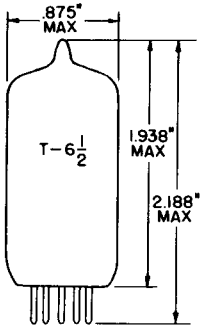
TUNG-SOL

TRIODE PENTODE

MINIATURE TYPE



GLASS BULB
MINIATURE BUTTON
9 PIN BASE E9-1
OUTLINE DRAWING
JEDEC 6-2

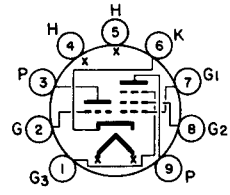
COATED UNIPOTENTIAL CATHODE

FOR USE AS A COMBINED

OSCILLATOR AND MIXER

IN AM-FM RECEIVERS

ANY MOUNTING POSITION



BOTTOM VIEW
BASING DIAGRAM
JEDEC 9AK

THE 5X8 IS A MULTI-UNIT TUBE USING THE 9 PIN MINIATURE CONSTRUCTION. IT CONTAINS A MEDIUM-MU TRIODE AND A SHARP CUTOFF PENTODE IN ONE ENVELOPE. IT IS DESIGNED PRIMARILY FOR USE AS A COMBINED OSCILLATOR AND MIXER TUBE IN 600 MA. SERIES HEATER OPERATED TELEVISION RECEIVERS UTILIZING AN INTERMEDIATE FREQUENCY IN THE ORDER OF 40 MC/S. IT IS ESPECIALLY USEFUL IN AM/FM RECEIVERS. THERMAL CHARACTERISTICS OF THE HEATER ARE CONTROLLED SUCH THAT HEATER VOLTAGE SURGES DURING THE WARM-UP CYCLE ARE MINIMIZED PROVIDED IT IS USED WITH OTHER TYPES WHICH ARE SIMILARLY CONTROLLED.

DIRECT INTERELECTRODE CAPACITANCES

	WITH[A] SHIELD	WITHOUT SHIELD	
PENTODE GRID 1 TO PENTODE PLATE:			
PG1 TO PP MAX.	0.06	0.09	pf
PENTODE INPUT: PG1 TO (H+K+PG2+PG3)	4.8	4.6	pf
PENTODE OUTPUT: PP TO (H+K+PG2+PG3)	1.6	0.9	pf
CATHODE TO HEATER: K TO H	6.0[B]	6.0	pf
TRIODE GRID TO TRIODE PLATE: TG TO TP	1.5	1.5	pf
TRIODE INPUT: TG TO (H+K)	2.4	2.0	pf
TRIODE OUTPUT: TP TO (H+K)	1.0	0.5	pf
PENTODE GRID 1 TO TRIODE PLATE:			
PG1 TO TP MAX.	0.04	0.05	pf
PENTODE PLATE TO TRIODE PLATE: PP TO TP MAX.	0.008	0.05	pf

[A] EXTERNAL SHIELD 315 CONNECTED TO PIN 6.

[B] EXTERNAL SHIELD 315 CONNECTED TO PIN 9.

CONTINUED ON FOLLOWING PAGE

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CONTINUED FROM PRECEDING PAGE

HEATER CHARACTERISTICS AND RATINGS

DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

AVERAGE CHARACTERISTICS	4.7 VOLTS	600	MA.
HEATER WARM-UP TIME[C]		11	SECONDS
HEATER SUPPLY LIMITS:			
CURRENT OPERATION		600±40	MA.
MAXIMUM HEATER-CATHODE VOLTAGE:			
HEATER NEGATIVE WITH RESPECT TO CATHODE			
TOTAL DC AND PEAK		200	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE			
DC		100	VOLTS
TOTAL DC AND PEAK		200	VOLTS

MAXIMUM RATINGS

DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

PENTODE PLATE VOLTAGE	275	VOLTS
TRIODE PLATE VOLTAGE	275	VOLTS
GRID 2 SUPPLY VOLTAGE	275	VOLTS
GRID 2 VOLTAGE	SEE RATING CHART	
PENTODE PLATE DISSIPATION	2.3	WATTS
GRID 2 DISSIPATION - SEE RATING CHART	0.45	WATT
POSITIVE DC GRID 1 VOLTAGE	0	VOLTS
POSITIVE DC TRIODE GRID VOLTAGE	0	VOLTS
TRIODE PLATE DISSIPATION	1.7	WATTS

