The Second Comi

ing of the Hornet

By Lt. Al E. Ron

When I got the call from Frank Montarelli—the public affairs guy for the F/A-18E/F *Super Hornet* Integrated Test Team (ITT)—inviting me to NAS Patuxent River, Md., to "test drive" their bird, I was, to say the least, excited. I mean, it's not every day that you're given the opportunity to get between the wings of the future of Naval Aviation.

If you work in the Naval Aviation community and haven't heard of the *Super Hornet* by now, you're living below the bilges. Or you just don't read newspapers. It's been touted up and down the chain and around the globe as a cost-feasible, next-generation aircraft, which will give the Navy a "first day of the war" precision strike fighter through the first part of the 21st century.

Photo by Erik Hildebrandt © 1996

Simulator flying is an integral part of any new flight test program. Above, a pilot uses the F/A-18E simulator at the McDonnell Douglas plant in St. Louis, Mo. Opposite, photographer Kevin Flynn captured F/A-18E/F ITT lead pilot Fred Madenwald putting the high angle of attack and spin aircraft, E4, through its paces over the Chesapeake Bay.

I know I've heard enough about it myself, being an F/A-18C driver; it's a common subject around the ready room. But it seems every other article you read in the base rag states that the "*Super Hornet* has achieved this record" or "marked that milestone." What's all the noise about?

Well, I found out. There are some pretty good reasons the Navy brass is so proud of this bird. It evolved from the proven design of the original F/A-18, so the engineers didn't have to throw out everything they knew and start over. The primary structure of the aircraft—such as the landing gear, wing fold, flap drives and wing attachments—didn't change. Furthermore, they were able to apply all the "lessons learned" during the *Hornet's* lifespan, such as those on corrosion resistance and fatigue monitoring. This redundancy of design allows the *Super Hornet* to go from design board to the fleet in a short seven and a half years, about half the time it would take to start from scratch.

In order to understand how the *Super Hornet* came to be, you need to know a little *Hornet* history. On the crisp autumn morning of 14 September 1978, the Navy's newest fighter attack aircraft, the F/A-18A *Hornet*, was rolled out before a small audience onto the tarmac at the McDonnell Douglas plant in St. Louis, Mo. Its sleek lines and aerodynamic contours earned the admiration of then-Chief of Naval Operations (CNO) Admiral Thomas Hayward, who praised the multimission strike fighter's "simplicity, reliability, maintainability and commonality." The original F/A-18 was intended to take over the job of the fleet's aging F-4 *Phantom IIs* and A-7 *Corsair IIs*.

In 1987, the fleet received the first upgrade on the *Hornet*, the C/D variant. It had improved systems and was capable of carrying advanced weapons. A further modification came to the fleet in 1989 with the F/A-18C/D Night Attack version, which was night vision goggle compatible. It added night and adverse-weather mission capabilities, as well as increased survivability enhancements. As time went on, additional improvements were made to the *Hornet*, such as the APG-73 radar upgrade, multisource integration, an enhanced performance engine and a reconnaissance version.

Some 18 years and a few hundred thousand flight hours later, the *Hornet* has been made over and redubbed the *Super Hornet*. Once again, the F/A-18 will take on more fleet responsibility. As the Navy phases out the F-14 *Tomcat* and the early models of the F/A-18 in the coming years, the multimission-capable *Super Hornet* will take over the jobs held by those aircraft.

Which brings me back to me. As I walked into the hangar housing the seven test *Super Hornets* at Pax, I couldn't help thinking how lucky I was. The reason I was chosen seemed simple; CNO Adm. Jay Johnson had already flown the *Super Hornet*, so why not let a fleet guy—a squadron JO out there turning and burning—have a shot at it? The team could get a fresh viewpoint on the program, and then I'd spread the word back in the fleet about what to expect.

At first glance, the *Super Hornet*

doesn't look very different from its namesake—same basic *Hornet* shape, just a little longer with sleeker, "stealthier" lines. With its 90 percent common avionics, the inside of the cockpit isn't all that different, with the only noticeable changes being a new up-front control display, engine/fuel display and multipurpose color display. The enhancements, system response, everything, make it a very different, yet very familiar, airplane.

