

In January, Eglin welcomed the first F-35 student pilots.

# The F-35 Readies For Takeoff

By Gabe Starosta





Here: An F-16 leads a formation of two F-35s from the 58th Fighter Squadron, Eglin AFB, Fla., during a training flight over the Gulf of Mexico. Above: Maj. Jay Spohn, an F-35 instructor pilot with the Florida Air National Guard, runs through a preflight check prior to a training sortie. Brand-new F-35 pilots fly six checkout flights of increasing complexity.



Photos by Jim Haseltine

**O**n Jan. 7, 2013, the first class of six F-35 student pilots started its academic training at Eglin AFB, Fla., and the future Lightning II pilots were to take to the air shortly thereafter. The Air Force as a whole has navigated a complicated series of hurdles to prove the safety of putting dozens of new students in the most advanced fighter jet in development today.

The F-35A is far from a finished product, and the Air Force's training enterprise is similarly just getting started. But more than a decade after the Joint Strike Fighter program began, and some time later than originally hoped, the Air Force's F-35A pilot and maintainer training pipelines are up and running. Some pilots were designated future F-35A students as far back as 2009 but are still waiting for their first ride.

The Air Force always has maintained that the decision on when to begin flight training would be "event-driven," rather than calendar-driven. Nonetheless, the service had planned to launch training operations in the fall of 2011.

The basic F-35 pilot syllabus lasts about three months, split roughly evenly between an academic classroom and simulator portion, and then a flight training portion. Lockheed Martin provides most of the academic training at Eglin, and Greg Wilder, the company's lead instructor for F-35 pilot training, said it provides about 47 classroom lectures and 14 simulator missions that cover normal and emergency operating procedures.

### Checking Out

Once students hit the flight line, they take a single F-35A taxi ride—a training maneuver borrowed from the F-22 Raptor program—followed by six full flights. As of early March, eight Air Force officers have completed that series and have been certified as instructor pilots.

Maj. Jay Spohn, an Air National Guard pilot who completed his F-35 instructor certification process in August, said the six flights used to check out pilots gradually increase in complexity. The first three are fairly simple and are important for pilots to get used to how the airplane handles, accelerates, slows down, and approaches runways for landing. Those flights are not limited to Eglin airspace; Col. Andrew J. Toth, commander of the 33rd Fighter Wing, said that on his first flight, he practiced approaches at both Eglin and nearby Duke Field.

The fourth and fifth are formation flights, in which students fly their aircraft alongside either another F-35 or an F-16. They are asked to be the lead aircraft on the fifth sortie. The final flight "is pretty well a standard United States Air Force instrument qualification check ride" that also requires students to instruct some or all of the mission brief for that flight, Spohn said.

Student pilots are accompanied in flight by a chase aircraft, which can be an F-35 or an F-16 fighter on loan from the 56th

## The Question and Promise of Simulators

An important trend for the future of F-35A training, and for flight training across the Department of Defense, is the move toward depending more heavily on simulators because of their increasing quality and low cost relative to flying. Rear Adm. Randolph L. Mahr, the F-35 deputy program executive officer, said the program office coordinates between Lockheed Martin and the military services to incorporate training updates into their flight procedures and simulator interfaces. It is up to each service, though, to decide how many actual flights student pilots should receive.

“Obviously, it’s less costly to the services to fly a simulated event than to fly in an airplane, so the more we can put into the simulators, the less expensive it’s going to be to operate the global fleet,” Mahr said. “What we’re trying to do is determine, what fidelity can we get in the simulators, and what are the core things that have to be done in an airplane? The fidelity of the simulators, the trainers, the visuals, is much, much higher now than it was even three or four years ago, so we’re able to accomplish more. But ... in the end, the services have to make a decision over how long does a pilot have to actually be sitting in a seat and feel the aircraft move, and what value does that add?”

