

A-6 INTRUDER

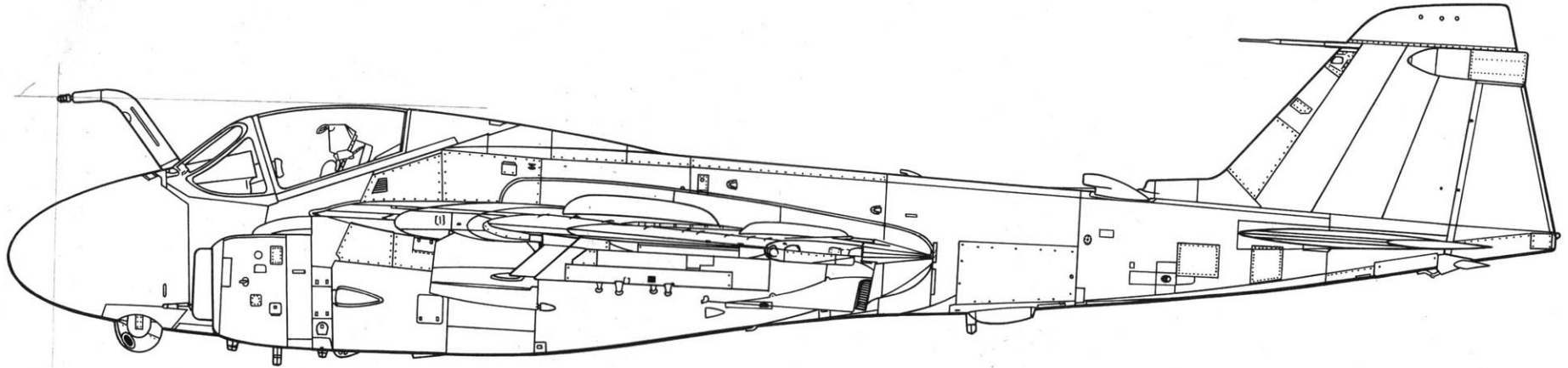
in action



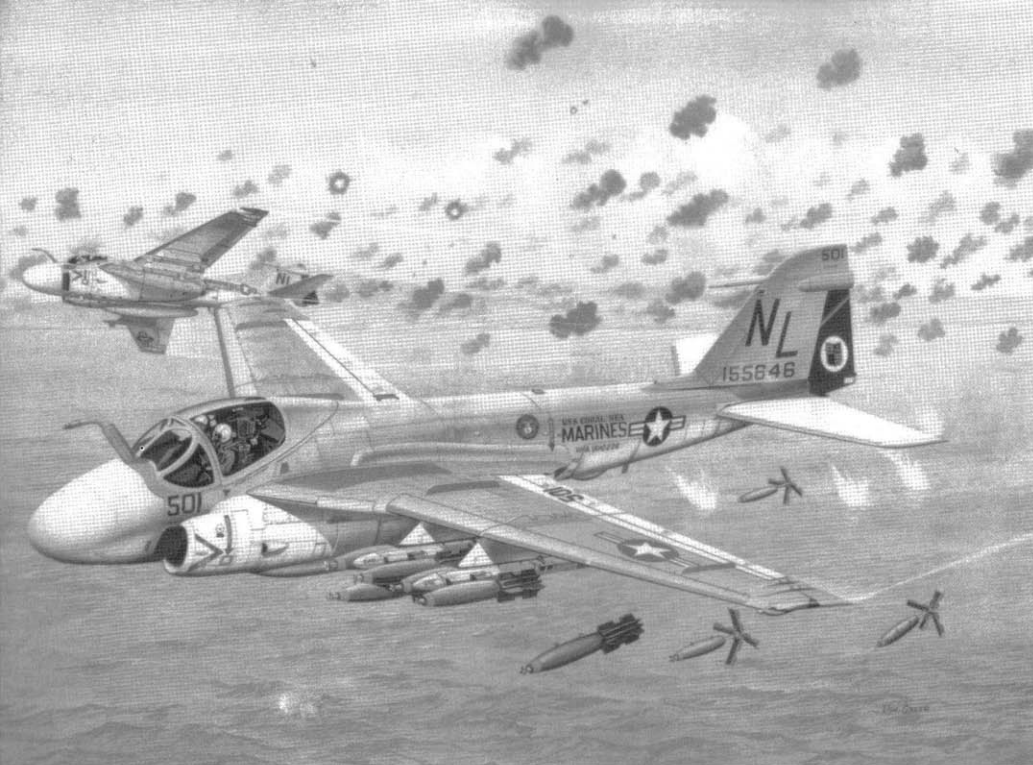
Aircraft Number 138
squadron/signal publications

A-6 INTRUDER

By Joe Michaels Ph.D. in action
Color by Don Greer &
Tom Tullis
Illustrated by Joe Sewell



Aircraft Number 138
squadron/signal publications



A pair of A-6As of VMA(AW)-224 lay Mk-36 mines in Haiphong harbor, North Vietnam on 8 May 1972 as part of Operation LINEBACKER II. The mining of Haiphong was one of the major events that brought the North Vietnamese back to the peace talks.



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ISBN 0-89747-302-7 First Edition

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Dedication

To all the knowledgeable and patient officers and enlisted men of the Navy and Marine Corps who gave generously of their time to provide accurate information for this publication.

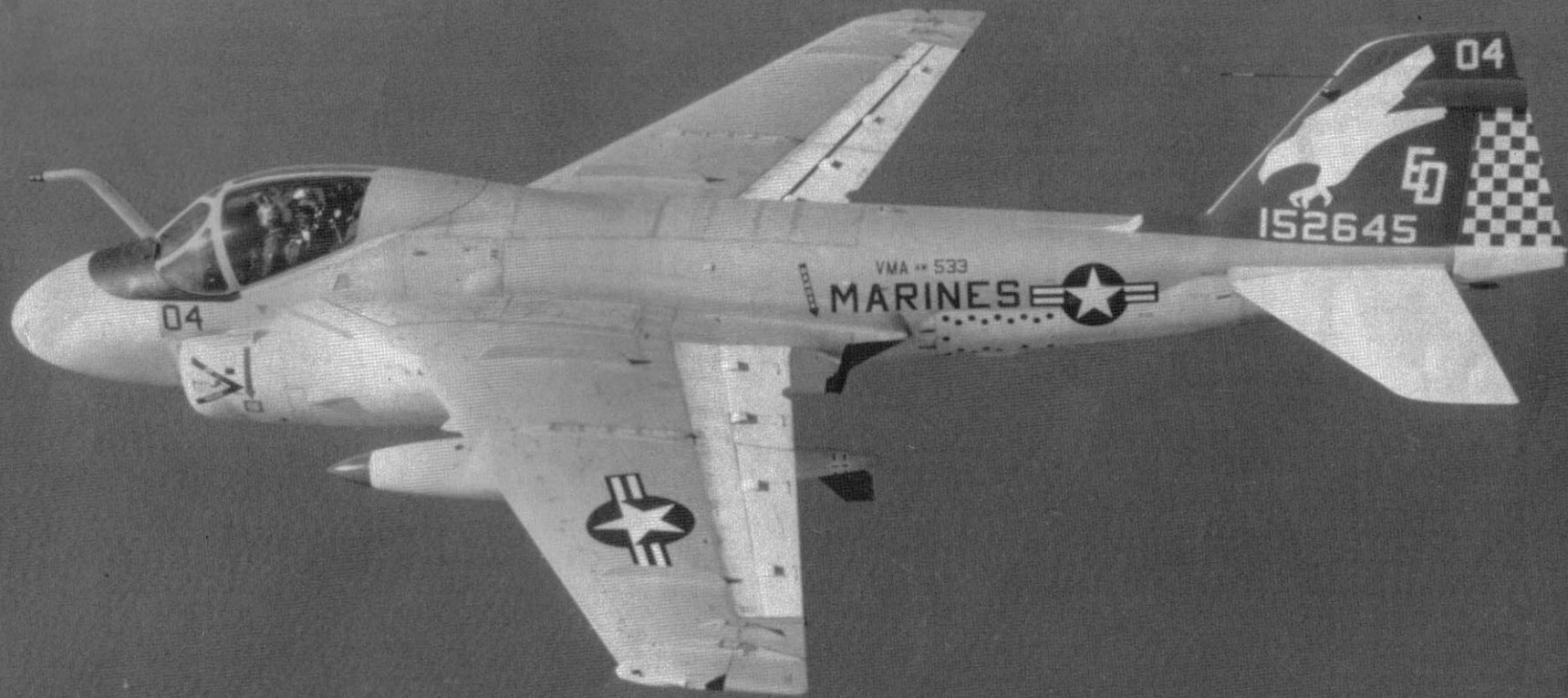
Acknowledgements

A sincere debt of gratitude is owed to Larry Davis who gave the initial push for this project, Jim Sullivan who provided the "hands on" example of how to lay out this book, and to Bruce Trombecky and Lionel Paul who generously shared their photographs.

Photo Credits

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This A-6A of VMA(AW) 533 Hawks had the fin in Medium Blue with a White and Blue checkered rudder. The diving hawk, lettering and numbers were in White. The upper surfaces were non-specular Light Gull Gray (FS 36640) while the undersurfaces, control surfaces and radome were Gloss Insignia White (FS 17875). (USMC)



Introduction

During 1955 the Navy's Long Range Objectives Study Group staff recognized that there was a need for a new attack aircraft. This aircraft would supplement the Douglas A-1 Skyraider and Douglas A-4 Skyhawk, in service with the light attack squadrons and the Douglas A-3 Skywarrior and North American A-5 Vigilante in use with the heavy attack squadrons. The Navy wanted an attack aircraft that could fly faster, higher, and carry a bigger and more sophisticated variety of weapons over a greater distance than the venerable A-1 Skyraider or the lightweight A-4. One of the capabilities that the new design was to feature was the ability to fly low-level missions at night and under all weather conditions. This requirement was considered to be of paramount importance.

In February of 1957 Grumman received Type Specification 149 along with Boeing, Douglas, Vought, Martin, Lockheed, Bell and North American Aviation. All of these companies presented their proposed designs and by December of 1957 the competition had been reduced to Douglas, Grumman and Vought. On 30 December 1957 the Navy announced that the Grumman Aircraft Corporation, led by the design team composed of Lawrence M. Mead, Robert Nafis and Bruce Tuttle, had won the design competition.

In May of 1958 the Grumman Aircraft Corporation formally signed a contract with the Navy to construct a full-scale mock-up of their winning medium attack aircraft design. In 1959 they received a one hundred million dollar incentive fee development and production contract. Of key importance was the fact that this was the first cost plus incentive contract ever awarded for a full weapons system (airframe, radar, software and Bombing/Navigation computer). The Grumman design team had the foresight to press for the responsibility of designing the entire weapons system and this approach led to the development of the first reliable integrated weapons system of any Naval aircraft.

Ordnance personnel load five inch rockets on the port wing pylons of an AD-2 at NAS Patuxent River during September of 1950. The Intruder eventually replaced the venerable Skyraider in fleet service, but it was a number of years before the Spads were all retired from active duty. (USN)



Construction of the first YA2F-1 (BuNo147864) began during early 1959. The prototype emerged as a large two seat (side-by-side seating) aircraft dominated by the large nose radome (which housed twin radar antenna arrays) and cheek air intakes. It featured swept mid-mounted wings and a long tapering fuselage. Its maiden flight took place on 16 April 1960 with Grumman test pilot Bill Smyth at the controls. Four days prior to this flight, the company announced that the name Intruder had been selected for the new aircraft. The name was chosen from the four thousand suggested names which were turned in during a company wide contest. In October of 1962 the Navy changed its aircraft designation system and the A2F Intruder became the A-6A Intruder.

The A-6A powered by two 8,500 lbst Pratt & Whitney J-52-P-6 engines gave the Intruder far better reliability and performance than a single engine design. Feedback from operational attack crews heartily endorsed this feature of the aircraft since it provided them with an added margin of safety. The forward location of the engines enabled the aircraft designers to use short and efficient air intakes. Initially it was intended to incorporate tilting tailpipes in the Intruder to meet the STOL (Short Takeoff and Landing) requirement of the Marine Corps. This was abandoned when it was determined that the tilting jet pipes only reduced landing speed by some seven miles per hour at normal approach weights. The test bed aircraft demonstrated that it could land with the tail pipes up in a shorter distance than they could takeoff at heavier weights with the tail pipes in the down position. Additionally, the Navy considered the 104 mph landing speed to be acceptable; therefore, the vectored thrust feature of the tilted tail pipes was expendable. This was a cost saving effort by the Navy that initiated some intense discussions with the Marine brass. The tilting pipes were replaced with stationary pipes, beginning with aircraft number eight (BuNo 148618).

Airframes 2 (BuNo 147865) and 3 (BuNo 147866) were completed in September of 1960

The first YA-2F Intruder prototype (BuNo 147864) had a small rudder and was fitted with a long instrument test probe on the nose. The aircraft featured tilting jet tail pipes that were intended to give the aircraft a STOL capability. (Grumman)



and all three aircraft were assigned to the structural and aerodynamic flight test program. Although the testing program was very successful, it had some incidents that could have proved disastrous were it not for the skill of the test pilots. On 28 July 1960 test pilot Ernie VonderHeyden made a deadstick landing with aircraft #2 at Calverton test field following a flight from Grumman's Bethpage facility. It was determined that a fuel shutoff valve had been installed incorrectly.

In the Fall of 1960 another incident involving a test aircraft occurred during a dynamic pressure test flight with power on and the fuselage speed brakes out. The test pilot noticed a slowness in the pitch response. A review and follow-up of the report revealed that the aerodynamic hinge movements on the tail stabilizers had exceeded the hydraulic actuator capacity which resulted in an actuator stall. With the fuselage air brake in the extended position the down wash pattern of the tail was changed causing the center of pressure to move inboard and forward, thus sharply increasing the hinge movements. To correct this, the horizontal stabilizers were moved rearward on the fuselage by sixteen inches.

Test aircraft numbers 4 through 7 (BuNos 147867, 148615-148617) were assigned to the systems development program. Aircraft No. 4 conducted search radar trials with a 35MM camera assembly attached on the underside of the fuselage just to the rear of the radome. The other three aircraft performed navigation, attack and tracking radar tests. Four significant pre-production changes were made during 1961 to the A-6A Intruder. Split wingtip speed brakes became standard since it was determined that the fuselage speed brakes were inadequate when dive-bombing and during carrier approaches where quick response drag control is critical. The

The fourth A-2F test aircraft (BuNo 147867) was used in ordnance testing as part of the weapons system development program. The aircraft was armed with thirty Mk 83 General purpose low drag bombs, six on each of the five ordnance pylons. (Grumman)



The A2F(A-6A) replaced the A-3 Skywarrior in the bombing role, however, the A-3 continued to serve in a number of other roles. This RA-3 was assigned to VAP-61 in Vietnam for night road reconnaissance missions. (Tom Hanson via Wayne Mutza)

rudder chord was enlarged to provide better spin recovery qualities, the aircraft was provided with a fixed In-flight Refueling probe on the nose, and the pilot and Bombardier Navigator (BN) cockpit display cathode-ray tubes (CRT) were increased in size.

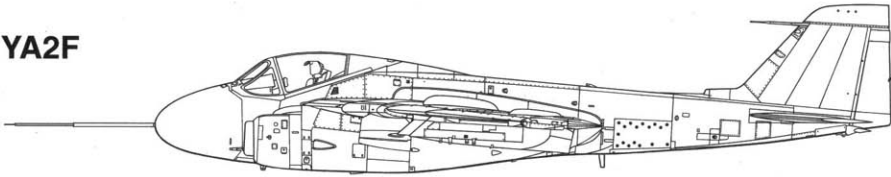
Carrier suitability tests were completed aboard USS ENTERPRISE with the Intruder rapidly gaining a reputation for stability and reliability.

The A2F development aircraft carried non-standard markings with the NAVY carried in Black on the fin instead of its normal position on the fuselage. The A2F development aircraft had fuselage speed brakes which were supplemented by wingtip mounted speed brakes. (Grumman)

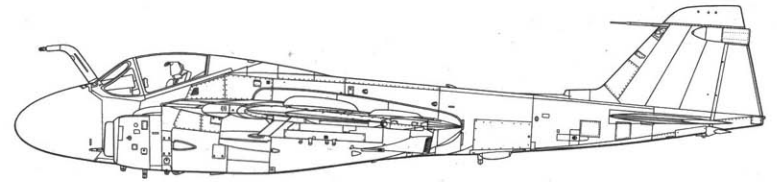


Development

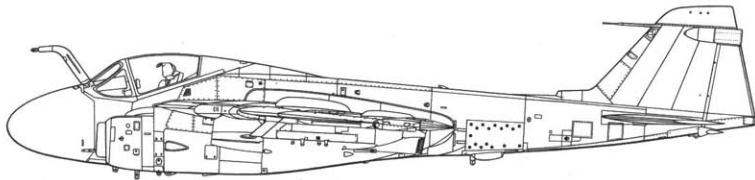
YA2F



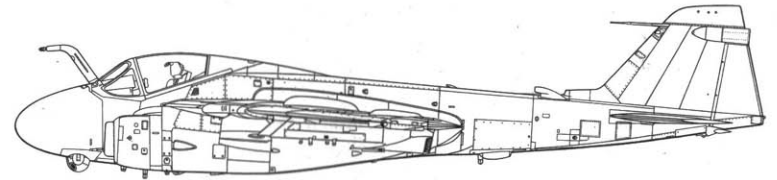
A-6E



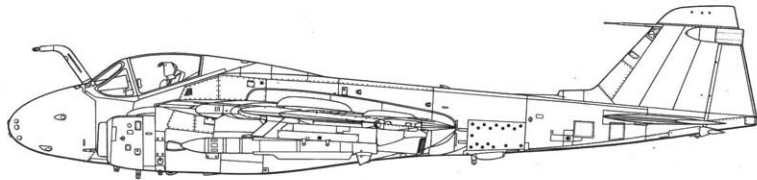
A-6A



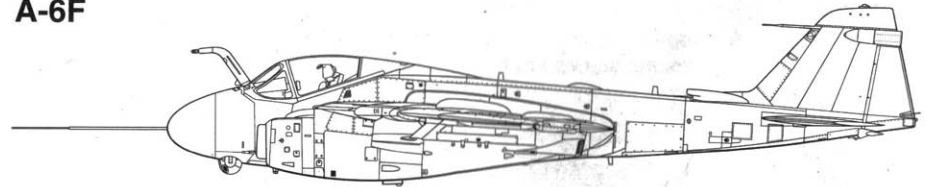
**A-6E
TRAM**



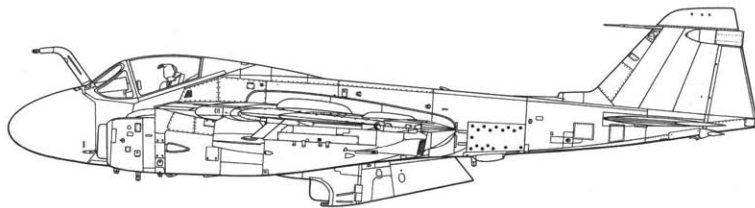
A-6B



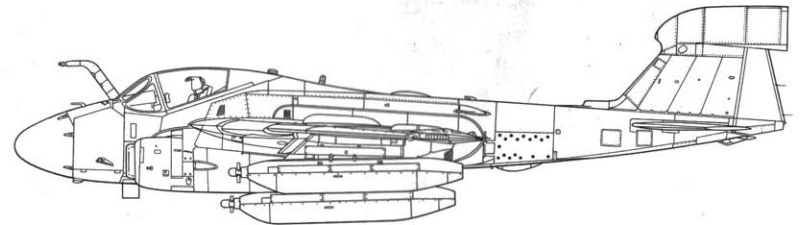
A-6F



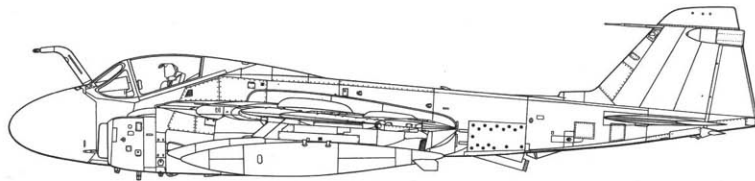
A-6C



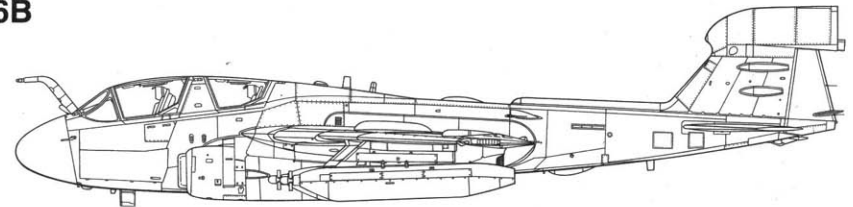
EA-6A



KA-6D



EA-6B



A-6A Intruder

The A-6A Intruder is basically constructed of aluminum. Its fuselage is of semi-monocoque construction, however, the ventral area is composed of a deep structural keel beam of steel and titanium, located between the engines and the non-structural doors that enclose the engine compartment. The wings, vertical and horizontal stabilizers are of multibeam construction with machined aluminum skins and honeycomb trailing edges. The center section of the wing is a box beam that passes through the fuselage which is milled from a solid block of aluminum alloy. This gives the Intruder tremendous strength and weight lifting capabilities.

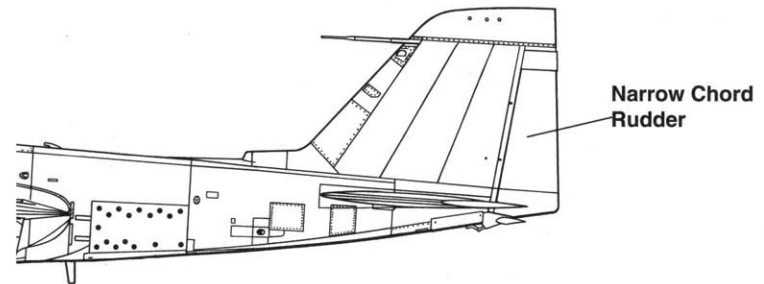
The heart of the A-6A Intruder is the Digital Integrated Attack and Navigation Equipment (DIANE), without this system the Intruder's attack capability would have been severely limited. DIANE and its sub-systems enable the crew to attack preselected targets or targets of opportunity with a variety of ordnance under many different tactical and environmental conditions without the crew ever having to look outside the cockpit from launch to recovery. This innovative system was not immune to the avionics gremlins that always creep into new systems and it was Grumman Technical Representatives and their Navy counterparts who worked out the bugs as the Intruder began to enter fleet service.

