

## DUPLEX-DIODE TRIODE

### DESCRIPTION AND RATING

The 6CN7 is a duplex-diode high-mu triode in which separate cathodes are provided for the diode and triode sections. The triode section of the 6CN7 is electrically identical to the triode section of the 6T8. The tube is primarily intended for service as a combined horizontal phase detector and reactance tube in television receivers. The triode section may also be used in a variety of other applications, such as in sync-separator, sync-amplifier, or audio-amplifier circuits.

Except for heater ratings, the 8CN7 is identical to the 6CN7. Both of the tubes incorporate a controlled heater-warm-up characteristic which makes them especially suited for use in television receivers that employ series-connected heaters.

#### GENERAL

##### ELECTRICAL

	6CN7		8CN7		
	Series	Parallel	Series	Parallel	
Cathode—Coated Unipotential					
Heater Voltage, AC or DC	6.3	3.15	8.4	4.2	Volts
Heater Current	0.3	0.6	0.225	0.45	Amperes
Heater Warm-up Time*		11		11	Seconds
Direct Interelectrode Capacitances†					
Triode Grid to Plate			1.8		$\mu\mu\text{f}$
Triode Input			1.5		$\mu\mu\text{f}$
Triode Output			0.5		$\mu\mu\text{f}$
Grid to Each Diode Plate			0.006		$\mu\mu\text{f}$
Diode-Number 1 Plate to Diode Cathode and Heater			3.6		$\mu\mu\text{f}$
Diode-Number 2 Plate to Diode Cathode and Heater			3.6		$\mu\mu\text{f}$

##### MECHANICAL

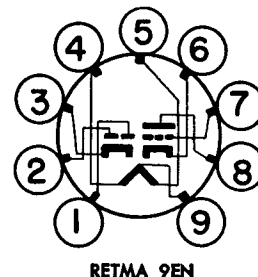
Mounting Position—Any  
Envelope—T-6½, Glass  
Base—E9-1, Small Button, 9-Pin

#### MAXIMUM RATINGS

##### DESIGN-CENTER VALUES

Plate Voltage	300 Volts
Positive DC Grid Voltage	0 Volts
Plate Dissipation	1.0 Watts
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
Diode Current for Continuous Operation, Each Diode	5.0 Milliamperes

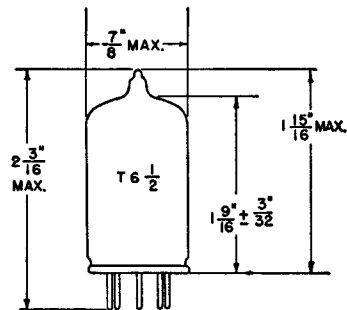
#### BASING DIAGRAM



#### TERMINAL CONNECTIONS

- Pin 1—Diode Number 2 Plate
- Pin 2—Diode Number 1 Plate
- Pin 3—Diode Cathode and Internal Shield
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Triode Cathode
- Pin 7—Triode Grid
- Pin 8—Triode Plate
- Pin 9—Heater Center-Tap

#### PHYSICAL DIMENSIONS



## CHARACTERISTICS AND TYPICAL OPERATIONS

### CLASS A<sub>1</sub> AMPLIFIER

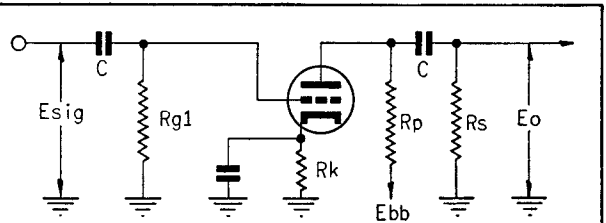
Plate Voltage.....	100	250 Volts
Grid Voltage.....	-1.0	-3.0 Volts
Amplification Factor.....	70	70
Plate Resistance, approximate.....	.54000	58000 Ohms
Transconductance.....	.1300	1200 Micromhos
Plate Current.....	0.8	1.0 Milliamperes
Average Diode Current, Each Diode		
with 5.0 Volts DC Applied.....		20 Milliamperes

\* 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.

