6BE6—3BE6—4BE6—12BE6

HEPTODE

FOR PENTAGRID CONVERTER APPLICATIONS

DESCRIPTION AND RATING

The 6BE6 is a miniature heptode primarily designed to perform the combined functions of the mixer and oscillator in superheterodyne circuits in both the standard broadcast and FM bands. Its performance in these applications is characterized by high conversion gain and a high degree of oscillator stability with variations in the applied automatic-volume-control bias voltage.

Except for heater ratings, the 3BE6 and 4BE6 are identical to the 6BE6. In addition, they incorporate a controlled heater-warm-up characteristic which makes them especially suited for use in radio or television receivers that employ series-connected heaters.

The 12BE6, which differs from the 6BE6 only in heater ratings and heater-cathode voltage ratings, is especially useful in a-c/d-c radio receivers.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

	3BE6	4BE6	6BE6	12BE6	
Heater Voltage, AC or DC	3.15	4.2	6.3	12.6	Volts
Heater Current	0.6	0.45	0.3	0.15	Amperes
Heater Warm-up Time*	11	11	...	...	Seconds

Direct Interelectrode Capacitances	With Shield†	Without Shield	
Grid-Number 3 to All	7.0	7.0	μμf
Plate to All	13	8.0	μμf
Grid-Number 1 to All	5.5	5.5	μμf
Cathode to All Except Grid-Number 1	20	15	μμf
Grid-Number 3 to Plate, maximum	0.25	0.30	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	3.0	3.0	μμf

MECHANICAL

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

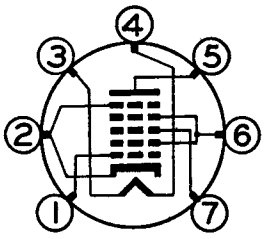
MAXIMUM RATINGS

DESIGN-CENTER VALUES

Plate Voltage	300	Volts
Screen-Supply Voltage	300	Volts
Screen Voltage	100	Volts
Positive DC Grid-Number 3 Voltage	0	Volts
Negative DC Grid-Number 3 Voltage	50	Volts
Plate Dissipation	1.0	Watts
Screen Dissipation	1.0	Watts
DC Cathode Current	14	Milliamperes

Heater-Cathode Voltage	3BE6 4BE6 6BE6	12BE6	
Heater Positive with Respect to Cathode			
DC Component	100	...	Volts
Total DC and Peak	200	100	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak	200	100	Volts

BASING DIAGRAM

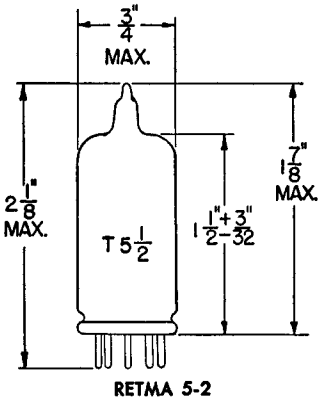


RETMA 7CH

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—Grids Number 2 and 4 (Screen)
Pin 7—Grid Number 3 (Mixer Grid)

PHYSICAL DIMENSIONS



RETMA 5-2

GENERAL ELECTRIC

Supersedes ET-T891, dated 8-54

CHARACTERISTICS AND TYPICAL OPERATION

CONVERTER SERVICE‡

Plate Voltage	100	250	Volts
Screen Voltage	100	100	Volts
Grid-Number 3 Voltage	−1.5	−1.5	Volts
Grid-Number 1 Voltage, RMS	10	10	Volts
Grid-Number 1 Resistance	20000	20000	Ohms
Plate Resistance, approximate	0.4	1.0	Megohms
Conversion Transconductance	455	475	Micromhos
Plate Current	2.6	2.9	Milliamperes
Screen Current	7.0	6.8	Milliamperes
Grid-Number 1 Current	0.5	0.5	Milliamperes
Cathode Current	10.1	10.2	Milliamperes
Grid-Number 3 Voltage, approximate G_c = 10 Micromhos	−30	−30	Volts
Grid-Number 3 Voltage, approximate G_c = 100 Micromhos	−6	−6	Volts

OSCILLATOR CHARACTERISTICS (NOT OSCILLATING)

Plate Voltage		100	Volts
Screen, Connected to Plate			
Grid-Number 3 Voltage		0	Volts
Grid-Number 1 Voltage		0	Volts
Amplification Factor§		20	
Transconductance§		7250	Micromhos
Cathode Current		25	Milliamperes
Grid-Number 1 Voltage, approximate I_b = 10 Microamperes		−11	Volts

* The time required for the voltage across the heater to reach 80 percent of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the rated heater voltage divided by the rated heater current.