VA-42, the Atlantic Replacement Air Group (RAG), received the fleet's first two A-6As in February of 1963 when they were accepted by Vice Admiral Frank O'Beirne, Commander in Chief Atlantic Fleet (CinCLANTFLT). VA-75 Sunday Punchers became the second squadron to receive the Intruder and they trained with VA-42 at NAS Oceana, Virginia. The squadron's complement, for the most part, was composed of men drawn from squadrons that had operated A-4 Skyhawks and A-3 Skywarriors. Following their initial training and a short shakedown

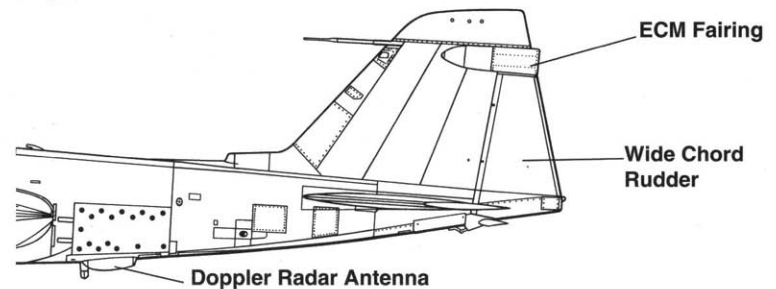
This early production A-6A (BuNo 149485) carried a pitot tube on the port wingtip. The stylized S on the rudder identified the aircraft as being assigned to the service test role at NAS Patuxent River, Maryland during 1963. (USN)

Rear Fuselage Development

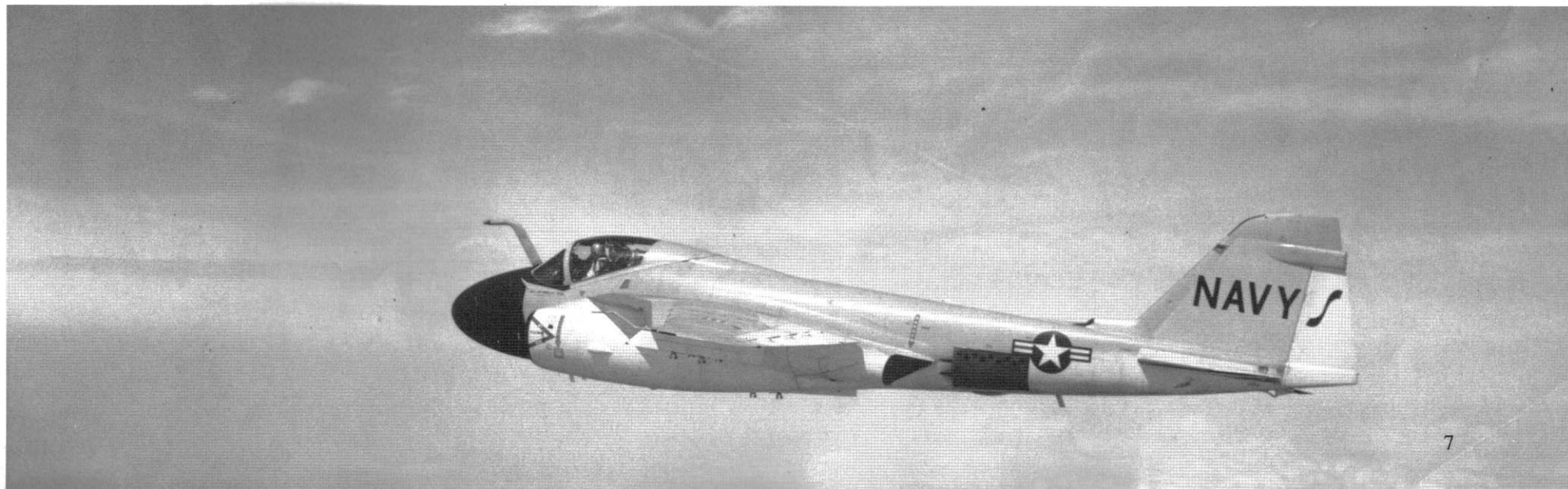
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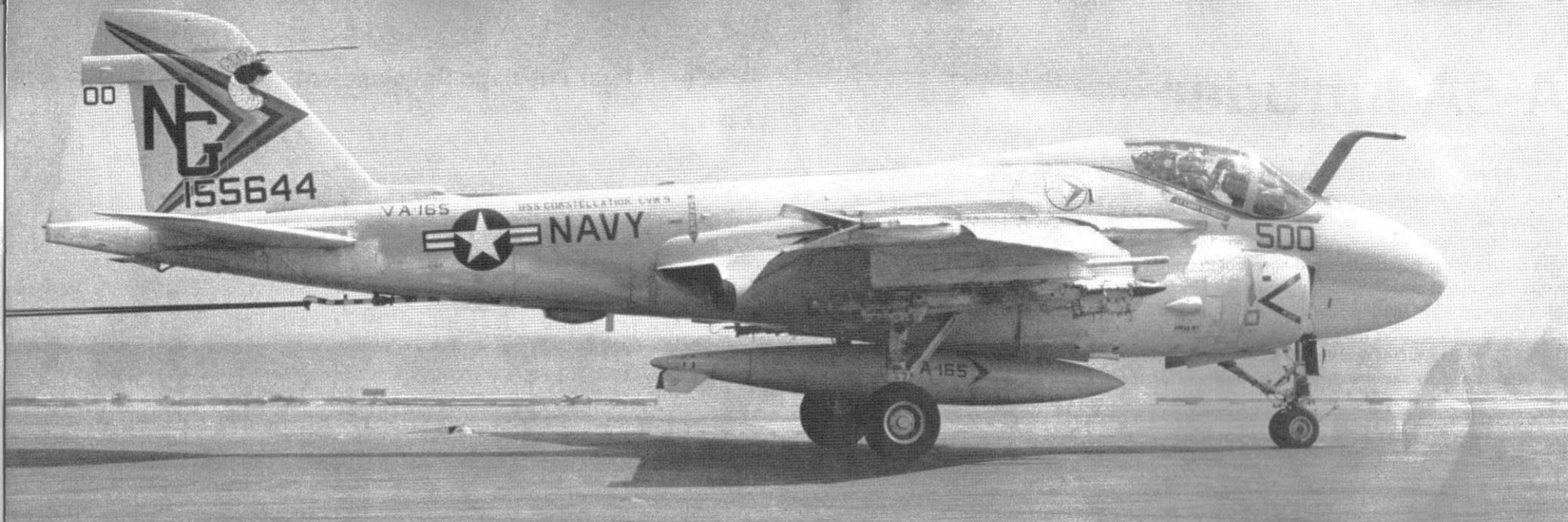


A-6A



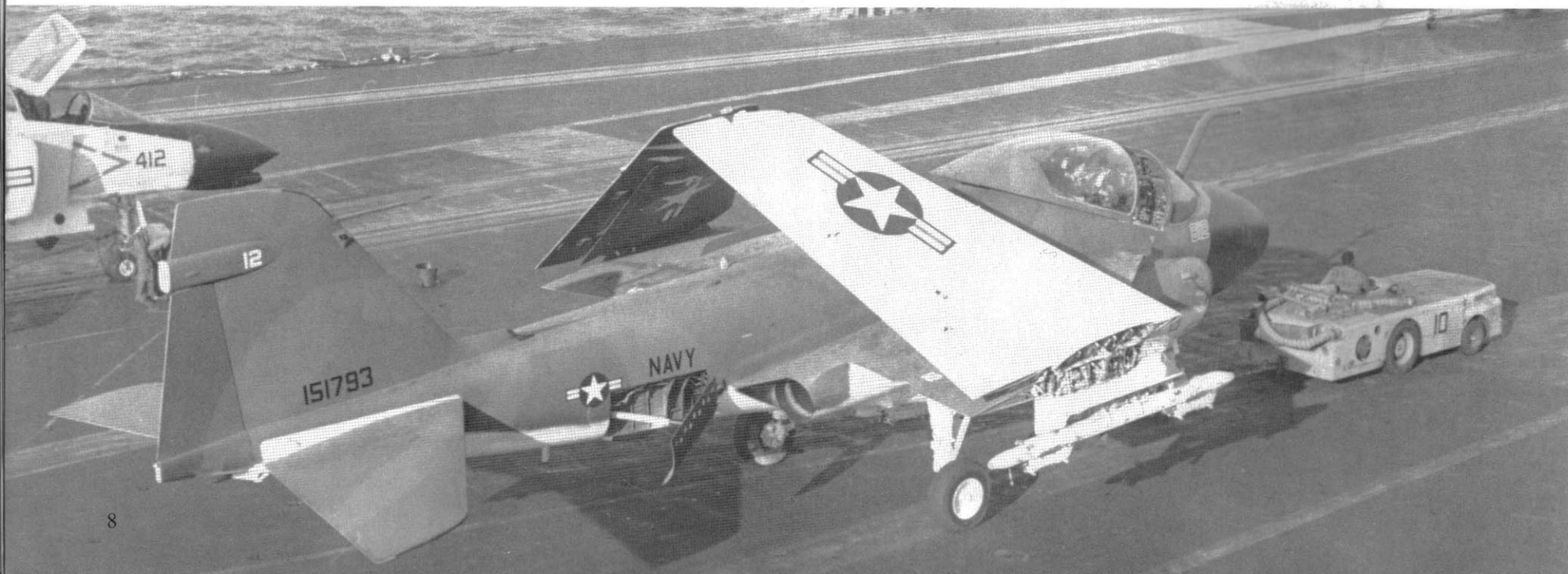
cruise on the USS INDEPENDENCE, VA-75 made their first Western Pacific (WestPac) cruise in May of 1965. It was in this new environment that the Intruder was put to the test. The exposure to temperatures of 90 degrees plus and 75 percent or higher humidity had an adverse effect on the aircraft's avionics system and it was not uncommon for reports to state





An A-6A (BuNo 155644) of VA-165 Boomers catches an arresting wire aboard USS CON-
STELLATION (CVA-64) following a combat mission over North Vietnam during April of
1972. The aircraft carries an antenna for the AN/ALQ-100 electronic countermeasures
(ECM) set on the outboard underwing pylon. (USN)

VA-85 A-6A Intruders aboard the USS KITTY HAWK (CVA-63) in June of 1966 carried an
experimental two-tone Green uppersurface camouflage scheme of FS 34079 and FS
34102 over Insignia White FS 17875 undersurfaces. This was early A-6A with both
wingtip and fuselage mounted speed brakes. Some A-6As had the fuselage brakes bolted
shut. (Lionel Paul)

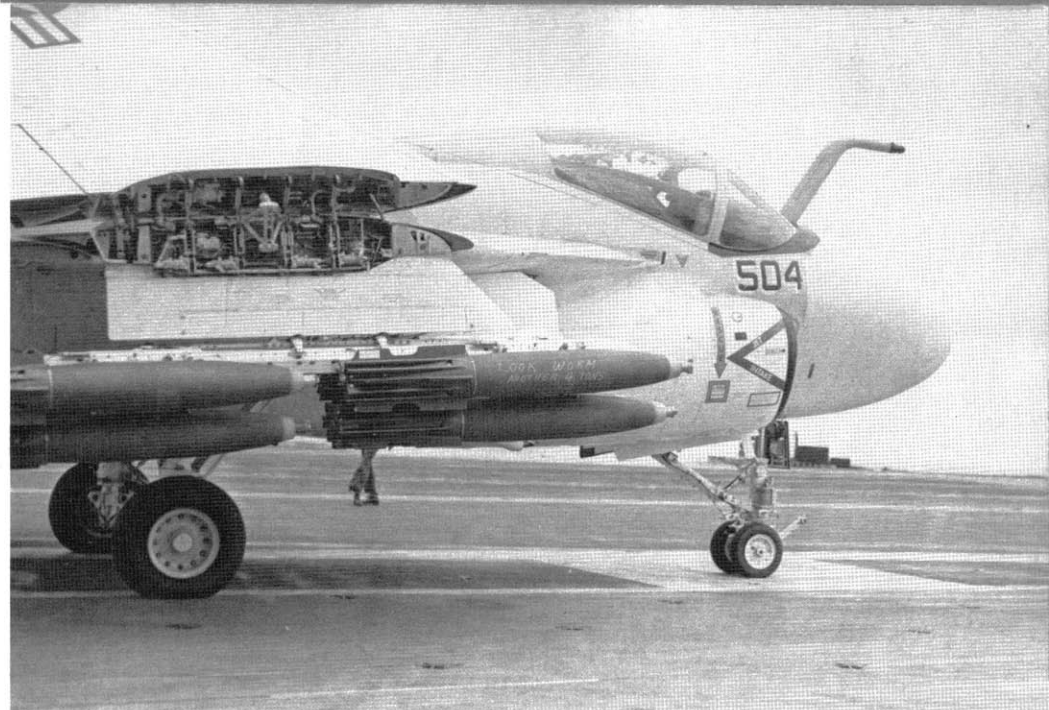


that the average for full systems being up was 26 percent and radar reliability was approximately 40 percent. Even with these problems, maintenance personnel were always able to provide aircraft for night and foul weather sorties. Even when a high percentage of the avionics system was not up to par the Intruder was still the best attack aircraft on the carrier. The squadron entered combat with the A-6A during July of 1965, attacking bridges at Bac Bang, North Viet Nam.

The A-6As most serious operational problem was related to the separation of the bombs from the bomb racks and one Intruder was lost due to the early explosion of its own bombs. The problem was solved by replacing the mechanical bomb racks with the Multiple Ejector Rack (MER). This Douglas designed bomb rack provided an explosive, sequenced release that enabled the ordnance to clear the wing and kept the bombs from colliding and exploding near the aircraft.

When the production of the A-6A stopped on 28 December 1970, the Intruder was serving in fourteen Navy and six Marine squadrons and some 488 aircraft had been produced. The Navy and Marine Corps were the only operators of the A-6A and no foreign sales of the A-6A were ever approved.

(Right) An A-6A Intruder of VA-85 armed with a full load of Mk 82 500 pound Snakeye retarded general purpose bombs carried on multiple ejector racks (MERs). Crewmen have left a message "Look worm another 4 tons", for the enemy on the one of the weapons in chalk. (USN)

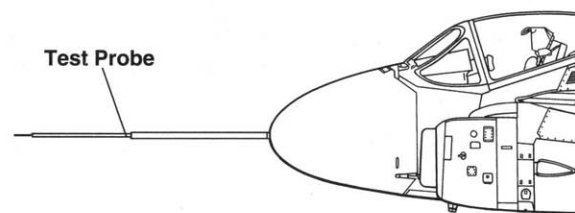


A section (two) of A-6As of VA-85 enter the landing pattern for USS KITTY HAWK (CVA-63) with their tail hooks deployed in preparation for landing. The A-6A in the background (BuNo 151798) was lost in combat over Vietnam on 21 April 1966. The A-6A in the foreground carries the unit commander's side number (801) but lacks the ship name and squadron designation normally carried on the fuselage side. (USN)

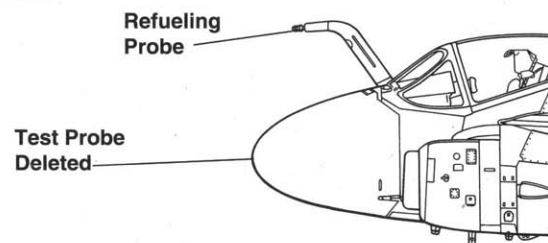


Nose Development

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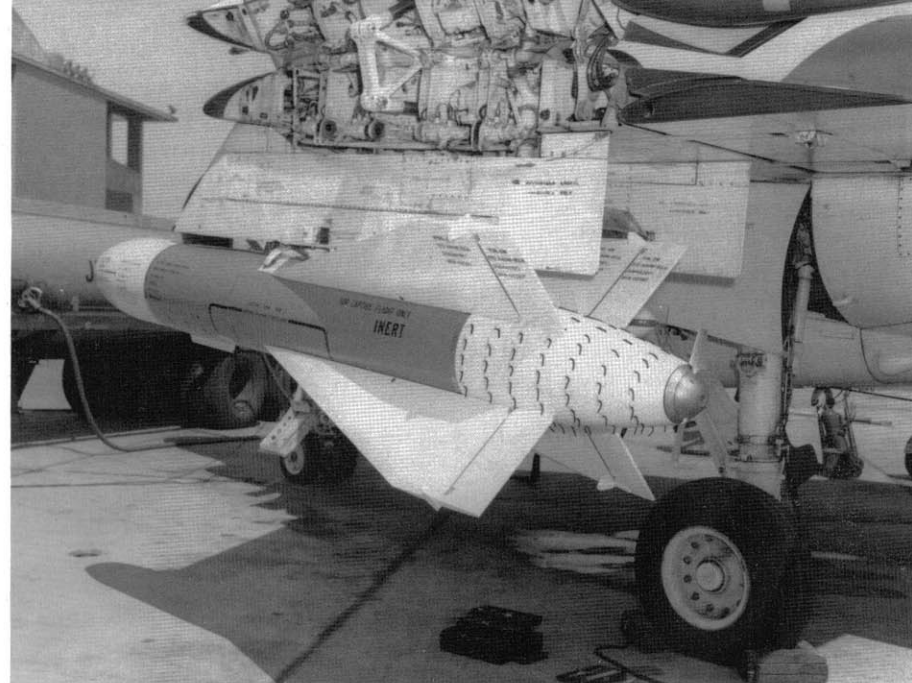


A-6A





VA-75 Sunday Punchers was the first squadron to take the A-6A Intruder into combat. VA-75 was assigned to Carrier Air Wing Seven aboard USS INDEPENDENCE and was home based at Naval Air Station Oceana, Virginia. The tail code was in Black with a Green outline. (PHCS A. B. Montgomery, USN)



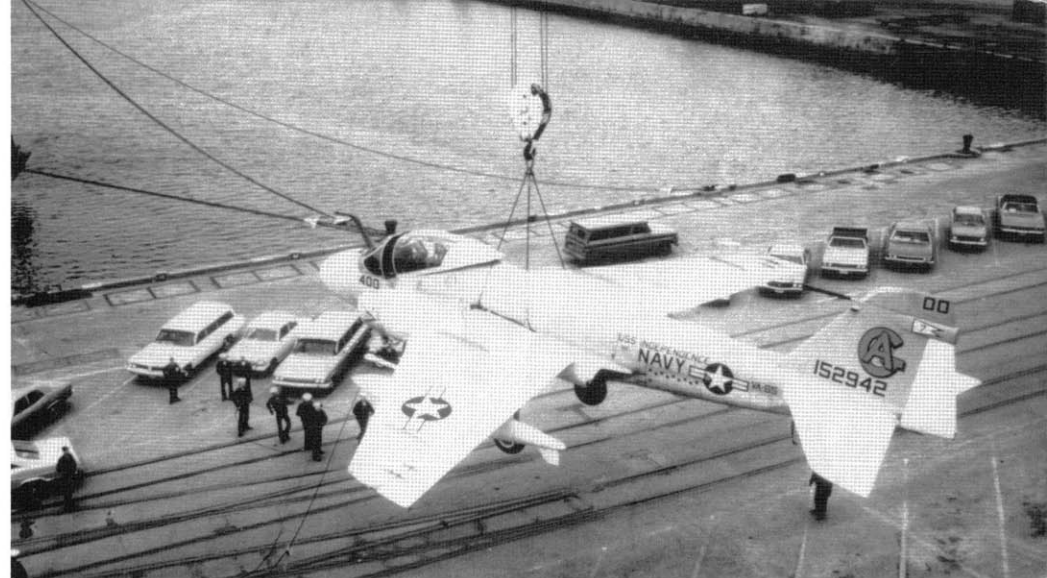
This A-6A is carrying an inert Walleye air-to-ground TV guided missile on an Aero 7A pylon during captive tests of the missile. The wing folding mechanism is hydraulically operated and is moved by the scissors in the center of the wing fold. The four dark protrusions at the top of the fold are the wing locking lugs that engage with similar lugs at the bottom of the fold. (USN)

This A-6A of VA-85 was parked next to the deck edge elevator aboard USS KITTY HAWK (CVA 63) during 1965 with the nose wheel tow bar in place. It carried the standard paint scheme of Light Gull Gray (FS 16440) and Insignia White (FS 17875). The Black radome was soon changed to a White neoprene coating (starting with BuNo 155642). (Lionel Paul)





With its wingtip speed brakes deployed, an A-6A (BuNo 151787) of VA-85 flares out on final approach for landing aboard USS KITTY HAWK (CVA-63) during 1965. The Intruder carries Black mission markings on the starboard engine nacelle and empty triple ejector racks (TERS) on the outboard pylons of both wings. (Lionel Paul)



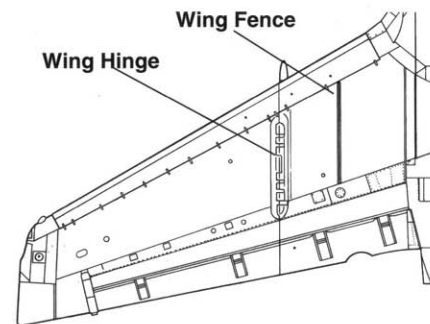
This A-6A of VA-65 was hoisted aboard USS INDEPENDENCE (CVA-62) along side the carrier pier at NAS Norfolk, Virginia. The AG tail code was Orange outlined in Black and the double zeros on the fin cap indicated that this was a CAG bird. The pennant marking on the tail was White with a Black 7, the unit marking for Carrier Air Wing Seven. (USN)

VAH-123 was the west coast Intruder training squadron and was based at NAS Whidbey Island, Washington. The unit markings consist of a Gold band with Black stripes on the fin with the tail code and fin cap in Black. (Lionel Paul)

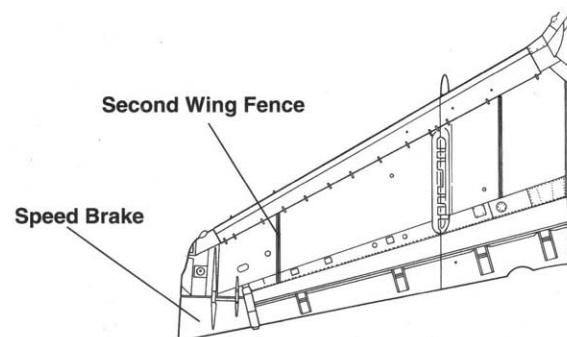


Wing Development

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A-6A



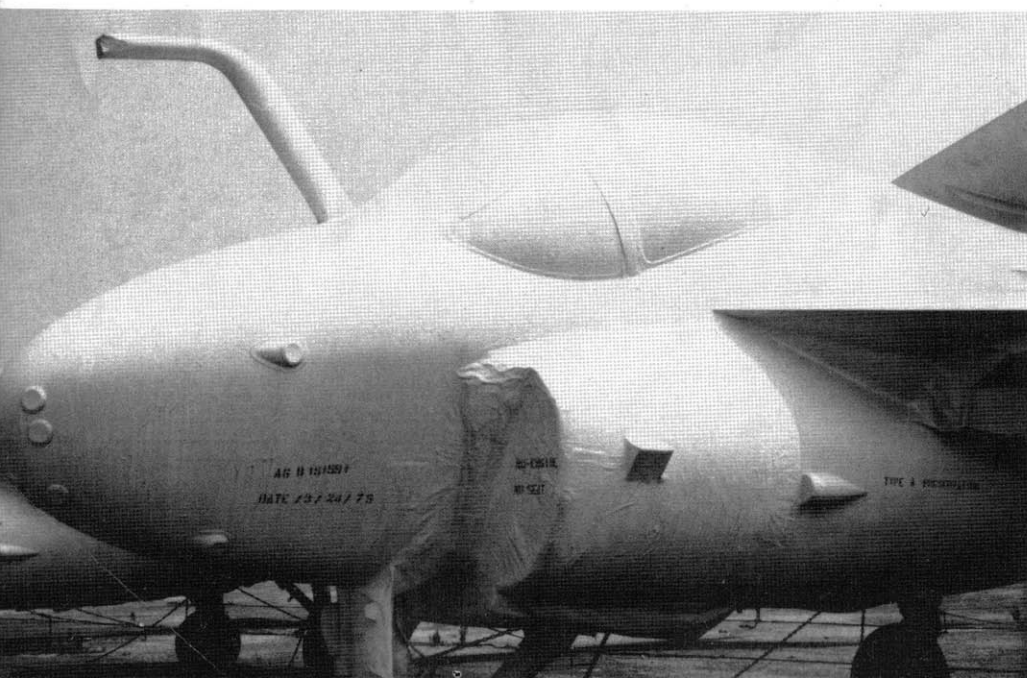
A-6B

The A-6B was basically an A-6A that was modified to carry the General Dynamics AGM-78/Mod 0 Standard ARM (anti-radiation missile). The first A-6B was converted during 1967 under the Iron Hand program. The missile was designed to home on radiation emitted from ground radars such as surface-to-air (SAM) missile guidance radars, fire control radars for gun sites and ground-controlled intercept (GCI) radars that directed defending fighters.

