

December 1, 1956

Triode Pentode Converter Types 5CG8, 6CG8 and 6CG8-A

The 5CG8, 6CG8 and 6CG8-A are 9-pin miniature medium-mu triode and sharp-cutoff pentode types designed for service as combined oscillator and mixer in television receiver tuners using an intermediate frequency of approximately 40 mc.

The 5CG8 and 6CG8-A have been designed for use in receivers which employ series connected heaters especially in television receivers where the picture-tube heater is in series with other heaters. When each is employed in this type of circuit with other tubes similarly designed having the same heater current rating, heater voltage surges across individual tubes are minimized inasmuch as heater warm-up characteristic is controlled.

GENERAL DATA

Electrical:

Cathode	Coated Unipotential		
Heater	5CG8	6CG8	6CG8-A
Voltage (ac or dc)	4.7	6.3	6.3
Current	0.60	0.45	0.45
Warm-up Time	11	..	11
			Seconds

Direct Interelectrode Capacitances

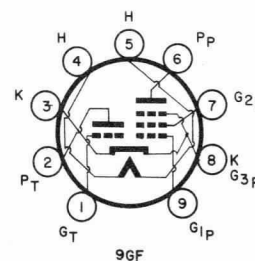
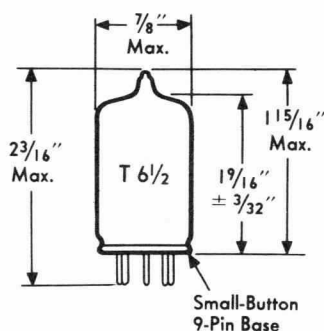
	Unshielded	Shielded #	
Triode Unit			
Grid to plate	1.5	1.5	$\mu\mu\text{f}$
Input	2.6	3.0	$\mu\mu\text{f}$
Output	0.05	1.0	$\mu\mu\text{f}$
Pentode Unit			
Grid 1 to Plate	0.03 max.	0.016 max.	$\mu\mu\text{f}$
Input	4.8	5.0	$\mu\mu\text{f}$
Output	0.9	1.6	$\mu\mu\text{f}$
Heater to Cathode	5.5	5.5	$\mu\mu\text{f}$
Pentode Grid 1 to Triode			
Plate	0.05 max.	0.04 max.	$\mu\mu\text{f}$
Pentode Plate to Triode Plate			
Plate	0.05 max.	0.007 max.	$\mu\mu\text{f}$

Mechanical:

Bulb	T-6-1/2
Base	Miniature 9-pin (JETEC E9-1)
Basing	9GF
Outline	6-2
Mounting	Any

CHARACTERISTICS

	Triode Unit	Pentode Unit	
Plate Voltage	100	250	Volts
Grid 2 Voltage	..	150	Volts
Cathode Bias Resistor	100	200	Ohms
Amplification Factor	40	..	
Plate Resistance (Approx.)	6900	750000	Ohms
Transconductance	5800	4600	μmhos
Grid 1 Bias (Approx.) for			
I_b of 10 μamp	-10	-10	Volts
Plate Current	8.5	7.7	Ma.
Grid 2 Current	..	1.6	Ma.



Receiving Tube Section

CONVERTER SERVICE

Maximum Ratings

Design Center Values

	Triode Unit as Osc.	Pentode Unit as Mixer	
Plate Voltage	250 max.	250 max.	Volts
Grid 3 (Suppressor) Voltage ..	..	0 max.	Volts
Grid 2 (Screen) Voltage	..	See Grid 2 Input Rating Curve	
Grid 2 Supply Voltage	..	250 max.	Volts
Grid 1 (Control Grid) Voltage			
Negative Bias Value	40 max.	40 max.	Volts
Positive Bias Value	0 max.	0 max.	Volts
Plate Dissipation	1.5 max.	2.0 max.	Watts
Grid 2 Input	..	0.5 max.	Watt
Grid 1 Input	0.5 max.	..	Watt
Heater Cathode Voltage			
Heater Positive with Respect to Cathode			
D-C Component	100 max.		Volts
Total D-C and Peak	200 max.		Volts
Heater Negative with Respect to Cathode			
Total D-C and Peak	200 max.		Volts

