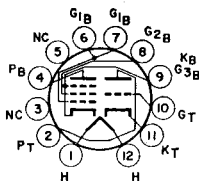


6LU8

16LU8A, 21LU8

Duodecar type used as a combined vertical-deflection oscillator and vertical-deflection amplifier in color television receivers. Outlines section, 15D; requires duodecar 12-contact socket. Types 16LU8A and 21LU8 are identical with type 6LU8 except for heater ratings.

**HIGH-MU TRIODE—
BEAM POWER TUBE**

12DZ

	6LU8	16LU8A	21LU8	
Heater Voltage	6.3	16	21	volts
Heater Current	1.5	0.6	0.45	amperes
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

Class A₁ Amplifier

CHARACTERISTICS	Triode Unit		Beam Power Unit		
Plate Voltage	250	45	135	120	volts
Grid-No.2 (Screen-Grid) Voltage	—	125	120	120*	volts
Grid-No.1 (Control-Grid) Voltage	—4	0	—10	—10	volts
Amplification Factor	58	—	—	6.5	
Plate Resistance (Approx.)	16000	—	12000	—	ohms
Transconductance	3600	—	9300	—	μmhos
Plate Current	2.3	200**	56	—	mA
Grid-No.2 Current	—	20**	3	—	mA
Grid-No.1 Voltage (Approx.):					
For plate current of 10 μA	—6.6	—	—	—	volts
For plate current of 100 μA	—	—	—30	—	volts
For plate current of 1 mA	—	—	—26	—	volts

* Triode connection, Grid No.2 connected to plate at socket.

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

Vertical-Deflection Oscillator and Amplifier

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

MAXIMUM RATINGS (Design-Maximum Values)	Triode Unit		
	Oscillator	Beam Power Unit Amplifier	
Plate Voltage	400	400	volts
Grid-No.2 Voltage	—	300	volts
Peak Positive-Pulse Plate Voltage#	—	2500	volts
Peak Negative-Pulse Grid-No.1 Voltage	400	250	volts
Plate Dissipation*	2.5	14	watts
Peak Cathode Current	105	260	mA
Average Cathode Current	30	75	mA
Grid-No.2 Input	—	2.75	watts
Bulb Temperature (At hottest point)	—	210	°C

MAXIMUM CIRCUIT VALUES

Grid-Circuit Resistance:			
For fixed-bias operation	—	1	megohm
For cathode-bias operation	2.2	2.2	megohms

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.

6LX6

For replacement use type 6LF6/6LX6.

6LX8/LCF802

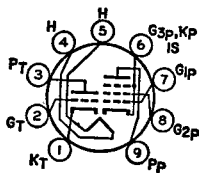
Refer to type 6JW8/ECF802.

6LY8

10LY8

**HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE**

Miniature type used in color and black-and-white television receiver applications. The pentode unit is used as a video amplifier, and the triode unit for general-purpose use. Outlines section, 6E; requires 9-contact socket. Type 10LY8 is identical with type 6LY8 except for heater ratings.



9DX

	6LY8	10LY8	
Heater Voltage	6.3	10.5	volts
Heater Current	0.75	0.45	ampere
Heater Warm-up Time (Average)	—	11	seconds
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)	Triode Unit	Pentode Unit	
Plate Voltage	330	330	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	0	volts
Plate Dissipation	1	5	watts
Grid-No.2 Input:			
For grid-No.2 voltages up to 165 volts	—	1.1	watts
For grid-No.2 voltages between 165 and 330 volts	—	See curve page 300	

CHARACTERISTICS

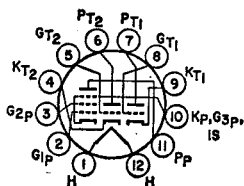
Plate Voltage	250	35	200	volts
Grid-No.2 Voltage	—	100	100	volts
Grid-No.1 Voltage	-2.0	0	—	volts
Cathode-Bias Resistor	—	—	82	ohms
Amplification Factor	100	—	—	
Plate Resistance (Approx.)	59000	—	60000	ohms
Transconductance	1700	—	20000	μmhos
Plate Current	1.0	54	19.5	mA
Grid-No.2 Current	—	13.5	3	mA
Grid Voltage (Approx.) for plate current of 10 μA	-5	—	—	volts
Grid-No.1 Voltage (Approx.) for plate current of 100 μA	—	—	-6.3	volts

MAXIMUM CIRCUIT VALUES

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

Refer to chart at end of section.

