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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:

Operating Position. Any

Cooling Natural ←

Maximum Overall Length. 19-3/8"

Metal-Shell Diameter. 1.375" ± 0.005"

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

Collector-Terminal Connector. Birnbach No.403 Banana Jack ←

RF Connectors:

Input terminal. Type N UG-18B/U Plug ←

Output terminal Type N UG-18B/U Plug ←

Base. Octal 8-Pin

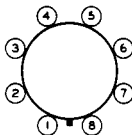
BOTTOM VIEW

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. 500 max. μa ←

DC HELIX CURRENT. 5 max. μa ←

MAGNETIC FIELD STRENGTH 400 min. gauss ←

PEAK RF POWER INPUT 100 max. watt ←

AVERAGE RF POWER INPUT. 0.4 max. watt ←

METAL-SHELL TEMPERATURE (At hottest point). 175 max. °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 25 μa. ←

●: See next page.

← Indicates a change.

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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 a
DC Helix Current	0.5	μ a
DC Grid-No.4 Current	}	each less than 1 μ a
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	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	
DC Helix Voltage	3	350	390	volts
→ DC Grid-No.4 Voltage	3	160	275	volts
→ DC Grid-No.3 Voltage	3	20	50	volts
Saturated Power Output	3	0.25	-	mw
Gain	3	20	-	db
Noise Figure	3	-	7	db

Note 1: With heater voltage of 5 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 gauss, 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 gauss 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.

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

† For RCA Solenoid Type MW-4900.

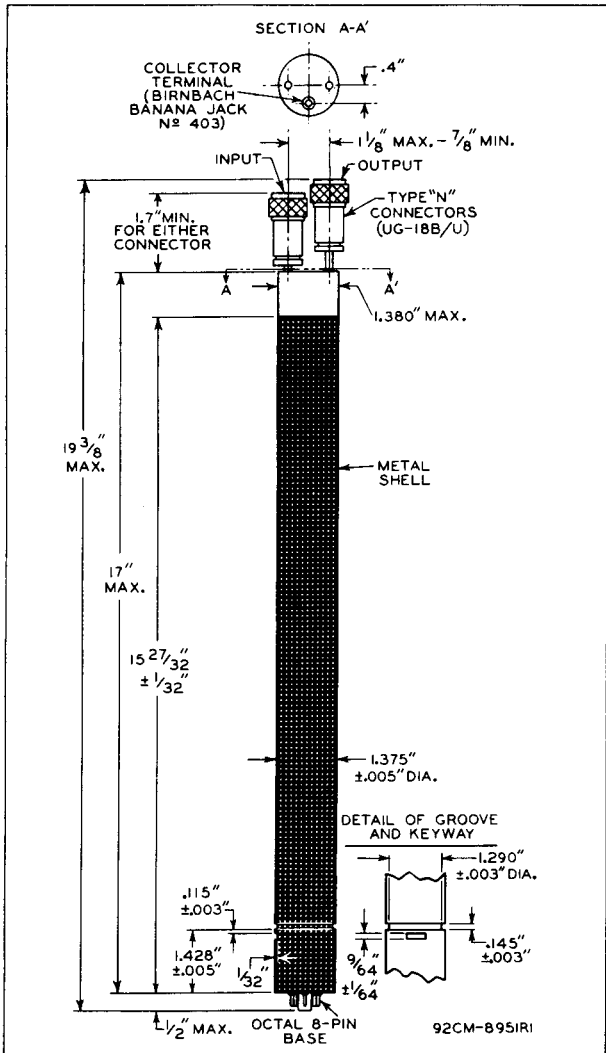
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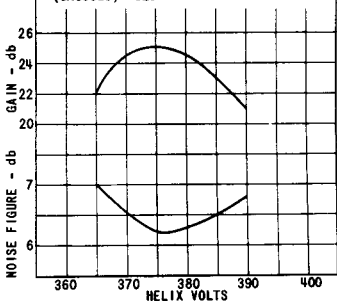




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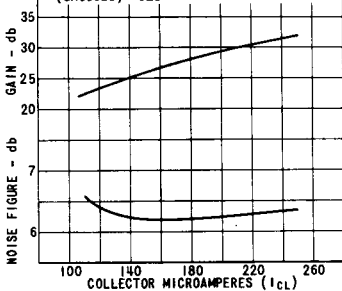
NOISE-FIGURE CHARACTERISTICS

$E_f = 5$ VOLTS
 COLLECTOR VOLTS = 400
 GRID-No.4 VOLTS = 200
 GRID-No.3 VOLTS = 40
 GRID-No.2 VOLTS ADJUSTED TO GIVE COLLECTOR
 MICROAMPERES = 150
 GRID No.1 CONNECTED TO CATHODE AT SOCKET
 SIGNAL FREQUENCY (Mc) = 3100
 FIELD STRENGTH ALONG HELIX AXIS
 (GAUSSES) = 525



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$E_f = 5$ VOLTS
 COLLECTOR VOLTS = 400
 HELIX VOLTS } ADJUSTED TO GIVE
 GRID-No.4 VOLTS } MINIMUM NOISE
 GRID-No.3 VOLTS }
 GRID-No.2 VOLTS ADJUSTED TO GIVE
 INDICATED I_{CL}
 GRID No.1 CONNECTED TO CATHODE AT SOCKET
 SIGNAL FREQUENCY (Mc) = 3100
 FIELD STRENGTH ALONG HELIX AXIS
 (GAUSSES) = 525



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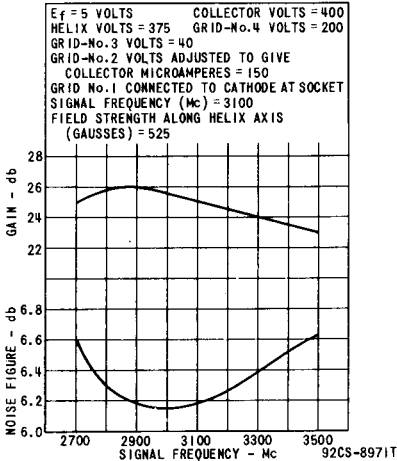


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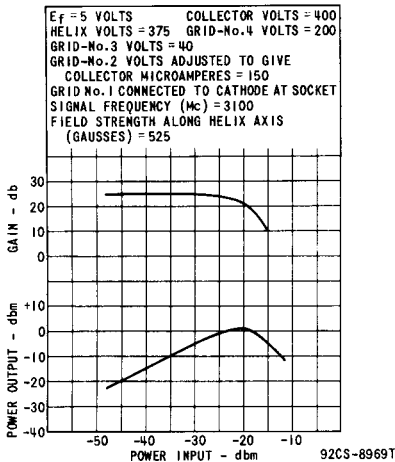
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NOISE - FIGURE CHARACTERISTICS



SATURATION CHARACTERISTICS

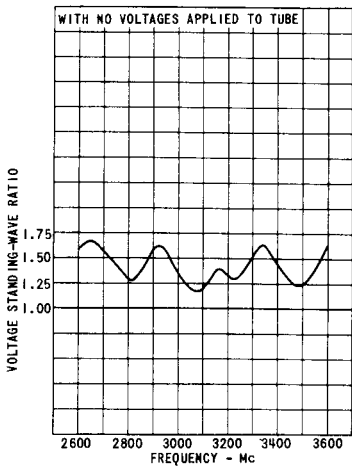


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INPUT-MATCHING CHARACTERISTIC



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