

## Tube of the Month

# THYRATRONS

The first triode tubes were made to be sensitive detectors. They had a low vacuum and were gassy. The best sensitivity was achieved when the operating parameters were set just before the tube went into conduction due to the gas. With the gas ions adding to the electron flow, the tube became a switch. In the future, this switching action was used for many applications and these tubes were called thyratrons. They were made as triodes, tetrodes and pentodes and used several gasses such as hydrogen, mercury, argon and neon.

Thyratrons are very fast, high current switches. They are used in electronic speed controllers for power machinery as they will operate with small control voltages. A simple DC power supply will work with a thyatron as a rectifier when the grid is positive and it can be turned off with a negative voltage. No need for heavy switches or relays. The famous proximity fuse used a miniature thyatron to fire its explosive.

RADAR is a common use for high current and voltage thyratrons. The grid voltage can be controlled by a timer to produce the required pulse duration. When the thyatron fires, a capacitor that is hooked to a pulse transformer discharges. The surge in the transformer secondary causes a pulse of voltage to a magnetron over the required time interval required to "see" its target. A tube such as the 5949 that was used in the AN/MPQ-21 RADAR, could handle 25,000 volts at 500 amps. These tubes are made much larger.

Modern thyratrons, like this CX2708, are being made with ceramic insulation.

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