

# U.S. AIRPOWER AT SEA

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# INTRODUCTION

If you have never been aboard an aircraft carrier, your first visit will be a surprise. First, the size is overwhelming. The USS Enterprise, CVN-65, for example, is 1,123 feet long with a breadth of 257 feet. Its flight deck area is 4.47 acres and its height, keel to mast top is 250 feet, equal to a 25 storey building. An aircraft carrier is quite simply the largest warship in the world. Next, the activity level is astonishing. Thousands of crewmembers make their homes in these floating cities and, particularly when air operations are underway, the combination of action and clamor is difficult for the novice to endure. In the bowels of the monster below the flightdeck, one is occasionally unaware of being on a ship at sea. Shops, huge dining halls, a post office, television and radio stations, library, recreation areas, work rooms - all have a life beyond day or night. The city lives twenty-four hours a day and the sky well above can be sunny, stormy or dark and go virtually unknown to those immersed in life inside.

The flightdeck is a place of high drama. It is also extremely dangerous. People have died here. Nonsense is not tolerated. It is serious business. One does not wander aimlessly around an operational flightdeck. Each move is carefully and precisely choreographed. There is a specific, functional reason for everyone's position, movement and piece of equipment. The incredible fury of an aircraft slamming onto the deck has to be seen and felt and heard to be at all understood. An operational flightdeck is a mixture of sensational beauty and startling brutality. All sensations are assaulted by raw engine heat, deafening jet screams and afterburner thunder, by vivid images of tons of airborne machinery falling out of the sky to literally smash onto the deck, by catapults shooting aircraft into the sky like huge bullets and steam covering the scene making immediate

ghosts of launch crews. You can see it again and again and it never loses its intensity. It is an impressive, memorable experience. Until you have been there, all other descriptions fall short.

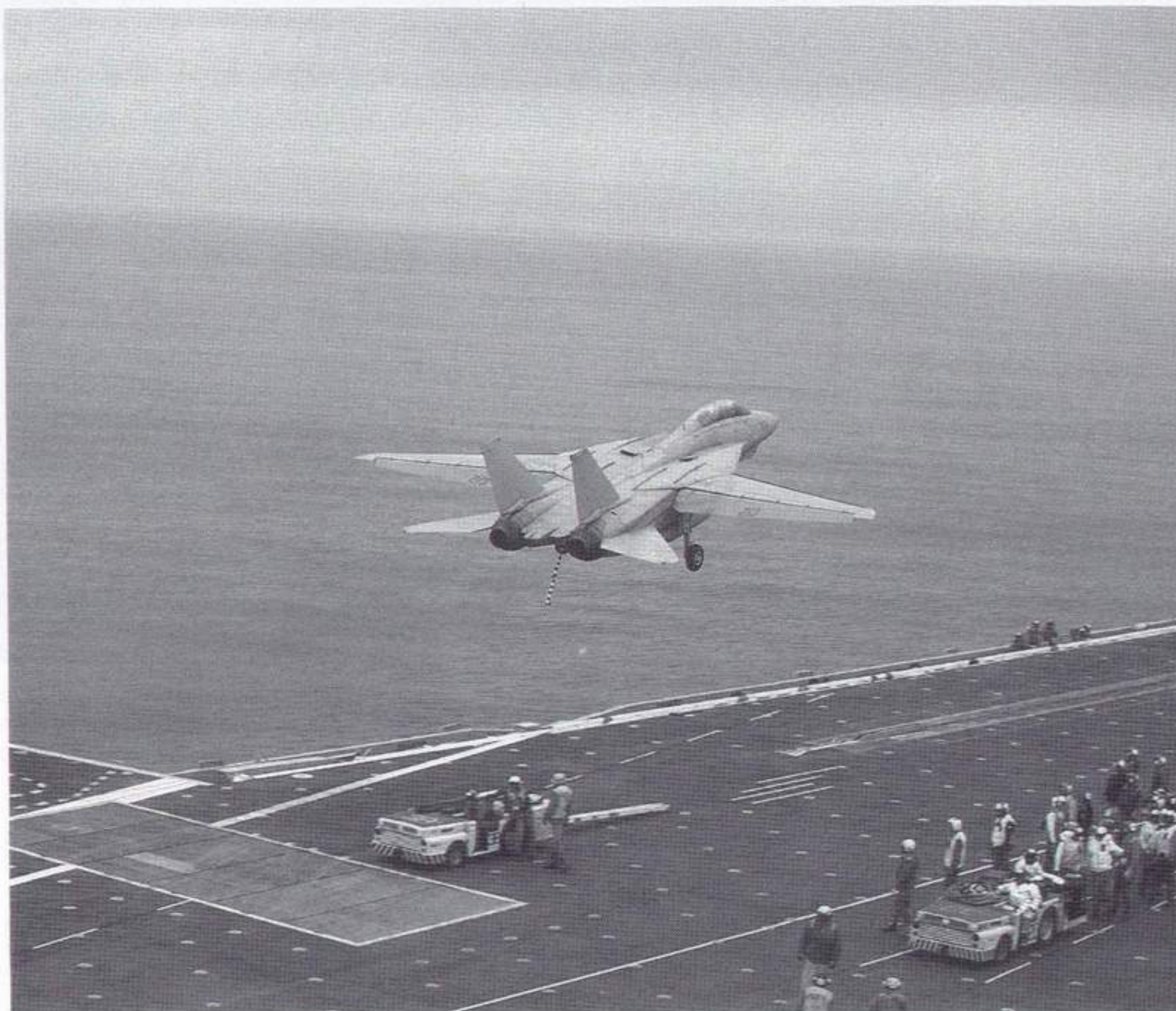
The United States Navy is good at what it does with carriers. It has had some eighty years to get it right. On November 14, 1910, the Curtiss civilian test pilot, Eugene Ely, made the first takeoff from any ship, in this case a

wooden platform erected over the forecastle of the anchored U.S.S. Birmingham, at Hampton Roads, Virginia. And, at 11:01 AM of 18 January 1911, Ely landed his Curtiss pusher biplane upon a large platform built over the stern of U.S.S. Pennsylvania anchored in San Francisco Bay. This was the first shipboard landing. The aircraft carrier has been born. Early in 1911, Lt. Theodore G. Ellyson, reported to the Glenn Curtiss Aviation Camp at North Island, San Diego, for flight training as Naval Aviator Number One. The glorious tradition of gold-winged aviators had begun.

Eighty years later the incredible feat of launching and landing aircraft from an aircraft carrier is performed with staggering regularity. The 50HP Curtiss that Eugene Ely flew has been replaced by a thundering herd of supersonic fighters, attackers and various support type aircraft.

Without a doubt, the aircraft carrier is the tip of the spear in the US projection of airpower and military might.

Special acknowledgment for making this publication possible goes to Admiral Chuck McGrail, Assistant Deputy Chief of Naval Operations (Naval Warfare), Captain Richard "Turtle" Redditt, former F-8 driver and "Top Gun" instructor, and the Captains and crews of CV-61, the USS Ranger, and CVN-65, the USS Enterprise.





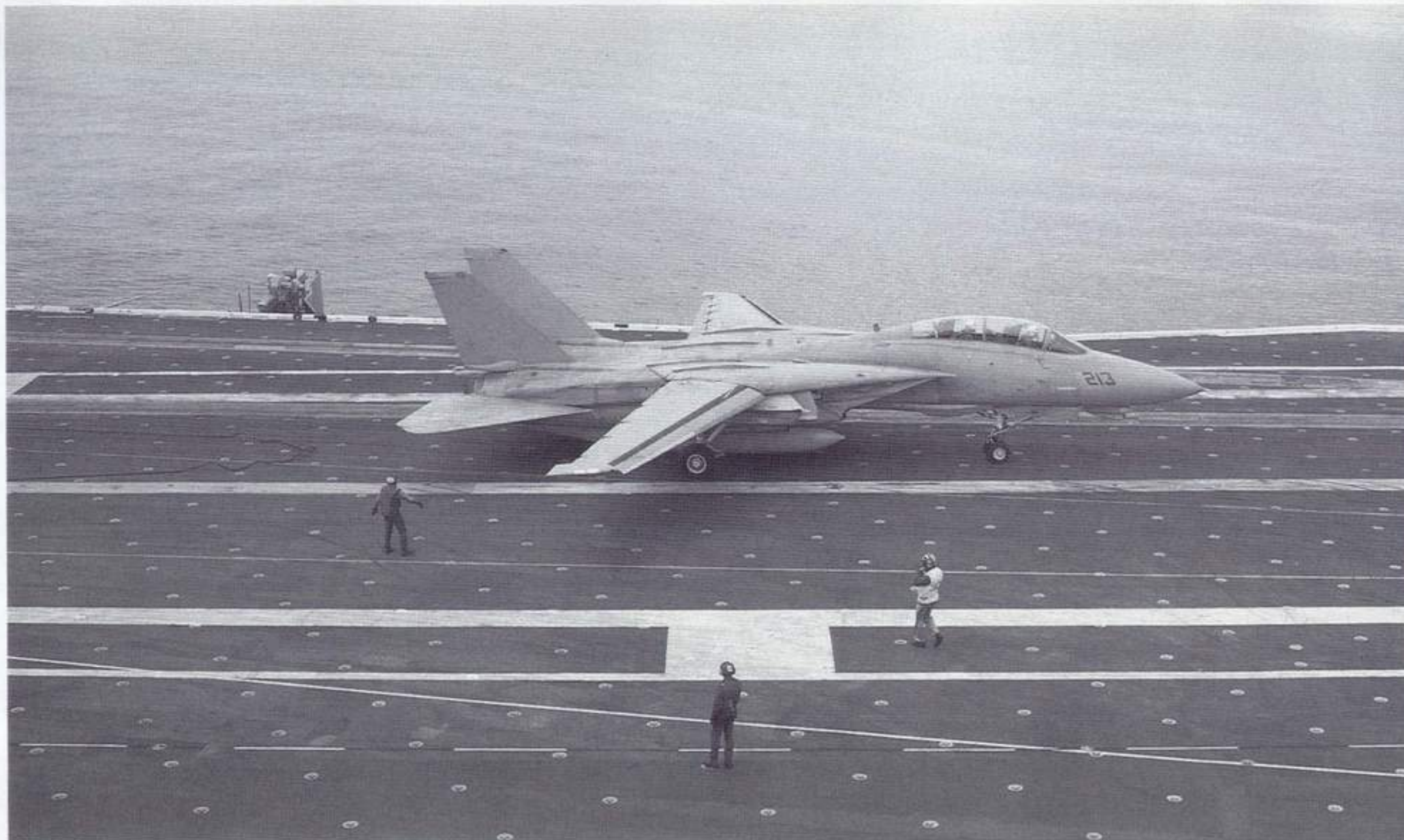


An F-14A Tomcat receives a successful starboard bow cat shot from the USS Ranger. The aircraft accelerates down the catapult from a standstill to 170 MPH in about 2.5 seconds.

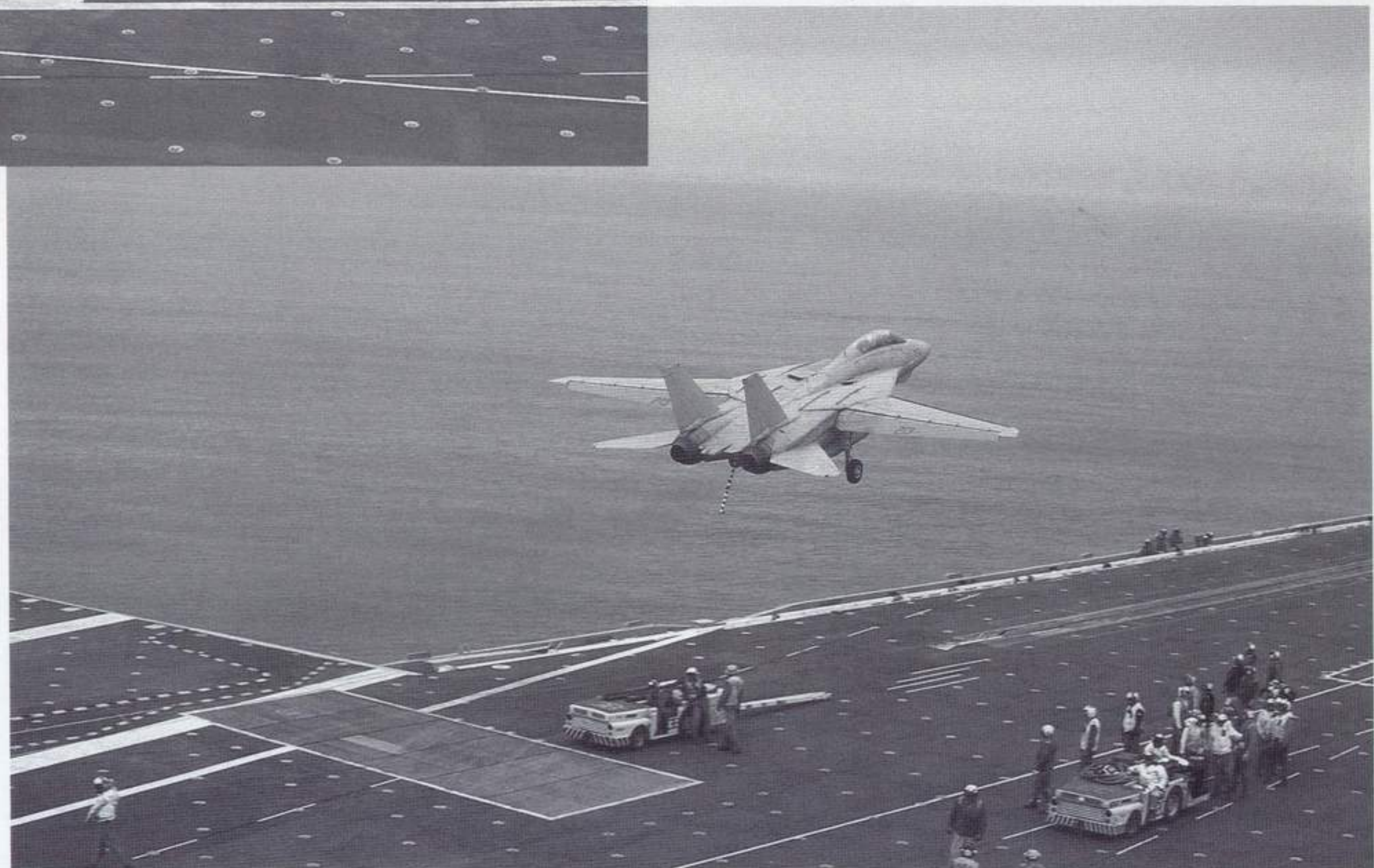


The F-14's huge engine intake contains movable ramps inside which control airflow to the engine for all speed ranges. In the landing configuration, the aircraft is in the high, constant angle-of-attack, low-speed region, and in a constant rate of sink until impact with the deck.



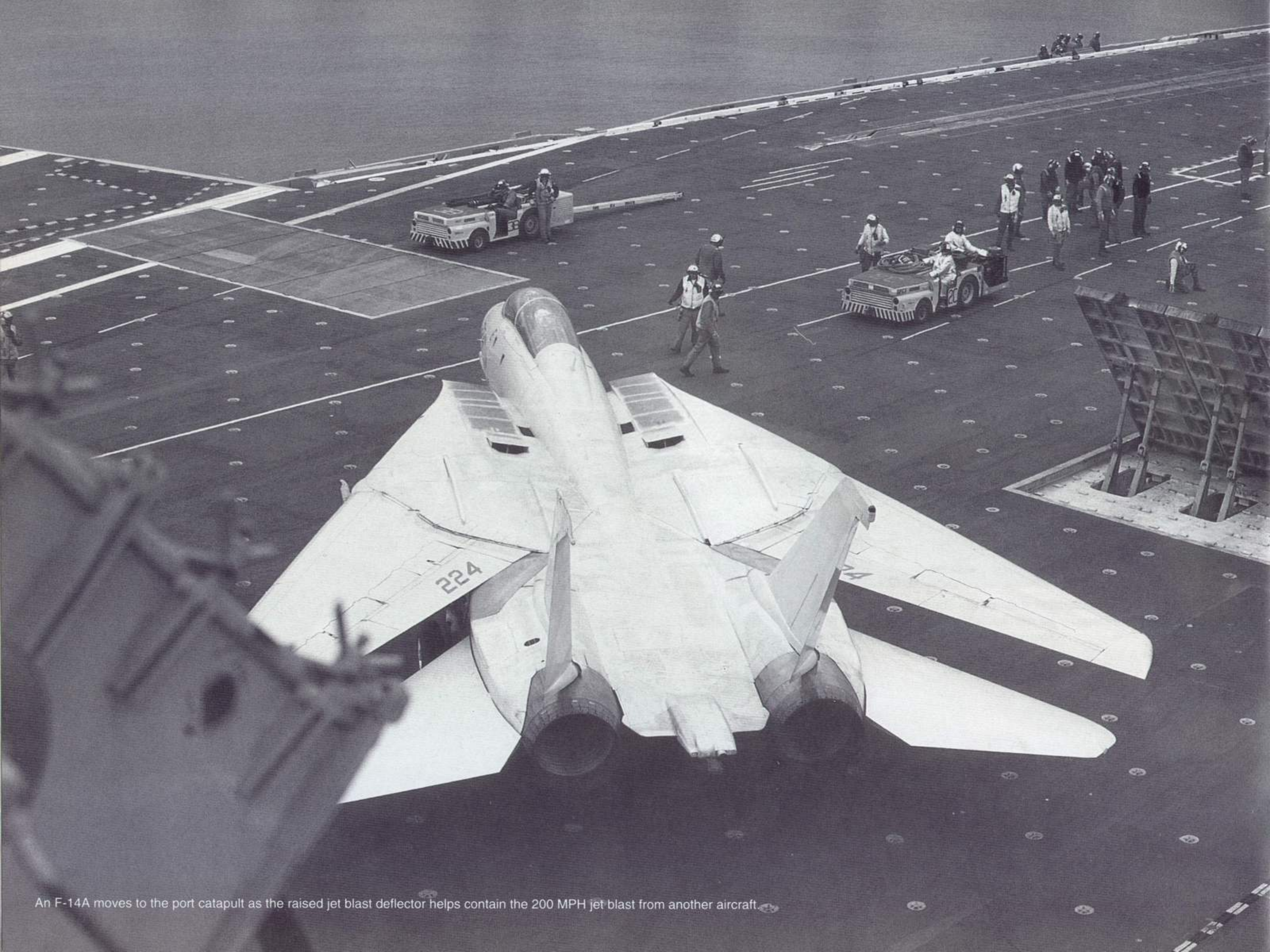


This Tomcat has just come aboard and has released the cable which can still be seen on the deck. Engaging the wire sets up a fifty ton pull bringing the aircraft from over 130 knots to a full stop in two seconds.



A Tomcat climbs away after a "bolter" as its tailhook missed or skipped a wire.





An F-14A moves to the port catapult as the raised jet blast deflector helps contain the 200 MPH jet blast from another aircraft.



The dark exhaust cloud indicates this Tomcat pilot has added considerable power, in this case, for a go-around.



After the wheels touch, the pilot goes to full power in case the wire is missed or the hook skips. To do otherwise is to risk a quick trip into the sea. This full stretched wire means the aircraft is still at full power.





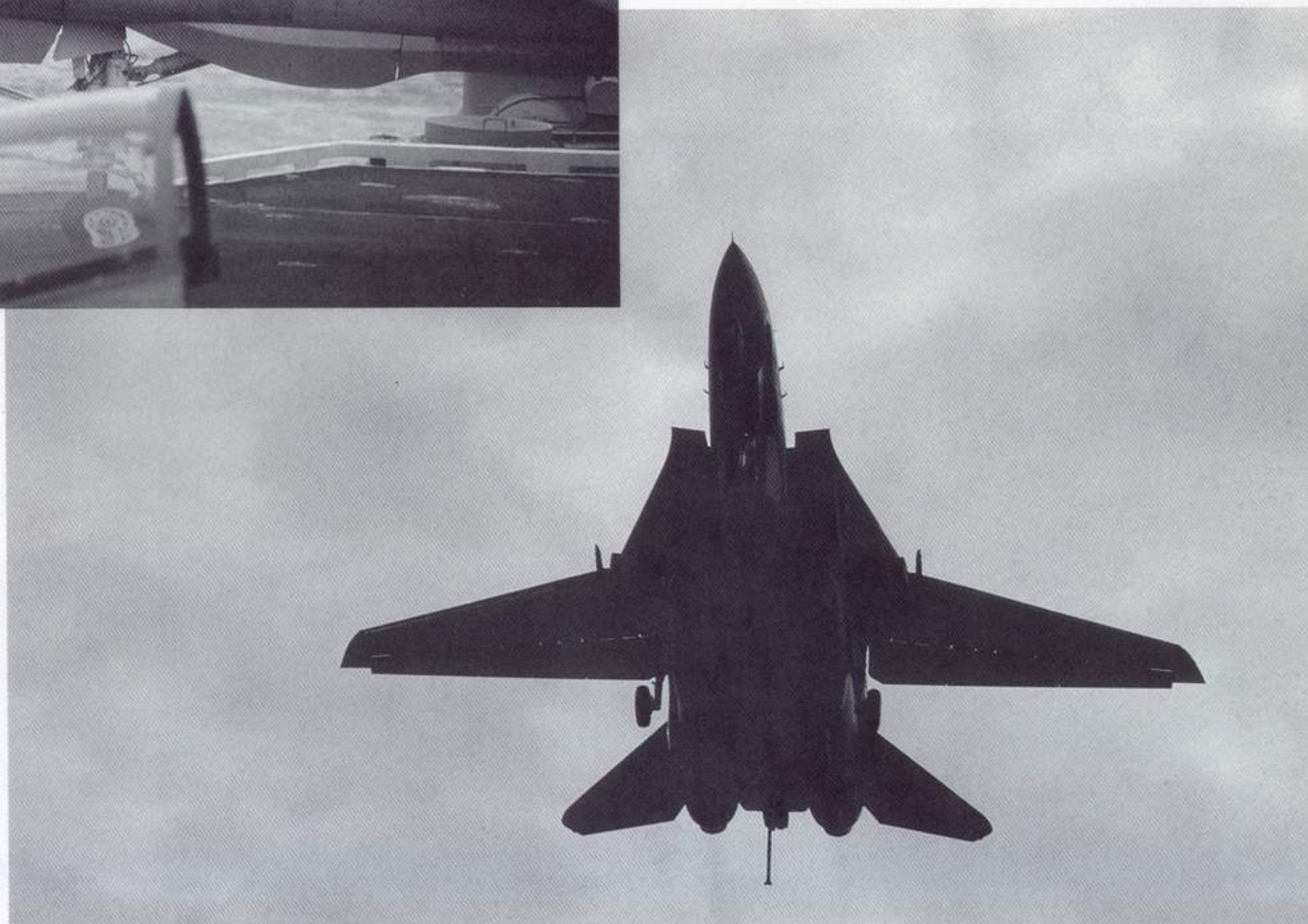
The crew access ladder hinges down from the fuselage. The two cockpit access steps are open. Red triangles designate ejection seat locations. The F-14's nose houses a Hughes AWG-9 radar and fire-control system. This sensational radar has the power and ability to detect and track 24 possible targets, select the six most threatening and individually guide missiles against those six.





Following a trap aboard the USS Ranger, this F-14 pilot is guided to his parking spot extremely close to the edge of the deck.

An F-14 overflies the carrier to the cry of "foul deck", meaning the deck is not ready for landing aircraft.





The F-14 maintains a high angle-of-attack as it literally drops in for an arrested landing on the USS Ranger.



As this F-14 waits to taxi forward, its nose section reveals the bulges of its M61A1 gun muzzle, the Northrop Television Camera Set (TCS) and lowest, the ALQ-100 ECM housing.



