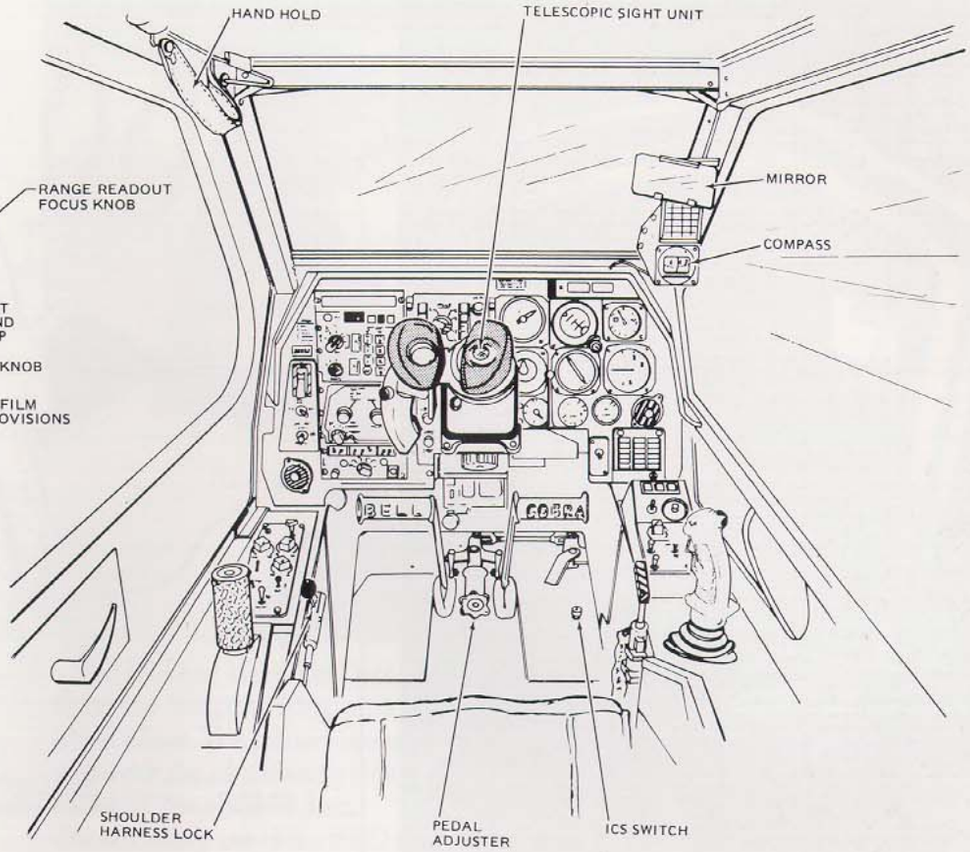
These two pages are devoted to the front cockpit or the gunners compartment. Most noteworthy is the Telescopic Sight Unit (TSU) control column in the center of the main panel. The function of each button and switch is described in the diagram on page 21.

Note that the flight instruments are located on the right side of the panel and the control panels for armament, navigation and communications are located on the left.

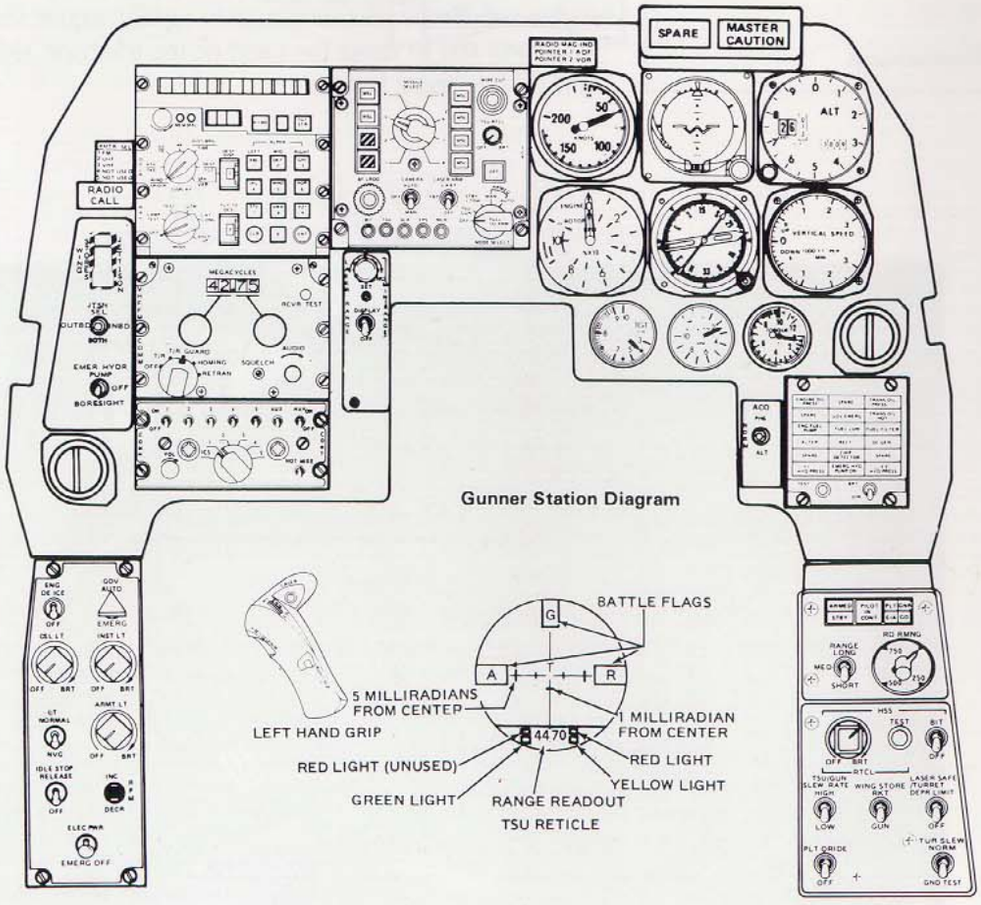
In case of emergency, or when the pilot has to cease control of the aircraft for one reason or another, the gunner is able to take over the controls with the F-16-like side control stick on the right auxiliary panel and the collective pitch control handle on the left. Both can be seen in the pictures on this page.

The gunner's controls are slaved to the pilot's controls. The system includes a cyclic system, a collective control system, a tail rotor system, a force trim system and a stability/control augmentation system (SCAS).





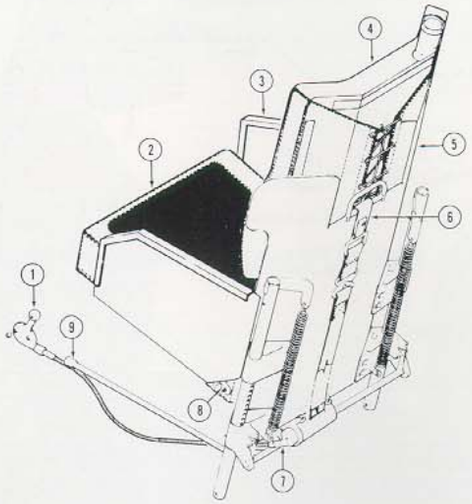
Gunner Telescopic Sight Unit (TSU).



Gunner Station Diagram

ITEM	FUNCTION
Left-hand grip switches MAG switch	LO — Magnifies target two times. HI — Magnifies target 13 times.
TRIGGER switch	— Fires TOW if selected in first or second detent. — Fires turret if selected in First Detent — Limited to 16 round burst. Second Detent — Continuous burst.
ACTION switch	— Activates TOW launchers. — Slaves turret to TSU or gunner helmet sight.
LASER switch	— Fires laser pulses at target for range finding.
TSU Reticle	
G battle flag	— When flashing, indicates TCP MODE SELECT switch is TSU/GUN position and turret not aligned with TSU. — When steady, indicates TCP MODE SELECT switch is in TSU/GUN position and turret is aligned with TSU.
A battle flag	— Indicates TCP MODE SELECT switch is in ARMED position.
R battle flag	— Indicates pilot has achieved prelaunch constraints for TOW firing.
Red light	— Indicates no-valid laser return pulse
Green light	— Indicates multiple targets detected by laser range finder.
Yellow light	Steady — Indicates laser range finder malfunction. Flashing — Indicates laser range finder overtemperature.
Range readout	— Indicates range from helicopter to target.
Filter select lever	— Selects filters of different light intensities.
Range readout focus knob	— Focus battle flags and range readout display.
Focus knob	— Focus target image.

Pilots station



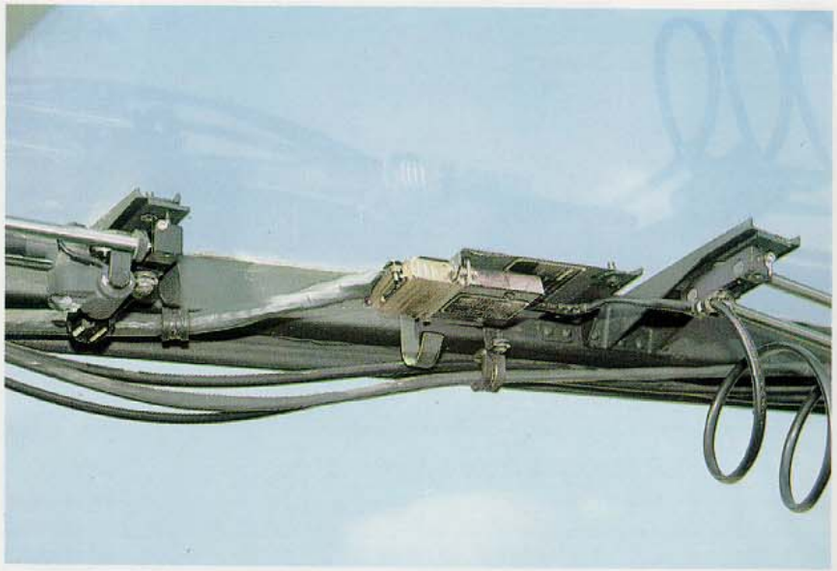
1. Shoulder harness lock
2. Seat cushion
3. Side armor panels
4. Seat back cushion
5. Seat assembly
6. Shoulder harness
7. Inertia reel
8. Seat lap belt
9. Height adjustment handle

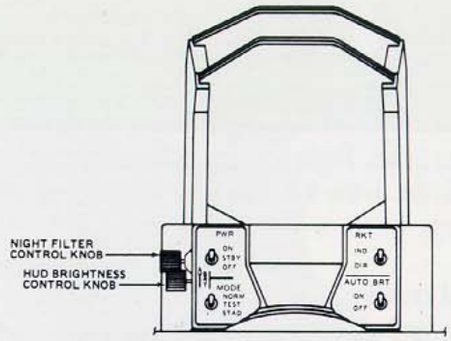
Pilot Seat Installation (Typical)

(Far left) A closeup of the inside of the pilot's access door which swings outward and up (like the gunner's door) to provide access to the cockpit.
The doors have gas operated struts that will hold the doors in the full open position with a force of approximately 70 pounds. Note the distinctive yellow markings on the door frame.

