

Zero-Signal Plate Current	33.5	45	mA
Maximum-Signal Plate Current	36	47	mA
Zero-Signal Grid-No.2 Current	1.6	4.5	mA
Maximum-Signal Grid-No.2 Current	3.2	7	mA
Plate Resistance (Approx.)	75000	50000	ohms
Transconductance	4000	4100	μ mhos
Load Resistance	6000	5000	ohms
Total Harmonic Distortion	8	8	per cent
Maximum-Signal Power Output	3.3	4.5	watts

MAXIMUM CIRCUIT VALUES

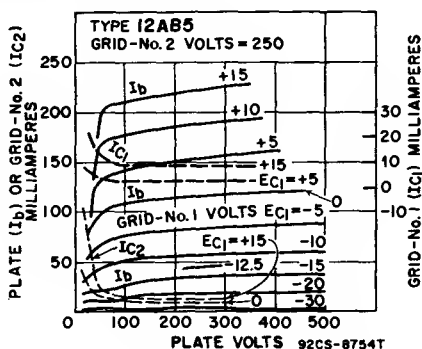
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.1		megohm
For cathode-bias operation	0.5		megohm

Push-Pull Class AB₁ Amplifier**MAXIMUM RATINGS (Same as for Single-Tube Class A₁ Amplifier)****TYPICAL OPERATION WITH 12.6 VOLTS ON HEATER (Values are for two tubes)**

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	-15	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	30	volts
Zero-Signal Plate Current	70	mA
Maximum-Signal Plate Current	79	mA
Zero-Signal Grid-No.2 Current	5	mA
Maximum-Signal Grid-No.2 Current	13	mA
Effective Load Resistance (Plate-to-Plate)	10000	ohms
Total Harmonic Distortion	5	per cent
Maximum-Signal Power Output	10	watts

MAXIMUM CIRCUIT VALUES

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

**12AC6**

Refer to chart at end of section.

12AD6

Refer to chart at end of section.

12AE6

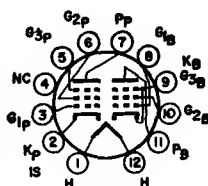
Refer to chart at end of section.

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 (av-

**12EZ**

erage), 11 seconds; maximum heater-cathode volts, ± 200 peak, 100 average.

Beam Power Unit as Class A₁ 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	μ 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

Pentode Unit as Class A₁ 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	μ mhos
Transconductance, Grid No.3	400	μ mhos
Plate Current	1.3	mA
Grid-No.2 Current	2	mA
Grid-No.1 Voltage (Approx.) for plate current of 10 μ A	—4.5	volts
Grid-No.3 Voltage (Approx.) for plate current of 10 μ A	—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 98	
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

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.

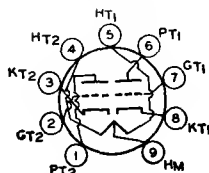
12AT6

12AT7

12AT7/

ECC81

HIGH-MU TWIN TRIODE



9A

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:	Series	Parallel	
Heater Voltage (ac/dc)	12.6	6.3	volts
Heater Current	0.15	0.3	ampere
Peak Heater-Cathode Voltage		±90 max	volts
Direct Interelectrode Capacitances:			
Grid-Drive Operation:			
Grid to Plate (Each unit)		1.5	pF
Grid to Cathode and Heater (Each unit)		2.2	pF
Plate to Cathode and Heater:			
Unit No.1		0.5	pF
Unit No.2		0.4	pF
Cathode-Drive Operation:			
Cathode to Plate (Each unit)		0.2	pF
Cathode to Grid and Heater (Each unit)		4.6	pF
Plate to Grid and Heater (Each unit)		1.8	pF
Heater to Cathode (Each Unit)		2.4	pF

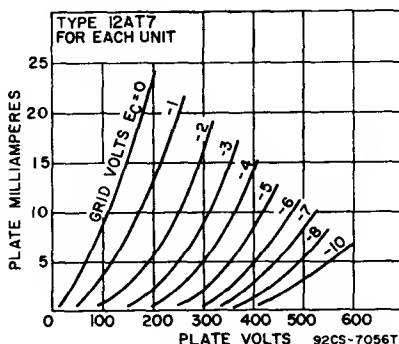
Class A₁ Amplifier (Each Unit)

MAXIMUM AND MINIMUM RATINGS (Design-Center Values)

Plate Voltage	300	volts
Grid Voltage, Negative-bias value	50	volts
Plate Dissipation	2.5	watts

CHARACTERISTICS

Plate Supply Voltage	100	250	volts
Cathode-Bias Resistor	270	200	ohms
Amplification Factor	60	60	
Plate Resistance (Approx.)	15000	10900	ohms
Transconductance	4000	5500	μmhos
Grid Voltage (Approx.) for plate current of 10 μA	-5	-12	volts
Plate Current	3.7	10	mA



12AU6

Refer to type 6AU6A.

12AU7

Refer to chart at end of section.