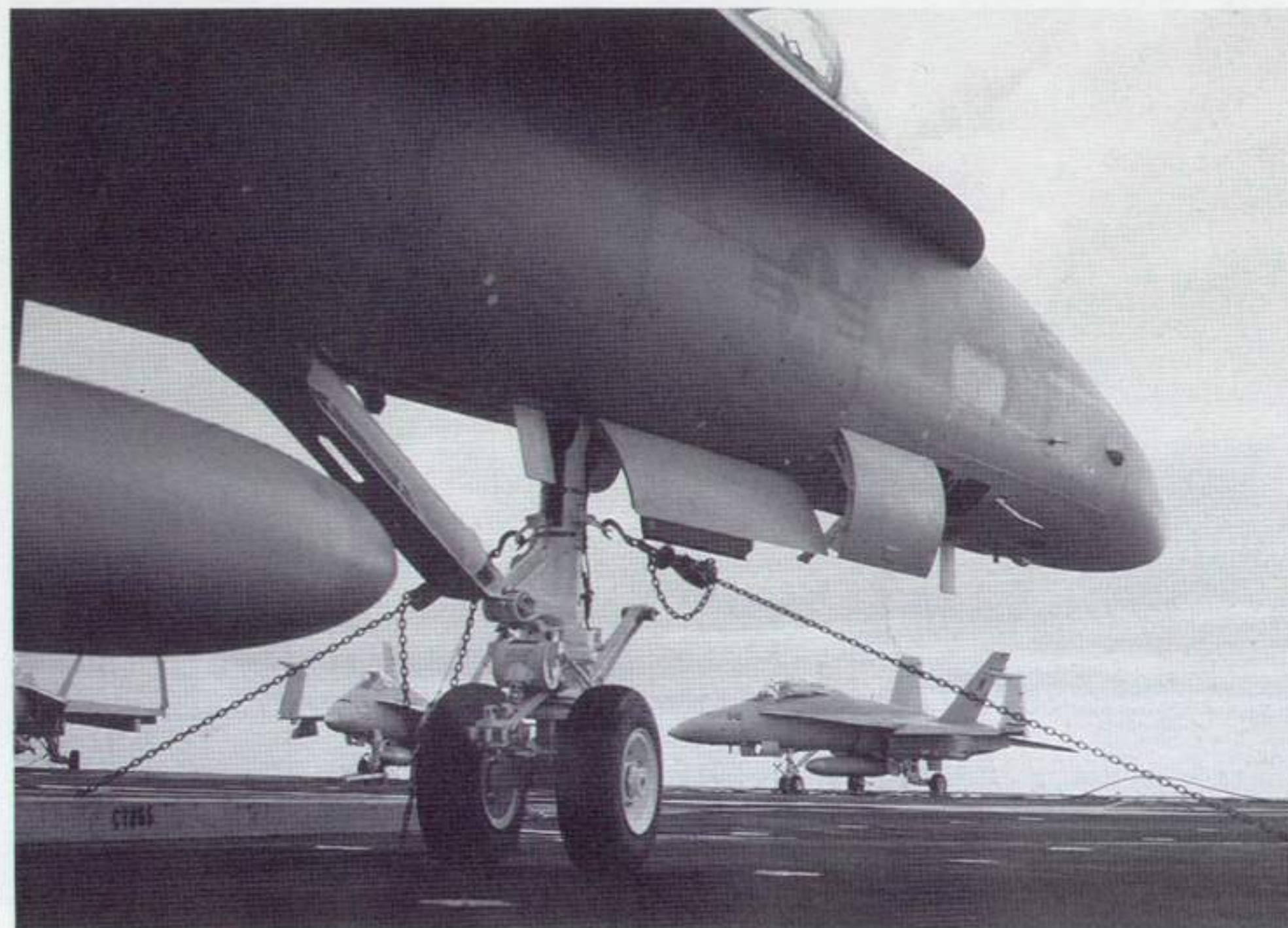


A parked Hornet covered with "red shirts". These maintenance personnel are working on some part of the weapons system. They are known as ordnancemen, or "ordies". The brown shirt is the aircraft's plane captain. He is the keeper of that particular aircraft when the pilot is not in it. During flight quarters, he will be in or on that aircraft throughout the flying day, usually twelve hours.





This F/A-18 head-on view shows the three ports for the M61A1 Vulcan 20mm cannon. The two side holes are gas-purging air intakes while the center one is the gun port itself. The nose houses the Hughes AN/APG-65 radar and the radome covers its planar array radar scanner and tracking mechanism.



The Hornet's tailhook in its retracted position between the exhausts of the twin F-404-GE-400 low-bypass afterburning turbofan engines. Unlike former jet engines, these can go from idle to full power in four seconds. The F/A-18 has a thrust-to-weight ratio of better than one-to-one.

Aircraft parked on the deck are securely tied down with heavy-duty chains. Even though carriers are huge, in heavy seas there can be a good amount of pitch and roll to the deck plus heavy winds and jet blast.



Everyone on deck wears head and ear protection when flight operations are in progress. With running engines and moving equipment, the activity level is high and the flightdeck becomes a dangerous place. The youngest of the crewmen seem to enjoy it as the average age of a flightdeck crewman is about 19!



Preparations are made to start launching F/A-18s. These aircraft are from VFA-125, the "Rough Raiders", from NAS Lemoore, California. VFA-125 was the first Hornet squadron and its mission is the training of new Hornet pilots. VFA-125 aircraft carry the Marines name on the aft port side and Navy on the starboard aft fuselage.





The pilot is already strapped in and ready to go in a two-seat, F/A-18B. Once the order is given, tie-down chains are removed and the action begins. The flight deck is covered with tie-down anchor points in the white circles.

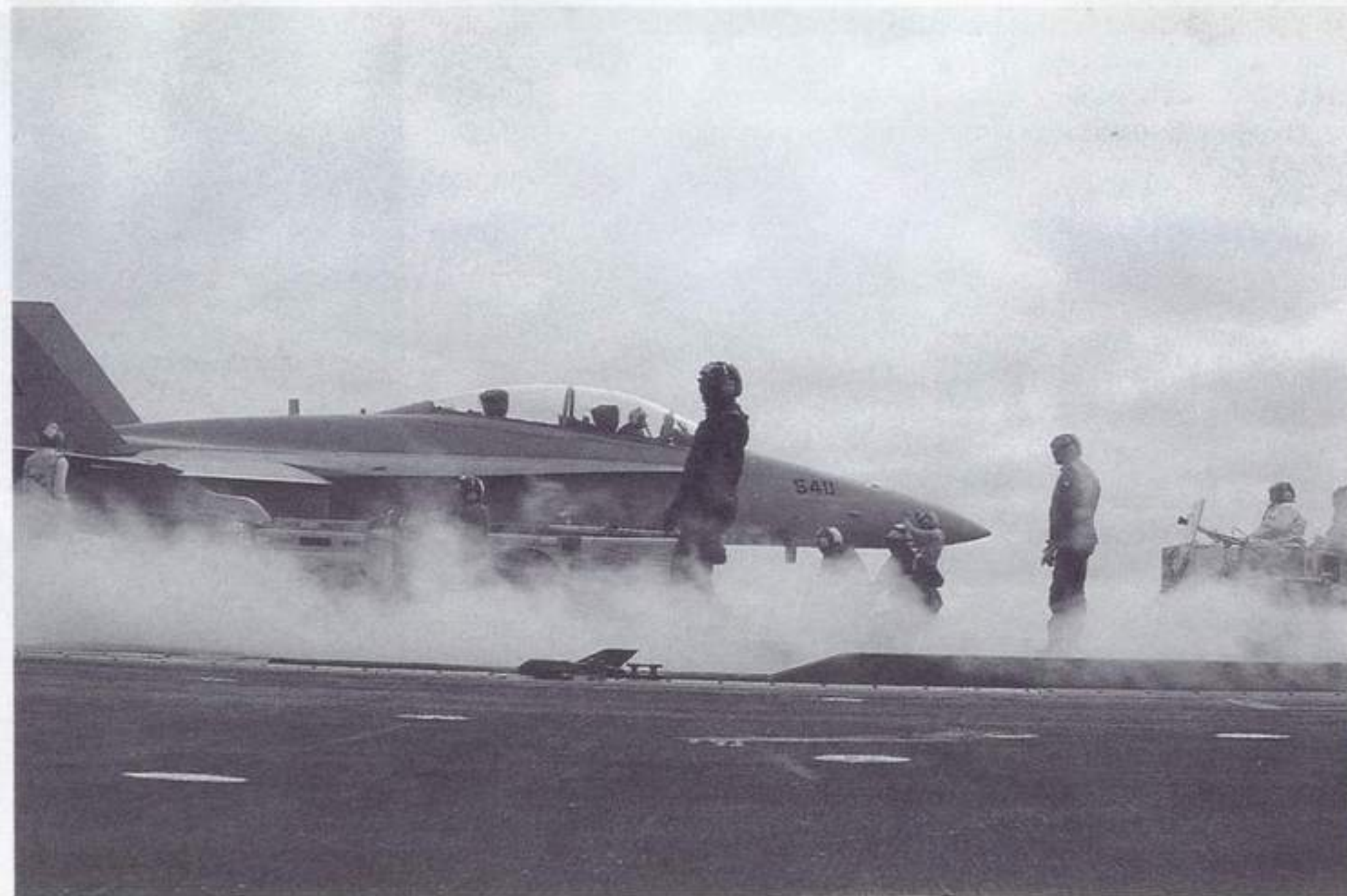


A group of visitors huddle together on the forward flight deck of the USS Enterprise as an F/A-18 moves forward to launch.





Steam from a catapult launch makes ghosts of deck crewmen as this Hornet is guided into final position on the catapult.



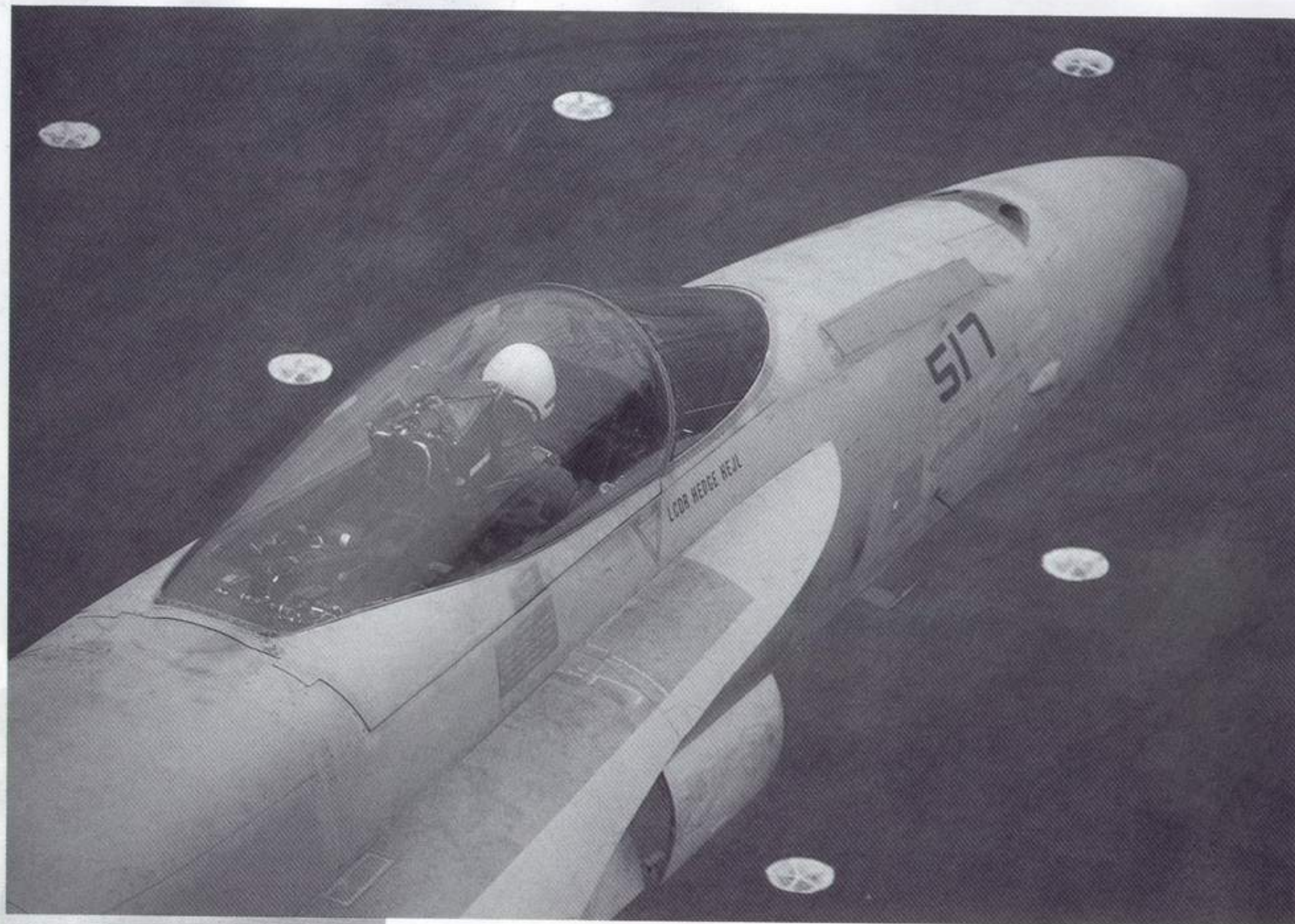
In position, this Hornet is given the signal to stop. Other deck crewmen await the arrival of another F/A-18 for a launch.



A Hornet is being guided forward by a taxi director while a green shirt waits to attach the catapult gear.



As this Hornet taxis forward to launch, the top rear of the ejection seat is clearly seen. This headrest area contains a parachute and riser assembly. This top view also shows the leading-edge-extension (LEX) which permits sustained controlled flight at very high angles of attack (AOA).



With a Hornet in position on the catapult, deck crews are about ready to launch.





This Hornet waits for a launch and the blast deflector to be lowered before being directed onto a catapult. The F/A-18 is a true dual-role aircraft, hence its "F/A" designation, and it is formidable in both ground attack and the air-to-air (ACM) environment.



A Hornet about to receive a cat shot while an A-7 sits behind the blast deflector next in line. Standard low-visibility paint schemes are the norm as the F/A-18 topsides are FS 36375, "Light Ghost Grey", while lower surfaces are FS 36495, "Light Grey". The anti-glare panel is FS 35237, "Medium Grey".



The bar slanted upwards (retracted) from this F/A-18's nose gear assembly is the catapult shuttle bar or catapult launch bar. When lowered, it engages hooks on the catapult shuttle.





Once connected and final checks are completed, the director will signal the pilot for brakes off and full power. The pilot performs a final cockpit check. With thumbs up all around, the pilot salutes the cat officer and braces himself against his headrest. Seconds later he is airborne and climbing away while the entire process is repeated for the next airplane.



Thumbs up all around is a requirement to launch. This F/A-18 is on the cat ready to go. Many eyes are on various parts of the aircraft and all must give thumbs up to the catapult officer before the signal to fire the catapult is given. This white shirted safety inspector and the deck edge observer are indicating that it is OK to launch.



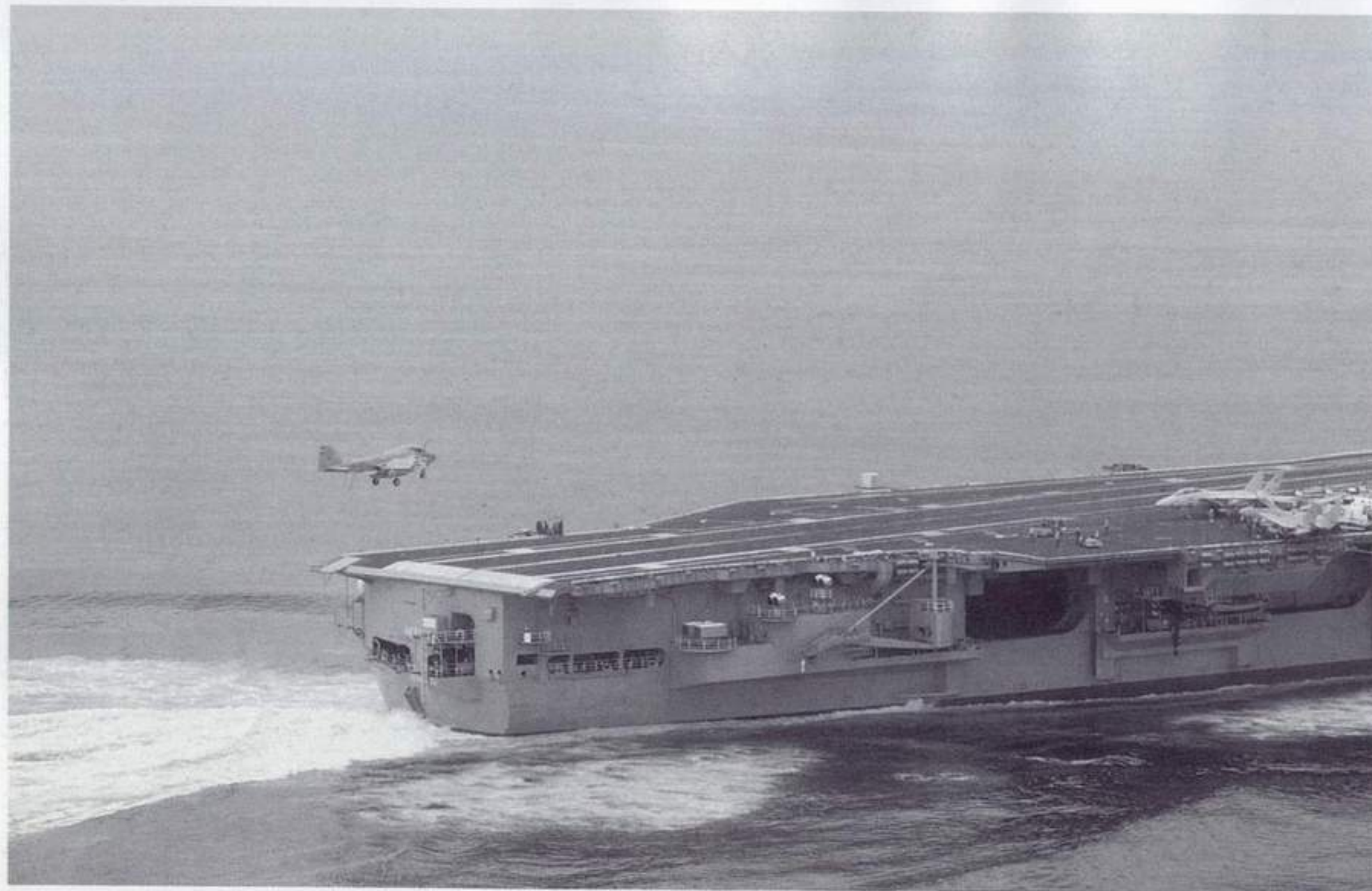
This launching F/A-18 will accelerate down the catapult to around 150 knots in just over two seconds.



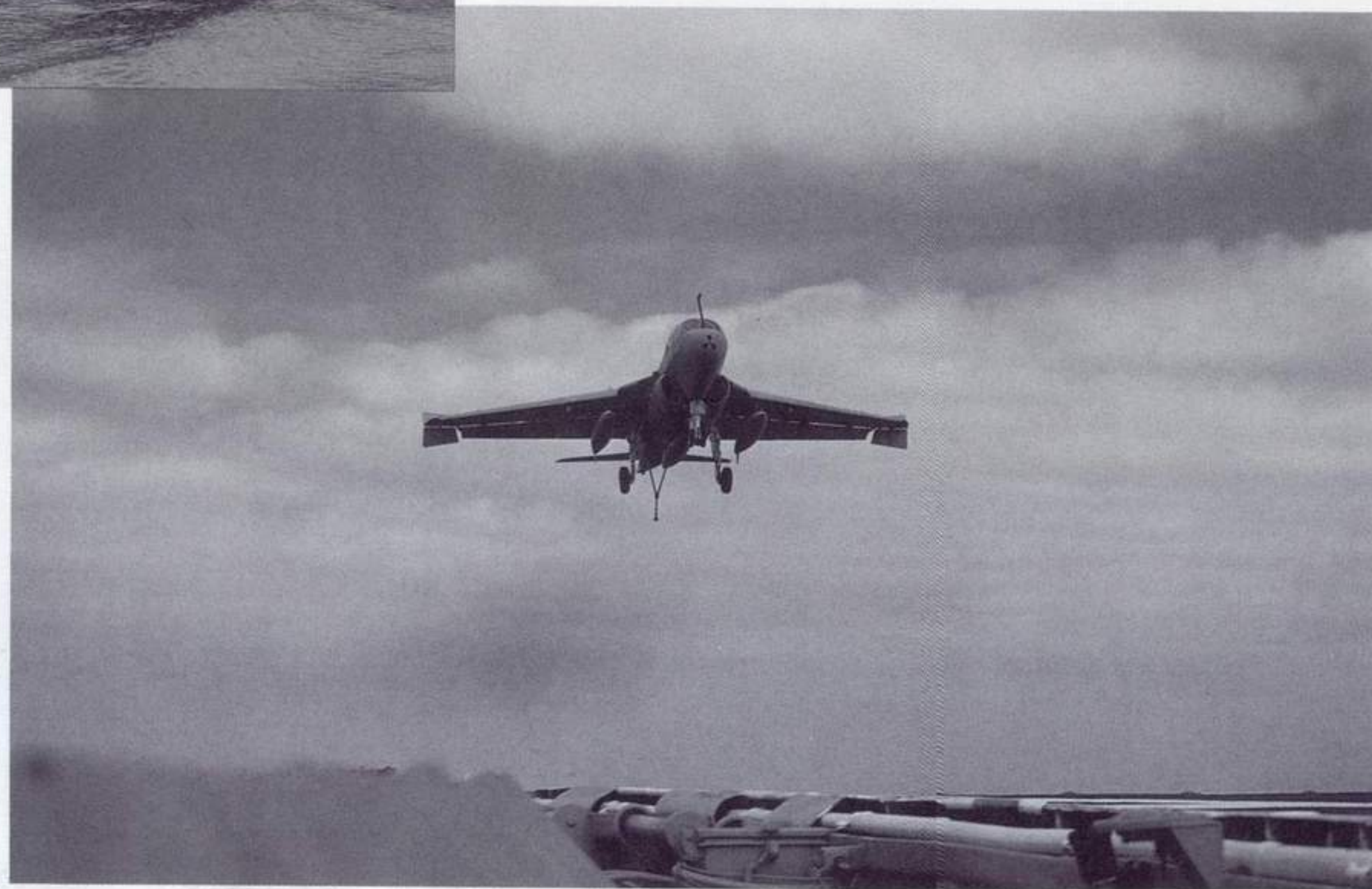
A yellow shirt taxi director giving a stop signal to an F/A-18 pilot. He does this by crossing his hands at the wrists in front of his chest with closed fists indicating that the pilot must apply brakes and stop.



An A-6 Intruder coming aboard. The calm seas and large wake of the carrier indicates that the ship is making nearly all of the usually thirty knots of headwind necessary for landing. As a carrier pilot, one learns to "read" these cues since they make slight differences in landing techniques.



Seconds from hitting the deck, this EA-6B shows its extended wingtip speedbrakes.



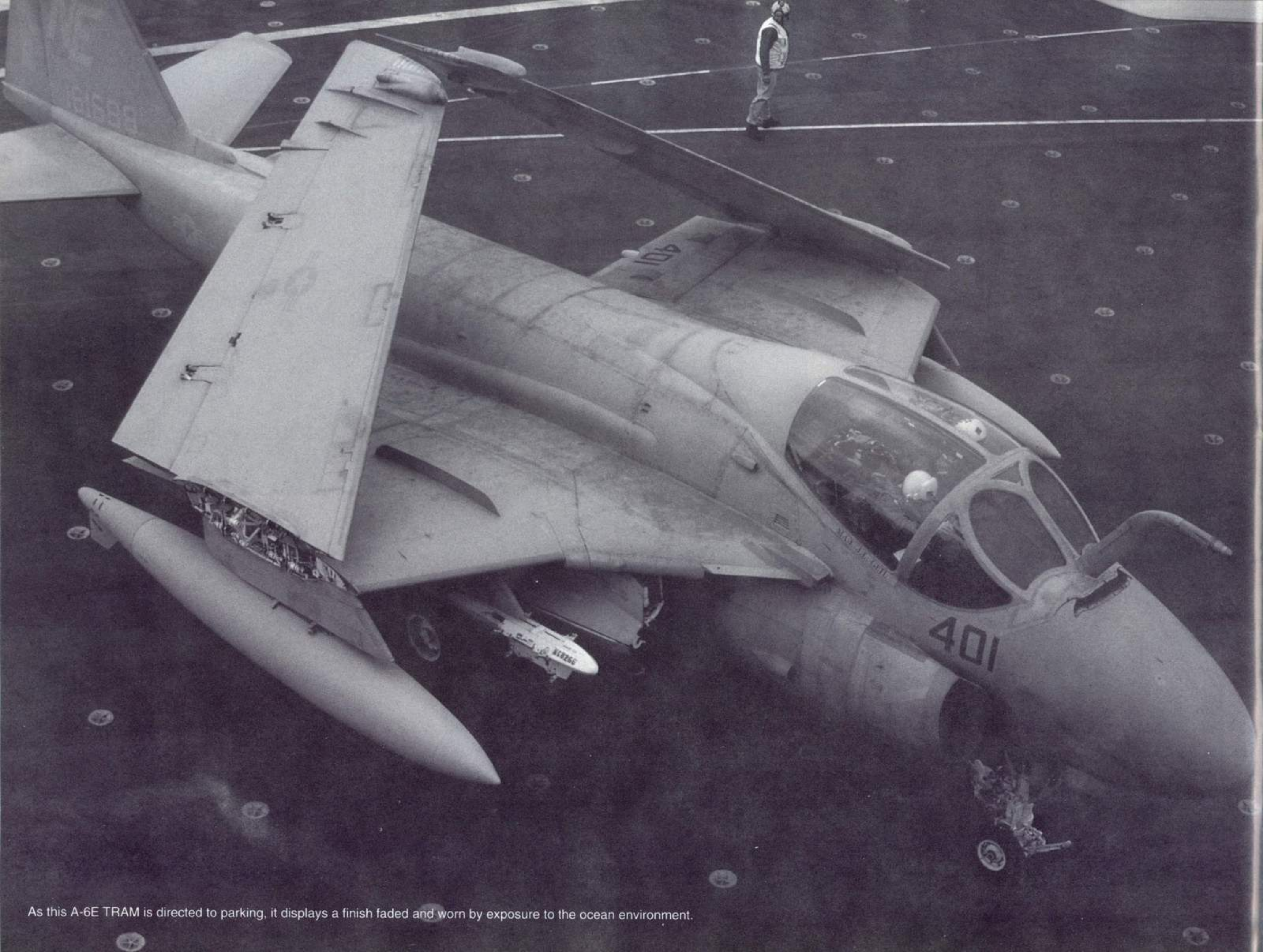


This landing Prowler carries two external Aero-1D 300 gallon fuel tanks as well as two AN/ALQ-99 jamming pods which constitute part of its tactical jamming system (TJS). The pods have integral generators driven by ram-air-turbines (RAT) on the pod's nose.



