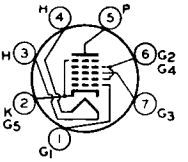
6BY6 PENTAGRID AMPLIFIER

Miniature type used as a gated amplifier in color television receivers. In such service, it may be used as a combined sync separator and sync clipper. **Outlines section,** 5C; requires miniature 7-contact socket.



7CH

	6BY6	
Heater Voltage (ac/dc)	6.3	volts
Heater Current	0.3	ampere
Heater Warm-up Time (Average)	—	seconds
Peak value	±200 max	volts
Average value	100 max	volts
Direct Interelectrode Capacitances:		
Grid No.1 to Plate	0.08 max	pF
Grid No.3 to Plate	0.35 max	pF
Grid No.1 to Grid No.3	0.22 max	pF
Grid No. 1 to All Other Electrodes	5.4	pF
Grid No.3 to All Other Electrodes	6.9	pF
Plate to All Other Electrodes	7.6	pF

Class A_1 Amplifier

CHARACTERISTICS

Plate Voltage	250	volts
Grids-No.2-and-No.4 Voltage	100	volts
Grid-No.3 Voltage	—2.5	volts
Grid-No.1 Voltage	—2.5	volts
Grid-No.3-to-Plate Transconductance	500	μmhos
Grid-No.1-to-Plate Transconductance	1900	μmhos
Plate Current	6.5	mA
Grids-No.2-and-No.4 Current	9	mA
Grid-No.3 Volts (Approx.) for plate current of 35 μA and grid-No.1 volts = —4	—15	volts
Grid-No.1 Volts (Approx.) for plate current of 35 μA and grid-No.3 volts = 0	—12	volts

Gated Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

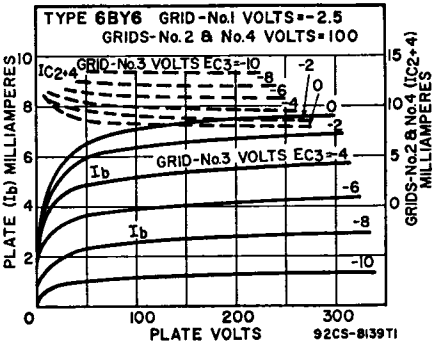
Plate Voltage	330	volts
Grids-No.2-and-No.4 Voltage	See curve page 300	
Grids-No.2-and-No.4 Supply Voltage	330	volts
Grid-No.3 Voltage:		
Negative-bias value	55	volts
Positive-bias value	0	volts
Positive peak value	27	volts
Grid-No.1 Voltage, Negative bias value	110	volts
Plate Dissipation	2.3	watts
Grid-No.3 Input	0.1	watt
Grids-No.2-and-No.4 Input:		
For grids-No.2-and-No.4 voltages up to 165 volts	1.1	watts
For grids-No.2-and-No.4 voltages between 165 and 330 volts	See curve page 300	
Grid-No.1 Input	0.1	watt

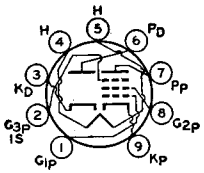
CHARACTERISTICS AS SYNC SEPARATOR AND SYNC CLIPPER

Plate Voltage	10	volts
Grid-No.3 Voltage	0	volts
Grids-No.2-and-No.4 Voltage	25	volts
Grid-No.1 Voltage	0	volts
Plate Current	1.4	mA
Grids-No.2-and-No.4 Current	3.5	mA
Grid-No.3 Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.1 voltage of 0 volts, and plate current of 50 μA	—2.5	volts
Grid-No.1 Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.3 voltage of 0 volts, and plate current of 50 μA	—2.3	volts

MAXIMUM CIRCUIT VALUES

Grid-No.1 or Grid-No.3-Circuit Resistance:		
For fixed-bias operation	0.5	megohm
For cathode-bias operation	1	megohm





9FN

DIODE—SHARP-CUTOFF PENTODE

6BY8

Miniature type used in television receiver applications. The pentode unit is used as an rf amplifier and the high-perveance diode as a limiter or detector. Outlines section, 6E; requires miniature 9-contact socket.

