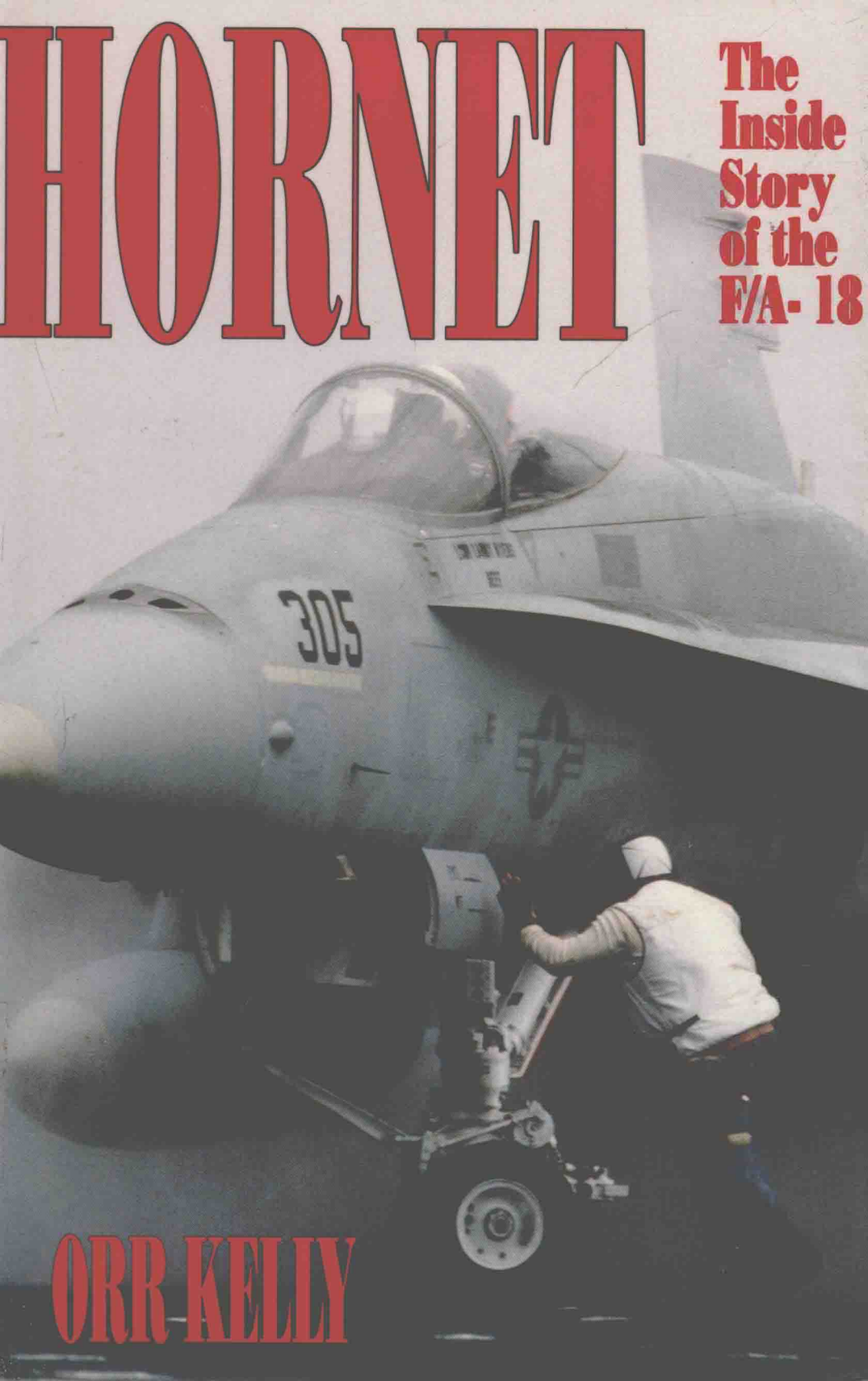
HORNET

The Inside Story of the F/A-18



ORR KELLY

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The Inside Story of the F/A-18

Orr Kelly

PRESIDIO

To the late Rev. Edward Shipsey, S. J. . . . Jesuit, teacher, friend and wise man.

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Preface

Throughout my reporting and research on this book, I had a good deal of help both from the navy and from the companies that manufacture the plane or provide major components.

They provided their assistance freely although they had no way of knowing whether the book, in its final form, would reflect favorably on the navy and its contractors, which it does, or whether it would highlight serious faults, which it also does.