At the end of its arrested landing, this Prowler is still at max power as evidenced by the still taught arresting cable.

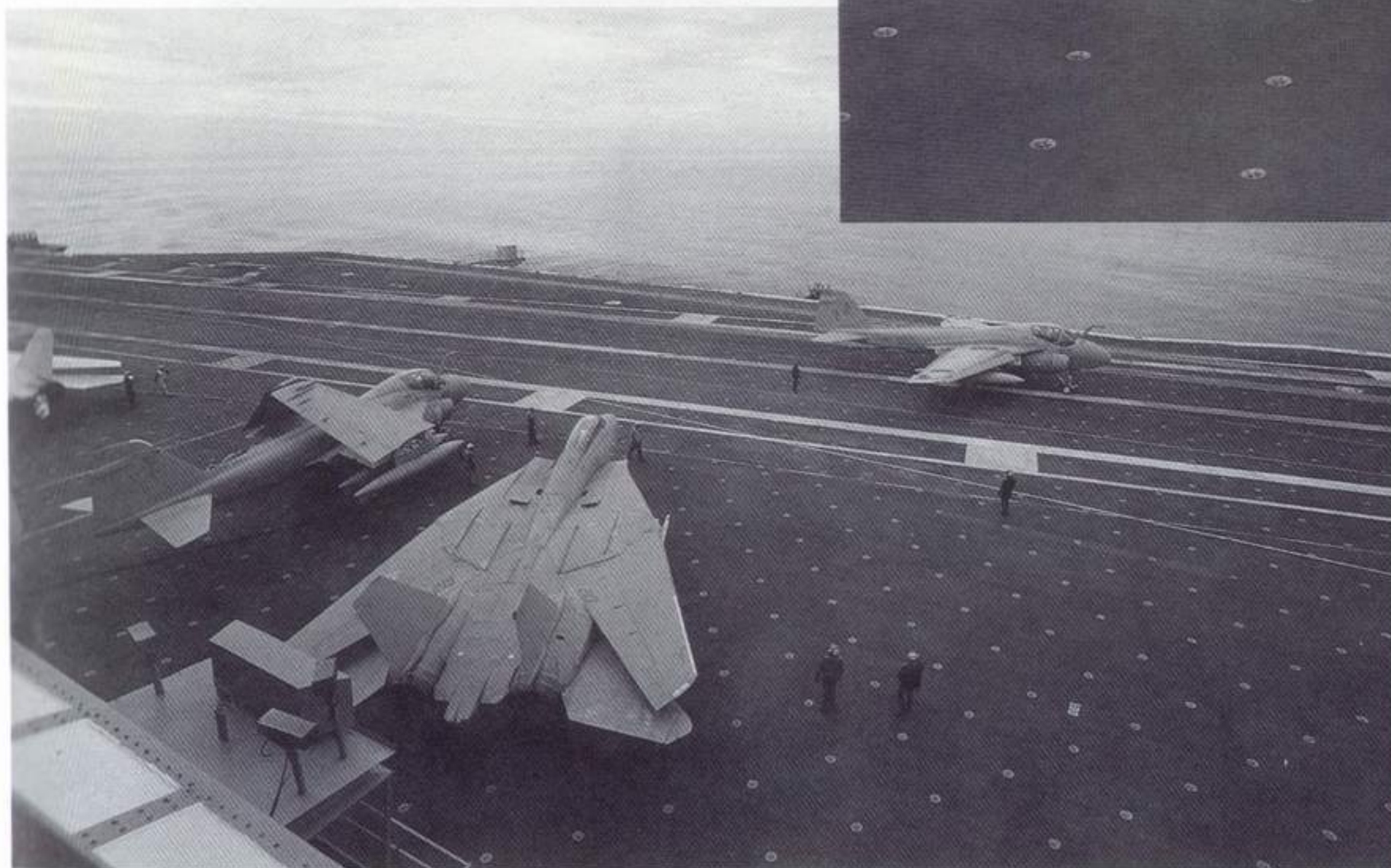
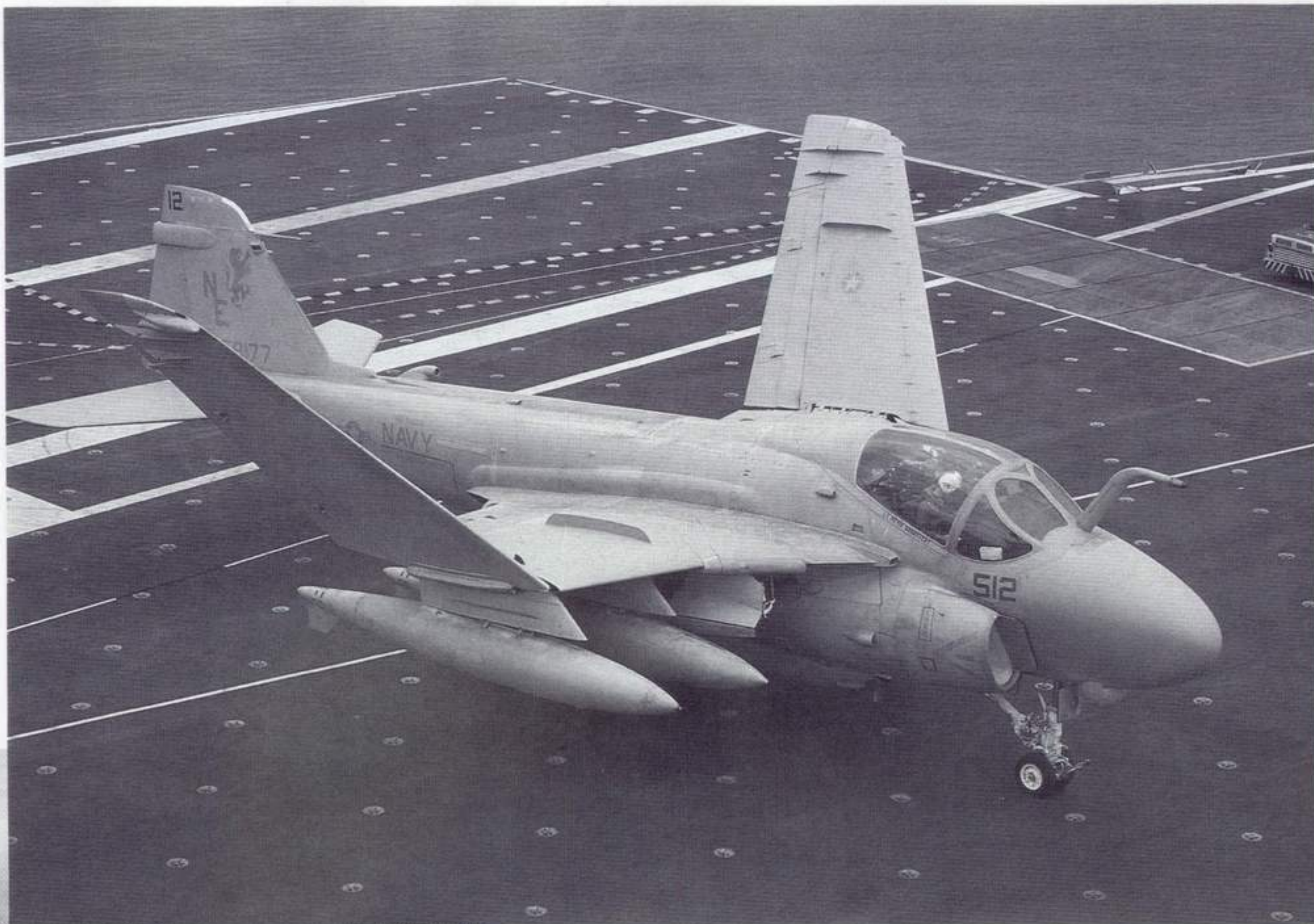




As this A-6E TRAM is directed to parking, it displays a finish faded and worn by exposure to the ocean environment.



On taxi away from the landing area, this A-6E TRAM (Target Recognition and Attack Multisensor) folds its wings enroute to parking. The A-6E TRAM modification added a turret ball below the base of the nose radome which houses an infrared/laser tracker. There is also an aft fuselage airscoop which provides an intake for cooling air to the aft avionics bay.



An A-6 of VF-145, the "Swordsmen", at the end of its landing roll on the USS Ranger. Note the overswept wings on the parked F-14.





Seconds following its arrested landing, this EA-6B Prowler is folding its wings on its way to parking. This aircraft carries AN/ALQ-99 jamming pods and external fuel tanks.



A parked Prowler, wings folded, stands among deck crews as A-6 flight operations begin.



A parked A-6E TRAM with a yellow start tractor in front. This unit is known as a "huffer" and is used for starting the aircraft.



Parked, this EA-6B Prowler and the one behind it show huge tail cap radomes on their vertical fins. These huge, distinctive, one piece radomes of honeycomb fiberglass contains a number of antennas for use with the tactical jamming system (TJS).







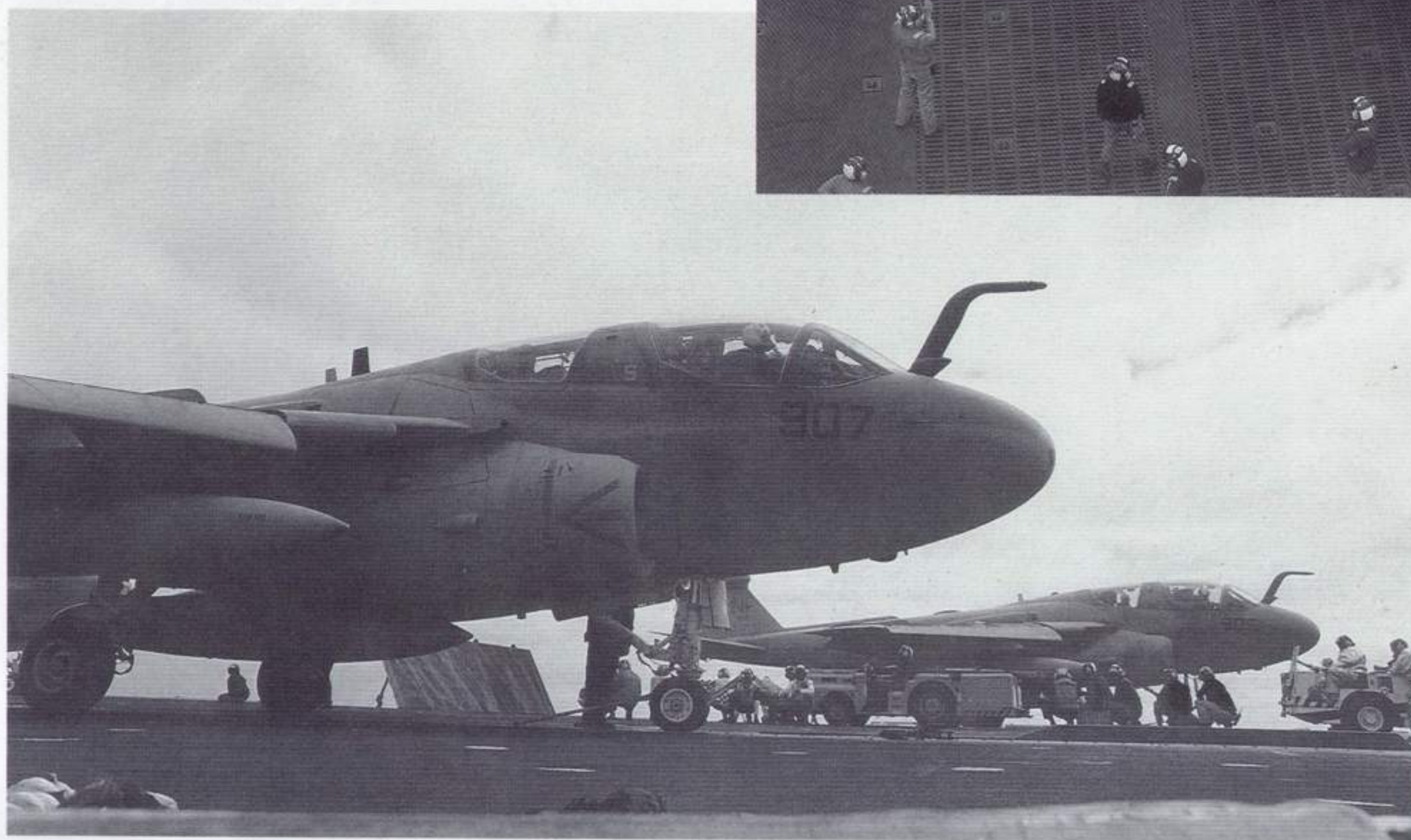
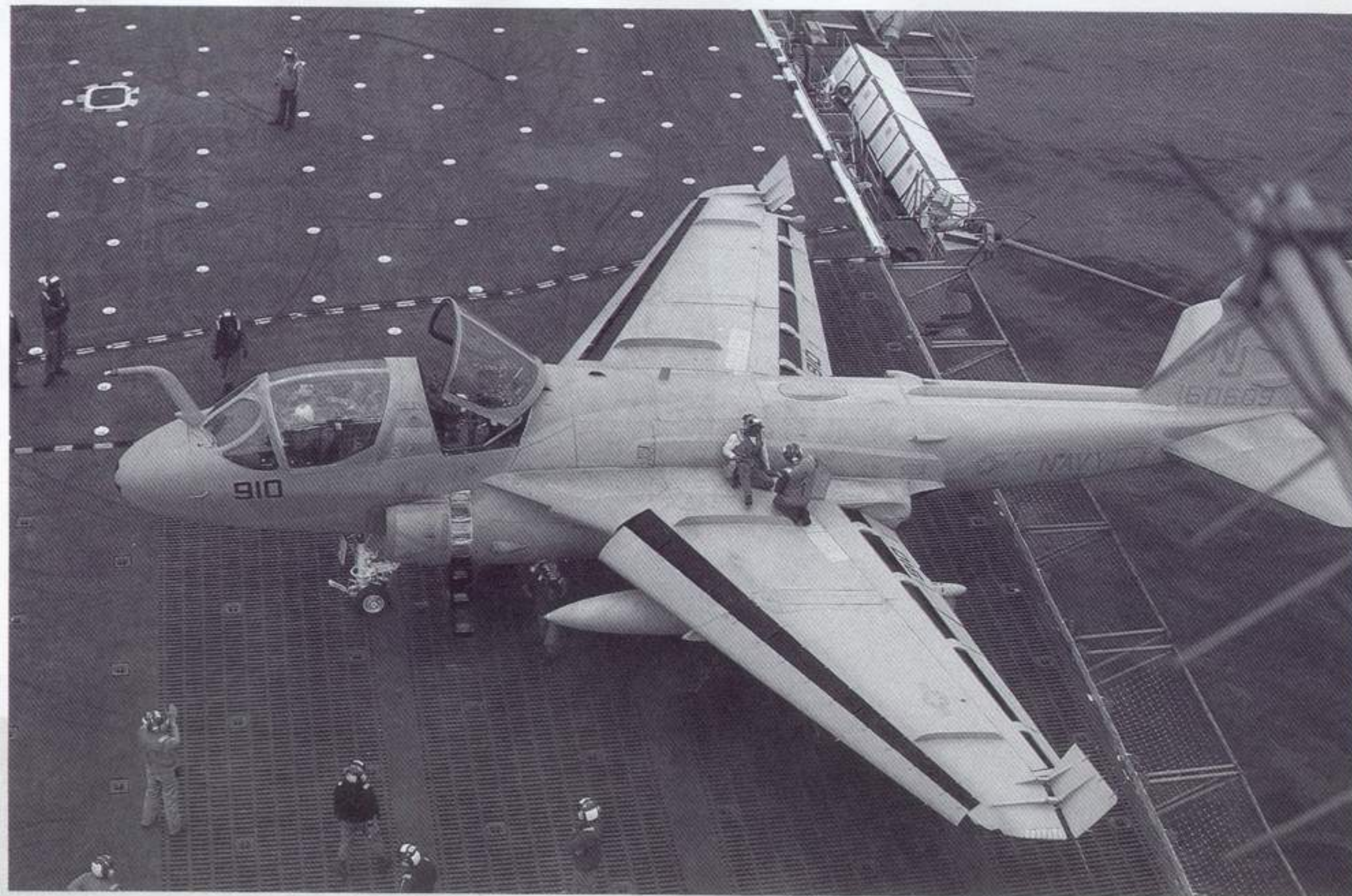
Prowlers being positioned on the aft elevator. The fit is tight and the tails will hang out over the water.



Four parked EA-6B Prowlers of VAO-129, the "New Vikings", from NAS Whidbey Island, Washington. VAO refers to Tactical Electronic Warfare Squadron, also known as TACELRON. VAO-129 is the EA-6B RAG, or training squadron.



Top view of an EA-6B going through control checks prior to launch operations. The green shirt crewman at the left bottom is visually reporting control position to the pilot. Note the wingtip airbrakes and red paint inside both leading edge slats and trailing edge flaps.

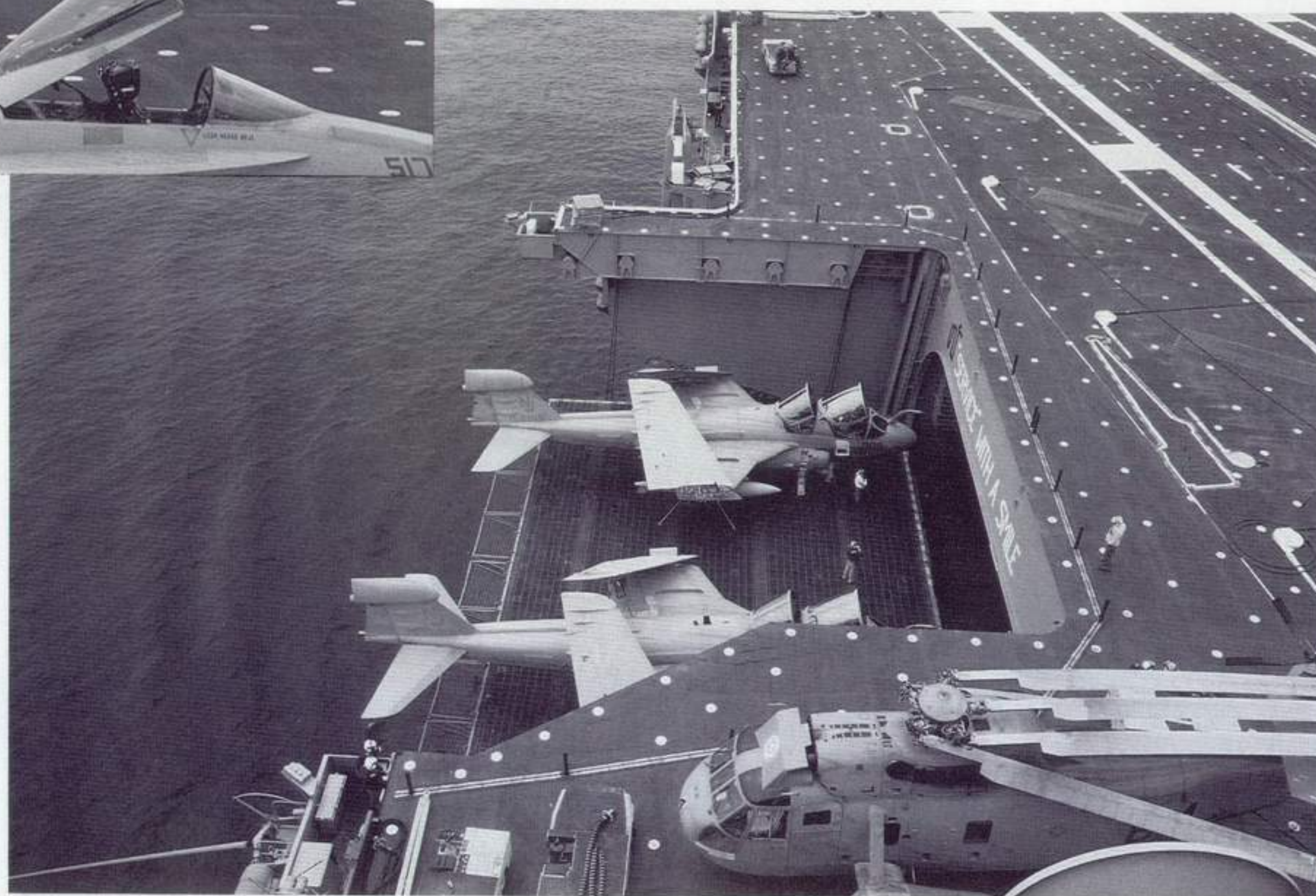


Two Prowlers positioned on the bow catapults. The "sawtooth" refueling probe has an AN/ALQ-125 radar receiver in the base giving the notched shape.





EA-6Bs and an A-7 Corsair II about to begin early morning launch operations.

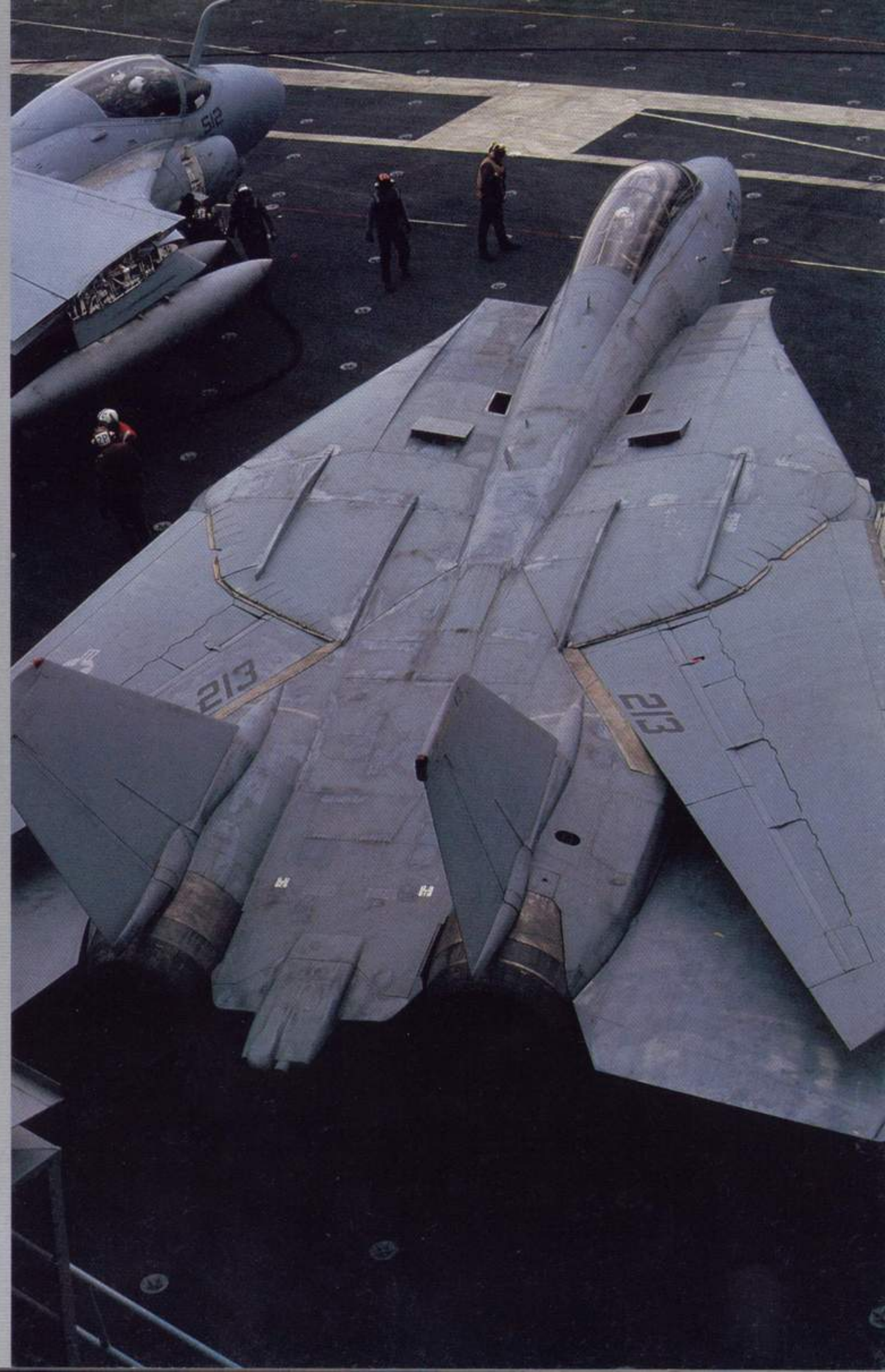


The aft elevator has taken the Prowlers below where they can be moved to the hanger deck for maintenance and/or storage.





