

A man in a light-colored short-sleeved shirt, sunglasses, and camouflage pants is walking on a runway. He is holding a rope that is attached to a yellow chock. In the background, the nose and cockpit area of a large, dark-colored aircraft are visible. The aircraft has yellow triangles on its side.

# High-Altitude ISR at Risk

By Aaron M. U. Church, Senior Editor

The future of the U-2 and Global Hawk missions are up in the air.

USAF photo by TSgt. Christopher Boltz



**A crew chief escorts an RQ-4 back to a hangar in Southwest Asia. Because of sequestration, USAF tried to mothball the Global Hawk in 2013.**

**T**he Air Force's high-altitude intelligence, surveillance, and reconnaissance capability, centered at Beale AFB, Calif., is both a critical national asset and an endangered species. Despite being tasked at or near maximum capacity supporting combatant commanders, plans call for cutting USAF's high-altitude ISR fleet in half.

Sequestration forced the Air Force to offer up the RQ-4 Global Hawk to make ends meet.

When that idea was barred, the venerable U-2 Dragon Lady was to be sacrificed instead.

Necessity spared it until 2019 when, according to current plans, operational assets will drop from 55 combined U-2 and RQ-4 platforms to just 28.

Beale's 9th Reconnaissance Wing—manager of both fleets—is no stranger to uncertainty about the future of its mission, and as the politics play out, “our job here is to execute the mission, and that’s what these airmen here have to be focused on, nothing else,” wing commander Col. Douglas J. Lee told *Air Force Magazine* in an interview at Beale. That being said, “at the end of the day, though, I can only execute the mission if I have the resources assigned to me to accomplish that mission.” Russian

aggression in Eastern Europe, heightened tensions with China, renewed threats in the Middle East, and other uncertainties have made things “more complicated” and kept Beale busy, 9th Operations Group Commander Col. Darren B. Halford acknowledged.

The U-2 fleet is operating at “max sustainment” tempo and “if we did much more, I would call it a surge,” he said.

The RQ-4 has likewise been heavily tasked, given its long range and endurance over the vastness of the Pacific.

“In the past four years, we’ve had a 1,000 percent sortie increase and a 2,200 percent on-station increase in the Pacific,” said Lt. Col. Geoffrey Church, commander of the 12th Reconnaissance Squadron, Beale’s resident RQ-4 unit. Because it’s almost half the high-altitude ISR capacity, “when the U-2 goes away, I think it’s safe to say there will be some reduction in capacity,” Halford said.

With the budgetary strictures that are in place “there is a reality that we’re going to have to do less,” he said.

This directly affects government policy-makers and a commander’s ability to stay ahead of potential threats and make the best decision. “What the United States needs to understand is

that if the Air Force has less resources, we can only fly less,” said Lee. “If we fly [fewer] missions, we are accepting risk. That’s a function for national decision-makers to say: Do [we] want to accept that risk, making decisions with less ISR information?”

#### **COMPLEMENTARY COMPETING**

Air Force officials have made no secret that cutting the U-2 fleet is a purely budget-driven measure forced by the 2011 Budget Control Act. “We would love to have this platform, but unfortunately we can’t afford both” the U-2 and the RQ-4 if sequestration continues, explained Lee. “They are complementary assets that fly different mission profiles,” and given the threat environment, demand for them is only increasing. “I will always advocate how best to use those platforms together. . . . The question is, are you, the taxpayer, through Congress, going to fund the Air Force with both?” Lee asked rhetorically. “If you’re not, . . . we’re forced to make a risked-decision” to eliminate one of the fleets.

The 9th RW operates 27 manned U-2S models and 28 unmanned RQ-4 Block 30s. Both types are constantly dispersed from Beale to several per-

manent and semipermanent forward operating locations worldwide. The wing also oversees a handful of Block 40 Global Hawks stationed at Grand Forks AFB, N.D.

These aircraft collect everything from radar and electro-optical imagery to signals intelligence and high-resolution wet-film photos in the case of the U-2. The RQ-4 Block 40 offers ground moving target data as its unique contribution.

The Air Force originally attempted to divest Global Hawk in Fiscal 2013, citing the U-2's broader, more sophisticated array of sensors. Congress blocked the move, prompting service officials to request retiring the U-2 as early as this year instead. More recent estimates showed upgrading the Global Hawk to carry sensors comparable to those of the U-2 would actually cost less than holding onto the U-2 over the next five years, according to Air Force officials. They then asked for, in the Fiscal 2016 budget request, a delay in retirement citing "current operational requirements" and the need to "reduce risk by aligning U-2 divestitures with anticipated fielding of enhanced RQ-4 Block 30 sensors." Plans now call for holding onto the U-2 until 2019.

