



5KE8, 6KE8

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODES

9-Pin Miniature Types
For Combined Oscillator-Mixer Applications in TV Receivers

RCA Dark Heater
High Pentode Transconductance (12000 μ mhos)

Frame-Grid Pentode
High Mixer Gain

RCA-5KE8 and 6KE8 are multiunit tubes of the 9-pin miniature type each containing a medium-mu triode and a sharp-cutoff pentode in one envelope. The 5KE8 and 6KE8 are designed primarily for use as combined oscillator-mixer (converter) tubes in television receivers utilizing an intermediate frequency in the order of 40 Mc.

The pentode units of these tubes feature frame-grid construction, high transconductance (12,000 micromhos), and an excellent "knee" characteristic which contributes to high mixer gain.

Each unit of the 5KE8 and 6KE8 has its own cathode to permit flexibility of circuit design. An internal shield is provided to reduce interaction between the units.

The 6KE8 has a 6.3-volt/0.400-ampere heater. The 5KE8 is identical to the 6KE8 except that the 5KE8 has a 0.450-ampere/5.6-volt heater having a controlled 11-second warm-up time.

In addition, the 5KE8 and 6KE8 utilize the RCA Dark Heater which assures long and dependable performance.

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

	5KE8	6KE8	
Voltage (AC or DC)	5.6 ^a	6.3 $\pm$ 0.6	volts
Current	0.450 $\pm$ 0.030	0.400 ^b	amp
Warm-up time (Average)	11	—	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200	max	volts
Heater positive with respect to cathode	200 ^c	max	volts

Direct Interelectrode Capacitances:^d

Triode Unit:			
Grid to plate	1.3		pf
Grid to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater.	2.4		pf
Plate to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater.	2.0		pf

Pentode Unit:

Grid No.1 to plate.	0.015	max	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater.	5.0		pf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	3.4		pf
Heater to triode cathode and pentode cathode	5.5 ^e		pf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage.	125	125	volts
Grid-No.2 Supply Voltage.	—	125	volts
Grid-No.1 Supply Voltage.	0	0	volts
Cathode Resistor.	68	33	ohms
Amplification Factor.	40	—	
Plate Resistance (Approx.).	5000	125000	ohms
Transconductance.	8000	12000	μ mhos
Plate Current	13	10	ma
Grid-No.2 Current	—	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μ a =			
100	—5	—	volts
50	—	—3	volts

Mechanical:

Operating Position.	Any
Maximum Overall Length.	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" $\pm$ 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline	JEDEC No.6-2
Bulb.	T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC No.E9-1)

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	280 max	280 max	volts
GRID-No.2 SUPPLY VOLTAGE.	—	280 max	volts
GRID-No.2 VOLTAGE	—	See Fig.1	
GRID-No.1 VOLTAGE:			
Positive-bias value	0 max	0 max	volts



CATHODE CURRENT	20 max	20 max	ma
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 140 volts	-	0.5 max	watt
For grid-No.2 voltages between 140 and 280 volts	-	See Fig.1	
PLATE DISSIPATION	2 max	2 max	watts

Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation.	0.5 max	0.25 max	megohm
For cathode-bias operation.	1 max	0.5 max	megohm

- a At heater amperes = 0.450.
- b At heater volts = 6.3.
- c The dc component must not exceed 100 volts.
- d With external shield JEDEC No.315 connected to cathode of unit under test except as noted.
- e With external shield JEDEC No.315 connected to ground.