In full carrier landing configuration the Tomcat's wings are positioned to the twenty degree position. The aft positioned speed brake is out which allows the engines to operate at higher power meaning quicker engine response if necessary.



The F-14's 72 degree wing oversweep position is used for crowded flightdeck parking. Wings extended, the F-14 spans just over 64 feet but, overswept, spans only 32 feet 8.5 inches. Life at sea creates heavy weathering on the aircraft, clearly shown in this top view.

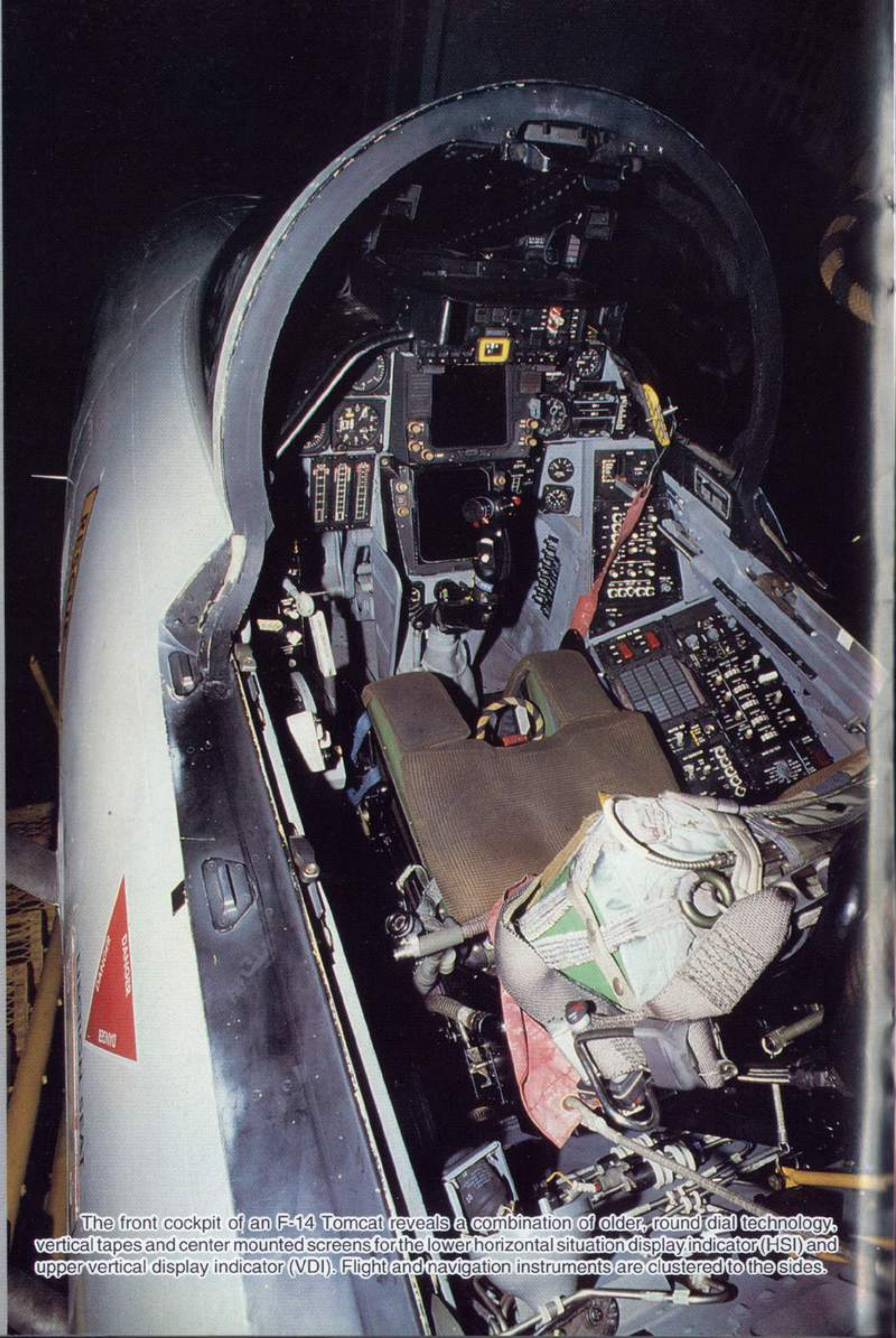




A pilot and his radar intercept officer (RIO) taxi forward for launch.

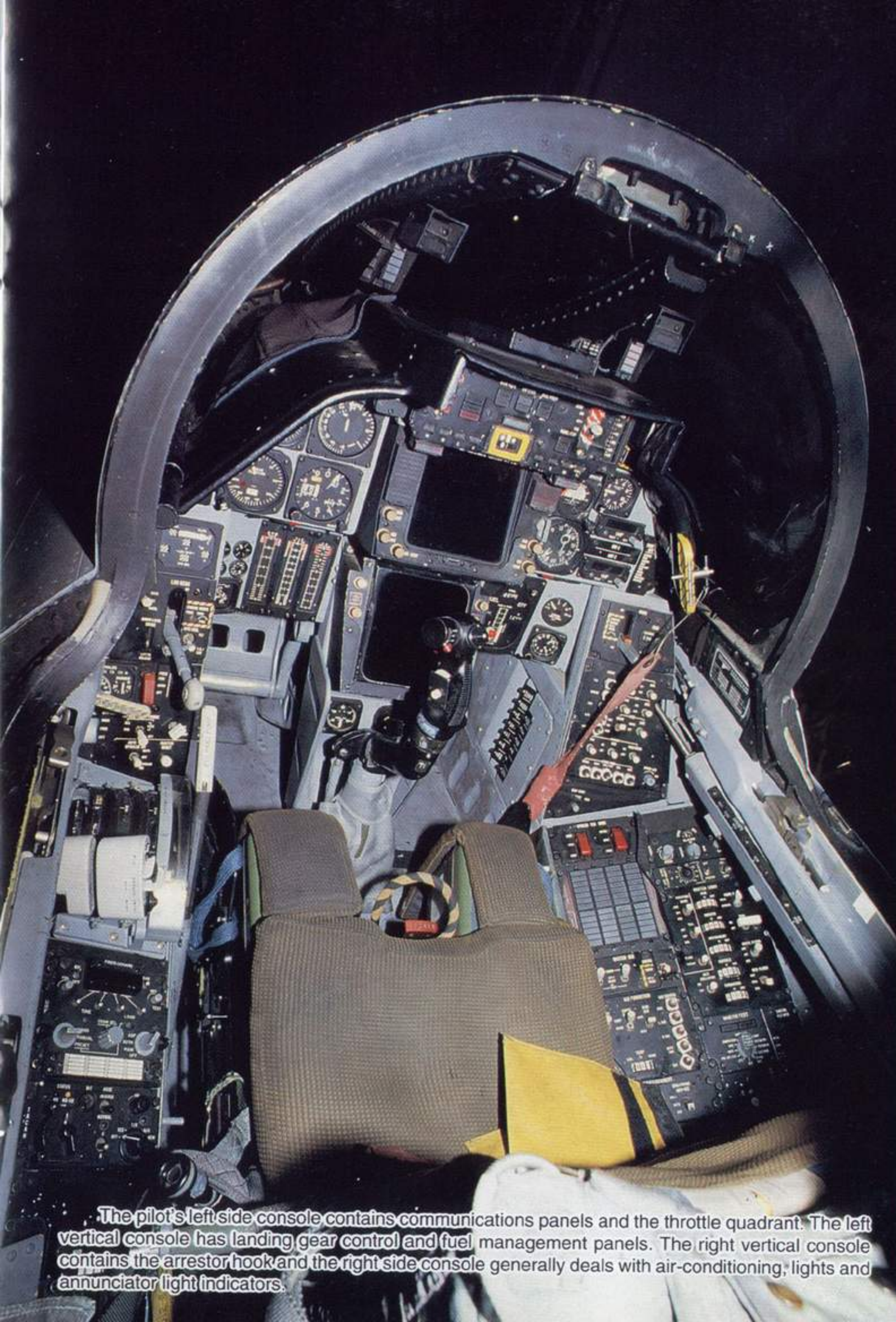


Following a successful arrested landing, or "trap," the aircraft is quickly guided away as another aircraft is close behind.



The front cockpit of an F-14 Tomcat reveals a combination of older, round dial technology, vertical tapes and center mounted screens for the lower horizontal situation display indicator (HSI) and upper vertical display indicator (VDI). Flight and navigation instruments are clustered to the sides.





The pilot's left side console contains communications panels and the throttle quadrant. The left vertical console has landing gear control and fuel management panels. The right vertical console contains the arrestor hook and the right side console generally deals with air-conditioning, lights and annunciator light indicators.



A head-up display (HUD) sits atop the panel and an air combat maneuver panel is directly below. Instrumentation is straightforward, easy to read and interpret.



The cockpit area of an F-14 showing the pilot and rear seat radar and weapons officer. You can see the round ejection seat handles over both crewmembers. The large "E" painted on the aircraft is an award to the squadron for battle efficiency. It is awarded to the squadron that scores the best in a long term competition in many areas of mission readiness. The pilot is Bob Davis, "Sundance", a former Top Gun instructor.





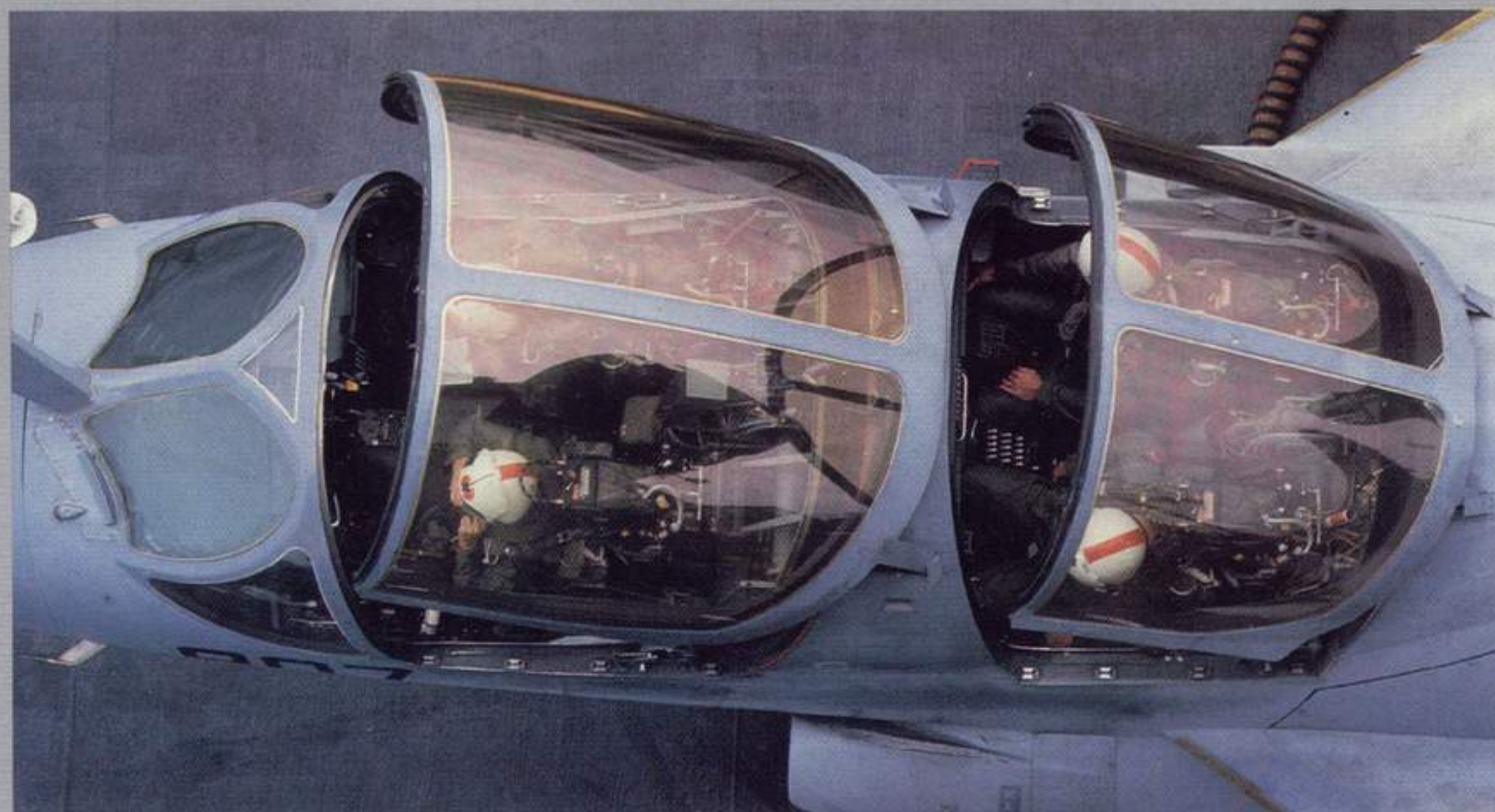
An EA-6B Prowler coming aboard. The Prowler's air-refueling probe is canted 12 degrees to right of center, clearly seen in this photo.



An A-6E TRAM carrying four external fuel tanks, two per side. The TRAM sphere can be seen below the large nose radome.



Helmets on, this EA-6B crew is about to board their Prowler for a flight back to NAS Whidbey Island in Washington state. Boarding steps fold down from the cowl.



A full EA-6B crew aboard and ready for start. An outgrowth of the A-6, the EA-6B received a 54 inch extension to the basic fuselage to make the "station wagon" model a four-seater. The "gold-plated" gold film canopy color is clearly seen. At the onset, designers were concerned about electronic radiation to the crew. The film was a protective measure - apparently unnecessary.





An EA-6B Prowler ready for start. The "huffer" is attached and the deck crewman signals the pilot to start.



Although the TA-4J can carry bombs and other weapons, the aircraft is not used in the fleet as an operational, front-line aircraft. It is used only in training with new Navy pilots. This aircraft carries external fuel tanks, a standard configuration. In this photo, the TA-4J is positioning on the catapult. The yellow shirted crewman is directing the pilot's taxi, the green shirted man has a weight board which shows the weight of the aircraft for the cat shot. The pilot must agree and give a thumbs up signal. The strength of the cat shot depends on this weight.



An A-7 pilot strapped in and waiting for his turn at flight operations. The air-refueling probe is retracted below the cockpit side.



A yellow shirt taxi director moving into position to direct an A-7 coming out of a parking space headed for launch. It is easy to see why the A-7 has a nickname of "man-eater".





Prior to aircraft operations hundreds of crewmen walk line abreast from bow to stern looking for any loose objects which can cause "foreign object damage" or FOD. The crewmen here are proceeding to the bow to begin the walkdown.



Amidships, eyes are focused on the deck for even the smallest object which, once sucked into an engine's inlet, can cause catastrophic damage - if not loss of the aircraft once airborne.



A Viking taxiing onto the catapult under the precise direction of the "yellow shirt" taxi director. The standard allows aircraft to be launched every 45 second to one minute from each catapult.





Coming out of the cat track indicates that an aircraft has just launched moments before. The steam will subside



Arriving near the stern, the completion of the FOD walkdown means aircraft engines can be started and flight operations begun.



Wings folded, the S-3 is positioned at the deck's edge to allow room for other aircraft. The tinted canopy is evident as are the two General Electric TF-34 turbofan engines mounted close to the fuselage.





The pilot and deck crew await the signal commence operations. The in-flight refueling probe has been extended. Gills on the fuselage side just forward of the nose gear door are gun compartment gas vents. A Grumman EA-6B sits alongside.



In the cockpit of this F/A-18 Hornet the pilot is ready to go. The brown shirts are plane captains and the white shirts are safety checkers. Behind the Hornet is the Landing Signal Officer (LSO) platform. The LSOs are getting ready to recover aircraft. This Hornet is about to be taxiied forward for launch. Everyone is awaiting word to go.

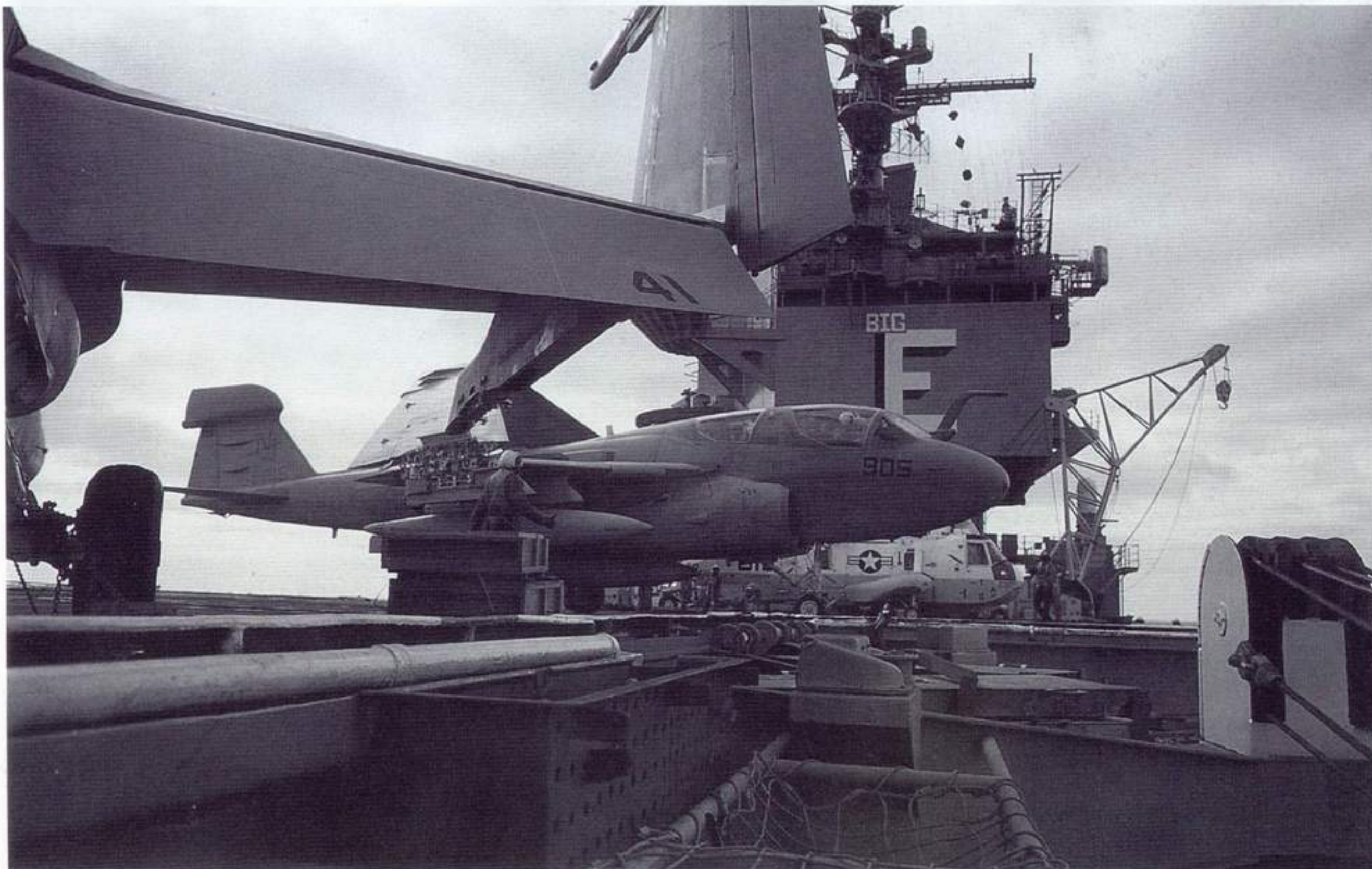


Exiting the landing area, this F/A-18 pilot starts to fold the wings and follow the taxi director's instructions. The Hornet's sturdy, heavy-duty landing gear is evident.

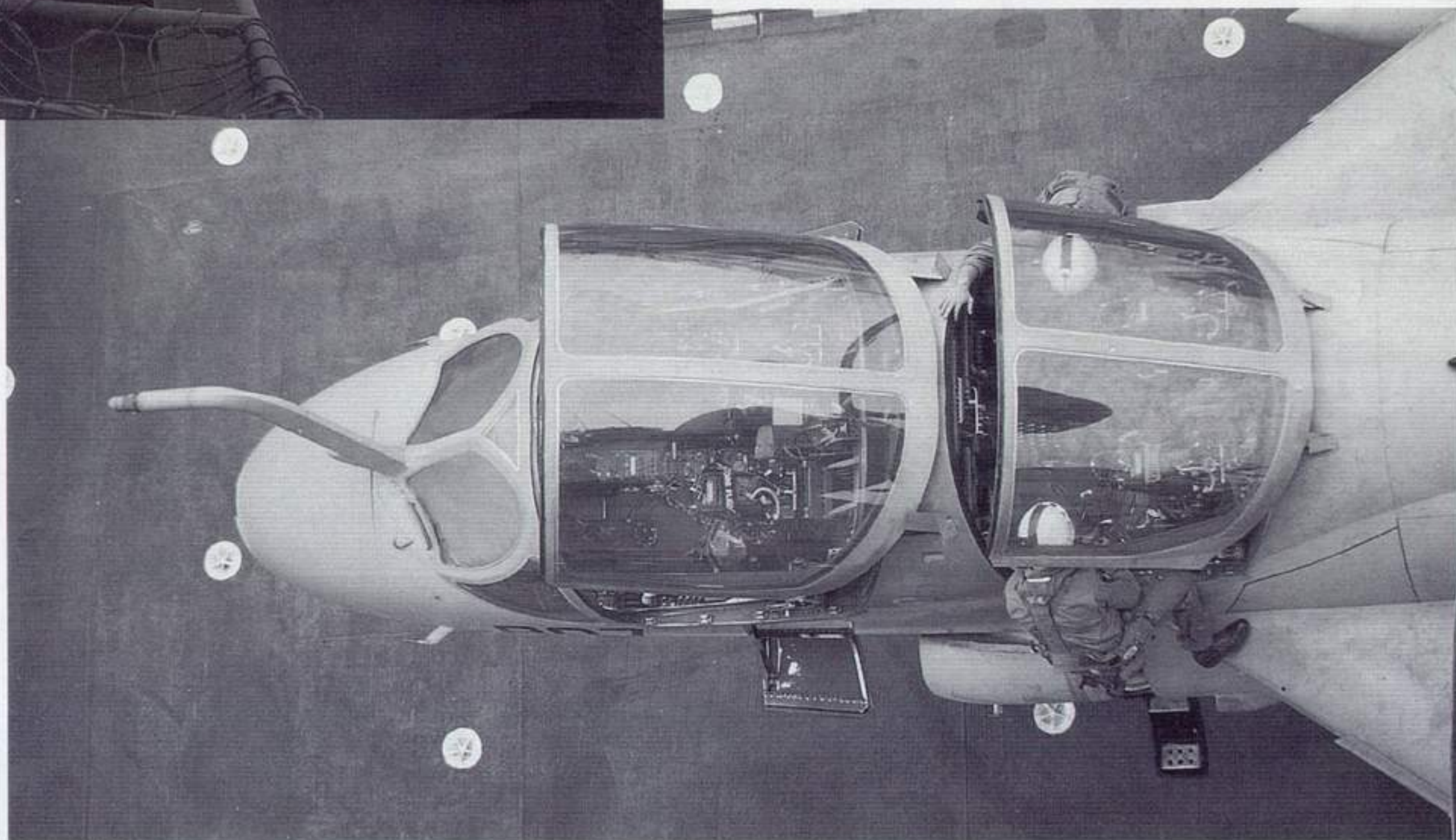


The green shirt, hookup man, has insured that the catapult launch bar is connected and the tension is correct. The aircraft's nose gear has been centered and aligned by use of a long metal channel known as "the box". Behind the nose gear is a metal bar attached to the deck by means of a breakable link known as a "holdback". When the catapult reaches full pressure, the holdback breaks and the aircraft shoots forward.