The A-6B differs from the A-6A principally in the equipment installed for navigation and weapons delivery. The first ten A-6Bs were stripped A-6As with navigation equipment only and these possessed no ground attack capability. The next three A-6Bs were A-6As taken from the production line and modified to the Passive-Angle-Tracking/Anti-Radiation Missile (PAT/ARM) configuration. The final A-6Bs were pulled from fleet aircraft during 1970 and modified to the Target Identification Acquisition System (TIAS) configuration. All three of these A-6B configurations were capable of operating with the AGM-78 missile, either the Mod 0 or Mod 1.

A-6Bs were distributed to various fleet A-6 squadrons, usually two or three to a unit. The A-6B saw combat with a number of squadrons, namely, VA-52, VA-75, VA-85, VA-145, VA-196 and VMA-224. The PAT/ARM A-6Bs saw service with VA-165, VA-52, VA-95 and VA-115. This variant did not have the nose and nacelle blisters used on the first A-6Bs (Mod 0). The A-6B TIAS variant differed from the earlier A-6Bs in that it carried and both the blisters and "bottle cap" button radar receiver antennas.

This A-6B (BuNo 151562) (TIAS-Mod 1) was stored at NAS Norfolk, Virginia with a protective coating sealing the aircraft. The location of the radar receiver button antennas on the radome are clearly visible. There are a total of twelve button antennas, two on each side and eight in the center of the radome. (Author)



An A-6B TIAS-MOD 1 (BuNo 149955) Iron Hand Intruder of VA-34 Blue Blasters on the ramp at the NAS Norfolk, Virginia, Naval Air Rework Facility awaiting its turn to be reconfigured to A-6E standard as part of the Conversion in Lieu of Procurement (CILOP) program. (Author)

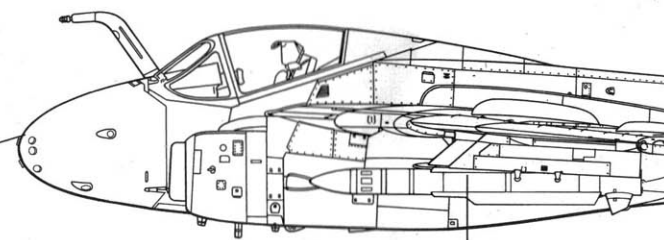
The A-6B proved its effectiveness during the war in Southeast Asia. VA-75, Sunday Punchers, the first A-6 squadron to see action in Southeast Asia also had the distinction of launching the first Standard ARM missile at the enemy during March of 1968. The first A-6B loss was on 20 August 1968 when a VA-196 aircraft (BuNo 151560) was unable to fully retract its slats after it launched from USS CONSTELLATION (CVA-64). The pilot and bombardier navigator were rescued. The first combat related loss of an A-6B occurred on 28 August 1968 when a VA-85 aircraft (BuNo 151561) failed to return from a sortie, it was suspected that the Intruder was hit by a surface-to-air (SAM) missile.

All surviving examples of the A-6B were later reconfigured to the A-6E standard as part of Grumman's remanufacture program.

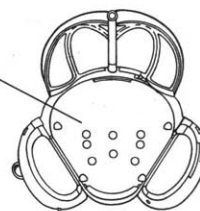
A-6B TIAS Mod I Receiver Antenna Locations

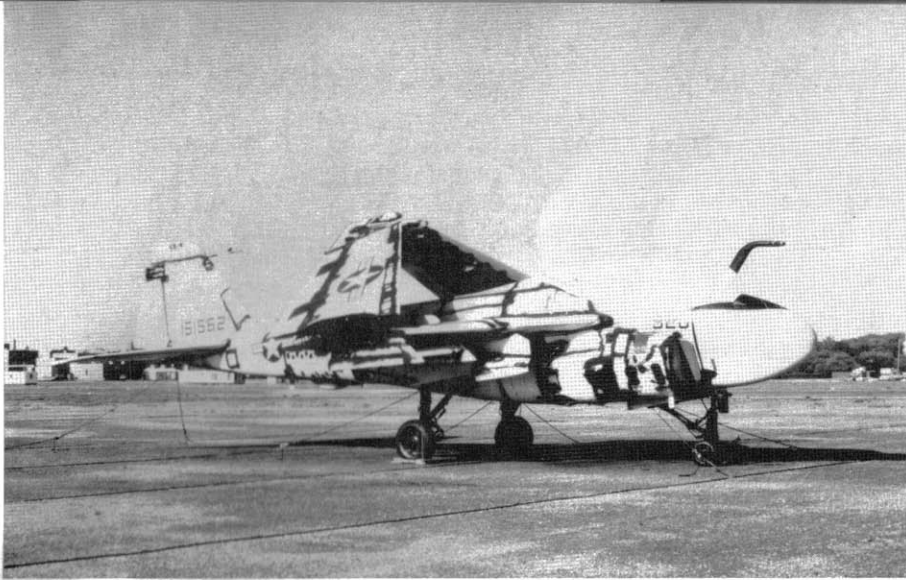
**A-6B TIAS Mod 1
Iron Hand Intruder**

**Radar Receiver Button
Antennas**



**Standard ARM
Missile**





This A-6B Mod 0 (BuNo 151562) on the ramp at the Naval Air Rework Facility, NAS Norfolk, Virginia during April of 1975 still has the protective sealant used to seal the aircraft during storage on the canopy. One of the radar receiver button antennas is visible on the radome just in front of the canopy. (Bruce Stewart)

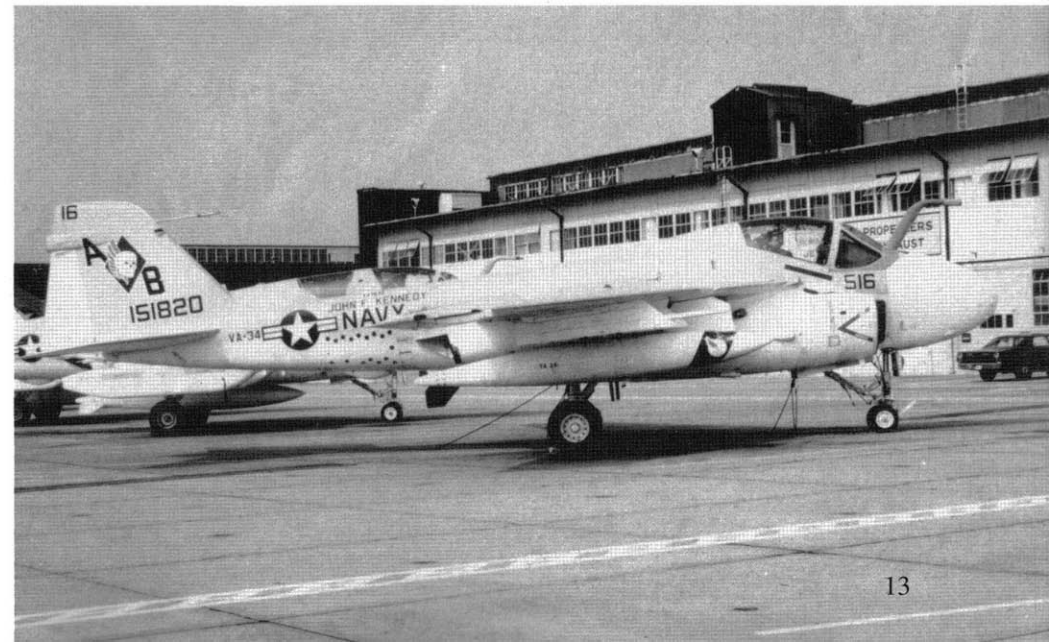


An A-6B (BuNo 155629) PAT/ARM of VA 115 off USS MIDWAY (CVA-41) lands at Atsugi, Japan in October of 1974. This variant of the A-6B did not carry the external blisters and radar receiver button antennas because of an internal modification to the radar system that rendered these unnecessary. (Lionel Paul)

This A-6B Mod 0 Iron Hand Intruder of VMA(AW)-224 aboard USS CORAL SEA (CVA-43) during 1972 was appropriately named *Sam Slam* and carried the name on the fuselage under the canopy in Black. The aircraft also carried fourteen Standard ARM (AGM-78) kill markings on the radome in Red. (G. Cipa)



An A-6B TIAS (BuNo 151820) of VA-34 off the USS JOHN F. KENNEDY (CV-67) tied down to the ramp at Naval Air Station Norfolk, Virginia during August of 1975. This aircraft was later reconfigured to the A-6E standard and reassigned to VMA(AW)-242. (Author)



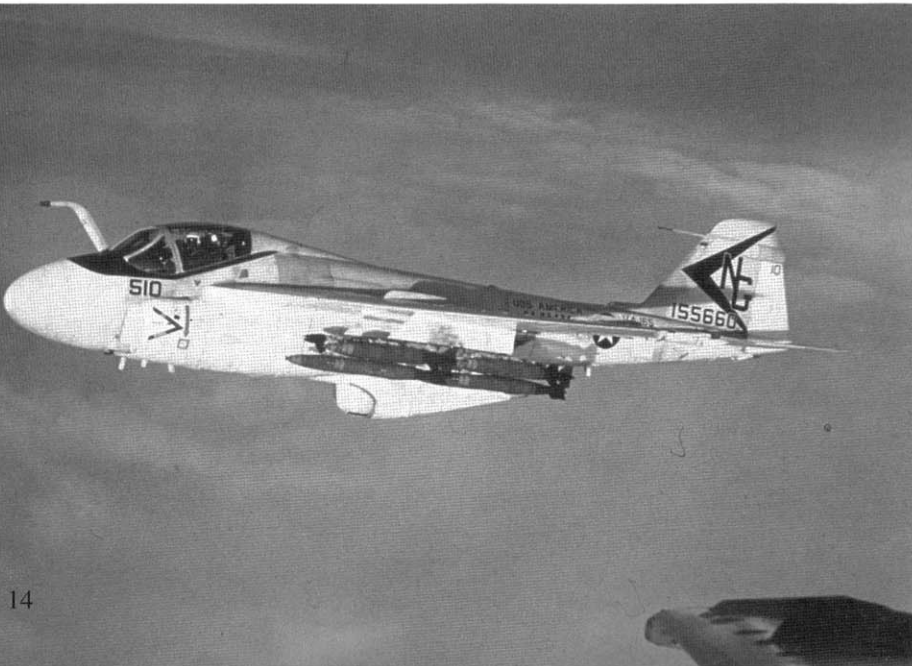
A-6C

A-6Cs were conversions of A-6As as a direct result of the Navy's Trails, Roads, Interdiction Multisensor Program. (TRIM). The A-6C differed from the A-6A in that it carried additional sensors in a centerline pod. The aircraft was modified to carry a Doppler frequency (DF) receiver and two electro-optical sensors in a large tear drop shaped pod on the aircraft centerline. This extended the capability of the crew to detect, track and attack significant radar and non-radar reflective targets. The electro-optical sensors consisted of a low light level television (LLLTV) system and a forward-looking infrared (FLIR) system located in the pod attached to the fuselage centerline weapons station. This reduced the normal A-6A weapons carrying capability somewhat with the loss of the centerline external station and the aft inboard hardpoints on stations 2 and 4. There were also systems changes in the cockpit controls and in the computer software to accommodate the TRIM system.

Testing of the TRIM system began in earnest during 1967. An early combat evaluation of TRIM, housed in four modified AP-2B Neptunes based at Cam Ranh Bay, South Vietnam between September 1968 and June 1969, provided enough feedback to Grumman to bring the first NA-6A (BuNo 147867) on line as a TRIM system test bed. Initially the TRIM system was placed in wing mounted angular shaped pods on the outboard pylons. Eventually these were replaced by a fuselage pod that could be detached when not needed. Because of the extra weight of the pod, an EA-6A tail hook assembly was retrofitted to the A-6C to accommodate the higher landing weight of the A-6C.

The first A-6Cs to be delivered went to VA-165 and, by the end of April 1970, the squadron

An A-6C (BuNo 155660) of VA-165 off USS AMERICA (CVA-66) heading towards a target in Vietnam loaded with 500 pound Mk 82 general purpose bombs during 1970. The Trails, Roads, Interdiction Multisensor (TRIM) system was housed in the ventral pod mounted under the fuselage centerline. (USN)

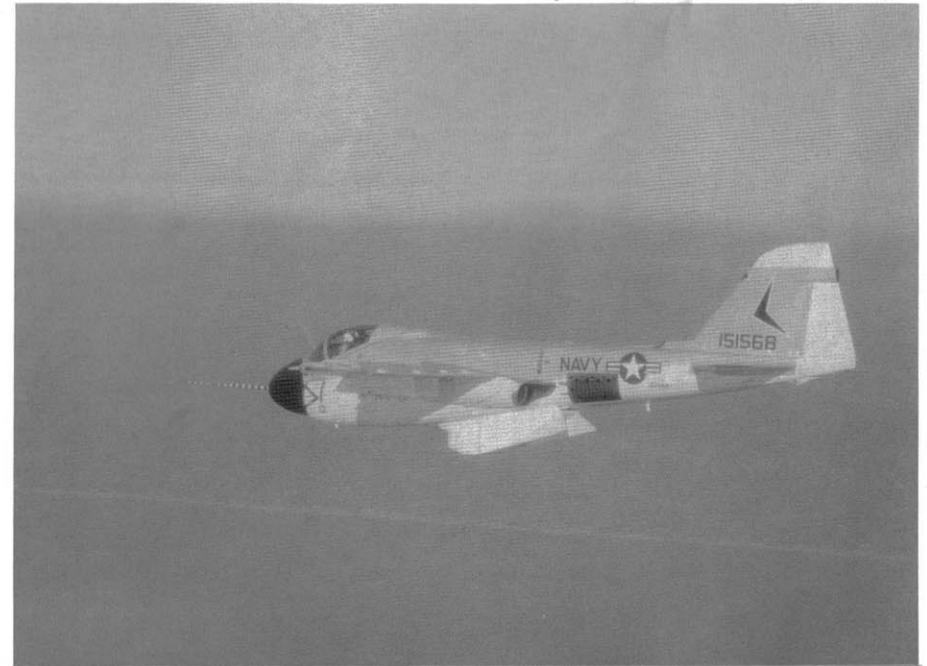


had at least eight A-6Cs on hand. VA-165 deployed aboard USS AMERICA during 1970 for its second WestPac cruise. The squadron launched its first A-6C strike mission in May of 1970 and flew approximately 675 A-6C combat sorties between 26 May and 7 November 1970. VA-145 serving aboard USS RANGER (CVA-61) was given five A-6Cs by VA-165 when USS RANGER arrived on station in Southeast Asia during November of 1970. It was during this period that one A-6C was lost. BuNo 155647 plunged into the sea following a cold cat shot on 8 January 1971. The Bombardier/Navigator (BN) was rescued, but the pilot was lost.

The A-6C was also operated by VA-35 aboard the USS AMERICA (CVA-66) during 1972-73. VA-35 Panthers employed the technique of using the A-6C as a stabilized laser designator. This technique involved acquiring a target via radar or Forward Looking Infrared (FLIR). After a target was identified the laser would be used to illuminate the target of opportunity for a BN in an accompanying A-6 (equipped with Texas Instruments Mk 82 Paveway 1,500 pound LGBs). The second A-6 would release its bombs on the illuminated target.

VA-34 Blue Blasters, VA-75 Sunday Punchers and VA-176 Thunderbolts all used the A-6C while they were in the fleet inventory. The A-6C remained in the fleet until late 1975, after which the remaining eleven were brought up to the latest strike configuration, either at a Navy Air Rework Facility or at the Grumman plant on Long Island, New York.

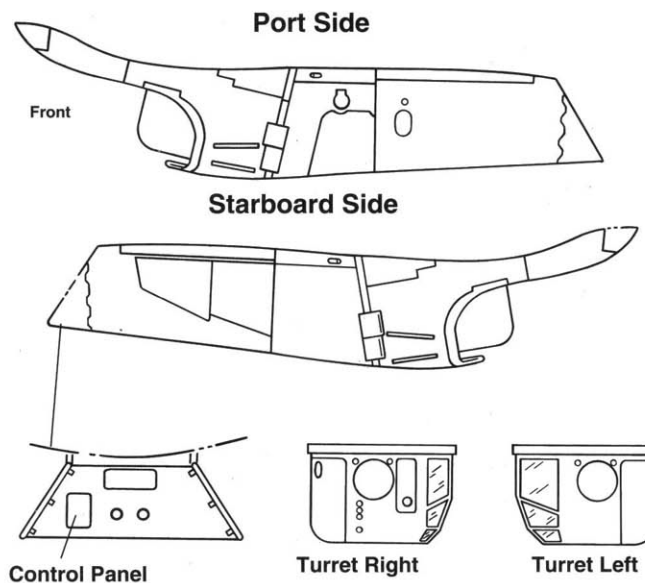
The TRIM sensor pod was attached to the fuselage centerline station, which did reduce the bomb carrying capability of the A-6C somewhat. This A-6A was used to test the pod before it was fitted to a fully reconfigured A-6C (the aircraft was later converted to the KA-6D tanker configuration). The chevron on the tail was Dark Blue outlined in White and the test probe on the nose was Red and White striped. (Grumman)





An A-6C of VA-35 assigned to Carrier Air Wing Eight, on the ramp at NAS Oceana, Virginia following its return from the Western Pacific (WestPac). This was one of three A-6Cs that had carried a new laser designator installed in place of the Low Light Level TV (LLLTV). It was also configured with an upgraded Forward Looking Infrared (FLIR) sensor system. (Author)

TRIM Pod



The first A-6C was converted from a standard production A-6A. The aircraft had the fuselage speed brakes faired over and had the ventral TRIM pod faired in to the underside of the fuselage. This particular aircraft was lost in combat on 8 January 1971 while assigned to VA-145 aboard USS RANGER (CVA-61). (Grumman)



KA-6D

The KA-6D is an air refueling tanker version of the A-6A. It differs from the A-6A in that the all weather avionics had been removed and replaced with refueling equipment. The bird-cage equipment bay area in the rear fuselage was used to house the refueling hose and drogue. The KA-6D does retain the capability to be employed as a daylight bomber. At one time plans were made to equip the KA-6D with four 20MM cannons in the nose, however, this idea was dropped because of a lack of funding.

The first four Intruder tankers were converted from high time A-6As and on 16 April 1970 Chuck Sewell completed the first flight in a production tanker (BuNo 151582). After the first four KA-6Ds were completed, the KA-6D conversion program moved to Grumman's facility in Stuart, Florida.

The feasibility of using the A-6 as an air-to-air refueling tanker was demonstrated during April of 1966, but it was not until the Summer of 1970 that the Navy began to procure the KA-6D tanker in quantity. Grumman utilized the Sargent-Fletcher hose and drogue kit mated to the A-6 to convince the Navy that the tanker could fulfill the Navy's requirement for a tanker to replace the KA-3B. The fuel supply of the KA-6D is contained in tanks located in the wing and fuselage, augmented by five 300 gallon external fuel tanks for a total of 3,844 gallons of fuel, of which approximately 3,000 gallons are transferable. The KA-6D can also carry a McDonnell Douglas D-704 "Buddy" refueling store in place of the centerline 300 gallon tank.

Later, Grumman reintroduced the KA-6D conversion line at its Saint Augustine plant in Florida for an update program that included rewiring the aircraft, replacement of internal bulk-

The second KA-6D prototype was converted from an A-6A and underwent testing at the Naval Air Test Center, NAS Patuxent River, Maryland during March of 1973. The refueling drogue and hose reel was housed in the equipment bay area of the A-6A with a large fairing housing the drogue. The aircraft had the experimental designation NA-6A stenciled on the fuselage in Yellow. (Lionel Paul)



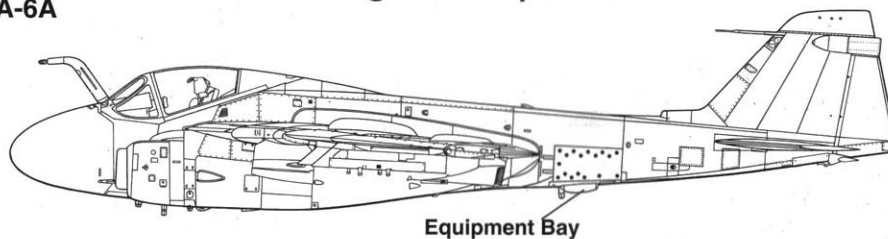
A KA-6D of VA-115 off USS MIDWAY (CVA-41) on final approach for landing at Atsugi Air Base, Japan. The fin was in Dark Blue with Yellow stars and chevron. The fin cap was in Green with a thin band of Yellow. The fuselage band was also Green as were the fins on the underwing fuel tanks. (Lionel Paul)

heads and installation of modified fuel cells. Plumbing and attachment points were reinforced, enabling these later rebuilds to carry 400 gallon underwing drop tanks. This increases the total fuel capacity to 4,344 gallons, of which some 2,000 gallons is not transferable. This later batch of KA-6Ds had all ground attack capability deleted. By 1985, some ninety-four A-6As had been converted to KA-6D standards with additional aircraft planned for conversion.

