

# Medium-Mu Triode— Pentagrid Converter

## 9-PIN MINIATURE TYPE

For Automobile Radio Receivers Operating  
Directly from 6-Cell Storage Batteries

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage range (DC) . . . . . 10 to 15.9 volts

*For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at 12.6 volts . . . . . 0.27 volts

Direct Interelectrode Capacitances:<sup>a</sup>

#### Triode Unit:

Grid to plate . . . . . 1.3  $\mu\text{f}$

Grid to cathode & heater . . . . . 2.2  $\mu\text{f}$

Plate to cathode & heater . . . . . 0.25  $\mu\text{f}$

#### Heptode Unit:

Grid No.3 to plate . . . . . 0.28 max.  $\mu\text{f}$

Grid No.3 to grid No.1 . . . . . 0.12 max.  $\mu\text{f}$

Grid No.3 to cathode & grid No.5 & internal shield, plate, grids No.2 & No.4, grid No.1, and heater (RF input) . . . . . 6  $\mu\text{f}$

Plate to cathode & grid No.5 & internal shield, grids No.2 & No.4, grid No.1, and heater (Mixer output) . . . . . 5  $\mu\text{f}$

Grid No.1 to cathode & grid No.5 & internal shield, grid No.3, grids No.2 & No.4, and heater (Oscillator input) . . . . . 5  $\mu\text{f}$

Grid No.1 to cathode & grid No.5 & internal shield . . . . . 3  $\mu\text{f}$

Cathode & grid No.5 & internal shield to plate, grids No.2 & No.4, grid No.3, and heater (Oscillator output) . . . . . 17  $\mu\text{f}$

Grid No.1 to plate . . . . . 0.16 max.  $\mu\text{f}$

Triode grid to heptode grid No.3 . . . . . 0.01 max.  $\mu\text{f}$

Triode plate to heptode grid No.3 . . . . . 0.18 max.  $\mu\text{f}$

Triode plate to heptode plate . . . . . 0.2 max.  $\mu\text{f}$

#### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

*With heater voltage of 12.6 volts*

Plate Voltage . . . . . 12.6 volts

Grid Voltage developed across a 2.2-megohm grid resistor . . . . . -0.8 volt

Amplification Factor . . . . . 10

Plate Resistance (Approx.) . . . . . 7150 ohms

Transconductance . . . . . 1400  $\mu\text{mhos}$

Plate Current . . . . . 1.3 ma

Grid Voltage (Approx.) for plate  $\mu\text{a} = 10$  . . . . . -3.2 volts

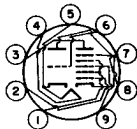


# 12FX8

## Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-7/16"
Maximum Seated Length . . . . .	2-3/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-13/16" ± 3/32"
Diameter . . . . .	0.750" to 0.875"
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9KV

- Pin 1 - Heptode  
Grid No.2,  
Grid No.4
- Pin 2 - Heptode  
Grid No.1
- Pin 3 - Heptode Plate
- Pin 4 - Heater
- Pin 5 - Heater,  
Triode  
Cathode



- Pin 6 - Triode Grid
- Pin 7 - Heptode  
Grid No.5,  
Cathode,  
Internal  
Shield
- Pin 8 - Triode Plate
- Pin 9 - Heptode  
Grid No.3

## HEPTODE UNIT — CONVERTER

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	16 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value . . . . .	16 max.	volts
Positive-bias value . . . . .	0 max.	volts
GRIDS-No.2 & No.4 (SCREEN-GRID) VOLTAGE . . . . .	16 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	16 max.	volts
Heater positive with respect to cathode. . . . .	16 max.	volts

### Typical Operation and Characteristics:

*With self-excitation and heater voltage of 12.6 volts*

Plate Voltage . . . . .	12.6	volts
Grid-No.3 Voltage developed across a 2.2- megohm grid-No.3 resistor . . . . .	-0.5	volt
Grids-No.2 & No.4 Voltage . . . . .	12.6	volts
RMS Grid-No.1 (Oscillator-Grid) Voltage . . . . .	1.6	volts
Grid-No.1 Resistor. . . . .	33000	ohms
Plate Resistance (Approx.) . . . . .	0.5	megohm
Conversion Transconductance . . . . .	300	μmhos
Grid-No.3 Voltage (Approx.) for con- version transconductance (μmhos) = 10 . . . . .	-3	volts
Plate Current . . . . .	290	μa
Grids-No.2 & No.4 Current . . . . .	1.25	ma

### Oscillator Characteristics (Not Oscillating):

*With grids No.2 & No.4 connected to plate  
and with heater voltage of 12.6 volts*

Plate and Grids-No.2 & No.4 Voltage . . . . .	12.6	volts
Grid-No.3 Voltage . . . . .	0	volts
Grid-No.1 Voltage . . . . .	0	volts



Amplification Factor between grid No.1 and grids No.2 & No.4 connected to plate.	9	
Transconductance between grid No.1 and grids No.2 & No.4 connected to plate . . .	3600	$\mu\text{mhos}$
Cathode Current . . . . .	4.4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu\text{a} = 10$ . . . . .	-4.5	volts

**Maximum Circuit Values:**

Grid-No.3-Circuit Resistance . . . . .	10 max.	megohms
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**TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>**

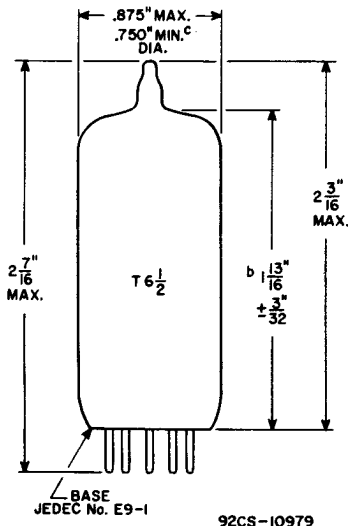
**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . .	16 max.	volts
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**Maximum Circuit Values:**

Grid-Circuit Resistance . . . . .	10 max.	megohms
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<sup>a</sup> Without external shield.



<sup>b</sup> Measured from base seat to bulb-top line as determined by ring gauge of 7/16" inside diameter.

<sup>c</sup> Applies in zone starting 0.375" from seat.