Since I'd be flying my test plane alone, I had to go through the same familiarization training that the ITT test pilots went through. But, because the avionics of the C/D and the E/F are so similar, the transition time was virtually zero. After only 16 hours of ground school, followed by 4 hours of simulator training, I was good to go. That's a far cry from the five months it took the A-7E guys to transition to the *Hornet* when they phased the *Corsair II* out back in 1991.

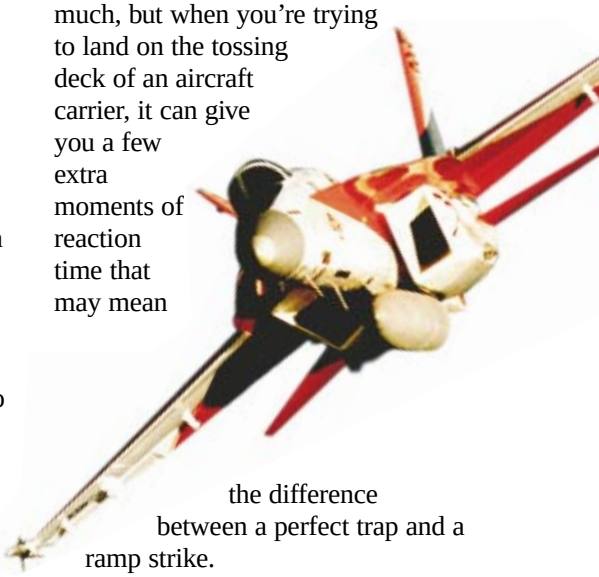
The ITT decided to put me into E2, the propulsion and aero performance test plane. It was slick—for you desk jockeys, that means I was carrying no external stores—but that still equaled 14,460 pounds of JP-5 fuel, compared to the 10,860 pounds the F/A-18C carries.

I was blessed with a beautiful, sunny day as I strolled outside and approached the jet. Not that it would have mattered; the *Super Hornet* is an all-weather, day or night-capable plane. After my preflight, I strapped in and started the engines. As I rolled out to the runway, I could almost feel the plane's eagerness to get airborne. After lining up and getting the go-ahead from the tower, I pushed the throttle to the firewall and lit off the afterburners. Sooner than I expected, I was in the air and heading out over the Chesapeake Bay, the engines roaring behind my back. The fuel-range limitations of the original *Hornet* were a fading memory. I felt like I could stay up in the blue forever—certainly longer than my escorts, the F/A-18Bs that the ITT uses as chase and photo planes.

What a ride! The controls were so familiar I felt that I could have flown the *Super Hornet* without any transition training at all. From talking with the test team, I learned that the *Super Hornet* engineers took a lot of input from the fleet when designing the bird. This resulted in a much more maintainable airplane, and a significant increase in survivability. Extra expendables, such as chaff and flares, have been added, as well as the ALE-50, a towed missile decoy system. Cautions and warnings and other display formats have been consolidated and simplified.

However, I'm happy to report that in the pursuit of survivability, maintainability and commonality, the nationwide industry team of McDonnell Douglas, General Electric, Northrop Grumman and Hughes have not forgotten that speed and manueverablity are essential to fighter guys like me. Those General Electric F414-GE-400 engines can kick out 44,000 pounds of total thrust, which is 35 percent more than the F404 engines on the current F/A-18C Lot 19s. This bird was everything that a *Hornet* was, and more. I could climb faster and stay up longer, and even though the F/A-18E is a bigger plane than the -C, it can corner just as well, if not a little better.

Unfortunately, all good things must come to an end, and so it was with my test drive. As I lined up for the approach, I experienced one last little pleasure: this plane can land slower, too. I came in a full eight knots slower than an F/A-18C can for a centered ball on touchdown. Eight knots might not seem like much, but when you're trying to land on the tossing deck of an aircraft carrier, it can give you a few extra moments of reaction time that may mean the difference between a perfect trap and a ramp strike.



