

DIODE—TRIODE—PENTODE

DESCRIPTION AND RATING

The 12FR8 is a miniature diode-triode-pentode intended for use as a combined intermediate-frequency amplifier, detector, and audio-frequency amplifier in automobile receivers. The tube is specially designed to operate with its plate and screen voltages supplied directly from a 12-volt storage battery.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC. 12.6* Volts

Heater Current. 0.32

Direct Interelectrode Capacitances†

Pentode Section

Grid-Number 1 to Plate: (Pg1 to Pp), maximum. 0.015 μ f

Input: Pg1 to (h+Pk+Pg2+Pg3+i.s.) 8.5 μ f

Output: Pp to (h+Pk+Pg2+Pg3+i.s.) 5.5 μ f

Triode Section

Grid to Plate: (Tg to Tp). 1.7 μ f

Input: Tg to (Tk+h+Pk+Pg3+i.s.) 2.6 μ f

Output: Tp to (Tk+h+Pk+Pg3+i.s.) 2.0 μ f

Pentode Grid-Number 1 to Triode: (Pg1 to Tg), maximum. 0.012 μ f

Pentode Grid-Number 1 to Diode Plate: (Pg1 to Dp), maximum. 0.004 μ f

Triode Grid to Diode Plate: (Tg to Dp), maximum. 0.17 μ f

Triode Plate to Diode Plate: (Tp to Dp). 0.8 μ f

MECHANICAL

Mounting Position—Any

Envelope—T-6½, Glass

Base—E9-1, Small Button 9-Pin

MAXIMUM RATINGS

DESIGN-CENTER VALUES

	Pentode Section	Triode Section
Plate Voltage.	16	16 Volts
Screen Voltage.	16	— Volts
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode.	16	16 Volts
Heater Negative with Respect to Cathode.	16	16 Volts
Grid-Number 1 Circuit Resistance.	10	10 Megohms
Diode Current for Continuous Operation.	5.0	Milliamperes

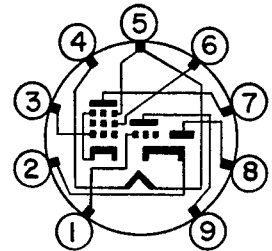
Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the tube manufacturer to provide acceptable serviceability of the tube in average applications, taking responsibility for normal changes in operating conditions due to rated supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all tubes.

The equipment manufacturer should design so that initially no design-center value for the intended service is exceeded with a bogey tube in equipment operating at the stated normal supply-voltage.

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or elements. In the absence of an express written agreement to the contrary, General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.

BASING DIAGRAM

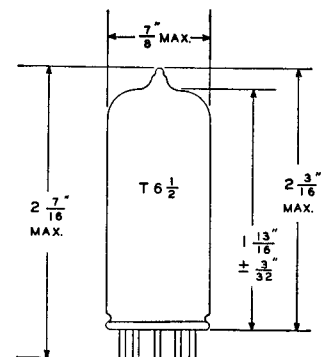


EIA 9KU

TERMINAL CONNECTIONS

- Pin 1—Triode Grid
- Pin 2—Triode and Diode Cathode
- Pin 3—Pentode Grid Number 1
- Pin 4—Heater
- Pin 5—Heater, Pentode Cathode, Pentode Grid Number 3, and Internal Shield
- Pin 6—Pentode Grid Number 2 (Screen)
- Pin 7—Pentode Plate
- Pin 8—Diode Plate
- Pin 9—Triode Plate

PHYSICAL DIMENSIONS



EIA 6-10

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS	Pentode Section	Triode Section
Plate Voltage	12.6	12.6 Volts
Screen Voltage	12.6	— Volts
Grid-Number 1 Voltage	0.8 #	0.6 # Volts
Amplification Factor	—	10
Plate Resistance, approximate	400000	— Ohms
Transconductance	2700	1200 Micromhos
Plate Current	1.9	1.0 Milliamperes
Screen Current	0.7	— Milliamperes
Grid-Number 1 Voltage, approximate Gm = 30 Micromhos	-2.8	— Volts
Grid-Number 1 Voltage, approximate Ib = 10 Microamperes	—	-3.5 Volts
Average Diode Current with 10 Volts, DC applied	2.0	Milliamperes

* When used in automobile service from a 12-volt source, under no circumstances should the heater voltage be less than 10.0 volts or more than 15.9 volts. These extreme variations in heater voltage may be tolerated for short periods; however, operation at or near these absolute limits in heater voltage necessarily involves sacrifice in performance at low heater voltage and in life expectancy at high heater voltage. Equipment reliability can be significantly increased with improved supply-voltage regulation.

† Without external shield.

Average contact potential developed across 2.2-megohm grid resistor.