Mahr did note that the F-35 program is making sure simulators are updated to newer configurations as those capabilities are delivered to the field, rather than much later on. In that situation, pilots could be taught outdated flight procedures until the simulator is updated.

In the past, “you used to say the simulator is trailing the aircraft down the runway because you’d always get [modifications and upgrades] down to the airplane first, so we’re trying to keep those tied together if we can. So far so good, but we’re relatively early,” Mahr said.

Photos by Jim Haseltine



**Right:** SSgt. Roger Sutter (r) and SrA. Herbert Tucker check maintenance procedures using a Portable Maintenance Aid after running a postflight inspection on an F-35A. **Below:** Three F-35s in a hangar at Eglin. Pilots from USAF, the Navy, Marine Corps, and F-35 partner nations will all go through initial training on the aircraft at Eglin before moving on to more advanced, service-specific training sites.





Fighter Wing at Luke AFB, Ariz. The checkout flights are being performed under restrictions that originally demanded the F-35A not exceed Mach 0.9 in speed, 30,000 feet in altitude, five Gs, or an 18-degree angle of attack. Those restrictions figure to be eased as the JSF program becomes more mature, Toth said. In two respects, they already have—by January, the jet's altitude ceiling had been raised to 39,000 feet and its G limit to 5.5.

Some 36 Air Force pilots and about 14 from the Marine Corps will go through F-35 pilot training at Eglin in 2013. Col. Dawn M. Dunlop, special assistant to the Air Force Secretary and Chief of Staff for F-35 integration, said the Air Force number alone should reach 50 per year, with the total number of pilot graduates per year rising to about 100 once the Marine Corps and Navy fully ramp up their training programs.

On the maintenance side, Dunlop said the academic training center eventually will be able to support around 2,000 maintenance students per year. Standing up a robust and sufficiently trained maintenance workforce was one of the key drivers of F-35A flight progress in Florida, and Air Force officials have widely praised Lockheed Martin's training program as well as the skills displayed by many Lightning II maintainers.

Maj. Mike Byrd, the F-35 academic training center's maintenance lead, said the center offers courses that range from four to 13 weeks depending on their focus. Those classes are mostly led by Lockheed personnel, putting Byrd and his team in a "quality assurance" type of role.

To get to this point, the program moved through three recent phases: the path toward airworthiness, local area operations, and an operational utility evaluation (OUE) performed in the fall.

The Air Force's airworthiness authority was the Aeronautical Systems Center (before the Air Force Materiel Command reorganization subsumed most ASC functions under the Air Force Life Cycle Management Center in 2012). ASC granted verification in late February 2012.

### 800 Graduates in 2013

Throughout last spring and summer, pilots and maintainers at Eglin performed local area flying in an effort to become more familiar with the F-35, the airspace around Eglin and its neighboring military facilities, and with basic maintenance procedures. That period also helped the 33rd Fighter Wing build up to some of the requirements it would need to meet to begin the operational utility evaluation. Those requirements included certifying four instructor pilots and being able to support at least eight F-35 flights per week, weather permitting.

By late May, Toth said, the wing had achieved the eight-flights-per-week sortie rate, and it hit its pilot requirement later in the summer. Air Force Secretary Michael B. Donley gave the green light to start the operational utility evaluation in late August.

The F-35A OUE at Eglin went smoothly and finished ahead of its expected 65-day duration, according to Toth and Lt. Col. Lee Kloos, the commander of the 58th Fighter Squadron. Both are certified F-35 instructor pilots. During the OUE, four more pilots were taught how to fly the F-35A using the exact syllabus intended for use on future students, and the process finished up in mid-November.

Toth attributed the pace of progress through the OUE to good weather in the storm-prone Florida Panhandle, as well as to high-quality support from Air Force and Lockheed Martin maintenance personnel.

Air Education and Training Command took about one month to study the results of the unit evaluation before its commanding officer, Gen. Edward A. Rice Jr., declared the F-35A ready for training on Dec. 17.