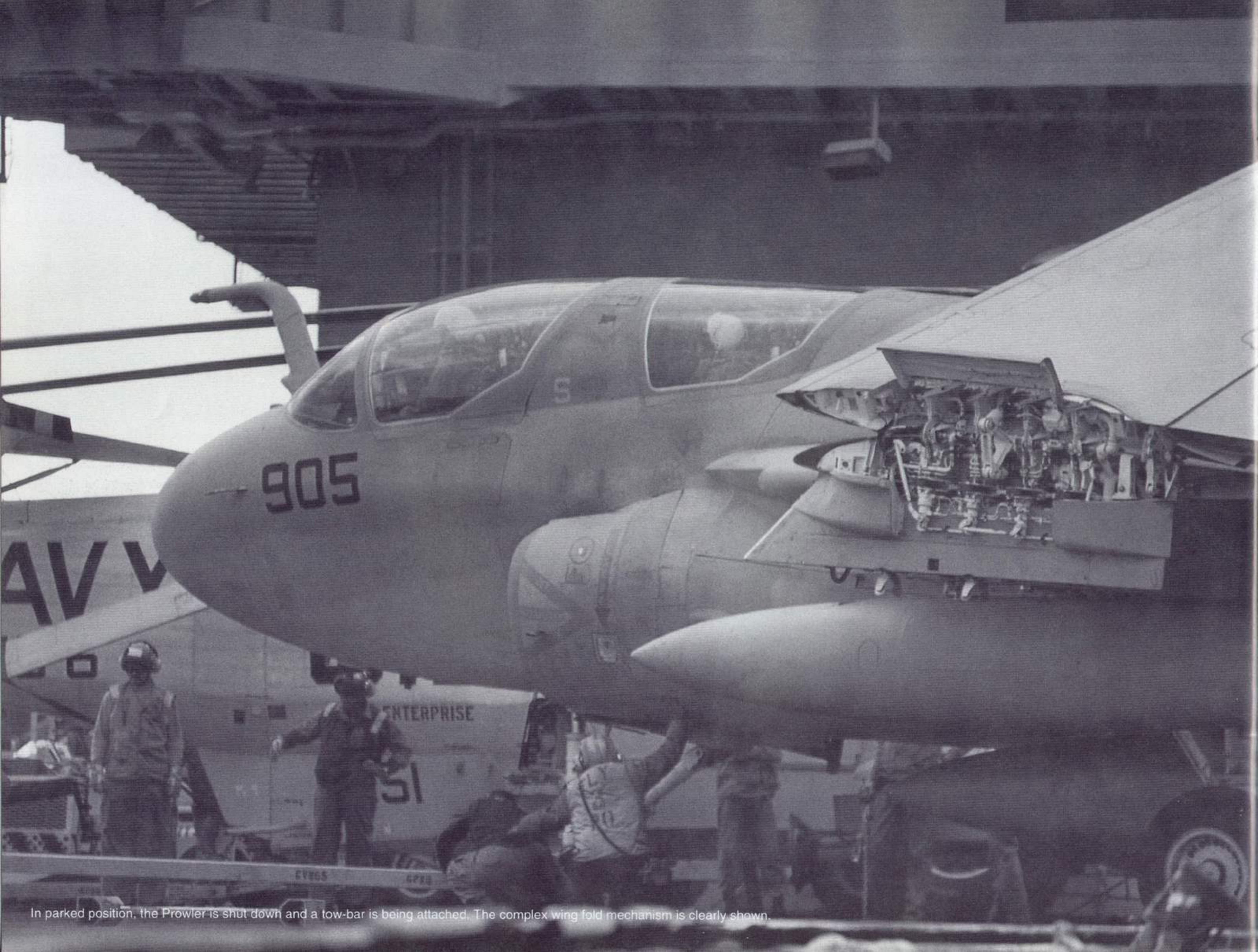


Taxi directors guide an EA-6B to the deck's edge for a 180 degree turn for parking on the USS Enterprise.



EA-6B rear-seat crewmembers climb aboard.



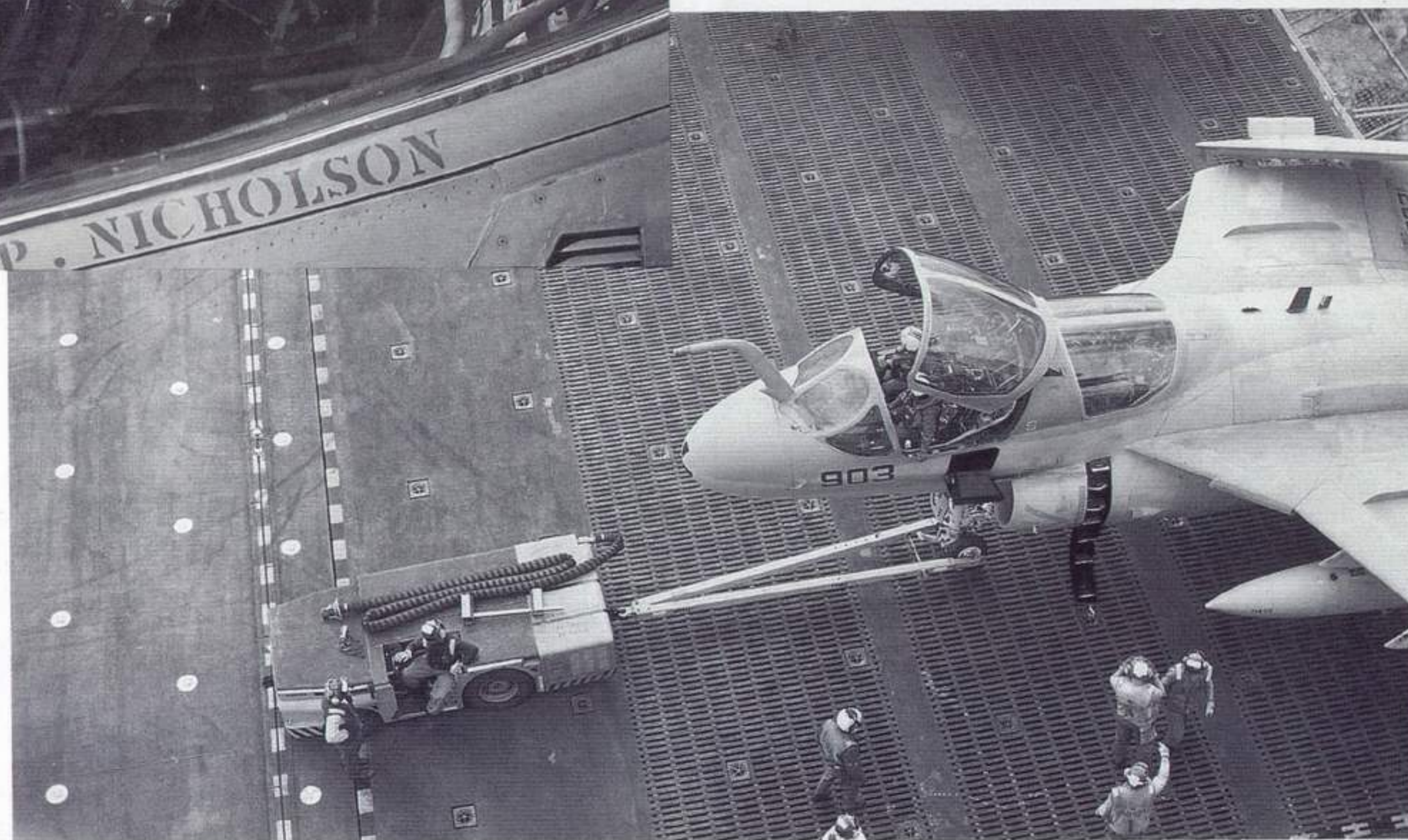


In parked position, the Prowler is shut down and a tow-bar is being attached. The complex wing fold mechanism is clearly shown.





Close-up of an A-6E pilot and the intricate plumbing of his ejection seat.



With tractor and tow bar attached to the airplane, this Prowler crew awaits word to commence operations.





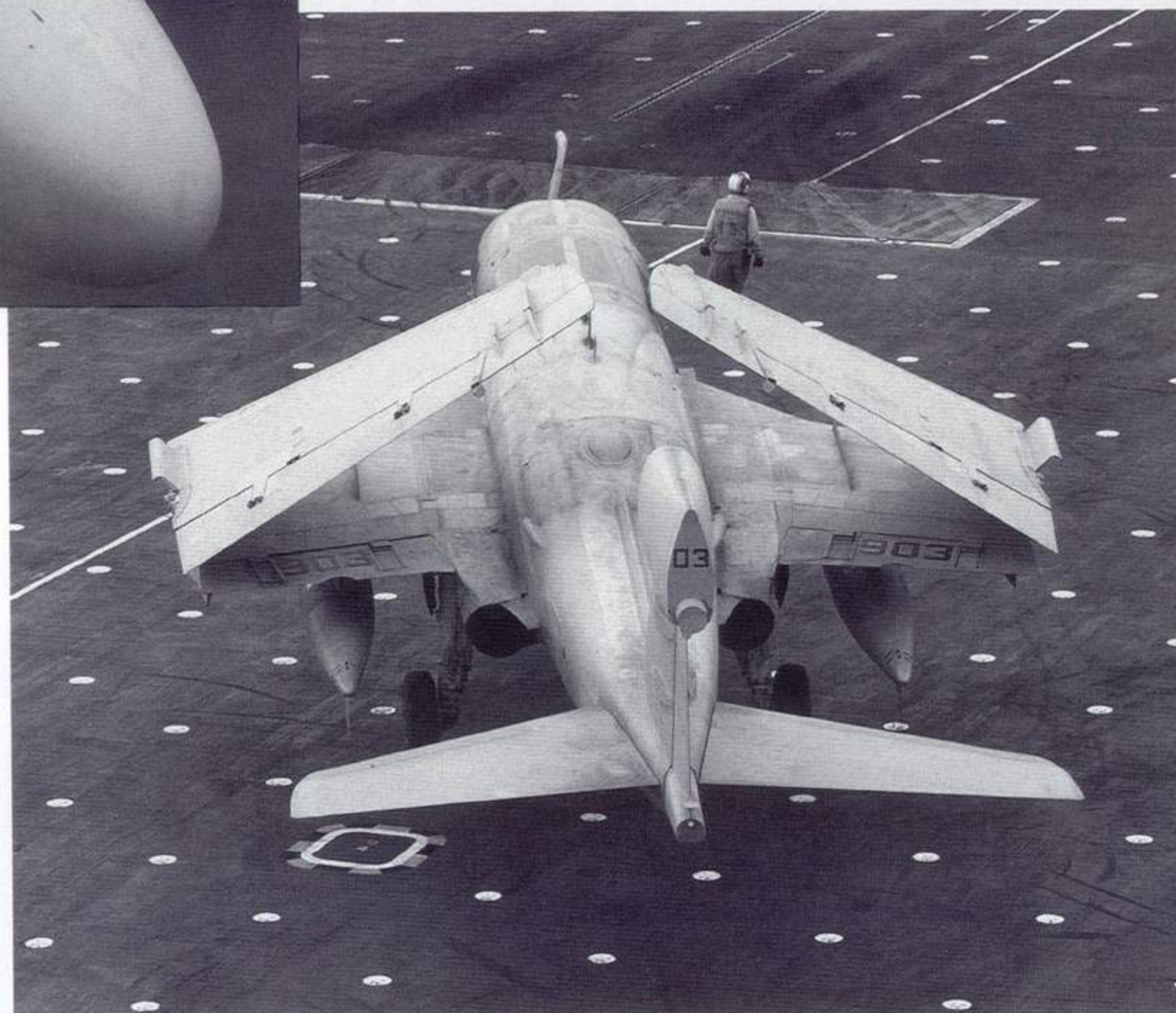
Very large canopy areas provide A-6 pilots with excellent visibility overhead, to the left, and ahead. The Intruder's large nose section is the result of design requirements for twin J-52 engines, side-by-side seating and twin radars under the radome.

Backseaters of a Prowler perform pre-flight cockpit duties.



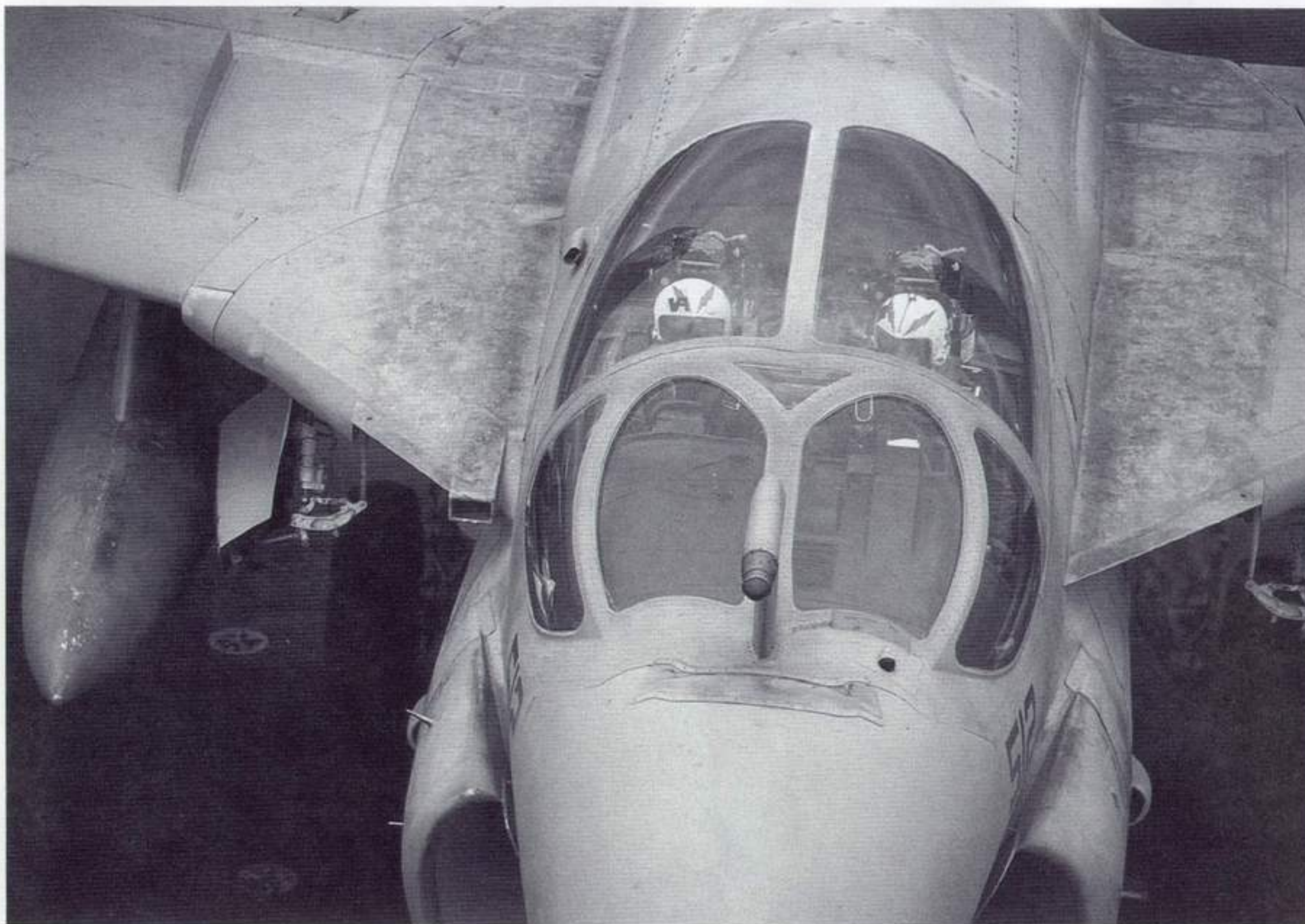


An A-6E crew moves forward to the bow catapults. Its finish suffers not only fading and discoloration from the elements but from great numbers of oily boots walking across the wing roots.



An EA-6B enroute to the port bow catapult. Its large fin radome also has an AN/ALQ-126B Deception ECM (DECM) system which provides the "beer can" antenna at the pod's base.





A head-on view of an A-6E showing the prominent air-refueling probe and the distinctive five-piece windshield. The two-seat Intruder carries a pilot in the left seat and a bombardier/navigator (B/N) in the right seat.

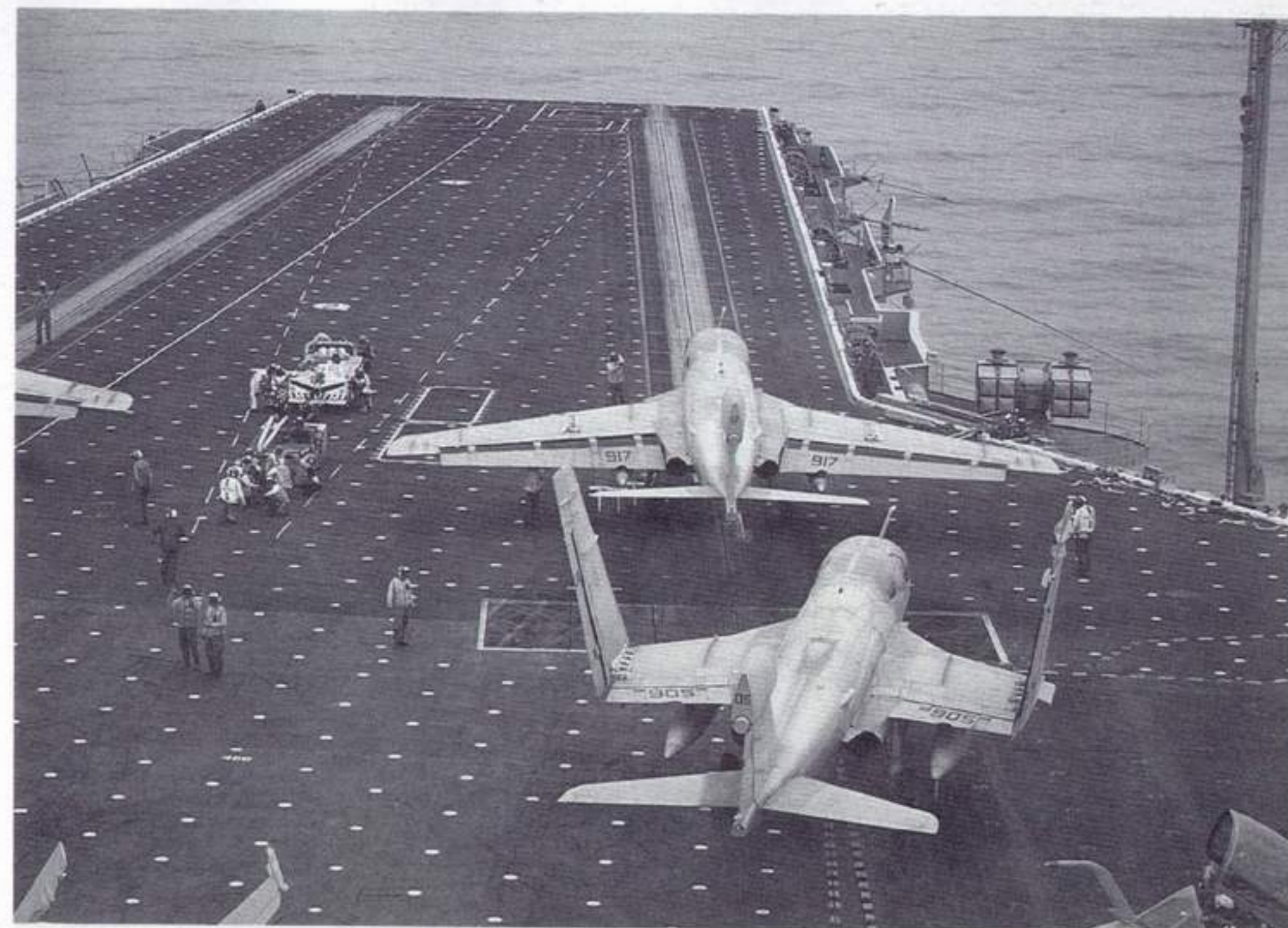


This Prowler is positioned on the port bow catapult and is about ready for launch as the crew makes final checks.





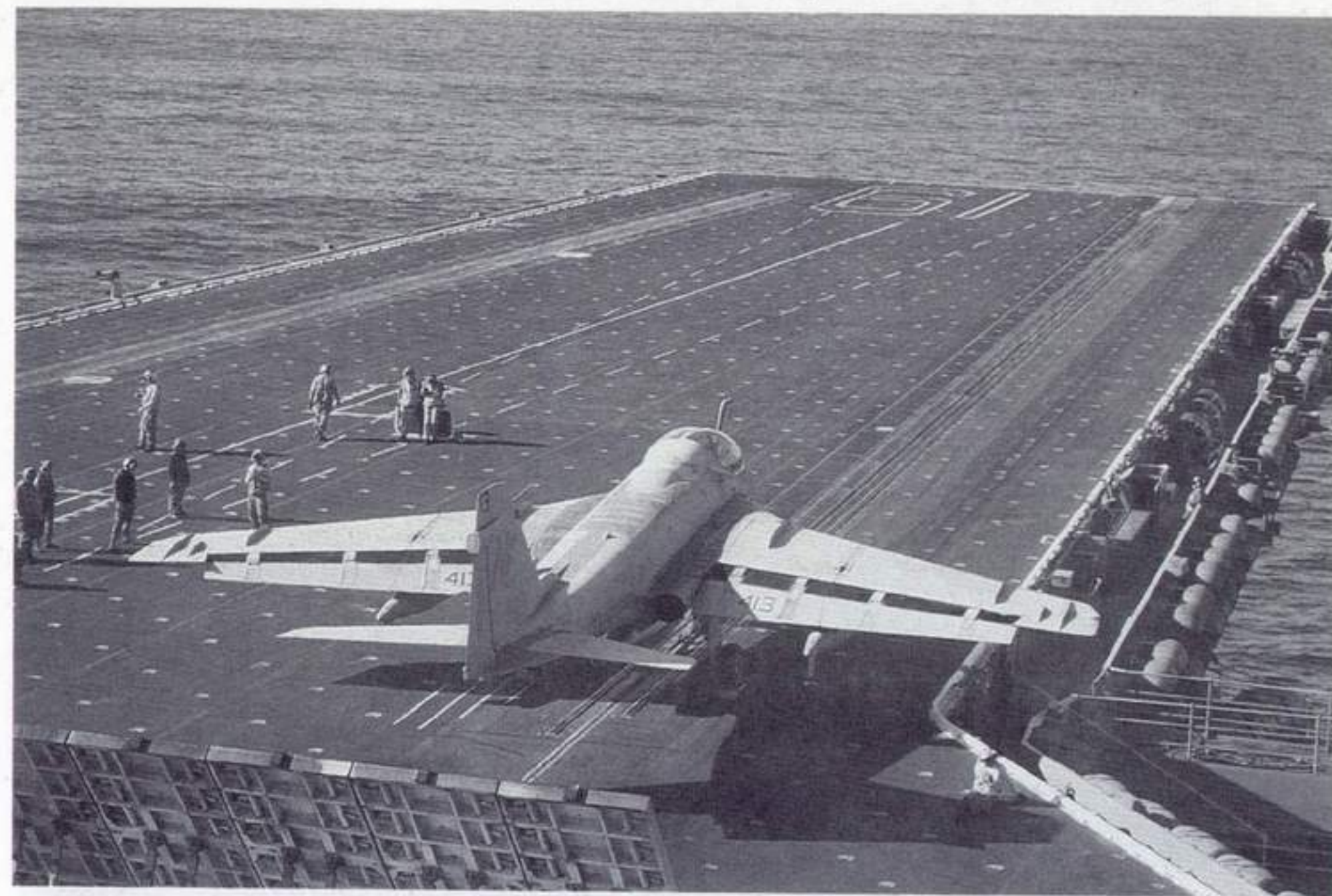
Lowering its wings for takeoff, an EA-6B moves to the port bow cat. Note the "box" in position on the track to align the nosegear.



EA-6Bs about to launch from bow catapults of the USS Enterprise, CVN-65.



Flight deck "ghosts" guide another Prowler into position on a catapult as steam covers the area from a previous A-6 launch.

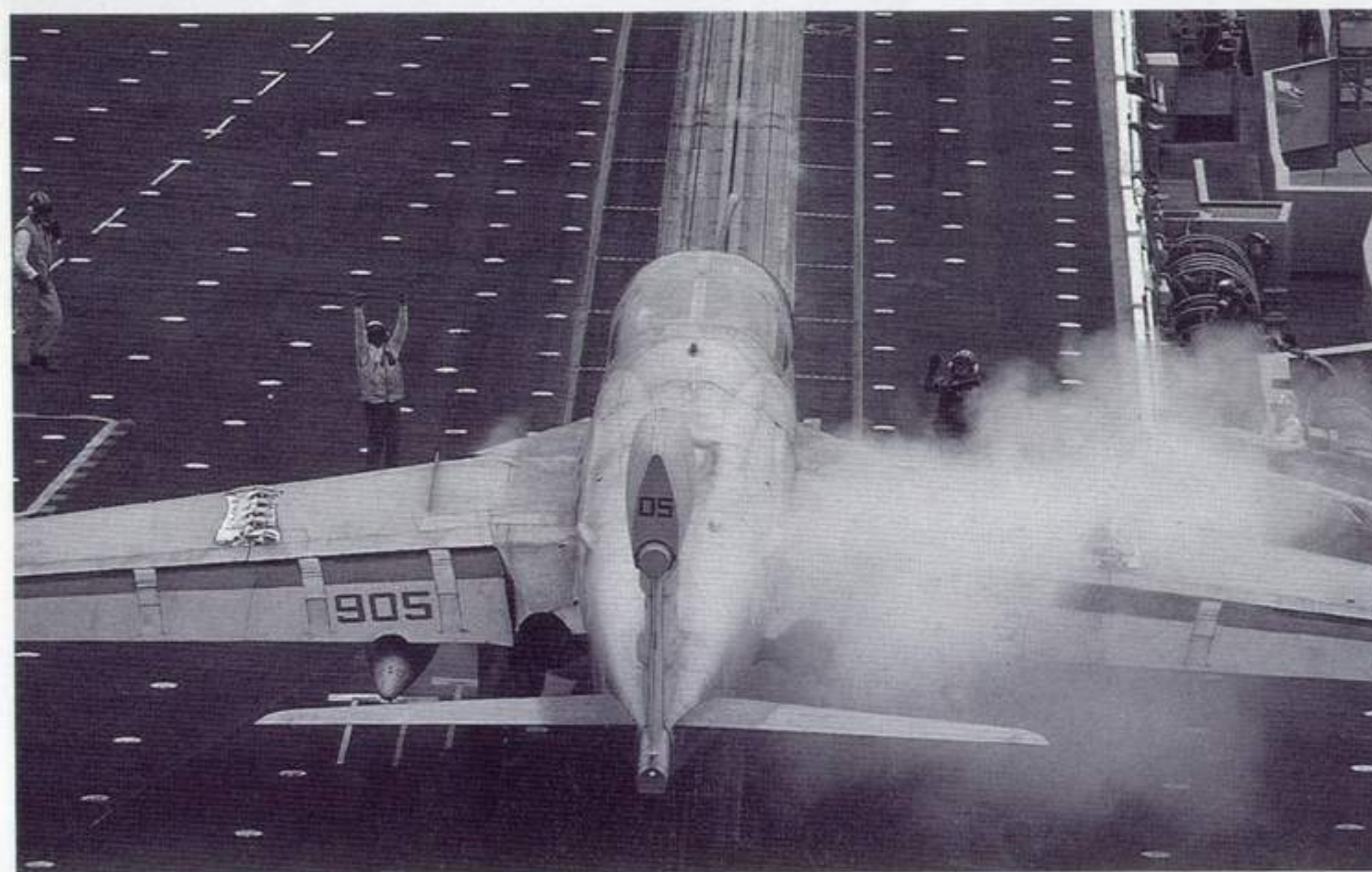


An A-6E Intruder on the USS Ranger's bow starboard catapult with the deck's jet blast deflector raised.





