Electronic TUBES

12GA6

HEPTODE

FOR PENTAGRID CONVERTER APPLICATIONS IN AUTOMOBILE RECEIVERS

DESCRIPTION AND RATING

The 12GA6 is a miniature heptode primarily intended to perform the combined functions of mixer and oscillator in automobile radio receivers. The tube is specially designed to operate with 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	0.15	Amperes

Direct Interelectrode Capacitances	With Shield†	Without Shield	
Grid-Number 3 to All	8.0	8.0	μμf
Plate to All	13	8.0	μμf
Grid-Number 1 to All	5.0	5.0	μμf
Cathode to All Except Grid-Number 1	20	15	μμf
Grid-Number 3 to Plate, maximum	0.25	0.3	μμf
Grid-Number 1 to Grid-Number 3, maximum	0.15	0.15	μμf
Grid-Number 1 to Plate, maximum	0.05	0.1	μμf
Grid-Number 1 to Cathode	2.5	2.5	μμf

MECHANICAL

Mounting Position—Any
Envelope—T-5½, Glass
Base—E7-1, Miniature Button 7-Pin

MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES

Plate Voltage	16	Volts
Screen Voltage	16	Volts
Positive DC Grid-Number 3 Voltage	0	Volts
Negative DC Grid-Number 3 Voltage	16	Volts
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode	16	Volts
Heater Negative with Respect to Cathode	16	Volts
Grid-Number 3 Circuit Resistance	10	Megohms

Design-Maximum 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 the worst probable conditions.

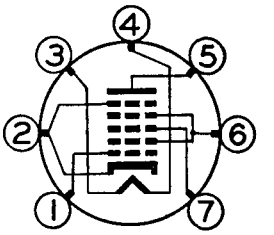
These values are chosen by the tube manufacturer to provide acceptable serviceability of the tube, taking responsibility for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, variation in characteristics of all other tubes in the equipment, equipment control adjustment, load variation, signal variation, and environmental conditions.

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.

GENERAL ELECTRIC

BASING DIAGRAM

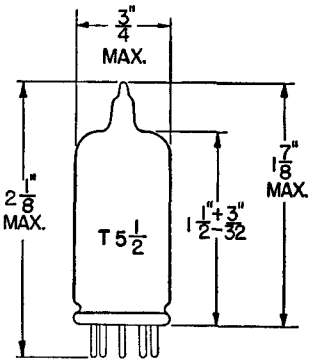


EIA 7CH

TERMINAL CONNECTIONS

Pin 1—Grid Number 1 (Oscillator Grid)
Pin 2—Cathode and Grid Number 5
Pin 3—Heater
Pin 4—Heater
Pin 5—Plate
Pin 6—Grid Numbers 2 and 4 (Screen)
Pin 7—Grid Number 3 (Signal Grid)

PHYSICAL DIMENSIONS



EIA 5-2

CHARACTERISTICS AND TYPICAL OPERATION

CONVERTER SERVICE

Plate Voltage	12.6	Volts
Screen Voltage	12.6	Volts
Grid-Number 3 Supply Voltage	0	Volts
Grid-Number 3 Resistor (Bypassed)	2.2	Megohms
Grid-Number 1 Voltage, RMS, approximate	1.6	Volts
Grid-Number 1 Resistor	33,000	Ohms
Plate Resistance, approximate	1.0	Megohms
Conversion Transconductance	140	Micromhos
Plate Current	0.30	Milliamperes
Screen Current	0.80	Milliamperes
Grid-Number 1 Current	0.060	Milliamperes
Grid-Number 3 Voltage, approximate Gc = 5 Micromhos	−3	Volts
Grid-Number 3 Voltage, approximate Gc = 20 Micromhos	−2.5	Volts

OSCILLATOR CHARACTERISTICS (Not Oscillating)

Plate Voltage	12.6	Volts
Screen, Connected to Plate		
Screen Voltage	0	Volts
Grid-Number 3 Voltage	0	Volts
Amplification Factor‡	9.0	
Transconductance‡	2400	Micromhos
Cathode Current	3.6	Milliamperes
Grid-Number 1 Voltage, approximate Ib = 10 Microamperes	−3.3	Volts

* 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.

† With external shield (EIA 316) connected to pin 2.

‡ Between Grid-Number 1 and Grid-Numbers 2 and 4 connected to Plate.

ELECTRONIC COMPONENTS DIVISION

GENERAL ELECTRIC

Schenectady 5, N. Y.

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