

November 5, 1954

Triode Pentode Converter Type 6X8

The 6X8 is a 9-pin miniature medium-mu triode and sharp-cutoff pentode designed for service as a combined oscillator and mixer in television receivers using an intermediate frequency of approximately 40 mc. The mixer portion of the 6X8 is similar to a 6AG5, and the oscillator section of the 6X8 is similar to one unit of the 6J6.

GENERAL DATA

Electrical:

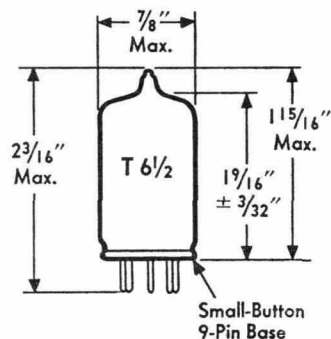
Cathode Coated Unipotential
Filament
Voltage 6.3 ac or dc Volts
Current 0.45 Ampere

Direct Interelectrode Capacitances:

	Unshielded	External Shield #315 Connected to Cathode	
Triode Unit			
Grid to Plate	1.4	1.4	$\mu\mu\text{f}$
Input	2.0	2.6	$\mu\mu\text{f}$
Output	0.5	1.0	$\mu\mu\text{f}$
Pentode Unit			
Grid 1 to Plate	0.09 max.	0.06 max.	$\mu\mu\text{f}$
Input	4.3	4.5	$\mu\mu\text{f}$
Output	0.7	1.4	$\mu\mu\text{f}$
Pentode Grid 1 to			
Triode Plate	0.045 max.	0.035 max.	$\mu\mu\text{f}$
Pentode Plate to			
Triode Plate	0.040 max.	0.008 max.	$\mu\mu\text{f}$
Pentode Unit Connected as Triode*			
Grid 1 to Plate	1.4	1.3	$\mu\mu\text{f}$
Input	3.0	3.2	$\mu\mu\text{f}$
Output	1.6	2.0	$\mu\mu\text{f}$
Heater to Cathode	6.0	6.0	$\mu\mu\text{f}$

Mechanical:

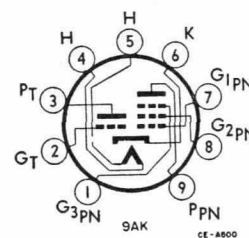
Bulb T-6½
Base Small-Button Noval 9-Pin (JETEC E9-1)
Basing 9AK
Mounting Position Any



CE-A554

CHARACTERISTICS

	Triode Unit	Pentode Unit
Plate Voltage	100	250 Volts
Grid 3 (Suppressor)	—	Connected to cathode at socket
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.
Pentode Unit Connected as Triode		
Plate Voltage	—	150 Volts
Grid 3	—	Connected to cathode at socket
Grid 2	—	Connected to plate
Cathode-Bias Resistor	—	250 Ohms
Amplification Factor	—	42
Plate Resistance (Approx.)	—	7900 Ohms
Transconductance	—	4000 μmhos
Grid 1 Bias (Approx.) for $I_b = 10 \mu\text{amp}$	—	-10 Volts
Plate Current	—	7.8 Ma.



BOTTOM VIEW

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 CE-A864	
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	—	0.4 max.	Watt
Grid 1 Input	0.5 max.	—	Watt
Peak Heater-Cathode Voltage:			
Heater Positive or Negative			
with Respect to Cathode	100 max.	100 max.	Volts
Pentode Unit as Triode-Connected Mixer*			
Plate Voltage		250 max.	Volts
Grid 1 (Control-Grid) Voltage			
Negative Bias Value		40 max.	Volts
Positive Bias Value		0 max.	Volts
Plate Dissipation		2.4 max.	Watts
Peak Heater-Cathode Voltage:			
Heater Positive or Negative with			
Respect to Cathode		100 max.	Volts

