

Heater Voltage (ac/dc)	6B10 6.3	8B10 8.5	volts
Heater Current	0.6	0.45	ampere
Heater Warm-up Time (Average)	11	11	seconds
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts

Class A₁ Amplifier (Each Triode Unit)

MAXIMUM RATING (Design-Maximum Value)

Plate Voltage	330	volts
Average Cathode Current	20	mA
Plate Dissipation	3	watts

CHARACTERISTICS

Plate Voltage	250	volts
Grid Voltage	—8	volts
Amplification Factor	18	
Plate Resistance (Approx.)	7200	ohms
Transconductance	2500	μmhos
Plate Current	10	mA
Grid Voltage (Approx.) for plate current of 50 μA	—20	volts

MAXIMUM CIRCUIT VALUES

Grid-Circuit Resistance:		
For fixed-bias operation	0.25	megohm
For cathode-bias operation	1	megohm

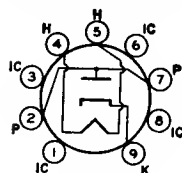
Diode Units (Each Unit)

MAXIMUM RATING (Design-Maximum Value)

Plate Current	5	mA
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CHARACTERISTICS, Instantaneous Value

Tube Voltage Drop for plate current of 20 mA	5	volts
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9HP

HALF-WAVE VACUUM RECTIFIER

6BA3

Novar type used as damper tube in horizontal-deflection circuits of black-and-white television receivers. Outlines section, 11B or 30C; requires novar 9-contact socket. Socket terminals 1, 3, 6, and 8 should not be used as tie points. This tube, like other power-handling tubes, should be adequately ventilated.

Heater Voltage (ac/dc)	6.3	volts
Heater Current		
Direct Interelectrode Capacitances (Approx.):	4.4	pF
Plate to Cathode and Heater	6	pF
Cathode to Plate and Heater	1.8	pF
Heater to Cathode	1.2	ampere

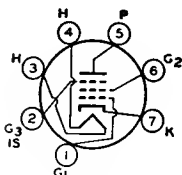
Damper Service

For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Values)

Maximum values			
Peak Inverse Plate Voltage#	5000		volts
Peak Plate Current	1000		mA
Average Plate Current	165		mA
Plate Dissipation	5.3		watts
Heater-Cathode Voltage:			
Peak value	+300	—5000	volts
Average value	+100	—900	volts

Pulse duration must not exceed 15% of a horizontal scanning cycle (10 microseconds).



7BK

REMOTE-CUTOFF PENTODE

6BA6 6BA6/EF93

12BA6

Miniature types used as rf amplifiers in standard broadcast and FM receivers, as well as in wide-band, high-

frequency applications. The low value of grid-No.1-to-plate capacitance minimizes regenerative effects, while the high transconductance makes possible high signal-to-noise ratio. Outlines section, 5C; require miniature 7-contact socket. Type 12BA6 is identical with type 6BA6 except for heater ratings.

	6BA6 6BA6/EF93	12BA6	
Heater Voltage (ac/dc)	6.3	12.6	volts
Heater Current	0.3	0.15	ampere
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts
Direct Interelectrode Capacitances:			
Grid No.1 to Plate		0.0035 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		5.5	pF
Plate to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		5*	pF

* This value is 5.5 pF with external shield connected to cathode.

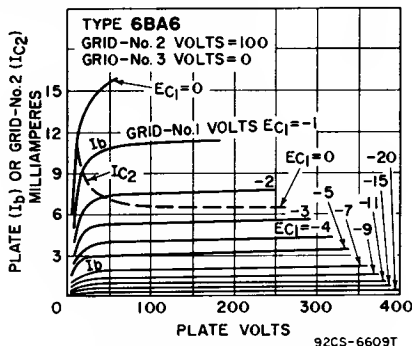
Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	330	volts
Grid-No.3 (Suppressor-Grid) Voltage, Positive value	0	volts
Grid-No.2 (Screen-Grid) Voltage	See curve page 98	
Grid-No.2 Supply Voltage	330	volts
Plate Dissipation	3.4	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	0.7	watt
For grid-No.2 voltages between 165 and 330 volts	See curve page 98	
Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value	55	volts
Positive-bias value	0	volts

