

**12AC6**

Refer to chart at end of section.

**12AC10A**

Refer to type 6AC10

**12AD6**

Refer to chart at end of section.

**12AE6**

Refer to chart at end of section.

**12AE6A**

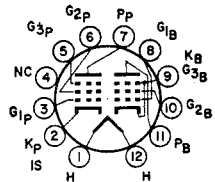
**12AE7**

Refer to chart at end of section.

**12AE10**

**BEAM POWER TUBE—  
SHARP-CUTOFF PENTODE**

Duodecar type used as combined FM detector and audio-frequency output amplifier in television receivers. The beam power unit is used in af output stages and the pentode unit as an FM detector. Outlines section, 8C; requires duodecar 12-contact socket. Heater: volts (ac/dc), 12.6; amperes, 0.45; warm-up time (average), 11 seconds; maximum heater-cathode volts,  $\pm 200$  peak, 100 average.



**12EZ**

**Beam Power Unit as Class A<sub>1</sub> Amplifier**

**MAXIMUM RATINGS** (Design-Maximum Values)

Plate Voltage .....	165	volts
Grid-No.2 (Screen-Grid) Voltage .....	150	volts
Cathode Current .....	60	mA
Plate Dissipation .....	6	watts
Grid-No.2 Input .....	1.25	watts

**TYPICAL OPERATION**

Plate Voltage .....	145	volts
Grid-No.2 Voltage .....	110	volts
Grid-No.1 (Control-Grid) Voltage .....	-7	volts
Peak AF Grid-No.1 Voltage .....	7	volts
Zero-Signal Plate Current .....	34	mA
Maximum-Signal Plate Current .....	39	mA
Zero-Signal Grid-No.2 Current .....	6.5	mA
Maximum-Signal Grid-No.2 Current .....	9.3	mA
Plate Resistance (Approx.) .....	33000	ohms
Transconductance .....	5600	$\mu$ mhos
Load Resistance .....	2500	ohms
Total Harmonic Distortion (Approx.) .....	12	per cent
Maximum-Signal Power Output .....	1.45	watts

**MAXIMUM CIRCUIT VALUE**

Grid-No.1-Circuit Resistance: For cathode-bias operation .....	1	megohm
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**Pentode Unit as Class A<sub>1</sub> Amplifier**

**CHARACTERISTICS**

Plate Voltage .....	150	volts
Grid-No.3 (Suppressor-Grid) Voltage .....	0	volts
Grid-No.2 Voltage .....	100	volts
Cathode-Bias Resistor .....	560	ohms
Plate Resistance (Approx.) .....	0.15	megohm
Transconductance, Grid No.1 .....	1000	μmhos
Transconductance, Grid No.3 .....	400	μmhos
Plate Current .....	1.3	mA
Grid-No.2 Current .....	2	mA
Grid-No.1 Voltage (Approx.) for plate current of 10 μA .....	-4.5	volts
Grid-No.3 Voltage (Approx.) for plate current of 10 μA .....	-4.5	volts

**Pentode Unit as FM Detector**

**MAXIMUM RATINGS (Design-Maximum Values)**

Plate Voltage .....	330	volts
Grid-No.3 Voltage .....	28	volts
Grid-No.2 Supply Voltage .....	330	volts
Grid-No.2 Voltage .....	See curve page 300	
Grid-No.1 Voltage, Positive-bias value .....	0	volts
Plate Dissipation .....	1.7	watts
Grid-No.2 Input .....	1.1	watts

Refer to type 6AF3.

**12AF3  
12AF3/12BR3/  
12RK19**

Refer to chart at end of section.

**12AF6**

Refer to chart at end of section.

**12AH7GT**

Refer to chart at end of section.

**12AJ6**

Refer to type 6AL5.

**12AL5**

Refer to chart at end of section.

**12AL8**

Refer to type 6AL11.

**12AL11**

Refer to type 6AQ5A.

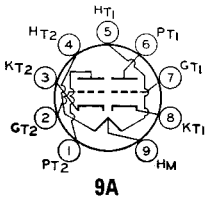
**12AQ5**

Refer to type 6AT6.

**12AT6**

For replacement use type 12AT7/ECC81.

**12AT7**



**9A**

**HIGH-MU TWIN TRIODE**

**12AT7/  
ECC81**

Miniature types used as push-pull cathode-drive amplifiers or frequency converters in the FM and television broadcast bands. **Outlines section, 6B**; require miniature 9-contact socket. Each triode unit is independent of the other except for the common heater. For typical operation as a resistance-coupled amplifier, refer to **Resistance-Coupled Amplifier section**.

Heater Arrangement:	<b>Series</b>	<b>Parallel</b>	
Heater Voltage (ac/dc) .....	12.6	6.3	volts
Heater Current .....	0.15	0.3	ampere
Peak Heater-Cathode Voltage .....		±90 max	volts