Heater Voltage (ac/dc)	6.3	volts
Heater Current	0.6	ampere
Heater Warm-up Time (Average)	11	seconds
Heater-Cathode Voltage:		
Peak value	±200 max	volts
Average value	100 max	volts
Direct Interelectrode Capacitances:°		
Pentode Unit:		
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
Diode Plate to All Other Electrodes	4.8▪	pF

° With external shield connected to cathode of pentode unit (pin 9), except as noted.
▪ With external shield connected to ground.

Pentode Unit as Class A_1 Amplifier

MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	300	volts
Grid-No.3 (Suppressor-Grid) Voltage, Positive value	0	volts
Grid-No.2 (Screen Grid) Supply Voltage	300	volts
Grid-No.2 Voltage	See curve page 300	
Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value	50	volts
Positive-bias value	0	volts
Plate Dissipation	3	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 150 volts	0.65	watt
For grid-No.2 voltages between 150 and 300 volts	See curve page 300	

CHARACTERISTICS

Plate Supply Voltage	100	250	volts
Grid No.3	Connected to cathode at socket		
Grid-No.2 Supply Voltage	100	150	volts
Cathode-Bias Resistor	150	68	ohms
Plate Resistance (Approx.)	0.5	1	megohm
Transconductance	3900	5200	μmhos
Plate Current	5	10.6	mA
Grid-No.2 Current	2.1	4.3	mA
Grid-No.1 Voltage (Approx.) for plate current of 10 μA	—4.2	—6.5	volts

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25	megohm
For cathode-bias operation	1	megohm

Diode Unit

MAXIMUM RATINGS (Design-Center Values)

Peak Inverse Plate Voltage	430	volts
Peak Plate Current	180	mA
Average Plate Current	45	mA

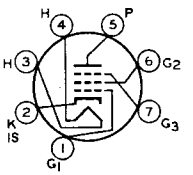
6BY11 Refer to chart at end of section.

6BZ3 For replacement use type 6BE3/6BZ3.

6BZ6
6BZ6/6JH6

3BZ6, 4BZ6, 12BZ6

SEMIREMOTE-CUTOFF PENTODE



7CM

Miniature type used in gain-controlled video if stages of color and black-and-white television receivers. **Outlines section,** 5C; requires miniature 7-contact socket. Types 3BZ6, 4BZ6, and 12BZ6 are identical with type 6BZ6 except for heater ratings.

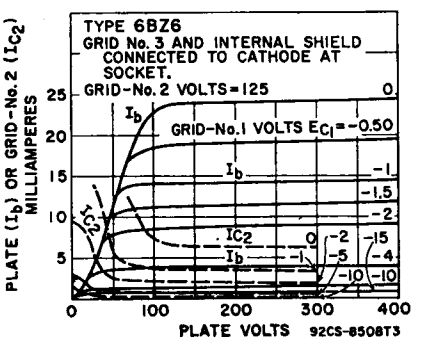
	3BZ6	4BZ6	6BZ6 6BZ6/6JH6	12BZ6	
Heater Voltage (ac/dc)	3.15	4.2	6.3	12.6	volts
Heater Current	0.6	0.45	0.3	0.15	ampere
Heater Warm-up Time (Average)	11	11	—	—	seconds
Heater-Cathode Voltage:					
Peak value	±200 max	±200 max	±200 max	±200 max	volts
Average value	100 max	100 max	100 max	100 max	volts
Direct Interelectrode Capacitances:			Unshielded	Shielded	
Grid No.1 to Plate			0.025 max	0.015 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield			7	7	pF
Plate to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield			2	3	pF

△ With external shield connected to cathode.