### CLASS A RESISTANCE-COUPLED AMPLIFIER

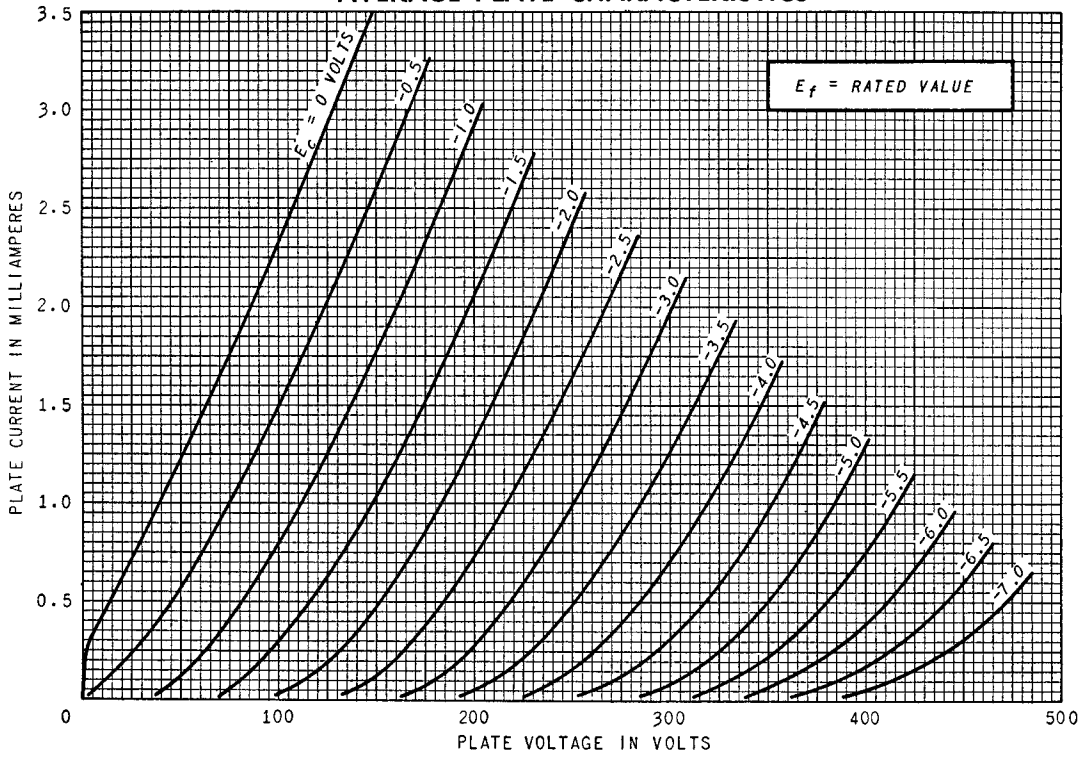
Rp Meg.	Rs Meg.	Rg1 Meg.	Ebb = 90 Volts			Ebb = 180 Volts			Ebb = 300 Volts		
			Rk	Gain	Eo	Rk	Gain	Eo	Rk	Gain	Eo
0.10	0.10	0.10	5700	21	7.0	2400	29	18	1800	33	35
0.10	0.24	0.10	6100	26	9.0	2700	34	23	2000	38	42
0.24	0.24	0.10	9100	30	10	4300	40	24	3000	44	43
0.24	0.51	0.10	10000	34	13	4700	45	31	3300	49	52
0.51	0.51	0.10	15000	37	14	7500	47	28	5600	51	50
0.51	1.0	0.10	16000	40	16	8200	50	35	6200	55	60
0.24	0.24	10	0	31	5.0	0	44	19	0	48	40
0.24	0.51	10	0	37	7.0	0	49	25	0	52	52
0.51	0.51	10	0	39	7.5	0	51	22	0	54	44
0.51	1.0	10	0	42	10	0	54	28	0	58	56



Note: Coupling capacitors (C) should be selected to give desired frequency response. Rk should be adequately by-passed.