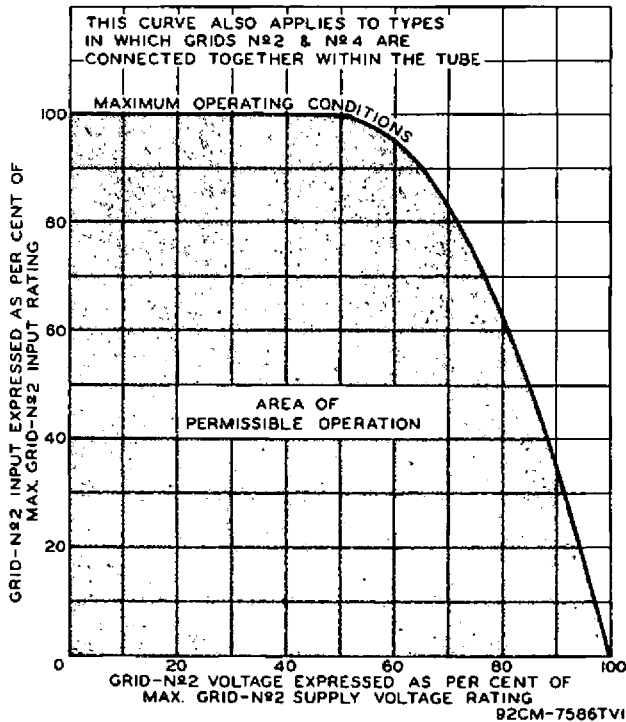


Fig. 1 - Grid-No.2-Input Rating Chart for the Pentode Unit of Types 5KE8 and 6KE8.

OPERATING CONSIDERATIONS

When the 5KE8 is used in television receivers employing series heater strings, a resistor in series with the string of heaters will minimize voltage surges across any individual heater during starting. The resistor should preferably have a negative temperature characteristic.

