

# RADIO MANUFACTURERS ASSOCIATION

SUITE 701-4 AMERICAN BUILDING  
1317 F STREET, N. W.  
WASHINGTON, D. C.



R.M.A. DATA BUREAU  
90 West Street  
New York, N. Y.



Release No. 600

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To  
Tube Engineers:

Registration has been made by the RMA  
Data Bureau of the vacuum tube type designation

5593 (Registration No. 1315)

as defined by the characteristics and ratings given in  
the attached data on application of

General Electric Company  
Schenectady, New York

Respectfully yours,

RMA DATA BUREAU

By

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LCFHorle/CAP

Electronics Department

# GENERAL ELECTRIC

## 5593 PHASITRON

### GENERAL DESCRIPTION

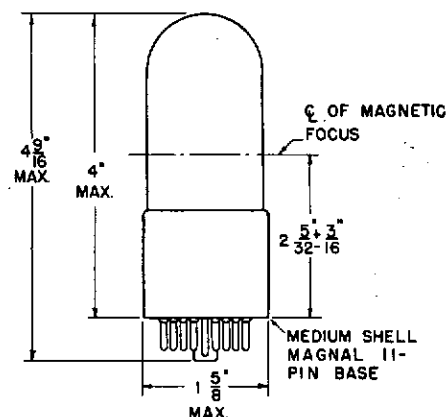
The 5593 is a phase-modulator tube for use in frequency-modulated transmitters. It is intended for operation up to 250 kilocycles with any degree of subsequent frequency multiplication.

As a modulator tube the 5593 enables the introduction of comparatively wide-phase excursions at audio-frequency rates in a crystal-controlled, radio-frequency carrier. The modulating circuit audio response is such that the tube has a wide-swing frequency-modulated output. Phase modulation is converted to frequency modulation directly at the tube through the self inductance of the external audio-modulating coil.

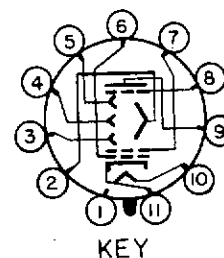
With a suitable three-phase supply circuit the only circuit voltage requiring adjustment is that which varies the Phasitron first focus voltage for maximum radio-frequency output. Low-frequency audio feedback is used with this type of operation. The constants of such a circuit are approximately 18 decibels audio feedback through a resistance-capacitance network of 2500 microseconds time constant. This may conveniently be obtained by one stage of radio-frequency amplification of voltage extracted from some point in the radio-frequency chain followed by a standard discriminator.

Cathode; . . . . .	Indirectly Heated
Heater Voltage (D-C) . . . . .	6.3 Volts
Heater Current . . . . .	0.3 Ampere
Mounting Position: . . . . .	Any
Direct Interelectrode Capacitances: (Approximate)	
Deflectors to Plate Number 1 . . . . .	0.05 $\mu$ f
Plate Number 1 to Plate Number 2 . . . . .	5.5 $\mu$ f

### PHYSICAL DIMENSIONS



### BASING DIAGRAM



KEY  
RMA 11R  
BOTTOM VIEW

### MAXIMUM RATINGS

Plate Number 1 Voltage . . . . .	250 . . . . .	Volts
Plate Number 2 Voltage* . . . . .	300 . . . . .	Volts
Deflectors Number 1, 2, and 3 Voltage . . . . .	100 . . . . .	Volts
Deflector Number 4 Voltage . . . . .	100 . . . . .	Volts
Grid Number 1 Voltage . . . . .	25 . . . . .	Volts
Grid Number 2 Voltage . . . . .	50 . . . . .	Volts
Cathode Current . . . . .	12 . . . . .	Milliamperes

\* There must be a differential of at least 50 volts d-c between the two anodes, with plate number 2 at the higher potential.

## CHARACTERISTICS AND TYPICAL OPERATION

### PHASE MODULATOR

Operating Frequency . . . . .	230 . . . . .	Kilocycles
Plate Number 1 Voltage . . . . .	200 . . . . .	Volts D-C
Plate Number 2 Voltage . . . . .	250 . . . . .	Volts D-C
Plates Number 1, and Number 2 Current . . . . .	3 . . . . .	Milliamperes
Deflectors Number 1, 2, 3, and 4 Current . . . . .	50 . . . . .	Microamperes
Deflector Number 4 Voltage . . . . .	30 . . . . .	Volts D-C
Deflectors Number 1, 2, and 3 Voltage . . . . .	60 . . . . .	Volts D-C
Grid Number 1 Voltage** . . . . .	15 . . . . .	Volts D-C
Grid Number 1 Current . . . . .	6 . . . . .	Milliamperes
Grid Number 2 Voltage . . . . .	50 . . . . .	Volts D-C
Grid Number 2 Current . . . . .	20 . . . . .	Microamperes
Radio-Frequency Driving Voltage; phase-to-neutral . . . . .	35 . . . . .	Volts RMS
Audio-Modulating Power for $\pm 130$ Degree Phase Shift, approximate . . . . .	50 . . . . .	Milliwatts
Radio-Frequency Output Voltage . . . . .	4 . . . . .	Volts RMS
Distortion at $\pm 199$ Degree Phase Shift# . . . . .	1 . . . . .	Per Cent

\*\* Adjusted for maximum Phasitron output.

# Distortion at output of typical frequency-modulated transmitter, frequency at resonance approximately 33 megacycles.