



6861

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TRAVELING-WAVE TUBE

LOW-NOISE AMPLIFIER TYPE

Useful over frequency range of 2700 to 3500 Mc

GENERAL DATA

Electrical:

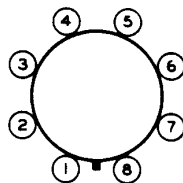
Heater, for Unipotential Cathode:
 Voltage 5 ac or dc volts
 Current at 5 volts. 0.65 amp
 Starting current: The maximum instantaneous starting current must never exceed 4 amperes, even momentarily.
 Minimum Cathode Heating Time. 1 minute
 Frequency Range 2700 to 3500 Mc
 Cold Insertion Loss 80 db

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.●	gausses	
PEAK RF POWER INPUT	100 max.	watts	←
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 gausses, 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 gausses 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.

→ Indicates a change.