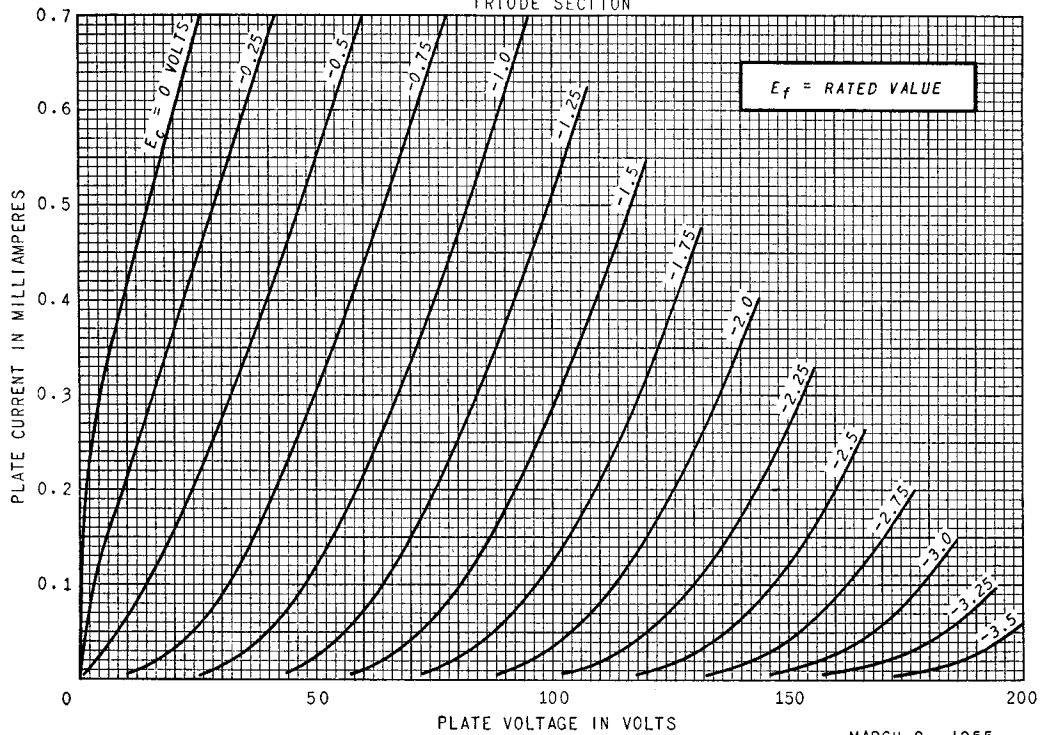
Notes: 1. Eo is maximum RMS voltage output for five percent (5%) total harmonic distortion. 2. Gain measured at 2.0 volts RMS output. 3. For zero-bias data, generator impedance is negligible.

