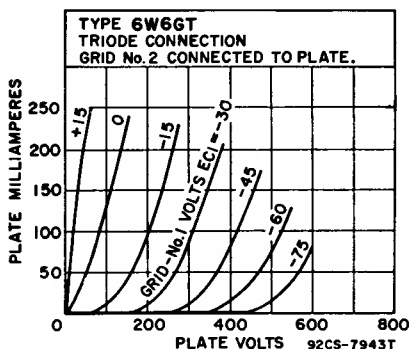
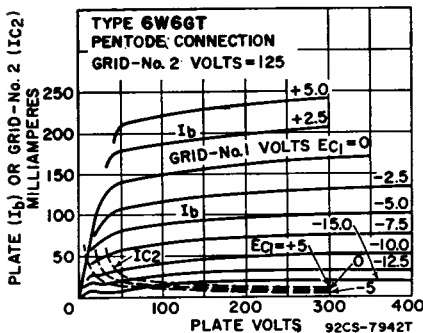


MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance, for cathode-bias operation 2.2 2.2 megohms

* Grid No.2 connected to plate.

Pulse duration must not exceed 15% of a vertical scanning cycle (2.5 milliseconds).

**6W7G**

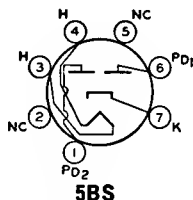
Refer to chart at end of section.

6X4

12X4

**FULL-WAVE
VACUUM RECTIFIER**

Miniature type used in power supply of automobile and ac-operated radio receivers. Equivalent in performance to larger type 6X5GT. Outlines section, 5D; requires miniature 7-contact socket. This tube, like other power-handling tubes, should be adequately ventilated. For discussion of Rating Chart and Operation Characteristics, refer to Interpretation of Tube Data. Type 12X4 is identical with type 6X4 except for heater ratings.



Heater Voltage (ac/dc)	6X4	12X4	
Heater Current	6.3 ^A	12.6	volts
Heater-Cathode Voltage:	0.6	0.3	ampere
Peak value	+200, -450 max		volts
Average value	100 max		volts

^A When the heater is operated from a 3-cell (nominal-6-volt) storage-battery source, the permissible heater-voltage range is from 5 to 8 volts.

Full-Wave Rectifier**MAXIMUM RATINGS (Design-Maximum Values)**

Peak Inverse Plate Voltage	1250	volts
Steady-State Peak Plate Current (Per Plate)	245	mA
AC Plate Supply Voltage (Per Plate, rms)	See Rating Chart	
DC Output Voltage (At filter input)†	350	volts
Average Output Current (Each plate)†	45	mA
Hot-Switching Transient Plate Current	#	

† This rating applies when the 6X4 is used in vibrator operation with a minimum duty cycle of 75 per cent.

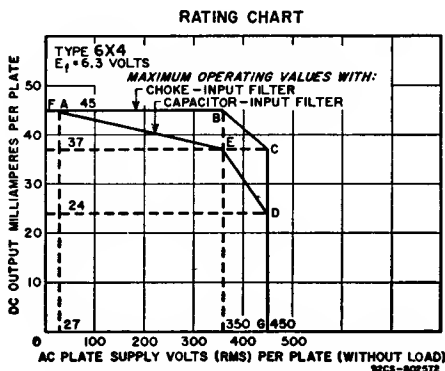
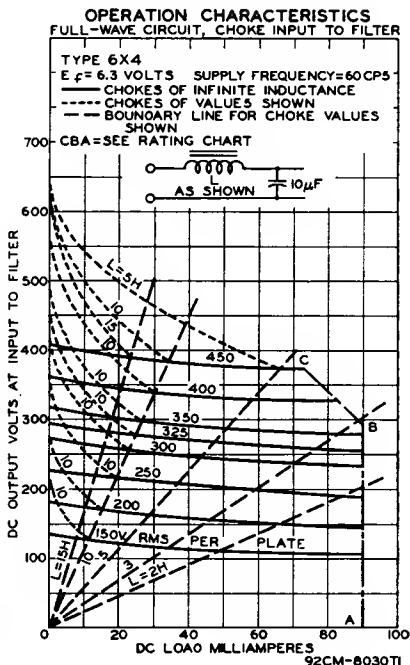
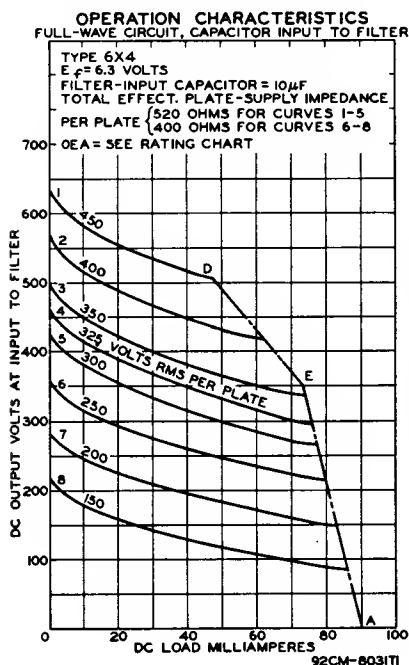
If hot-switching is regularly required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current. When capacitor-input circuits are used, a maximum peak current value per plate of 1.1 amperes during the initial cycles of the hot-switching transient should not be exceeded.