As steam flows aft from the USS Enterprise's starboard bow catapult, an EA-6B Prowler prepares to launch.



In position, the EA-6B pilot is shown a weight board which must agree with the aircraft weight as the strength of the cat shot is set accordingly.

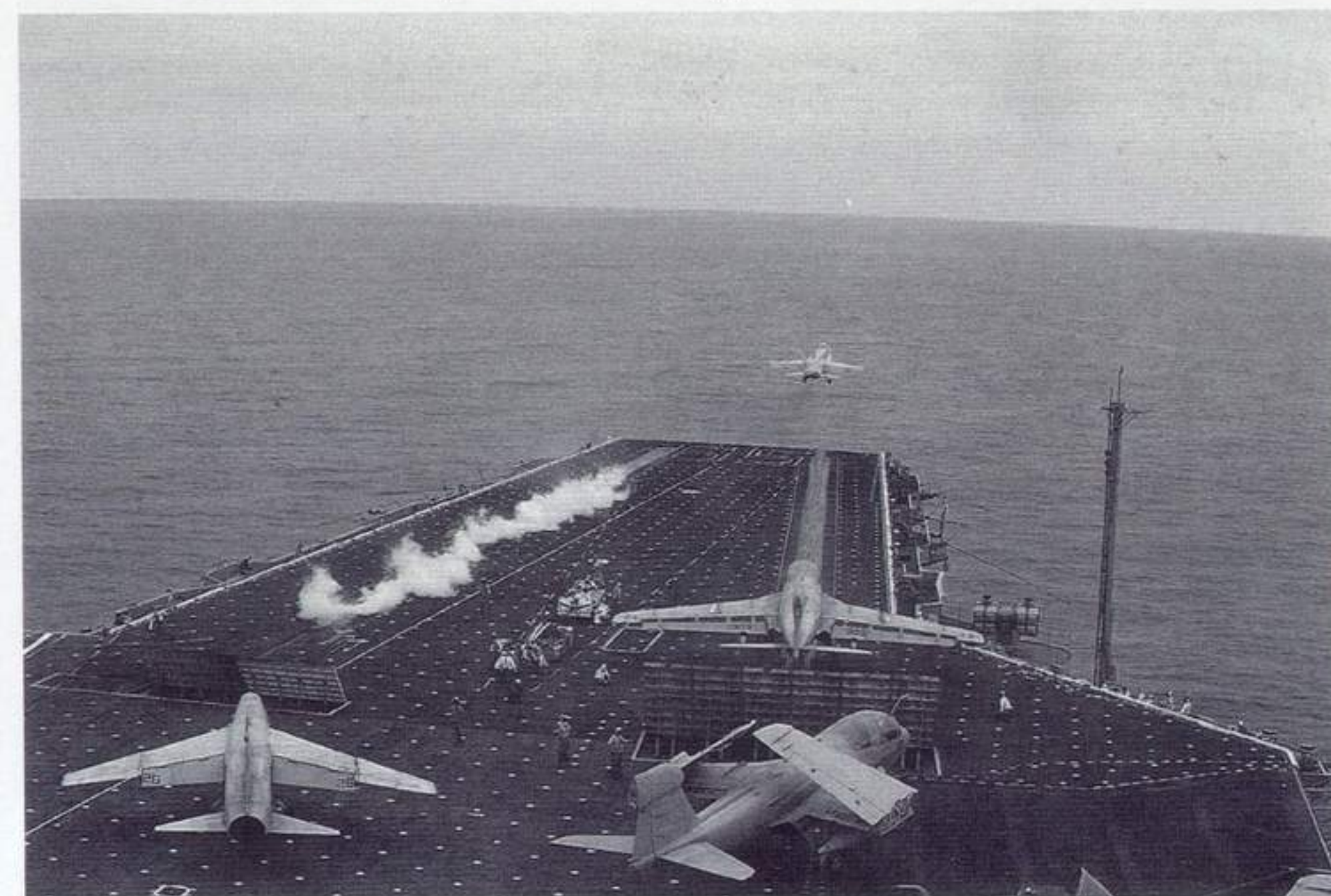


The huge EA-6B Prowler has but one pilot. The other three crewmembers are Naval Flight Officers (NFOs) (ECMOs) They have received nicknames of "FKMOS". In the Prowler, they are FKMO 1, 2 and 3.





An F/A-18 near the end of a catapult shot. Note the up-positioned stabilizer.

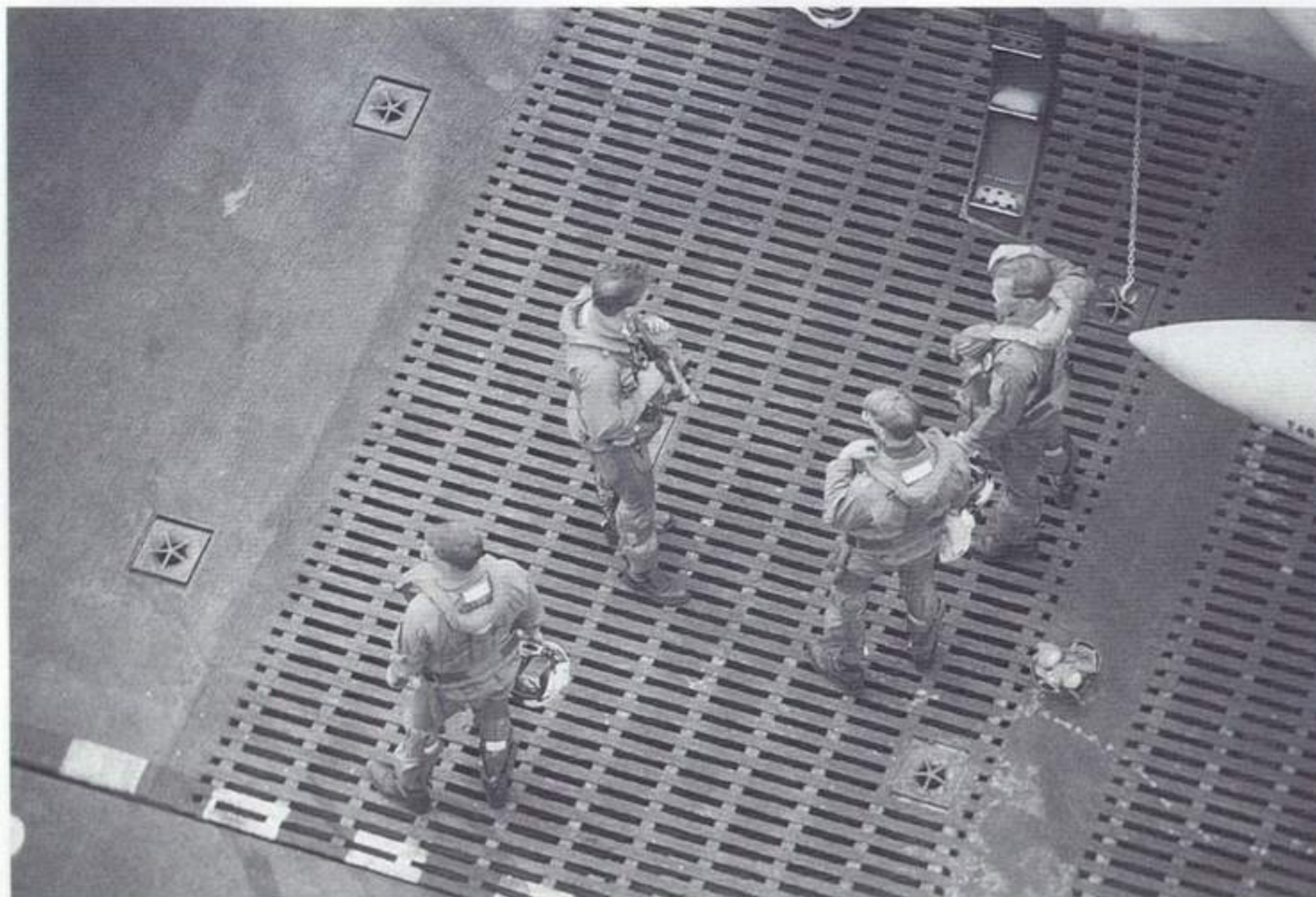


With the Hornet airborne on the left, the EA-6B Prowler is ready to go on the right.





As this Prowler is guided to a catapult, the nose section of an AN/ALQ-99 pod and its ram air turbine (RAT) propeller is shown in closeup. The EA-6B can carry five pods which then provide a total of ten jamming transmitters.



An EA-6B crew standing by their aircraft on the flight deck before flight operations begin.



In full landing configuration, this VA-145 A-6E Intruder clearly displays its wingtip speedbrakes. While low-visibility paint schemes are the norm, red is still found inside flap and speedbrake area as well as around various steps and panels.





In front of the USS Enterprise's island, an A-7 waits its turn to position on a catapult. A jet blast deflector is raised signifying launch of another aircraft.



Flat finish, low-visibility paints take a beating in the carrier environment of moisture, salt air and sun. This A-7 shows its well-worn, faded exterior.



An A-7 pilot preflights his aircraft in concert with the plane captain. Caution must be exercised at all times as, in this case, the edge of the deck is very close.





An A-7 Corsair II parked on the flight deck. It is from the A-7 transition squadron and is aboard for the purpose of qualifying a new pilot in the A-7. The A-7 is a ground attack aircraft.



An A-7 receives a successful launch off the catapult.



An A-7 coming out of its parking space. The yellow shirts are passing the pilot off from one to another further up the deck (the man with his left hand raised). The crewman beside the aircraft is holding the wheel chocks he has just removed from the aircraft tires.



The A-7 continues his taxi, being passed from one director to the next.



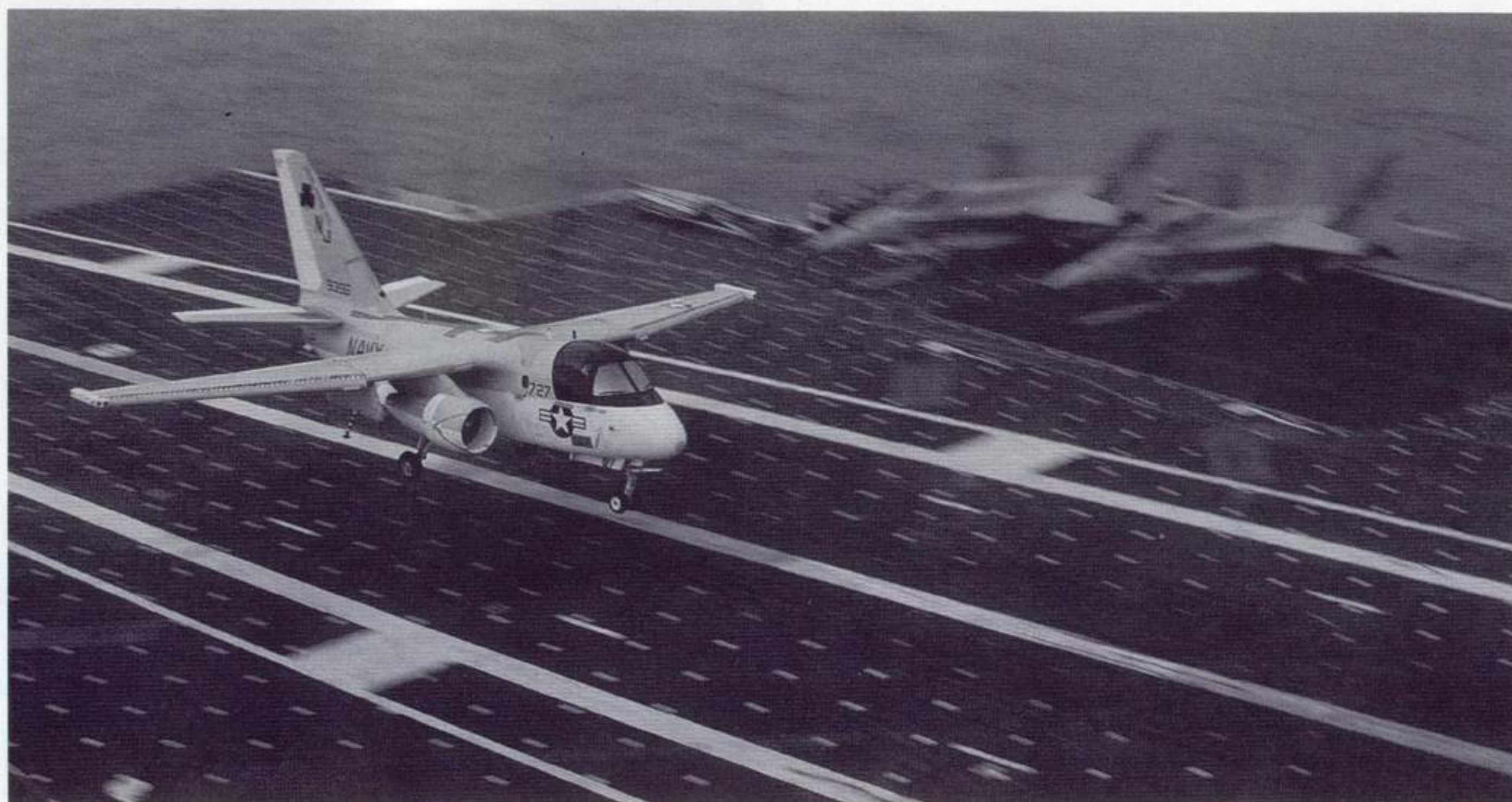
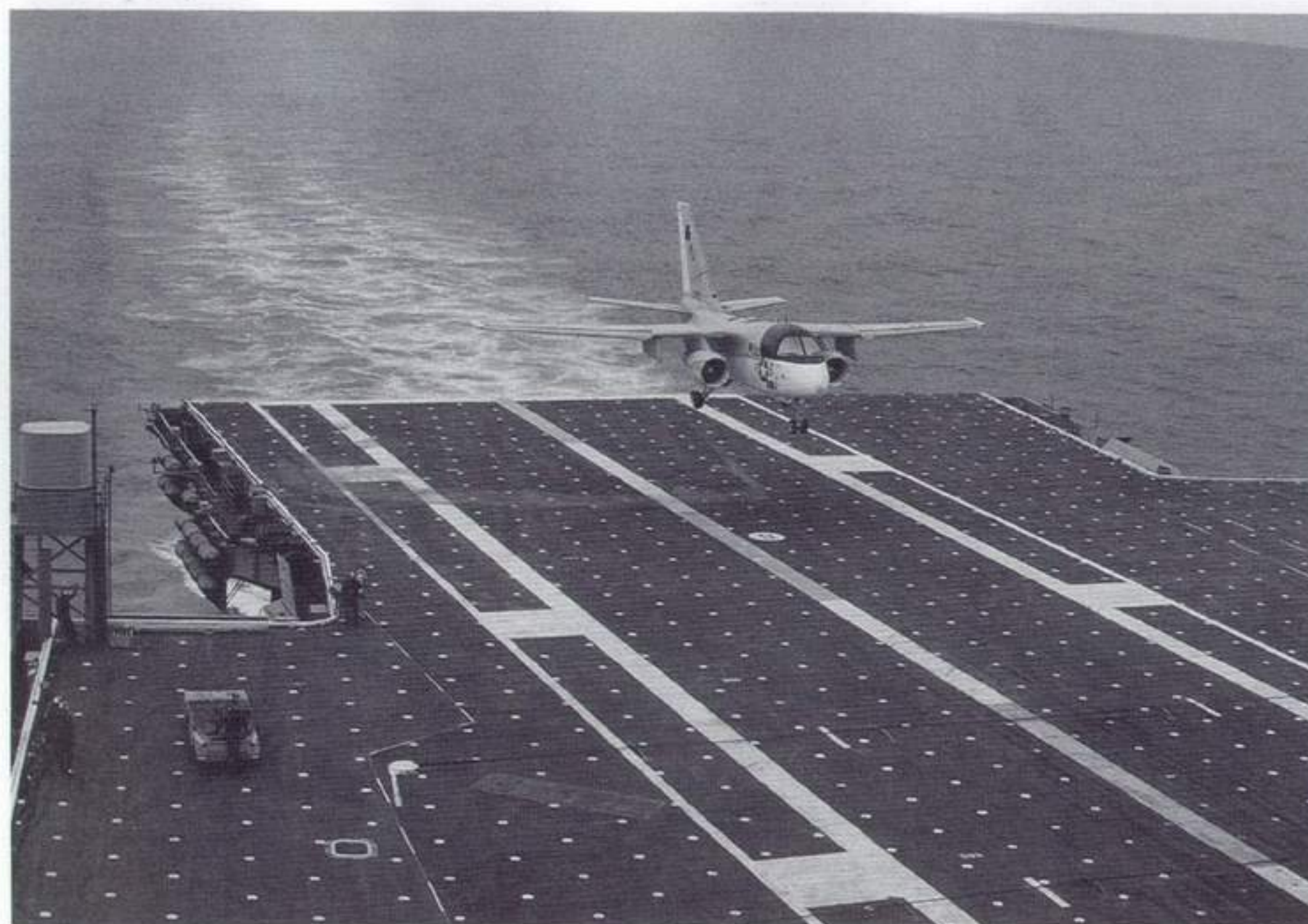
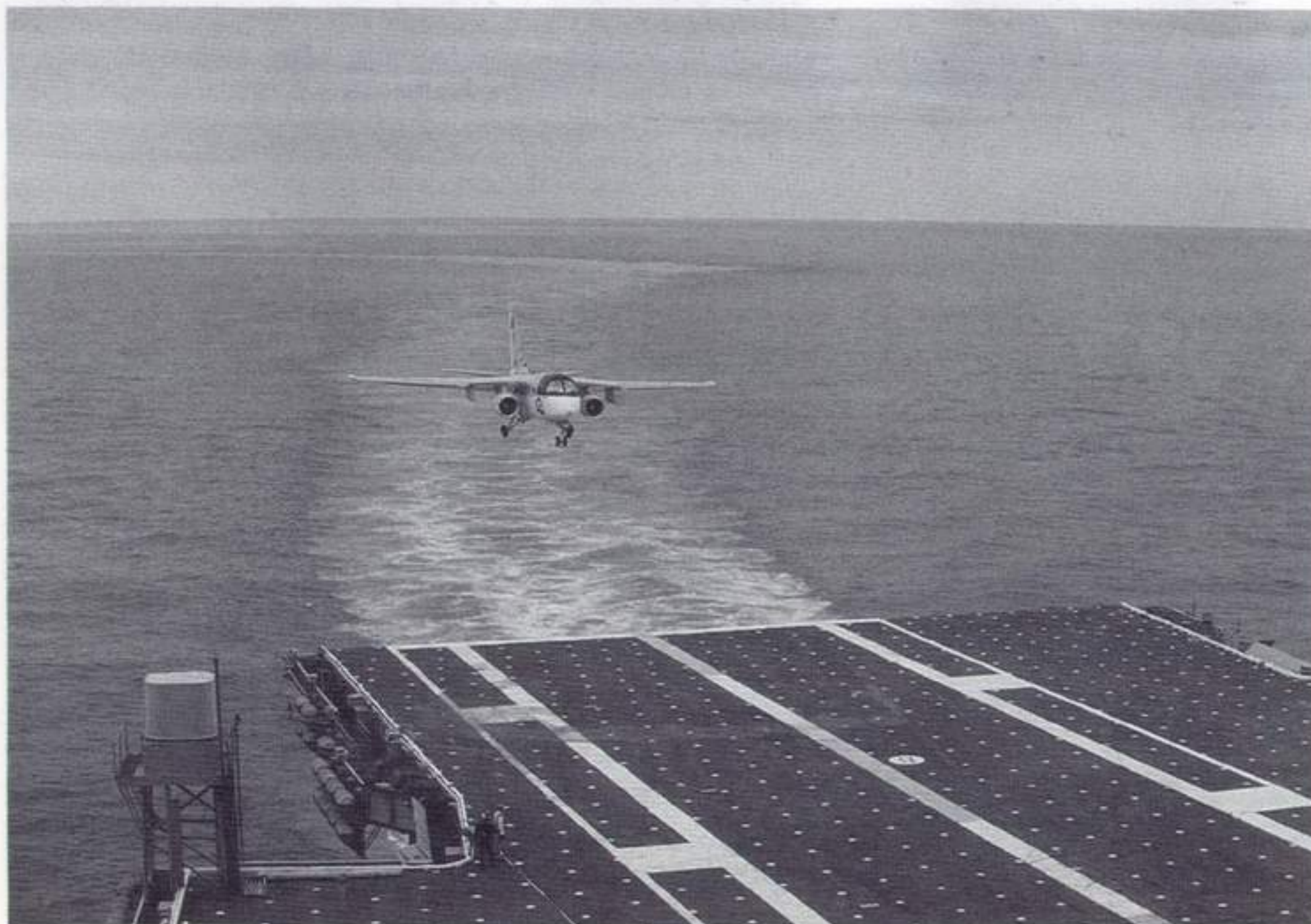


A Lockheed S-3A Viking on approach. The S-3A is a four-seat, twin-engine jet, anti-submarine (ASW) aircraft. It was designed to replace the older, piston-engine Grumman S-2. With a complement of two flightcrew and two tactical crew, the S-3 can put up a screen around a carrier task force weaving an electronic net.



Hook extended, this S-3A prepares to come aboard. Vikings have been nicknamed "Hoover" after the vacuum-cleaner due to the peculiar sound of its turbofan engines.





Landing sequence of an S-3A Viking. This S-3A is from VS-41, the training squadron, or RAG, at NAS North Island, California. NAS North Island is also the center for all Pacific Fleet carrier-borne ASW units.

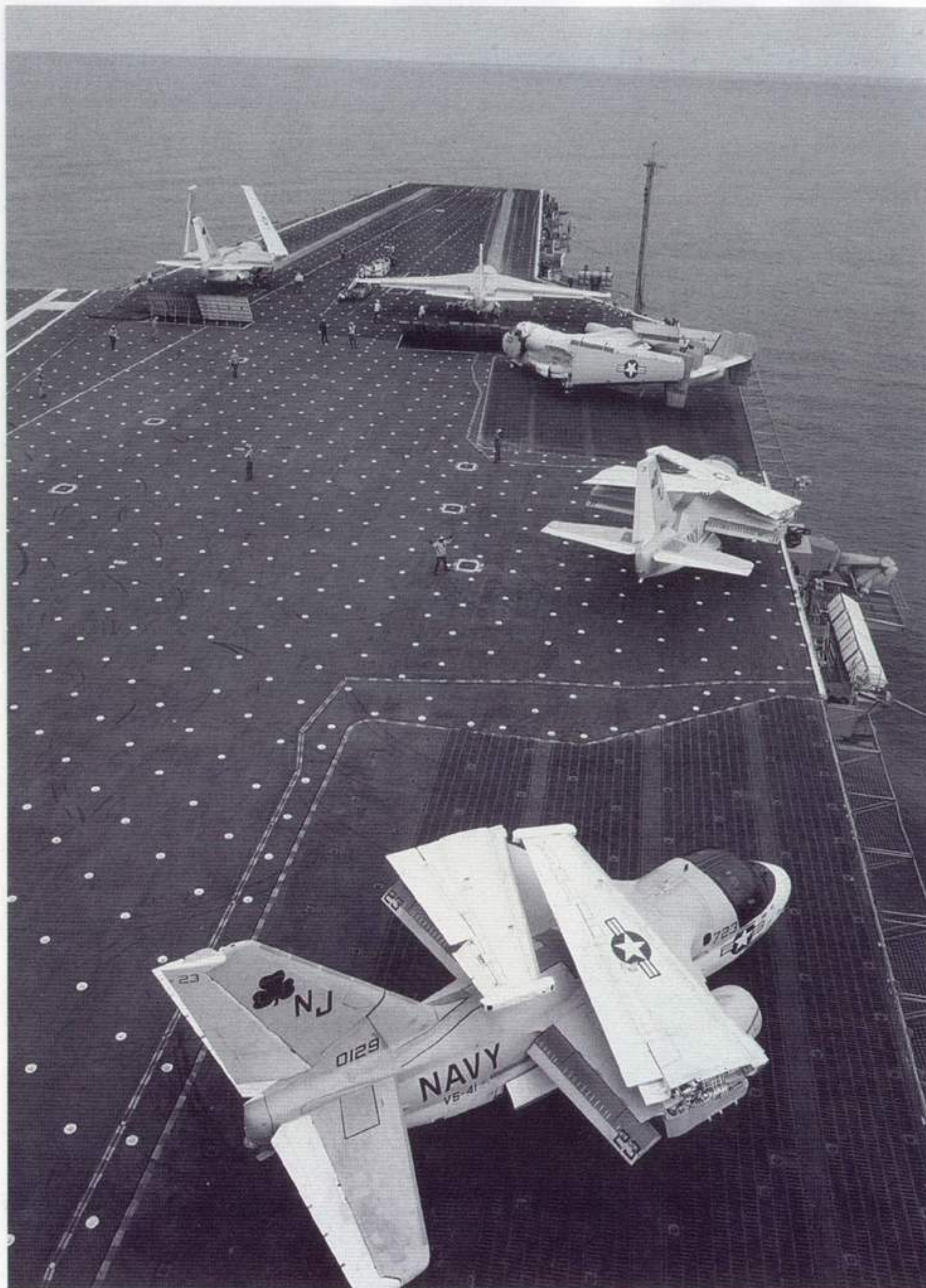


Clearing the landing area, this S-3's wings are folded to decrease its deck size.



