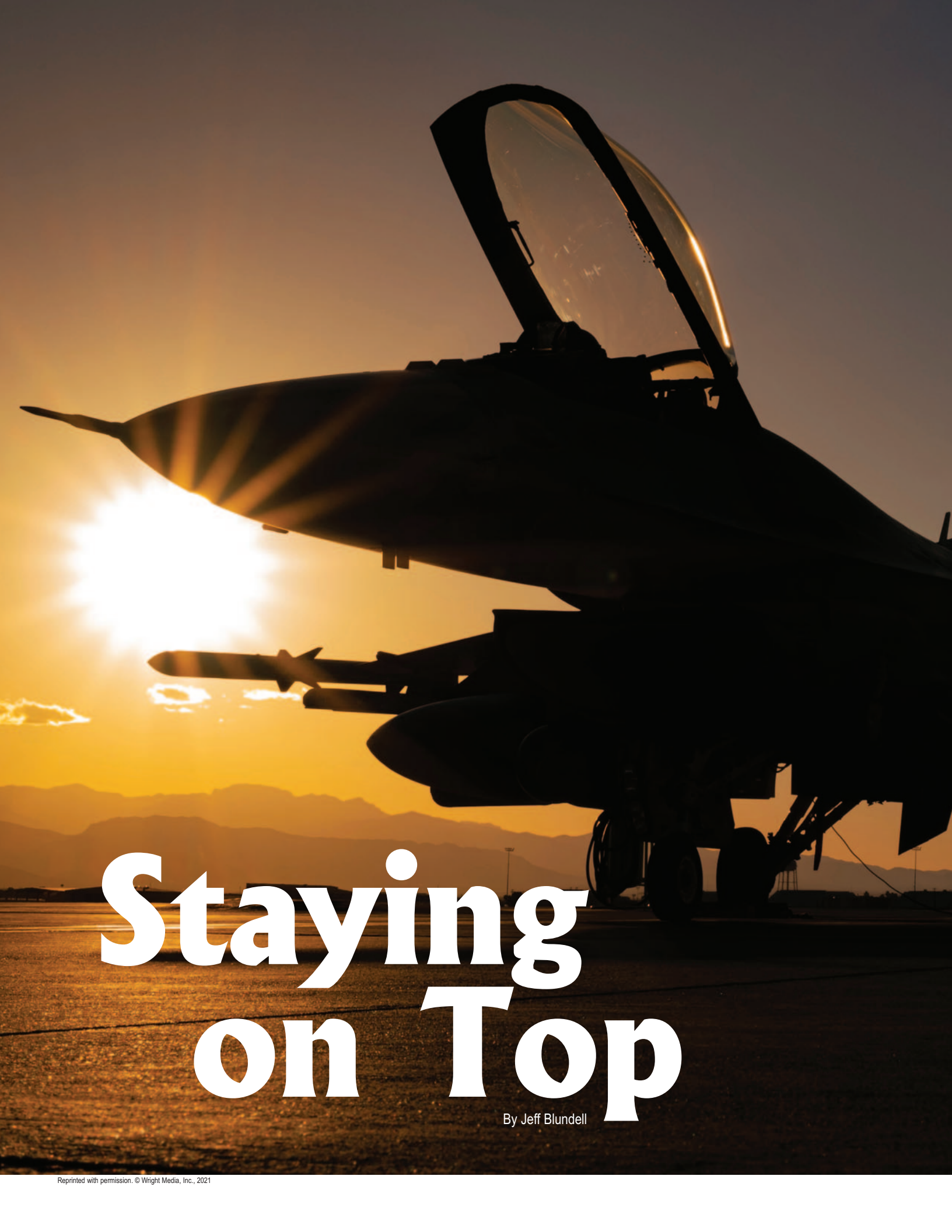




F-16 & PROVEN AIRCRAFT TCG WORLDWIDE REVIEW

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Staying on Top

By Jeff Blundell



U.S. Air Force photo by Airman First Class Zachary Rufus)

It started in 1972. The way wars were being fought was changing. As a result, the U.S. Air Force needed a new kind of air fighter.

It had to be light, and it had to be fast. The solution was a single-engine airplane powered by a Pratt & Whitney Turbofan engine, putting out 25,000 pounds of thrust. That combination of light weight and a powerful engine made it the fastest thing in the sky at the time.

The plane had a new shape, too. The fuselage flared out, right where the wings started. That gave it greater lift and stability at steep angles of attack. Thanks to the bubble canopy, the pilot could take advantage of much improved visibility in all directions. Some even thought the new design resembled a spaceship (*see the sidebar*).

First flown in 1974 and entering service in 1978, in just a few years, the F-16 had become a key piece of the U.S. Air Force fleet, and air forces around the world were banking on it as a pillar of their defense matrix. In 1982, it proved its worth during the Israeli-Syrian conflict. In the Persian Gulf War of 1990–1991, more missions were flown by F-16s than any other aircraft. More recently, they have been deployed as part of Operation Enduring Freedom in Afghanistan. And earlier this year, an Israeli F-16 shot down a Hamas-operated Shehab suicide drone with a Python-5 air-to-air missile.

