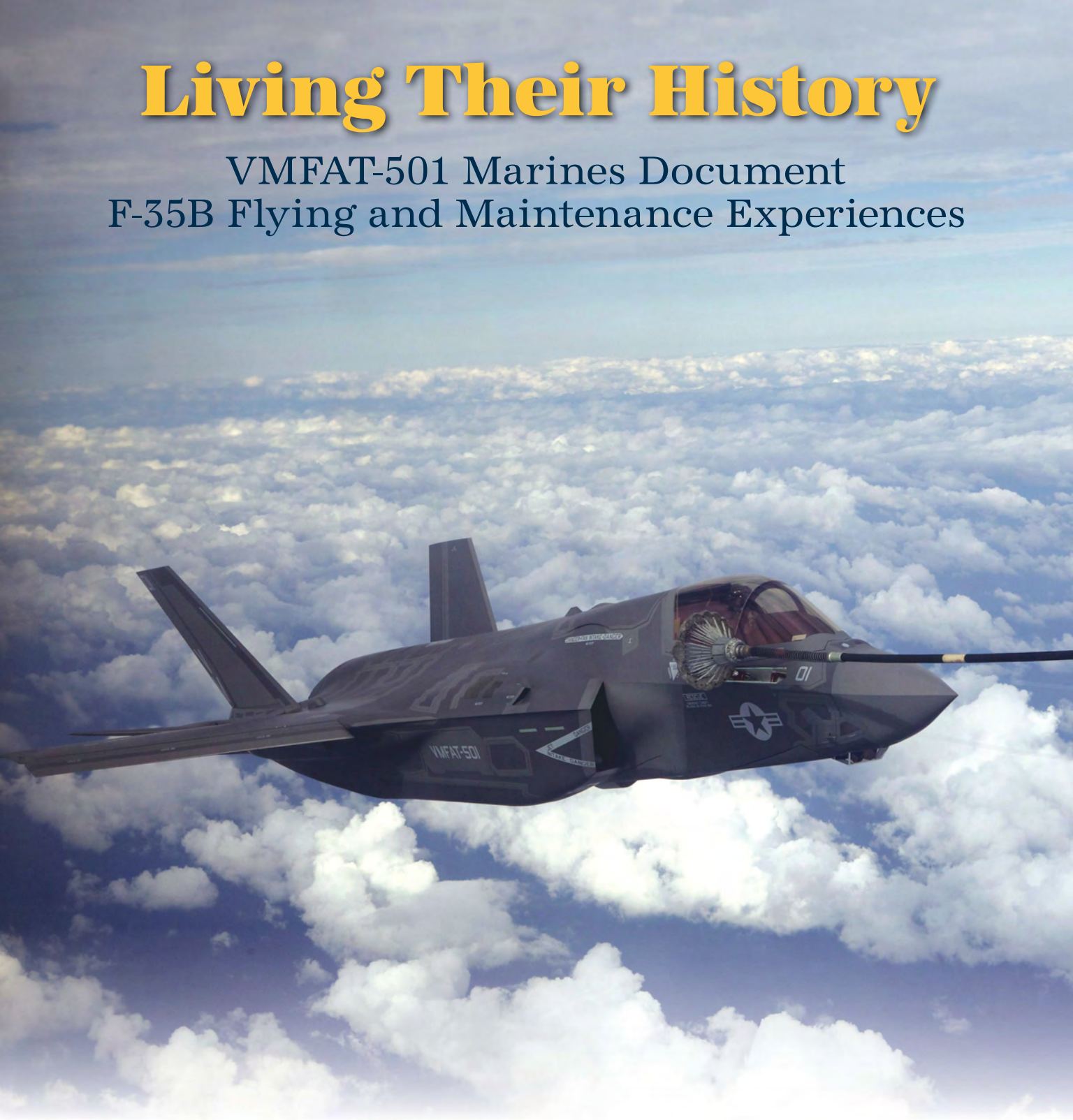
Living Their History

VMFAT-501 Marines Document F-35B Flying and Maintenance Experiences



By CWO-4 Randy Gaddo, USMC (Ret)

American author Ralph Waldo Emerson wrote, "Each age, it is found, must write its own books; or rather, each generation for the next succeeding."

A select group of Marines at Eglin Air Force Base in Florida are living those words as they write the book for the Corps' next-generation fighter-attack aircraft, the F-35B Lightning II Joint Strike Fighter. They are scribing the first pages of a new chapter in the long and venerable history of Marine Corps aviation as it enters its second century this year.