(Left) A drawing of the pilot's seat and it's components. The seats, side shoulder panels and head protective panels are of armor material. The pilot's seat is vertically adjustable but nonreclining, whereas the gunner's seat is fixed and therefore non-adjustable.
The inertia reel shoulder harness with the control handle in the unlocked position allows the occupant to lean forward; however, the reel will automatically lock when the helicopter encounters an impact of force of two to three 'G' deceleration. Manual locking of the reel is accomplished for emergency landings.

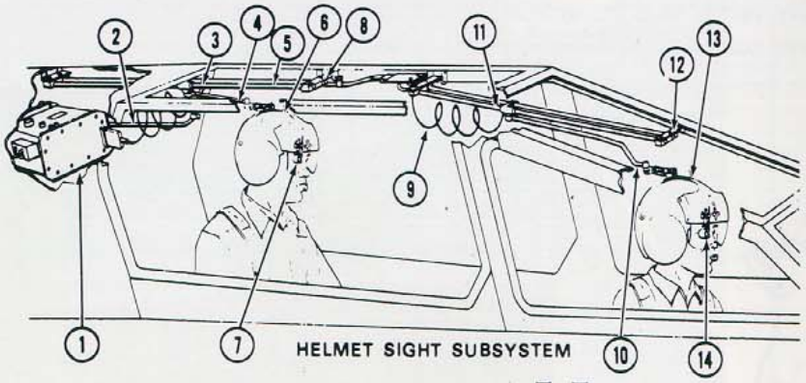
(Bottom & right) Three pictures showing the linkage arm attachment for the Helmet Sight Subsystem (HSS). This system permits the pilot or gunner to rapidly acquire visible targets and to direct the turret or the telescopic sight unit(TSU) to those targets.



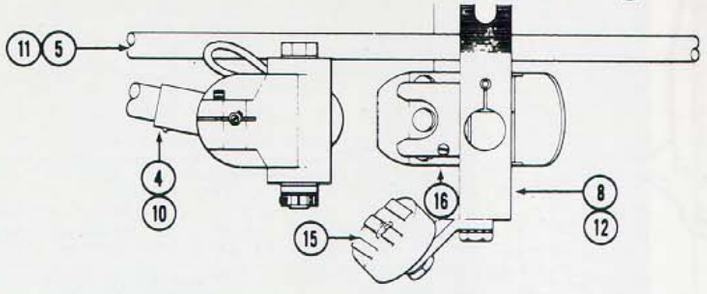


The HUD or Head Up Display. The HUD visually presents required symbology for flight and weapons firing on a partially reflective beam splitter superimposed on real world image. The primary use of the HUD is for aiming the helicopter to fire rockets and to provide the pilot steering indications for meeting the helicopter constraints in operation of the TOW missile system.

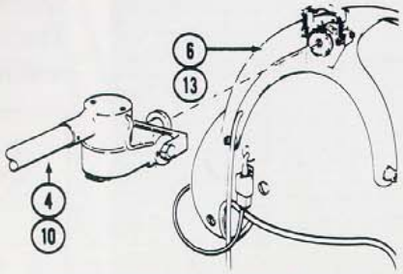
The secondary use of the HUD is for display of the engine torque, radar altitude, magnetic heading and range for flight safety purposes when the pilot is flying head-up with his (or her) eyes focused outside the cockpit.



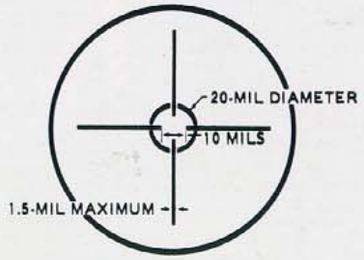
HELMET SIGHT SUBSYSTEM



PILOT/GUNNER LINKAGE ARM ATTACHMENT TO BIT MAGNET AND STOW BRACKET



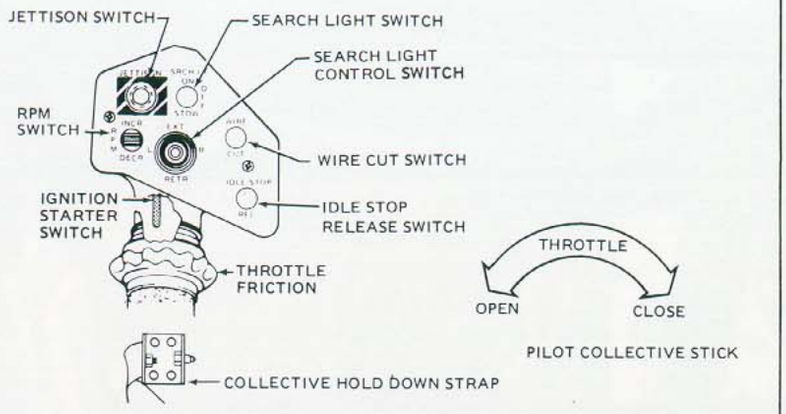
PILOT/GUNNER LINKAGE ARM ATTACHMENT TO HELMET SIGHT



PILOT/GUNNER EYEPIECE RETICLE PATTERN

1. Electronic interface assembly
2. Gunner extension cable
3. Pilot linkage cable
4. Pilot linkage arm
5. Pilot linkage rails
6. Pilot helmet sight
7. Pilot eyepiece
8. Pilot linkage front support
9. Gunner linkage cable
10. Gunner linkage arm
11. Gunner linkage rails
12. Gunner linkage front support
13. Gunner helmet sight
14. Gunner eyepiece
15. BIT magnet
16. Stow bracket

Helmet Sight Subsystem (HSS)

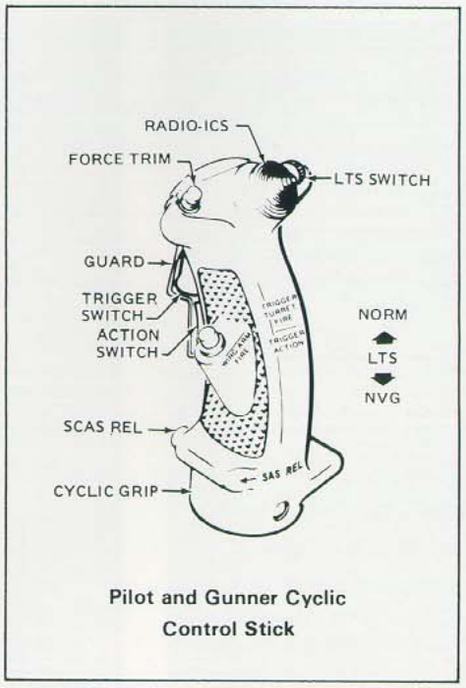


Pilot Collective Control Stick

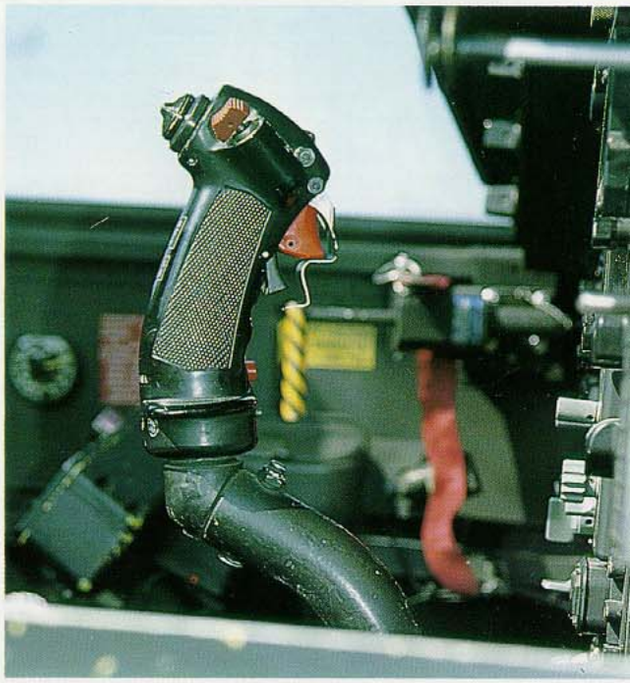
The pilot's instrument panel and side consoles. Flight control instruments are to the right; engine, communication and armament control panels are to the left. The pilot light control panel can be seen on the housing on top of the engine instruments.

Collective Control Stick (left picture and drawing).

The pilot and gunner collective pitch control stick control the vertical mode of flight. Moving the stick up or down changes the angle of attack and lift developed by the main rotor resulting in the ascent or descent of the helicopter. The collective assembly consists of a collective stick with adjustable friction system (pilot only), twist grip-type throttle with friction adjuster and switch box assembly (pilot only). The switch box assembly incorporates the ignition starter switch, rpm increase-decrease switch, jettison, searchlight switches, wire cut switch and idle stop release switch.

