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TRAVELING-WAVE TUBE

LOW-NOISE AMPLIFIER TYPE

*Useful over frequency range of 2700 to 3500 Mc***GENERAL DATA****Electrical:**

Heater, for Unipotential Cathode:

Voltage 5 ac or dc volts

Current at 5 volts. 0.65 amp

Starting current: The maximum instantaneous starting current must never exceed 4 amperes, even momentarily.

Minimum Cathode Heating Time 1 minute

Frequency Range 2700 to 3500 Mc

Cold Insertion Loss 80 db

Mechanical:

Mounting Position Any

Maximum Overall Length. 19-3/8"

Metal-Shell Diameter. 1.375" $\pm$ 0.005"

Weight (Approx.). 1-1/2 lbs

Collector-Terminal Connector. Birnbach No.406 Banana Jack

RF Connectors:

Input terminal. Type N UG-18/U Plug

Output terminal Type N UG-18/U Plug

Base. Octal 8-Pin

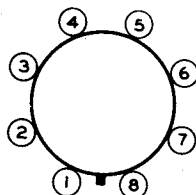
BOTTOM VIEW

Pin 1 - Grid No.1

Pin 2 - No Connection

Pin 3 - Helix

Pin 4 - Grid No.4



Pin 5 - Grid No.3

Pin 6 - Grid No.2

Pin 7 - Heater

Pin 8 - Heater, Cathode

Maximum and Minimum Ratings, Absolute Values:

DC COLLECTOR VOLTAGE. 500 max. volts

DC HELIX VOLTAGE. 500 max. volts

DC GRID-No.4 VOLTAGE. 500 max. volts

DC GRID-No.3 VOLTAGE. 300 max. volts

DC GRID-No.2 VOLTAGE. 75 max. volts

DC GRID-No.1 VOLTAGE. 20 max. volts

DC COLLECTOR CURRENT. 1000 max. μ ampDC HELIX CURRENT. 10 max. μ amp

MAGNETIC FIELD STRENGTH 400 min. gauss

PEAK RF POWER INPUT 250 max. watts

AVERAGE RF POWER INPUT. 1 max. watt

METAL-SHELL TEMPERATURE
(At hottest point). 175 max. $^{\circ}$ C

▲ During alignment of the tube in the magnetic-focusing field, the helix current may exceed this value for short periods, but should never exceed 50 μ amp.

● This value of field strength will focus the electron beam, but noise figure will not be optimum.



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Typical Operation at 3100 Mc:

DC Collector Voltage	400	volts
DC Helix Voltage	375	volts
DC Grid-No.4 Voltage	200	volts
DC Grid-No.3 Voltage	40	volts
DC Grid-No.2 Voltage (Approx.)	20	volts
DC Grid-No.1 Voltage	0	volts
DC Collector Current	150	μ amp
DC Helix Current	0.5	μ amp
DC Grid-No.4 Current	each less than 1 μ amp	
DC Grid-No.3 Current		
DC Grid-No.2 Current		
DC Grid-No.1 Current		
Magnetic Field Strength†	525 $\pm$ 5%	gausses
Gain (Low level)	25	db
Power Output (Saturated)	1.0	mw
Noise Figure	6.5	db

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.45	0.85	amp
Input VSWR (Non-operating)	2	—	1.7	
Output VSWR (Non-operating)	2	—	2.0	
DC Helix Voltage	3	350	390	volts
DC Grid-No.4 Voltage	3	160	250	volts
DC Grid-No.3 Voltage	3	30	50	volts
Saturated Power Output	3	0.25	—	mw
Gain	3	20	—	db
Noise Figure	3	—	7.0	db

Note 1: With heater voltage of 5.0 volts.

Note 2: Measured at specified connector over the frequency range of 2700 to 3500 Mc.

Note 3: Adjusted for optimum noise figure with a magnetic field of 525 gaussess, signal frequency of 3100 Mc, and heater voltage of 5 volts.

OPERATING CONSIDERATIONS

The *magnetic field* required for focusing the electron beam of the 6861 may be obtained from a solenoid or permanent magnet capable of providing a uniform field of 525 gaussess over the length of the tube axis starting 2 inches from the groove near the base end of the metal shell and continuing for at least 9 inches along the tube axis.