As I taxied back to the hangar, I considered this marvelous piece of technology I was riding in. I knew I wasn't the only one

Randy Hepp

McDonnell Douglas Corp./ Vernon Pugh

Above, F/A-18E/F ITT pilot Lt. Tom Hole fires ALE-47 flares from the weapons and vibration test plane, E5. Left, ITT test pilot Jim Sandberg, a former Marine aviator, completes the first in-flight test with ordnance aboard E5. The weapons package consisted of two 2,000-pound bombs, two antiradiation missiles and two Sidewinder missiles.

who had been impressed by it. Although the *Super Hornet* has about another year of test flights to go through, the Department of Defense has already approved the low-rate initial production of the aircraft, giving the Navy the green light to proceed with the fighter.

Not without some controversy, however. According to Cdr. Robert Wirt, the Government Flight Test Director for the ITT, the price tag of each *Super Hornet* is approximately $36 million per fly-away unit in FY-90 dollars. This prompts budget people to ask, "Why can't the Navy just wait until the Joint Strike Fighter (JSF) enters service?"

The JSF and F/A-18E/F will complement each other in providing a tremendous battle group warfighting capability. In truth, the Navy needs both aircraft to support future operations. However, the JSF aircraft is still in the concept phase, and adequate numbers will not be available to the fleet for at least 20 years.

The original F/A-18 was designed with 15 to 20 years of growth potential, enabling the development and integration of systems such as the Global Positioning System and the capability to deliver advanced weapons. The F/A-18C/D is a great aircraft, but has little room for growth to meet future requirements. The *Super Hornet* will provide the needed flexibility while the JSF is integrated into the fleet.

Developed for far less than the cost of a new-start aircraft, the *Super Hornet* carefully balances capability against cost. It provides significant improvements in range, endurance, payload flexibility, payload "bring-back" capability, survivability and growth potential. The *Super Hornet* features two additional weapons stations, bringing the total to 11. For carrier operations, approximately three times more payload can be brought back to the ship than with the F/A-18C/D. In short, the Navy has taken a tremendous aircraft and made it even better.

The *Super Hornet* is expected to enter operational service with the Navy in the year 2000, with a total of 1,000 to be delivered by 2017. Believe me, I'll look forward to rolling back to sea duty in time to ride this one.

JO2 E. Blake Towler (alias Lt. Al E. Ron) is Assistant Editor of *Naval Aviation News*. These are his opinions based on pilot interviews and technical research.

Bob Claus

Above, the front cockpit of the *Super Hornet*. Top, a cutaway view of the new F/A-18E shows the plane's internal systems, with fuel storage tanks noted in orange.

Playing the Numbers

	F/A-18E	F/A-18C Lot 19	F-14D
Dimensions (ft)			
length	60.2	56.0	62.7
height	16.0	15.3	16.0
width (wings extended)	44.9	40.4	64.0
(wings folded)	32.6	27.5	38.0
wing area	500 sq ft	400 sq ft	565 sq ft
Weight (lb)			
empty	30,564	23,832	40,104
max takeoff gross	66,000	51,900	74,348
carrier landing	42,900	33,000	54,000
Fuel (lb)			
internal	14,460	10,860	16,000
external	9,812[a]	6,730[b]	4,000[c]
Performance			
max thrust	44,000 lb	35,500 lb	60,400 lb
top speed	*	1,360 mph	1,544 mph
cruise speed	*	530 mph	576 mph
ceiling	50,000 ft	50,000 ft	56,000 ft
Range (unrefueled)			
interdiction mission radius	520 nm	341 nm	500 nm
patrol endurance (200nm)	1.8 hr	1 hr	3.2 hr
Payload			
weapon stations	11	9	8
max bringback	9,000 lb	5,500 lb	7,000 lb

Notes: [a] 3 x 480 gal droptanks [b] 3 x 330 gal droptanks [c] 2 x 300 gal droptanks
***** Figures are not currently available for test aircraft.

All figures are approximate and are for comparison purposes only.