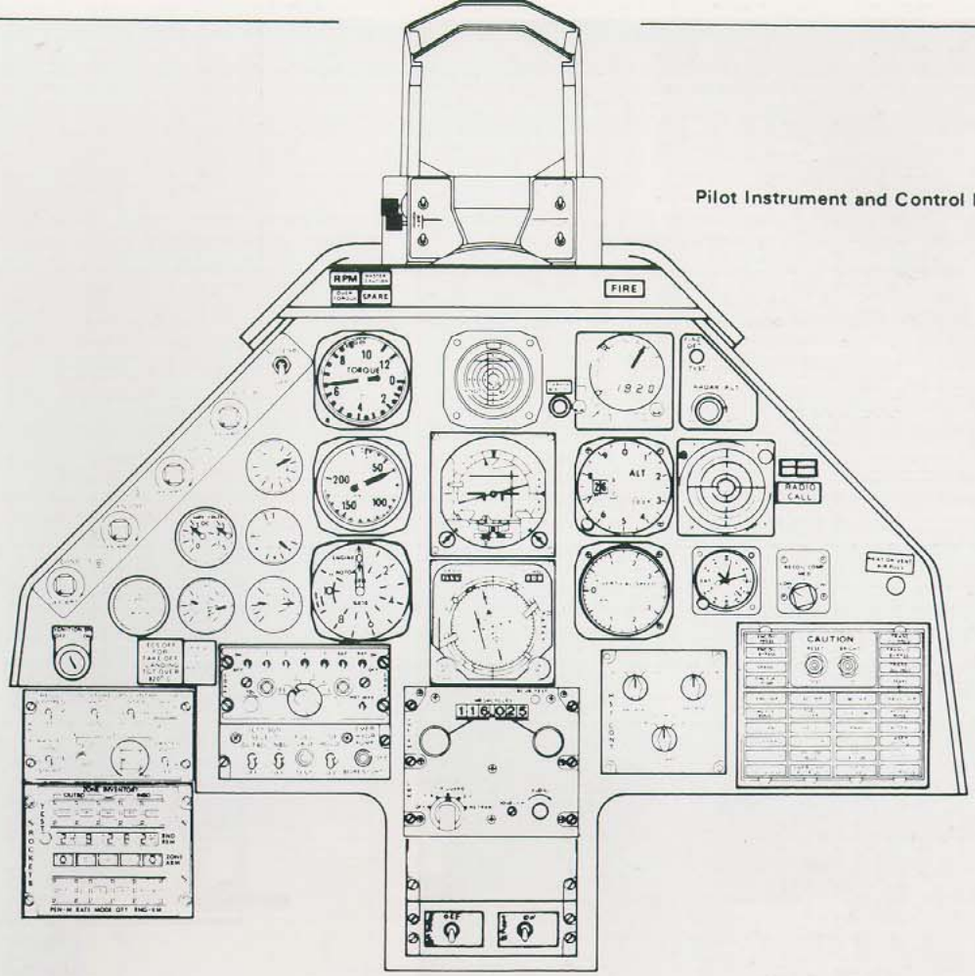


Pilot and Gunner Cyclic Control Stick

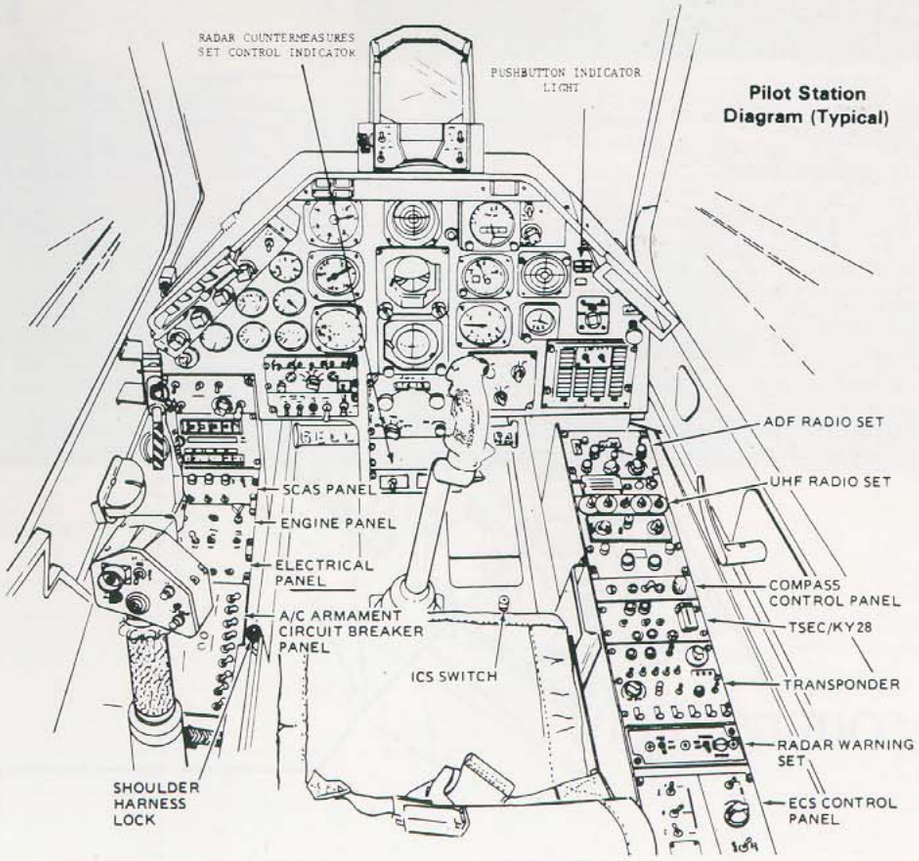


Selective Control Stick (bottom picture and drawing on page 24).
The pilot and gunner cyclic sticks have a built-in operating friction. The cyclic control movements are not mixed, but are transmitted directly to the swashplate. The longitudinal cyclic control linkage is routed from the stick through the SCAS actuator, the dual boost hydraulic actuator to the right horn of the fixed swashplate ring. The lateral is similarly routed to the left horn. Control 'feel' is provided by the force trim units. The for and aft movement also changes the synchronized elevator attitude to assist controllability.

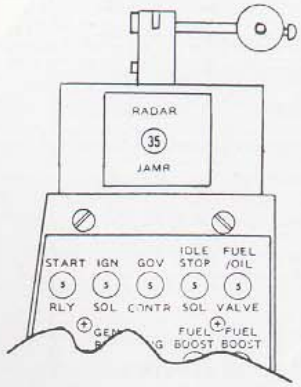
Tail Rotor Control System.
Pushing a pedal changes the pitch of the tail rotor resulting in directional control and is used to pivot the helicopter on its own vertical axis and trim the helicopter in flight. Heel rests are provided for the gunner to prevent inadvertent pedal operation.

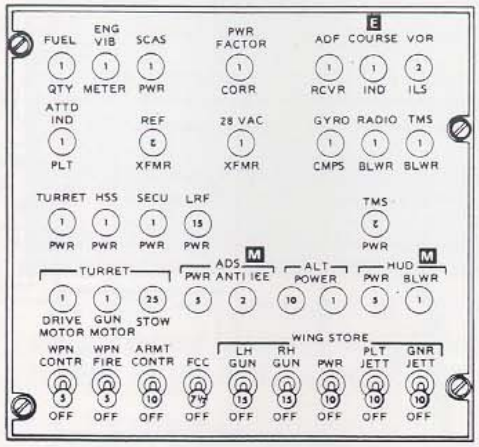


Pilot Instrument and Control Panel

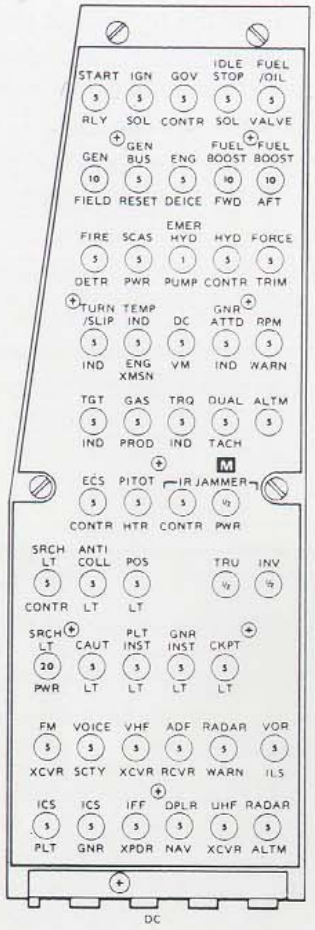


Pilot Station Diagram (Typical)



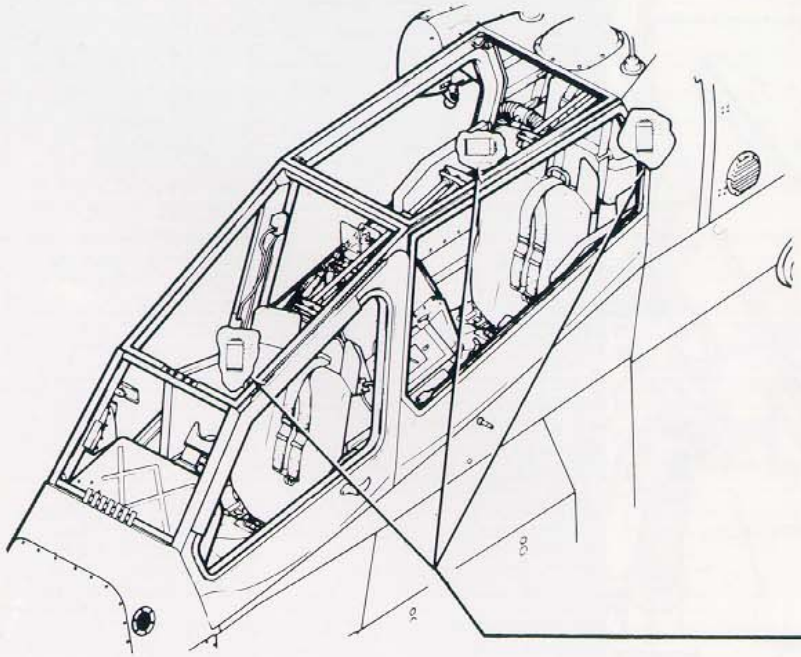


AC/ARMAMENT

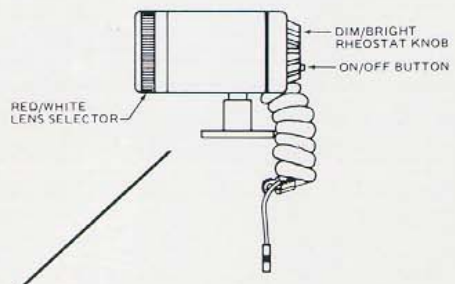


DC

Circuit Breaker Panels (Typical)



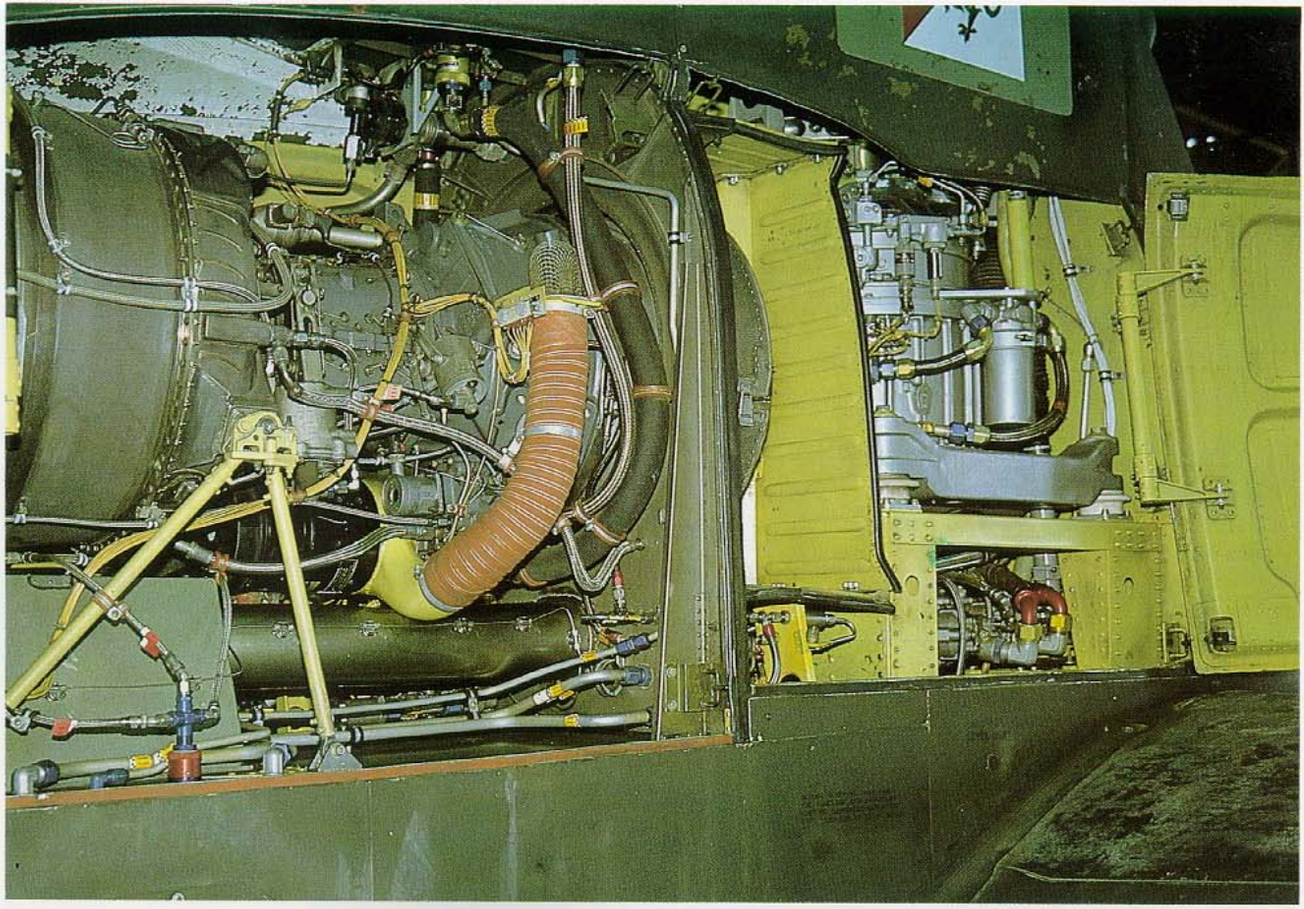
Cockpit (Map) Light (Typical)

