

### DESCRIPTION AND RATING

The 6CG7 is a miniature medium-mu twin triode suitable for use in a wide variety of general-purpose applications. It is particularly useful as a vertical-deflection oscillator and horizontal-deflection oscillator in television receivers. Like the 6SN7-GTB to which it is electrically equivalent, the tube may also be used as a resistance-coupled amplifier, phase inverter, or multivibrator.

Except for heater ratings, the 8CG7 is identical to the 6CG7. Both tubes exhibit a controlled heater-warm-up characteristic which makes them especially suited for use in television receivers that employ series-connected heaters.

#### GENERAL

##### ELECTRICAL

Cathode—Coated Unipotential	<b>6CG7</b>	<b>8CG7</b>
Heater Voltage, AC or DC	6.3	8.4 Volts
Heater Current	0.6	0.45 Amperes
Heater Warm-up Time*	11	11 Seconds

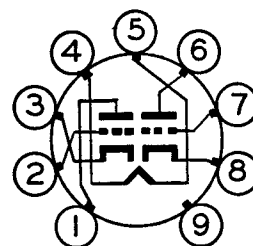
##### Direct Interelectrode Capacitances, approximate†

Grid to Plate, Each Section	4.0 $\mu\mu\text{f}$
Input, Each Section	2.3 $\mu\mu\text{f}$
Output, Each Section	2.2 $\mu\mu\text{f}$

##### MECHANICAL

Mounting Position—Any  
Envelope—T-6½, Glass  
Base—E9-1, Small Button 9-Pin

#### BASING DIAGRAM

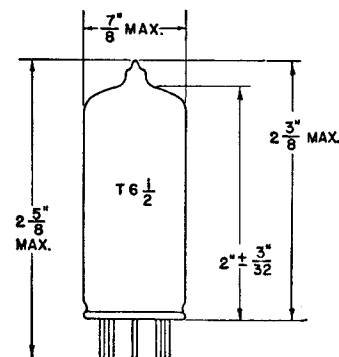


RETMA 9AJ

#### TERMINAL CONNECTIONS

- Pin 1—Plate (Section 2)
- Pin 2—Grid (Section 2)
- Pin 3—Cathode (Section 2)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Cathode (Section 1)
- Pin 9—Internal Shield

#### PHYSICAL DIMENSIONS



RETMA 6-3

## MAXIMUM RATINGS

### DESIGN-CENTER VALUES, EACH SECTION

	<b>Class A<sub>1</sub> Amplifier</b>		
DC Plate Voltage . . . . .	300		Volts
Positive DC Grid Voltage . . . . .	0		Volts
Plate Dissipation, Each Plate . . . . .	3.5		Watts
Total Plate Dissipation, Both Plates . . . . .	5.0		Watts
DC Cathode Current . . . . .	20		Milliamperes
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component . . . . .	100		Volts
Total DC and Peak . . . . .	200		Volts
Heater Negative with Respect to Cathode			
Total DC and Peak . . . . .	200		Volts
Grid Circuit Resistance			
With Fixed Bias . . . . .	1.0		Megohms
	<b>Vertical- Oscillator Service‡</b>	<b>Horizontal- Oscillator Service‡</b>	
DC Plate Voltage . . . . .	300	300	Volts
Peak Negative Grid Voltage . . . . .	400	600	Volts
Plate Dissipation, Each Plate . . . . .	3.5	3.5	Watts
Total Plate Dissipation, Both Plates . . . . .	5.0	5.0	Watts
DC Cathode Current . . . . .	20	20	Milliamperes
Peak Cathode Current . . . . .	70	300	Milliamperes
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component . . . . .	100	100	Volts
Total DC and Peak . . . . .	200	200	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak . . . . .	200	200	Volts
Grid Circuit Resistance			
With Fixed Bias . . . . .	2.2	2.2	Megohms
With Cathode Bias . . . . .	2.2	2.2	Megohms

## CHARACTERISTICS AND TYPICAL OPERATION

### CLASS A<sub>1</sub> AMPLIFIER, EACH SECTION

Plate Voltage .....	90	250	250 Volts
Grid Voltage .....	0	-12.5	-8.0 Volts
Amplification Factor .....	20	.....	20
Plate Resistance, approximate .....	6700	.....	7700 Ohms
Transconductance .....	3000	.....	2600 Micromhos
Plate Current .....	10	1.3	9.0 Milliamperes
Grid Voltage, approximate			
I <sub>b</sub> = 10 Microamperes .....	-7	.....	-18 Volts

\* The time required for the voltage across the heater to reach 80 percent 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 the rated heater voltage divided by the rated heater current.