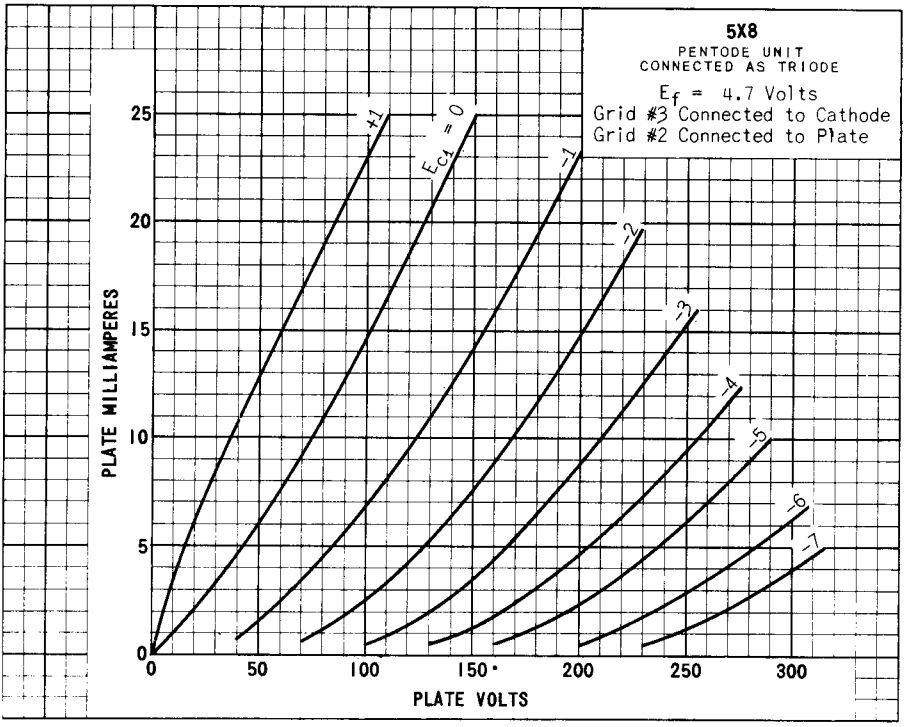
TYPICAL OPERATING CHARACTERISTICS

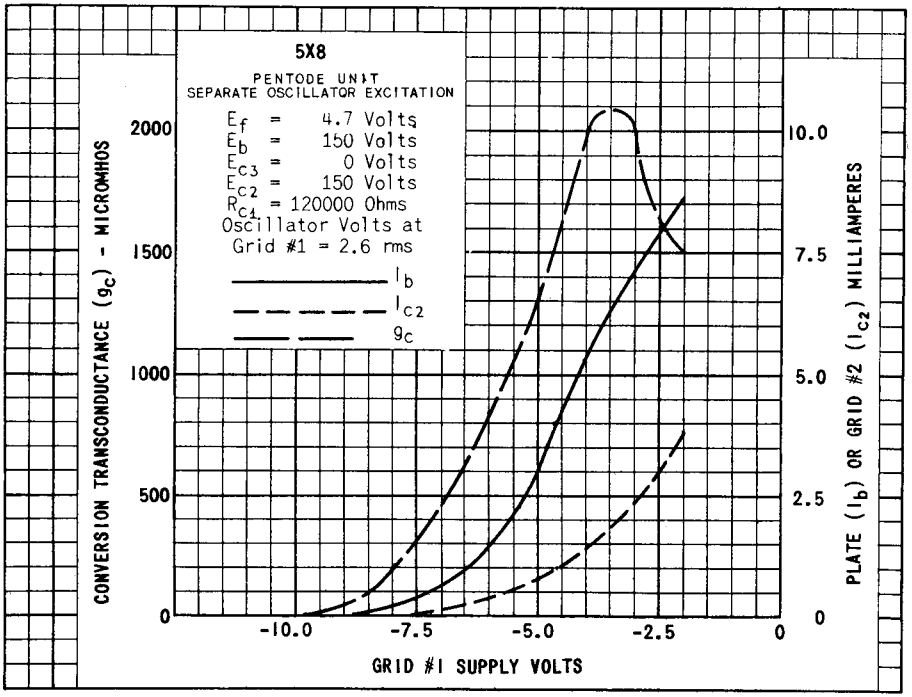
CLASS A1 AMPLIFIER

	TRIODE	PENTODE	
PLATE VOLTAGE	125	125	VOLTS
GRID 3 VOLTAGE	CONNECTED TO PIN 6 AT SOCKET		
GRID 2 VOLTAGE	-----	125	VOLTS
GRID 1 VOLTAGE	-1.0	-1.0	VOLTS
GRID 2 CURRENT	-----	2.2	MA.
PLATE CURRENT	12.0	9.0	MA.
TRANSCONDUCTANCE	6500	5500	μMHOS
AMPLIFICATION FACTOR	40	-----	
PLATE RESISTANCE (APPROX.)	6000	300,000	OHMS
GRID 1 VOLTAGE (APPROX.) FOR Ib=20 μA.	-7	-6.5	VOLTS
ZERO BIAS TRANSCONDUCTANCE (WITH Eb=100 V., Ec2=70 V)	-----	5700	μMHOS

C

HEATER WARM-UP TIME IS DEFINED AS THE TIME REQUIRED FOR THE VOLTAGE ACROSS THE HEATER TO REACH 80% OF ITS RATED VOLTAGE AFTER APPLYING 4 TIMES RATED HEATER VOLTAGE TO A CIRCUIT CONSISTING OF THE TUBE HEATER IN SEREIS WITH A RESISTANCE OF VALUE 3 TIMES THE NOMINAL HEATER OPERATING RESISTANCE.