The Air Force has largely been pleased with the level of training, although that will continue to mature as the aircraft gains more capability, and Lockheed Martin's Autonomic Logistics Information System (ALIS) remains a question mark in the JSF program's development.

Lockheed Martin's Matthew Moore, F-35 maintenance training lead, said students specialize in the model of F-35 they work on based on their service. The company plans to graduate about 800 Air Force and Marine Corps students in 2013.

Moore emphasized that the maintenance instructional program attempts to minimize the amount of training that requires students to actually touch operational airplanes, allowing those jets to remain available for flights. Part-task trainers, weapons load trainers, other simulators, and classroom lessons are of a high enough fidelity to make that teaching method effective, he said.

"What we have right now in this building is way advanced, more than anything I ever had when I was in the Air Force training, and it keeps the pilots able to focus on their mission so that they're better prepared when they have to go out into



the field and to war,” Moore said. “And the maintainers are able to do their thing without them interacting and taking assets away from each other.”

F-35 pilots do receive a small amount of training from maintenance instructors, with a focus on flight equipment and how to exit the aircraft in case of emergency, said a Lockheed Martin spokeswoman. They also are taught how to check the status of a jet.

The Air Force also needs to prepare to teach its current crop of students, who are flying an early, noncombat-capable version of the F-35A, how to operate some of the jet’s more advanced capabilities, which will come online in stages over the next five years.

### Devil in the Details

As Lockheed Martin delivers superior capability blocks for the F-35, culminating in Block 3F, Eglin personnel will identify the differences between blocks in conversations with Air Education and Training Command and determine the most efficient way to provide that “upgrade” training.

“What we’ll do for that type of thing is we’ll develop a differences course, potentially a simulator that goes with it, and then a flight, so that will be our basic transition from Block 1B to 2A,” Toth said. “This is really not a whole lot different than when you get a software upgrade or you get a new system capability on a fourth generation platform.”

According to Dunlop, the strike fighter’s eventual ability to employ weapons will require a major addition to the training syllabus.

“One of the big transitions in training is going to have to occur when we get weapons, when we start to develop tactics for how we employ the F-35,” said Dunlop, a former F-22 test pilot. “The actual specifics of whether or not we’re going to have operational test teams go out to the field and teach tactics, ... do it in the simulator, or ... send people somewhere, can’t really be decided until we know what’s in each block of capability. It’s kind of a two-step process. We want to lay the groundwork right now and bound it so that we have a good, actionable plan going forward, but we can’t actually get to

*An F-35A powers off the flight line in full afterburner at Eglin. The Lightning IIs flying now are non-combat capable. Training will change as each new block comes online with new capabilities.*

the details of planning until we know what the capability is going to be.”

In the meantime, the Air Force is doing its best to build basic F-35 tactics by considering how the service employs fourth generation platforms and how to transition those methods to a fifth generation aircraft. The standup of operational testing will give the process of designing those tactics a big boost, Toth and Dunlop agreed.

Pilots and maintainers from the Air Force, Navy, Marine Corps, and the F-35 program’s international partners all will go through initial training at Eglin before moving on to more advanced, service-specific training at other locations. For the Air Force, that site is Luke AFB, Ariz.

“There’s about a two-year process to stand up a training base, and within that two years, the large majority of it is all of the construction that has to be done,” Dunlop said. According to the current Air Combat Command beddown plans, the first F-35s will arrive at Luke in January 2014. “It’s not terribly far away,” Dunlop noted.

Luke initially will receive 72 F-35A jets broken into three training squadrons of 24 aircraft. The Air Force conducted an environmental impact statement that verified the base can support as many as 144 strike fighters—enough for six squadrons.

In the near future, the Air Force also will set up its first two operational F-35 units where pilots trained at Eglin and Luke can transition.

Those units are likely to be located at Hill AFB, Utah, and Burlington Arpt., Vt. ■

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