Class A_1 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) Supply Voltage	330	volts
Grid-No.2 Voltage	See curve page 300	
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	volts
Plate Dissipation	2.3	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	0.55	watt
For grid-No.2 voltages between 165 and 330 volts	See curve page 300	



CHARACTERISTICS

Plate Supply Voltage	125	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	125	volts
Cathode-Bias Resistor	56	ohms
Plate Resistance (Approx.)	0.26	megohm
Transconductance	8000	μmhos
Plate Current	14	mA
Grid-No.2 Current	3.6	mA
Grid-No.1 Voltage (Approx.) for transconductance of 50 μmhos	—19	volts
Grid-No.1 Voltage (Approx.) for transconductance of 700 μmhos	—4.5	volts

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25	megohm
For cathode-bias operation	1	megohm

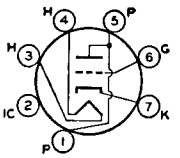
Refer to chart at end of section.
For replacement use type 6BQ7A/6BZ7/6BS8.

6BZ7

Refer to chart at end of section.
For replacement use type 6BC8/6BZ8.

6BZ8

POWER TRIODE — 6C4



6BG

Miniature type used as a cascode amplifier in vhf color local oscillator in FM and other high-frequency circuits and as a class C rf amplifier. **Outlines section,** 5C; requires miniature 7-contact socket. For typical operation as a resistance-coupled amplifier, refer to **Resistance-Coupled Amplifier** section. For additional curve of plate characteristics, refer to type 12AU7A.

Heater Voltage (ac/dc)	6.3		volts
Heater Current	0.15		ampere
Heater-Cathode Voltage:			
Peak value	±200 max		volts
Average value	100 max		volts
Direct Interelectrode Capacitances (Approx.)	**Unshielded**	**Shielded**△	
Grid to Plate	1.6	1.4	pF
Grid to Cathode and Heater	1.8	1.8	pF
Plate to Cathode and Heater	1.3	2.5	pF

△ With external shield connected to cathode.

Class A_1 Amplifier

MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	300 max	volts
Plate Dissipation	3.5 max	watts

CHARACTERISTICS

Plate Voltage	100	250	volts
Grid Voltage*	0	—8.5	volts
Amplification Factor	19.5	17	
Plate Resistance (Approx.)	6250	7700	ohms
Transconductance	3100	2200	μmhos
Plate Current	11.8	10.5	mA
Grid Voltage (Approx.) for plate current of 10 μA	—10	—25	volts

MAXIMUM CIRCUIT VALUES

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

* Transformer- or impedance-type input coupling devices are recommended to minimize resistance in the grid circuit.

RF Power Amplifier and Oscillator—Class C Telegraphy

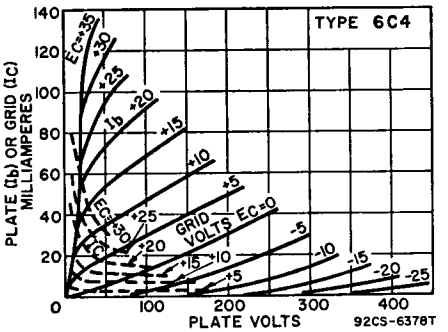
MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	300	volts
Grid Voltage	—50	volts
Plate Current	25	mA
Grid Current	8	mA
Plate Dissipation	5	watts

TYPICAL OPERATION AT FREQUENCIES UP TO 50 MHz

Plate Voltage	300	volts
Grid Voltage	—27	volts
Plate Current	25	mA
Grid Current (Approx.)	7	mA
Driving Power (Approx.)	0.35	watt
Power Output (Approx.)•	5.5	watts

• Approximately 2.5 watts power output can be obtained when the 6C4 is used at 150 MHz as an oscillator with grid resistor of 10,000 ohms and with maximum rated input.



6C5 Refer to chart at end of section.

6C5GT Refer to chart at end of section.

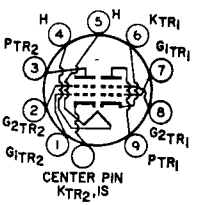
6C6 Refer to chart at end of section.

6C7 Refer to chart at end of section.

6C8G Refer to chart at end of section.

6C9
17C9

SHARP-CUTOFF DUAL TETRODE



Miniature type used as vhf rf-amplifier and autodyne mixer tube. **Outlines section,** 6B; except center pin is added to base; requires miniature 10-contact socket. Type 17C9 is identical with type 6C9 except for heater ratings.