Maximum Circuit Values

Grid 1 Circuit Resistance	
Fixed-Bias Operation	0.1 max. Megohm
Cathode-Bias Operation	0.5 max. Megohm

Typical Operation

	Triode Unit as 250 Mc. Osc.†	Pentode Unit as Mixer††
Plate Voltage	150	150 Volts
Grid 2 Voltage	..	150 Volts
Mixer Grid 1 Supply Voltage ..	..	-3.5 Volts
Oscillator Voltage (rms) at		
Mixer Grid 1	..	2.6 Volts
Mixer Grid 1 Circuit Resistance ..	..	120000 Ohms
Oscillator Grid Resistor	2700	.. Ohms
Conversion Transconductance ..	..	2100 μ mhos
Plate Current	13	6.2 Ma.
Grid 2 Current	..	1.8 Ma.
Grid 1 Current	3.6	.. Ma.
Grid 1 Current	..	2.0 μ amp
Oscillator Power Output (Approx.)	0.5	.. Watt

- Heater Warm-up Time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times rated heater voltage divided by rated heater current.

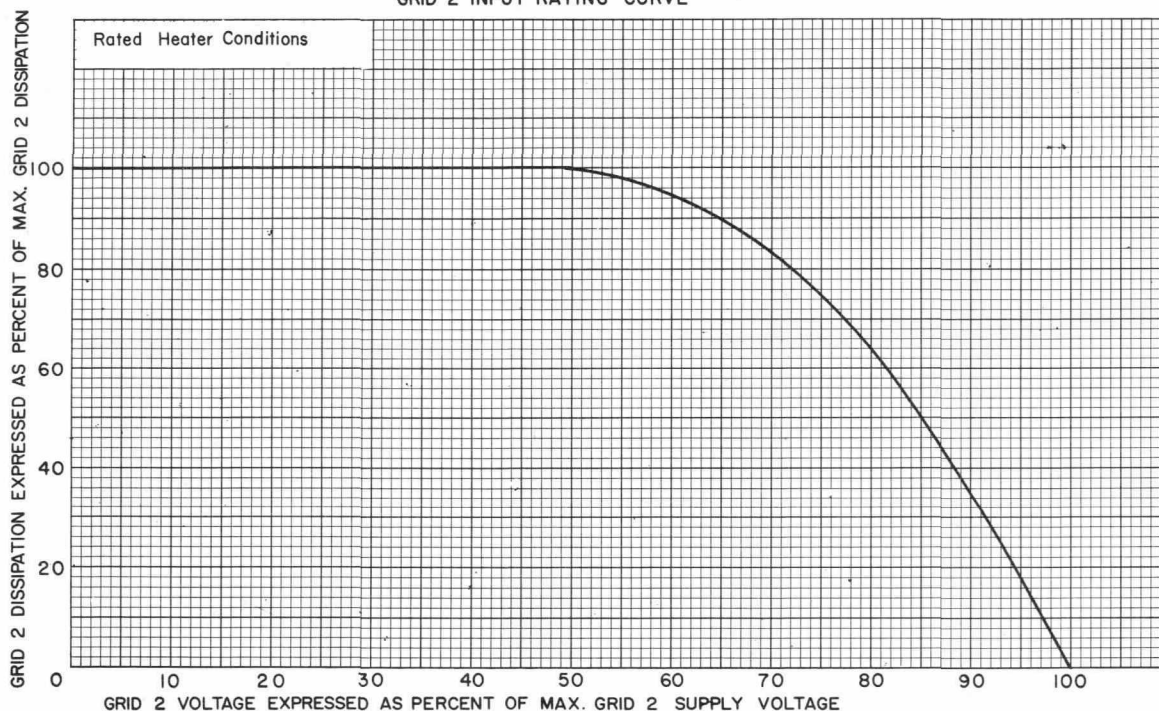
With JETEC shield #315 connected to Cathode.

