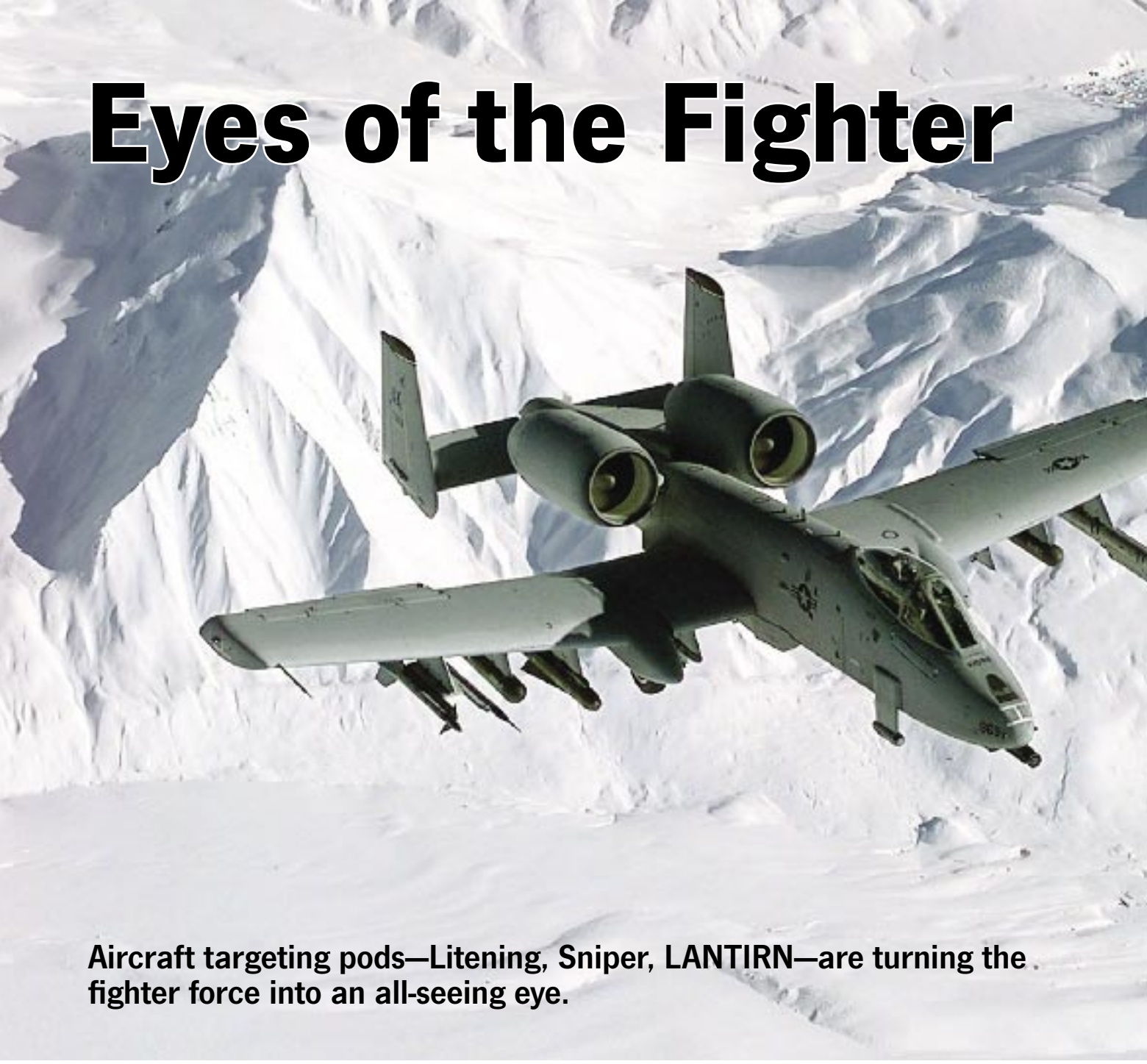
Eyes of the Fighter



Aircraft targeting pods—Litening, Sniper, LANTIRN—are turning the fighter force into an all-seeing eye.

By John A. Tirpak, Executive Editor

Air Force fighters in the skies over Afghanistan and Iraq are providing powerful backing to US ground forces, responding as they always have done with on-call air support when troops come into contact with the enemy. Increasingly, however, that support features not precision attack but delivery of video on demand.