CHARACTERISTICS

Plate Supply Voltage	100	250	volts
Grid No.3 and Internal Shield	Connected to cathode at socket		
Grid-No.2 Supply Voltage	100	100	volts
Cathode-Bias Resistor	68	68	ohms
Plate Resistance (Approx.)	0.25	1	megohm
Transconductance	4300	4400	μmhos
Plate Current	10.8	11	mA
Grid-No.2 Current	4.4	4.2	mA
Grid-No.1 Voltage (Approx.) for transconductance of 40 μmhos	-20	-20	volts



Installation and Application

Control-grid bias variation is effective in changing the volume of the receiver. To obtain adequate volume control, an available grid-No.1-bias voltage of approximately 50 volts is required. The exact value depends upon the circuit design and operating conditions. This voltage may be obtained, depending on the receiver requirements, from a potentiometer across a fixed supply voltage, from a variable cathode-bias resistor, from the avc system, or from a combination of these methods.

The grid-No.2 (screen-grid) voltage may be obtained from a potentiometer or bleeder circuit across the B-supply source, or through a dropping resistor from the plate supply. The use of series resistors for obtaining satisfactory control of grid-No.2 voltage in the case of four-electrode tubes is usually impossible because of secondary-emission phenomena. In the 6BA6, however, because grid No.3 practically removes these effects, it is practical to obtain grid-No.2 voltage through a series-dropping resistor from the plate supply or from some high intermediate voltage, provided the source does not exceed the plate-supply voltage. With this method, the grid-No.2-to-cathode voltage will fall off very little from minimum to maximum value of the resistor controlling cathode bias. In some cases, it may actually rise. This rise of grid-No.2-to-cathode voltage above the normal maximum value is allowable because both the grid-No.2 current and the plate current are reduced simultaneously by a sufficient amount to prevent damage to the tube. It should be recognized that, in general, the series-resistor method of obtaining grid-No.2 voltage from a higher voltage supply necessitates the use of the variable cathode-resistor method of controlling volume in order to prevent too high a voltage on grid No.2. When grid-No.2 and control-grid voltage are obtained in this manner, the remote "cutoff" advantage of the 6BA6 can be fully realized. However, it should be noted that the use of a resistor in the grid-No.2 circuit has an effect on the change in plate resistance with variation in grid-No.3 (suppressor-grid) voltage in case grid No.3 is utilized for control purposes.



8CT

PENTAGRID CONVERTER

6BA7

Miniature type used as converter in AM and FM receivers. Outlines section, 6E; requires miniature 9-contact socket.

Heater Voltage	6.3	volts
Heater Current	0.3	ampere
Peak Heater-Cathode Voltage	±90	volts
Direct Interelectrode Capacitances:		
Grid No. 3 to All Other Electrodes	9.5	pF
Plate to All Other Electrodes	8.3	pF
Grid No. 1 to All Other Electrodes	6.7	pF
Grid No. 3 to Plate	0.19 max	pF
Grid No. 3 to Grid No. 1	0.1 max	pF
Grid No. 1 to Plate	0.05 max	pF
Grid No. 1 to All Other Electrodes, except Cathode	3.4	pF
Grid No. 1 to Cathode	3.3	pF
Cathode to All Other Electrodes except Grid No. 1	4	pF

Converter Service

MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	300	volts
Grid-No.5-and-Internal-Shield Voltage ^a	0	volts
Grids-No.-2-and-No.4 (Screen-Grid) Voltage	100	volts
Grids-No.2-and-No.4 Supply Voltage	300	volts
Plate Dissipation	2	watts
Grids-No.2-and-No.4 Input	1.5	watts
Total Cathode Current	22	mA
Grid-No.3 Voltage:		
Negative-bias value	100	volts
Positive-bias value	0	volts

CHARACTERISTICS (Separate Excitation)*

Plate Voltage	100	250	volts
Grid No.5 and Internal Shield ^a	Connected directly to ground		
Grids-No.2-and-No.4 (Screen-Grid) Voltage	100	100	volts