**AVERAGE PLATE CHARACTERISTICS**

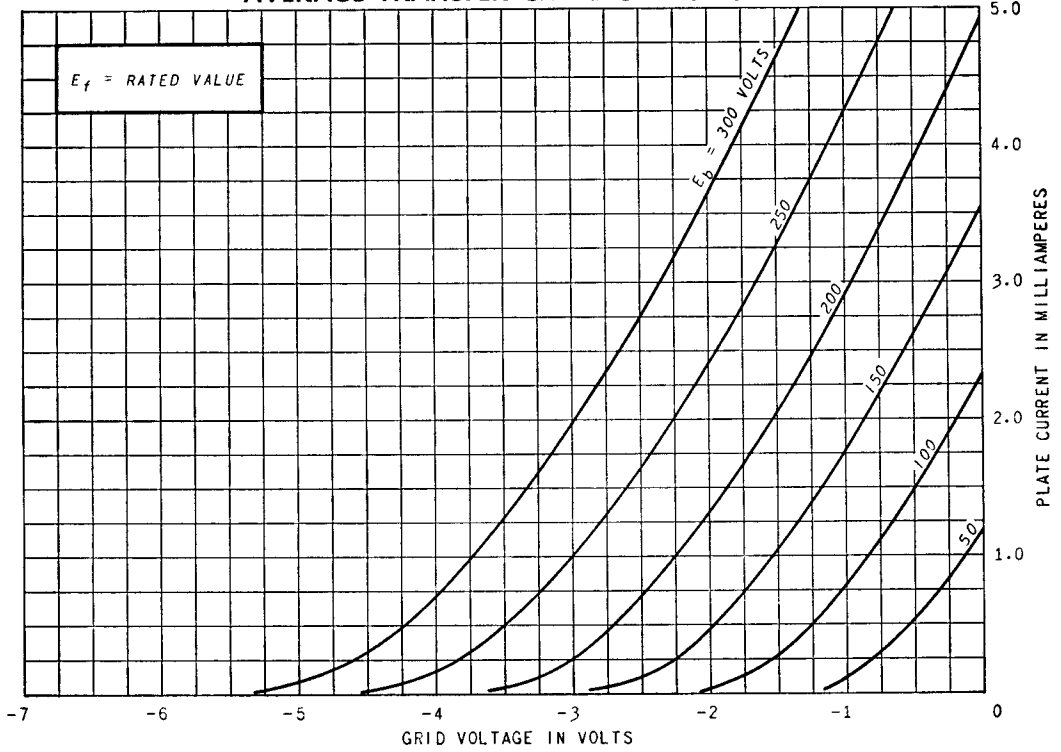


**AVERAGE PLATE CHARACTERISTICS**

TRIODE SECTION

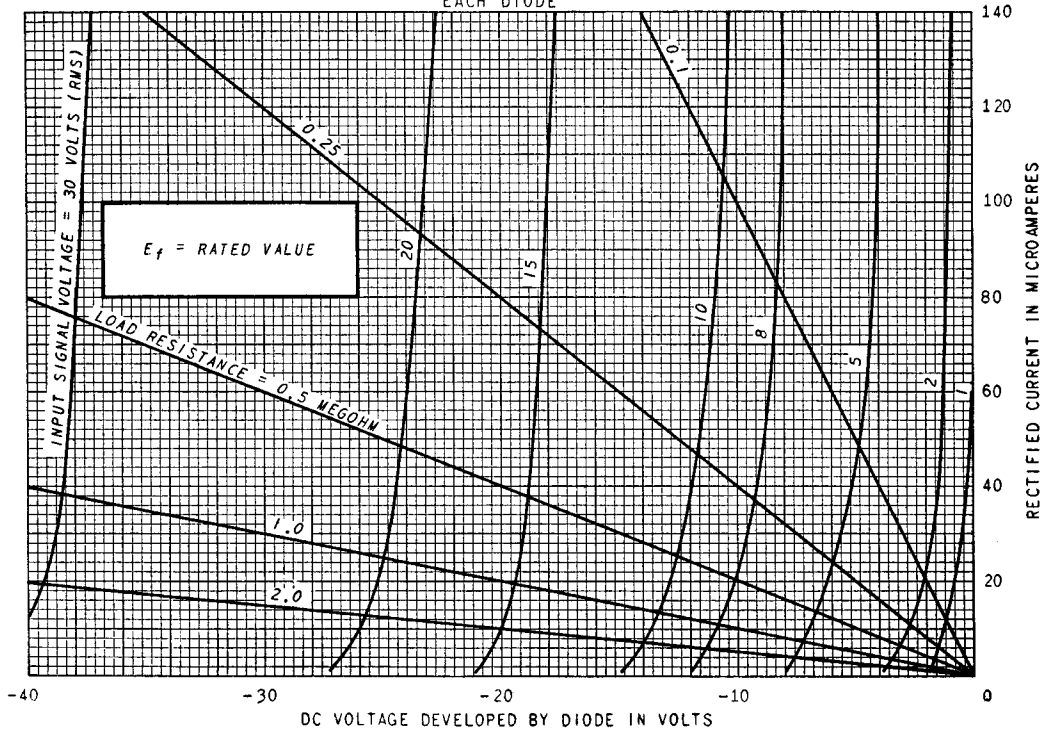


AVERAGE TRANSFER CHARACTERISTICS



OPERATION CHARACTERISTICS

EACH DIODE



**AVERAGE CHARACTERISTICS**