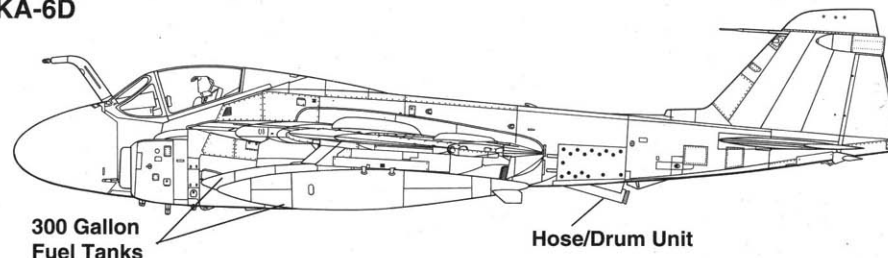
In 1979 Grumman proposed a tanker variant of the EA-6B which would have thirty percent greater fuel capacity than the KA-6D under the designation KA-6H. The proposal was killed by SecDef Brown later that same year.

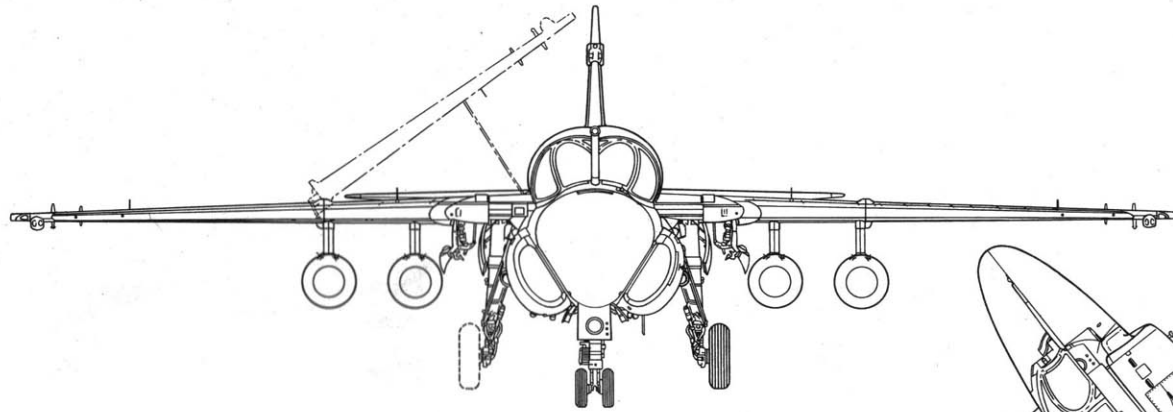
Fuselage Development

A-6A



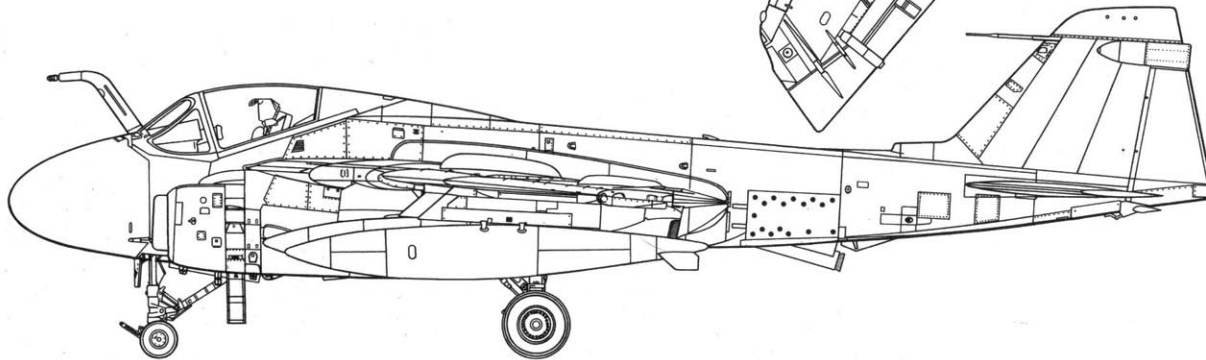
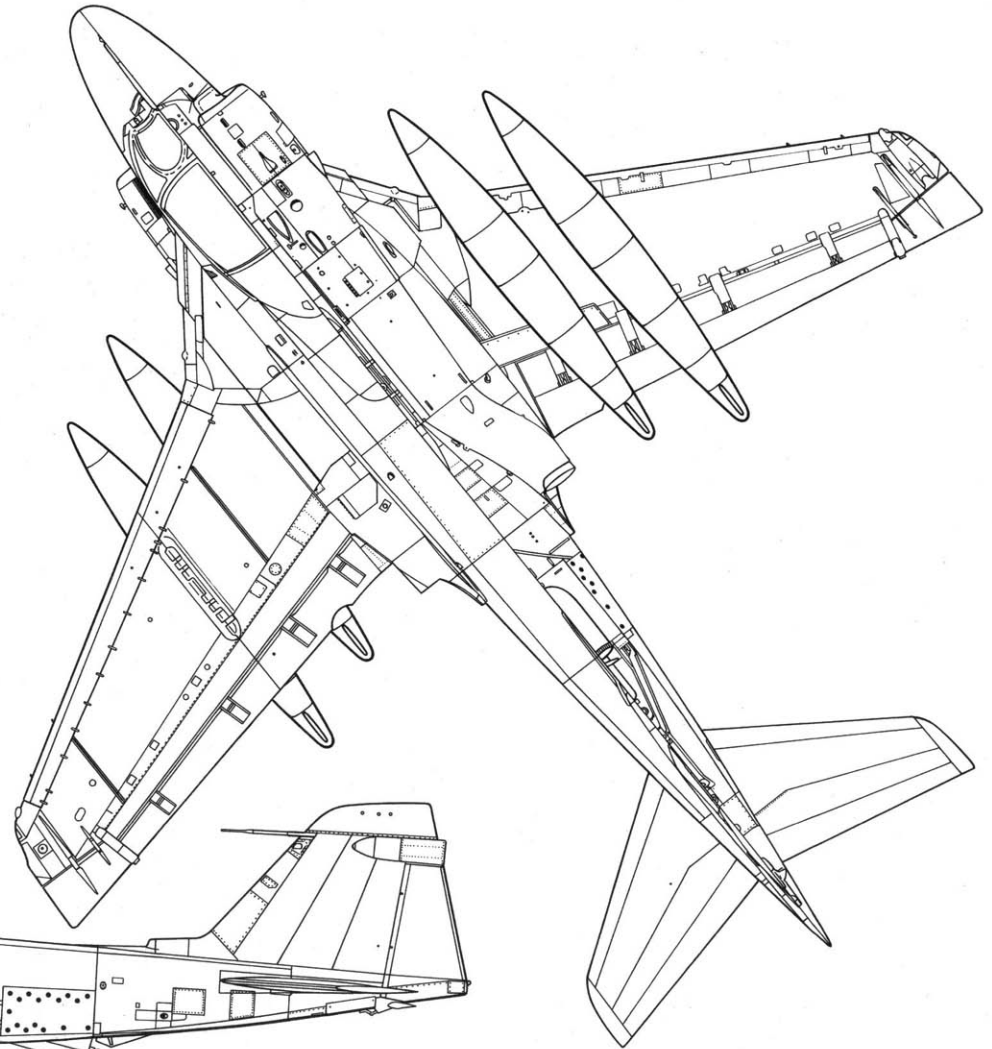
KA-6D

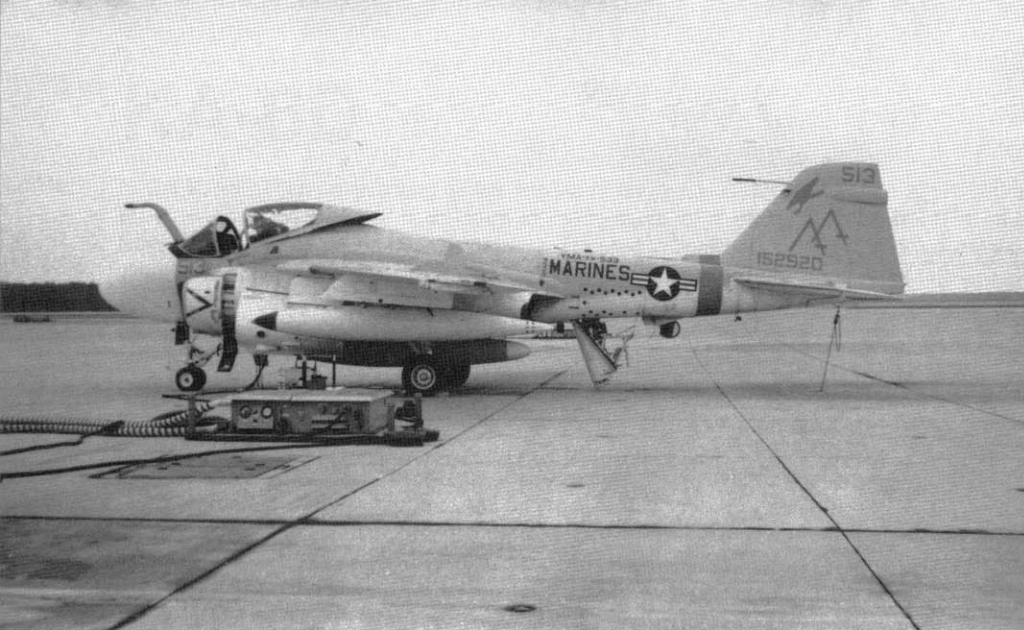




Specification Grumman KA-6D Intruder

Wingspan.....	53 feet (16.15 m)
Length.....	54 feet 9 inches (16.69 m)
Height.....	16 feet 2 inches (4.93 m)
Empty Weight.....	25,980 pounds (11,785 kg)
Maximum Weight.....	60,400 pounds (27,397 kg)
Powerplant.....	Two 9,300 lbst Pratt & Whitney J52-P-8 turbojet engines
Armament.....	None.
Speed.....	653 mph (1,052 kph)
Service Ceiling.....	44,600 feet (13,594 m)
Range.....	2,740 miles (4,410 km)
Crew.....	Two





A Marine KA-6D tanker of VMA (AW)-533 on the ramp at Marine Corps Air Station Cherry Point, North Carolina during May of 1983. The hose/drogue refueling system was in the open (lowered) position, a common practice when the aircraft is being serviced. The fuselage band is a common marking on KA-6Ds and is used as a recognition aid to rapidly identify the tanker. (Author)

A KA-6D of VA-65, attached to Air Wing Seven deployed aboard USS EISENHOWER (CVN-69) on final approach for landing at NAS Oceana, Virginia. The omega system blade antenna used for navigation is visible just to the rear of the cockpit. (Don Linn)



This KA-6D of VA-95 Green Lizards has the camouflage demarcation carried out onto the radome, with a Dark Gull Gray anti-glare panel in front of the canopy. There is a Red Remove Before Flight tag attached to the arresting hook. The trident on the fin and fuselage band are in Green. (Lionel Paul)

This KA-6D of VA-34 depicts an early effort at subdued markings on Navy aircraft. This aircraft was overall Flat Gull Gray with Fiat Black markings, but it still carried the standard Red and White jet intake warning markings in addition to the Yellow, White and Black rescue markings. It also had a Dark Blue band on the tail with the logo *BLUE BLASTERS* in White. (Don Linn)



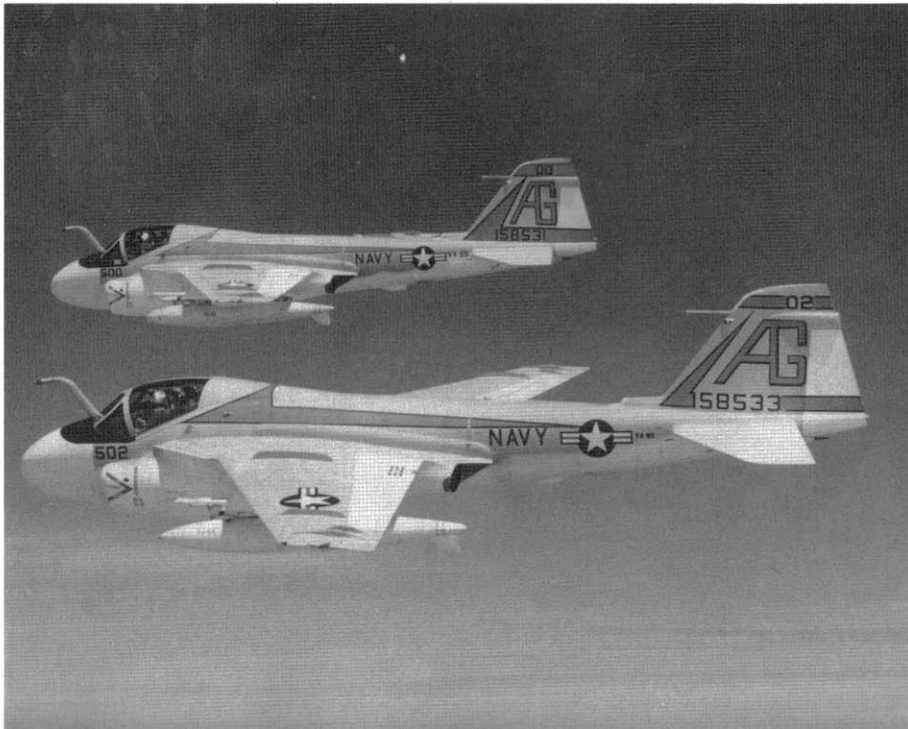
A-6E Standard

The principal differences between the earlier versions of the A-6A and the A-6E are the installation in the A-6E of an improved computer that is faster and has a greater memory capacity, a search radar with improved track capabilities, and an improved weapons release system.

Externally, the A-6E retains the basic A-6A airframe, power plant and flight instrumentation, but replaces the first generation digital integrated attack navigation equipment (DIANE) with a second generation, modernized attack/navigation system consisting of a new simultaneous multimode search radar (ground map, terrain clearance and track-while-scan), a solid-state, random-access, general-purpose digital computer and a centralized armament control unit. Interfaces with existing sub-systems are simplified and a self-contained ground blower (air conditioning unit) is incorporated. The A-6E was the first Intruder variant to have the fuselage speed brake faired over, although the speed brake well was still part of the aircraft's structure.

The modernized A-6E avionics is designed to significantly improve the reliability and maintainability of the complex weapon system. The number of on-board equipment boxes has been reduced and the use of modern technology components and features such as built-in-test, end-to-end dynamic calibration and fault isolation are incorporated to enhance operational readiness. The modernization of the A-6 avionics has resulted in a reduction in the maintenance

A pair of standard A-6Es of VA-65 carry a Red chevron on the fuselage and fin in Red with a Black outline. The fin cap and tail code were also in Red with a Black outline. The A-6E was the first A-6 variant to be built with the fuselage speed brake faired over. (Grumman)



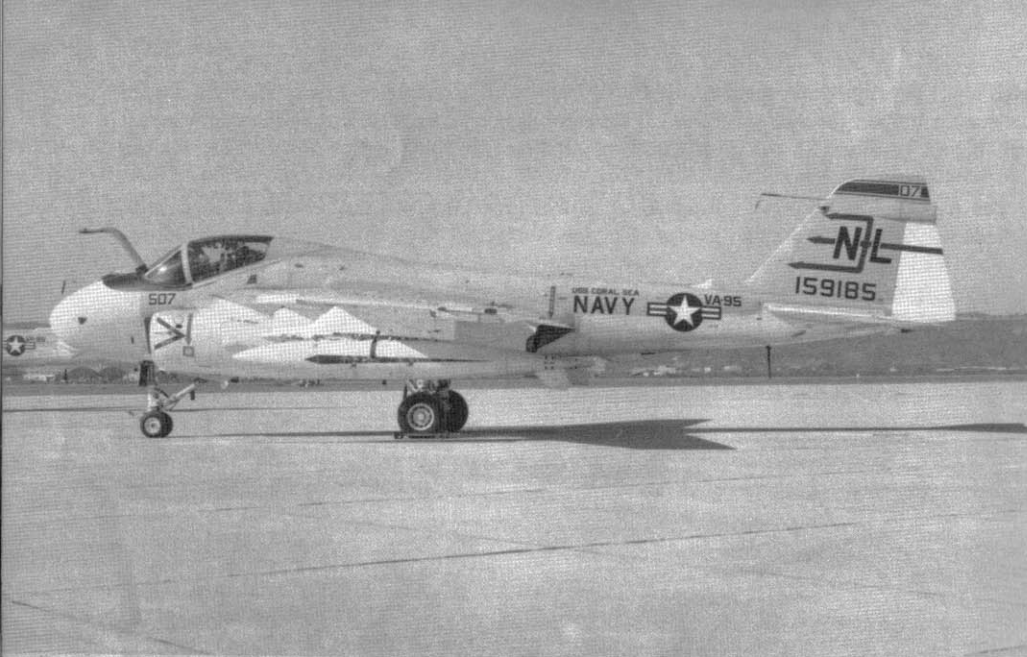
man-hours per flight hour required per squadron, as well as in the shop space required aboard carriers to support the A-6 unit. Ground support has been simplified through the built-in test capability, resulting in the elimination of all line test equipment requirements for the attack/navigation system.

The A-6E prototype was a refitted A-6A (BuNo 155673) which made its first flight on 27 February 1970 with Grumman project pilot Joe Burke and BN Jim Johnson at the controls. Approximately 240 A-6As were converted in lieu of procurement or CILOP at a rate of thirty-six aircraft per year. Upgrading an A-6A to an A-6E costs 1.6 million per aircraft while the cost of a new production A-6E was approximately 9.5 million (1972) dollars. The first new production A-6E (BuNo 158048) was accepted by the Navy on 17 September 1971 (this aircraft was written off on 21 April 1975 while assigned to VX-5 the Navy's test and evaluation squadron).

The first unit to receive the A-6E Intruder after the RAG, VA-42, was VA-85 Black Falcons, who received their new A-6Es on 9 December 1971. The first CILOP A-6E (BuNo 159207) was completed on 16 April 1973 and the last aircraft in the program was delivered in March of 1980. The A-6E CAINS (Carrier Airborne Inertial Navigation System) had a large air scoop added to the dorsal spine.

Carrying toned down Gray codes and unit markings, this A-6E of VA-176 Thunderbolts is parked on the hot fuel pad at NAS Oceana, Virginia. The aircraft is equipped with wing mounted 300 gallon fuel tanks and a 900 gallon centerline tank. The A-6E differed from earlier A-6s in that it had a large air scoop to provide cooling air for avionics on the upper rear fuselage. (Don Linn)





An A-6E of VA-95 on the ramp at NAS North Island, San Diego, California during December of 1977. This squadron is known as the Green Lizards and their unit marking is a Green trident which was carried on the fin. The fin tip had a wide Green band and two thin Green stripes on either side of the band. (B. Trombecky)



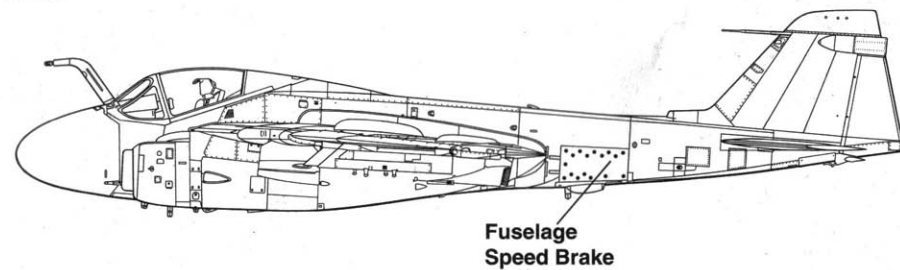
This A-6E is armed with an AGM-53 Condor missile carried on the number 4 stores station (inboard starboard wing pylon) along with a data link electronics pod on station number 3 (fuselage centerline pylon). The missile had alternating Red and White forward fins. (USN)

This A-6E of VA-85 is carrying a Ford Aerospace AN/AVQ-10 Pave Knife laser designator pod attached to the number 3 stores station (fuselage centerline pylon). Normally in this configuration, the Intruder would be acting as the designator aircraft for other Intruders armed with Laser Guided Bombs (LGBs). (Don Linn)

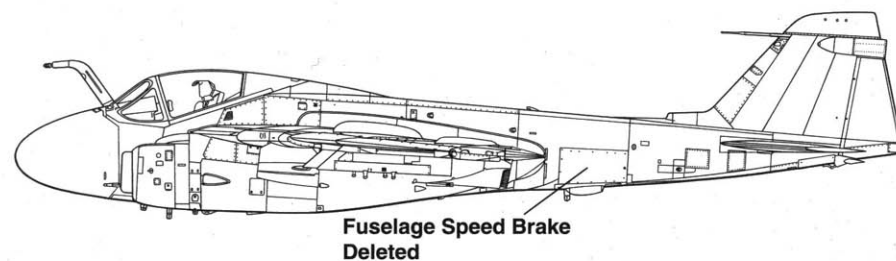


Fuselage Development

A-6A



A-6E



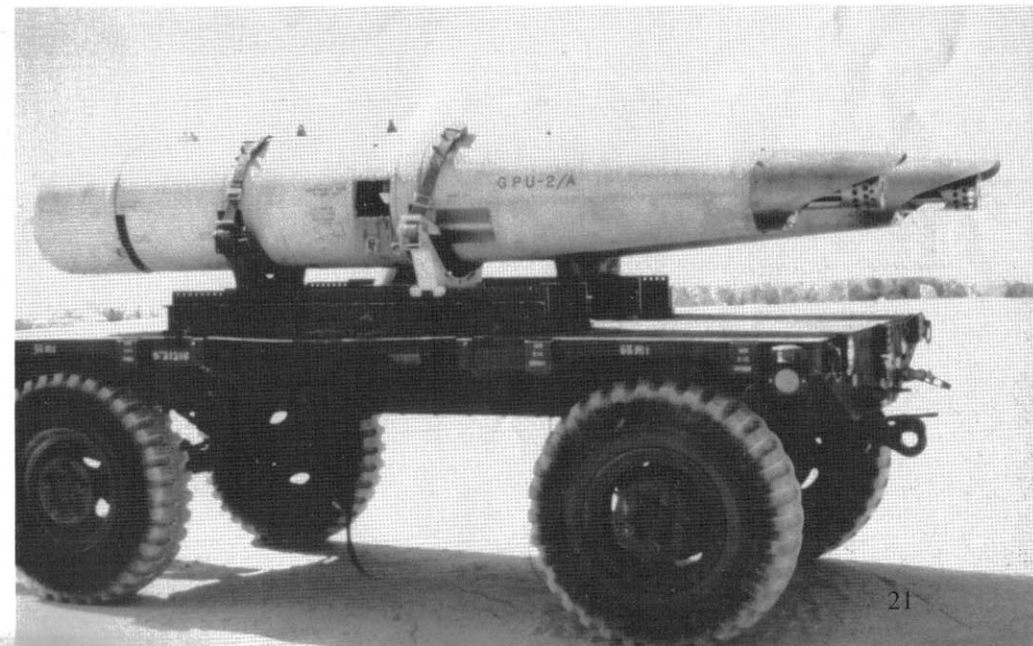


This A-6E of The Pacific Missile Test Center at NAS Point Mugu, California is carrying a Tomahawk cruise missile on the wing pylon and its guidance system electronics pod on the centerline station. The missile is a Reddish-Orange color with NAVY in White. The Intruder is also carrying a 1,000 pound bomb on the opposite wing as a counterweight. (USN)



Two Marine A-6Es of VMA(AW)-533 fly formation over the Pacific Ocean in December of 1982 armed with Mk 82 Snakeeye bombs on the centerline station and a LAU-10 rocket launcher pod on the wing station. The LAU-10 has not been fitted with its streamlined nose and back covers. (T. Metler)

This Marine Corps A-6E is carrying a Multiple Ejector Rack (MER) with BLU-27 fire bombs on the center rack. The overall Natural Metal bombs have not been fitted with their nose caps and the rear fin assemblies. The fuel caps have Red seals. (T. Metler)



A-6E TRAM

(Target Recognition Attack Multisensor)

A-6E BuNo 155673 had the distinction of being the first Intruder to fly with the TRAM system on 22 March 1974 at Calverton, Long Island. Fully integrated tests, however, did not commence until October of that same year. With the incorporation of TRAM system, the A-6E became the most advanced, electro-optically equipped attack aircraft in the world. TRAM presents television-type imagery of non-visual and/or non-radar significant targets, permits autonomous laser guided weapon delivery and offers more precise target discrimination during the terminal phase of an attack. By integrating Forward Looking Infrared (FLIR) laser sensors with the multimode search radar for identification, tracking and ranging, the A-6E TRAM has the ability to detect, identify and attack many different types of targets under all combinations of day/night or adverse weather conditions with a higher degree of accuracy than ever before.