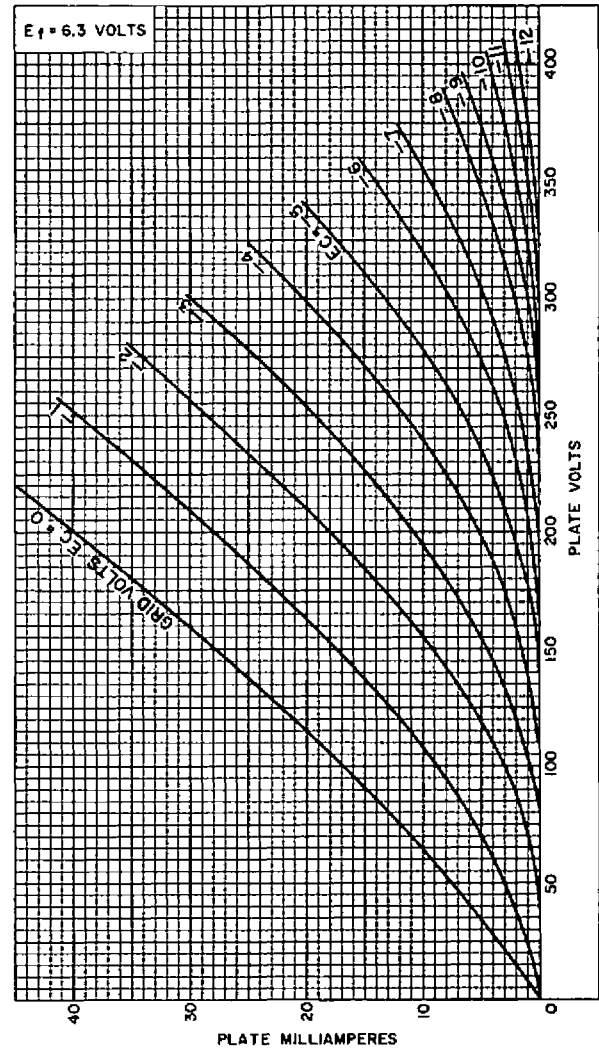
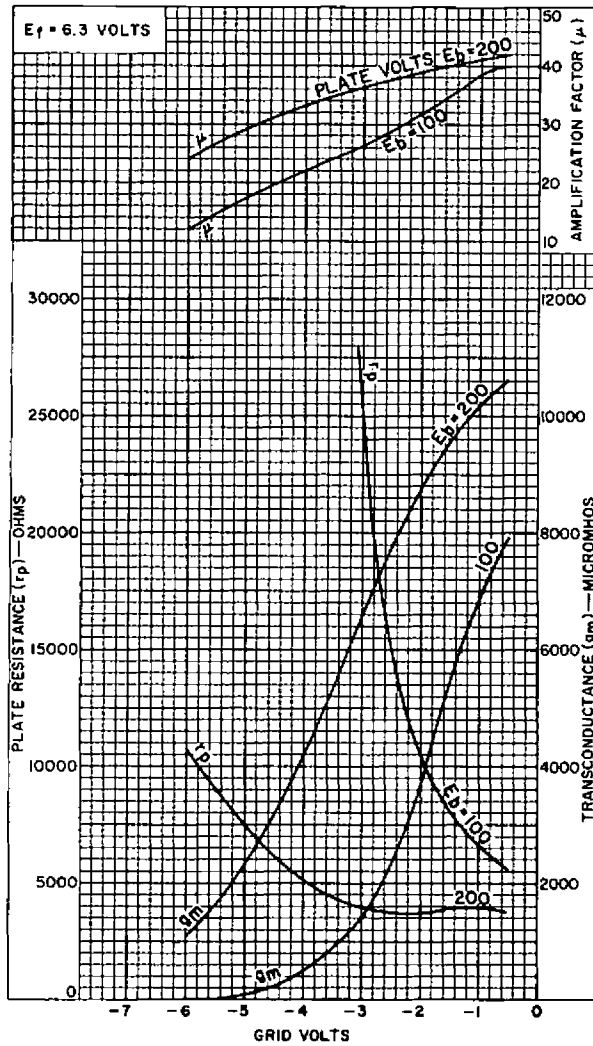
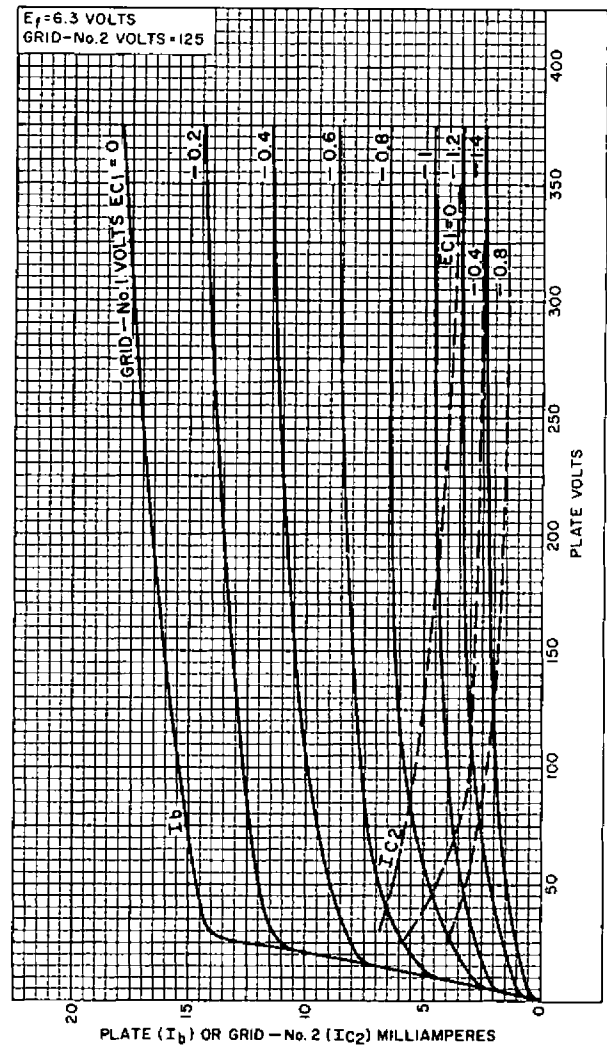


Fig. 2 - Average Plate Characteristics for the Triode Unit of Type 6KE8 and for the Triode Unit of Type 5KE8 except for $E_f = 5.6$ volts.



92CM-11904

Fig. 3—Average Characteristics for the Triode Unit of Type 6KE8 and for the Triode Unit of Type 5KE8 except for $E_f = 5.6$ volts.