6LZ6



12CA

**HIGH-MU TWIN TRIODE—
SHARP-CUTOFF PENTODE**

6M11

Duodecar type used in television receiver applications. The triode units are used in sync-separator and agc-amplifier circuits; the pentode unit is used in if-amplifier circuits. Outlines section, 8B; requires duodecar 12-contact socket.

Heater Voltage (ac/dc)	6.3	volts
Heater Current	0.77	ampere
Heater-Cathode Voltage:		
Peak value	±200 max	volts
Average value	100 max	volts
Direct Interelectrode Capacitances:**		
Triode Units:		
Grid to Plate	1.8	pF
Grid to Triode Cathode, Pentode Cathode, Heater, Pentode Grid No.3, and Internal Shield	3.4	pF
Plate to Triode Cathode, Pentode Cathode, Heater, Pentode Grid No.3, and Internal Shield	0.8	pF
Pentode:		
Grid No.1 to Plate	0.03	pF
Grid No.1 to Cathode, Grid No.2, Grid No.3, and Internal Shield	12	pF
Plate to Cathode, Grid No.2, Grid No.3, and Internal Shield	2.8	pF

** With external shield connected to pentode cathode, grid No.3, and internal shield.

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)	Each Triode Unit	Pentode Unit	
Plate Voltage	330	330	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	0	volts
Plate Dissipation	2.25	3.1	watts
Grid-No.2 Input:			
For voltages up to 165 volts	—	0.65	watt
For voltages between 165 and 330 volts	—	See curve page 300	

CHARACTERISTICS

Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	—	125	volts
Cathode-Bias Resistor	125	56	ohms
Amplification Factor	58	—	—
Plate Resistance (Approx.)	7250	20000	ohms
Transconductance	8000	13000	μ mhos
Plate Current	8	11	mA
Grid-No.2 Current	—	3.4	mA
Grid-No.1 Voltage (Approx.) for plate current of 20 μ A	—	—3.5	volts
Grid-No.1 Voltage (Approx.) for plate current of 50 μ A	—4.5	—	volts

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance, for cathode-bias operation	0.68	1	megohm
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6MA6

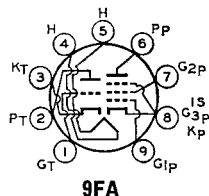
Refer to chart at end of section.

6MB8

5MB8

HIGH-MU TRIODE SHARP-CUTOFF PENTODE

Miniature type with frame-grid pentode unit used in color television receivers. The triode unit is used in video-amplifier applications. The pentode unit is used in burst-amplifier service. Outlines section, 6B; requires miniature 9-contact socket. Type 5MB8 is identical with type 6MB8 except for heater ratings.



Heater Arrangement	5MB8 Series	6MB8 Parallel	
Heater Voltage (ac/dc)	5.6	6.3	volts
Heater Current	0.45	0.4	amperes
Heater Warm-up Time	11	—	seconds
Heater-Cathode Voltage:			
Peak value	± 200 max	± 200 max	volts
Average value	100 max	100 max	volts

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	Triode Unit 280	Pentode Unit 280	volts
Grid-No.2 (Screen-Grid) Supply Voltage	—	280	volts
Grid-No.2 Pulse Voltage	—	300	volts
Grid-No.2 Voltage	—	See curve page 300	
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	0	volt
Plate Dissipation	2	2	watts
Cathode Current	20	20	mA
Grid-No.2 Input	—	0.5	watt

CHARACTERISTICS

Plate Voltage	125	125	volts
Grid-No.2 Voltage	—	125	volts
Grid-No.1 Voltage	0	0	volt
Cathode-Bias Resistor	68	33	ohm
Plate Current	13	10	mA
Grid-No.2 Current	—	2.8	mA
Transconductance	8000	12000	μ mhos
Amplification Factor	40	—	—
Plate Resistance (Approx.)	5000	125000	ohms
Grid-No.1 Voltage for plate current of 100 μ A	—5	—	volts
Grid-No.1 Voltage for plate current of 50 μ A	—	—3	volts

