

Broadband anti-TR gas switch for pulsed microwave circuits, decoupling the transmitter from a common transmit/receive antenna during non-transmitting intervals.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 MicrowaveTRSwitch

No fixed ratings recorded.

Representative electrical section; promoted values mapped from published ratings and characteristics where applicable.

1837 — Gas Switching Anti-TR Tube

The **1837** (also designated as the **GL-1B37**) is a specialized gas switching anti-transmit-receive (anti-TR) tube designed for use in pulsed microwave circuits. Its primary function is to decouple the transmitter from a common transmitting and receiving antenna during non-transmitting periods, thereby protecting sensitive receiver components and directing signal flow efficiently.

Microwave and Operational Band Characteristics

The 1837 operates within a defined microwave frequency band, specifically optimized for X-band applications:

- **Operational Band:** 8500 to 9000 megacycles (at a voltage standing wave ratio of 5 minimum).
- **Center Frequency:** 8750 megacycles.

In microwave systems, the tube acts as a gas-discharge switch. During the high-power transmit pulse, the gas within the tube ionizes, presenting a low-impedance path (an arc) that prevents the transmitter's high-power signal from reaching and damaging the receiver. During non-transmitting periods, the gas deionizes, allowing weak received signals to pass from the antenna to the receiver with minimal attenuation.

Electrical and RF Performance

The electrical behavior of the 1837 is characterized by its impedance matching, power handling, and loss characteristics under both low-level and high-level RF conditions:

- **Loaded Q (Maximum):** 6.5. This relatively low loaded Q indicates a moderately broadband response, consistent with its 500-megacycle operational bandwidth.
- **Center Frequency Normalized Conductance (Maximum):** 0.1.
- **Center Frequency Normalized Susceptance:** ± 0.06 .
- **High-Level Voltage Standing Wave Ratio (Maximum):** 1.10, ensuring excellent impedance matching during high-power transmission to minimize reflected power back to the transmitter.
- **Arc Power Loss (Maximum):** 0.8 decibels. This parameter is characterized under specific test conditions: a peak power of 4 kilowatts, a pulse repetition rate of 1000 pulses per second (pps), a pulse width of 1 microsecond, and an operating frequency of 8500 megacycles.

Power Ratings and Operating Limits

The 1837 is designed to handle substantial peak power levels typical of pulsed radar and microwave transmitter systems. The tube's operation is bounded by minimum and maximum transmitter peak power limits:

- **Minimum Transmitter Peak Power:** 5 kilowatts. This is the minimum power required to reliably initiate and sustain the gas discharge (arc) for proper switching action.
- **Maximum Transmitter Peak Power (Absolute Rating):** 250 kilowatts. Exceeding this limit can cause permanent damage to the tube's internal structure or window seals.

Mechanical and Environmental Specifications

The physical construction of the 1837 is designed for integration into waveguide assemblies or specialized microwave plumbing.

- **Mounting Position:** Any. The tube can be oriented in any direction within the system layout without affecting its electrical or gas-discharge characteristics.
- **Ambient Temperature Range (Nonoperating):** -40 to +100 °C. This wide storage and nonoperating temperature range ensures reliability in harsh environmental conditions before system activation.
- **Net Weight:** Approximately 1/8 pound.
- **Physical Dimensions:**

- **Flange Width:** 1.300" $\pm$ 0.003"
- **Body Width:** 1.000" $\pm$ 0.010"
- **Body Height:** 1.299" $\pm$ 0.003"
- **Total Height:** 1-13/16" maximum

The precise tolerances on the flange and body dimensions are critical for maintaining a proper RF seal and preventing microwave leakage at the waveguide junction.

Technical Summary

The **1837** (GL-1B37) is a gas switching anti-TR tube engineered for pulsed microwave systems operating in the **8500 to 9000 megacycles** band, with a center frequency of **8750 megacycles**. It serves as an automatic RF switch to decouple transmitters from shared antennas during idle periods. The tube features a maximum loaded Q of **6.5**, a maximum high-level VSWR of **1.10**, and a maximum arc loss of **0.8 dB** under pulsed conditions. It supports transmitter peak powers ranging from a minimum of **5 kilowatts** (required for ionization) up to an absolute maximum rating of **250 kilowatts**. Mechanically, the device is lightweight (1/8 pound), supports any mounting position, and is housed in a compact flanged structure designed for precise waveguide integration.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 General Electric Transmitting Types

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1950 GENERAL ELECTRIC TRANSMITTING TYPES

Section 1 · Microwave TR Switch

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Center frequency	8750 MHz	Published datasheet value
Operational band minimum	8500 MHz	Published datasheet value
Operational band maximum	9000 MHz	Published datasheet value
Loaded Q maximum	6.5	Published datasheet value

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transmitter peak power maximum	250 kW	Published datasheet value

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes,
and their source documents.

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker