The Military's Airborne Target Tracker Is Getting an Upgrade

It's been a long time coming for JSTARS

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Flight engineer Tech. Sgt. Bo Sullivan, a crew member with the 7th Expeditionary Air Combat and Control Squadron, prepares to take off on a JSTARS mission over Iraq. (USAF/Staff Sgt. Aaron Allmon)

After 30 years, the U.S. Air Force's eyes behind enemy lines, called JSTARS or Joint Stars (Joint Surveillance Target Attack Radar System), is finally getting an upgrade. Contracts are expected to be awarded this year for industry to update the system with new technology and a replacement aircraft. It's been a long wait for JSTARS, which uses airborne radar to monitor targets on the ground—particularly moving vehicles—and relay the data to allied forces below.

The program got its start during the Cold War, at a time when the U.S. military worried about being caught off guard by a surprise Soviet advance. The Army and Air Force lacked a reliable way to monitor Soviet tanks deep behind enemy lines, and looked to radar technology for a solution. Several concepts were considered, including mounting radar sensors onto Black Hawk helicopters or a stealth platform like Tacit Blue. The Air Force even explored the option of putting a ground-controlled radar antenna in an airplane's weapons bay to create detailed

maps of the battlefield. By the early 1980's, Congress and the Pentagon decided to merge the Army and Air Force efforts into the JSTARS program.

In 1985, the Boeing 707-300 (E-8C) was chosen as the platform for JSTARS, based on durability and cabin size. At the time, JSTARS required a crew of at least 21 people, all of whom needed access to onboard terminals to monitor the sensors.

The most prominent sensor is a 24-foot antenna in a canoe-shaped fairing under the airplane, which is capable of gathering data over an area of 19,305 square miles. Despite its unique capabilities, the system was installed on only 17 airplanes, in part because of competing budget priorities, and in part because the Cold War came to an end just as it came online.

JSTARS got a chance to prove itself during the first Gulf War, when the military used two prototypes to keep on eye on ground movements. During 49 missions the system proved crucial for finding targets such as Iraqi missile sites and military convoys. In one of its most famous missions, JSTARS detected a column of 200 Iraqi vehicles headed straight at the unwitting U.S. Army Third Infantry Division. The Iraqi column was completely destroyed before it caused any major damage. Military commanders were impressed, and by 1996 the system was in full production. The last aircraft rolled off the line in 2003.

JSTARS has seen service in the deserts and mountains of Iraq and Afghanistan, as the airplane of choice for tracking moving targets on the ground. By 2014 the system had 100,000 flying hours. But the radar technology is getting old, and the E-8C (modified Boeing 707-300) platform is increasingly expensive to maintain.

When the Air Force showed interest in moving JSTARS to a smaller airplane, several companies came forward with bids, including Lockheed Martin in partnership with Raytheon and Bombardier (proposing a Bombardier Global Express business jet), General Dynamics and Gulfstream (a Gulfstream 550), and Northrop Grumman and Boeing (a modified 737).

The Pentagon decided not to go ahead with the upgrade last September, then reversed itself in December by announcing that JSTARS "recapitalization," as it's known to defense budgeteers, was back on track. The Air Force recently delayed the contract award yet again, for as long as six months, but still says it hopes to field the new system in the mid-2020s.