Rear Adm. Jimmie Finkelstein, an old friend who was then the navy's chief of information, got me started. Vice Adm. Robert F. Dunn, deputy chief of naval operations for air warfare, suggested a number of people to interview and bases to visit and okayed my request for a flight in the F/A-18.

In Finkelstein's office, Lt. Comdr. Sheila Graham, Lt. Bruce Cole, Lt. Frank Thorp, and Lt. Robert Fallon helped me to make appointments and gather information from naval sources. Bob Fallon became my personal guide through the bureaucratic labyrinth, time after time making the impossible become possible. Also helpful were Denny Kline and Grace Green of the Naval Air Systems Command's public affairs staff.

At Patuxent River Naval Air Station, Bill Frierson, the public affairs officer, was both helpful and sympathetic as I went through the ordeal of the flight physical and the physiological training described in the Appendix.

At Cecil Field, Florida, the East Coast training base for Hornet pilots, Nick Young, a veteran navy public affairs officer, put me in the hands of Lt. Casey Albert, who introduced me to many of the instructor pilots and then arranged for me to spend several hours in the simulators so I could gain some appreciation of what it is like to land on a carrier at night, what it is like to attack targets on the surface, and what it is like to come up against a skilled foe in a dogfight.

During my visit to Lemoore Naval Air Station, California, where I flew in the F/A-18, Dennis McGrath, the air station's public affairs officer, put me in touch with the pilots in VFA-125, the first Hornet training squadron.

At the Fallon Naval Air Station, Comdr. William Shepherd, the Strike University's executive officer, found time in his schedule to fill me in on how entire air wings are trained there before they are deployed and how senior officers go through an intensive course to prepare them for war at sea.

When I visited the *Coral Sea,* during training exercises in the Atlantic north of Puerto Rico, Lt. Robert Rivera and JOC(SW) James P. McKane III ran me up and down ladders from the top of the ship to the deepest engine rooms to help me understand how the Hornet operates aboard a carrier. At Norfolk, Lt. Comdr. Mike John helped arrange for my visit to the ship.

At the Top Gun school at Miramar, Lt. Jim McAloon, an F-14 backseater—a naval flight officer and not a pilot—not only described the training in aerial combat but helped me to understand how air crews are learning to use the Tomcat and the Hornet together to take advantage of their unique capabilities.

My visits to the factories where the Hornet, its radar, and its engines are made began at the McDonnell Douglas plant in St. Louis, where Timothy J. Beecher, director of communications, and his assistant, Thomas J. Downey, arranged for me to interview a parade of engineers, managers, and test pilots who had been involved in designing, manufacturing, and testing the plane—and who had suffered through the difficult days when everything seemed to go wrong.

From St. Louis, I went on to southern California. At Northrop, Tony Cantafio and Gregory A. Waskul, of the company's public affairs staff, filled me in on Northrop's role in development of the F/A-18 at the corporate headquarters in Century City. Then I went to the plant in nearby Hawthorne for a tour of the plant under the guidance of Terry Clawson and visits with officials involved in development and production of the plane.

A short distance away, at Hughes Aircraft's Radar Systems Group, Kearney Bothwell, director of public relations, introduced me to three of the executives involved in development and production of the radar and then took me on a tour through the plant.

Later, on the East Coast, I spent two days at the General Electric jet

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engine plant in Lynn, Massachusetts, where the engines for the F/A-18 are made. My guide there was Kent Schubert, an independent public relations consultant who works under contract for G.E.

Much of my preliminary research for the book was carried out at the Pentagon library, the library of the Smithsonian Institution's Air and Space Museum, and the Montgomery County library branch in Bethesda. The files of the *Current News,* the Pentagon's daily summary of newspaper and magazine articles, were an important source of background information. Earlier, when I was an associate editor and Pentagon correspondent for *U.S. News & World Report* magazine, I did some research on the history of the F/A-18 with the help of members of the magazine's library staff.

My reporting on the history of the F/A-18 provided a fascinating opportunity to see a major Pentagon weapons procurement program whole—from the early debates over whether the navy needed a new plane and what kind it should be to the plane's first use in combat. Robert Tate, my editor at Presidio Press, patiently helped me to organize this complex story, covering a period of nearly two decades and involving politics, billions of dollars, high technology, tactics, and strategy. Because it is a complex story, the reader may benefit from a brief guide to the way the book is put together.