	6C9	17C9	
Heater Voltage (ac/dc)	6.3	16.8	volts
Heater Current	0.4	0.15	ampere
Peak Heater-Cathode Voltage	±100 max	±100 max	volts
Direct Interelectrode Capacitances:	Unit No. 1	Unit No. 2	
Grid No.1 to Plate	0.055 max	0.06 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Internal Shield	4.4	4.2	pF
Plate to Cathode, Heater, Grid No.2 and Internal Shield	2.2	2.2	pF
Heater to Cathode	4.2	4.8	pF
Plate of Unit No.1 to Plate of Unit No.2	0.003 max		pF
Grid No.1 of Unit No.1 to Grid No.1 of Unit No.2	0.001 max		pF
Grid No.1 of Unit No.1 to Plate of Unit No.2	0.001 max		pF
Grid No.1 of Unite No.2 to Plate of Unit No.1	0.032 max		pF

Class A_1 Amplifier (Each Unit)

MAXIMUM RATINGS (Design-Maximum Values)

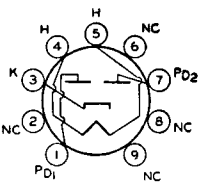
Plate Voltage	250	volts
Grid-No.2 (Screen-Grid) Supply Voltage	180	volts
Grid-No.2 Voltage	See curve page 300	
Cathode Current	20	mA
Plate Dissipation:		
Either plate	1.5	watts
Both plates (both units operating)	2.5	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 90 volts	0.5	watt
For grid-No.2 voltages between 90 and 180 volts	See curve page 300	

CHARACTERISTICS

Plate Voltage	125	volts
Grid-No.2 Voltage	80	volts
Grid-No.1 Voltage	—1	volt
Plate Resistance (Approx.)	0.1	megohm
Transconductance	8000	μmhos
Plate Current	10	mA
Grid-No.2 Current	1.5	mA
Grid-No.1 Voltage (Approx.) for plate current of 20 μA	—6	volts

Refer to chart at end of section.

6C10



9M

FULL-WAVE VACUUM RECTIFIER

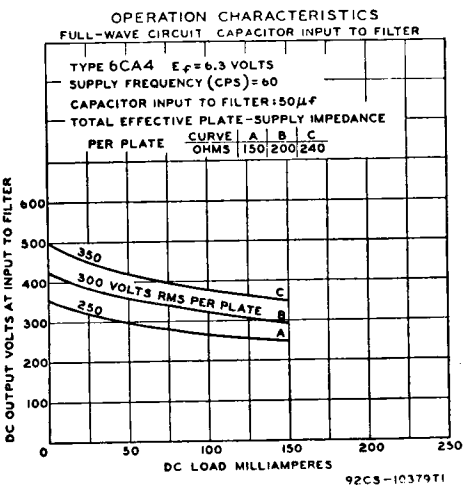
6CA4

Miniature type used in power supply of compact audio equipment having moderate dc requirements. **Outlines section,** 6G; requires miniature 9-contact socket. This tube, like other power-handling tubes, should be adequately ventilated. **Heater:** volts (ac/dc), 6.3; amperes, 1.

Full-Wave Rectifier

MAXIMUM RATINGS (Design-Center Values)

Peak Inverse Plate Voltage	1000	volts
Peak Plate Current (Per Plate)	450	mA
AC Plate Supply Voltage (Per Plate, rms) with Capacitor Input to Filter	350	volts
Average Output Current	150	mA
Hot Switching Transient Plate Current (Per Plate)	#	
Peak Heater-Cathode Voltage	—500	volts



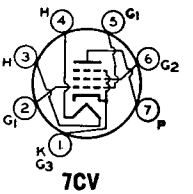
TYPICAL OPERATION WITH CAPACITOR INPUT TO FILTER

AC Plate-to-Plate Supply Voltage (rms)	500	600	700	volts
Filter-Input Capacitor	50	50	50	μF
Total Effective Plate Supply Impedance per Plate	150	200	240	ohms
DC Output Voltage at Input to Filter (Approx.) For dc output current of 150 mA	245	293	347	volts

When capacitor-input circuits are used, a maximum peak current value per plate of 1 ampere during the initial cycles of the hot-switching transient should not be exceeded.