The incorporating of the Carrier Inertial Navigation System (CAINS), which is also common to Grumman's F-14, increases the reliability and maintainability of the A-6E. The new systems that have been integrated into the A-6E TRAM made it possible to eliminate the need for uniquely configured Intruders such as the A-6B and A-6C.

The first fleet aircraft to have the full TRAM capability was an A-6E CILOP (BuNo

An A-6E TRAM of VA-35 PANTHERS makes a low pass over NAS Oceana, Virginia during May of 1981. The AJ tail code identified the aircraft as being assigned to Air Wing Eight (CVW-8) aboard the USS NIMITZ (CVN-68). (Don Linn)

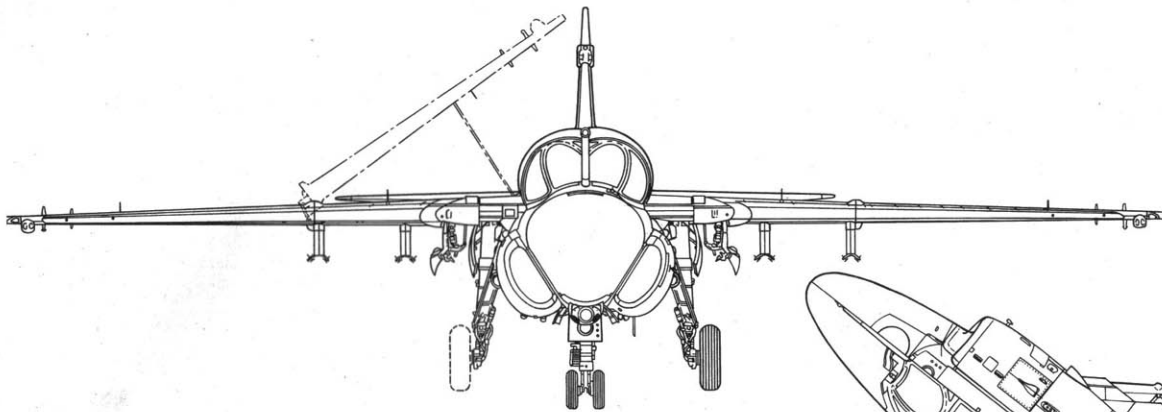


Grumman's A-6E TRAM prototype (BuNo 155673) carried a special color scheme of over-all Gloss White with Red and Blue stripes on the fuselage and Red and Blue bands around the wing and stabilizer tips. The TRAM turret was installed under the radome and the TRAM logo on the fin was in Red.(Grumman)

155710) which was delivered to VA-42 at NAS Oceana on 1 December 1978 and the first new built A-6E TRAM (BuNo 160995) was also delivered to VA-42 on 14 December 1978. The A-6E TRAM currently serves with all Navy Medium Attack Squadrons. The five Marine All-Weather Attack Squadrons operated the A-6E TRAM until the Spring of 1993..

The A-6E TRAM differs externally from the standard A-6E by the addition of a Detection and Ranging Set (DRS) turret installed under the radome forward of the nose landing gear well. Another external change is the addition of a large ram air intake on top of the fuselage offset to port near the leading edge of the vertical stabilizer.

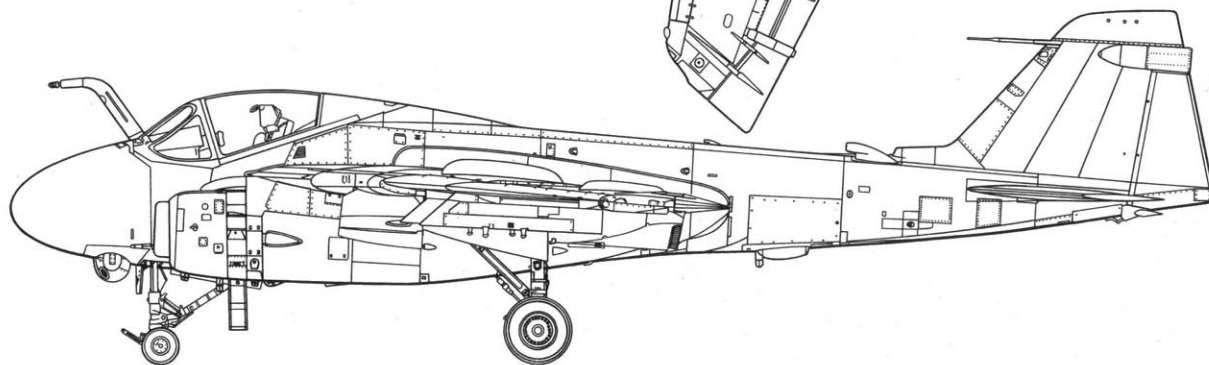
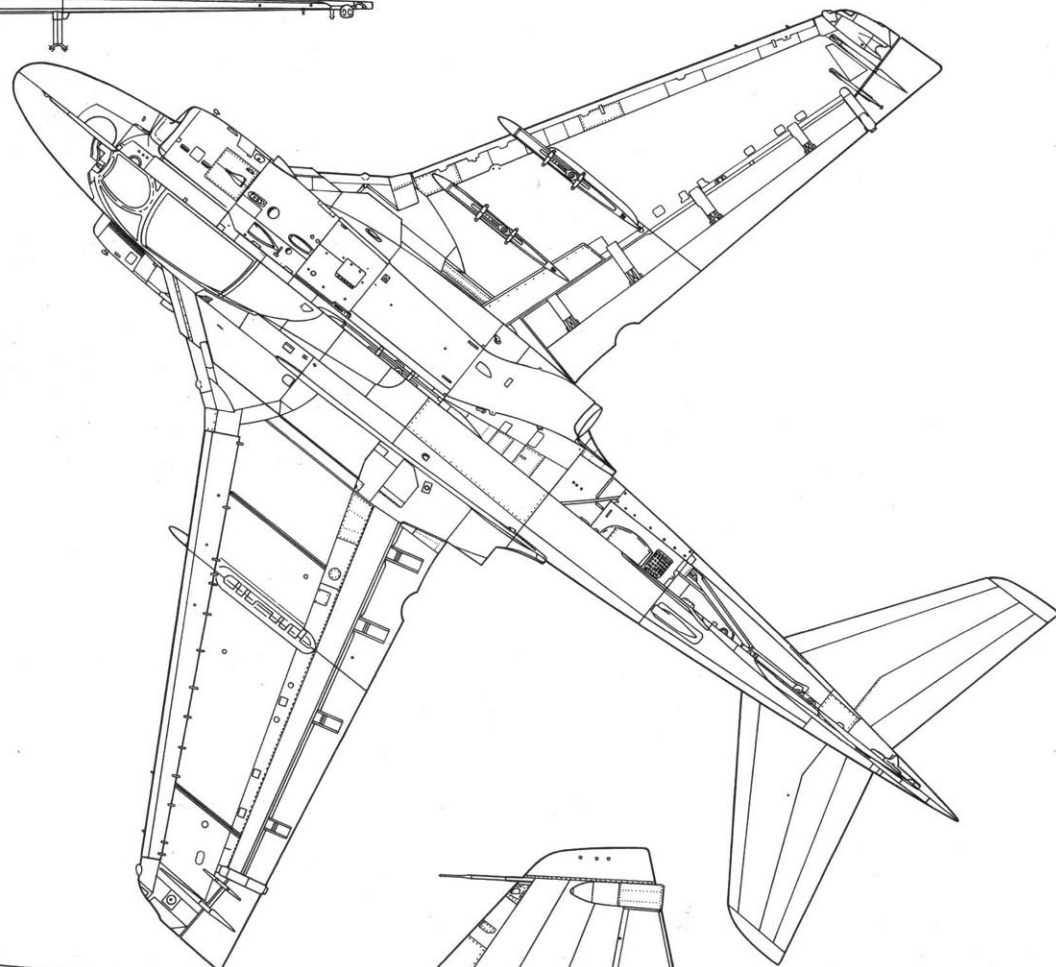


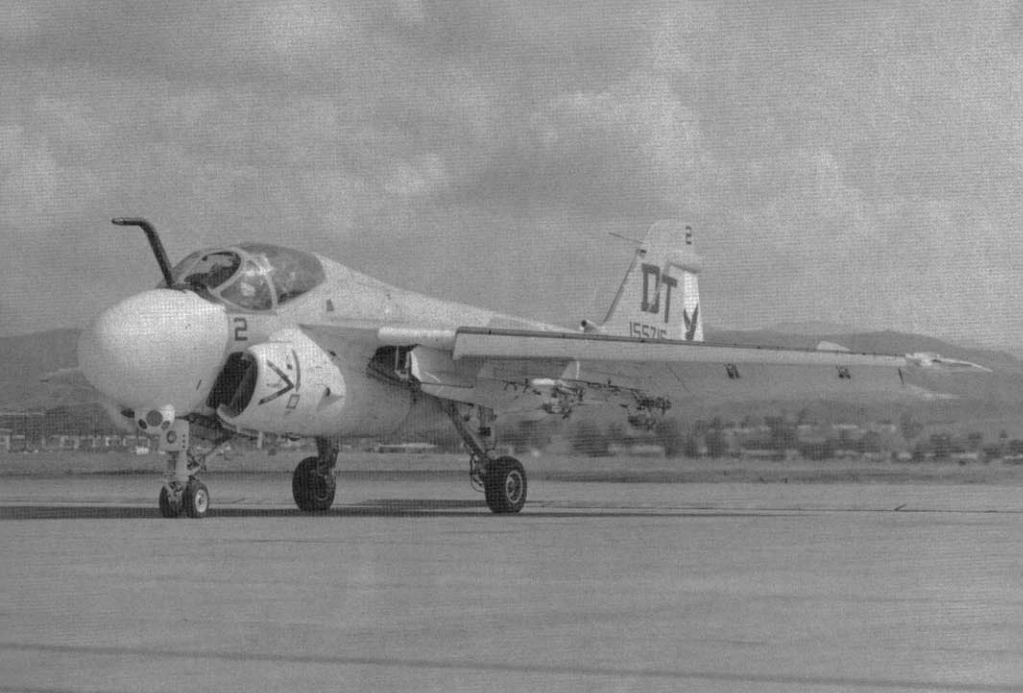


Specification

Grumman A-6E TRAM Intruder

Wingspan.....	53 feet (16.15 m)
Length.....	54 feet 9 inches (16.69 m)
Height.....	16 feet 2 inches (4.93 m)
Empty Weight.....	25,980 pounds (11,785 kg)
Maximum Weight.....	60,400 pounds (27,397 kg)
Powerplant.....	Two 9,300 lbst Pratt & Whitney J52-P-8 turbojet engines
Armament.....	Up to 18,000 pounds (8,164.8 kg) of underwing ordnance.
Speed.....	653 mph (1,052 kph)
Service Ceiling.....	44,600 feet (13,594 m)
Range.....	2,350 miles (3,781.8 km)
Crew.....	Two





An A-6E TRAM of VMA(AW)-242 Batmen on the ramp at MCAS El Toro, California during 1975. The Batmen turned over their last A-6E TRAMs to VA-128 and have converted to the FA-18 Hornet. (Larry Davis)

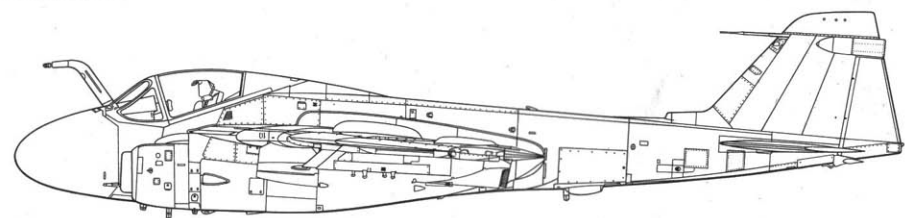
This A-6E TRAM of VMA(AW)-224 Bengals on the taxiway at NAS Glenview, IL on 17 December 1988 is in the low visibility tactical Gray camouflage scheme with subdued markings. (Nathan Leong)



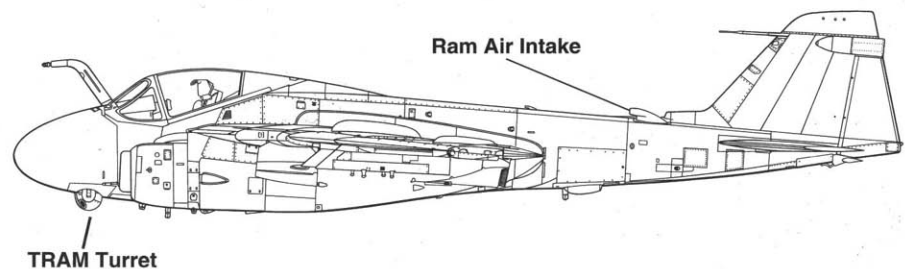
This A-6E TRAM of VA-34, parked on the deck edge of USS DWIGHT D. EISENHOWER (CVN-69) in the northern Red Sea on 18 August 1990, is armed with twelve Mk 24 Rockeye II cluster bombs, six on each outer wing pylon. (USN)

Fuselage Development

A-6E Standard

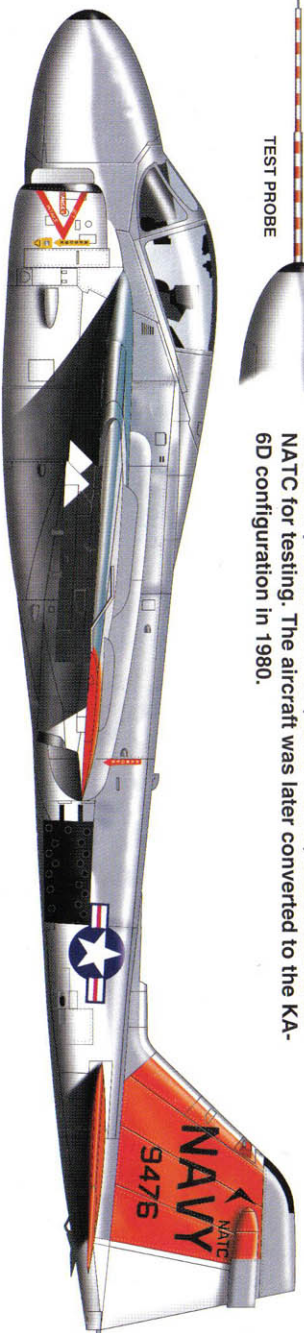


A-6E TRAM





The tenth production A-6A (BuNo 149476) was based at the NATC for testing. The aircraft was later converted to the KA-6D configuration in 1980.



This A-6A Intruder of VMA-332 *Polka Dots* carries Red polka dots on the rudder and underwing fuel tanks.



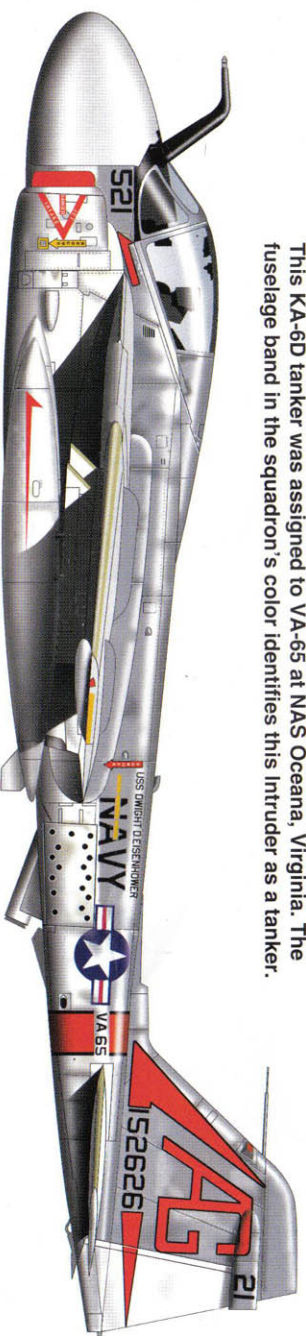
This A-6B PAT/ARM (Passive Angle Tracking/Anti-Radiation Missile), also known as the Iron Hand Intruder, was assigned to VA-115 Arabs.



VA-165 Boomers was the first squadron to take the A-6C Intruder into combat over southeast Asia during 1970.



This KA-6D tanker was assigned to VA-65 at NAS Oceana, Virginia. The fuselage band in the squadron's color identifies this Intruder as a tanker.



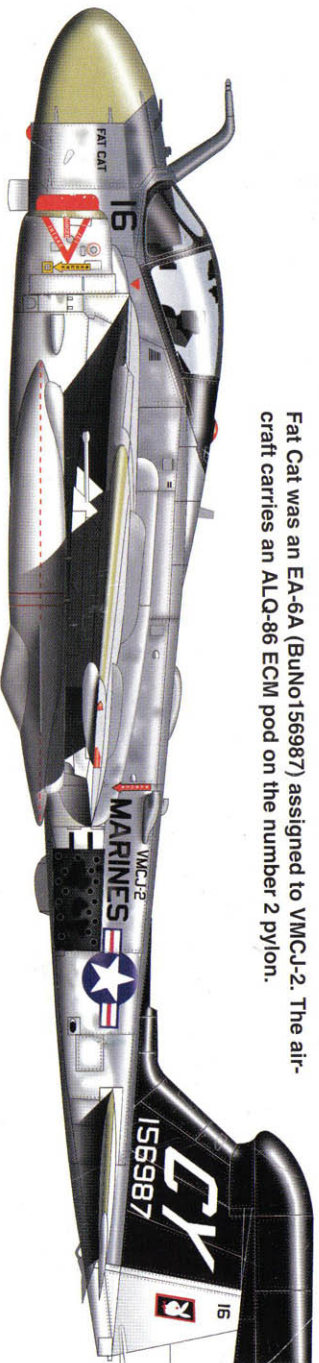
VMA(AW)-224 had the distinction of being the first Marine A-6 squadron to fly combat from a Navy carrier, USS CORAL SEA (CV-43) during 1972.



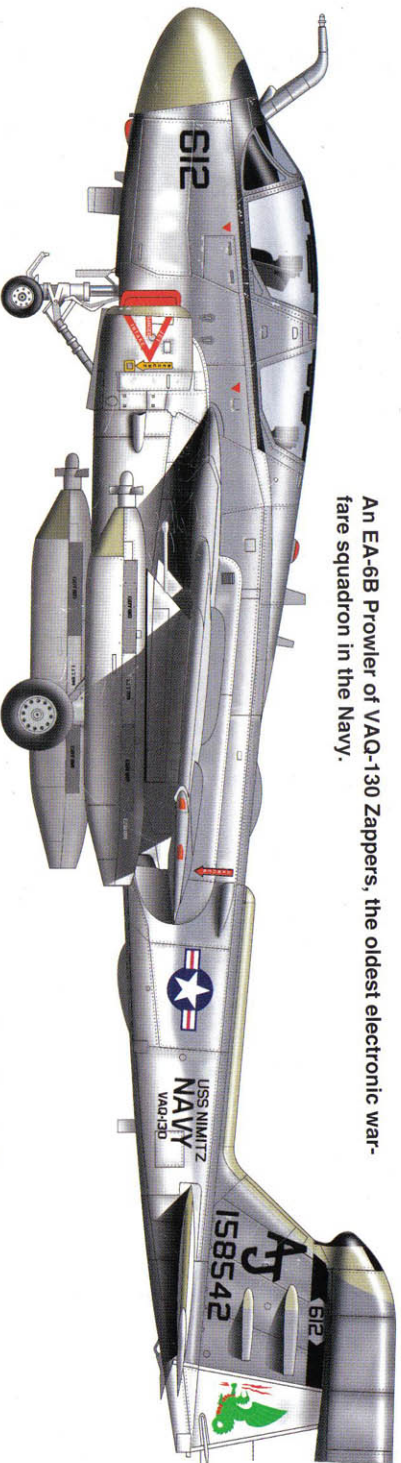
This A-6E TRAM Intruder of VMA(AW)- 533 carries the low-vis camouflage used on Intruders during Operation DESERT STORM.



Fat Cat was an EA-6A (BuNo156987) assigned to VMCI-2. The aircraft carries an ALQ-86 ECM pod on the number 2 pylon.



An EA-6B Prowler of VAQ-130 Zappers, the oldest electronic warfare squadron in the Navy.