□ With JETEC shield #315 connected to ground.

† In television or FM receivers it is generally desirable to operate the oscillator with less power input than shown in order to avoid over-excitation and excessive oscillation radiation.

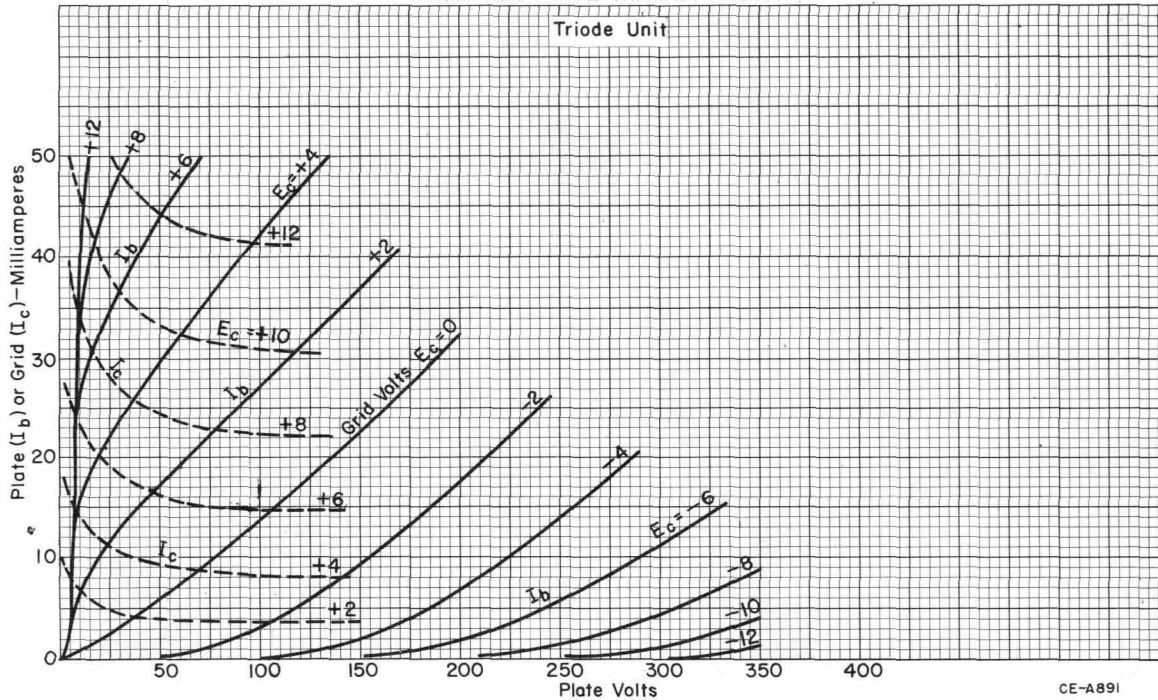
†† With separate excitation and triode unit grounded.