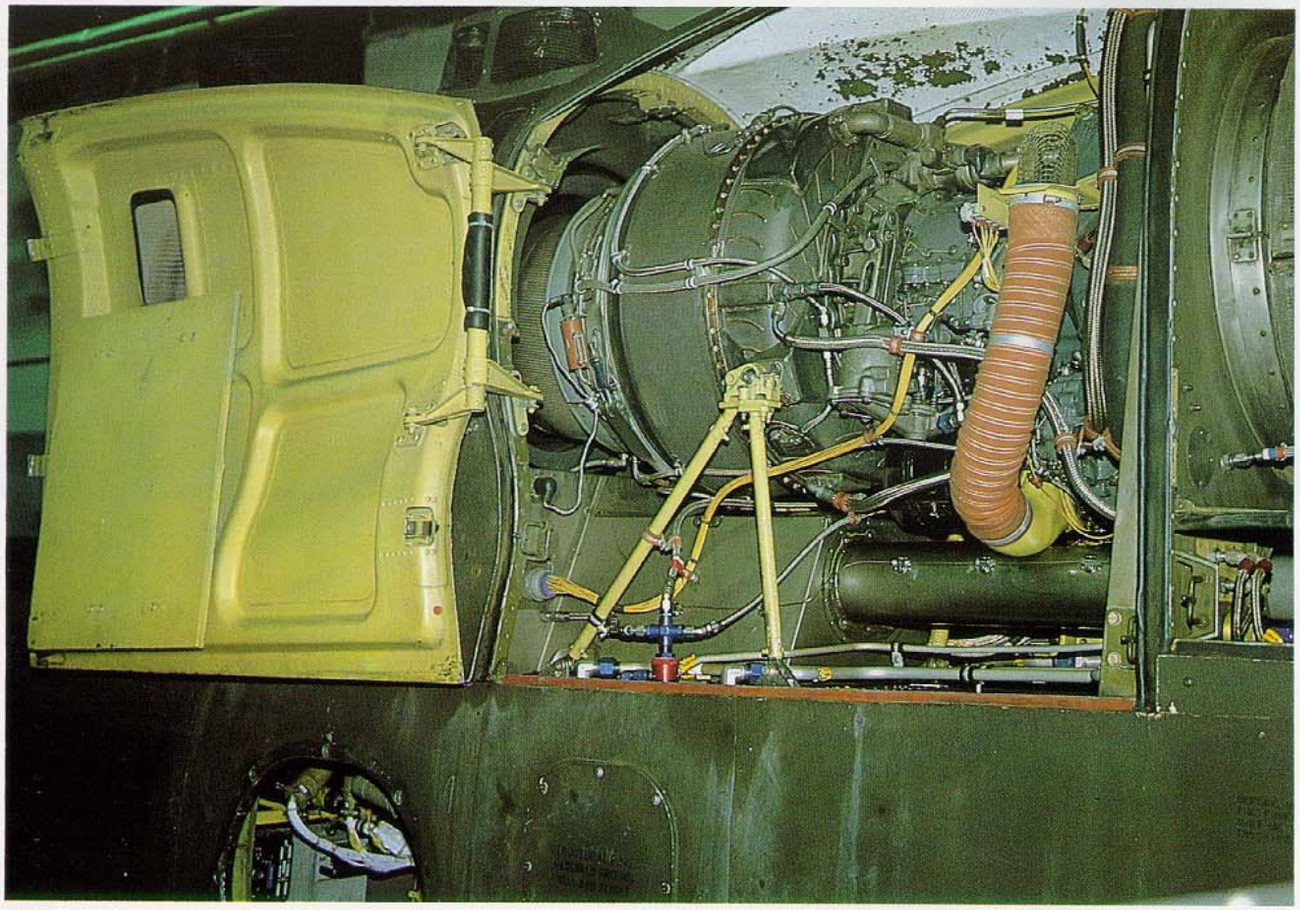


An AH-1S Cobra inside the maintenance hangar at Büdingen airfield in Germany. Note the protective cover over the gun barrels and the FOD can in front of the helicopter. Parked next to it is an OH-58 A scout helicopter, which is also part of the flight arsenal of this airfield.