Typical Operation

	Triode Unit as 250 Mc. Osc.†	Pentode Unit as Mixer††	
Plate Voltage	150	150	Volts
Grid 3 (Suppressor)	—	Connected to cathode at socket	
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	μmhos
Plate Current	13	6.2	Ma.
Grid 2 Current	—	1.8	Ma.
Grid 1 Current	3.6	—	Ma.
Grid 1 Current	—	2.0	μamp
Oscillator Power Output			
(Approx.)	0.5	—	Watt
Pentode Unit as Triode-Connected Mixer*			
Plate Voltage		150	Volts
Grid 1 Supply Voltage		-3.5	Volts
Oscillator Voltage (rms) at Grid 1		2.6	Volts
Grid 1 Circuit Resistance		120000	Ohms
Conversion Transconductance		2800	μmhos
Plate Current		7.8	Ma.
Grid 1 Current		2.0	μamp

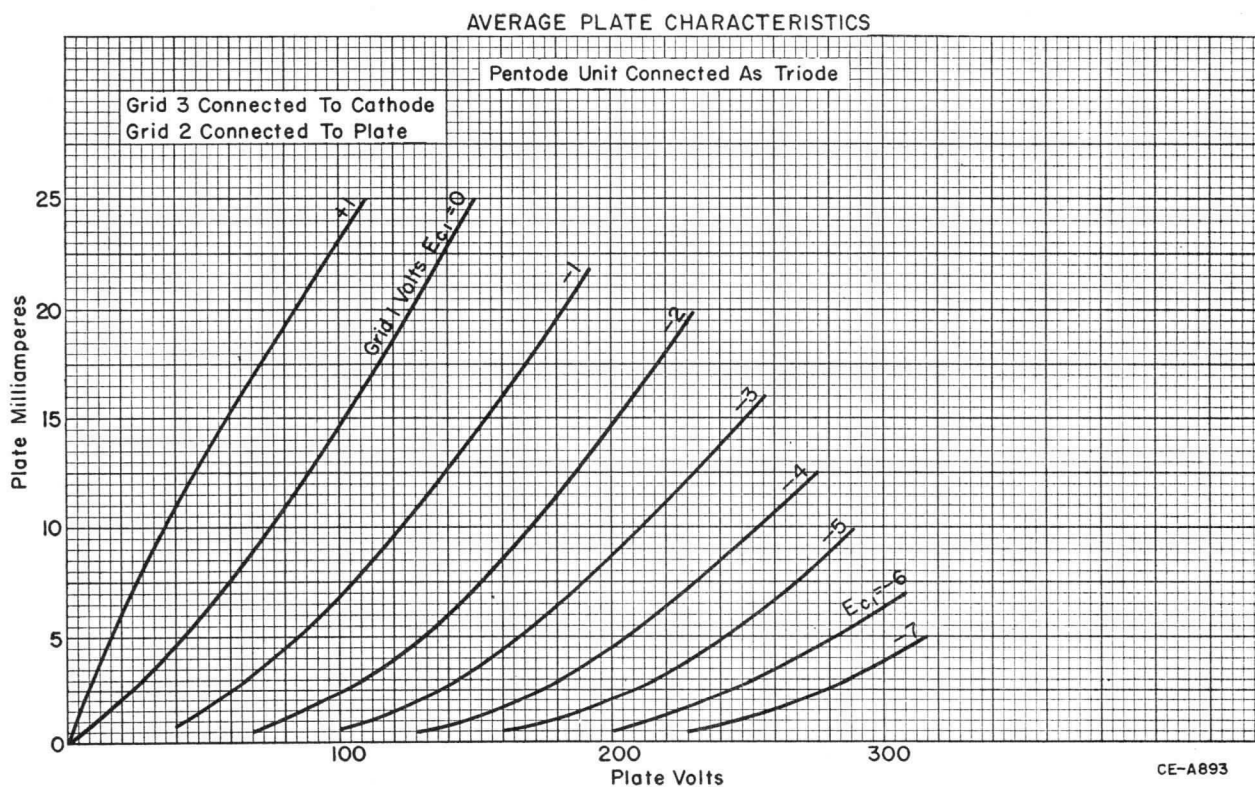
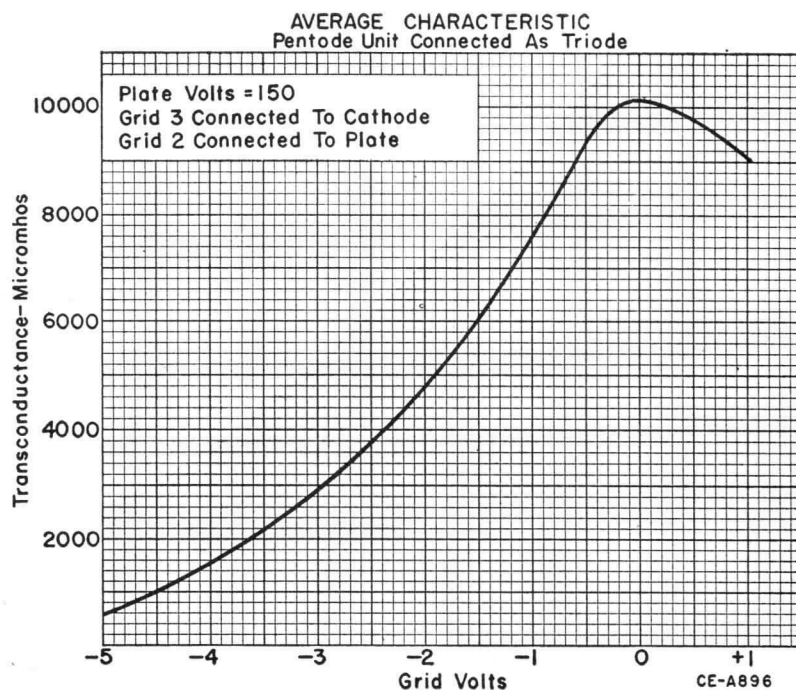
Maximum Circuit Values