Close-up of S-3A number 731's starboard nose area as it returns from an arrested landing. All four crewmembers have individual ejection seats.





Wings folded and engines running, two S-3A Vikings and a C-2A Greyhound await their turn to launch. On the port bow catapult, an S-3 lowers its wings in preparation for the cat shot while the one on the starboard catapult is ready to go.

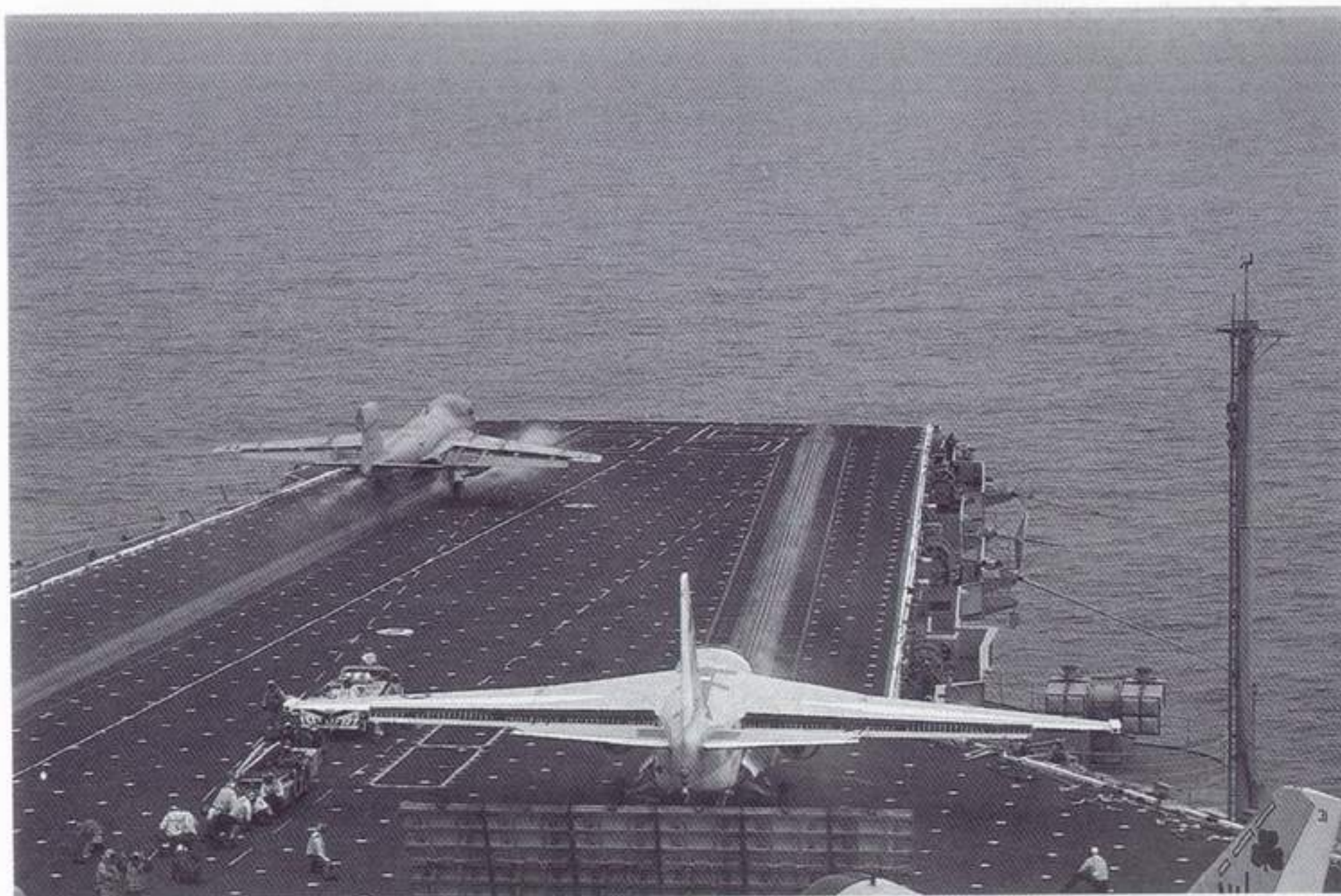


The Viking's swept wings fold in a staggered, right wing in front of left, angular position. Extended flap areas are red with white stripes.

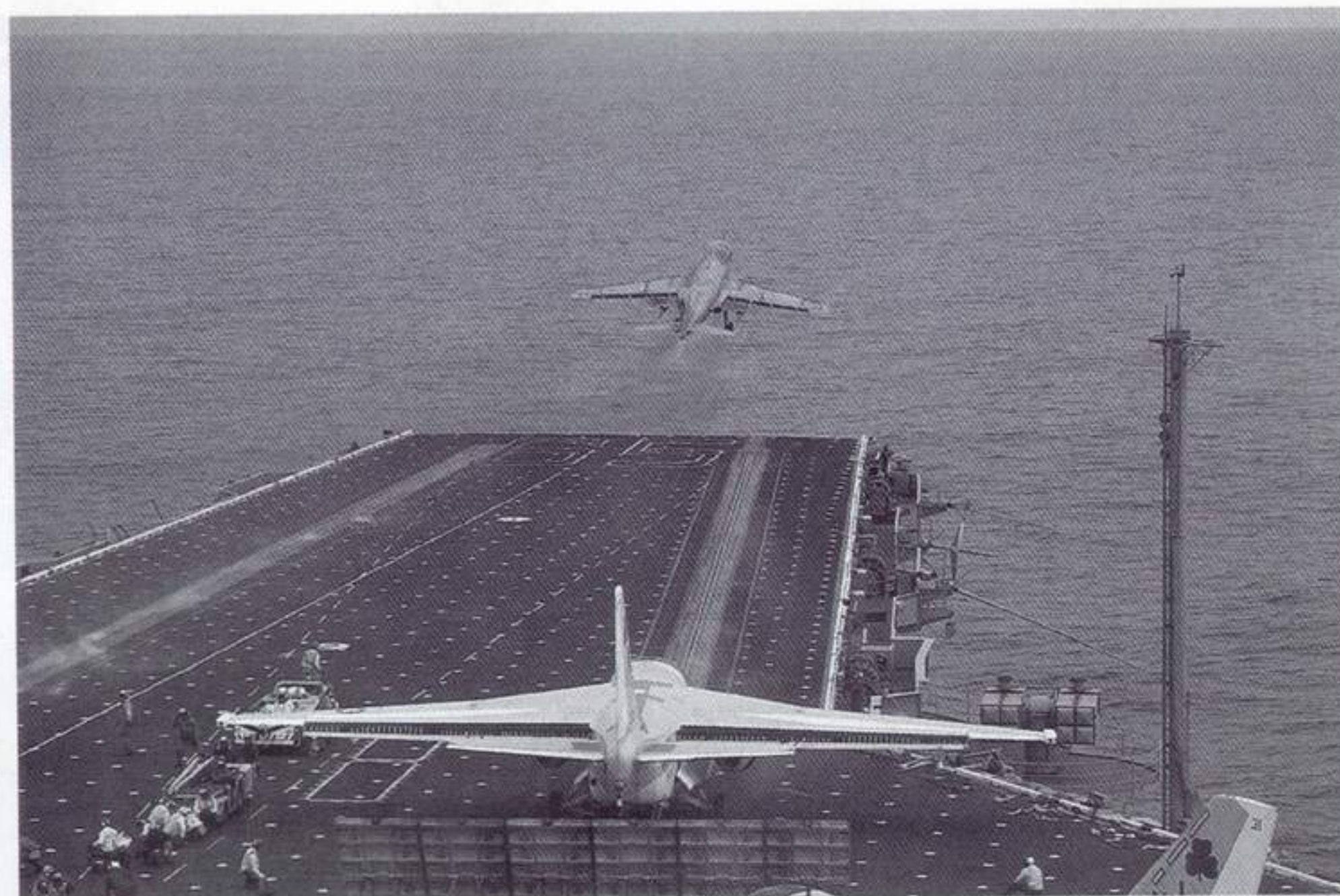


Each of the S-3's wingtips has an Electronic Support Measures (ESM) pod which contains IBM AN/ALR-47 ESM equipment. The black dots are ESM antennas. VS-41 is known as the "Shamrocks" and the vertical fin carries the dark green shamrock design.





While a Grumman EA-6B launches from the port catapult, an S-3A Viking sits poised to go on the starboard cat.



The blast fence is raised behind the S-3 so its exhaust will not blast wind, heat and objects down the deck behind. With the EA-6B in the air, the Viking is just seconds from its own cat shot.

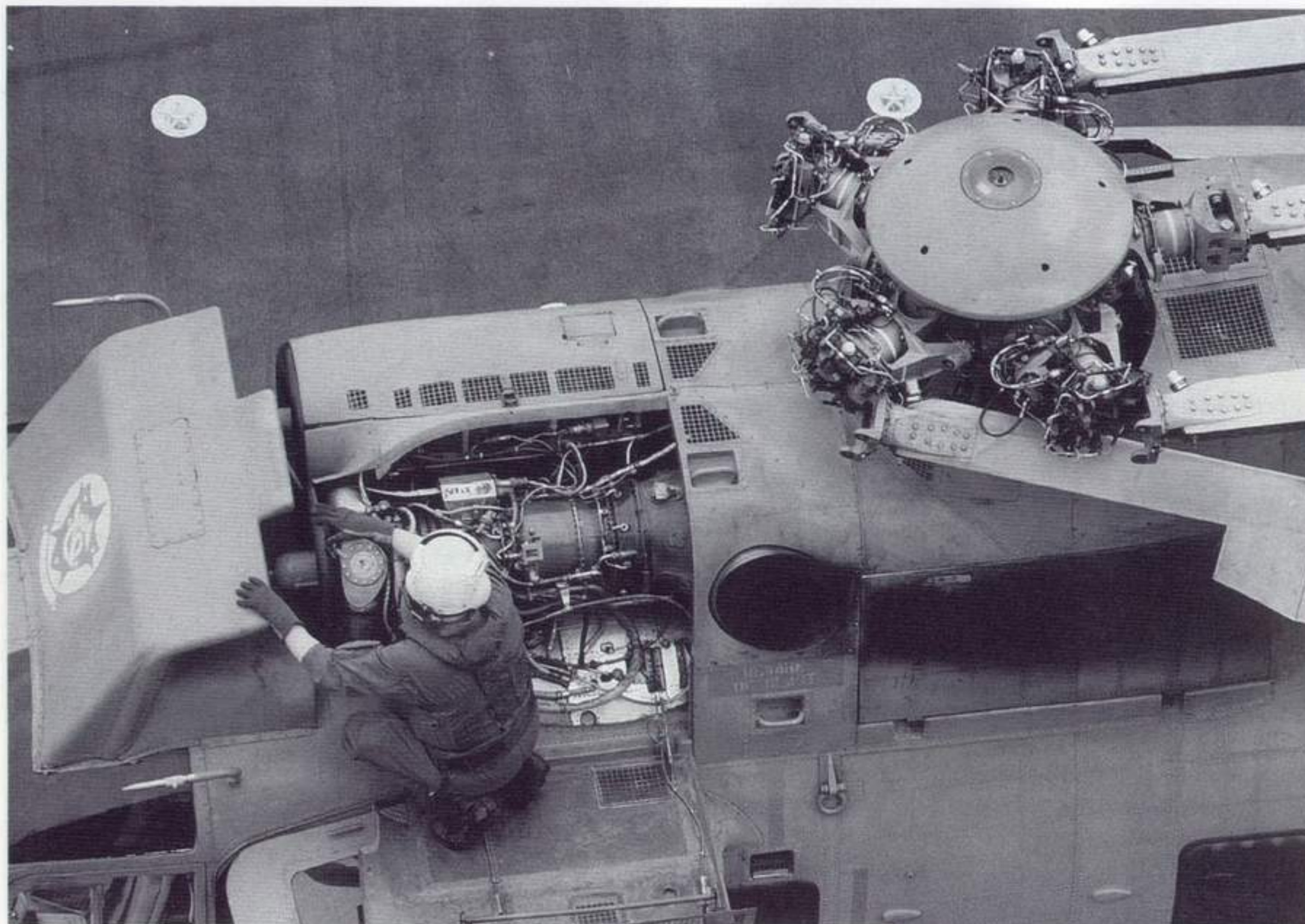


The S-3 just airborne after its cat shot. The Viking is an outstanding ASW aircraft able to stay on patrol for many hours, hundreds of miles from the ship. Since it can air-refuel, the S-3's endurance is a matter of crew fatigue.

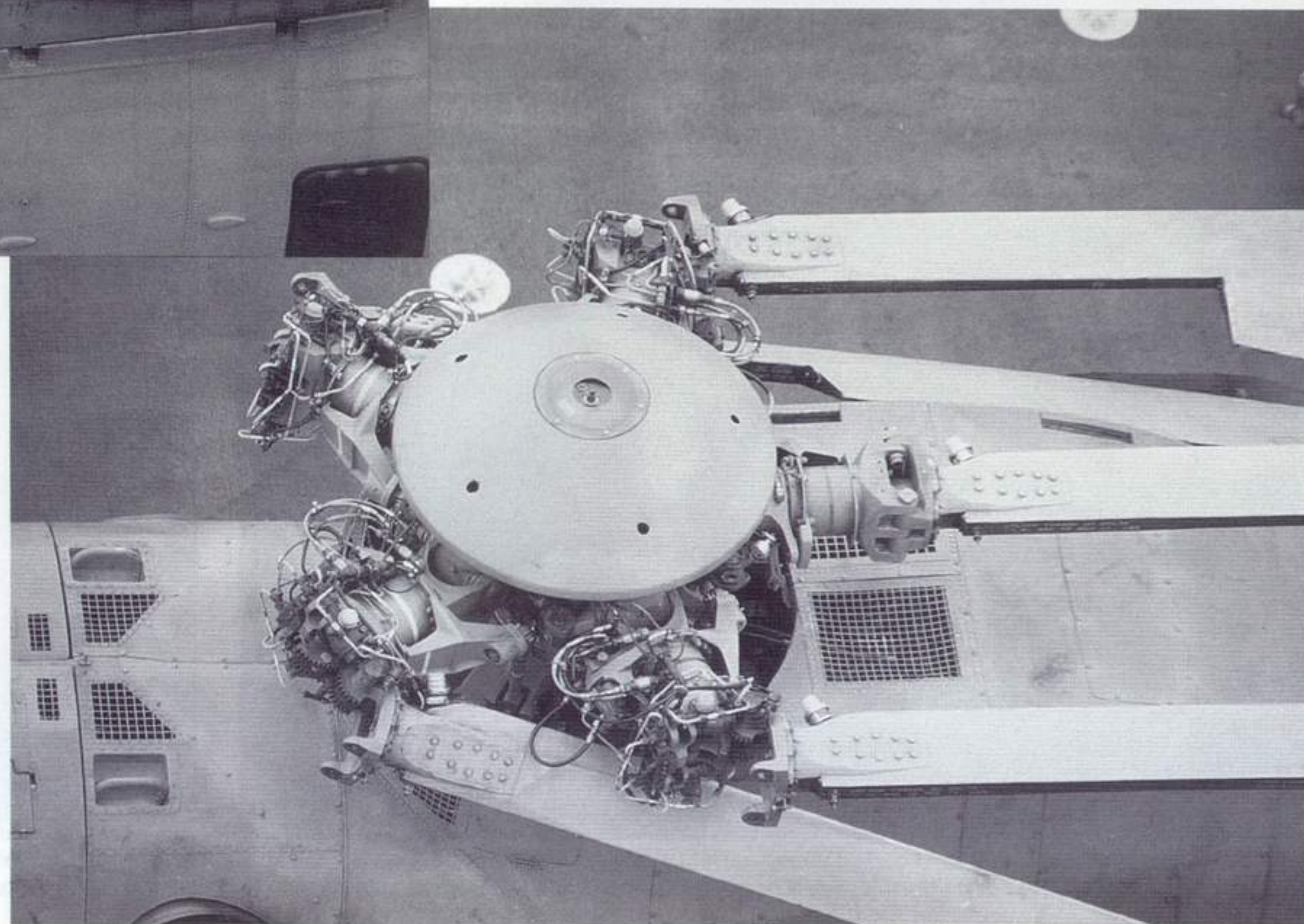


Hook, gear and flaps extended for a "trap", an S-3A Viking overflies the carrier as it awaits a clear landing area. Its extensive ASW equipment is capable of detecting and destroying even the new, "quiet" submarines. Its primary armament is a homing torpedo but it also carries depth charges, mines, flares and rockets.





A crewman checks one of the two General Electric T58-GE-10 jet engines which power the SH-3 Sea King helo. Note that the rotors fold back to save space. An SH-3 is always in the air during flight operations - just in case. The carrier normally carries two or three of these helos that act as guards for men overboard or pilots in the water during flight operations. It also has an anti-submarine capability.



A close-up of the complex Sikorsky SH-3 rotor assembly. The main rotor diameter is 62 feet when the blades are fully extended.





While one TA-4J is being positioned for launch, another has missed the cables (a "bolter") on the angle deck and accelerates back into the air. A real milestone in a Navy pilot's life is the radio transmission following the last qualifying catapult shot: "You are qualified, gear up, hook up, your signal Bingo (i.e., head for the nearest shore airbase) your vector for Miramar is 090 degrees at 90 miles." It means that after all the sweat, work and occasional doubts and fears, you finally, once and for all, are a Navy pilot!



In the TA-4J, the student pilot will receive six daytime carrier landings to bring his total to ten carrier landings when he receives his wings. Four have been performed earlier in the T-2B.

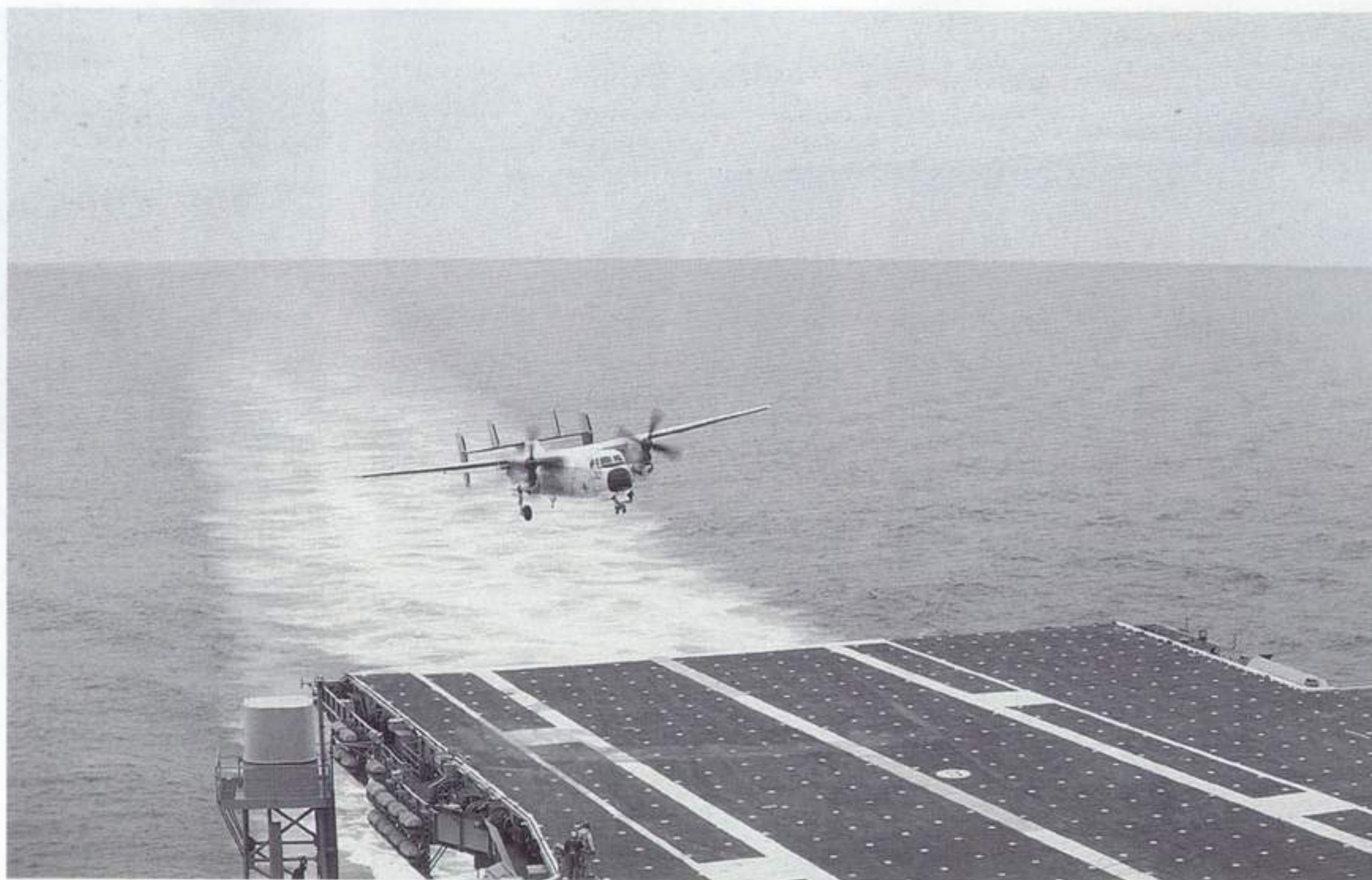


A TA-4J only a second away from an arrested landing on the USS Enterprise. F/A-18s are parked either side of the landing area - there is no margin for error. The standard paint scheme for USN training aircraft is gloss white and red-orange.



A Grumman C-2A Greyhound carrier-on-board-delivery (COD) aircraft making lineup corrections as it comes aboard. The C-2A is a transport derivative of the E-2 Hawkeye early- warning surveillance (AEW) aircraft.

About to touch down on the flight deck, the C-2A pilot is still making corrections. Note the slight right wing down attitude for a left of centerline condition. Touching down in a wings-level attitude is important to preserve the aircraft. F/A-18 Hornets are parked to the left of the landing area. The large C-2A will also use a tailhook to "trap aboard".