Maintenance

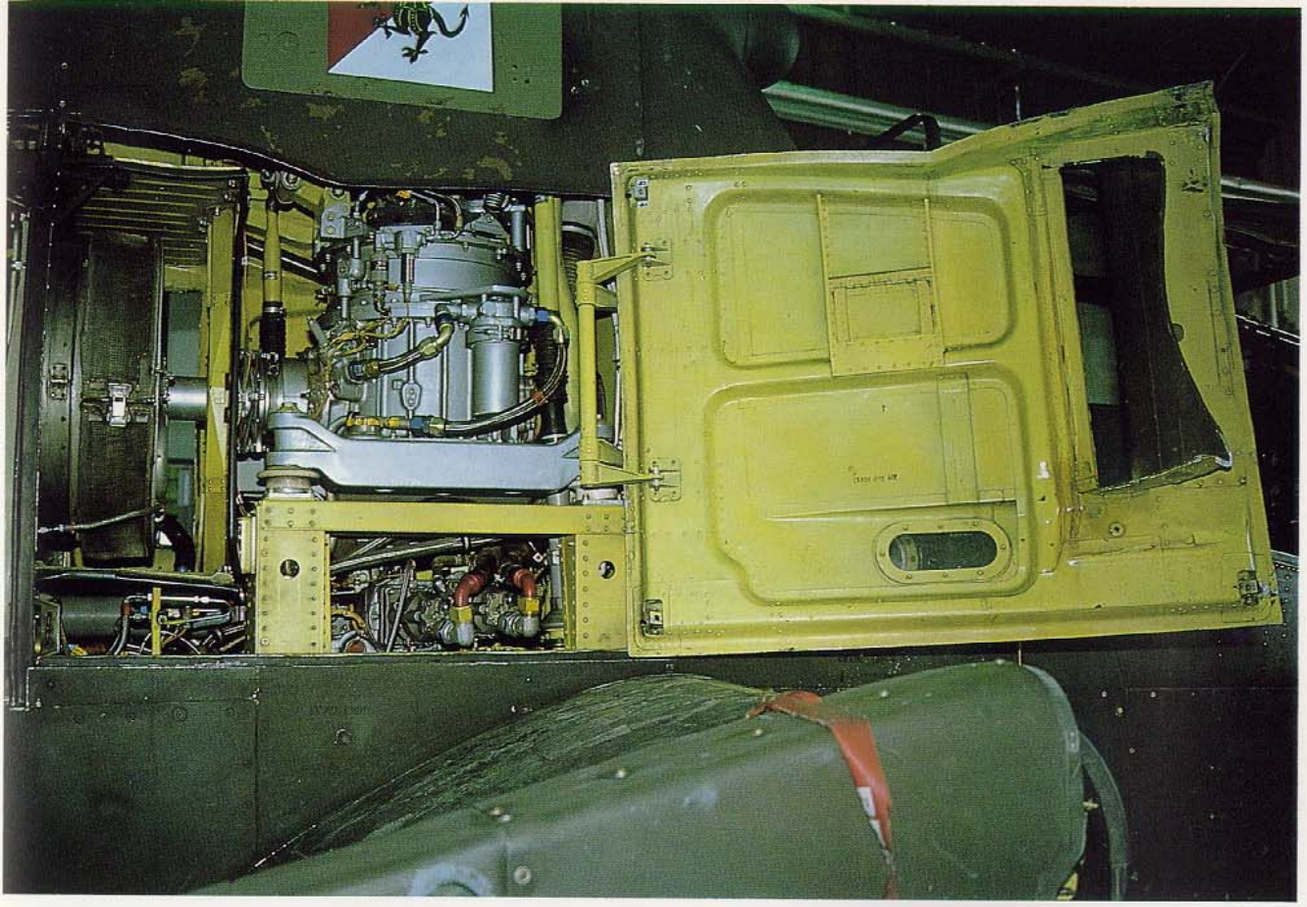
Engine compartment

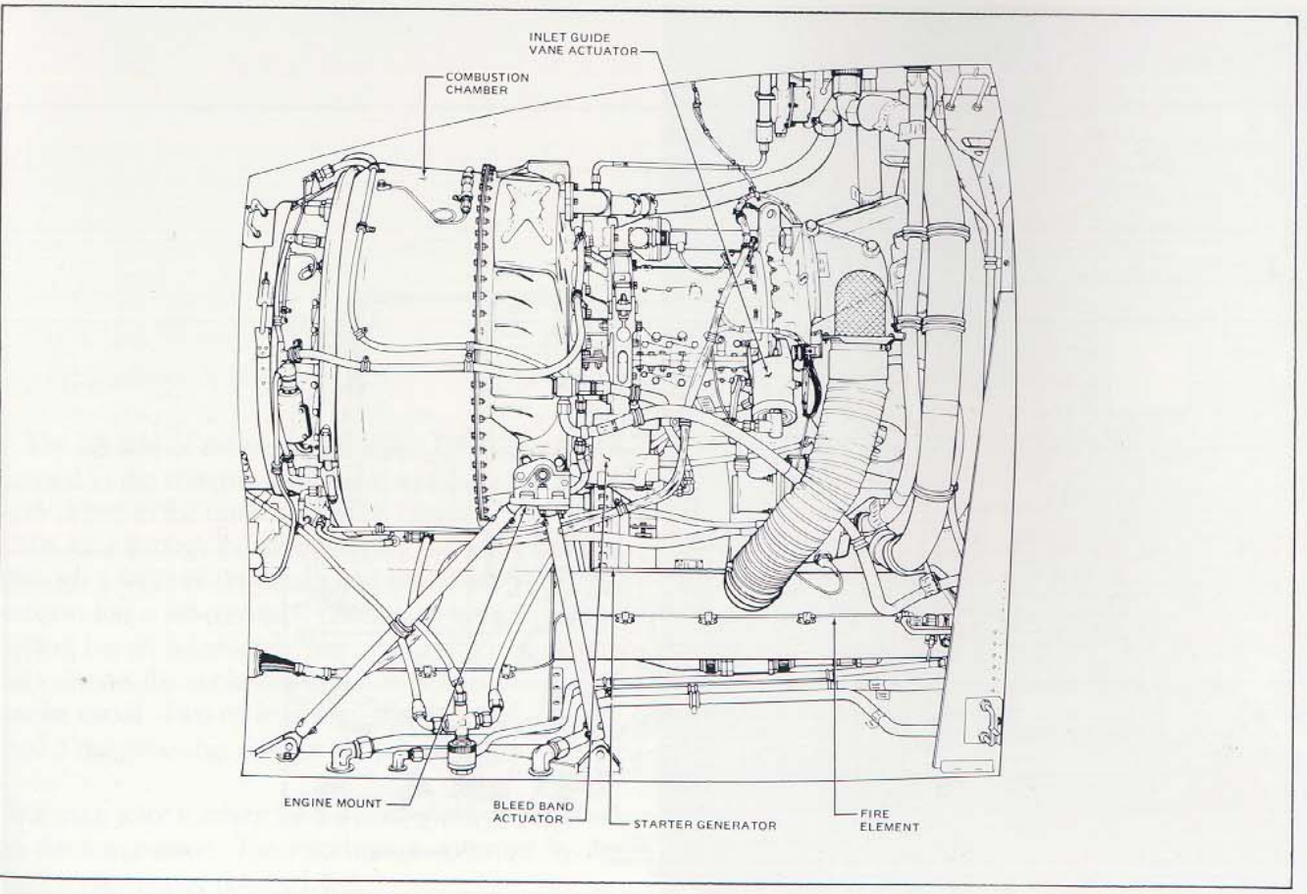


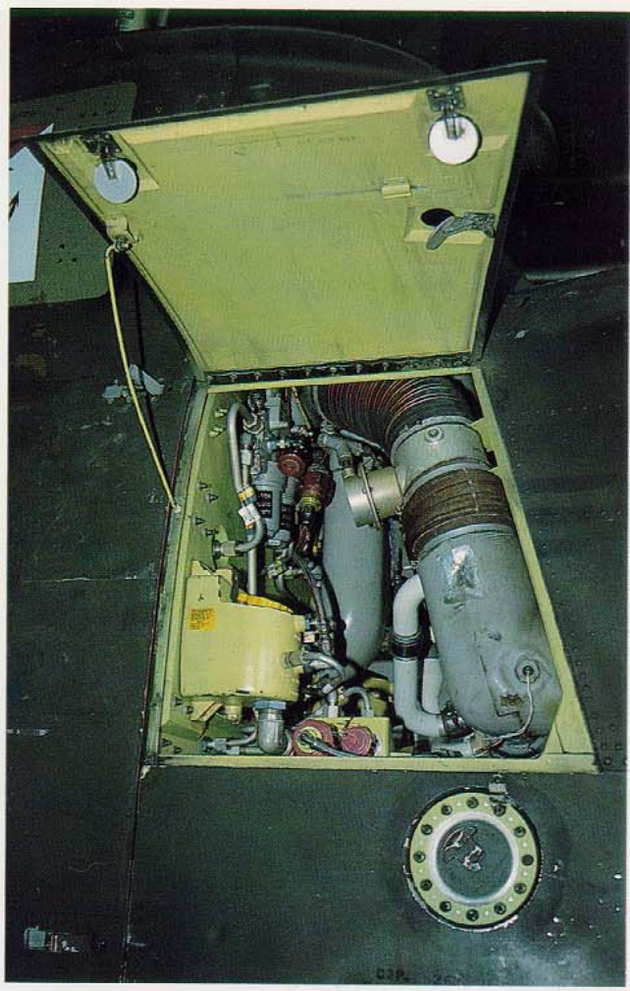


Three large pictures showing the open engine compartment and the transmission compartment on the right side. Note the inside of the compartments and the covering doors are painted zinchromate yellow.

The AH-1S is equipped with a T53-L-703 engine which in this installation is derated by limitation of the helicopter transmission to 100 % torque for 30 minutes and 80 % torque for continuous operation at 100 % rpm. The engine compartment is cooled by ram and ambient air. Armor material is located on the left and right engine compartment doors to provide protection for the engine compressor, fuel control lines, oil filter and fuel filter. Note the FOD screen which is mounted around the particle separator on the forward end of the engine in the transmission compartment (see picture on page 29).







Closeup of the inside of the panel just in front of the engine compartment with the fuel filler cap just below it. Fuel capacity of the AH-1S is 260 US gallons of MIL-T-5624 or JP-4 fuel. Alternate fuel is MIL-T-5624 JP-5 (NATO F-44) or MIL-T-83133 JP-8 (NATO F-34).
The helicopter is equipped with a crashworthy fuel system. The system is designed with the potential of containing fuel during a severe, but survivable crash impact to reduce the possibility of fire. The system has a 50 caliber ballistic protection level.

The helicopters engine oil system is a dry sump, pressure type, and completely automatic. The oil tank is located in the upper pylon fairing. It will self-seal a 30 caliber projectile hole and is equipped with deaeration provisions. Oil is gravity fed from tank to engine driven oil pump, which provides pressure and scavenging for the system. Engine oil cooling is accomplished by an oil cooler and a bleed air driven turbine fan. The engine and transmission oil coolers use the same fan.

FOREWORD

For a shortterm, interim gunship helicopter, the AH-1 COBRA and all of its variants have weathered the test of time. The AH-1 has served on many fronts with many nations. It can be safely said that the AH-1 COBRA has been an important mainstay to our military triad; combatting the cold war, and a few hot ones, for over twenty five years now.

Although all models of the AH-1 are not depicted in this book, the most prevalent in United States Army aviation today is, namely, the AH-1S or the fully modernised Cobra as shown in the following pictures from the 4th Squadron, 7th Cavalry, 3rd Armored Division at Büdingen, West Germany.

The AH-1S, not the most advanced Cobra by far, is well suited for the task at hand... killing tanks and area suppression fire. It can carry eight Tow anti-tank missiles, thirty eight ten pound high explosive warhead rockets, 750 rounds of 20mm ammo, or any combination thereof depending on mission requirements.

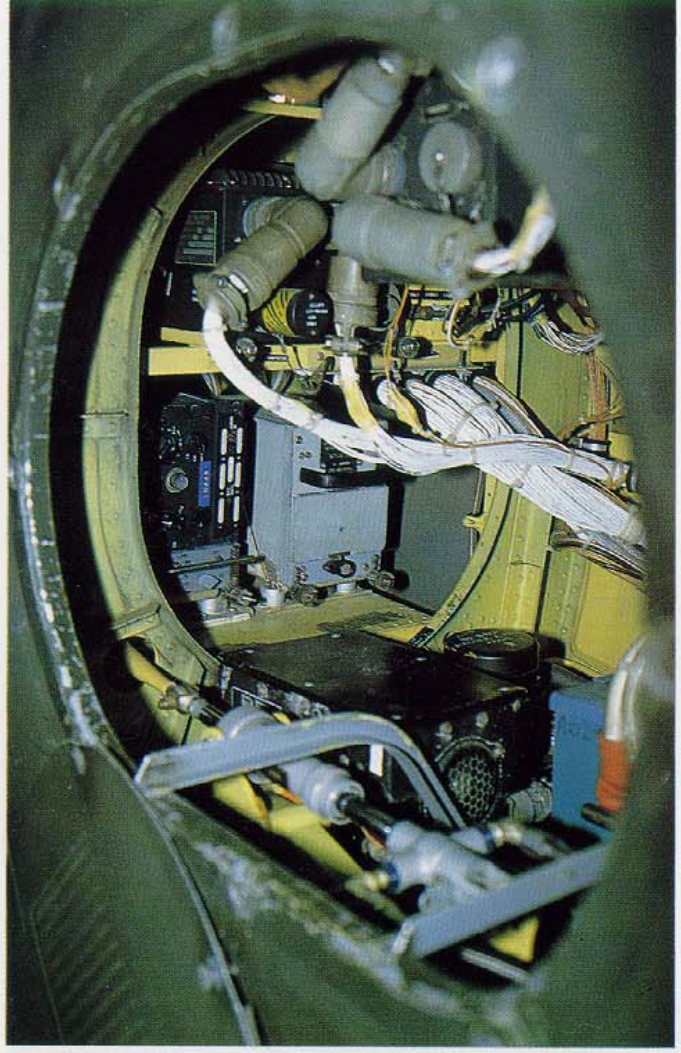
The AH-1 carries a crew of two pilots, one of which is the designated gunner/front seat pilot; the other, the rear seat pilot, usually is the pilot in command. With the AH-1's narrow frontal silhouette, a mere 36 inches, its massive firepower, its nap of the earth tactics, it is more than capable of tipping the scales on the modern battlefield in favor of those who possess it.

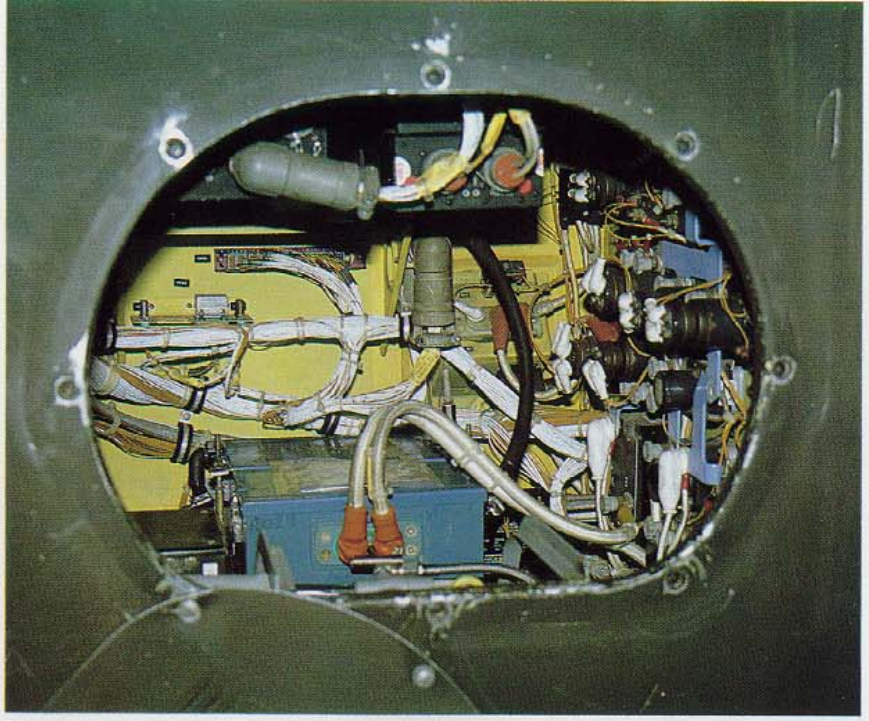
Understandably time marches on, as does technology, and the AH-1 Cobra is an old warhorse that is being replaced by the AH-64 Apache. Even though its replacement is a superior machine, the Cobra can still be expected to hold the line well into the 21st century. This is admirable testimony for an airframe that was originally intended to serve for only five years.

Therefore, the unsung hero of the latter part of the twentieth century, the AH-1 Cobra, ranks high on the list of warbirds.

