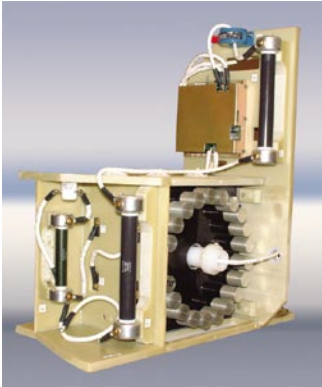




PowerMod Technology Breakthrough Brings High Availability to High Power Electronics

## **PowerMod™** Radar Modernization



This solid-state cathode modulator assembly replaced the entire mod-anode modulator and crowbar circuit for the AN/SPQ-9A radar.

DTI's solid-state, high voltage switches work as high-power cathode modulators for klystrons, CFAs or magnetrons, and as low-power modulators for tubes that use modulating anodes, grids, or control electrodes. PowerMod switches are perfect for retrofits, test sets and new designs. DTI's high-efficiency modulators are inherently pulse-width agile, and can open in less than a microsecond, often eliminating the need for a conventional crowbar.

### **New Transmitter Designs**

DTI designs and manufactures complete transmitter systems, from prime power to the RF output waveguide, to meet the most demanding military and commercial requirements. Recent installations of solid state, X-band and S-band transmitter systems supporting the U.S. Air Force Cobra Judy precision data collection radar on board the USNS Observation Island included switching power supplies, series opening switches, modulators, and controls driving TWTs and phased-array radar. Similar transmitter systems, including power supplies, RF modulators, and controls have been delivered for other state of the art, high power W-band radars.

### **Transmitter Retrofits**

A transmitter upgrade using modern, solid state technology, may be the most cost-effective answer to problems of high failure rates and lengthy repair procedures common to transmitters using vacuum switch tubes. A retrofit may encompass a few components or a complete subsystem. In most cases, the modernization is accomplished within the existing structural envelope, whether a typical shipboard cabinet or a transportable shelter. DTI can provide the upgrades as fully MIL-Qualified, field-installable kits ready for installation into ship-mounted cabinets, or in new enclosures.



Cobra Judy S-band transmitter power supplies.



DTI designed, manufactured and installed upgrade kits for the U.S. Navy's AN/SPQ-9A Surface Surveillance and Tracking Radar. The high resolution, X-band TWT narrow beam system detects sea skimming missiles at the horizon while simultaneously providing detection and tracking of surface targets and beacon responses.

Another kit for the Naval Surface Warfare Center's incorporates DTI's solid-state switch module and switching power supply as an upgrade for the AN/SPG-60 transmitter. The compact 13 kV, 20 A klystron pulsed-modulator delivers up to 35 kHz PRF at .8 – 8  $\mu$ s pulse widths. The upgraded radars have gained tens of thousands of hours of reliability.

The AN/FPQ-17 Multiple Target Instrumentation Radar (MIR) at the Naval Air Warfare Center, was upgraded with a new power supply and a protective opening-switch. The new switching power supply provides adjustable output voltages up to – 51 kV at 750 mA, and maintains pulse-to-pulse voltage regulation of  $\pm 5$  volts. The solid-state opening switch safely disconnects the TWT's cathode connection upon sensing a fault condition.

DTI has successfully modernized many other radar systems with reliable solid-state electronics.



AN/SPG-60 radar transmitter enclosure with DTI modulator retrofitted in lower compartment.



AN/FPQ-17 MIR switching power supply and opening switch.