Yet, the leathernecks of Marine Fighter Attack Training Squadron (VMFAT) 501 hesitate to say they are making history. If asked, they'll more likely say they are applying their acquired experience and skills to a new, advanced aircraft weapons platform.

"Bottom line is that things are different here—they're not special, they're not better, but they are different," said squadron commanding officer Lieutenant Colonel David R. Berke. "We're interested in establishing good maintenance and flying practices and learning along the way, but capturing and documenting all those lessons."

The CO explained that the initial cadre of Marine pilots was board-selected several years ago and that the enlisted Marines were handpicked for this duty. There are no "junior" Marines there; they are all seasoned pros.

"They come with tremendous reputa-

SGT GABRIELA GARCIA

CWO-4 RANDY GADDO, USMC (RET)

Above: Sgt Stephen Fink, right, an F-35B engine mechanic in training to be a plane captain, greets Maj Adam Levine, the VMFAT-501 operations officer, during flight training at Eglin AFB, Fla.

Left: A Marine KC-130 Super Hercules with Marine Aerial Refueler Transport Squadron (VMGR) 252 refuels a VMFAT-501 F-35B Lightning II aircraft over Florida, Oct. 2, 2012. The mission was the first aerial refueling training flight to be performed on F-35B aircraft.

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tions," he affirmed. "Their previous commands and Headquarters Marine Corps know that these are the type of Marines who are going to be able to operate in the nontraditional environment here at Eglin."

VMFAT-501 was formed in April 2010, assuming the lineage of Marine Fighter Attack Squadron 451, originally known as the Blue Devils in World War II and then the Warlords in the mid-'50s and on to Operation Desert Storm. VMFA-451 was deactivated in January 1997.

The 115-member (and growing) squadron's mission is nontraditional in that it is collocated with similar Air Force and Navy squadrons who are conducting parallel operations with other F-35 variants.

"We're in a really unique spot—on an Air Force base with a unique command structure in a joint environment with the Navy and Air Force," said LtCol Berke. "We've got Marine Corps, Air Force and Navy leadership embedded here serving multiple end states for this program. But on a daily basis, fleet Marine pilots man the F-35B, and fleet maintainers turn wrenches and keep them flying, day and night, every day here, including weekends."

The Marine Corps "B" variant will replace and perform the roles of three venerable but aging "legacy" aircraft: the F/A-18 Hornet, AV-8B Harrier II and EA-6B Prowler. The F-35B is the only Lightning II Joint Strike Fighter variant that features short takeoff and vertical landing (STOVL) capabilities.

The "A" model is going to the Air Force, and the "C" model is destined for carrier duty with the Navy, although Marine Corps "B" models will serve on various Navy ships as well. U.S. allies also are purchasing the Lockheed-Martin aircraft.

In spite of the groundbreaking capabilities embodied in F-35 technology, VMFAT-501's mission is parallel with similar squadrons at other points in Marine Corps history when new aviation capabilities were being introduced.

"We are a fleet replacement squadron," explained Major Adam Levine, the squad-

ron's operations officer. "Our mission is to conduct effective training and operations in the F-35B in coordination with joint and coalition partners in order to successfully attain the annual pilot training requirement," said the Greenwood Lake, N.Y., native.

The F/A-18 pilot transferred to the squadron from VMFAT-101, the F/A-18 training squadron in Miramar, Calif., so for him, "the idea of teaching transition and conversion fighter-attack aviation concept is familiar."

Leathernecks in -501 have collaborated with the Air Force, the Navy and prime contractor Lockheed-Martin to design a common training syllabus for pilots and aircraft maintenance staff. They have sent their instructor pilots and maintainers through the syllabus to validate it and made recommendations up the chain of command for approval.

Starting about July 2012, they began training the instructor pilots and maintainers, and by September they started training operational staff. Those aviators and maintainers helped form the first operational squadron, VMFA-121, at Marine Corps Air Station Yuma, Ariz.

VMFAT-501's officers and enlisted Marines make a relatively small footprint on the mammoth 724-square-mile Air Force base that employs more than 15,000 combined military and civilians in Florida's panhandle, but the magnitude of their mission more than makes up for it.

As Maj Levine digs deeper into the squadron's mission at Eglin, the complexity of the task emerges.

"It's been 30 years since the Marine Corps has introduced a new fighter or attack platform," he said. "The diverse experience of our instructor pilots has enabled us to effectively collaborate towards the desired end state of providing safe and effective training on the F-35B."