6CA5
12CA5

BEAM POWER TUBE



7CV

Miniature type used in af power output stage of radio and television receivers. **Outlines section,** 5D; requires miniature 7-contact socket. Type 12CA5 is identical with type 6CA5 except for heater ratings.

	6CA5	12CA5		
Heater Voltage (ac/dc)	6.3	12.6		volts
Heater Current	1.2	0.6		ampere
Heater Warm-up Time (Average)	—	11		seconds
Heater-Cathode Voltage:				
Peak value	±200 max	+200	—300 max	volts
Average value	100 max	+100	—200 max	volts

Class A_1 Amplifier

MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	130	volts
Grid-No.2 (Screen-Grid) Voltage	130	volts
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	volts
Plate Dissipation	5	watts
Grid-No.2 Input	1.4	watts
Bulb Temperature (At hottest point)	180	°C

TYPICAL OPERATION

Plate Voltage	110	125	volts
Grid-No.2 Voltage	110	125	volts
Grid-No.1 (Control-Grid) Voltage	—4	—4.5	volts
Peak AF Grid-No.1 Voltage	4	4.5	volts
Zero-Signal Plate Current	32	37	mA
Maximum-Signal Plate Current	31	36	mA
Zero-Signal Grid-No.2 Current (Approx.)	3.5	4	mA
Maximum-Signal Grid-No.2 Current (Approx.)	7.5	11	mA
Plate Resistance (Approx.)	16000	15000	ohms
Transconductance	8100	9200	μmhos
Load Resistance	3500	4500	ohms
Total Harmonic Distortion	5	6	per cent
Maximum-Signal Power Output	1.1	1.5	watts

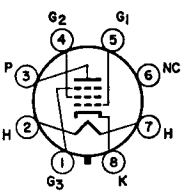
MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1	megohm
For cathode-bias operation	0.5	megohm

6CA7 Refer to chart at end of section.

6CA7/ EL34

POWER PENTODE



8ET

Glass octal types used in the output stage of audio-frequency amplifiers. Maximum dimensions: over-all length, 4 7/16 inches; seated height, 3 7/8 inches; diameter, 1½ inches. Tube requires octal socket.

Heater Voltage (ac/dc)	6.3	volts
Heater Current	1.5	amperes
Peak Heater-Cathode Voltage	±200 max	volts

Direct Interelectrode Capacitances:		
Grid No.1 to Plate	1	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3	15.5	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3	7.2	pF

Class A_1 Amplifier

MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	800	volts
Grid-No.2 (Screen-Grid) Voltage	425	volts
Grid-No.2 Input	8	watts
Cathode Current	150	mA
Plate Dissipation	25	watts

TYPICAL OPERATION

Plate Voltage	265	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	—13.5	volts
Peak AF Grid-No.1 Voltage	12.3	volts
Zero-Signal Plate Current	100	mA
Zero-Signal Grid-No.2 Current	15	mA
Transconductance	11000	μmhos
Plate Resistance	15000	ohms
Load Resistance	2000	ohms
Maximum-Signal Power Output	11	watts
Total Harmonic Distortion	10	per cent

MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance, for cathode-bias operation	0.7	megohm

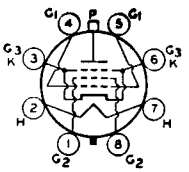
Push-Pull Class AB_1 Amplifier

MAXIMUM RATINGS (Same as for Class A_1 Amplifier)

TYPICAL OPERATION (Values are for two tubes)

Plate Supply Voltage	450	volts
Grid-No.2 Supply Voltage	450	volts
Cathode-Bias Resistor	232	ohms
Grid-No.2 Resistor	1000	ohms
Peak AF Grid-No.1 to Grid-No.1 Voltage	38.2	volts
Zero-Signal Plate Current	120	mA
Maximum-Signal Plate Current	143	mA
Zero-Signal Grid-No.2 Current	20	mA
Maximum-Signal Grid-No.2 Current	44	mA
Effective Load Resistance (Plate-to-plate)	6500	ohms
Total Harmonic Distortion	5.1	per cent
Maximum-Signal Power Output	40	watts

Refer to chart at end of section. **6CB5**



8GD

BEAM POWER TUBE **6CB5A**

Glass octal type used as horizontal-deflection amplifier in color and black-and-white television receivers. **Outlines section,** 21B; requires octal socket.