The first chapter covers the early controversy over the kind of plane that was needed. The second provides some perspective with a review of the history of military and, especially, naval aviation. The third picks up again with the development of the plane and the early decisions on what it should be expected to do.

The next four chapters describe the technology that makes the Hornet the unique plane that it is. Chapter 4 covers the all-important radar, the computers, the cockpit, and the controls. Chapter 5 covers the development of the engine. Chapter 6 brings these elements together with the airframe to make an airplane. Chapter 7 is devoted to the largely untold story of the critical problems associated with the tall vertical tails and how the manufacturers and the navy struggled to fix them.

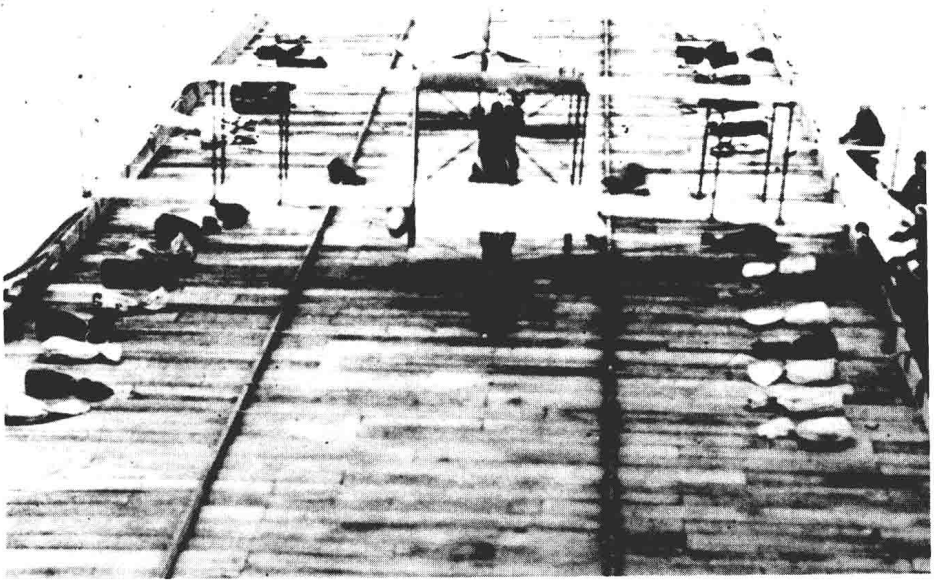
The final two chapters cover the training of the pilots and ground crews and the first use of the plane by the marines and navy, including an account of the Hornet's first use in combat in the 1986 raid against Libya. The book ends with a description of how the F/A-18 would be used in the ultimate test: a major war with the Soviet Union.

The reader may be puzzled to find that every fighter pilot has a nickname,

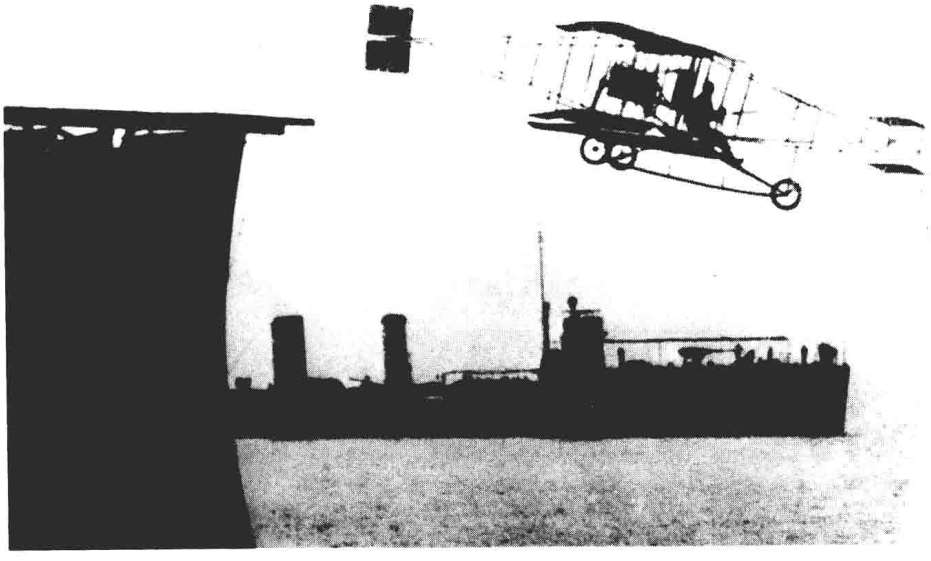
often an exotic one. The reason is that each pilot is given a distinctive call sign by his squadron mates to help avoid confusion during aerial operations, and many pilots are known better by their nicknames than by the names their mothers gave them.