The F-35 is a fifth-generation aircraft, and the "B" model uses a new idea of a STOVL lift system that is vastly different from the AV-8 system.

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—Maj Adam Levine

The F-35, in all its variants, means cutting-edge stealth capability, high-performance airframes, advanced avionics features and highly integrated computer systems. As a package, these advancements enable pilots to network with other elements in the operational training or combat theater to achieve a dominating advantage in situational awareness.

As noted, the Marines' "B" variant is the only F-35 model capable of vertical takeoff and landing. What sets it apart from the previous Harrier-generation STOVL technology is that the F-35B also can fly at supersonic speeds, horizontally.

So, it can take off vertically, accelerate to supersonic speed in level flight, slow down to a hover and then land vertically.

For Marines or other military personnel in combat on the ground, that means the "B" model will get there fast from a nearby austere land base or ship to provide close air support on time and on target.

In a business where seconds can mean the difference between life and death, that is huge.

The capability comes from a patented Rolls Royce system, built on the experience the company has from their initial groundbreaking VSTOL systems in the AV-8 Harrier. Officially, the new system is called the "Rolls-Royce LiftSystem® comprising the Rolls-Royce LiftFan®, Driveshaft, 3 Bearing Swivel Module (3BSM) and Roll Posts."

In layman's terms, the system uses 21st-century technology to make the aircraft easier and more stable to fly in STOVL mode, but quickly transition to supersonic flight. This pilot-friendly system also impacts how pilots are trained.

"The training system, which encompasses academic lectures, interactive courseware and high-fidelity mission system trainers, enables the pilot to quickly and safely adapt to the F-35B," Maj Levine explained.

"The unique nature of teaching and learning a new airplane without a two-

Marine Col Art Tomassetti, second from the right, checks out an F-35B prior to an early morning training flight at Eglin Air Force Base.

CWO-4 RANDY GADDO, USMC (RET)

seat variant represents a departure from the AV-8B and F/A-18 pilot training. The overwhelmingly positive response from our initial transition pilots has been the affirmation of the training system. The situational awareness that this aircraft will give the pilots and the Marine air-ground task force is going to be tremendous."

Marine Colonel Art Tomassetti punctuates that sentiment. He is the vice commander of the Air Force's 33d Fighter Wing, the command that encompasses all the F-35 training units under the Joint Strike Fighter Integrate Training Center. He is one of the most highly qualified pilots in the U.S. Armed Forces with decades of experience in VSTOL flying.

Col Tomassetti is a command pilot with more than 3,200 hours in 35 different aircraft, including Harriers early in his career. He was the lead test pilot for the X-35 test team; the X-35 was the experimental aircraft that paved the way to the F-35. He flew the first-ever short takeoff, level supersonic dash and vertical landing accomplished on a single flight. Nearly half of his 26-year Marine Corps career has been spent with the program. When he talks about the F-35, others stop talking and listen.

"I've been around this program since 1998 when the X-35 was just a schematic on paper, then it began to look like an aircraft on the factory floor, then it became something we could fly," he related, trying to summarize decades of work into a sound bite. "The F-35 is very easy to fly, and building an airplane that's easy to fly is not an easy task."

The colonel explained that the F-35's advanced pilot-aircraft interface systems allow the pilot to focus more on the mission and less on flying the airplane.

"It has advances in technology that pilots have wanted for a long time," he said. "The cockpit is very clean, and what I'm impressed by is what's not there—all those buttons, knobs, switches and dials that are in the older airplanes. What I have in front of me is a large touch screen, like my smartphone, so it's technology I've become comfortable with. A pilot can have 14 windows of information up or two windows or whatever is needed. It has voice recognition, like some people's cars have today, so if I want to change my radio frequency, I can talk to the airplane and change the radio frequency.

"Growing up in some of the airplanes I started out in 26 years ago, that was science fiction. Today, it's reality, and it's what young pilots expect when they climb into a 21st-century aircraft."

The same technology that enables easier piloting of the F-35 also allows for more streamlined maintenance, but there still

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Sgt Stephen Fink (above, left) assists Maj Adam Levine, VMFAT-501, as Levine gets ready for a training flight (below) piloting the Corps' newest aircraft, the F-35B Lightning II. The Corps' first operational F-35B squadron was stood up at MCAS Yuma, Ariz., in November 2012.

is a unique learning curve for squadron aircraft-maintenance Marines who come from several different aircraft backgrounds, including helicopters.