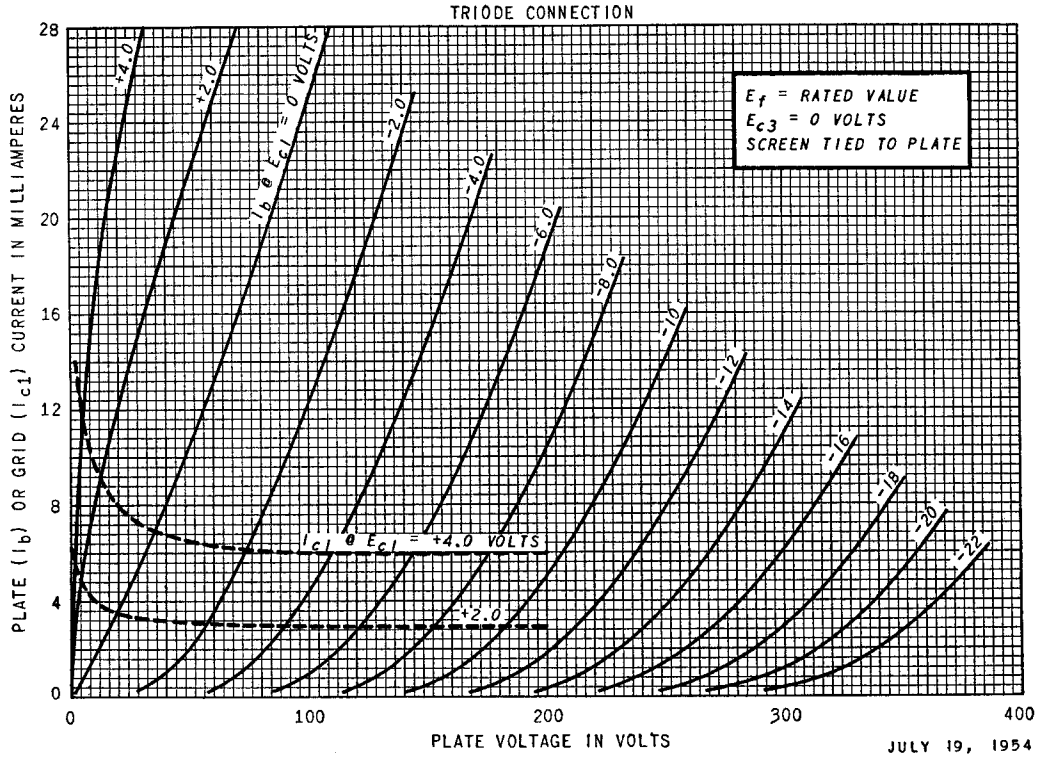
† With external shield (RETMA 316) connected to pin 2.

‡ Characteristics shown are obtained in the standard RETMA conversion conductance test set which uses separate excitation. The characteristics under these conditions correspond very closely with those obtained in a self-excited oscillatory circuit operating with zero bias.

§ Between grid number 1 and grids number 2 and 4 connected to plate.

