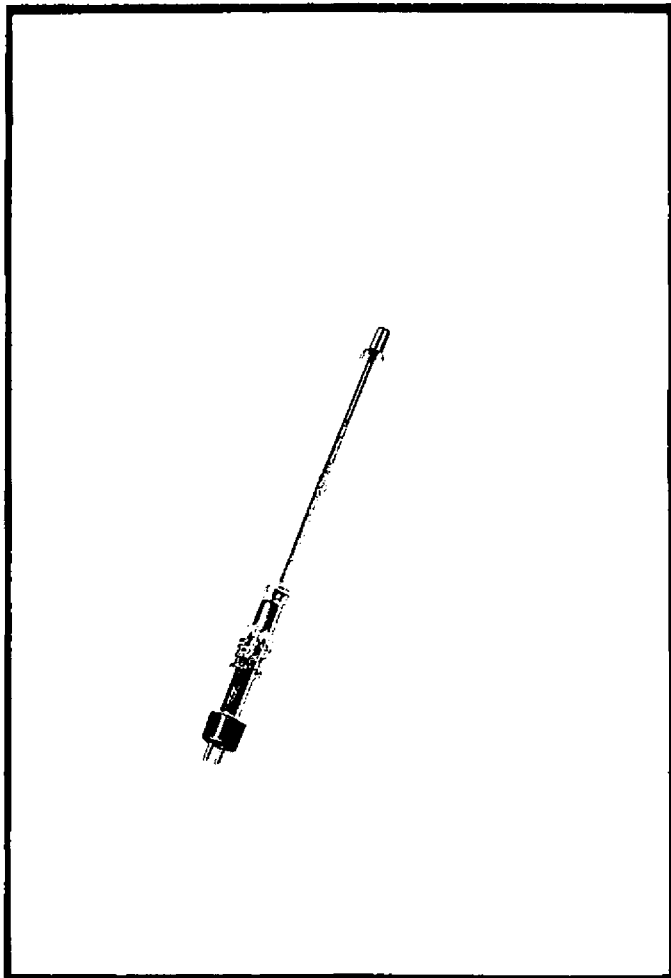


GAS NOISE SOURCE, NEON, PULSE



DESCRIPTION

This tube is designed for use as a noise source in microwave measurements. It is constructed for use with the RG 52/u waveguide to provide noise in the 8.20 - 12.40 kMc waveband. When used in a terminated 15° E-plane mount assembly, such as Hewlett Packard HC02 347A or equivalent, it functions as a broadband noise generator. It is a cold cathode type noise source designed primarily for pulse operation but may be used for continuous service with somewhat reduced life.

OPERATING CHARACTERISTICS

The use of pure inert gas eliminates the dependence of noise output on the operating temperature. The noise source is available for measurement instantaneously with little change due to ambient temperature variations. The performance of the tube is non-critical with respect to variations in the discharge current over a wide range.

The operating voltage standing wave ratio (VSWR) over the recommended transmission bandwidth of the guide is typically 1.07 with a maximum of 1.15. The excess noise ratio, $10 \log \left(\frac{T_{eff}}{290} - 1 \right)$, is $17.60 \pm .3db$.

The circuit of Figure 1 is a basic starting and operating circuit. The pentode or beam tube acts as a switch interrupting the current flow in L_1 when the cut-off bias switch is closed. The resultant voltage spike developed is impressed across the noise tube. The current is limited by R_3 to rated value. Capacitor C_1 flattens the pulse peak and assists in initiating the noise tube discharge. C_1 must not be large enough to lower the voltage spike below the firing voltage of the noise tube and must be of high voltage rating. Current through the beam tube is adjusted by R_4 to provide rated choke current. If the application requires only infrequent starting, the hard tube may be replaced by a mercury switch.

For most normal pulse applications, this basic circuit can be modified to drive the grid of the switch tube with pulses, thus pulsing the noise output. For high repetition rates or for control of pulse shape, a circuit, similar to that shown in Figure 2, which insures extinguishing of the noise tube current, is necessary.

RATINGS

Anode Current, pulse	150 mA max.
Anode Current, Avg	150 mA max.
Starting Current (Ckt Fig. 1)	170 mA
Tube Dissipation	28 watts
Tube Voltage Drop	185 Vdc (note)
Ambient Temp. Range	-55° C to +85° C

Note: If the anode current during the "on time" of a square pulse (of greater than 100 microsec duration) is nominally the same as the rated D.C. anode current, the tube during this period will be approximately the same as the rated D.C. tube drop.

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