This ICAP II EA-6B Prowler (BuNo) of VAQ-130) assigned to Air Wing Three (CVW-3) aboard the USS KENNEDY (CV-67) during DESERT STORM has eight HARM missile kills on the nose in Black.





This A-6E TRAM of VA-155 aboard USS RANGER (CV-61) is armed with twelve Mk 82 500 pound low drag bombs. The aircraft carries twenty-two camel shaped mission markings on the engine nacelle in Black. (LT Doug Stevens via LT Richard Dann)

A jogger runs past a line-up of bomb armed A-6E TRAMS of VA-155 aboard USS RANGER (CV-61) during a lull in operations. Each Intruder was armed with twelve Mk 82 500 pound low drag bombs for missions against Iraqi targets during Operation DESERT STORM. (Lt Doug Stevens via LT Richard Dann)



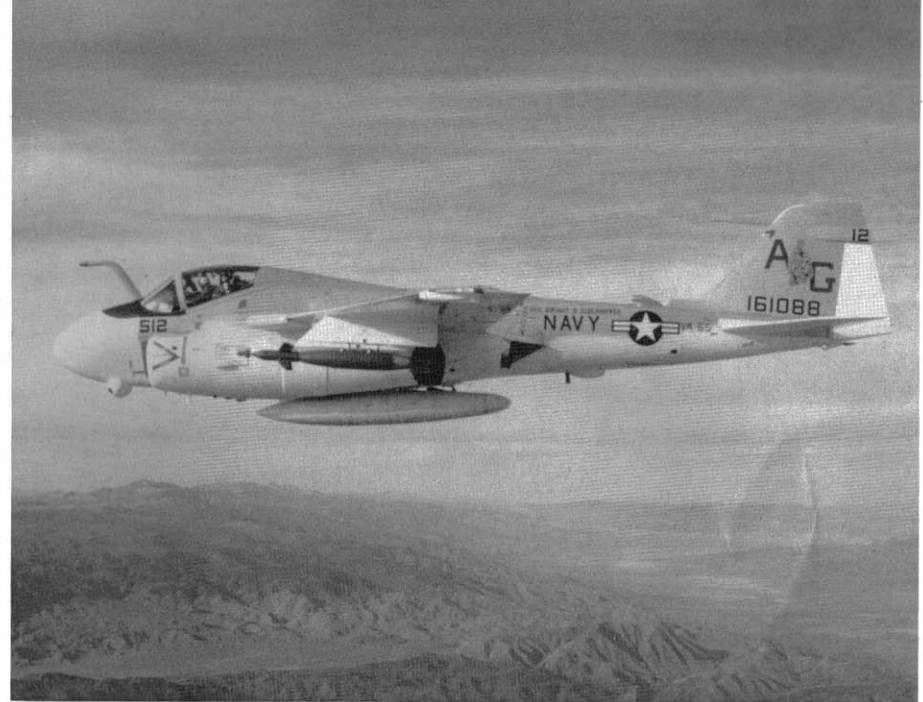
An A-6E TRAM of VMA-224 being loaded for another mission over Kuwait during DESERT STORM. The Marine unit was based in Bahrain and shared this location with FA-18 Hornets (in the background). A load of Rockeye cluster bombs attached to a MER is being loaded on the outboard pylon, while a Laser Guided Bomb (LGB) is already in place on store station 2. (CPL Murray van Pelt USMC)

This VMA-224 A-6E TRAM at Cherry Point MCAS during April 1991 carried kill markings on the port engine nacelle and had the Red protective intake cover in place. The Red refueling light is visible just forward of the pilot's windscreen. (Author)





Ordnancemen check the internal bomb locks on the starboard inboard weapons pylon of an A-6E (TRAM) Intruder prior to loading a Harpoon air-to-surface (ASM) missile at the Pacific Missile Test Center (PMTC) which is located at Naval Air Station Point Mugu, California. (PH1 Jerry Jolin USN)



This A-6E TRAM of VA-65 aboard the USS EISENHOWER (CV-69) is carrying a two thousand pound GBU-10 Laser Guided Bomb (LGB) on the number two stores station (inboard port wing pylon). The main body of the bomb is Medium Blue which indicated that it was a training bomb. The rear fin area and the nose are Olive Drab. (Grumman)

This A-6E TRAM of VA-75 Sunday Punchers off the USS JOHN F. KENNEDY (CV-67) carries thirty-four DESERT STORM mission markings on the nose in Black just in front and below the aircraft side number . The weathering and use of different shades of Gray for touch ups during maintenance makes the aircraft appear very patchy. (Author)



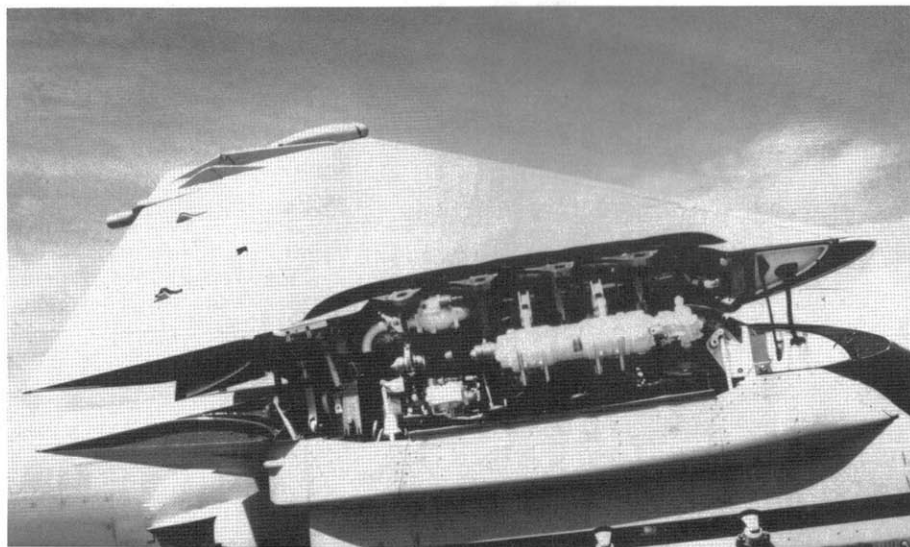
A-6E TRAM Composite Wing

The A-6 Replacement Wing program was established by the Navy to correct a wing fatigue problem which was limiting the service life of the A-6 fleet and to increase its strength capability for an anticipated follow-on model, the A-6F. The existing A-6E wing was rebuilt using high technology composite materials as a method of maintaining the wing's existing weight while gaining additional load carrying capability and service life for the current A-6 fleet. The A-6 Replacement Wing program is intended to extend the life of the current A-6 fleet until an appropriate replacement is introduced into service.

During the early 1970s it was recognized that the Navy fleet of approximately 339 A-6Es needed a wing rebuild program to maintain this important component of the Navy's Air Arm. The Navy, however, had experienced some fifty percent less fatigue life with the metal wing than they expected and the program was delayed. During 1985 the Navy, via an Invitation for Bid (IFB) awarded Boeing Military Airplanes (BMA) a contract to provide new wings for the existing A-6E fleet.

Boeing proposed a wing constructed primarily of graphic/epoxy composite materials, which would be both lighter and stronger than the current all metal wing. This was accepted and the first production composite wing was delivered during May of 1988. The first A-6E fleet aircraft modified with the new wing was BuNo 155682, which made its first flight on 3 April 1989.

The wing fold mechanism and the number 5 pylon of an A-6E TRAM Composite Wing. The new wing permits the flaps and slats to be operated with the wings are in the folded position, permitting below deck maintenance of these systems. Earlier A-6s had to have the wings spread in order to perform maintenance on the slats and flaps. (Author)



The new composite wing significantly improves the performance, survivability and service life of the A-6. The wing provides for an eighteen percent increase in gross weight capability, is equipped with a new outboard self-defense weapon (air-to-air missile) station, ALR-67 wingtip provisions, split center-wing fuel cell (which will enhance survivability), more accurate fuel-gauging components, corrosion-resistant wing materials, flaps and slats that operate with the wing folded for below deck maintenance and an 8,000 hour service life.

On 27 September 1993, the Navy announced that it was canceling the contracts with Boeing and Grumman for the composite wing program

A-6E SWIP

The A-6E SWIP is the designation applied to A-6Es with standoff weapons capability. These aircraft are wired to carry and fire the AGM-65E/F Maverick, AGM-84 Harpoon, AGM-88 HARM and AGM-84E SLAM. These A-6Es have a fully digital missile fire control system and other internal improvements. It was intended that all A-6E SWIP aircraft would have the new composite wing; however, delays in the rewing program have led to three sub types within the program; A-6E SWIP (with metal wings), A-6E SWIP Block 1 (with composite wing) and A-6E SWIP Block 1A aircraft which will also have the composite wing. The first A-6E SWIP Block 1A aircraft is expected to fly during early 1994 and will incorporate the ASN-139 INS, ARN-118 TACAN, GPS system and a new headup display (HUD).

This was one of the A-6Es (BuNo 152941) used by Boeing as a Composite Wing testbeds at their Wichita plant. The inside of the boarding ladder well and the boarding ladder itself is Insignia Red. The pylon on the number one stores station is quite different from those used on standard A-6Es and has a bulge on the outboard side. (Boeing)



A-6F

The A-6F Intruder prototype (BuNo 162183) made its maiden flight on 26 August 1987 at the Naval Air Facility, Calverton, Long Island. The A-6F was to be the most advanced all-weather attack aircraft the Navy and the Marines had ever flown. It was to be powered by two 10,080 lbst F-404-GE-404 engines that provided a fifteen percent increase in power over the current Pratt and Whitney engines (more than enough thrust to compensate for the extra weight of the A-6F's improvements).

The A-6F was to incorporate an improved radar with sharper resolution, longer range and additional modes of operation (including an air-to-air mode for self defense). The new air-to-air radar capability would have enabled the crew to track airborne targets and launch missiles such as the AIM-9 Sidewinder and the AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM). These missiles were to be carried on two new wing stations, one on each wing.

Although the A-6F looked similar to the A-6E TRAM it differed from the earlier aircraft in a number of ways. The General Electric F-404 engines necessitated deeper engine nacelles, a reduction in size of the radar antennas made it possible to use a smaller radome and there were a number of new vents and air scoops, including two large ram air intake ducts for the electronics compartment just forward of the vertical stabilizer. There are ECM receivers mounted above the wing fuel tank overboard vents (which was incorporated into the A-6E SWIP). Unfortunately with various defense cutbacks, the A-6F program was canceled during 1988.

A-6G

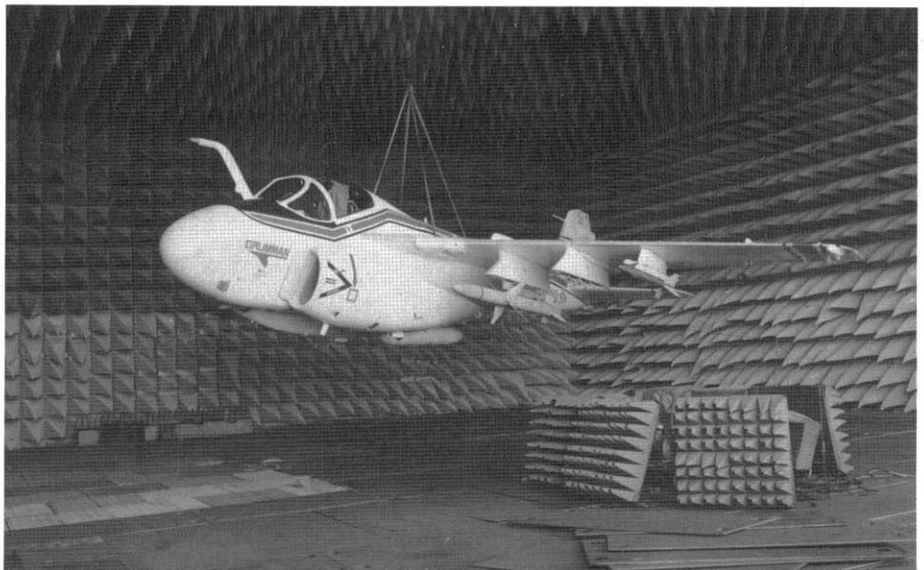
The A-6G program was an attempt by the Navy and Grumman to salvage the improvements on the Intruder that were intended for the A-6F by dropping the re-engining portion of the program. In the event, the program was canceled before a prototype was even started.

The third A-6F Intruder II prototype (BuNo 162185) takes off on another test flight. The small bulge at the base of the refueling probe houses the AN/ALQ-126 receiver antenna. The DSD logo on the tail stands for Digital Systems Development. (Grumman)



The number 1 A-6F prototype was fitted with a large test probe on the radome and carried an overall Gloss White paint scheme with thin Red stripes and a broad Blue bands on the fuselage and fin. There is a small additional stores station on the outer port wing, which was intended to carry self-defense missiles, such as the AIM-9 Sidewinder or AIM-120 AMRAAM (Grumman)

The number 2 A-6F prototype (BuNo 162184) was suspended in the Grumman Calverton anechoic chamber for electronic systems testing during 1987. The enlarged engine bays housed 10,700 lbst smokeless General Electric F-404-GE-404 turbofan engines, giving the A-6F a considerable increase in available power. The aircraft carries a HARM missile on the inboard pylon and a dummy AIM-9 Sidewinder on the new outboard self-defense pylon. (Grumman)



Electronic Intruders

EA-6A INTRUDER

The EA-6A was the first electronic warfare variant of the A-6A and was originally identified as the A2F-1H. Lew Scheuer was the Project Engineer that broached the concept of an Intruder outfitted with an integrated set of electronic systems capable of jamming enemy radars. Active work on this project began in August of 1961 and the prototype (BuNo 148618) made its first flight on 26 April 1963. The second A2F-1 test aircraft (BuNo 147865) had a number of aerodynamic changes, the most prominent being the fintip electronics fairing on the tail. This was necessary to accommodate some of the thirty antennas used in the AN/ALQ-86 receiver/surveillance system, the AN/ALQ 41 I and J-Band track breaker and the AL/ALQ-100 protection system. Additionally, the wing tip speed brakes were also omitted and an eight inch plug was added just behind the radome to accommodate the new ECM installation.

A considerable amount of the electronic countermeasures (ECM) equipment was pod-mounted on the underwing pylons. The wing mounted AN/ALQ-76 pods, which are the primary jammers, are supplemented by an AN/ALQ-55 communications jammer. This system radiates through a large blade antenna mounted on the nose gear door.

The EA-6A also employs a chaff dispenser set that ejects countermeasures chaff to disorient enemy radars. The chaff is dropped from two chutes located side by side in the bottom of the "birdcage" aft equipment rack. Additional chaff dispensers are pod mounted on the outer wing pylons. The chaff dispenser unit located in the aft equipment rack was also capable of

This ex-China Lake EA-6A test aircraft was at NAS Lakehurst, New Jersey during March of 1973 for use in catapult tests at the Lakehurst land based catapult facility. The aircraft was designated NEA-6A. The N signified that the aircraft cannot be modified, the Bureau Number is suspect since Grumman's Aircraft Location Report of 1984 listed this aircraft as an administrative strike (write off) and identified it as a standard A-6A. (Roger Besecker)



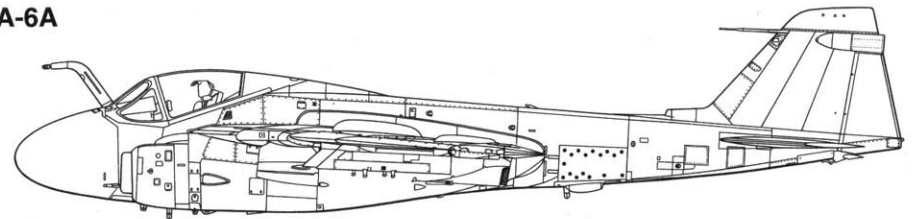
An EA-6A of VMJ-1, without underwing jammer pods, lands at Atsugi Air Base, Japan in January of 1970. The EA-6A has a large VHF blade antenna mounted on the forward portion of the nose gear door and the pitot tube was relocated from the fin to the port wingtip. (Lionel Paul)

ejecting flares to deceive infrared detection systems. Although most of the A-6A's attack avionics were removed from the EA-6A, the aircraft was still capable of delivering a sizable weapons payload, should the need arise.

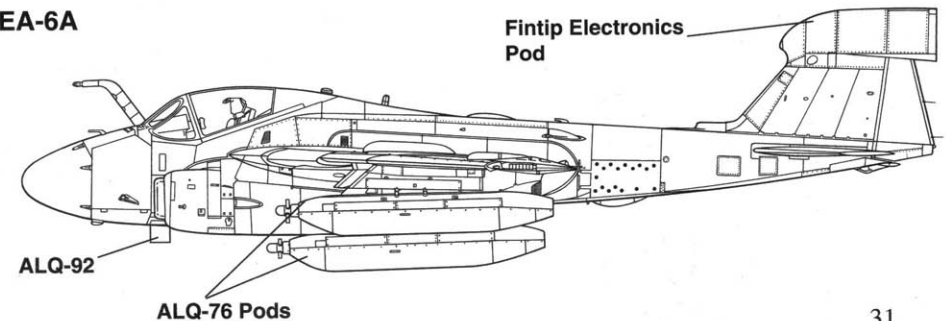
Initially, the EA-6A served with three Marine squadrons VMJ-1, 2 and 3. When these squadrons disestablished, the aircraft were reassigned to other Marine and Navy squadrons, namely VMAQ-1 (formed in 1975) and VMAQ-4 (1981), VAQ-209, VAQ-309 and VAQ-33. A total of twenty-seven EA-6As served with the Navy and Marine squadrons, including BuNos 147865, 148616, 148618, 149475, 149477, 149478, 151595-151600 and 156979-156993.

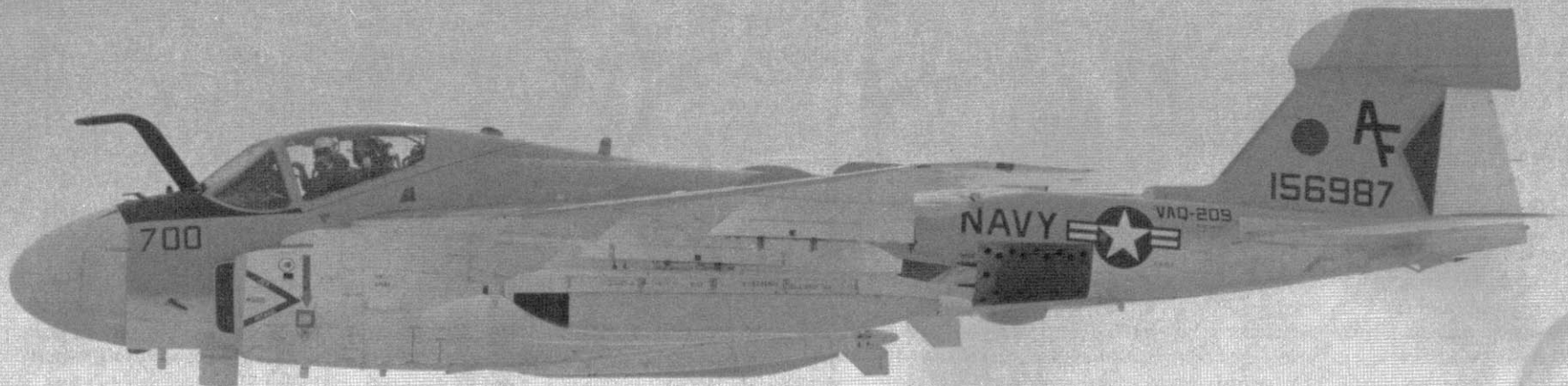
Fuselage Development

A-6A



EA-6A





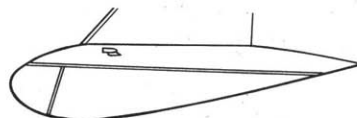
An early EA-6A of VAQ-209 based at Naval Air Station Norfolk, Virginia. The tail markings are a Green triangle outlined in Gold lined up against the White rudder. A Green circle was located above the BuNo on the fin. This style of unit marking was carried for only a very short time during 1979. (USN)

The EA-6A proved its effectiveness during the Viet Nam War and played a vital role in the history of aerial electronic warfare. It became readily apparent; however, that to keep pace with the increasing electronic warfare countermeasures battle; more equipment, space and systems operators, would require a totally new aircraft.