When the manuscript was complete, John M. Elliott of the aviation branch of the Naval Historical Center and Dr. Robert Goulard, an aeronautical engineer and professor of engineering at George Washington University, were kind enough to read it for technical accuracy. I owe them both a debt of gratitude for helping to protect me from error, although any remaining errors are, of course, my responsibility.

Throughout the research and writing of *Hornet* I enjoyed the patient encouragement and support of my wife, Mary.

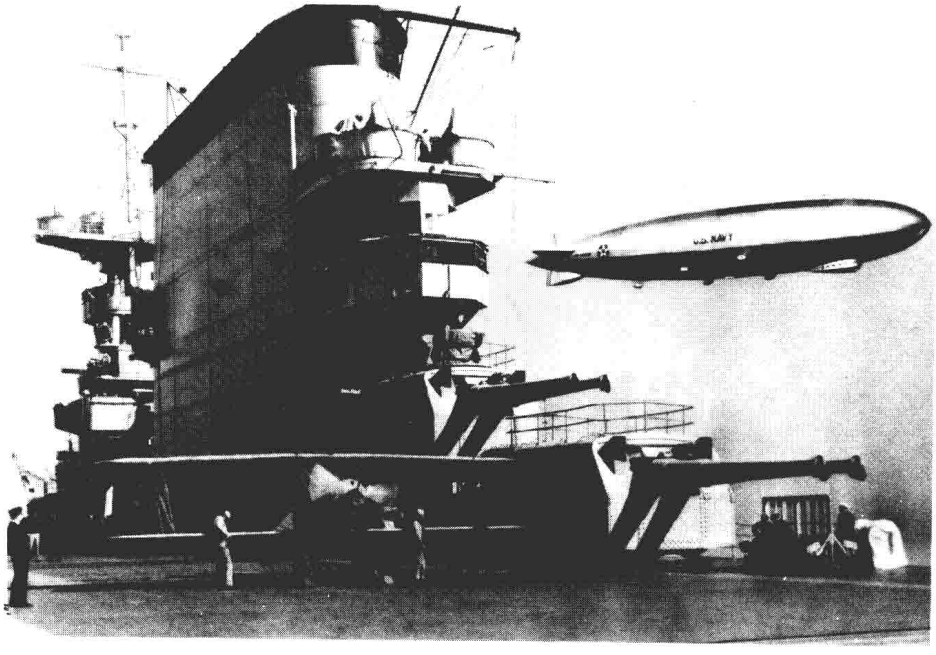


Eugene Ely, a civilian pilot flying a Curtiss biplane, makes the first landing on a ship, the U.S.S. *Pennsylvania*, anchored in San Francisco Bay, on 18 January 1911. (*Smithsonian Institution.*)

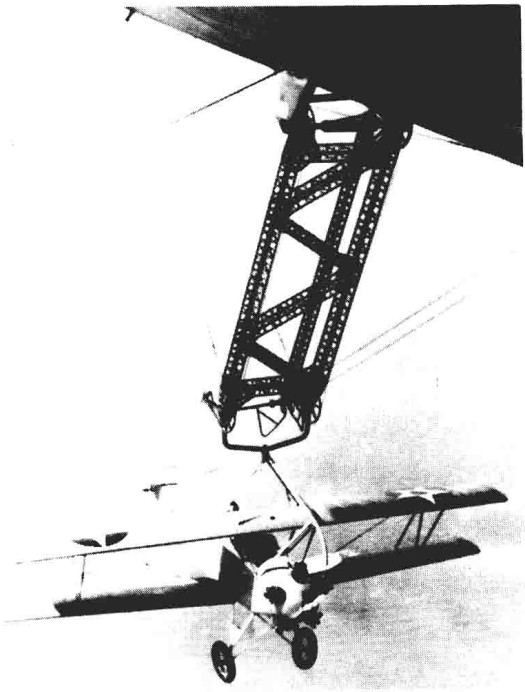


Ely takes off from *Pennsylvania* and flies ashore, duplicating his first takeoff from a ship two months earlier. (*Curtiss Wright Co. photo from Smithsonian Institution.*)

