

Microwave Solutions Guard Against Mounting Threats

From systems that perform surveillance, reconnaissance, and detection to the communications that deliver their findings, microwave technologies are being applied on the front lines of the battle against terrorism.

[Nancy Friedrich](#) | ED Online ID #21358 | [June 2009](#)

Terrorism continues to plague the US, as evidenced by the recent arrest of four men who planned to bomb synagogues in New York City. From a law-enforcement perspective, the problem with such threats is the varied forms that they take. The plan that was just foiled, while harmful and frightening, was localized. Yet the events of September 11, 2001 clearly were not. Those working in counter-terrorism must imagine every possible attack scenario and figure out how to prevent it. For help, both local and federal agencies have turned increasingly to technology. Microwave, millimeterwave, and terahertz electronic systems are performing an increasing amount of weapon, explosive, and chemical detection as well as surveillance. Microwave systems then enable this crucial information to be transmitted back so that diverse agencies can efficiently react.

Surveillance and reconnaissance are two of the main goals of unmanned aerial vehicles (UAVs), which have become a hotbed of development for defense applications. When rescue helicopters and aircraft are grounded due to heavy fog or smoke from wild fires, for example, remote-controlled, Global Positioning System (GPS) UAV Air Drones can be called in to continue search and rescue missions. Hailing from AirStar, part of the [Mundus Group, Inc.](#), the Air Drone boasts ducted fan technology and self-stabilizing counter-rotating propellers in a completely enclosed shell. As a result, it can safely operate near pedestrian bystanders, trees, buildings, bridges, traffic, and other infrastructure. With the Optics and Surveillance packages from sister company [Air Intel Systems](#), police can observe, automatically monitor, and track moving vehicles while sending pinpoint-accuracy GPS coordinates and real-time, high-definition video images to enforcement agencies.

According to Joe Hajduk, CEO of [dB Control](#), "Within the Department of Homeland Security, the Customs and Border Protection Agency is charged with securing our nation's borders, including detecting and preventing the entry of terrorists, weapons of mass destruction, and unauthorized aliens into the country. In its July 15, 2008 report to Congress, the DHS noted that it considers UAVs to be 'force multipliers' that allow the Border Patrol to '...deploy fewer agents in a specific area while maintaining the ability to detect and counter intrusions.' As such, UAVs are increasingly becoming integral to day-to-day operations. For instance, the Predator B monitors the US' southwest and northern borders from 65,000 feet above."

The traveling-wave-tube (TWT) amplifiers from dB Control are well suited for UAV applications ([Fig. 1](#)). Hajduk notes, "dB Control's TWT amplifiers are onboard several UAV platforms including General Atomics

Aeronautical Systems' Predator A & B and Northrop Grumman's Global Hawk and Fire Scout. At any given second, there are more than 25 Predators in the air equipped with Lynx SAR/GMTI radar systems powered by dB Control's TWT amplifiers. It's the reliability of our amplifiers that enables the UAVs' radar systems to transmit near-real-time, fullmotion images of objects on the ground with resolutions as fine as 4 inches. Amazingly, these images can be captured from 16 miles above, in total darkness, through clouds and rain."

1. Thanks to the reliability of these TWT amplifiers, UAV radar systems can transmit near-real-time, full-motion images of objects on the ground with resolutions as fine as 4 in.