MAXIMUM CIRCUIT VALUES

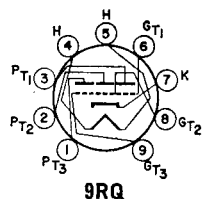
Grid-No.1-Circuit Resistance:	Triode Unit	Pentode Unit	
For fixed-bias operation	0.5	0.25	megohm
For cathode-bias operation	1	0.5	megohm

6MD8

12MD8

MEDIUM-MU TRIPLE TRIODE

Novar type used in matrixing circuits of color and black-and-white television receivers. Outlines section, 11E; requires novar 9-contact socket. Type 12MD8 is identical with type 6MD8 except for heater ratings.



9RQ

Heater Arrangement	6MD8 Parallel	12MD8 Series	
Heater Voltage (ac/dc)	6.3	12.6	volts
Heater Current	0.9	0.45	ampere
Heater Warm-up Time (Average)	—	11	seconds
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts
	Unit No.1	Unit No.2	Unit No.3
Direct Interelectrode Capacitances (Approx.):			
Grid to Plate	3	3	3 pF
Grid to Cathode and Heater	3.6	3.6	3.4 pF
Plate to Cathode and Heater	0.48	0.48	0.36 pF

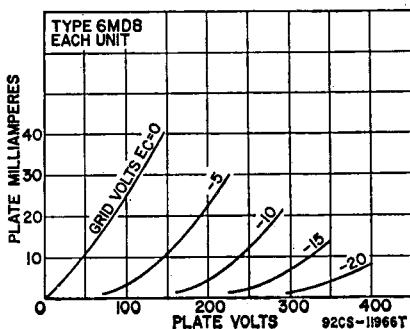
Class A₁ Amplifier (Each Unit)

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage		330	volts
Grid Voltage, Positive-bias value		0	volts
Plate Dissipation		3	watts

CHARACTERISTICS

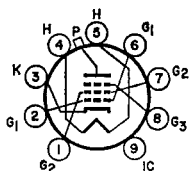
Plate Voltage		250	volts
Grid Voltage		-10.5	volts
Amplification Factor		17	
Plate Resistance (Approx.)		5500	ohms



Transconductance		3100	μmhos
Plate Current		11.5	mA
Plate Current for grid voltage of -14 volts		4	mA
Grid Voltage (Approx.) for plate current of 50 μA		-23	volts

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance, for fixed-bias operation		1	megohm
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9QL

BEAM POWER TUBE

6ME6

Novar types used as horizontal-deflection amplifier in color and black-and-white television receivers. Outlines section, 32C; require novar 9-contact socket.

Heater Voltage (ac/dc)		6.3 ±0.6	volts
Heater Current		2.3	amperes
Heater-Cathode Voltage:			
Peak value		±200 max	volts
Average value		100 max	volts
Direct Interelectrode Capacitances:			
Grid No.1 to Plate		0.6	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		11	pF

Class A₁ Amplifier

CHARACTERISTICS	Triode* Connection		Pentode Connection		
	Connection	5000	55	175	
Peak Positive-Pulse Plate Voltage#	—	—	—	—	volts
Plate Voltage	125	—	55	175	volts
Grid-No.3 (Suppressor-Grid) Voltage	—	0	30	30	volts
Grid-No.2 (Screen-Grid) Voltage	125	125	125	125	volts
Grid-No.1 (Control-Grid) Voltage	-25	—	0	-25	volts
Plate Resistance (Approx.)	—	—	—	5800	ohms
Transconductance	—	—	—	9600	μmhos
Plate Current	—	—	580 $\frac{1}{2}$	130	mA
Grid-No.2 Current	—	—	40 $\frac{1}{2}$	2.8	mA
Grid-No.1 Voltage for plate current of 1 mA	—	-125	—	-44	volts
Amplification Factor	3.5	—	—	—	

* Grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.