TYPICAL OPERATION

Filter Input

	Sine Wave Operation	Vibrator Operation	
AC Plate Supply Voltage (Each plate, rms)*	325	400	volts
Filter Input Capacitor	10	—	μ F
Effective Plate Supply Impedance (Each plate)	525	—	ohms
Filter Input Choke	—	10	henries
Average Output Current	70	70	mA
DC Output Voltage at Input to Filter (Approx.)	310	340	volts

* AC plate supply voltage is measured without load.

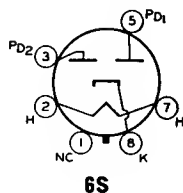


Refer to chart at end of section.

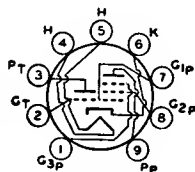
6X5

6X5GT**FULL-WAVE
VACUUM RECTIFIER**

Glass octal type used in power supply of automobile and ac-operated receivers. Outlines section, 13D; requires octal socket. This type may be supplied with pin No.1 omitted. For maximum ratings, and typical operation, refer to type 6X4.

**6S****6X8A****5X8, 19X8****MEDIUM-MU TRIODE—
SHARP-CUTOFF PENTODE**

Miniature type used as combined oscillator and mixer tube in television receivers utilizing an intermediate frequency in the order of 40 MHz and in AM/FM receivers. Outlines section, 6B; requires miniature 9-contact socket. Types 5X8 and 19X8 are identical with type 6X8A except for heater ratings.

**9AK**

	5X8	6X8A	19X8	
Heater Voltage (ac/dc)	4.7	6.3	18.4	volts
Heater Current	0.6	0.45	0.15	ampere
Heater Warm-up Time (Average)	11	11	—	seconds
Heater-Cathode Voltage:				
Peak value	±200 max	±200 max	±200 max	volts
Average value	100 max	100 max	100 max	volts
Direct Interelectrode Capacitances:				
Triode Unit:				
Grid to Plate		1.5	1.5	pF
Grid to Cathode and Heater		2	2.4	pF
Plate to Cathode and Heater		0.5	1	pF
Pentode Unit:				
Grid No.1 to Plate		0.09 max	0.06 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3		4.6	4.8	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3		0.9	1.6	pF
Pentode Grid No.1 to Triode Plate		0.05 max	0.04 max	pF
Pentode Plate to Triode Plate		0.05 max	0.008 max	pF
Heater to Cathode		6.5	6.5*	pF

* With external shield connected to cathode except as noted.

• With external shield connected to pentode plate.

Class A₁ Amplifier**MAXIMUM RATINGS (Design-Maximum Values)**

	Triode Unit	Pentode Unit	
Plate Voltage	275	275	volts
Grid No.2 (Screen-Grid) Supply Voltage	—	275	volts
Grid-No.2 Voltage	—	See curve page 98	
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	0	volts
Plate Dissipation	1.7	2.3	watts
Grid-No.2 Input:			
For grid-No.2 voltages up to 137.5 volts	—	0.45	watt
For grid-No.2 voltages between 137.5 and 275 volts	—	See curve page 98	

CHARACTERISTICS

Plate Voltage	125	125	volts
Grid No.3	Connected to cathode at socket		
Grid-No.2 Voltage	—	125	volts
Grid-No.1 Voltage	—1	—1	volt
Amplification Factor	40	—	
Plate Resistance (Approx.)	6000	300000	ohms
Transconductance	6500	5500	μmhos
Plate Current	12	9	mA
Grid-No.2 Current	—	2.2	mA
Grid-No.1 Voltage (Approx.) for plate current of 20 μA	—7	—6.5	volts