Various targeting pods, developed to enhance bombing accuracy, have been pressed into service as part of the nation's intelligence-surveillance-reconnaissance (ISR) network. These airborne sensors help generate instant situation updates, either automatically or via the pilot, to troops engaged in combat.

This new technique has vastly improved the ability to find and engage the enemy. Moreover, it has done so by taking advantage of capability already present, eliminating the need to conceive, finance, develop, and produce new systems.

The capability—known as "nontraditional ISR," or NTISR—also has vastly sped up the process of battle damage assessment, giving air commanders a faster read on whether targets have been hit and destroyed or need to be struck again. The power to do this is critical early in an air campaign against high-value objectives.

In both Southwest Asia theaters of operation, armed fighters fly high above the ground, ready to respond immediately to a call for air support from ground troops. When that call comes,

USAF photo by TSgt. David W. Richards

Fitted with targeting pods, fighters such as this A-10 can offer full-motion video intelligence to troops on the ground.

they can use their targeting pods—Litening, Sniper, or LANTIRN—to zoom in on a target and put ordnance precisely where it's needed.

Eye in the Sky

However, while they are orbiting over their "kill boxes," fighters can use the pods to watch the action below and provide useful "eye-in-the-sky" information to the ground commander in a fight or pursuit—before or after the action takes place. They also can use this capability while moving to and from their assigned kill boxes, watching for suspicious activities along main roads, pipelines, and rail routes. When they detect suspect behavior, they can hand off the ISR target to one of the dedicated sensor platforms in the area for further investigation.

In fact, when dealing with ground controllers equipped with specially configured laptop computers, the fighters can beam down an image allowing friendly troops to see where the enemy is hiding or what escape route he may be using. The ground commander can have a real-time image of how many enemy combatants he's up against or be warned of, say, an explosive device up the road a mile or two.

In short, the targeting pods have integrated the fighters even more fully into the ground fight.

The capability is comparable to that provided by Predator unmanned aerial ISR systems, which perpetually are in high demand but short supply. The range of threats to be observed has expanded so much that, for most fighter aircraft, ISR taskings have taken priority over physical attack in the daily air tasking order.

"Initially, there was tremendous pushback from fighter pilots who resisted the notion of becoming 'manned Predators,'" noted Lt. Gen. Walter E. Buchanan III, commander of USAF's 9th Air Force and of US Central Command Air Forces.

However, he went on, "it was the right thing to do, and it demonstrated a real-time way ... to leverage a system in theater, which could also pick up valuable video intel."

Buchanan credited the transformation to Brig. Gen. William J. Rew, former director of operations for CENTAF and 9th Air Force and former commander of 20th Fighter Wing. In 2002, Rew came up with the idea of substituting an F-16 with a Litening pod for U-2 reconnaissance aircraft flying over southern Iraq. At the time, U-2 imagery could be foiled by a low cloud deck, and, in any event, the aircraft were only flown on regular daily runs. The F-16s, on the other hand, were either already flying in the vicinity or could be dispatched more quickly than the U-2s and could record video imagery from their targeting pods. Rew is now commander of the 57th Wing at Nellis AFB, Nev.

Rew's suggestion came during the unfolding of Operation Southern Focus, the effort by CENTCOM to better map defenses and other sites in the Iraqi southern no-fly zone, Buchanan explained. It was part of an effort toward "intelligence preparation of the battlefield over the entire south" of Iraq, he said.

Buchanan said that, when Operation Iraqi Freedom in 2003 shifted from a force-on-force battle with regular Iraqi forces to an anti-insurgent operation, he and his then-deputy, Maj. Gen. Robert J. Elder Jr., brought about a shift in the use of the fighter pod ISR capability.

Over the "Crown Jewels"

On their way from bases outside Iraq to their kill boxes, fighter pilots were ordered to fly over what Buchanan called the "crown jewels" of Iraqi infrastructure—pipelines, railroad tracks, power lines, and the main roads radiating out of Baghdad like spokes from a hub. In a two-ship formation, one aircraft would fly low to observe the ground with the pod; the other would fly higher and clear for other air traffic.

If a pilot saw something "of interest," he would turn on his camera and film it.

"Now, I've got the time [of the event], it's date-stamped, it tells me the coordinates on the screen, so I've got all the data, and I have the video," Buchanan said. While LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) imagery was "quite a bit fuzzy" compared with that obtained from the U-2, "it was good enough to show them what they wanted to see."

Using this capability freed up other ISR assets for higher-priority missions and provided the kind of detail and man-in-the-loop judgment not otherwise available. The clarity of the images also improved as more advanced versions of the pods became available.