Those are just a few highlights. Over five decades of deployment, more than 4,500 F-16s have been produced for twenty-six nations. But is it still as fast? Still as fierce? Still as functional? In a word, yes.

STAYING MISSION READY

“The aircraft’s 47 years old,” says Jim Waring of Crestwood Technology Group (CTG). “But it’s probably one of, if not *the* most popular fighter aircraft in the world, based on performance and continuous upgrades of the aircraft.”

Waring served in the U.S. Army for 26 years and has a healthy respect for what the F-16 can do. “We called in F-16 strikes from the 101st Airborne,” he says, referring to his time in Iraq. “I’ve seen them in action firsthand, using a multitude of weapon systems, including bomblets for creating obstacles. So, yeah, I have a high regard for the F-16 aircraft. That’s coming from a boots-on-the-ground kind of guy.”

These days, Waring is putting his experience in the field to work with CTG, a company that provides supply chain solutions to all branches of the military, helping them keep their fleets mission ready. They maintain a massive international network of suppliers, providing the parts needed to keep F-16s in top fighting form.

“Specifically, our real forte is obsolescence



THE GREAT NAME DEBATE

Is it a Fighting Falcon? Or is it a Viper? The F-16 fighter jet has gone by both of those names at various points in time.

In 1976, while this new fighter was still in development, the U.S. Air Force staged a “Name-the-Plane Contest.” Of all the submissions, the chosen winner was from Technical Sergeant Joseph Kurdell. He had been recently stationed at Lowry Air Force Base in Colorado and was a fan of the nearby U.S. Air Force Academy football team, known as The Falcons.

“My family and I would visit there quite often, especially during their football seasons,” Kurdell wrote as part of his suggestion. “As you probably know, the falcon is the school mascot.” (Remarkably, since 1956, cadets have trained falcons to fly for cheering spectators.)

In the big picture, the name made sense. The F-15 already was dubbed the “Eagle,” and the F-16 was to be a smaller, less powerful option. The name “Fighting Falcon” was officially announced on July 21, 1980. As a prize, Kurdell was given a free dinner at the local mess hall.

The delay between the contest and the official announcement is what led to some confusion. Between those two events, in 1979, the television series “Battlestar Galactica” was released. It later became a movie and then another, more modern TV show. In the science fiction series, the fighter jet the good guys flew was a futuristic, streamlined design, with wings part of the fuselage, and it was called a “Viper.” In the show, Vipers usually were victorious due to their incredible maneuverability. They were, in short, the plane every young pilot wanted to fly.

The F-16 bore a vague similarity in shape to the fictional spacecraft. Pilots flying those early versions started wearing “Viper Pilot” name tags. That practice was discouraged by the administration, and the pilots were told to remove the tags. But the name stuck.

Nowadays, the term “Viper” refers to the latest variant, the F-16V. The Viper features highly advanced capabilities, enabling it to fly joint missions with fifth-generation fighters, such as the F-35 and the F-22.

“The big challenge is to organize it all and be in control of the full mod program. To do that, you need to orchestrate all the different elements.”



Jim Waring is the Vice President of Strategic Business Development with Crestwood Technology Group. (Image courtesy of CTG.)



Harry Barmentloo heads ILIAS Solutions's Business Development: Air Force & MRO in Europe. (Image courtesy of ILIAS Solutions.)



Lockheed Martin Depot Operations Manager Patrick Conlan. (Image courtesy of Lockheed Martin.)

management: acquiring hard-to-find parts for legacy systems,” says Waring. “We have a unique capability to locate and source parts that a lot of our competitors don’t. Also, we’ve seen that people in the defense supply chain can be hamstrung a bit by the systems that they’re allowed to use. We’re much more contemporary.”

To be blunt, they have ways of finding stuff that no one else can. But here’s the surprise, it is not the parts you think of as rare or essential that they get the most calls about. In fact, some of the key missing pieces are surprisingly mundane. Flatware washers and 12-point bolts top the list.

What also may be surprising is that a scenario involving a multimillion-dollar jet being grounded for lack of a \$10 part is all too real. It even has a name. A “single downer” refers to a single piece keeping an aircraft needed for vital missions on the ground.

“The common solution to that is cannibalization,” explains Waring. “You’ve got the old hangar queen. It’s



Greece's Air Force is updating its fleet of eighty-four F-16s. (Image courtesy of Rob Schleifert.)

that one aircraft you always go to for a part. 'I need a widget? I take the widget off that aircraft. Then, when I need a strut, I go to that aircraft, and I take a strut.' Now, you have an aircraft, sitting in the hangar, that's going to take an act of God to get it operational again. It's a common practice, but it's not an approved practice. It's actually indicative of an inefficient maintenance and supply system."

