



ISR EXPLOSION

By Wilson Brissett, Senior Editor

**New missions call for unmanned systems,
but the old missions are as important as ever.**

The Air Force has faced significant operational challenges over the last decade to keep pace with the increased demands for intelligence, surveillance, and reconnaissance. The wars in Afghanistan, Syria, and Iraq have brought dramatic changes to the way these missions are conducted, including the retirement of some ISR assets, the rise and fall of others, and the emergence of the unmanned ISR mission as the wave

of the future.

Through it all, the Air Force continues to return to the phrase “insatiable demand” to describe combatant commanders’ calls for keeping a better watch on the world. While USAF leaders still say they struggle to fulfill these requests, the shape of the Air Force has shifted decidedly toward ISR. For example, ISR assets as a portion of the total aircraft inventory have more than tripled over the





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past decade. In 2007, ISR aircraft made up 3.2 percent of the USAF total inventory. Today, ISR assets represent 9.9 percent of all Air Force aircraft.

RISE OF THE RPA

A large part of this shift has come with the rapid increase in remotely piloted aircraft. As of Sept. 30, 2016, the Air Force had 533 ISR aircraft in its total active inventory. Of that ISR fleet, 357 were RPAs: MQ-1B Predators (129), MQ-9A Reapers (195), and RQ-4B Global Hawks (33). The Air Force has more of each of these three platforms than any of its other ISR aircraft. If you combine all three versions of the E-3 Sentry, the Air Force has 31 of them. Next comes the U-2S Dragon Lady at 27.

These numbers are striking given that 10 years before, in September 2006, the Air Force's 11 RQ-4s were its most prevalent unmanned asset, and the service had more numbers of four different manned aircraft: the U-2 (34), E-3 (32), RC-135 (22), and EC-130 (16).

Today, 67 percent of the Air Force ISR inventory is made up of unmanned aircraft. A decade ago, there were only 24 unmanned aircraft in the entire ISR inventory, and they constituted less than 18 percent of the ISR active fleet. In the intervening years, ISR underwent a revolution of sorts.

While the direct predecessor of the Predator, the General Atomics Gnat-750, made its military debut as a CIA asset in the skies over Bosnia in 1993, unmanned ISR did not begin to approach its current prevalence in the Air Force until the post-9/11 wars had fully developed. They pushed USAF toward an "airborne-centric" ISR architecture, said Lt. Gen. Larry D. James, then Air Force deputy chief of staff for ISR, in 2013. The asymmetric nature of the counterinsurgency



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Previous pages: An E-3 Airborne Warning and Control System aircraft is refueled over Iraq during Operation Inherent Resolve. The wars in Afghanistan, Syria, and Iraq have increased the demand for intelligence, surveillance, and reconnaissance. /1/ The MQ-9 Reaper carries the Multispectral Targeting System, a suite of visual sensors. /2/ A pilot and sensor operator fly a simulated Reaper mission at Creech AFB, Nev., in 2014. /3/ A 380th Air Expeditionary Wing EQ-4 Global Hawk, with the Battlefield Airborne Communications Node, lands in Southwest Asia. /4/ A1C Paige Sager, left, and SrA. David Garcia examine connectors on an EC-130 Compass Call antenna in Southwest Asia in 2007. /5/ An E-9A surveillance aircraft takes off in 2008 from Tyndall AFB, Fla.

Previous pages: SSgt. Douglas Ellis; These pages: A1C Aaron Montoya; SSgt. Nadine Barclay; SrA. Tyler Woodward; SSgt. Phillip Butterfield; SSgt. Bennie J. Davis III

wars in Afghanistan, Syria, and Iraq offered fertile ground for innovation in ISR assets.

Commanders were feeling the need for more data on the ground and were putting pressure on the fleet for greater production. In March 2008, the Pentagon reported a 300 percent increase for full-motion video from ISR assets and said that demand was outpacing supply by a factor of four-to-one. By September of the same year, the Air Force announced that it wanted to more than double its number of RPA operators—from 450 to 1,100—by 2012. One of the ways it planned to achieve that goal was to train, for the first time, airmen with no previous flying experience to become RPA pilots. USAF also said it wanted to increase its MQ-1/MQ-9 combat air patrols (CAPs) from 33 to 50.

In many ways, and by Herculean effort, the Air Force began to achieve many of its ISR goals. By February 2010, the first group of RPA pilots from nonflying career fields had flown their initial in-theater MQ-1 missions from Creech AFB, Nev., and they were making a difference. In April 2012, USAF announced it had increased its ISR capacity by more than 4,000 percent since 2002 and that its airmen were flying 1,500 hours of airborne ISR and producing 1,000 hours of full-motion video per day.

In 2012, the MQ-1 and MQ-9 platforms were approaching a combined 1.5 million combat hours flown over Afghanistan and Iraq, and by June 2014, the Air Force had reached the higher goal, set by Secretary of Defense Robert M. Gates in 2009, of 65 CAPs for its RPAs. Still, the Air Force said it was barely fulfilling 66 percent of the “insatiable demand” for ISR.

THE BRIEF, TRIUMPHANT CAREER OF LIBERTY

While the unmanned renaissance was ramping up, the manned ISR mission was by no means being neglected. In June 2009 at JB Balad, Iraq, the Air Force debuted a new platform, the MC-12W Liberty. It used a four-person crew to provide signals intelligence and live-streaming overhead video. The turboprop aircraft had been developed as a special project under an accelerated acquisition program, and the service initially acquired 37 specifically to strengthen ISR in Afghanistan and Iraq.