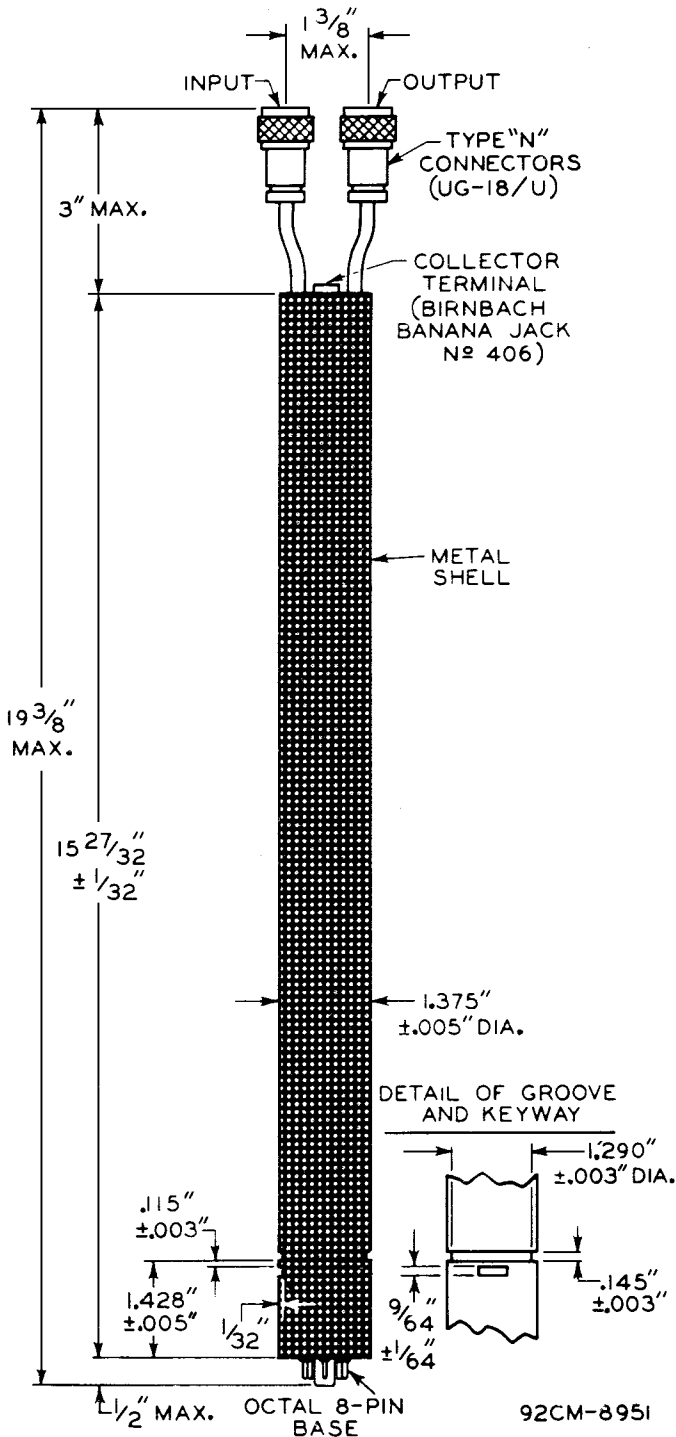
† For RCA Solenoid, Developmental No.J-2006.