It was also at this time that the initial take on lessons learned in OIF highlighted the lack of quick-response BDA. Again, the targeting pods were a solution at hand.

Buchanan noted that the targeting pods are not capable of performing the full process of BDA, assessing destruction, casualties, poststrike functionality of the target, and whether other desired effects were achieved. That process can take a long time. However, fighters coming along 10 minutes after a strike, when the smoke had cleared, could use their own pods to tell if there was, for example, a hole in the top of a hardened shelter.

An attacking fighter's gun camera footage would show whether correct

USAF photos by SrA. Lynne Neveu

Pictured are Sniper Advanced Targeting Pods on F-15Es from RAF Lakenheath, UK. Intended to offer greater precision in aiming laser guided bombs, the pods have provided bonus surveillance and bomb damage assessment functions now widely employed in Southwest Asia. The Sniper can "talk" directly to controllers on the ground.

coordinates had been given. Even if "you never saw it hit, we've probably got an 85 percent" chance that the bomb went where it was supposed to go and "probably" inflicted the desired damage, Buchanan said.

By early 2004, targeting pods had become tools for both ISR and quick-look BDA. The adaptations didn't stop there, though.

In 2004, Buchanan began pushing to equip A-10 attack aircraft with targeting pods, which are used primarily to employ laser guided bombs. Buchanan concedes that the A-10 is not the ideal platform for the LGB. However, the podded A-10 had another value; in the rugged mountains of Afghanistan, the pods could provide pilots better situational awareness. They had infrared as well as daylight mode. Besides giving the pilots a better chance to avoid the terrain in the nearly blacked-out mountain regions, the pods allowed the pilots to zoom in on action on the ground, a feature not available otherwise.

"This is where NTISR begins to take another step," Buchanan explained. Up until that point, the pods had been drafted into a tactical reconnaissance role, he said, but now, with new radios and the imagery from the pods, A-10 pilots could begin "coordinating with the ground force." The A-10s could scout ahead of convoys, "looking for activity, ambushes, all those kinds of things," and talk down to ground units about the threats they were facing.

Nice Rover

The next technological leap was the Remote Operations Video Enhanced Receiver. The ROVER is a special-built laptop that allows a joint tactical air controller on the ground to see exactly what the targeting pod on the fighter above is seeing. This not only allows the JTAC to have a firsthand, aerial view of what's going on, it dramatically streamlines the JTAC-pilot discussion about what target to bomb.

Lt. Col. John Johanson, deputy director of the Air Force Intelligence Analysis Agency, said that the system brought dramatic gains in the speed of a "talk-on," the process where the air controller on the ground talks the pilot, landmark by landmark, to the specific enemy spot. According to Johanson, a Marine Corps commander reported that, with the ROVER, marines were able "to get talk-ons of under five minutes, which is an incredible statistic."

Johanson went on, "From the time the guy on the ground is reporting he's in deep mortal danger to the impact of weapons on the ground is less than five minutes," compared to a process that used to take 30 to 40 minutes.

The latest version, ROVER 3, will have new features, including what's called the "John Madden" display, named for the former coach and now NFL television analyst who popularized the use of the telestrater to diagram plays visible on a television screen. The JTAC on the ground and the pilot in the air, both looking at a pod image, can diagram the route to the spot where the ground commander wants an air attack.

The use of pods is not an all-Air Force affair. Marine and Navy fighters, primarily using the Litening system, also have the ability to hook up with ground forces and use their pods for close air support, full-motion video, and BDA. However, it was the Air Force that took the initiative to broaden the application and coordinate it among the services.

All of the Air Force's ROVER-compatible pods are being used in Afghanistan, Buchanan noted.

"That's where I need it," he said.

In Afghanistan, special operations forces teams are traveling through the countryside with no armored vehicles or any close-at-hand support. Some, operating at mountain altitudes up to 12,000 feet, can't even take their full packs, given the lack of oxygen. Aside from personal small arms, said Buchanan, "airpower ... [is] their only firepower."

At first, the A-10 community balked at taking up the ISR mission. Warthog pilots worried the A-10 would be turned

USAF photo by MSgt. Andrew Gates

Capt. Keith Wolak checks out the Litening pod on his A-10 as he preflights a mission out of Bagram AB, Afghanistan. Targeting pods are a high priority in Afghanistan, offering precise air surveillance and fire support for troops in high-altitude mountainous terrain.

into a manned Predator. However, Buchanan said, "I'm glad we did it, because we saved more than one person's life." In doing so, he got the wholehearted support of the then-USAF Chief of Staff, Gen. John P. Jumper, and the then-Secretary of the Air Force, James G. Roche.