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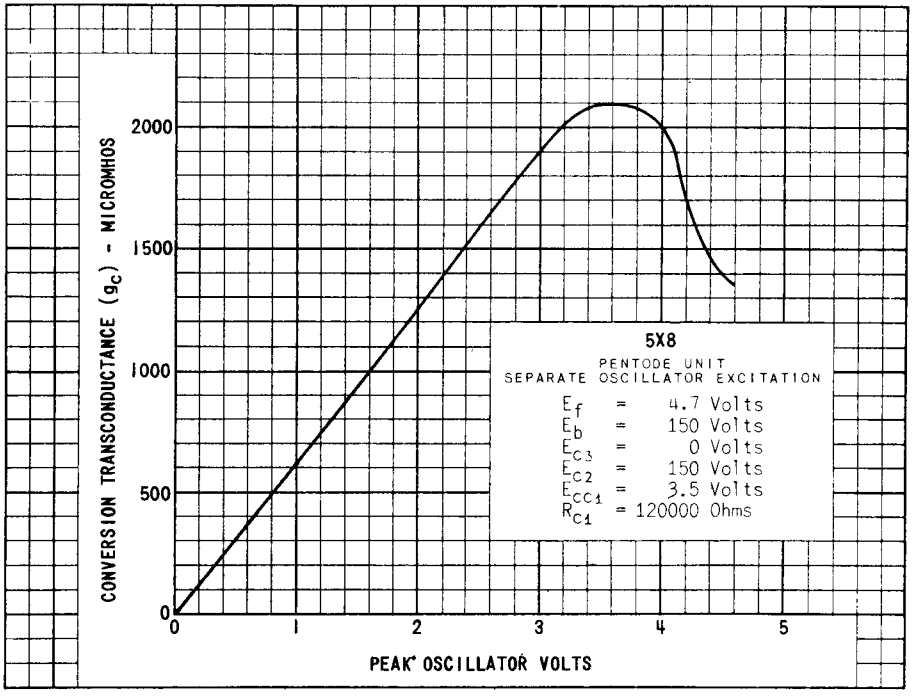
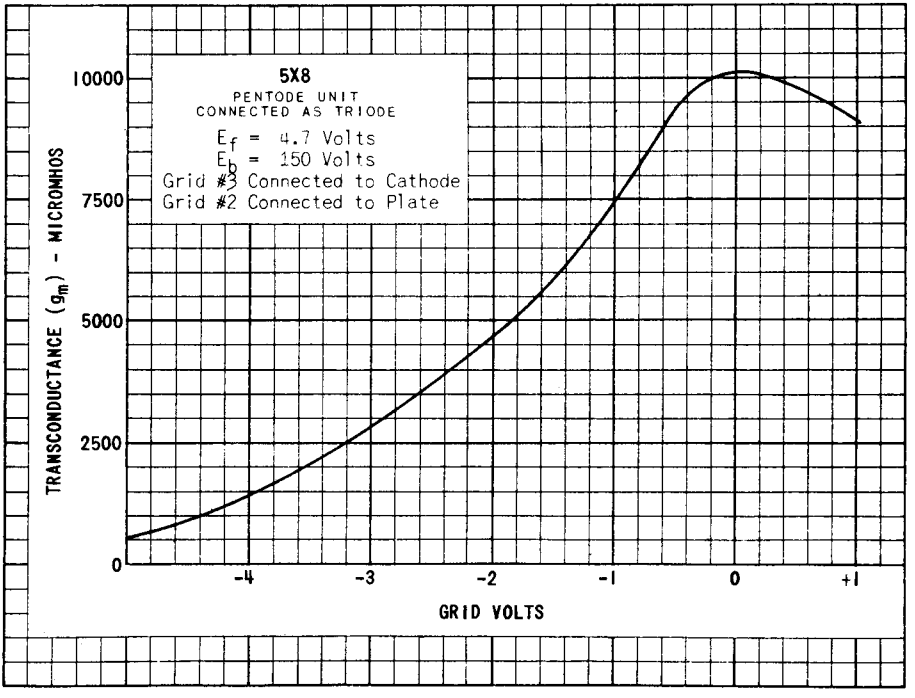

CONVERSION TRANSCONDUCTANCE (g_c) - MICROMHOS
2000
1500
1000
500
0
0
1
2
3
4
5
PEAK OSCILLATOR VOLTS
5X8
PENTODE UNIT
SEPARATE OSCILLATOR EXCITATION
E_f = 4.7 Volts
E_b = 150 Volts
E_{c3} = 0 Volts
E_{c2} = 150 Volts
E_{cc1} = 3.5 Volts
R_{c1} = 120000 Ohms


TRANSCONDUCTANCE (g_m) - MICROMHOS
10000
7500
5000
2500
0
-4
-3
-2
-1
0
+1
GRID VOLTS
5X8
PENTODE UNIT
CONNECTED AS TRIODE
E_f = 4.7 Volts
E_b = 150 Volts
Grid #3 Connected to Cathode
Grid #2 Connected to Plate