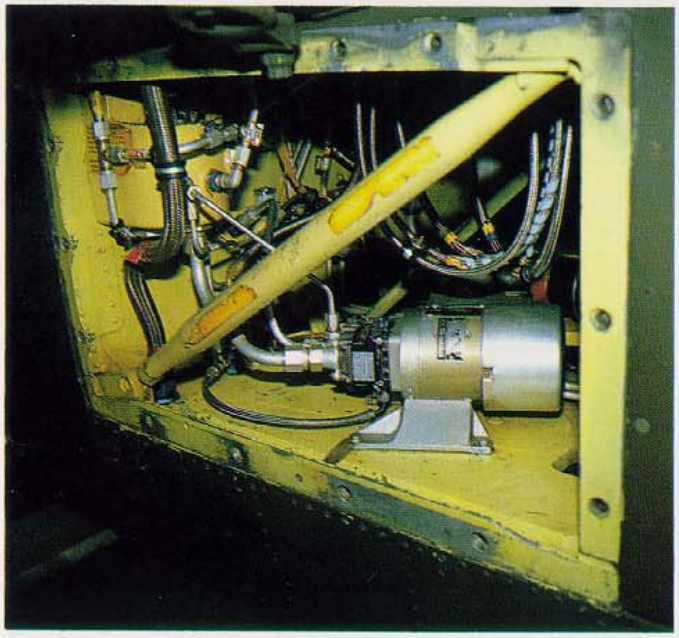
LtCol Charles D.McFETRIDGE
Commander 4th Sq/7th Cav
Büdingen, West Germany

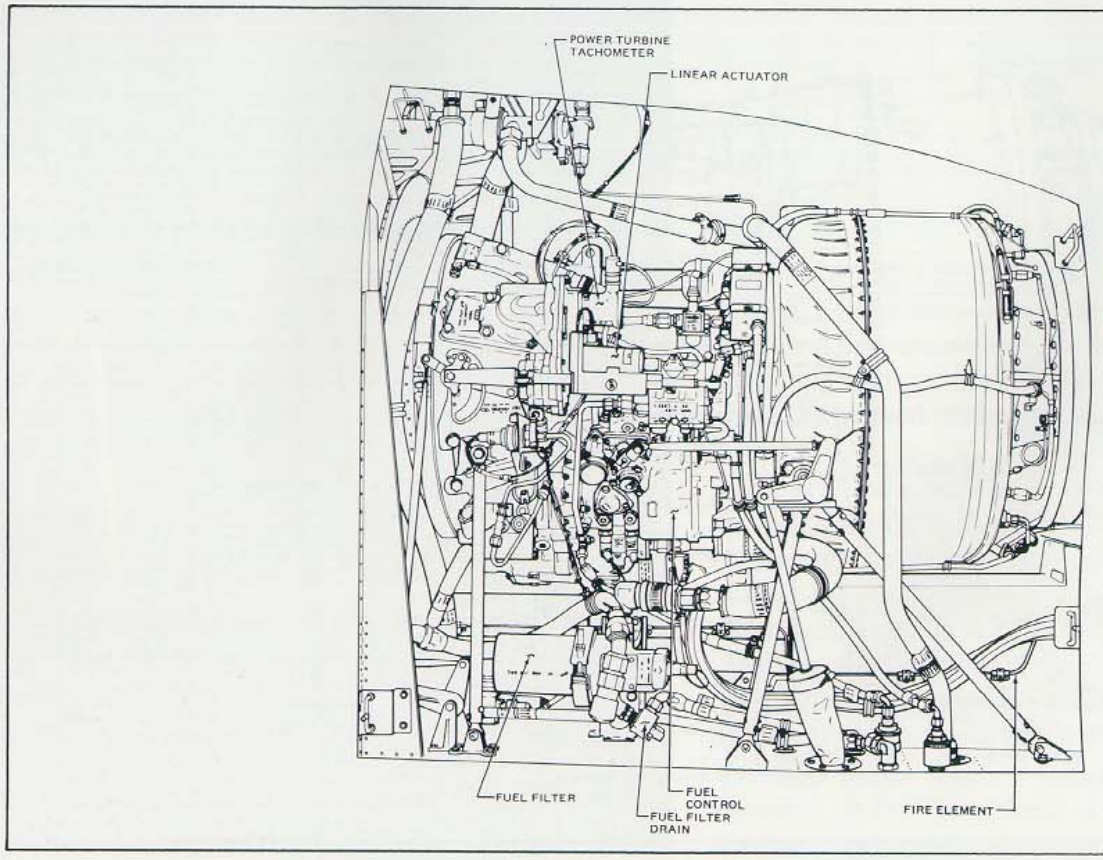
CW4 Gregory L.CAIN
Squadron Standardization Officer
Büdingen, West Germany

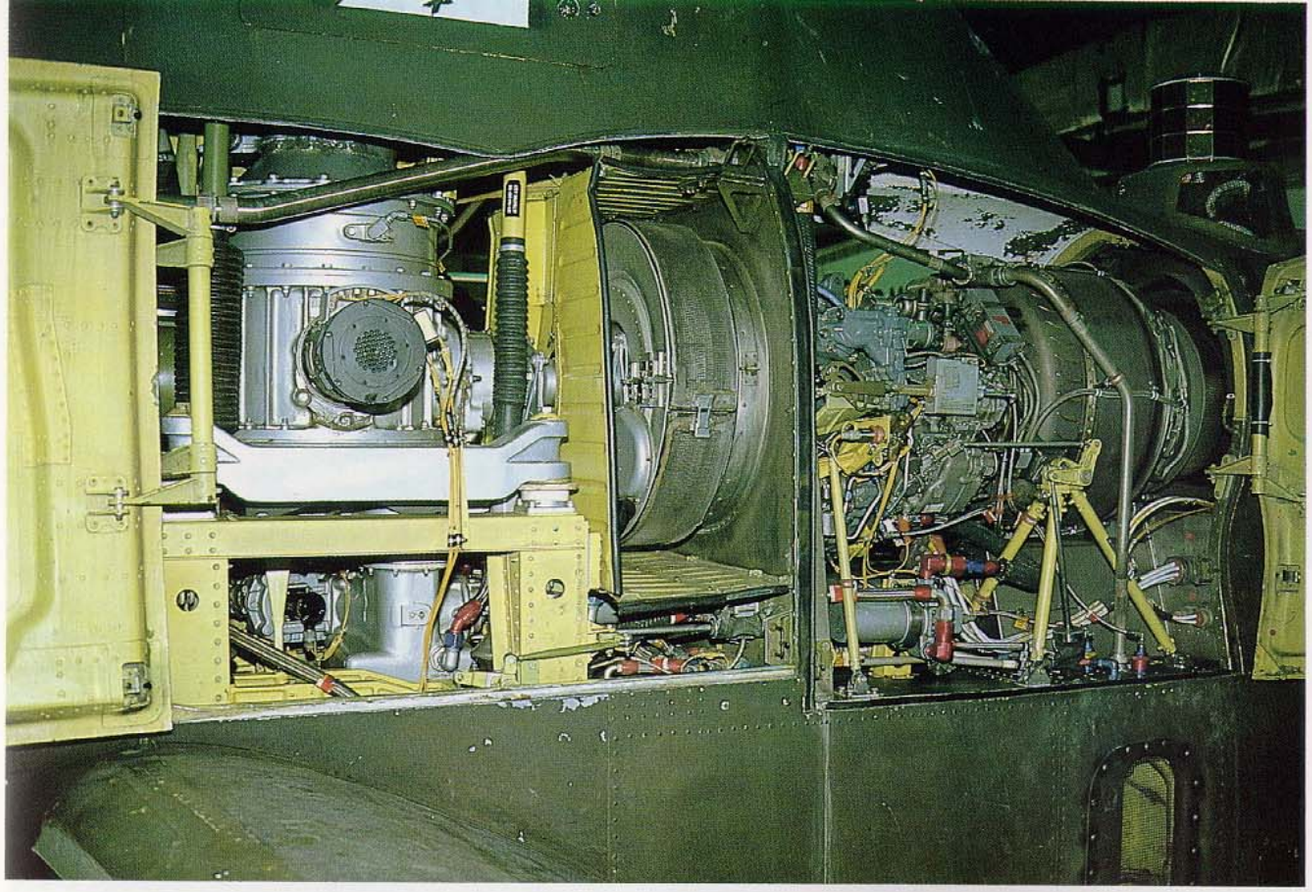




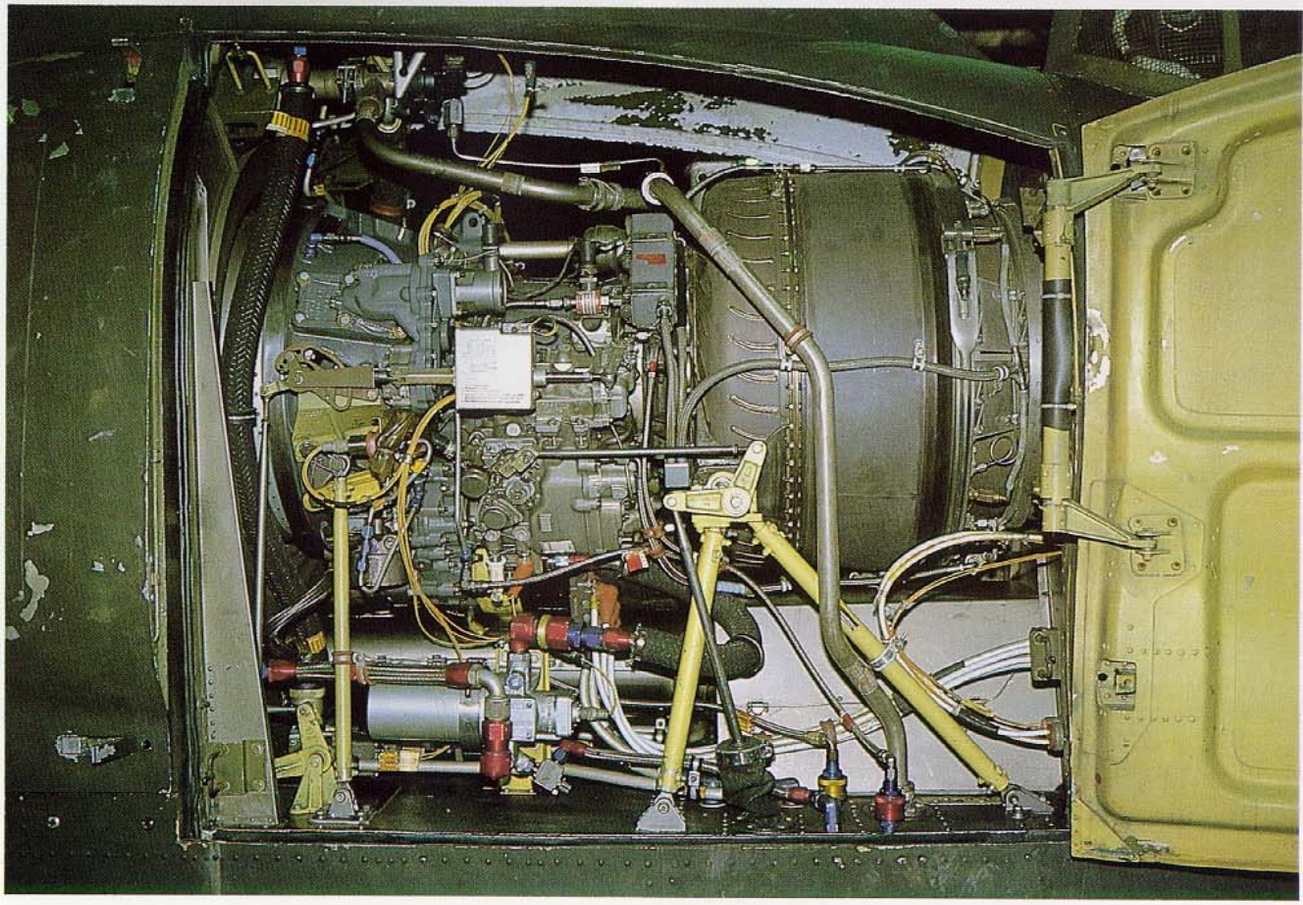
Two pictures showing the inside of the battery compartment which is located on the aft right side of the aircraft.
This compartment also holds radar warning and communications control boxes as can be seen in the picture on the left.
The compartment shown in the bottom left picture is located just below the right wing. Note the panel is completely removed.