Since it's been on the chopping block several times before, Lee said he is preparing for divestiture but also mindful that they may be called on to keep the Dragon Lady flying—possibly much longer. "I don't know what's going to hold past this year or next, ... which is why I have to be postured to execute that mission" in any case, he said.

The U-2 gathers 70 percent of all high-altitude imagery. This helped forestall its demise, but the two platforms "unfortunately have been pitted against

each other" due to sequestration, observed Halford. "In reality ... both have strengths and both have weaknesses." The RQ-4 has tremendous range and endurance beyond what a pilot in a cramped cockpit can tolerate at 70,000 feet. The RQ-4 can fly a "24-plus-hour sortie. You can range the entire continent of Africa, the vastness of the Pacific," required by certain missions, noted Lee. For its part, "the U-2 gives you the ability to carry heavy sensors that produce high-fidelity images and intelligence to the decision-maker, and is extraordinarily responsive."

### MR. POTATO HEAD

To retire the U-2, Congress stipulated that the Air Force demonstrate the RQ-4 can collect the same quality of imagery and data as the Dragon Lady. As directed by the Fiscal 2016 defense authorization bill, "before we can even start to think about retiring the U-2, we have to demonstrate parity with the RQ-4 sensors," Church said. From a sensor standpoint, Global Hawk's electro-optical suite is less capable than the U-2's, and it cannot carry the "old school wet film" Optical Bar Camera (OBC) required for treaty verification.

Sigint is the one area where the two platforms are already equivalent. "They have a unique set of sensors that go onto the U-2 and we have a unique set of sensors that go onto the RQ-4," Church said, but in terms of Sigint "you're getting about the exact same information off of both platforms." Global Hawk is less flexible than the U-2 in quickly adapting payload to meet mission requirements. The U-2 has a "Mr. Potato Head nose" that allows maintainers to swap sensor packages and within

several hours "tailor a sensor package to a particular requirement," Halford explained. This also allows for quick fielding of new sensor technology on the U-2.

Efforts are underway to address the Global Hawk shortcomings. Northrop Grumman is developing a universal payload adapter for the RQ-4 to permit payload swap-outs and easier integration of new sensors. The first Global Hawk is being modified "so that you could literally plug and play new sensors," said Church. The adapter is the foundation for bringing Global Hawk's sensor suite up to U-2 standards, as well.

The first payload developed for the Block 30 is the new MS-177 electro-optical sensor. It is on par with the U-2's Senior Year Electro-Optical Reconnaissance System IIC. "We are starting to move forward with new cameras to put on the RQ-4 that should start being tested at Edwards here very, very shortly," Church said in an interview at Beale.

Modernization plans call for upgrading MS-177 to "give us our 10 spectral bands" for optimal coverage, said Church. After testing is completed at Edwards AFB, Calif., "if that camera is actually good to go, then we will be able to roll that out in about 2017," well ahead of the U-2's planned phaseout, he said. The same MS-177 contract



*When Congress blocked retirement of the RQ-4, the Air Force suggested divesting the fleet of U-2s like this one at Beale AFB, Calif.*

Staff photo by Aaron M. U. Church



*Upgrades have kept the U-2 potent, but quality-of-life investments for deployed support personnel and pilots, like Lt. Col. Merryl Tengesdal, have suffered.*

adds the U-2's OBC that produces the world's highest resolution broad-area imagery, capturing a 135,000-square nautical-mile swath in a single pass. "The OBC requirement really stems from a Department of State requirement for treaty verification" rather than from the Pentagon, Church stated, but the payload should be operational on the RQ-4 "around the same time" as the electro-optical sensor.

While the Air Force is working to mitigate some of the RQ-4's shortcomings, what the unmanned aircraft needs even after upgrades is a pilot's pair of eyes and judgment, Lee pointed out. Global Hawk operators lack any significant degree of situational awareness, greatly diminishing their ability to operate in adverse weather, respond to emergencies, or exploit pop-up opportunities. "I always get concerned when I hear the word 'replacement'" used to describe the RQ-4's relationship to the U-2, said Lee. "Nowhere in Air Force literature have I seen that we're going to retire the U-2 because we have a great replacement."

### THE U-2 GLIDE SLOPE

Though the U-2 celebrated its 60th anniversary last year, today's U-2S model is much newer than even many legacy fighter fleets and boasts a glass cockpit, state-of-the-art sensors, and recently completed structural upgrades to decrease the effects of high altitude on pilots.