Seeing the Future

Today, the NTISR concept has advanced toward what's called predictive battlespace awareness.

Intelligence specialists, Buchanan said, do "a great job of analyzing when people shoot" mortars and other weapons toward coalition or civilian targets in Iraq and Afghanistan. They will frequently succeed in predicting when and where a group of insurgents will set up, and a fighter will be assigned to watch that space. If the predicted enemies show up, the pilot can quickly alert the ground commander, and a quick-reaction force can be dispatched to deal with them on the ground. Of course, the fighter is also carrying missiles and bombs that can be used if it becomes necessary.

In Iraq, Buchanan said, the fighters with pods also have been helping direct pursuits. The pilots tell Army or Marine Corps vehicle drivers what turns to take in the streets of a city to head off fleeing insurgents. Buchanan likened it to police chases directed by an overhead helicopter, except that the aircraft can zoom away to another location.

Fighters with pods often are used as a kind of backup ground force, according to Maj. Gen. Norman R. Seip, assistant deputy chief of staff for air and space operations. "The Sniper pod allows us to be part of some of the raids," said Seip, whose portfolio includes some of the battlefield ISR operations.

The fighters with the pods can respond "immediately ... if the troops get in trouble" but also can "watch the back door of a building" as coalition forces approach. The fighter can use the eye-safe laser designator to finger a specific person or group of suspects on the ground. Troops equipped with the right optical gear, said Seip, "can see who we're pointing at, and they can go round up folks."

Seip added, "Not only are you an ISR platform, but you're a little bit of a command and control network up there. ... You can assist the ground forces in keeping track of what's going on."

Seip said the fighter can stand off "a couple of miles ... so that the noise of the airplane doesn't tip anyone on the ground that something's about to happen to them." With the high-resolution zoom optics, the standoff distance doesn't affect clarity, he said.

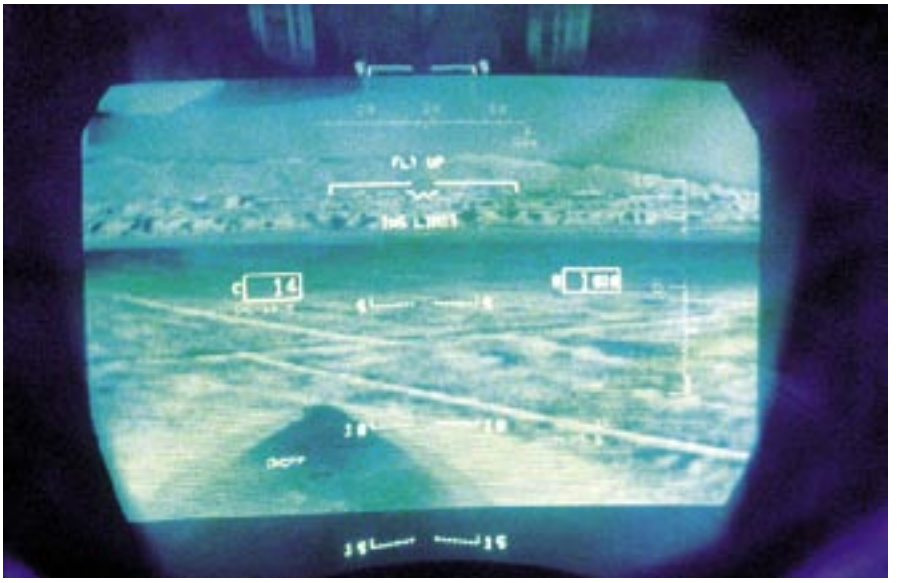
The daily ATO, Johanson said, usually specifies NTISR as a fighter's principal tasking "until that lethal capability is required." In that sense, the advent of the NTISR concept, he said, has eliminated the condition of fighter pilots "waiting for things to happen."

Coordinating the use of fighter pods in the combined air operations center and putting the pod surveillance mis-

USAF photo by TSgt. Debbie Hernandez

Two F-15Es from Mountain Home AFB, Idaho, are pictured on a practice bombing mission. Some of the "nontraditional ISR" mission can be carried out by the old LANTIRN unit, but backseaters prize the high resolution of the advanced pods.