‡ This value may 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-Maximum Values)

Plate Supply Voltage	990	volts
Peak Positive-Pulse Plate Voltage#	7500	volts
Peak Negative-Pulse Plate Voltage	1100	volts
Grid-No.3 Voltage*	75	volts
Grid-No.2 Voltage	220	volts
Peak Negative-Pulse Grid-No.1 Voltage	330	volts
Peak Cathode Current	1200	mA
Average Cathode Current	350	mA
Plate Dissipation ^o	30	watts
Plate Dissipation (Temporary overload) [▲]	200	watts
Grid-No.2 Input	5	watts
Envelope Temperature (At hottest point)	250	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance for Cathode Bias (with min. R _k = 100Ω)	1.0	megohm
Grid-leak Bias (with signal peak clamped to zero bias)	10.0	megohms
Fixed Bias (where positive grid current is not drawn)	0.47	megohm

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

^o For horizontal-deflection service, a positive voltage may be applied to grid-No.3 to minimize "snivets" interference in both vhf and uhf television receivers. A typical value is 30 volts.

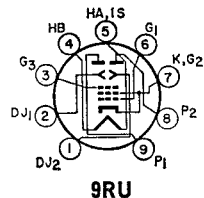
[▲] A bias resistor or other means is required to protect the tube in absence of excitation.

▲ Total continuous or accumulated time not to exceed 40 seconds.

6ME8

TWO-PLATE
BEAM-DEFLECTION TUBE

Miniature type used for color-demodulator applications in color television receivers and a variety of other switching and gate applications. Outlines section, 6E; requires miniature 9-contact socket. Pin 5 should be connected directly to ground. The 6ME8 should be so located in the equipment that it is not subjected to stray magnetic fields.



9RU

Heater Voltage (ac/dc)	6.3	volts
Heater Current	0.3	ampere
Direct Interelectrode Capacitances:		
Grid No.1 to All Other Electrodes Except Plates	7.5	pF
Either Plate to All Other Electrodes	6	pF
Either Deflecting Electrode to All Other Electrodes	6	pF
Plate No.1 to Plate No.2	0.4	pF
Deflecting Electrode No.1 to Deflecting Electrode No.2	0.4	pF
Grid No.1 to Deflecting Electrode No.1	0.07 max	pF
Grid No.1 to Deflecting Electrode No.2	0.1 max	pF

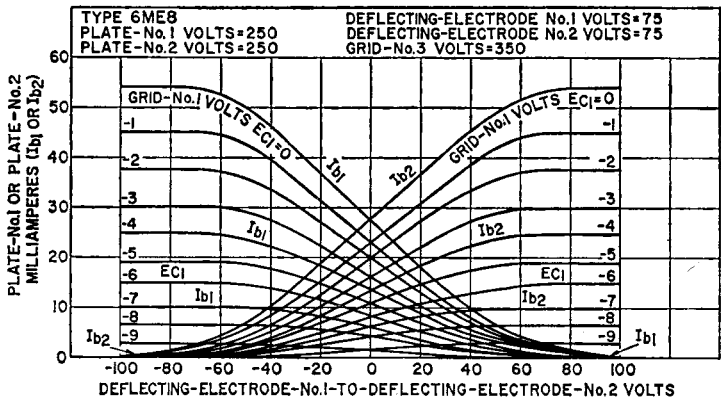
Color TV Demodulator

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage (Each Plate)	400	volts
Peak Deflecting-Electrode Voltage (Each Electrode)	±200	volts
Deflecting-Electrode Voltage (Each Electrode)	100	volts
Grid-No.3 (Accelerating-Grid) Voltage	400	volts
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	volts
Cathode Current	30	mA
Plate Dissipation (Each Plate)	2	watts
Grid-No.3 Input	2	watts

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1	megohm
For cathode-bias operation	0.25	megohm