† Without external shield.

‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

## CLASS A RESISTANCE-COUPLED AMPLIFIER

EACH SECTION

LOW IMPEDANCE DRIVE (APPROXIMATELY 200 OHMS)											
R <sub>L</sub>	R <sub>gf</sub>	E <sub>bb</sub> = 90 Volts			E <sub>bb</sub> = 180 Volts			E <sub>bb</sub> = 300 Volts			
		R <sub>k</sub>	E <sub>o</sub>	Gain	R <sub>k</sub>	E <sub>o</sub>	Gain	R <sub>k</sub>	E <sub>o</sub>	Gain	
0.10	0.10	2600	11	14	2100	28	15	2000	49	16	
0.10	0.24	3200	15	16	2700	36	16	2600	65	17	
0.24	0.24	6200	12	15	5000	27	16	4700	53	17	
0.24	0.51	7400	16	16	6300	37	16	6000	66	17	
0.51	0.51	14000	13	15	12000	30	16	11000	54	16	
0.51	1.0	17000	16	15	15000	36	16	13000	56	16	

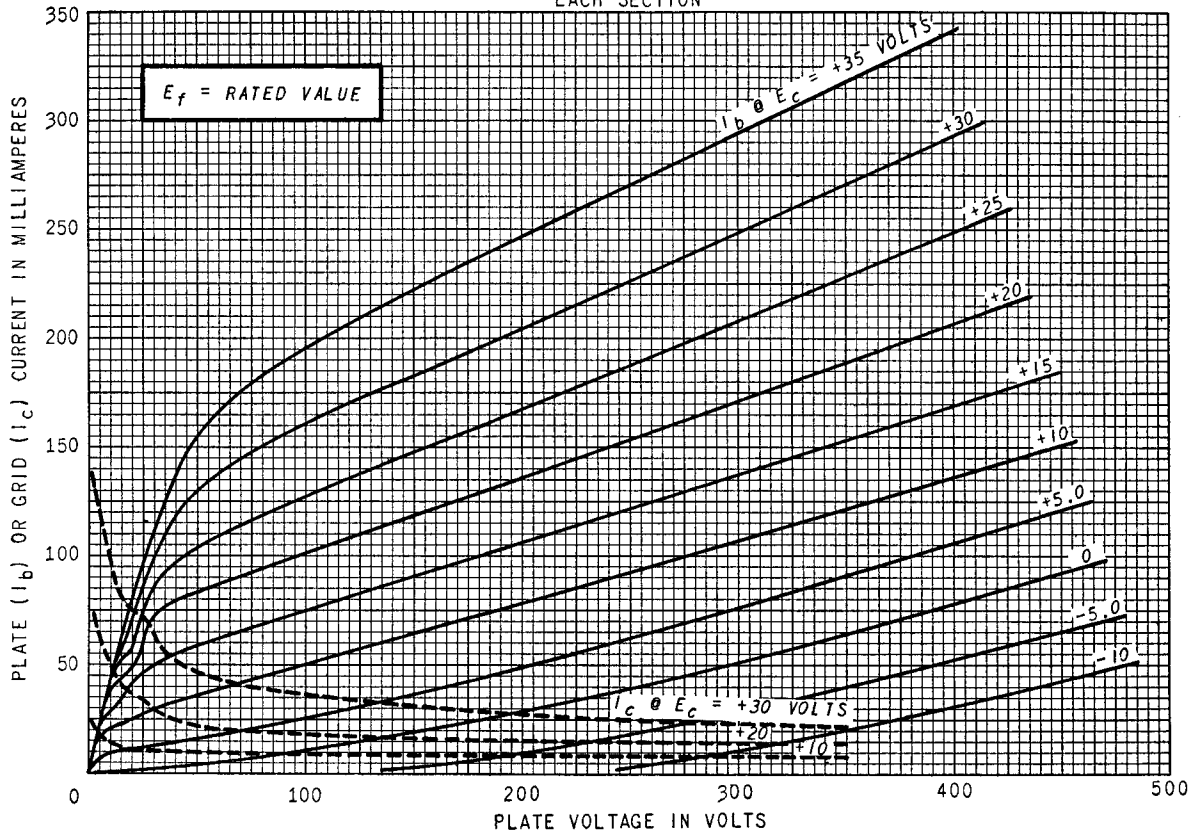
HIGH IMPEDANCE DRIVE (APPROXIMATELY 100K OHMS)											
R <sub>L</sub>	R <sub>gf</sub>	E <sub>bb</sub> = 90 Volts			E <sub>bb</sub> = 180 Volts			E <sub>bb</sub> = 300 Volts			
		R <sub>k</sub>	E <sub>o</sub>	Gain	R <sub>k</sub>	E <sub>o</sub>	Gain	R <sub>k</sub>	E <sub>o</sub>	Gain	
0.10	0.10	3400	13	14	2700	29	15	2500	51	15	
0.10	0.24	4300	17	15	3600	37	16	3400	67	16	
0.24	0.24	8100	15	14	6500	32	15	6100	57	16	
0.24	0.51	9900	18	15	8400	40	16	8000	71	16	
0.51	0.51	16000	15	14	13000	32	16	12000	59	16	
0.51	1.0	21000	19	15	18000	41	16	16000	73	16	