Heater Voltage (ac/dc)	6.3	volts
Heater Current	2.5	amperes
Heater-Cathode Voltage:		
Peak value	±200 max	volts
Average value	100 max	volts
Direct Interelectrode Capacitances (Approx.):		
Grid No.1 to Plate	0.4	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3	22	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3	10	pF

Class A_1 Amplifier

CHARACTERISTICS

Plate Voltage	75	175	volts
Grid-No.2 Voltage	150	175	volts
Grid-No.1 Voltage	0	—30	volts

Mu-Factor, Grid No.2 to Grid No.1	—	3.8	
Plate Resistance (Approx.)	—	5000	ohms
Transconductance	—	8800	μmhos
Plate Current	460●	90	mA
Grid-No.2 Current	42●	6	mA
Grid-No.1 Voltage (Approx.) for plate current of 1 mA	—	—60	volts

● These values can be measured by a method involving a recurrent waveform such that the maximum rating of the tube will not be exceeded.

Horizontal-Deflection Amplifier

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

MAXIMUM RATINGS (Design-Maximum Values)

DC Plate Voltage	880	volts
Peak Positive-Pulse Plate Voltage#	6800	volts
Peak Negative-Pulse Plate Voltage	1650	volts
DC Grid-No.2 (Screen-Grid) Voltage	220	volts
DC Grid-No.1 (Control-Grid) Voltage	—55	volts
Peak Negative-Pulse Grid-No.1 Voltage	220	volts
Peak Cathode Current	850	mA
Average Cathode Current	240	mA
Grid-No.2 Input	4	watts
Plate Dissipation†	26	watts
Bulb Temperature (At hottest point)	220	°C

MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance	0.47	megohm

Pulse duration must not exceed 15% of a horizontal scanning cycle (10 microseconds).
† A bias resistor or other means is required to protect the tube in absence of excitation.

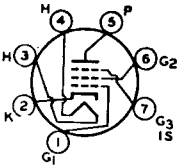
6CB6 Refer to chart at end of section.
For replacement use type 6CB6A/6CF6.

6CB6A For replacement use type 6CB6A/6CF6.

6CB6A/ 6CF6

3CB6/3CF6, 4CB6

SHARP-CUTOFF PENTODE



7CM

Miniature types used in color and black-and-white television receivers as if amplifier at frequencies up to about 45 MHz and as rf amplifiers in vhf television tuners. **Outlines section, 5C;** requires miniature 7-contact socket. For typical operation as resistance-coupled amplifiers, refer to **Resistance-Coupled Amplifier** section. Types 3CB6/3CF6, and 4CB6 are identical with type 6CB6A/6CF6 except for heater ratings.

	3CB6/3CF6	4CB6	6CB6A/6CF6	
Heater Voltage (ac/dc)	3.15	4.2	6.3	volts
Heater Current	0.6	0.45	0.3	ampere
Heater Warm-up Time (Average)	11	11	11	seconds
Heater-Cathode Voltage:				
Peak value	+200 max —300 max	+200 max —300 max	±200 max	volts
Average value	100 max	+100 max —200 max	100 max	volts
Direct Interelectrode Capacitances:		Unshielded	Shielded▲	
Grid No.1 to Plate		0.025 max	0.015 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		6.5	6.5	pF
Plate to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		2	3	pF

▲ With external shield connected to cathode.