This Marine EA-6A of VMCJ-2 at Marine Corps Air Station Cherry Point, North Carolina during July of 1975 was named FAT CAT and carried the name on the fuselage side just behind the radome in Black. The Intruder carries an ALQ-86 pod on the number 2 station instead of its more normal position on the centerline. (Dick Starlnchak)



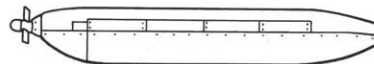
ECM Pods



ALQ-53 Passive Receiver
(EA-6A Only)



ALE-32 Chaff Pod



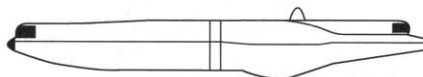
ALQ-76 Jammer Pod



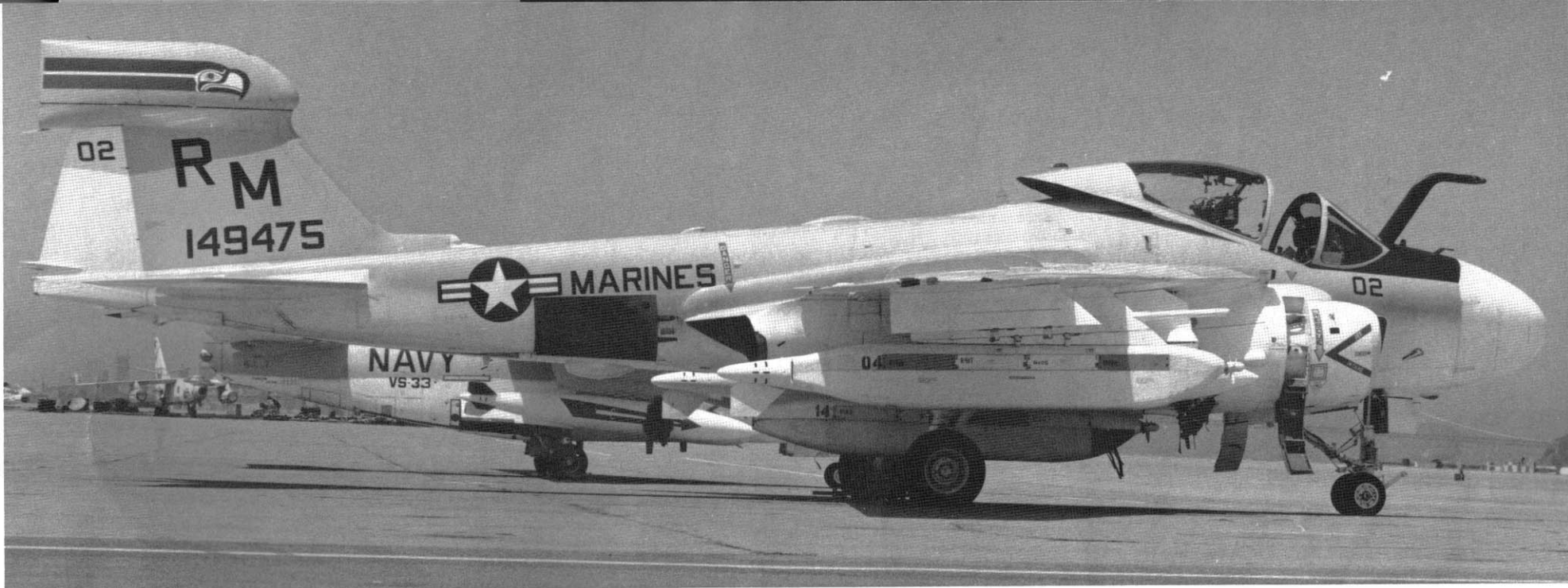
ALQ-54 Passive Receiver Pod



ALE-41 Chaff Pod



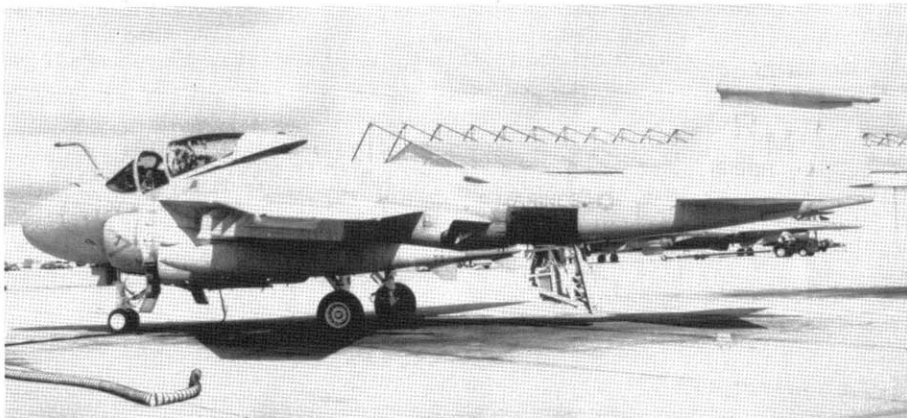
ALQ-86 Jammer Pod



An EA-6A of VMAQ-4 on the ramp at NAS Alameda, California. The squadron was based at NAS Whidbey Island, Washington and used the Seattle Sea Hawk NFL football team's logo as its tail markings. An AN/ALQ-76 Tactical Jammer System Pod is mounted on the number 5 station (outboard starboard wing pylon). (Tom Chee via Don Linn)

(Right) This EA-6A of VAQ-209 Star Warriors clearly shows the three wing fences on the port wing and the AN/ALQ-76 jammer transmitter pod on stores station number one (outboard port wing pylon). VAQ-209 is a reserve unit stationed at NAF Andrews. (B. Trombecky)

A (RECAP) EA-6A Intruder of VMAQ-4 on the ramp at NAS Cecil Field during February of 1989. The small "beer can" antenna fairing on the lower portion of the tail cap radome and the "sawtooth" at the base of the air refueling probe indicate that this aircraft has had the AN/ALQ 41 and AN/ALQ/100 ECM systems replaced by AN/ALQ 125 and 126B ECM systems. This aircraft also had the Doppler navigation radar system replaced (J. Tunney)



EA-6B Prowler Standard

The first EA-6B was built from the fifteenth A-6A (BuNo 149481) produced by Grumman. This flying demonstrator took to the air on 25 May 1968 piloted by Grumman test pilot Don King, and served primarily as an aerodynamic test bed. The second prototype designated an NEA-6B (BuNo 149479) was converted from the thirteenth A-6A produced by Grumman and was used mainly in systems flight trials. The third NEA-6B (BuNo 148615) was another rebuilt A-6A and was used as the static electronic test aircraft. It spent a considerable amount of time in the anechoic chamber at Grumman's Calverton facility as a test bed for the tactical jamming system.

Grumman then produced five pre-production aircraft (BuNos 156478-156482) between April of 1968 and March of 1970. Of these, BuNo 156478 is now in storage at Grumman, BuNos 156479 and 156480 have been stricken from the inventory, and BuNo 156482 had the distinction of being designated as the Advanced Capability (ADVCAP) development aircraft. Grumman produced twenty-three EA-6B Standard models between January of 1971 and November of 1972 — Bureau Numbers 158029-158040, 158540-158547 and 158649-158651.

The fourth pre-production EA-6B Prowler (BuNo 156481) on the ramp at the Naval Air Test Center, NAS Patuxent River, Maryland during early 1971. The aircraft carried the designation P4 on the top of the rudder. The pilot's access step was in the down position as was the port boarding ladder. (USN)

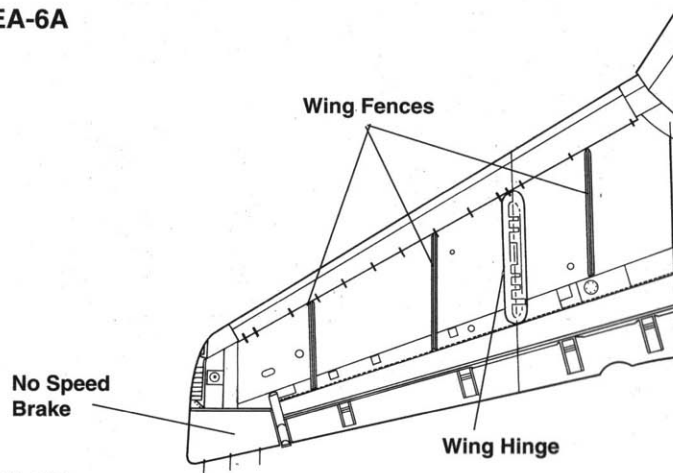


The EA-6B Standard differed from the earlier EA-6A in a number of ways. It had a longer fuselage with a fifty-four inch fuselage extension added to accommodate an enlarged cockpit for its four member crew. In addition, the nose gear and the main gear was strengthened, as was the tail hook truss. A new inboard slat and a modified wing to fuselage fillet was also added to the wing and the aircraft had a slightly smaller radome.

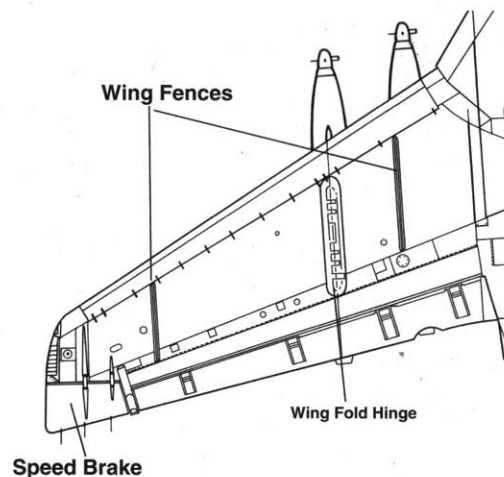
The first fleet standard EA-6Bs, named the Prowler by Grumman, went to VAQ-132 during 1971 while VAQ-136 received the last standard EA-6Bs during March of 1977. All EA-6B Standards, exclusive of the eight that were stricken from the inventory were later rebuilt to ICAP configuration. The long range plan was to upgrade all EA-6Bs to the current model; however, budget constraints have made this a slow process.

Wing Development

EA-6A



EA-6B





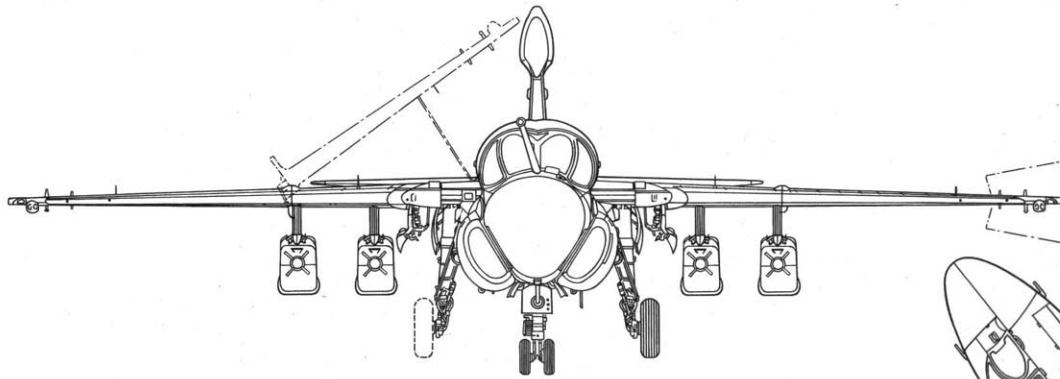
The underside of the centerline station of an EA-6B (looking forward) showing the rear of an early low band AN/ALQ-99 jammer pod which had a wider bottom than the pod now in use. The four curved pipes are engine bay vents. (Bruce Trombecky)



An EA-6B Standard Prowler of VAQ-130 off the USS NIMITZ parked on the transit line at NAS North Island, California. The probe extending from the outboard pylon is the antenna for the AN/ALQ-100 ECM system. (Bruce Trombecky)

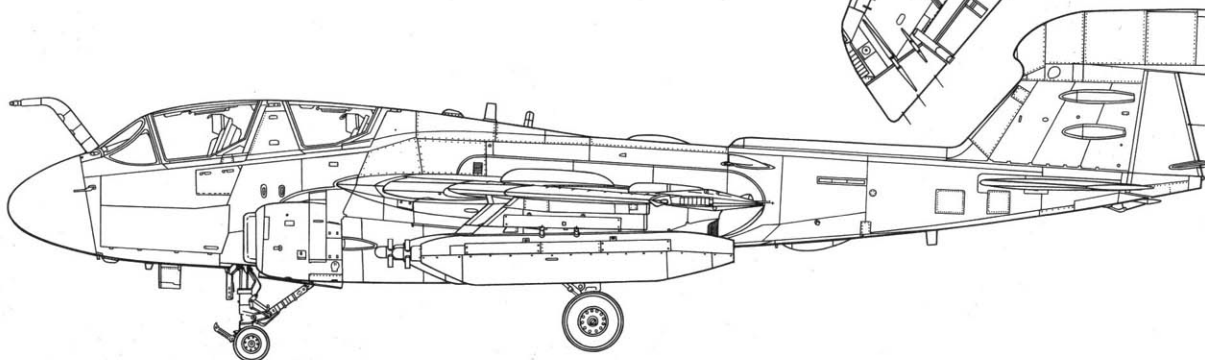
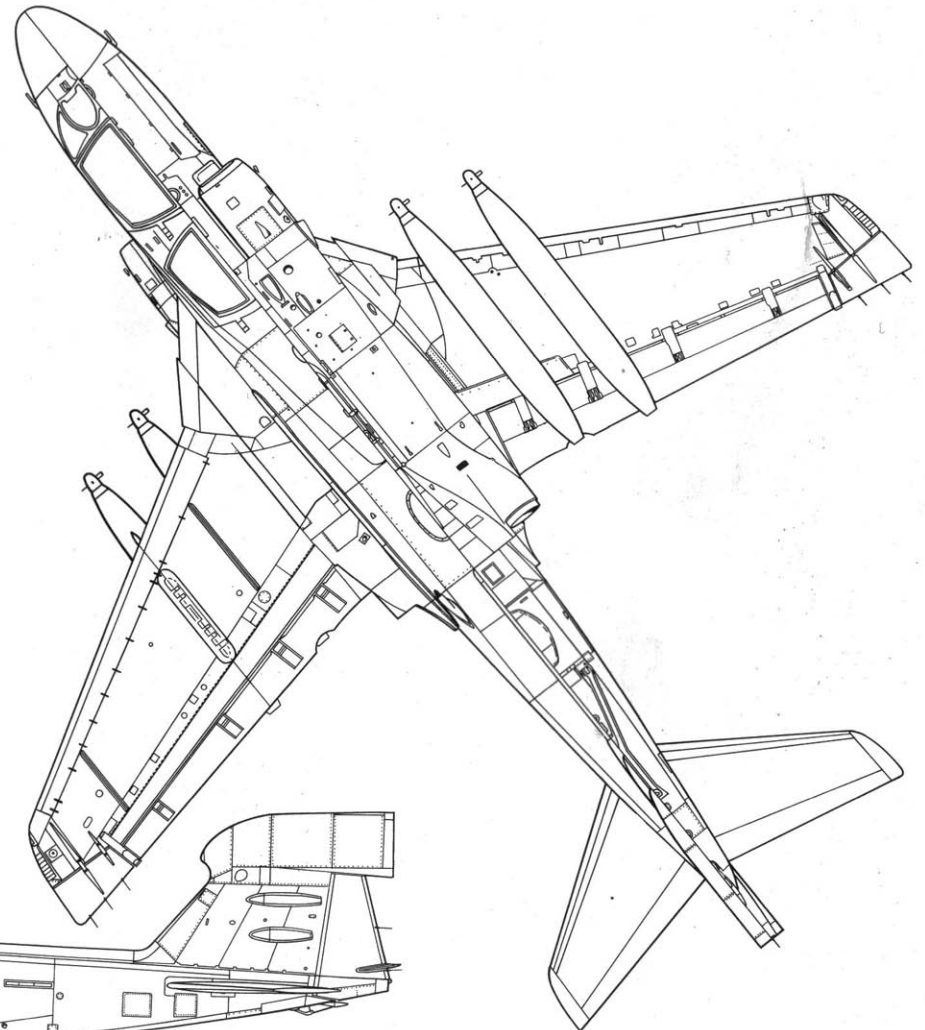
This standard EA-6B of VAQ-130 reveals a number of details. The pod on the rear section of the lower fuselage houses the Doppler radar antenna, there is a Yellow formation light in the Blue field of the national insignia (both sides) and there are pylon lights at the top of the trailing edge of both outboard wing pylons. (Bruce Trombecky)





Specification Grumman EA-6B Prowler

Wingspan	53 feet (16.15 m)
Length	59 feet 10 inches (18.23 m)
Height	16 feet 3 inches (4.93 m)
Empty Weight	32,162 pounds (14,588 kg)
Maximum Weight	60,610 pounds (27,492 kg)
Powerplant	Two 11,200 lbst Pratt & Whitney J52-P-408 turbojet engines
Armament	Two AGM-88A HARM missiles
Speed	659 mph (1,060 kph)
Service Ceiling	38,000 feet (11,582 m)
Range	2,022 miles (3,254 km)
Crew	Four



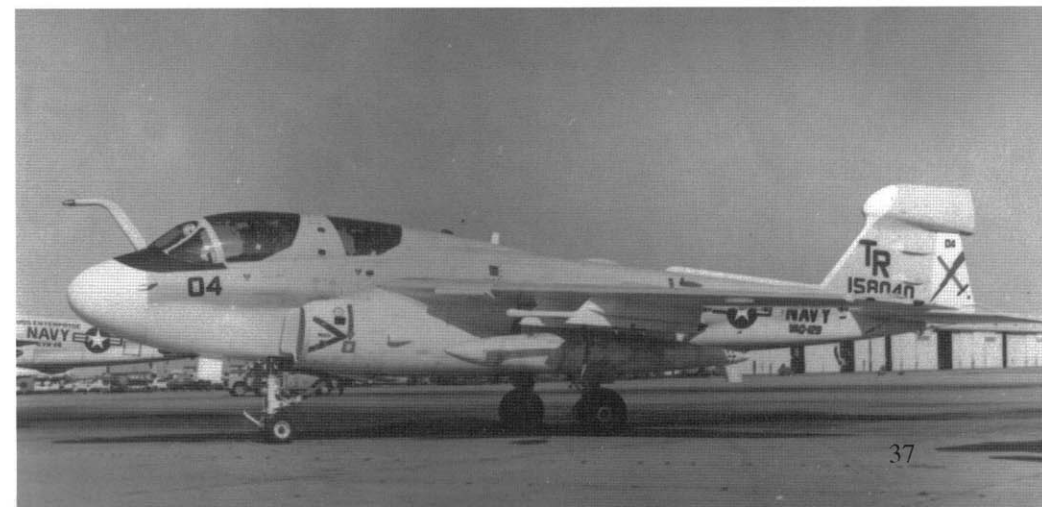


An EA-6B Standard (BuNo 158542) of VAQ-130 carries a Black triangle with a White number 8 in the center, identifying this Prowler as being assigned to Carrier Air Wing Eight. This marking on the center of the nose is used by the Landing Signal Officer (LSO) to help him distinguish the Prowlers from Intruders on final approach to the carrier. (Bruce Trombecky)

A standard EA-6B of VAQ-131 Lancers on the ramp at NAS Lemoore, California during 1973. VAQ-131 became the second EA-6B operational squadron and saw action in the Vietnam war as part of Carrier Air Wing 14. (Lionel Paul)



A very clean standard EA-6B (BuNo 158040) of VAQ-129 on the ramp at Naval Air Station Lemoore, California during April of 1972. This squadron is the EA-6B Fleet Replacement Squadron (FRS) and is home based at Naval Air Station Whidbey Island, Washington, the home for all west coast A-6 and EA-6 squadrons. (Bruce Trombecky)



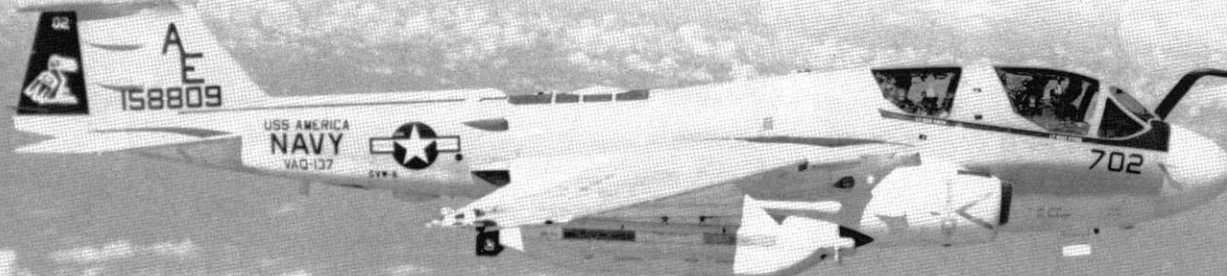
EA-6B Prowler EXCAP (Expanded Capability)

Even though the EA-6B EXCAP doubles the frequency capability of the EA-6B Standard, it is externally identical to the earlier variant. Twenty-five EXCAPS were built — BuNos 158799 -158817 and 159582-159587. The EXCAP was re-engined with more fuel efficient, 11,200 lbst J52-P-408 engines in place of the earlier 9,350 lbst J52-P-8A engines.

VAQ-133 Wizards was the first squadron to receive the EA-6B EXCAP variant of the Prowler, making their maiden cruise aboard USS AMERICA (CV-66) beginning in January of 1974. Other EXCAP versions of the EA-6B served with VAQ-129, 131, 132, 134, 137 and 138. VAQ-133 was the last Prowler squadron to employ the EXCAP model.

(Right) The pilot's instrument panel of an EA-6B EXCAP Prowler is dominated by the video screen in the center which is the Vertical Display Indicator (VDI - attitude). Directly below the is the hooded search radar scope. The protruding shaft with the circular handle is the landing gear handle/isolation valve switch. (USN)

An EA-6B EXCAP of VAQ-137, Carrier Air Wing Six (CVW-6) embarked aboard the aircraft carrier USS AMERICA (CV-66) during a Mediterranean cruise during December of 1980. EXCAP Prowlers are re-engined with 9300 lbst J52-P-408 engines and have double the jamming capability of the standard EA-6B.(USN)





This VAQ-133 Wizards EA-6B EXCAP carries the standard Gloss Gull Gray and White scheme. The EA-6B has only two wing fences while the earlier EA-6A carried three fences. The fairings on the wingtip are the hinges and actuator for the wingtip speed brake. (Bruce Trombecky)



An EA-6B EXCAP Prowler (BuNo 158811) of VAQ-129 comes to rest on its port wingtip after the port main landing gear failed during an arrested landing at Naval Air Station Whidbey Island during July of 1981. The aircraft has four mirrors on the inside of the forward canopy framing. (USN)

A VAQ-132 Scorpions EA-6B EXCAP Prowler parked on the ramp at NAS North Island, San Diego, California during February of 1972. The NG is Yellow outlined in Black, the Scorpion is Red and the lightning bolt is Yellow while the number 623 is in Black. The front tip of the ECM pod on the tail is Medium Gray. (Bruce Trombecky)

This EA-6B EXCAP of VAQ-133, on the ramp at Abbotsford, British Columbia, Canada during August 1973, carried the Air Wing Eight (CVW-8) logo just to the rear of the canopy. The top half of the rudder was Maroon and the lower half was Black. The stylized trident was Red with a White outline. VAQ-133 was the first fleet squadron to receive the EA-6B EXCAP. (Lionel Paul)



EA-6B Prowler ICAP I (Improved Capability)

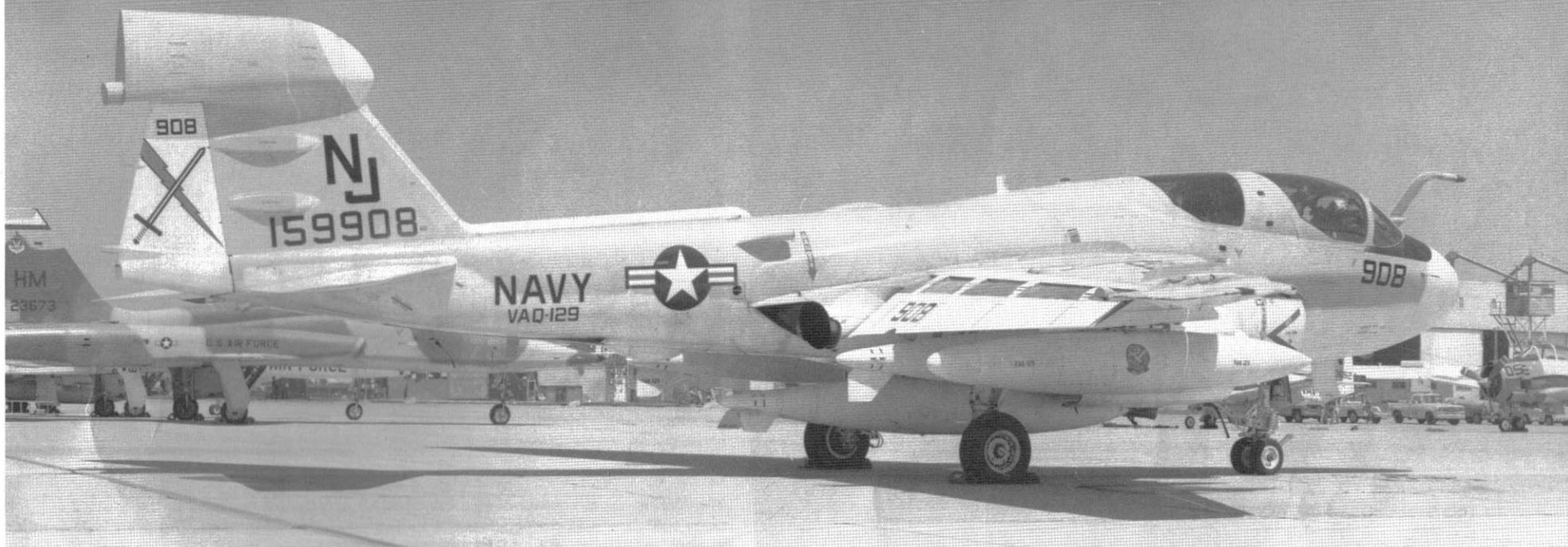
The major internal difference between the ICAP and EXCAP variants of the EA-6B Prowler involved moving the ALQ-99 system to the back seat and changing the duties of the electronic countermeasure officer from ECM to navigator/co-pilot. Another very important change was a more logical arrangement of crew member responsibilities among the four man crew. The pilot's cockpit displays were also modified. Forty-five Prowlers — BuNos 159907-159912, 160432-160437, 160409, 160704-160709, 160786-160791, 161115-161120, 161242-161247, 161947-161352 and 161774-161775 were built to the IACP configuration. The ICAP I joined the fleet in March of 1976.