"Standing up a program like this is one of the most challenging things I've ever done," said Gunnery Sergeant Bart Stoltenberg, an F-35B engine mechanic who previously worked on CH-46 helicopters. The Ririe, Idaho, native, along with two sergeants and a staff sergeant who work with him, talked about the task.

"It is unique that we are writing our own SOPs [standard operating procedures]," he said. "If these guys have a suggestion, they let me know, and I'll bounce it to people for input, then get it up the chain of command. Everyone here has experience; that's why you won't see any junior Marines here."

Sergeant Richard R. Wharton, a Springtown, Texas, native, added, "I think it's beneficial because everybody is learning at the same time, and if there's a problem, everybody's going to work it out, so you know as much as the expert."

"It does give us the opportunity where if we don't like the way something is, we actually have a way to change that through our chain of command, instead of saying, 'Well, that's the way it's been for the past 20 years,' " said Staff Sergeant Travis L. Webb.

The Waynesfield, Ohio, native was an

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One more check by Sgt Fink, squatting, and a civilian technician clears Maj Levine for a training flight at VMFAT-501, Eglin AFB, Fla.

F-18 mechanic before being selected for this mission.

"The chain of command here is good about taking our suggestions, and if we think we have a suggestion about how something can be easier or smarter or safer, they're all for it," he said. "If it's a bad idea, they'll tell you it's a bad idea; if it's a good idea, it'll be put on paper. We have direct contact with the instructors at the Academic Training Center, too, and they'll come here and ask for our input."

As Webb spoke, his fellow mechanics were nodding their heads in agreement, and Sgt Sean M. Fagan from Huntington, N.Y., affirmed, "We definitely have good support up our chain of command."

The Academic Training Center, right across the street from the squadron hangar, is where all pilots and mechanics receive their first classroom training before touching the aircraft. It is as 21st century as the F-35, using "avatars" on individual large-screen workstations providing simulated training scenarios.

Sgt Rodgers LeBlanc, a 6½-year Marine veteran, is an F-35B avionics mechanic, who went to the program from the Harrier community. He was assigned after stringent screening as part of a reenlistment option.

"It was pretty competitive because there were only 14 slots," said the native of Channelview, Texas, just east of Houston. He talked about the once-in-a-lifetime opportunity the assignment presents.

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>
> —Sgt Rodgers LeBlanc

"I am one of the people actually on the flight line going through the maintenance procedures, helping with flight testing and working with Lockheed-Martin contractors to establish precedents," he said. "I put my inputs in, and they go up the chain of command. I have actually helped write a good portion of the training program for this aircraft. The chain of command acts upon our inputs, they take our suggestions for a solution, or figure out an alternate solution, but they consider what we pass along."

LeBlanc is especially impressed with the aircraft's advanced maintenance systems.

"The aircraft troubleshoots itself, it diagnoses failures on its own using the pilot memory device that we can download to a computer, and it will show us what the problem was and make suggestions on how to fix it. It is very advanced compared to existing platforms," said LeBlanc, who was a certified electrician and welder while still in high school.

Col Tomassetti underscored the broad nature of the mission assigned to VMFAT-501. "We've asked these Marines to move into a new, empty building, populate that building with everything needed to be a working facility, start with a blank sheet of paper and write the book on how to operate the F-35B from the pilot's perspective, from the maintenance perspective, from the admin perspective. We didn't give them a template or model. … We said, 'You are hand-picked; go figure it out.' "

Speaking more broadly about the joint-services mission, he asserted, "Here at Eglin, we are building that foundation for the F-35 weapons system that will be used for the next 40 years. … We are shaping the future."

VMFAT-501 Marines will be at Eglin for at least another year or so as the F-35 program evolves. Eventually, the squadron is slated to move to MCAS Beaufort, S.C., to continue training duties.

Until then, the 21st-century aviation warriors will continue to document their flying and maintenance experiences as they prepare the way for future generations of Marines and their flying machines.

"We believe that with the F-35 we delivered the airplane we hoped to deliver … to first and foremost take care of the people who are flying it, to allow services to accomplish the missions they are tasked to do, to dominate the air battlespace for the foreseeable future," Col Tomassetti confirmed.

Editor's note: The author, CWO-4 Randy Gaddo, USMC (Ret), was a combat correspondent as an enlisted Marine and later a public affairs officer. He retired from active duty in 1996 and now is a contributing editor for Leatherneck.