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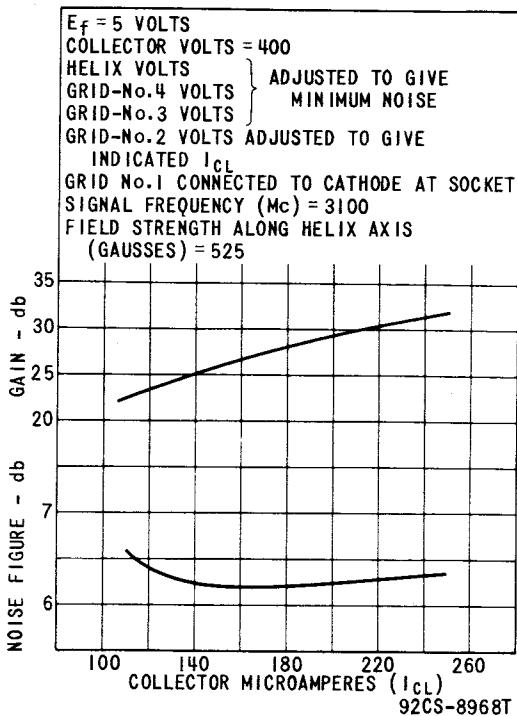
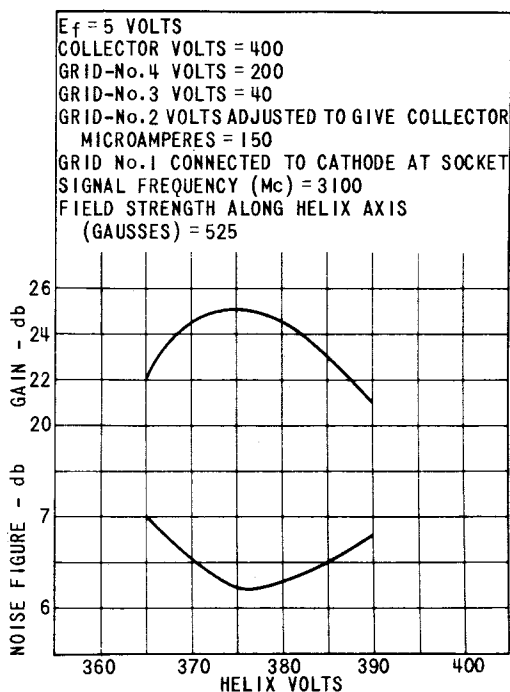
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NOISE-FIGURE CHARACTERISTICS

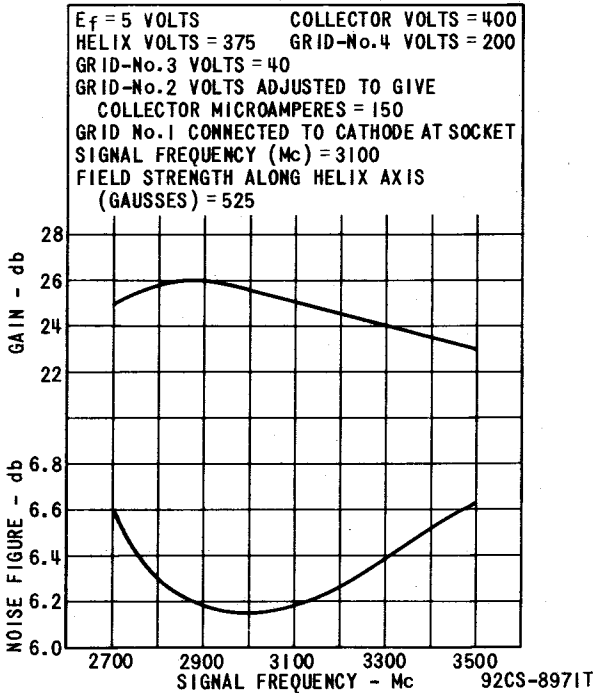




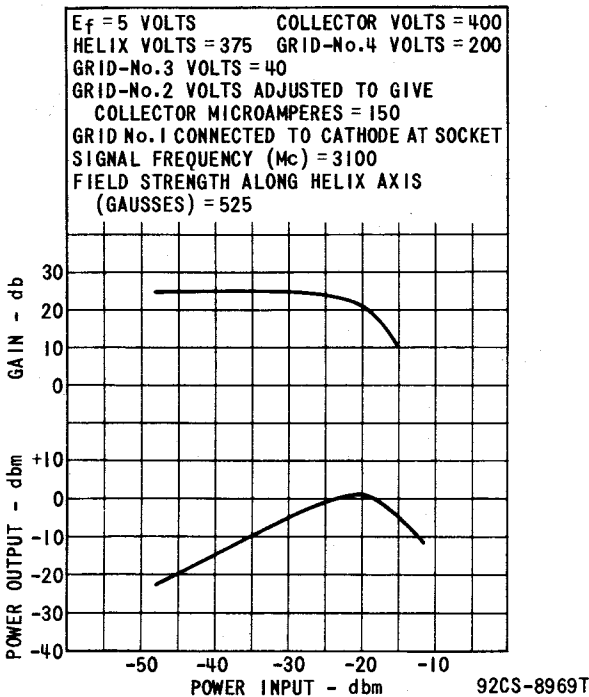
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TRAVELING-WAVE TUBE

NOISE - FIGURE
CHARACTERISTICS

SATURATION CHARACTERISTICS



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INPUT-MATCHING CHARACTERISTIC