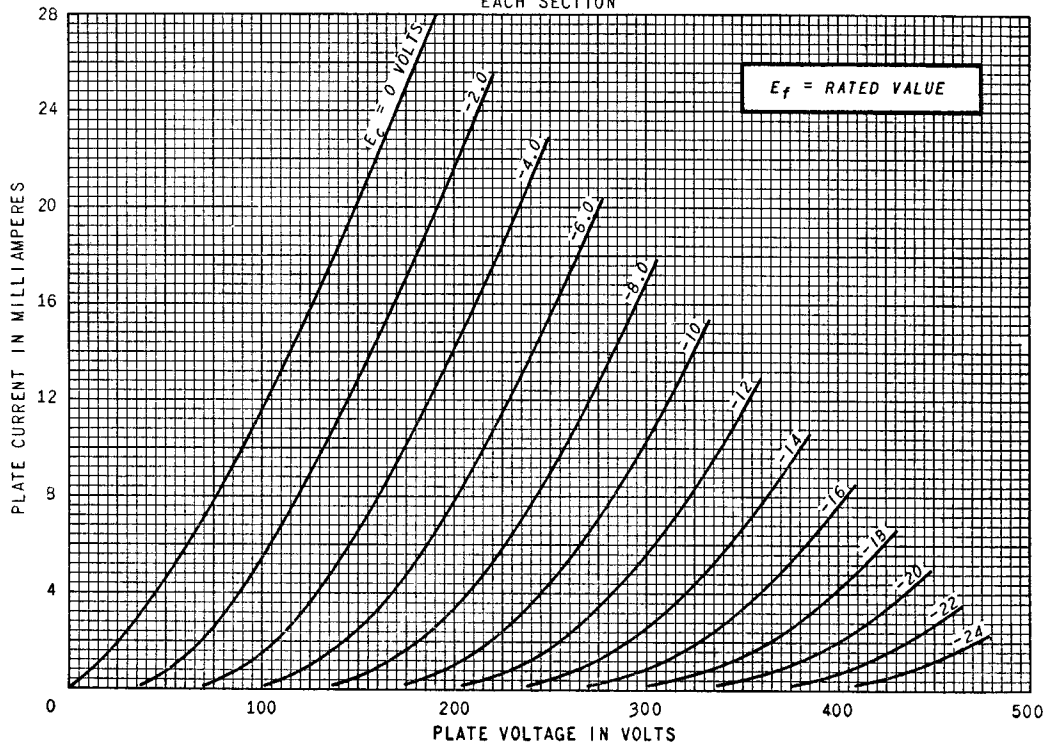
Notes:

1. E<sub>o</sub> is maximum RMS voltage output for approximately five percent total harmonic distortion.
2. Gain is measured for an output voltage of two volts RMS.
3. R<sub>k</sub> is in ohms; R<sub>L</sub> and R<sub>gf</sub> are in megohms.
4. Coupling capacitors (C) should be selected to give desired frequency response. R<sub>k</sub> should be adequately by-passed.

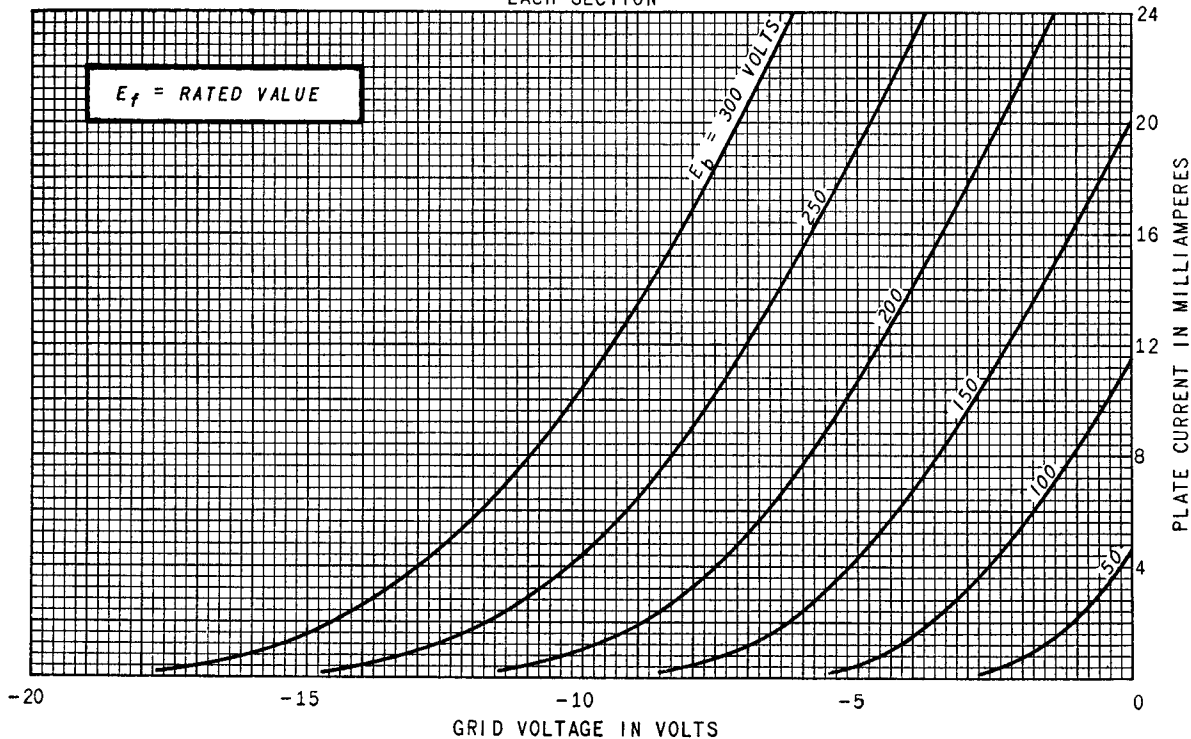
**AVERAGE PLATE CHARACTERISTICS**  
 EACH SECTION



**AVERAGE PLATE CHARACTERISTICS**  
 EACH SECTION



**AVERAGE TRANSFER CHARACTERISTICS**  
 EACH SECTION



**AVERAGE CHARACTERISTICS**  
 EACH SECTION