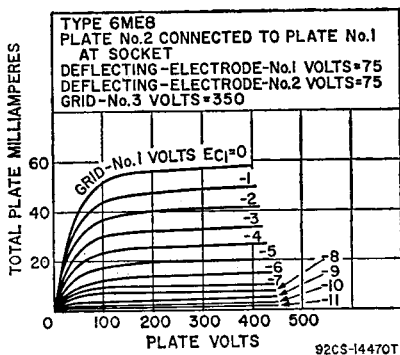


Class A₁ Amplifier

CHARACTERISTICS

Plate-No.2 Supply Voltage	250	volts
Plate No.2	Connected to Plate No.1	
Plate-No.1 Supply Voltage	250	volts
Grid-No.3 Supply Voltage	350	volts
Grid-No.1 Supply Voltage	0	volts
Deflecting-Electrode-No.2 Supply Voltage	75	volts
Deflecting-Electrode-No.1 Supply Voltage	75	volts
Cathode-Bias Resistor	390	ohms
Transconductance, Grid No.1 to both plates	4400	μmhos
Total Plate Current	14.5	mA
Grid-No.3 Current	0.7	mA
Grid-No.1 Voltage for total plate current of 10 μA	-16	volts
Deflecting-Electrode Switching Voltage*	30 max	volts
Voltage Difference between Deflecting Electrodes for equal plate currents	0	volts
Plate-No.1 Current with Deflecting-Electrode-No.1 Voltage = 55V and Deflecting-Electrode-No.2 Voltage = 95V	1.3 max	mA
Plate-No.2 Current with Deflecting-Electrode-No.1 Voltage = 95V and Deflecting-Electrode-No.2 Voltage = 55V	1.3 max	mA
Deflecting-Electrode-No.1 Current with Deflecting-Electrode-No.1 Voltage = 125V and Deflecting-Electrode-No.2 Voltage = 25V	0.04 max	mA
Deflecting-Electrode-No.2 Current with Deflecting-Electrode-No.1 Voltage = 25V and Deflecting-Electrode-No.2 Voltage = 125V	0.04 max	mA

* Defined as the total voltage change from 75 volts on either deflecting electrode with an equal and opposite change on the other deflecting electrode required to switch the plate current from one plate to the other.

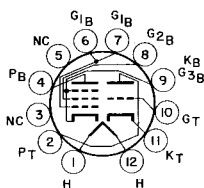


6MF8

15MF8

HIGH-MU TRIODE— BEAM POWER TUBE

Duodecar type used in combined vertical-deflection-oscillator and vertical-deflection-amplifier applications in color television receivers. Outlines section, 15D; requires duodecar 12-contact socket. Type 15MF8 is identical with type 6MF8 except for heater ratings.



12DZ

	6MF8	15MF8	
Heater Voltage	6.3	15.7	volts
Heater Current	1.4	0.6	amperes
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts

Class A₁ Amplifier

CHARACTERISTICS	Triode Unit		Beam Power Unit		
	250	250	60	250	
Plate Voltage	250	250	60	250	volts
Grid-No.2 (Screen-Grid) Voltage	—	250	250	250	volts
Grid-No.1 (Control-Grid) Voltage	—4	0	—20	—20	volts
Plate Current	2.6	200	50	50	mA
Grid-No.2 Current	—	20	3.5	3.5	mA
Transconductance	4100	—	4100	—	μmhos
Amplification Factor	58	—	—	—	
Plate Resistance (Approx.)	14000	—	5000	—	ohms
Grid-No.1 Voltage for plate current of 10 μA	—6.6	—	—	—	volts
Grid-No.1 Voltage for plate current of 100 μA	—	—	—65	—	volts

Vertical-Deflection Oscillator and Amplifier

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

MAXIMUM RATINGS (Design-Maximum Values)	Triode Unit	Beam Power	
	Oscillator	Unit Amplifier	
Plate Voltage	400	400	volts
Peak Positive Pulse Plate Voltage#	—	2500	volts
Grid-No.2 Voltage	—	300	volts
Peak Negative Grid-No.1 Voltage	400	—	volts
Plate Dissipation*	2.5	12	watts
Grid-No.2 Dissipation*	—	2.75	watts
Average Cathode Current	30	75	mA
Peak Cathode Current	105	260	mA
Peak Power Output	2.5	—	watts
Bulb Temperature	—	200	°C

MAXIMUM CIRCUIT VALUES

Grid Circuit Resistance:			
For fixed-bias operation	—	1	megohm
For cathode-bias operation	2.2	2.2	megohms

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

* A bias resistor or other means is required to protect the tube in absence of excitation.