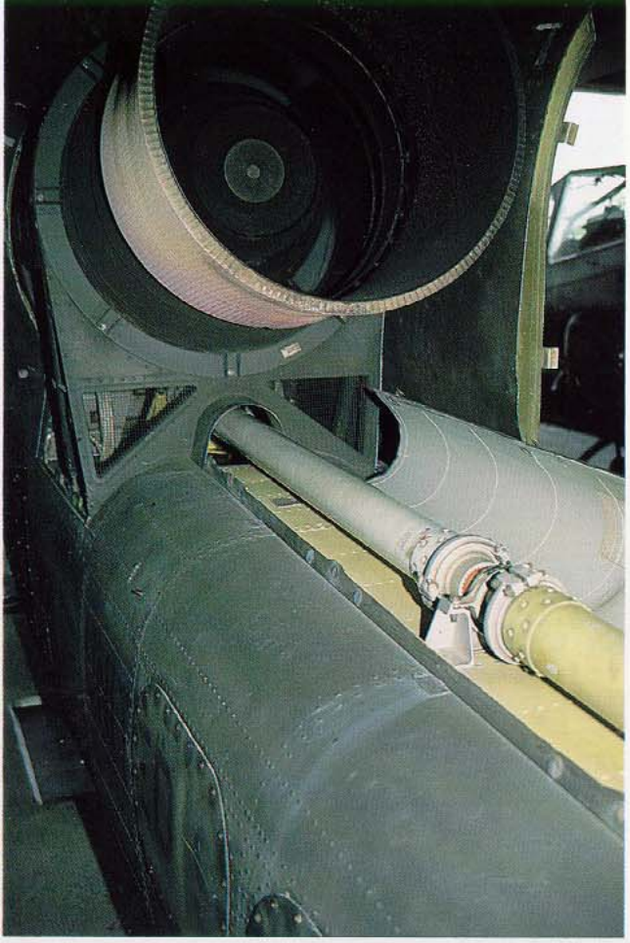


Transmission housing



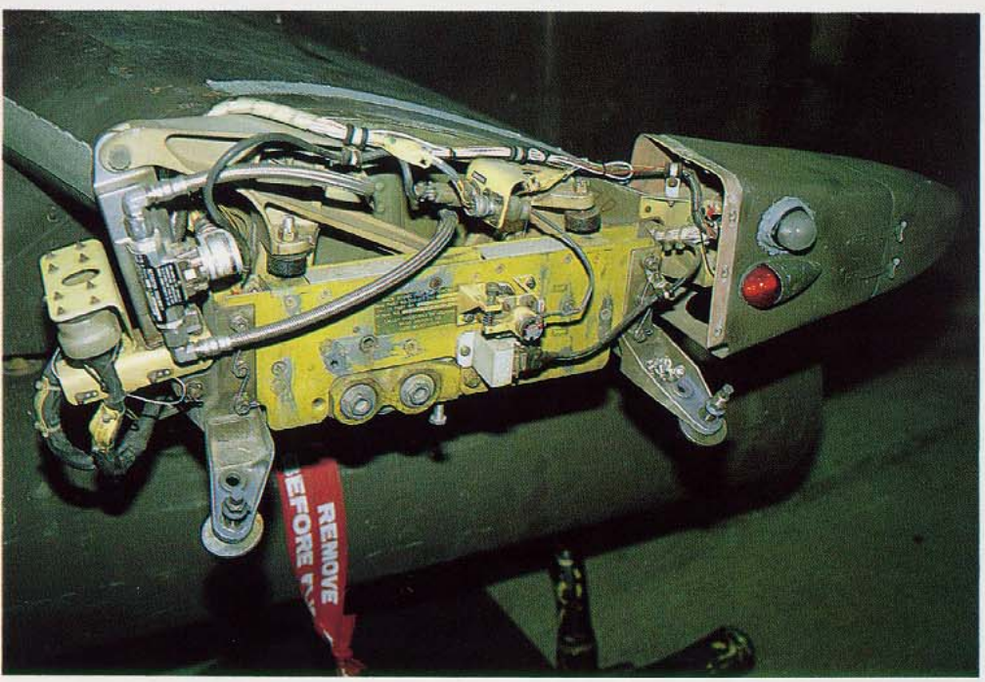
The left side of the engine in detail. The transmission, located in the compartment shown in the picture above and closest to the camera, transfers engine power to the main rotor through the mast assembly and to the tail rotor through a series of driveshafts and gearboxes. The transmission has a self-contained pressure oil system. The oil system has an automatic bypass system which causes the oil to bypass the cooler when a leak is sensed in the oil cooler circuit. Two oil level sight glasses, an oil filler cap and a magnetic chip detector are provided.

The main rotor is driven by the mast which is connected to the transmission. The rotor rpm is governed by the engine rpm during powered flight.

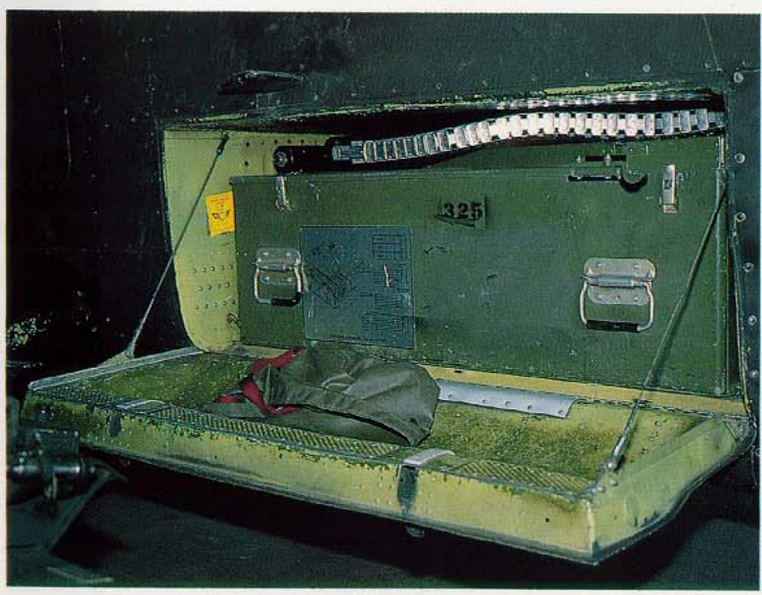


(Far left) The tail rotor driveshaft consists of five driveshafts and three hanger bearing assemblies. The assemblies and the 42 and 90 degree gearboxes (described earlier in this book) connect the transmission tail rotor drive quill to the tail rotor.

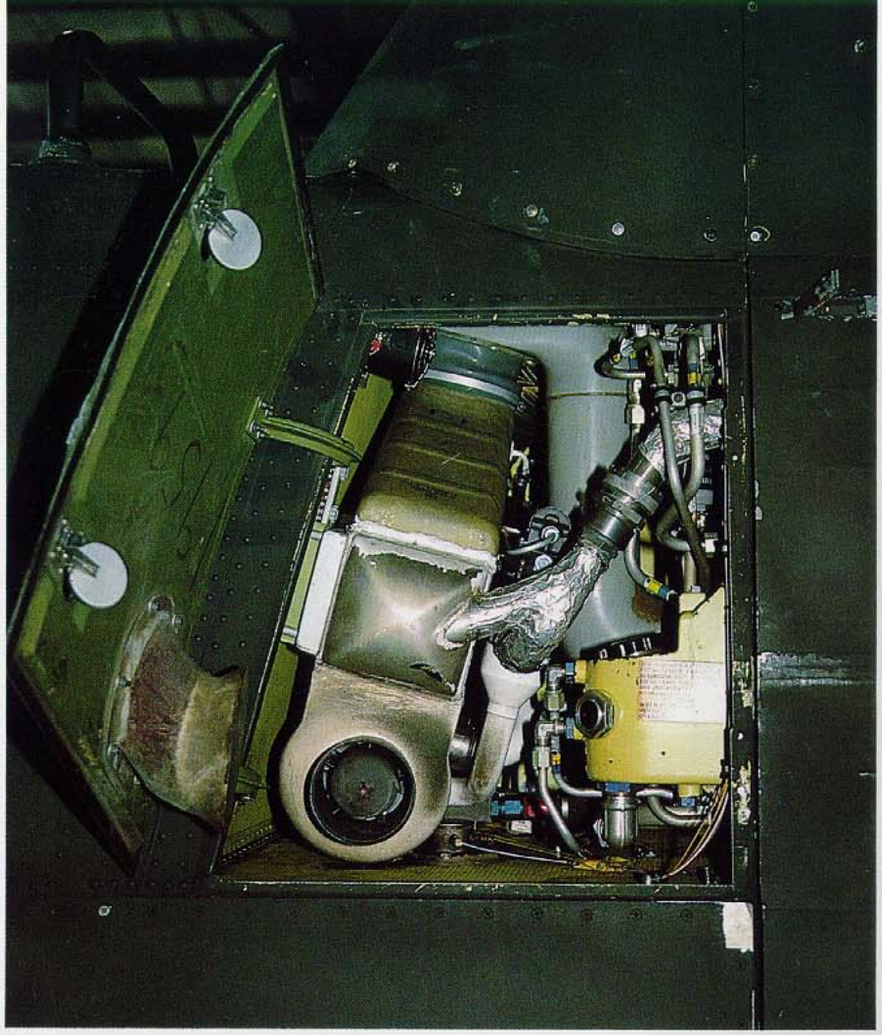
(Left) The 42 degree gearbox revealed. Note the driveshaft covers are hinged sidewards for ease of maintenance or for easy checking by the pilot during pre-flight check-ups. This is one of the most important parts being looked after by the pilot before taking off.



The pylon on the left wing uncovered. Control cables and hoses for jettisoning of the stores as well as firing control cables are revealed in this picture.



The ammunition box inside its compartment viewed from the right side. The ammo compartment door is used as maintenance platform, as can be detected from the wear and tear of the zinchromate paint.



Two more inspection panels on the left side of the helicopter. The picture above shows the main rotor control shaft which is mechanically connected to the collective control stick and the cyclic stick.