Regardless of its ultimate fate, since the U-2S is technically earmarked for divestiture, the service is "prohibited from spending new money on new advancements" without explicit permission from the Secretary of the Air Force, said Halford. "The upgrades that we're working on right now are really on a glide slope to keep us very viable up through 2019." Most of the specially requested funds are going toward sensor improvement projects that are either already far along or not specific to the U-2 alone. Other efforts include finding replacement suppliers for specialized, out-of-production components. Halford described this as "unique equipment, and we need to make certain that the supply chain and fundamentals of the aircraft stay safe and solid through the end."

Sustaining the U-2 presents another challenge. While there's no formal contingency plan for keeping the aircraft beyond 2019, the fleet has an estimated 40 years of serviceable life left.

The threat environment and political turbulence present the real possibility the U-2 may see its expected retirement delayed yet again. "We're not banking anything to get us beyond 2019, but we're also trying to hedge such that we're not hollow when we get there, in case, as before, it ends up being continued," Halford said.

The U-2 community has become adept at dealing in uncertainty and has kept the aircraft on a solid path. Infrastructure and quality of life in-

vestments for airmen supporting the mission have been more challenging. Investment in ancillary improvements, such as dormitories to house personnel at forward operating locations, are "such a long lead time item, and such a significant infrastructure investment that everybody goes, 'Well, OK, you're on again-off again every five years,'" so we'll allocate the funds elsewhere," said Halford. But "it's those kinds of things that set the foundation for the program and allow us to care for our airmen," he said.

### SCARIEST PLACES

Lockheed Martin's Skunk Works—the U-2's original designer—announced last year it is undertaking an independent study into developing a possible follow-on to the spyplane, dubbed TR-X. The aircraft would combine the U-2's best features with new capabilities and characteristics suited to future threats and missions.

"I think it's exciting that industry is coming up with ideas on how we can modernize," Lt. Gen. Robert P. "Bob" Otto, deputy chief of staff for ISR, said

at a roundtable in Washington, D.C., last October. In evaluating any potential successor to the platforms—which Otto noted have substantial service life and viability remaining—USAF must ask, “What gap would it fill?”

The Air Force is focused on developing concepts, tactics, and technology to conduct high-altitude ISR in highly contested airspace. Whatever the next high-altitude platform is, the service wants it to “be able to be used in anti-access, area-denial-type environments, which we expect to be more lethal than they are today,” stipulated Otto. A future unmanned, or optionally manned, platform must improve beyond Global Hawk, to be capable in nearly all weather, incorporating advanced collision avoidance features.

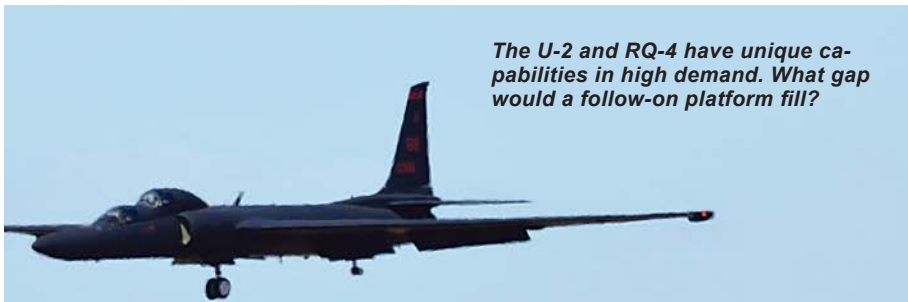
“Then we need exquisite sensors that allow us to either stand in, and allow us to do the observation from a Geoint and signals intelligence perspective, or stand out and have the range to be able to do those things” outside the reach of adversaries’ defenses, he said.

12th RS commander Church said, “We have a very difficult problem ... finding, fixing, and tracking mobile targets in an A2/AD environment.” Strike aircraft cannot loiter in heavily defended airspace, and to quickly and precisely transfer data without losing a target is critical in the high-end fight. “To be able to help our brothers and sisters who will be going into the scariest environment imaginable, we need some way to be able to pass them the coordinates in a very expeditious manner,” he said. “Given the appropriate sensors, it’s something that we can do from a stand-off” distance with the U-2 and Global Hawk. Although it is a “very, very difficult problem to solve,” Church said he is confident that with the right mix of tactics and technology, the Air Force can achieve it. ★

Staff photo by Aaron M. U.S. Church



*At Beale, SrA. Daniel Perez and SSgt. Derek Harris connect ground power to an RQ-4 before running a maintenance check on it.*



*The U-2 and RQ-4 have unique capabilities in high demand. What gap would a follow-on platform fill?*

USAF photo by A1C Bobby Cummings