Externally there were two main differences between the EA-6B ICAP and the EA-6B EXCAP, namely the location of the AN/ALQ-126 receiver antennas. One is located in the "sawtooth" protrusion at the base of the refueling probe and the other is located in a small "beer can" shaped extension on rear of the fin tip ECM antenna pod. The first EA-6B ICAP (BuNo 159907) made its first flight in July of 1975. VAQ-135 was the first squadron to take the ICAP to sea, deploying with CVW 8 during 1977 aboard the USS NIMITZ (CVN-68). Ten squadrons received ICAP-I aircraft, VAQ-129, 130, 131, 132, 134, 135, 136, 138, 139 and one Marine Corps squadron, VMAQ-2.

The first EA-6B ICAP I (BuNo 159907) on the ramp at the NATC, NAS Patuxent River during July of 1976. There are two external changes between the EXCAP and ICAP, the "beer can" extension on the fin tip and the AN/ALQ-126 antenna "sawtooth" at the base of the refueling probe. (Jim Sullivan)



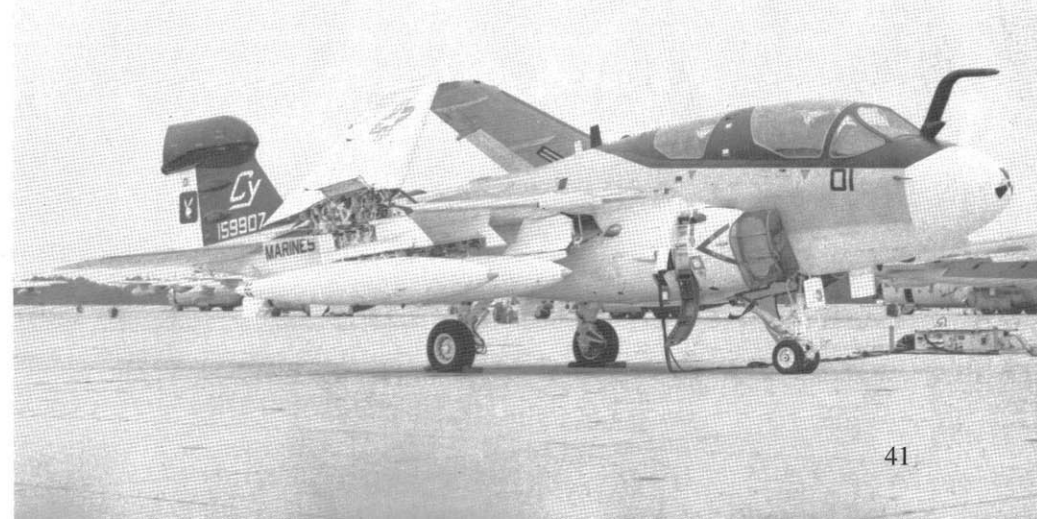
The EA-6B ICAP Prowler featured a modified refueling probe that housed an AN/ALQ 126 ECM antenna in the "sawtooth" housing at the base of the probe. The small object just in front of the side number is the starboard pitot tube and the bulge under the fuselage just behind the radome is the Red anti-collision light. (Author)

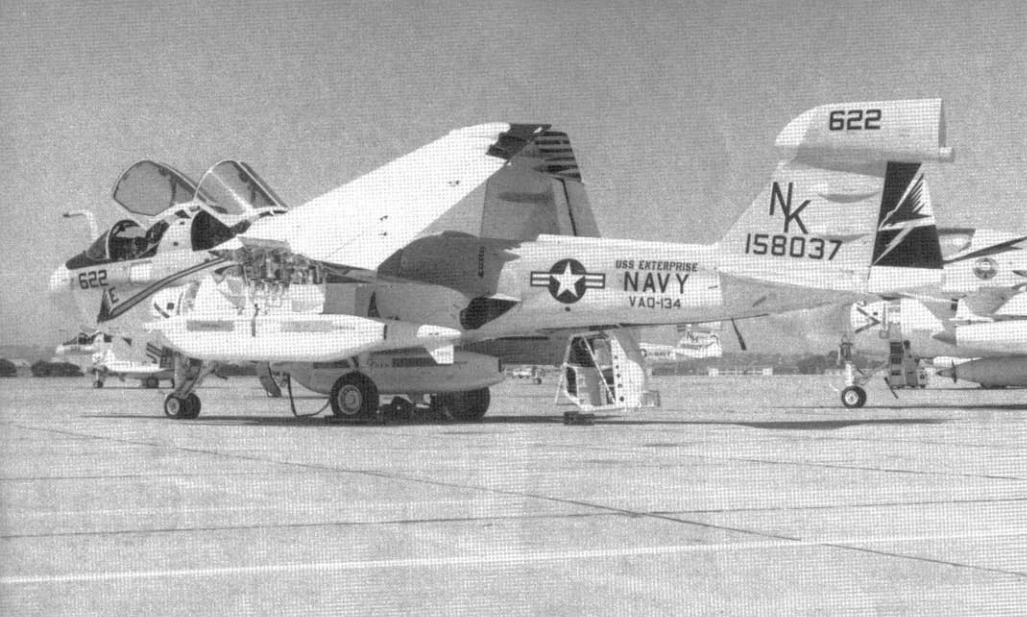


The second EA-6B Prowler ICAP I was assigned to VAQ-129. The blisters on the fin housed antennas for the AN/ALQ-99 I band jammers, while the small round object at the base of the rudder is the Red position light. The interior color of the trailing flaps is Red, as is the interior color of the leading edge slats. (Bruce Trombecky)

This EA-6B ICAP I (BuNo 159907) Prowler was assigned to the only Marine Corps squadron to receive the ICAP I, VMAQ-2 Playboys at Marine Corps Air Station Cherry Point, North Carolina during June of 1982. The tail and cockpit areas are Black, the CY and numerals are White. (Jim Sullivan)

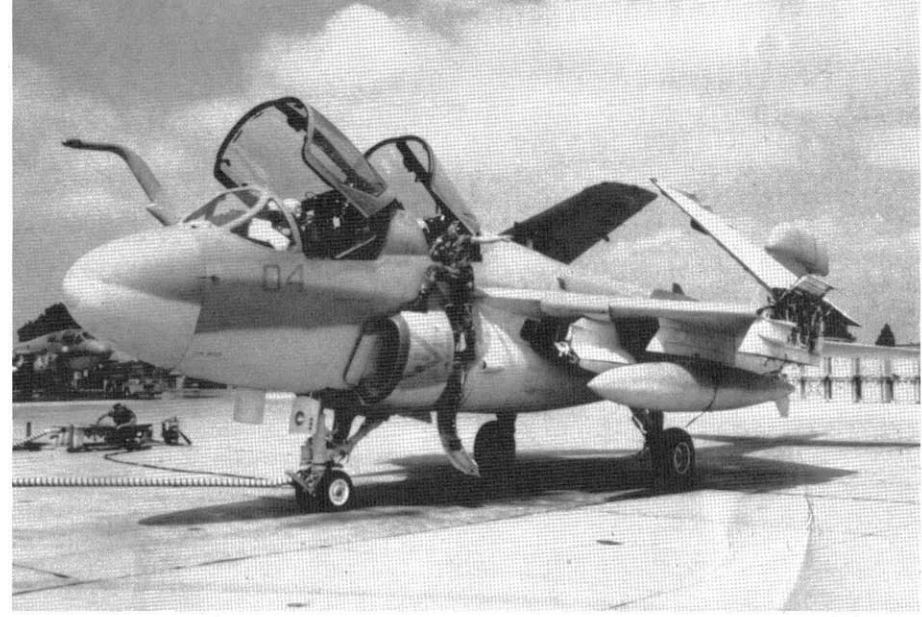
This EA-6B Prowler ICAP I of VAQ-135 Black Ravens assigned to USS NIMITZ. The port boarding platform on the pilot's side is in the open position and both boarding ladders are in the lowered position. The raised canopies have a Goldish tint unlike the windshield, which is clear. (Bruce Trombecky)





This EA-6B ICAP I of VAQ-134 has the rear equipment platform in the lowered position and the wings folded. This aircraft was one of the seventeen EA-6B Standards that were upgraded to ICAP I standards. Unfortunately, this aircraft was lost in an accident on 17 December 1979. (Bruce Trombecky)

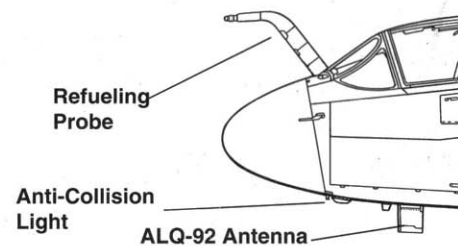
An EA-6B ICAP I of VMAQ-2 on the ramp at Naval Air Station North Island, San Diego, California during September of 1978. The aircraft was assigned to the squadron commander and carried the side number 000 or "triple nuts". The Playboy bunny was also carried on the fins of the 300 gallon fuel tanks in Black. The area around the canopy and tail was Gloss Black with the exception of the forward area of the fin tip pod which was Flat Black. (Author)



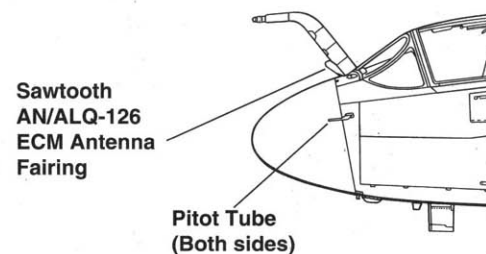
The Marine plane captain of this EA-6B ICAP of VMAQ-2 beckons to the ground support team that the ECM Officer needs a bad oxygen mask replaced. The pilots are wearing overall White helmets with Red squares. (Author)

Nose Development

EA-6B Standard



EA-6B ICAP

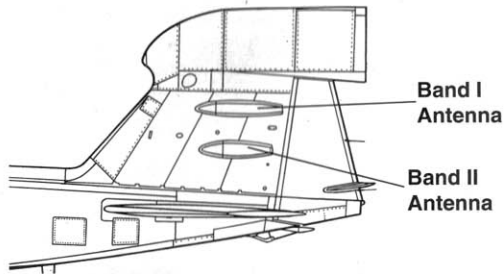




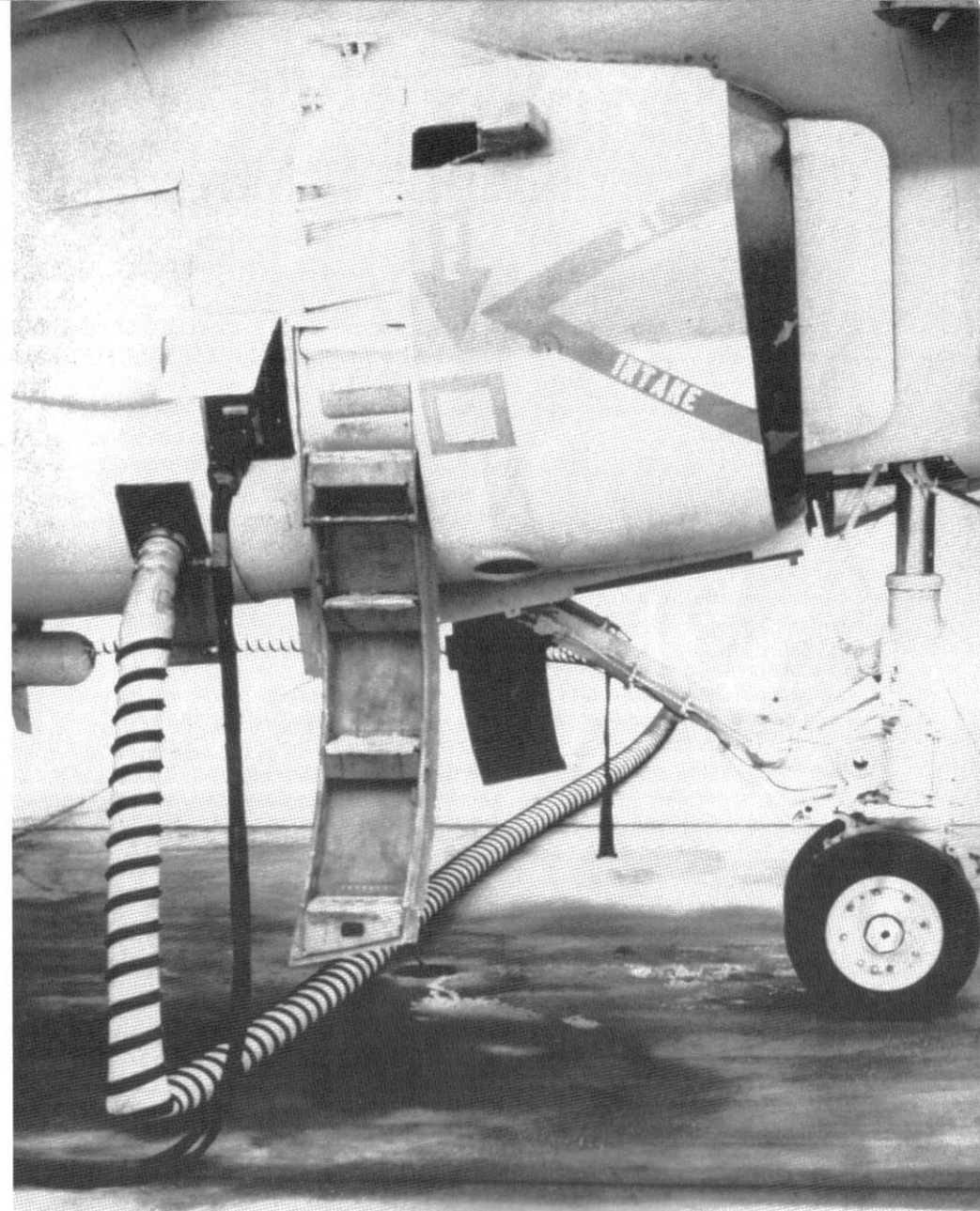
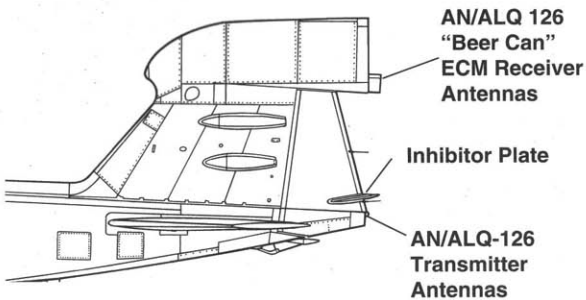
A group of Marine ground crewmen receive on-the-job-training (OJT) from an expert on the proper way to use a small start unit to start an EA-6B. The starter unit is overall Yellow with Red warning markings. The hose is attached to the Prowler in the starting receptacle which is located just to the rear of the boarding ladder. (Author)

Fin Antenna Development

EA-6B
Standard



EA-6B
ICAP



The starter cart hose is attached to receptacle on the starboard side of the EA-6B just to the rear of the aircraft boarding ladder. The heavy Black cord just ahead and above the start cart hose is the power cord from the external power cart that supplies the aircraft with electrical power. (Author)

EA-6B ICAP II (Improved Capability II)

The first production example of the ICAP II variant was BuNo 161776, which was delivered to the Naval Air Test Center (NATC) at NAS Patuxent River, Maryland during late 1983. The ALQ-99 pods were reworked to incorporate new exciters which enabled each of the pods to jam two different bands. Forty-one of the ICAP IIs were built, BuNos 161776-161885, 16223-162230, 162934-162939, 163030-163035), 163044-163049 and 163395-163399. In addition fifteen EXCAP variants were updated to ICAP II standards.

Two very significant add-ons to the Prowler came on line with the introduction of the ICAP II. Starting with the thirteenth ICAP II production model (BuNo 162225) the Prowler was given the capability to act in concert with other Prowlers to provide a joint jamming capability using the tactical air navigation system (TACAN) antenna for coordinated jamming. ICAP II Prowlers can also carry the Texas Instruments AGM-88A High Speed Anti-Radiation missile (HARM). This was the first Prowler variant to be armed.

Starting with BuNo 163049 three new swept-back antennas were added, two are located on top of the fuselage and the third is positioned under the nose. The ventral Doppler radar antenna located on the underside of the rear fuselage was also eliminated.



The first EA-6B ICAP II Prowler (BuNo 161776) on the ramp at Naval Air Station Whidbey Island NAS during August of 1985. The aircraft was assigned to VAQ-133 aboard the USS ENTERPRISE and carried the dull but highly effective tactical low visibility Gray paint scheme. (Bruce Trombecky)

An EA-6B ICAP II Prowler of VAQ-133 on the ramp at Naval Air Station Oceana, Virginia during a visit to the east coast during October of 1988. The Black "S" on the fuselage between the cockpits indicates that the squadron was the recipient of the Chief of Naval Operations (CNO) safety award. (Author)





An EA-6B ICAP II Prowler of VAQ-138 Yellow Jackets climbs away from USS CONSTELLATION (CV-64). The aircraft is carrying an AGM-88A High Speed Anti-Radiation (HARM) missile on the starboard inboard pylon. The ICAP II was the first variant of the EA-6B Prowler to be armed. (USN)

An EA-6B IACP II Prowler of VAQ-138 Yellow Jackets on the ramp at Naval Air Facility Andrews, Washington, D.C. during September of 1987. The exhaust covers are Black with a Yellow Jacket positioned in the center. The squadron number was also carried on the fin of the 300 gallon fuel tanks. (David F. Brown)



The most recent VAQ squadron is VAQ-142 Grim Watchdogs, which was established as the thirteenth EA-6B Prowler squadron on 1 June 1988. This VAQ-142 aircraft was visiting NAS Cecil Field NAS in August of 1989. The blotchy appearance of the aircraft shows the intense effort of maintenance personnel to control corrosion. (Jim Tunney)

A VAQ-131 EA-6B ICAP II Prowler at Naval Air Station Fallon, home of the Navy's Strike school. This squadron had the distinction of being the first to operate the first four variants of the EA-6B. The aircraft is fitted with a Tactical Air Combat Training System (TACTS) pod on the outboard pylon. The pod is an overall Reddish Orange with a Black section just to the rear of the nose probe. (Bruce Trombecky)

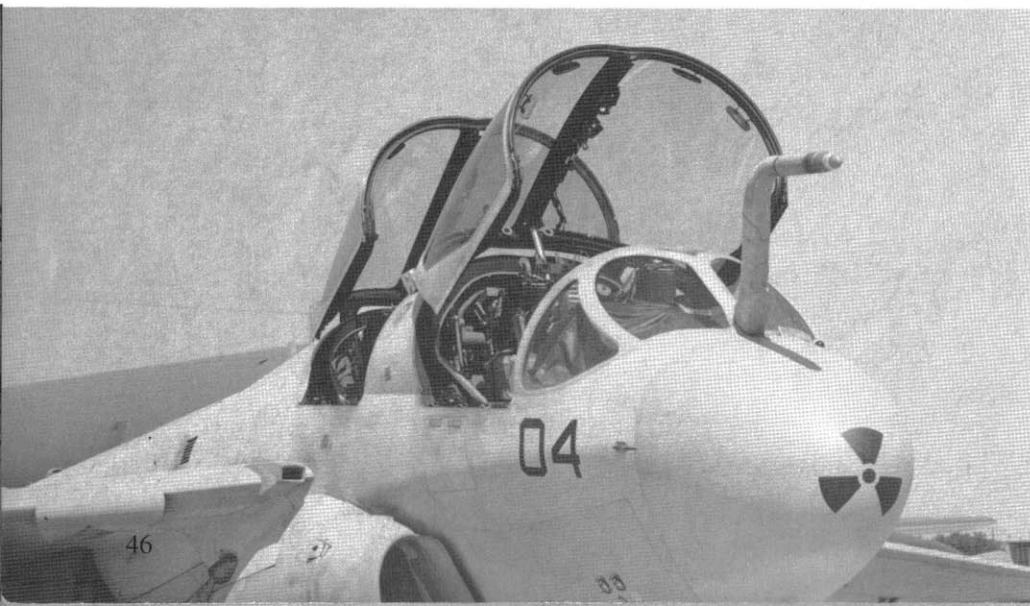




This ICAP II EA-6B of VMAQ-1 Screaming Banshees on the ramp at Dallas Love Field reveals the arrangement of the rear view mirrors on the front canopy framing, the "saw-tooth" ECM antenna fairing on the refueling probe and air intake in the starboard wing root. (Nick Waters III)

An EA-6B ICAP II of VAQ-130 flies over the USS JOHN F. KENNEDY (CV-67) during Operation DESERT STORM. The aircraft is armed with an AGM-88 HARM anti-radiation missile on the inboard pylon. (USN)

The Screaming Banshees of VMAQ-1 operate five IACP II EA-6Bs from their home base at Marine Corps Air Station Cherry Point, North Carolina. The squadron was formed on 1 July 1992 from the assets of Detachment X of VMAQ-2 Playboys. (Nick Waters III)



A KA-6D tanker of VA-52 on takeoff from USS KITTY HAWK (CV-63) during Vietnam combat operations in the Summer of 1972.



An EA-6B Prowler of VMAQ-2 flies off the North Carolina coast near its home base at Marine Corps Air Station Cherry Point, NC.