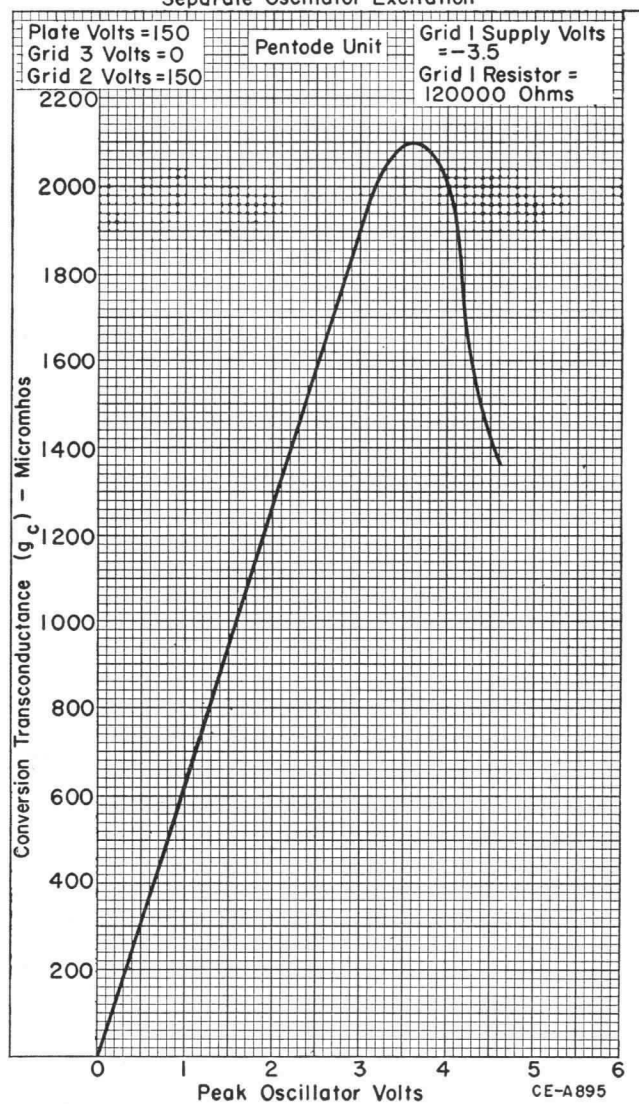
Grid 1 Circuit Resistance	
Fixed-Bias Operation	0.1 max. Megohm
Cathode-Bias Operation	0.5 max. Megohm

* Grid 2 connected to plate, grid 3 connected to cathode.

† 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.



OPERATION CHARACTERISTIC
Separate Oscillator ExcitationOPERATION CHARACTERISTICS -
Separate Oscillator Excitation