GRID 2 INPUT RATING CURVE

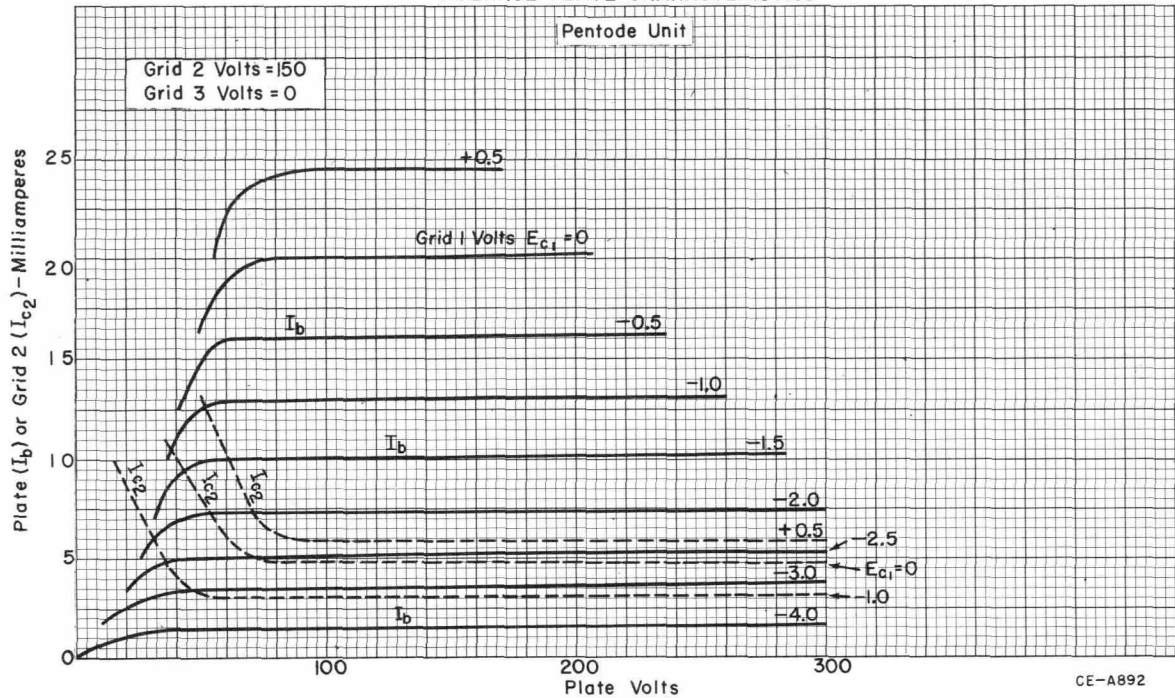


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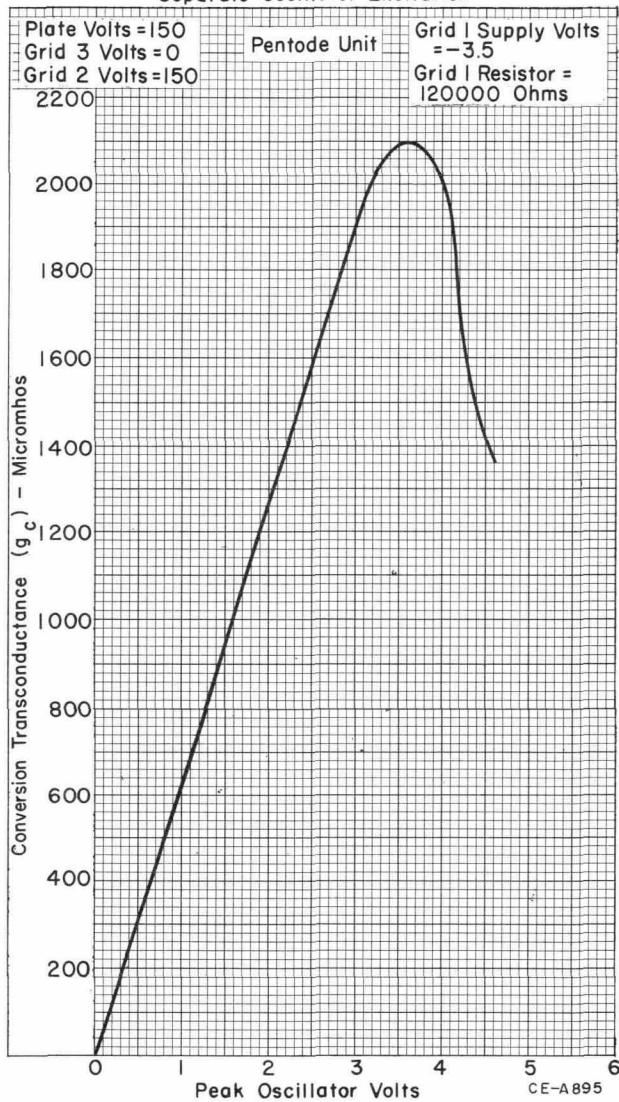
AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS



OPERATION CHARACTERISTIC
Separate Oscillator Excitation



OPERATION CHARACTERISTICS -
Separate Oscillator Excitation