The MC-12 was a great success. Even Chief of Staff Gen. David L. Goldfein gained experience flying the MC-12W. The fleet was normalized in 2011 and bedded down at Beale AFB, Calif. The Liberty continued to perform heavy-duty service overseas. By September 2012, the 4th Expeditionary Reconnaissance Squadron at Bagram Airfield, Afghanistan, had flown 100,000 hours in its MC-12s in less than three years of operation. The pace was also quickening, as half those hours had been flown within the previous 12 months. “That’s about 11-and-a-half years’ worth of flying for the MC-12s in two years and nine months,” Lt. Col. Jeffrey Alexander, 4th ERS commander, said at the time.

Just one year later, in October 2013, the entire USAF fleet of MC-12Ws reached 300,000 combat flight hours. Col. Phillip A. Stewart, then Beale’s 9th Reconnaissance Wing commander, used a familiar catch phrase, noting “an insatiable demand” for this aircraft. At that moment, however, it was already clear that the Air Force would have to consider cutting the MC-12W because of budget constraints. Those fears were realized in 2015, when the 9th RW flew its final MC-12W mission.

The Air Force sold most of its 41-strong fleet to the Army and civilian contract operators. Air Force Special Operations Command asked Congress for authorization to retain 33



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/1/ An MC-12W is refueled by a forward area refueling point team at Hurlburt Field, Fla. The Liberty platform provided immediate intelligence and live video during this 2016 special operations exercise. /2/ A pair of MQ-1 Predators at JB Balad, Iraq, in 2009. The remotely piloted aircraft performed armed ISR missions throughout Southwest Asia. /3/ A maintainer attaches “pogos” to the wings of a U-2 after the spyplane returned to Beale AFB, Calif., from a sortie. /4/ An RC-135W reconnaissance aircraft from the 55th Wing, Offutt AFB, Neb., on a training mission in 2000. Rivet Joints have been in service since 1973. /5/ An airman completes a preflight inspection on an E-3 Sentry engine before a sortie for Operation Inherent Resolve in Southwest Asia.



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MC-12Ws to replace its U-28 mission, but AFSOC was only authorized to keep 13. Currently, Will Rogers ANGB, Okla., home of the recently transitioned 137th Special Operations Wing, has received 11 of the 13.

THE FUTURE IS UNMANNED (AND MANNED)

The unmanned revolution has definitively reshaped the way the Air Force carries out the ISR mission, and the future of that mission is poised to bring more of the same. In 2019, the service plans to retire the venerable U-2 Dragon Lady high-altitude ISR aircraft. As a replacement, Northrop Grumman is outfitting the RQ-4 Global Hawk with new capabilities to take over the U-2's mission set. In February 2016, Northrop Grumman successfully demonstrated the RQ-4's Universal Payload Adaptor. It enables the RQ-4 to fly with an advanced Senior Year Electro-Optical Reconnaissance System-2 sensor. In October that year, the company announced that Global Hawk had flown with the U-2's Optical Bar Camera, and in February 2017 Northrop Grumman said it had demonstrated the RQ-4's use of the MS-177 high-altitude multispectral sensor.

Even within the manned ISR enterprise, the Air Force has spoken of the need to make use of machines to process collected data more quickly and accurately. ISR chief James, who in 2013 acknowledged the Afghanistan-based airborne-ISR revolution, also said then that new ISR assets were enabling data collection at such high volumes that "machines and artificial intelligence tools have to help the Air Force get control of all this information."

But the Air Force's manned ISR fleet remains crucial to its mission, and recapitalizing those systems is a service priority. The RC-135 Rivet Joint surpassed 25 years of continuous

service for US Central Command in September 2016 and is the most pressing need, Gen. Herbert J. "Hawk" Carlisle, then head of Air Combat Command, said that year.

The Air Force is already working to replace its fleet of 16 E-8C JSTARS—which reached one million flying hours in September 2016—with 17 new aircraft. With Northrop Grumman, Boeing, and Lockheed Martin competing, a contract is expected sometime in 2018.

Meanwhile, the E-3 AWACS aircraft have been undergoing upgrades that are likely to keep them operational into the 2030s. Clearly, manned ISR missions will continue to play a significant role even as unmanned capabilities extend their dominance—at the very least in terms of numbers—in this area.

The larger shift at play, however, is the remarkable way the Air Force—whether manned or unmanned—has become an ISR force. Beyond the rising share of service aircraft devoted to ISR missions, this transformation can be gauged by listening to the way Air Force leaders talk about the new ISR capabilities of the bomber and fighter fleets.

In March, Gen. Robin Rand, chief of Air Force Global Strike Command, said he is now telling his bomber pilots, "Frankly, the least important thing you might do is drop a bomb. The most important thing you might do is provide a critical piece of ISR that's going to save someone's life." Similarly, Lt. Gen. Darryl L. Roberson, chief of Air Education and Training Command, has said the F-35 is "more like an AWACS than an individual fighter."

When you have the bosses of the bomber fleet and of pilot training praising the ISR capabilities of the deadliest aircraft in the Air Force, it's safe to say the ISR revolution has arrived. 🚀



/1/ An airman from the 62nd Expeditionary Reconnaissance Squadron conducts a postflight inspection on an MQ-9 Reaper at Kandahar Airfield, Afghanistan, in 2015. /2/ E-8C JSTARS aircrew perform preflight checks before a 2016 training mission at Robins AFB, Ga. The E-8C fleet reached one million flying hours that year. /3/ A1C Jeremy Cole, a 379th Expeditionary Aircraft Maintenance Squadron crew chief, guides a JSTARS at Al Udeid AB, Qatar. /4/ A 163rd Reconnaissance Wing MQ-1 Predator is inspected in 2012 at Southern California Logistics Airport—formerly George Air Force Base—in Victorville, Calif.



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