Ammo housing

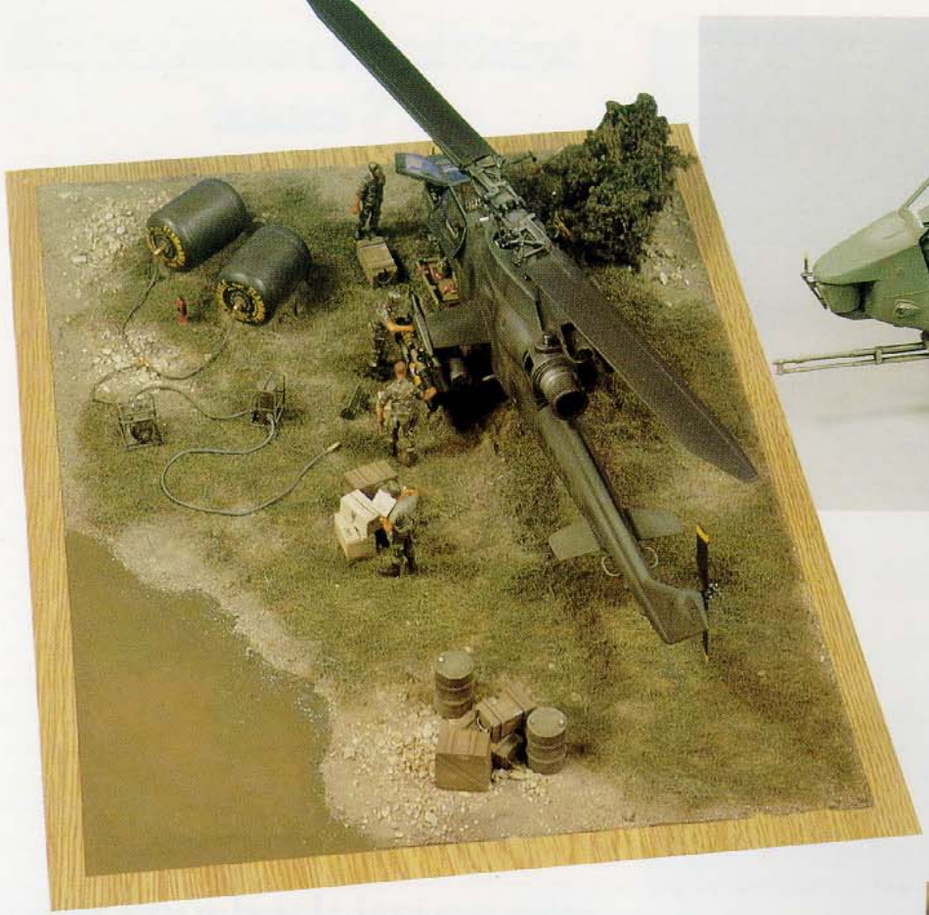
The empty ammo bay with the two doors/platforms hinged down. Note the four hold-back cables.

The ammunition box which holds 750 rounds of continiously belted 20MM ammunition as seen draped over the 3 feet long ammo box.

Major overhaul being executed on an AH-1S Cobra in the hangars at Ansbach airfield, Germany.
Stands, seats, toolboxes and protective covers can be seen in the vicinity of the helicopter. The yellow test units are used to check the proper functioning of the gun turret, telescopic sight unit and related avionics.

Major overhaul

Kit review



The best available kit of the AH-1S Cobra is the Monogram kit on 1/48th scale. Thorough research went into the development of this kit and Monogram claims to have the kit made according to an actual AH-1S and that contemporary data was kindly provided to them by the Bell Helicopter Division. This may well be true because 95 per cent of the panel lines and the exterior detail is correct.

Molded in dark green plastic, fitting of the components pose no major problems (unlike most of the Monogram kits). Cockpit detail is adequate although it can use some extra detail because the large canopy windows allow an unlimited view inside the cockpit. The helmet sight subsystem, for one, is something to be worked on.

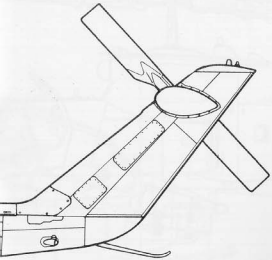
The gun turret can use some extra detail as well and the TOW launchers, although basically correct, can be updated using the clear pictures in this book.
As mentioned before, overall shape of this AH-1S is good, it looks and 'sits' like a real Cobra.

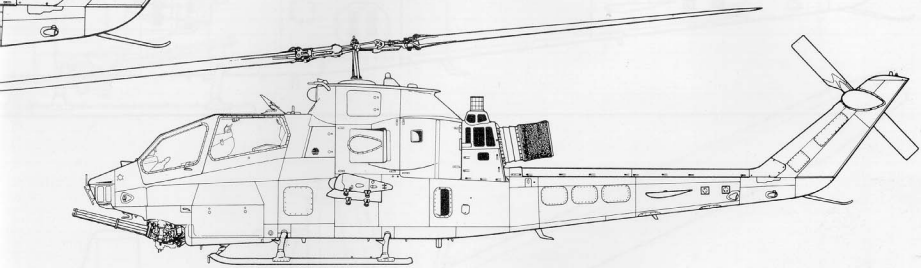
The pictures on this page are of the Monogram AH-1S, built by the renowned modeler François Verlinden as it appeared in the Verlinden Productions Modeling Magazine which was released only recently.

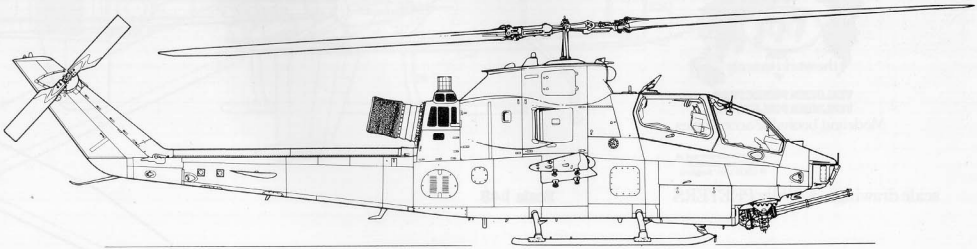
Back cover picture: An Israeli AH-1S testing it's gun turret and telescopic sight unit. Note the helicopter is started up to perform these tests or any other for that matter, as can be seen in the picture on the front cover.
This photo was kindly provided by BIAF/Israel Aviation & Space Magazine.

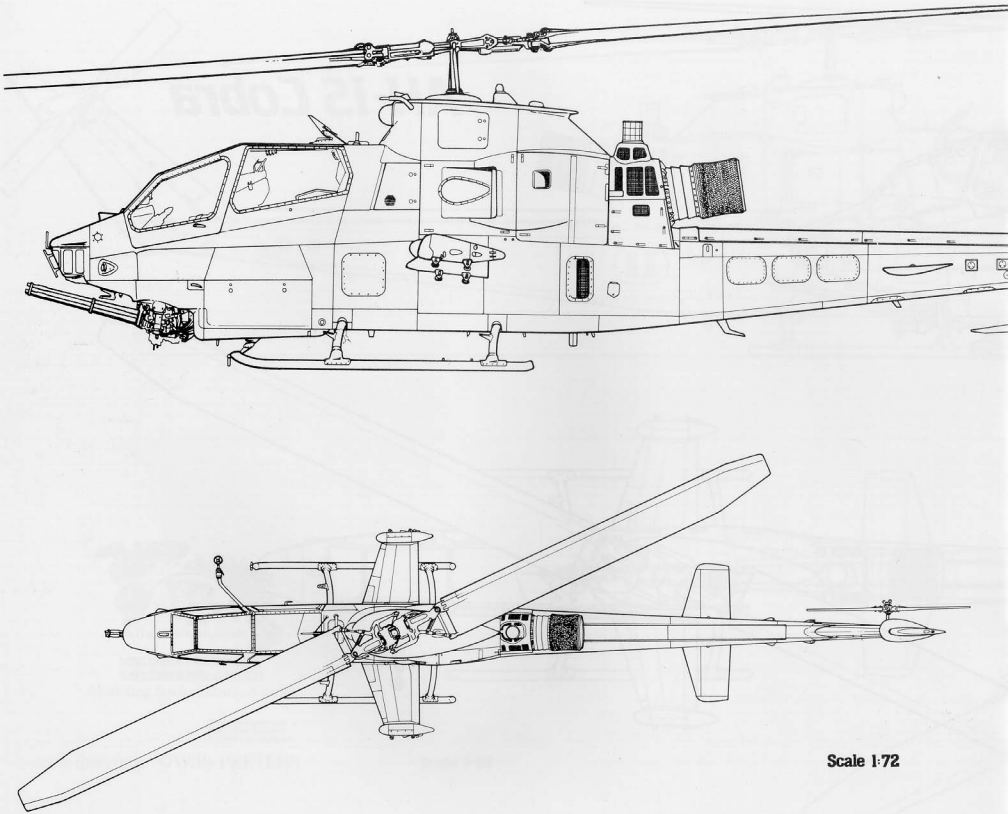
VERLINDEN PRODUCTIONS
Ondernemersstraat ,4
KMO-Zone Mallekot
B-2500 Lier/Belgium

AH-1S Cobra









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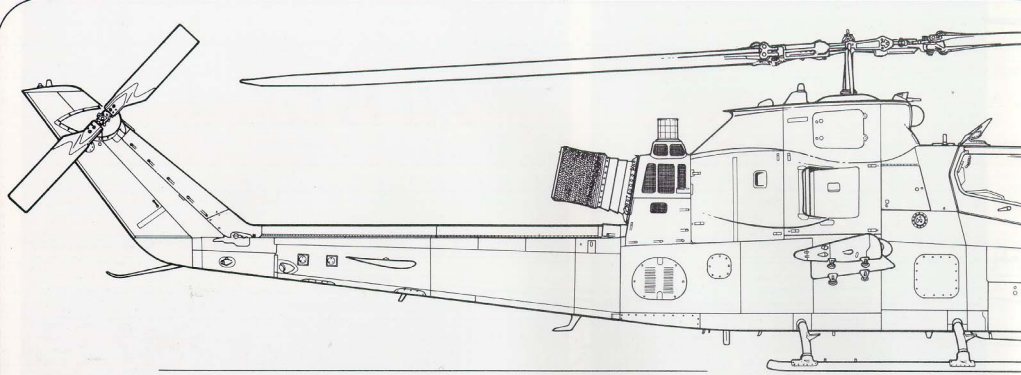

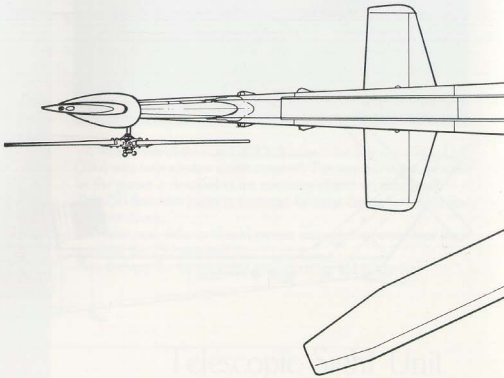

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