Class A_1 Amplifier

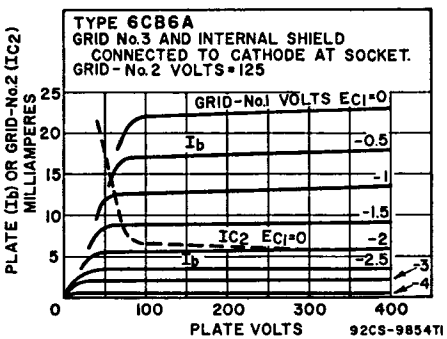
MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	330	volts
Grid-No.3 (Suppressor-Grid) Voltage, Positive value	0	volts
Grid-No.2 (Screen-Grid) Voltage	See curve page 300	

Grid-No.2 Supply Voltage	330	volts
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	volts
Plate Dissipation	2.3	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	0.55	watt
For grid-No.2 voltages between 165 and 330 volts	See curve page 300	

CHARACTERISTICS

Plate Supply Voltage	125	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	125	volts
Cathode-Bias Resistor	56	ohms
Plate Resistance (Approx.)	0.28	megohm
Transconductance	8000	μmhos
Plate Current	13	mA
Grid-No.2 Current	3.7	mA
Grid-No.1 Voltage (Approx.) for plate current of 20 μA	—6.5	volts
Grid-No.1 Voltage (Approx.) for plate current of 2.8 mA	—3	volts



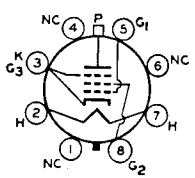
For replacement use type 6CE3/6CD3/6DT3. **6CD3**

Refer to chart at end of section. **6CD6G**

6CD6GA

25CD6GB

BEAM POWER TUBE



5BT

Glass octal type used as horizontal-deflection amplifier in high-efficiency deflection circuits of color and black-and-white television receivers. **Outlines section, 21B;** requires octal socket. This type may be supplied with pins 1, 4, and 6 omitted. Vertical tube mounting is preferred, but horizontal operation is permissible if pins No.2 and 7 are in vertical plane. Type 25CD6GB is identical with type 6CD6GA except for heater ratings.

	6CD6GA	25CD6GB	
Heater Voltage (ac/dc)	6.3	25	volts
Heater Current	2.5	0.6	amperes
Heater Warm-up Time (Average)	—	11	seconds
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts
Direct Interelectrode Capacitances (Approx.):			
Grid No.1 to Plate		1.1	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3		22	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3		8.5	pF

Class A_1 Amplifier

CHARACTERISTICS

Plate Voltage	60	175	volts
Grid-No.2 (Screen-Grid) Voltage	100	175	volts
Grid-No.1 (Control-Grid) Voltage	0	—30	volts
Mu-Factor, Grid No.2 to Grid No.1	—	3.9	

Plate Resistance (Approx.)	—	7200	ohms
Transconductance	—	7700	μmhos
Plate Current	230•	5.5	mA
Grid-No.2 Current	21•	5.5	mA
Grid-No.1 Voltage (Approx.) for plate current of 1 mA	—	—55	volts

• This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

Horizontal-Deflection Amplifier

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

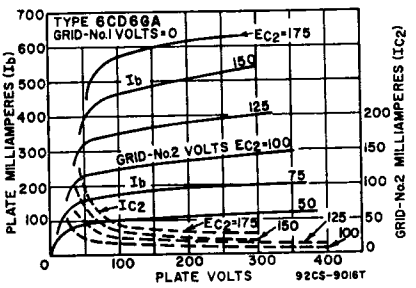
MAXIMUM RATINGS (Design-Center Values)

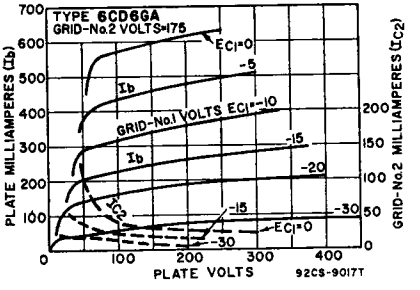
DC Plate Voltage	700	volts
Peak Positive-Pulse Plate Voltage# (Absolute Maximum)	7000▪	volts
Peak Negative-Pulse Plate Voltage	1500	volts
DC Grid-No.2 (Screen-Grid) Voltage	175	volts
Peak Negative-Pulse Grid-No.1 Voltage	700	volts
Peak Cathode Current	200	mA
Average Cathode Current	—200	mA
Plate Dissipation†	20	watts
Grid-No.2 Input	3	watts
Bulb Temperature (At hottest point)	225	°C

