

Spy Plane Eyes Get Improved Resolution with New TWT Amps

By Joe Hajduk, CEO, dB Control, Fremont CA

Unmanned Aerial Vehicles (UAVs) — remotely piloted or self-piloted aircraft that can carry cameras, sensors, communications equipment or other payloads — have been used for reconnaissance and intelligence gathering since the 1950s. Today, more than 20 manufacturers offer at least 40 different UAV products for tactical and strategic reconnaissance, target drones and uninhabited combat aerial vehicles.

General Atomics Aeronautical Systems I-GNAT Unmanned Aerial Vehicle (UAV) with Lynx Synthetic-Aperture Radar (SAR) system. The surveillance aircraft now has new higher-resolution SAR imaging system, may see service over Afghanistan.



In our heightened military climate, long-range UAVs are in extremely high-demand for reconnaissance and surveillance because they can loiter for 24 hours or more at altitudes of over 65,000 feet and deliver high-quality synthetic-aperture-radar (SAR) images in real time to surface platforms.

While SAR images with resolutions of 6 to 12-inches (0.15 to 0.3 meters) are commonplace, producing finer images has been difficult due to the instability and unreliability of the transmitters supplying RF power to the SAR system. Just in time, advances in TWT (traveling wave tube) amplifier technology have allowed manufacturers such as dB Control, Fremont, CA, to produce a phase-stable Ku-band SAR transmitter that enables SAR/GMTI (Ground Moving Target Indicator) systems to produce images with resolutions as fine as four inches (0.1 meter).

One recent application for the company's new Ku-band transmitter is in the Lynx™ SAR/GMTI advanced sensor for airborne applications, developed jointly by General Atomics, Inc. (GA), La Jolla, CA, and Sandia National Laboratories, Albuquerque, NM. Once installed into UAVs such as the General Atomics Aeronautical Systems, Inc. Predator® or I-GNAT™, the Lynx SAR/GMTI can produce four-inch resolution images of scenes which are 25 kilometers away (about 16 miles) in total darkness, even through clouds and

light rain.



New high-resolution SAR radar image has resolution of 4 inches, taken from an altitude of 65,000 feet.

The military utility of the Predator and I-GNAT UAVs as a force multiplier in combat areas was proven in the Balkans and Southwest Asia and will undoubtedly continue to be essential in coming months for surveillance, reconnaissance, battle damage assessment and signal intelligence in Afghanistan.

In addition to SAR applications, transmitters and TWT amplifiers are used for pulse Doppler radar, electronic counter measure (ECM) transmitters and electronic warfare (EW) threat simulation. Other common applications include measuring antenna patterns, radar cross sections and radio frequency interference (RFI) susceptibility, as well as testing electro-magnetic compatibility (EMC) and RF components.

In all applications, TWT amplifiers and transmitters that consistently and reliably deliver high amplitude, phase stability and spectral purity enable electronics manufacturers to push the envelope for capabilities of their systems and equipment. "Without a doubt, the high quality of the RF power provided by dB Control's Ku-band transmitter enables us to produce fine-resolution SAR/GMTI images," said Jon Lathrop, Lynx SAR Program Manager for General Atomics.

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