Royal Flying Corps aircraft similar to the Morane-Saulnier Roland Garros fitted with a machine gun that could shoot through the propeller. (*Smithsonian Institution.*)



A plane prepares for takeoff from a sea-based aircraft carrier to rendezvous with the airborne carrier *Los Angeles*. (*U.S. Navy photo from Smithsonian Institution.*)



A biplane "lands" on a retrieval mechanism extending below the hangar bay of the airship *Los Angeles* at Lakehurst, New Jersey, in 1931. Note the metal guard extending out over the propeller. (*U.S. Navy photo from Smithsonian Institution.*)

In this painting by artist R. G. Smith, Douglas SBD Dauntless dive-bombers are shown attacking Japanese carriers at the Battle of Midway on 3 June 1942. (*McDonnell Douglas Co.*)

Hellcats preparing for takeoff jam the decks of a carrier late in World War II. (*Smithsonian Institution.*)

A Grumman F-6F-5N Hellcat of VMF-511 gets the signal for takeoff near Okinawa in May 1945. Note the radar antenna protruding from the right wing. Installed late in the war, radar permitted the Hellcat to operate as a night fighter. (*Smithsonian Institution.*)

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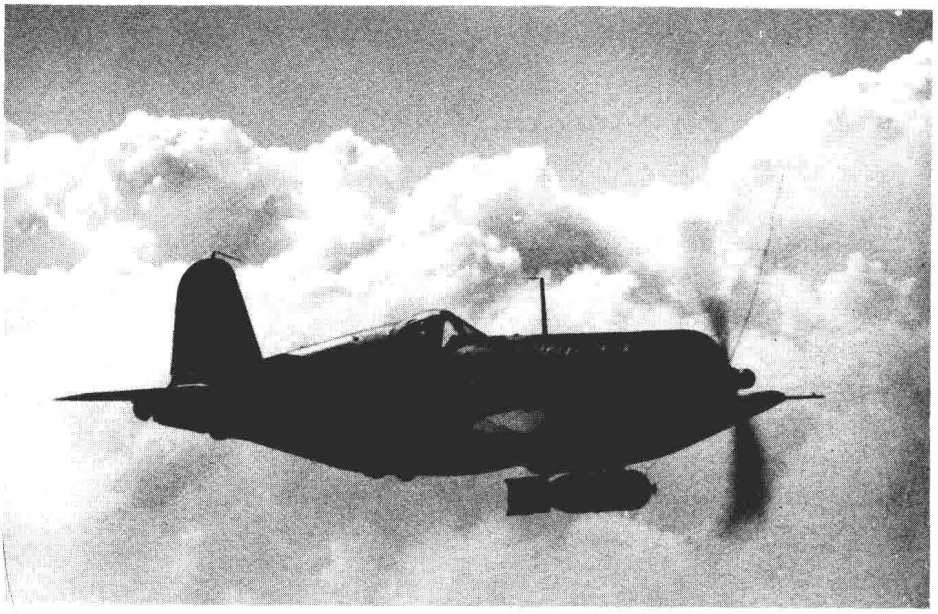
The famed gull-winged F-4U Corsair, at first considered too hot for carrier operations, became one of the workhorses of both World War II and the Korean War. (*Sciences Services Inc. photo from Smithsonian Institution.*)