92CM-11903

Fig. 4—Average Characteristics for the Pentode Unit of Type 6KE8 and for the Pentode Unit of Type 5KE8 except for $E_f = 5.6$ volts.

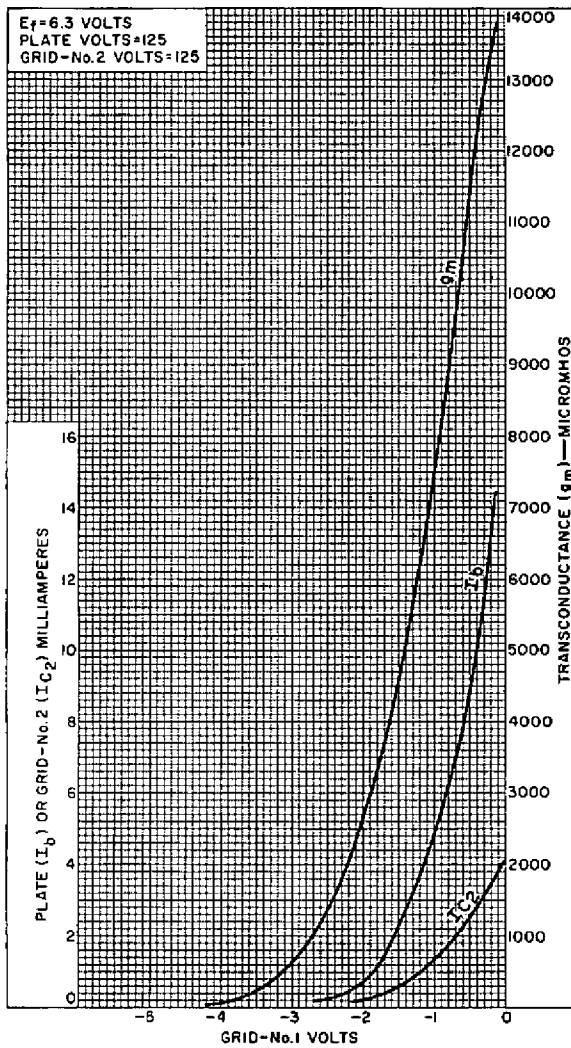
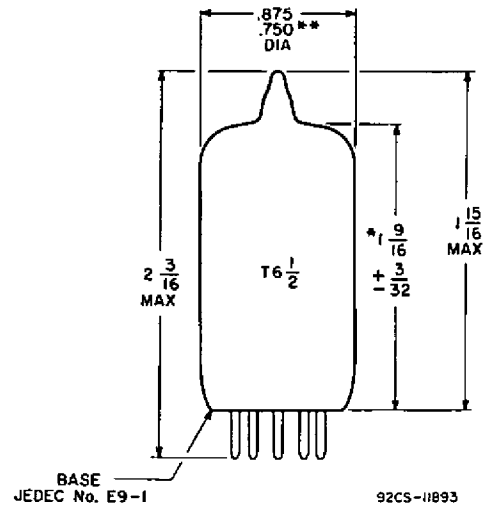


Fig. 5—Average Characteristics for the Pentode Unit of Type 6KE8 and for the Pentode Unit of Type 5KE8 except for $E_f = 5.6$ volts.

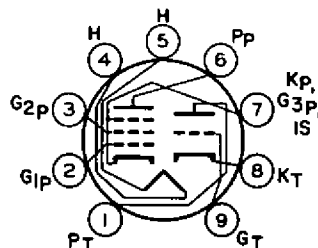
DIMENSIONAL OUTLINE JEDEC No. 6-2 All Dimensions in Inches



* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY RING GAUGE OF 7/16" INSIDE DIAMETER.
** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

TERMINAL DIAGRAM Bottom View

- Pin 1—Triode Plate
- Pin 2—Pentode
Grid No. 1
- Pin 3—Pentode
Grid No. 2
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Pentode Plate



- Pin 7—Pentode
Cathode,
Pentode
Grid No. 3,
Internal
Shield
- Pin 8—Triode
Cathode
- Pin 9—Triode Grid

JEDEC 90C

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