STAYING ORGANIZED AND COLLABORATING

While it might be a stopgap measure for existing parts, stealing parts from a hangar queen does not work when you are trying to upgrade your jets to improve capabilities. Right now, Greece's Hellenic Air Force is working on increasing the capabilities of eighty-four F-16s. The upgrade package essentially brings Block 52 aircraft up to the equivalent of the Block 72 configuration, effectively turning them into the latest-evolution F-16V version, also known as a Viper.



While it looks similar to a commercial de-icing setup, the jet-washing robot is customized to clean the F-16, so it can get to even hard-to-reach areas. (U.S. Air Force image by Senior Airman Ryan Mancuso.)

The Viper upgrades extend to almost every aspect of the plane, including the avionics, radar capability, and cockpit display systems, all of which are connected by a high-speed data network. The new technology additions also include an advanced weapons package. It is a project where the details threaten to overwhelm the big picture.

"ILIAS is central to all this," explains Harry Barmantloo, of ILIAS Solutions, providers of logistics software for fleet management.

"It's like a big blender, bringing all the different variables together—IT systems, databases, all kinds of technical instructions, parts, and planning cards," he says. "The big challenge is to organize it all and be in control of the full mod program. To do that, you need to orchestrate all the different elements."

"We use a secured cloud environment, where

according to the Lockheed security policies, we can hold the development, testing, and production activities, and keep track of the progress of the mod execution," says Barmantloo. "We also kept track of the different shipments coming in from both the commercial supply chain and through Foreign Military Sales (FMS)."

Upgrading eighty-four fighter jets is a project so huge that it is only possible with the leadership of and collaboration with the original equipment manufacturer (OEM), Lockheed Martin. Patrick Conlan is the Lockheed Martin Depot Operations Manager for Greece's Viper Upgrade Program and the main conductor of the logistical orchestra.

According to Conlan, "We deliver large kits with huge builds and materials. But mapping each one of those material requirements to a specific production-need date is something that has eluded us in the past. We are dealing with both serialized and non-serialized items being delivered. We also have to track multiple items that are coming and going from the Hellenic Air Force for the engine, the seat, the canopy, and the gun. All that needs to be managed and controlled."

"Of course, what this all leads to is the ability to measure our cost and schedule performance, what we



A new jet-washing robot prototype blasts grime off an F-16. (Image courtesy Aenier)



The jet-washing robot is effectively hosing down one of the F-16's pylons. (U.S. Air Force image by Senior Airman Ryan Mancuso.)

refer to as 'Earned Value Management.' And through all this, we hope to capture management visibility and transparency. Because, as opposed to siloed reports and siloed systems, all of the information is flowing out of one system. We all get to speak with one truth."

In January of this year, the project hit its first major milestone. Upgrades to the first jet were completed, and it was flown to the United States for further testing. The program is expected to run until 2027. When it is complete, Greece's F-16 fleet will be ready for an array of new roles. A little older, a little wiser, but just as useful as the original F-16s were in their day.

STAYING CLEAN

Sometimes, a jet doesn't need a full upgrade. Sometimes, all it needs is a good bath, or at least a shower.

Traditionally, washing down a jet after a mission has been a four-person job, taking about six hours. But the Texas National Guard's 149th Fighter Wing recently demonstrated a robotic arm that remarkably can do the whole job in just one hour.

"Cleaning removes any built-up dirt and grime," explains Senior Airman Ryan Mancuso. "That includes grease, oil, and hydraulic fluids, as well as soot from the

engines, smoke from firing the gun and launching weapons, and environmental debris like insects."

While it looks pretty much like the de-icing sprayer you might see at a commercial airport, the robotic cleaner is programmed specifically for the shape of an F-16. That means it can even get to the hard-to-reach spots. The idea came out of an initiative meant to empower frontline personnel to use their experience to design new processes and inspire new technology.

According to Mancuso, "It was developed under the AFWERX innovation initiative and was designed and built as a proof of concept to potentially be rolled out Air Force-wide."

Right now, there is only one such robot in operation. But plans are underway to expand the program—if so, there undoubtedly will be opportunities for manufacturer and aftermarket involvement. So stay tuned.

INCREDIBLE AND ESSENTIAL

Staying-mission ready, organized, and clean—, all ultimately are a means to an end. What really matters is whether the F-16 can make a difference in the air. Jim Waring says it can.

"The collision avoidance radar on the F-16 Vipers now is just unbelievable," he points out. "But from my perspective, being a field artillery guy and a fire support guy on the ground, the thing that I think that's come a long way are the munitions. I mean, we can put a munition off a wing of an F-16 through the window of a building 27 miles away. That's just incredible."

Waring adds that this legacy model still has a lot of life left. "The U.S. Air Force has made it very clear that the F-16 Viper is an essential aircraft," he says. "It's one of the ones that's going to remain in the inventory and be upgraded, even as the Air Force looks to narrow down the fleet for cost savings."

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