MAXIMUM CIRCUIT VALUE

Grid-No.-Circuit Resistance, for grid-resistor-bias operation ..... 0.47 megohm

Pulse duration must not exceed 15% of a horizontal scanning cycle (10 microseconds).
▪ Under no circumstances should this absolute value be exceeded.
† A bias resistor or other means is required to protect the tube in absence of excitation.





6CE3

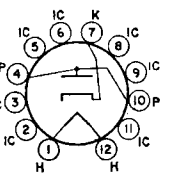
Refer to chart at end of section.
For replacement use type 6CE3/6CD3/6DT3.

6CE3/ 6CD3/6DT3

34CE3

HALF-WAVE VACUUM RECTIFIER

Duodecar type used as a damper diode in the horizontal-deflection circuit of color television receivers. **Outlines section,** 8G; requires duodecar 12-contact socket. Type 34CE3 is identical with type 6CE3/6CD3/6DT3 except for heater ratings.



12GK

	6CE3/ 6CD3/6DT3	34CE3	
Heater Voltage (ac/dc)	6.3	34.5	volts
Heater Current	2.5	0.45	amperes
Heater Warm-up Time (Average)	—	11	seconds
Direct Interelectrode Capacitances:			
Plate to Cathode and Heater		13	pF
Cathode to Plate and Heater		18	pF
Heater to Cathode		5.5	pF

Damper Service

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

MAXIMUM RATINGS (Design-Maximum Values)

Peak Inverse Plate Voltage#		5000	volts
Peak Plate Current		1500	mA
Average Plate Current		350	mA
Plate Dissipation		11	watts
Bulb Temperature (At hottest point)		220	°C
Heater-Cathode Voltage			
Peak value	+300	—5500	volts
Average value	+100	—900	volts

CHARACTERISTIC, Instantaneous Value

Tube Voltage Drop for plate current of 680 mA	20	volts

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

6CE5 — Refer to chart at end of section. For replacement use type 6BC5/6CE5.

6CF6 — Refer to chart at end of section. For replacement use type 6CB6A/6CF6.

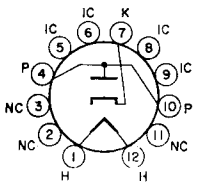
6CG3 — For replacement use type 6CG3/6BW3/6DQ3.

6CG3/6BW3 — For replacement use type 6CG3/6BW3/6DQ3.

HALF-WAVE VACUUM RECTIFIER

6CG3/ 6BW3/ 6DQ3

19CG3/19DQ3, 25CG3



12FX

Duodecar type used as damper diode in horizontal-deflection circuits of color and black-and-white television receivers. **Outlines section,** 8G, requires duodecar 12-contact socket. Types 19CG3/19DQ3 and 25CG3 are identical with type 6CG3 except for heater ratings.

	6CG3/ 6BW3/6DQ3	19CG3/ 19DQ3	25CG3	
Heater Voltage (ac/dc)	6.3	19	25	volts
Heater Current	1.8	0.6	0.45	amperes
Heater Warm-up Time	—	11	11	seconds

Damper Service

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

MAXIMUM RATINGS (Design-Maximum Values)

Peak Inverse Plate Voltage#		5000	volts
Peak Plate Current		2100	mA
Average Plate Current		350	mA
Plate Dissipation		6.5	watts
Heater-Cathode Voltage:			
Peak value	+300	—5000	volts
Average value	+100	—900	volts

CHARACTERISTIC, Instantaneous Value

Tube Voltage Drop for plate current of 700 mA	25	volts

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

Refer to chart at end of section. For replacement use type 6CG3/6BW3/6DQ3. — **6CG3/6CD3**

For replacement use type 6FQ/6CG7. — **6CG7**

Refer to chart at end of section. — **6CG8**