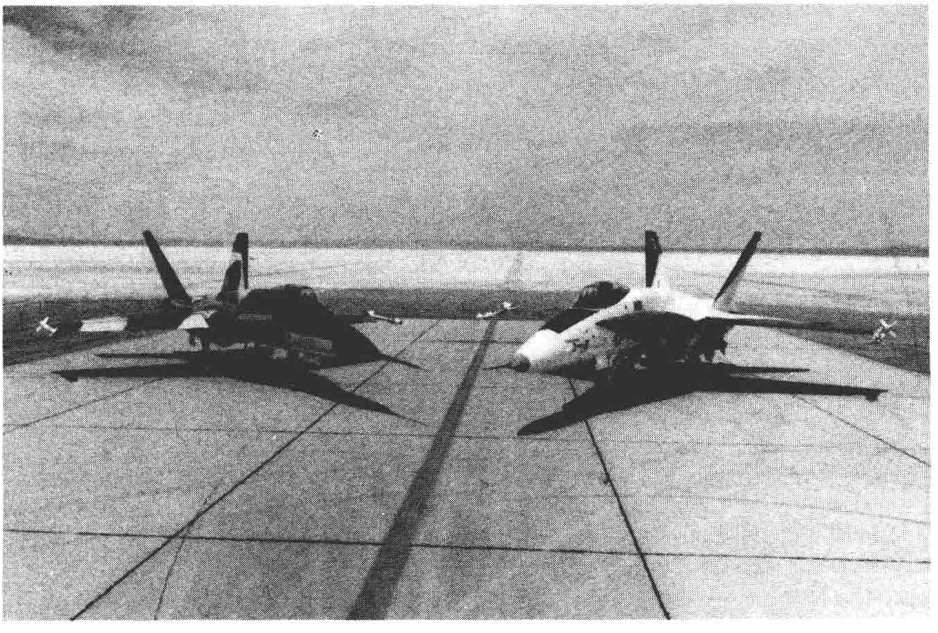
A landing signals officer, or LSO, uses colored paddles to guide a Corsair to a carrier landing. (*Smithsonian Institution.*)



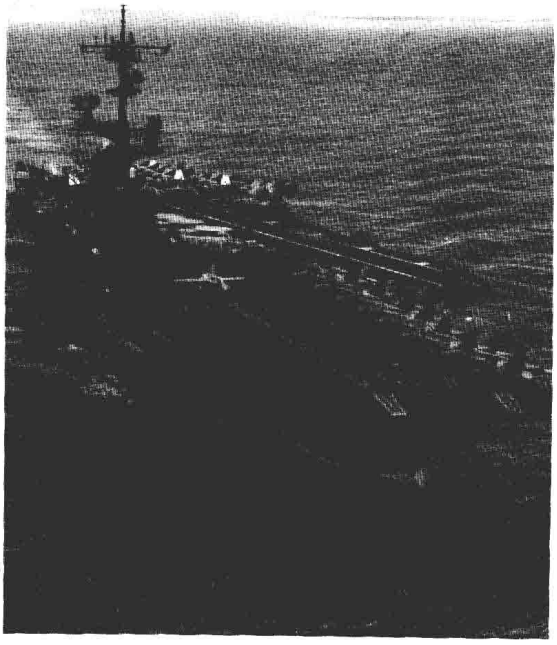
Here, in the first official photo of the plane in its new role as a fighter bomber, a Corsair is shown on 11 September 1944 carrying a thousand-pound bomb. (*Chance Vought Aircraft Division of United Aircraft.*)

Photographic proof of the existence of a new Soviet bomber, the Tu-26 Backfire, sent a shock wave through the U.S. Navy's hierarchy in 1970. The four-man plane is seen here with its wings fully extended. For supersonic flight, they are swept back close to the fuselage. (*Smithsonian Institution.*)

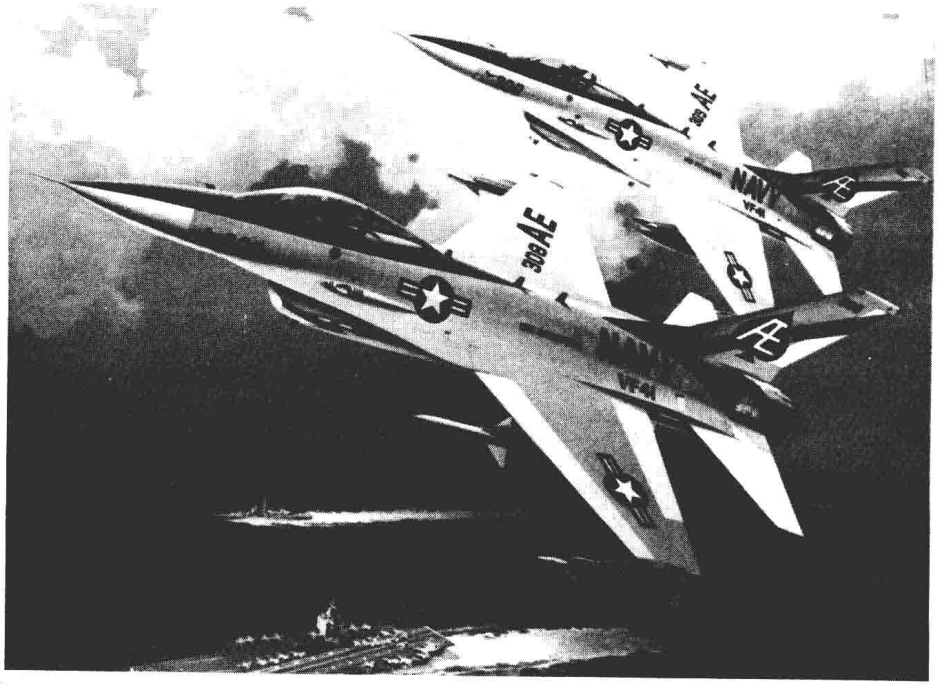
Jack Krings, chief McDonnell Douglas test pilot, takes the new F/A-18 Hornet into the air for the first time on 11 November 1978. (*McDonnell Douglas Co.*)