USAF photo by SrA. Brad Fallin



A LANTIRN view is projected on an F-15E pilot's head-up display. Advanced pods offer far greater detail, in both daylight and, with infrared imaging, at night. With the laser designator, aircrews can finger a specific enemy on the ground.

sions on the ATO means that Predators, the "preferred" provider of video to ground forces, can be apportioned to where their long dwell time can be used to maximum effect.

In Layers

"It's all part of a layered approach" to persistence, Seip noted. He added that the CAOC coordination is essential, because it will sometimes divert a fighter to an area of interest for surveillance, but must first make sure it is not being pulled away from a higher-priority mission. The dynamic retasking of fighters for both ISR and weapons functions is "an art and a science," he said.

The Air Force plans to expand its success by investing in more pods, to provide both better strike accuracy and, as a by-product, additional ISR coverage. It's the service's plan to acquire an advanced targeting pod for all fighters over the next few years. That plan was temporarily delayed last year, when pod money was shifted to pay for some fighter communication modifications, and many pods landed on USAF's unfunded priorities list. The pod plan is back on track for Fiscal 2007, Air Force officials reported.

For now, if possible, every fighter two-ship that goes out is apportioned a Litening or Sniper pod, with an older-generation LANTIRN as the spare.

Seip praised Air Combat Command for making judicious use of its pods, using only the bare minimum needed for training and only just in time to spin up units that are deploying into the theater. He also noted that pilots new to the theater usually have as much as a 90-minute "drive" to their kill box, allowing plenty of time for "hands-on" practice along the way.

As more pods are acquired, it will be possible to devote more time to training at home station. Such may result in devising even more applications of the versatile pods, which cost about $2 million apiece.

If there is a drawback to the use of fighter ISR, it's the bugaboo of bandwidth.

Seip said that bandwidth management is a constant struggle, as the appetite for full-motion video is "insatiable" among commanders of every stripe.

Dealing with the demand means "in some cases ... prioritization," he said. "In other cases, we've had to turn to commercial enterprise to rent space."

Technological efforts are under way, as well, to compress the signals or "take the available bandwidth and put more data in it" with burst methods or dividing communications "pipes" into "smaller pipes," he said.

Seip noted that the evolution of fighter ISR is very much a product of the unique circumstances in the two theaters over the last few years and may not be a blueprint for different kinds of wars.

"The moons aligned correctly, in that you had counterinsurgency warfare, you had the technology evolving, you had the fact that we as an Air Force are very much a supporting component to the ground commander, and we wanted to look for ways to assist that soldier or marine in the foxhole," he said.

A Luxury

Fighter ISR "really is, right now, a luxury," Johanson noted. Out of the many fighters launched every day, "some—maybe none—of them will drop ordnance." In a medium- or high-intensity conflict, however, the emphasis would be to revert to using combat aircraft for mostly attack and kinetic combat, not ISR.

"At that point, NTISR is kind of out the window," Seip asserted.

Nevertheless, the rapid pace of trying out the idea of fighter ISR and adapting it to fill an important role in the fight is "a testament to the flexibility of airpower," Johanson observed. It shows "that we do not, as a service, treat our weapon systems canonically. ... We leave it to the smart young men and women to come up with the ... solution to the problem set in front of them." The attitude, he said is "that's cool, let's give it a shot. Worse that will happen is, we won't do it again tomorrow."

Buchanan didn't go as far, observing that the BDA mission with pods will probably continue to be performed, even in a high-optempo campaign.

He also noted that the mission of using a dedicated, high-resolution tactical aerial reconnaissance system, or TARS pod, is still very much alive. The pod can be carried on F-16s and is used by two Air National Guard units. The high-resolution reconnaissance imagery it captures can be electronically downloaded to a ground station, but it isn't moving pictures. The TARS pod went home with the two Air Guard units when they rotated Stateside, but "we liked it so much, I lobbied to get it back. And now we have TARS forward in the AOR again. And it is a very good system," Buchanan noted.

With regard to NTISR, Buchanan said he thinks enemy forces in Iraq and Afghanistan are aware of it.

"These guys aren't dummies," he said. "They read all the technical journals." The use of NTISR has "been talked about, and it would be very hard to disguise it."

Actually, he's hoping the word spreads throughout the insurgent community. As Buchanan put it, "I'd like them to think that every single airplane they see in the sky has got a targeting pod on it and is looking right at them." That will, he said, "keep them on their best behavior." ■