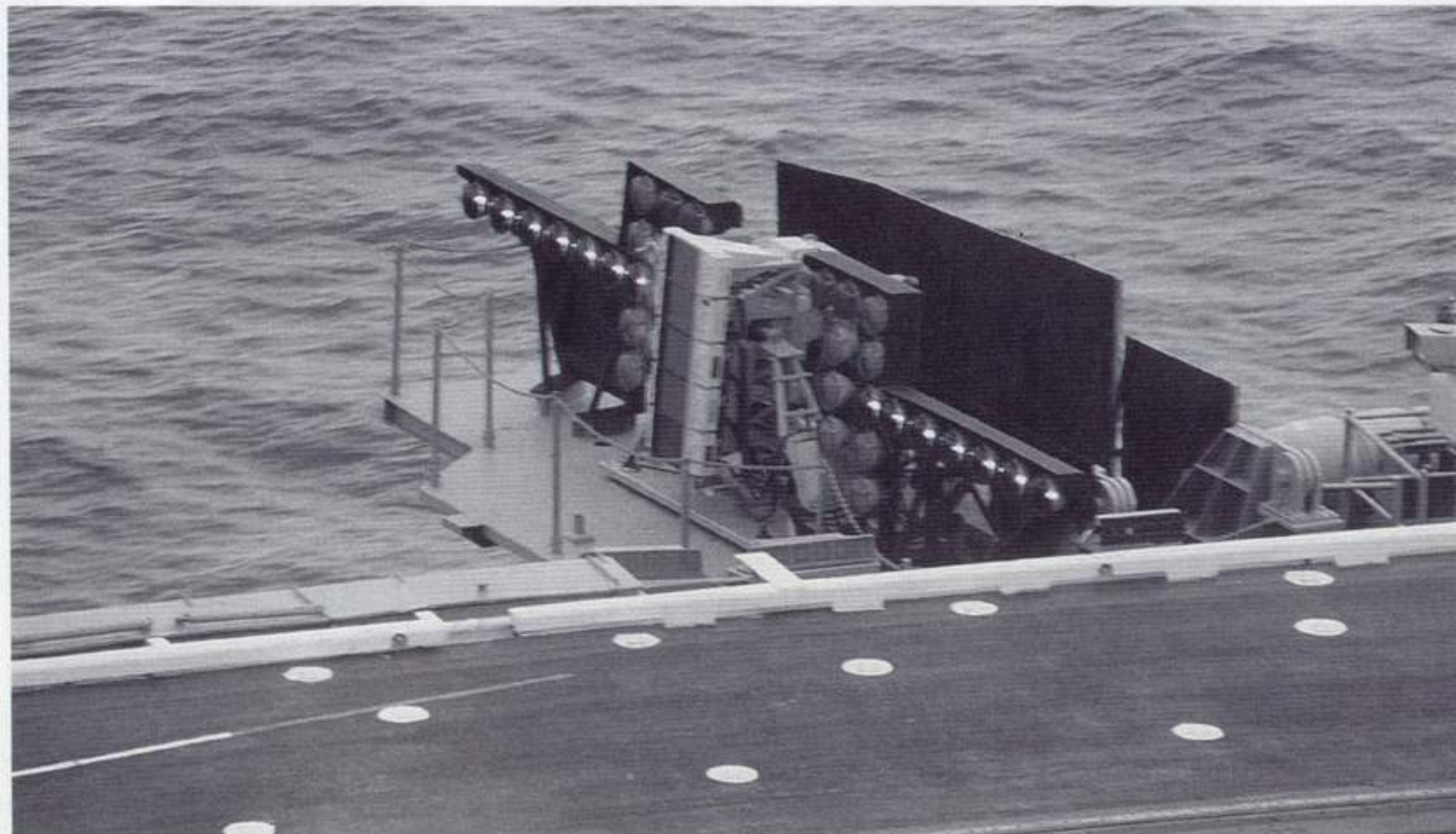


A C-2A COD takes a cat shot. Even though it is a relatively large airplane with a wingspan of 80' 7" it operates well from a carrier. Able to carry 39 passengers or freight, the C-2A COD utility aircraft is also a means of delivering the mail. The arrival of one of these planes aboard ship is viewed as a notable event for this reason.





A clear view of the starboard bow catapult on the USS Enterprise.



The "lens". This is the device that projects a glide slope out into space so the pilot can fly down to a perfect landing. The green bar of lights on each side form a horizontal datum reference line. The vertical bar in the center will give a yellow "ball" of light to indicate to the pilot whether he is on, above or below the proper glide slope. If he is on the glide slope, the yellow ball will be in the middle, in line with the green datums. If he is high, the yellow ball will be high, above the green datums. If he is low, the yellow ball will be low, below the datums. If he is dangerously low, the yellow ball will turn red. The red cell can be seen at the bottom of the lens. The mass of red lights clustered around the vertical column are activated by the LSO or the tower, and indicate to the pilot that landing is not authorized, that he must go around and come back for another try. The lens is gyro stabilized to counter the movements of the ship within certain limits - which are sometimes exceeded.

The pilot landing aid television (PLAT) which uses cameras on the ship's centerline and by the bridge. All catapult launches and arrested landings are filmed and a pilot can review his performance from approach down the glide slope to landing. The system also records any incident or accident to aid in investigations. Viewing screens are located at various places in the ship. An F/A-18 can be seen on the screen along with the time, winds and temperature.



A pilot headed for his aircraft to go flying. He is carrying a bag indicating that he is planning to leave the ship and not return. If he is going to a fighter or attack aircraft he will probably stuff the bag in the ammo compartment of the aircraft. Anything breakable had better be well padded to protect against the shock of the cat shot.





Landing Signal Officers (LSOs) on the platform. The white vests are officer pilots who are the LSO. LSOs are referred to as "Paddles", hence the stencil "Tomcat Paddles" is the F-14 LSO. The round insignia is from VF-1, one of the two F-14 Tomcat squadrons aboard an aircraft carrier. This man is a VF-1 pilot who is also the VF-1 LSO.



Showtime at the LSO platform. The LSOs are listening to the radio transmission for the incoming aircraft and are ready to order a wave-off (go-around) on a split-second notice if something should go wrong. The equipment pedestal in front of the LSOs provides a display of the speed, angle-of-approach and other information about the incoming aircraft.



A view from the LSO platform of an F-14 coming aboard. There is usually an LSO from each squadron on the platform. Each LSO knows his pilots and their quirks and will be the expert on his squadron's aircraft type. Normally, each squadron has at least one LSO. It is an extra duty with lots of work and no extra pay. One has to WANT that responsibility of holding lives in his hand.



View of an EA-6B coming aboard from the LSO platform. Note the extended wingtip speedbrakes. They are out to increase drag so the engines are at a higher power setting for instant response in case of a wave-off.





Pilots in the VF-2 ready room aboard USS Ranger, CV-61. The ready room is the daily home base for the officers and pilots of the squadron. It is the place where they are likely to spend a major portion of their work day if not flying. The Commanding Officer has the chair up front and in the center. It is the best seat in the house for the evening movie. The junior officers sit in back.



VF-1's ready room aboard the USS Ranger. VF-1 is the other F-14 squadron aboard the ship. There are two F-14 squadrons aboard each aircraft carrier. There is always a healthy rivalry between the two outfits as they try to outfly and out-perform the other in missions flown and carrier landing grades, just to name a few areas of competition.



Coffee cups of the "Bounty Hunters" of VF-2. This is in the ready room. There are always a few extra cups for VIPS and other visitors.



A rear view of VF-2's ready room. There is a large briefing board up front and a TV equipped with a VCR and a gun camera playback device for showing and reviewing videocamera footage taken during airborne missions. A pilot's mail will be put in his mailbox in this room. A highly perfumed letter from a sweet-smelling girlfriend has been known to disrupt all official business in ready rooms for some time with much teasing to the lucky recipient. ("Can I sniff your letter - just once?")





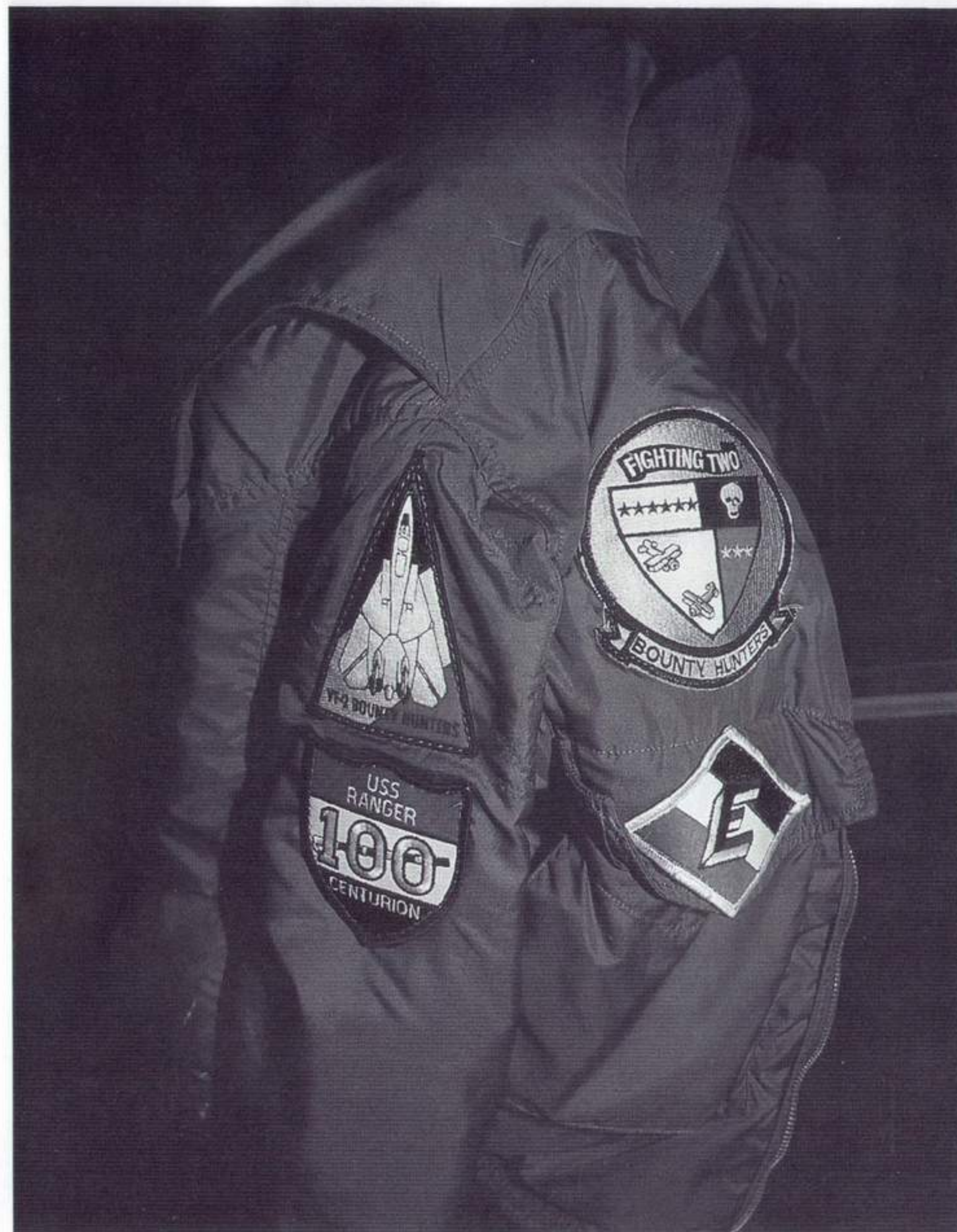
A leather Navy flight jacket with patches and name tag. Most squadrons have a standard patch arrangement for wear on the jacket, although the flight jacket is still not officially a part of any uniform in the Navy.

The flight gear locker is usually a small room close to the ready room where the flight gear is kept ready for use by specialists in maintaining this gear. Note the standardized helmet design.





A flight jacket owned by a pilot from VF-1, the "Wolfpack". This pilot also flew the F-4 Phantom as can be told by the F-4 patch and he also has some considerable carrier experience denoted by the 200 carrier landings on a particular ship. When a pilot obtains 100 carrier landings on a particular ship, he is referred to as a Centurion. Two hundred landings denotes a double Centurion on the Midway, CV-41.



A flight jacket with the squadron insignia of VF-2, a Centurion patch for 100 F-14 landings on the USS Ranger, and an "E" patch signifying that VF-2 won the coveted "Battle E" during the last competition period. This is the same "E" denoted by the "E" stenciled on the sides of the squadron aircraft.





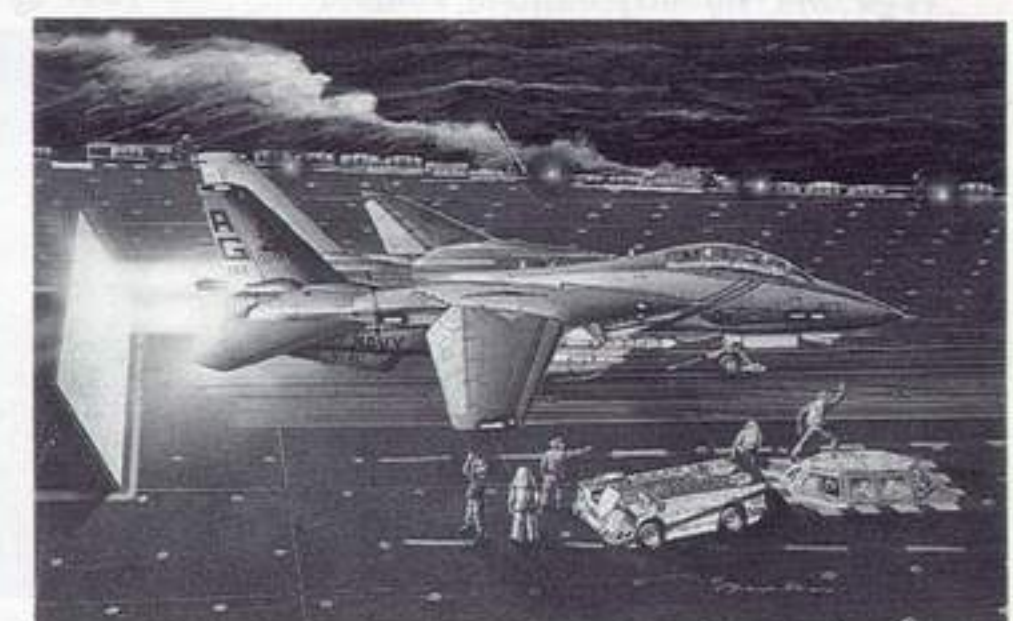
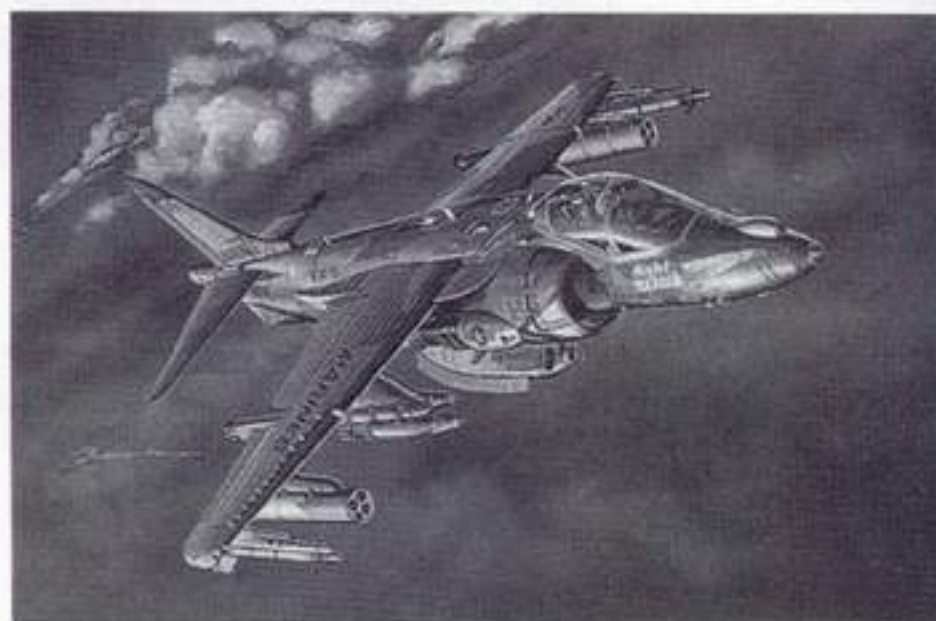
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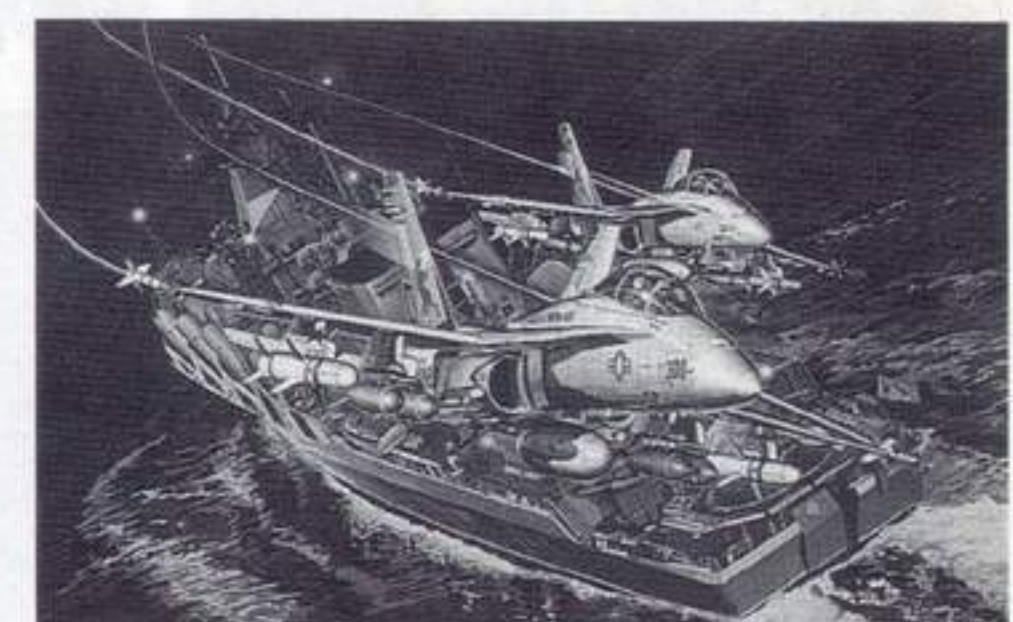


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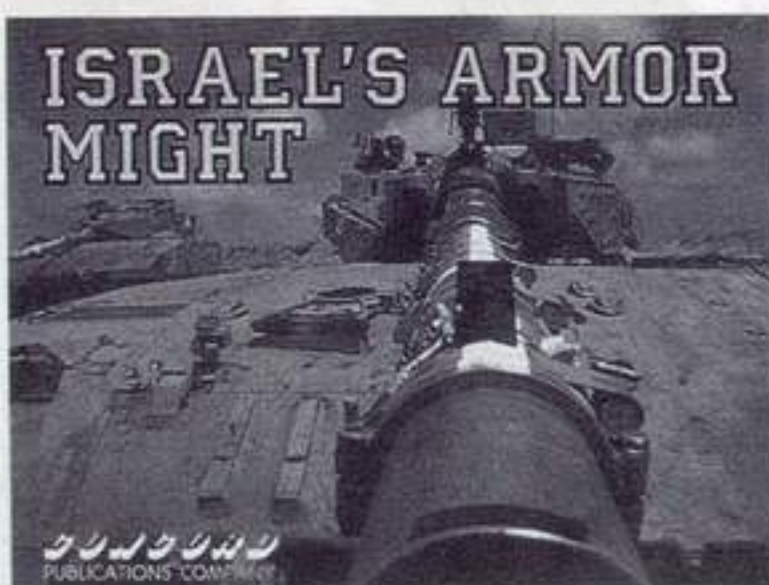
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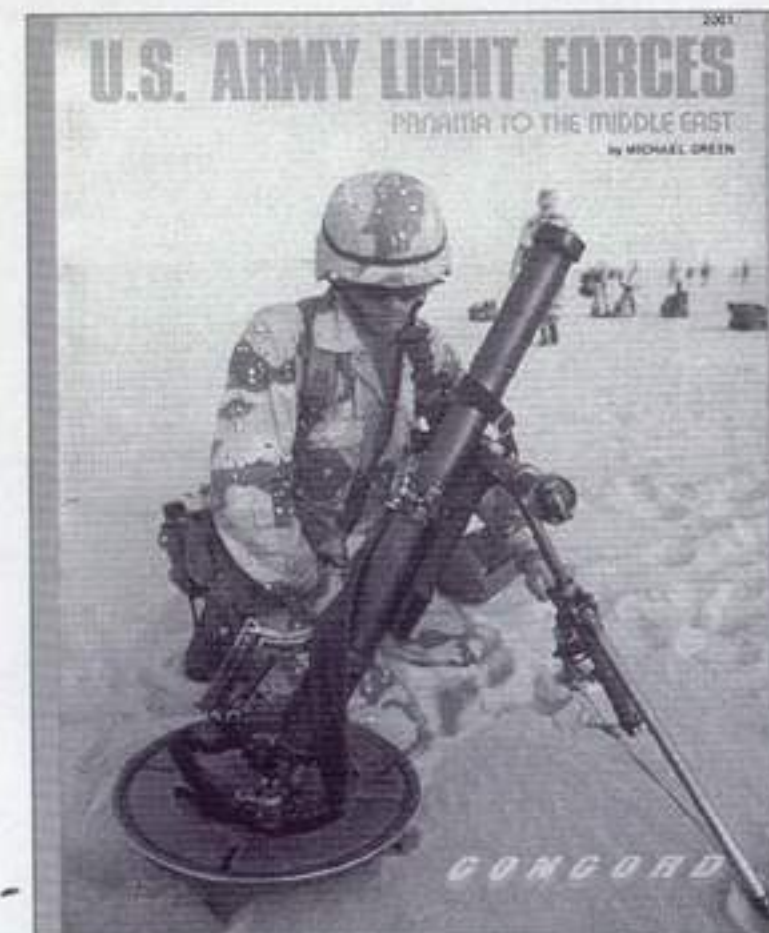
1013 Soviet Wheeled Armored Vehicles



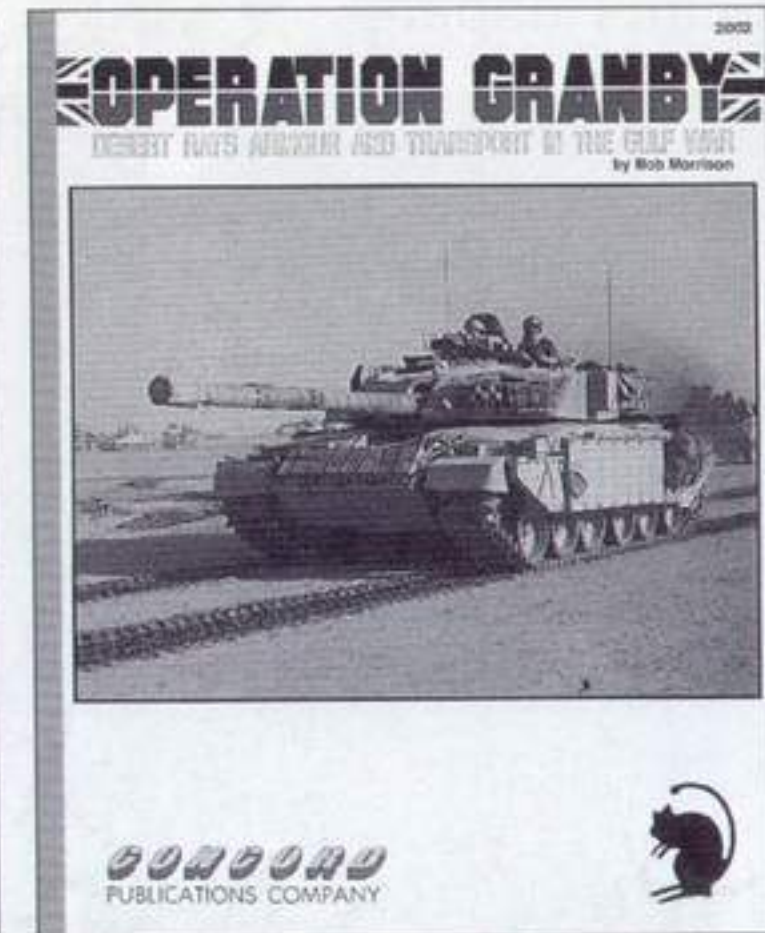
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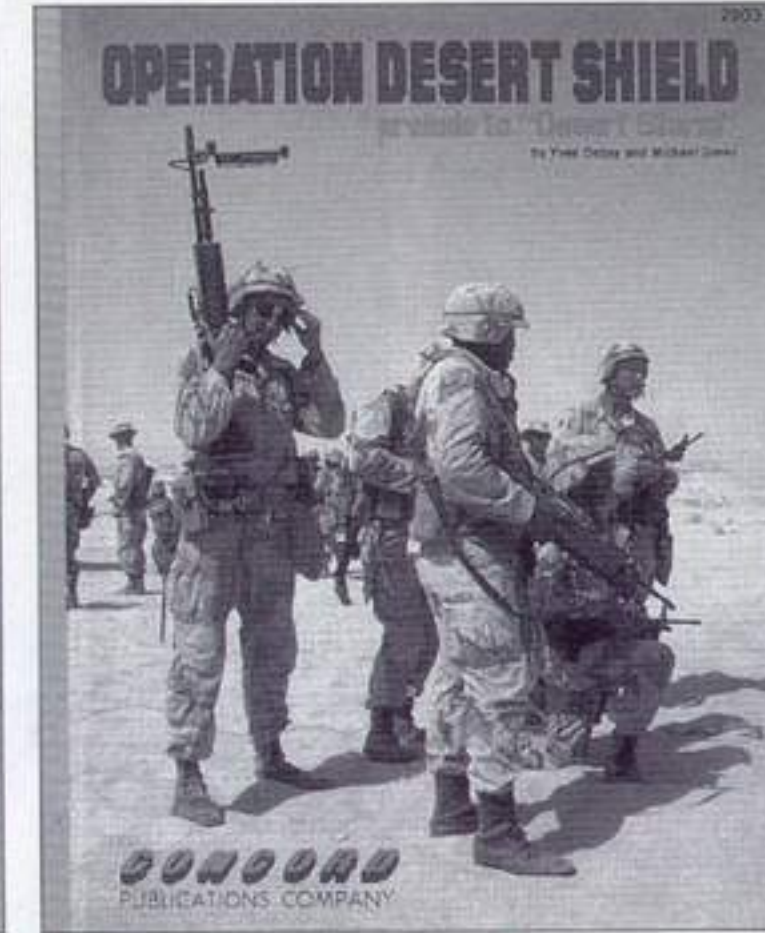
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