The Northrop YF-17 prototype, left, and the F/A-18, right, look almost like twins. But beneath the surface similarity, the Hornet is almost entirely different—bigger, heavier, and no longer a cheap lightweight fighter. (*McDonnell Douglas Co.*)



The U.S.S. *Coral Sea* is shown here with an F/A-18 ready for takeoff. During the raid on Libya on 14 April 1986, the *Coral Sea* was ready to respond with Hornets if Libyan fighters had taken to the air. (*U.S. Navy photo.*)

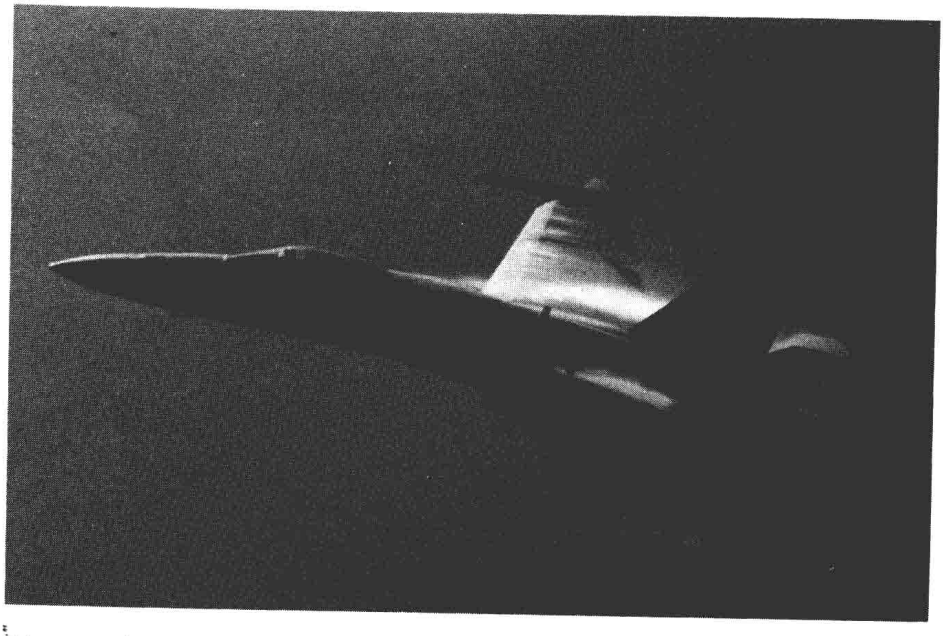


Artist's rendering of L.T.V. and General Dynamics' navy F-16s flying from the U.S.S. *Enterprise*. The McDonnell Douglas-Northrop team won the competition with their F/A-18, and the F-16 never joined the fleet except for use in air combat training. (*L.T.V. Aerospace.*)

The main landing gear of the Hornet dangles awkwardly below the plane, seeming to grope for the deck, as a pilot comes in for a carrier landing. (*McDonnell Douglas Co.*)

The main landing gear of a Hornet abruptly changes its appearance as the plane settles onto a carrier deck. The gear bends at the "knees" and seems to crouch beneath the plane. (*McDonnell Douglas Co.*)

As one Hornet banks away to the left, it provides a clear view of the leading edge extension—the LEX—that extends forward from the wing to the area beneath the cockpit. Each plane carries two Sidewinder missiles on the wingtips and a 330-gallon external fuel tank on the centerline. (*McDonnell Douglas Co.*)



Air sweeping over the LEX moves so rapidly that it forms a visible gray fog. This vortex gives the tall vertical tails a bite on the air, but also causes buffeting so severe that it damages the tail structure. (*McDonnell Douglas Co.*)

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