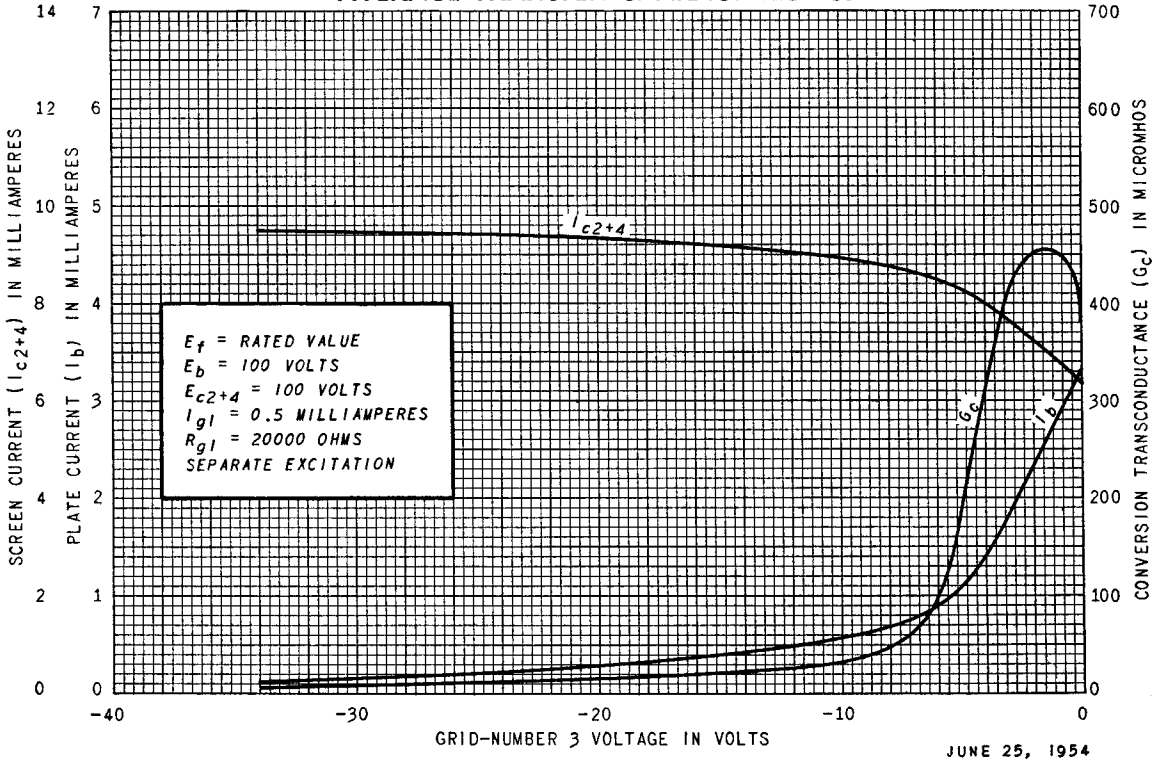
AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



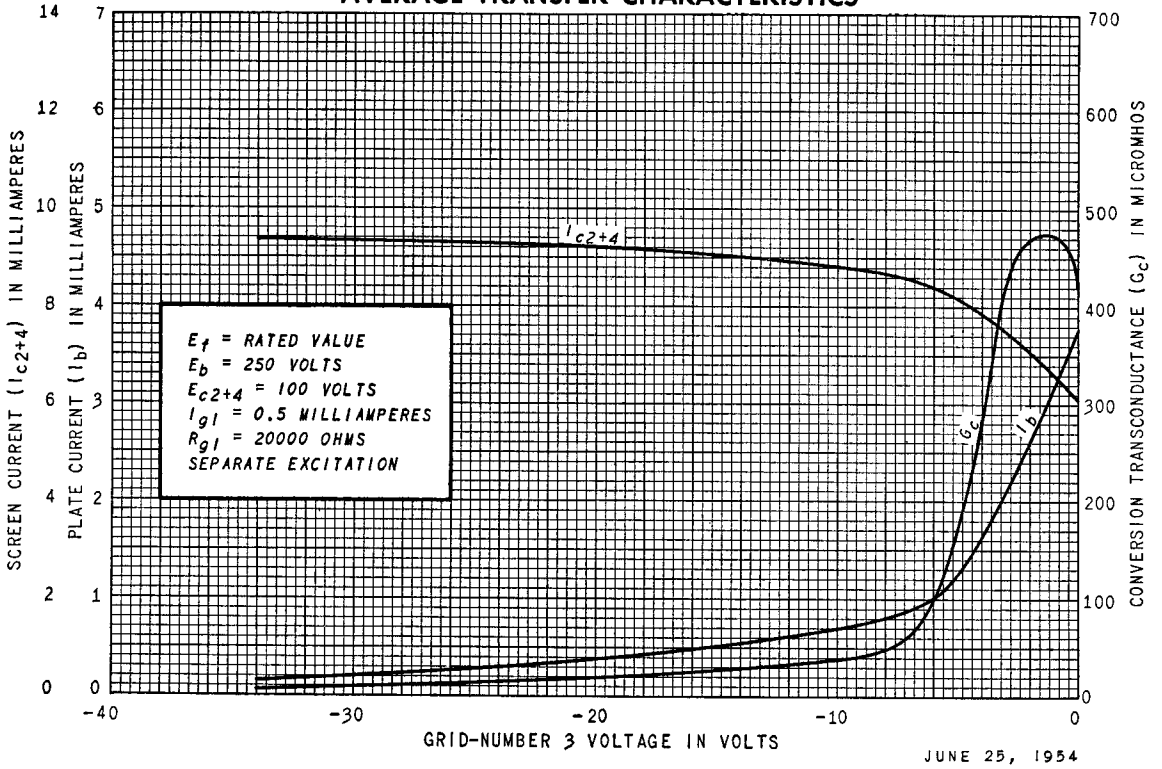
JULY 19, 1954

AVERAGE TRANSFER CHARACTERISTICS

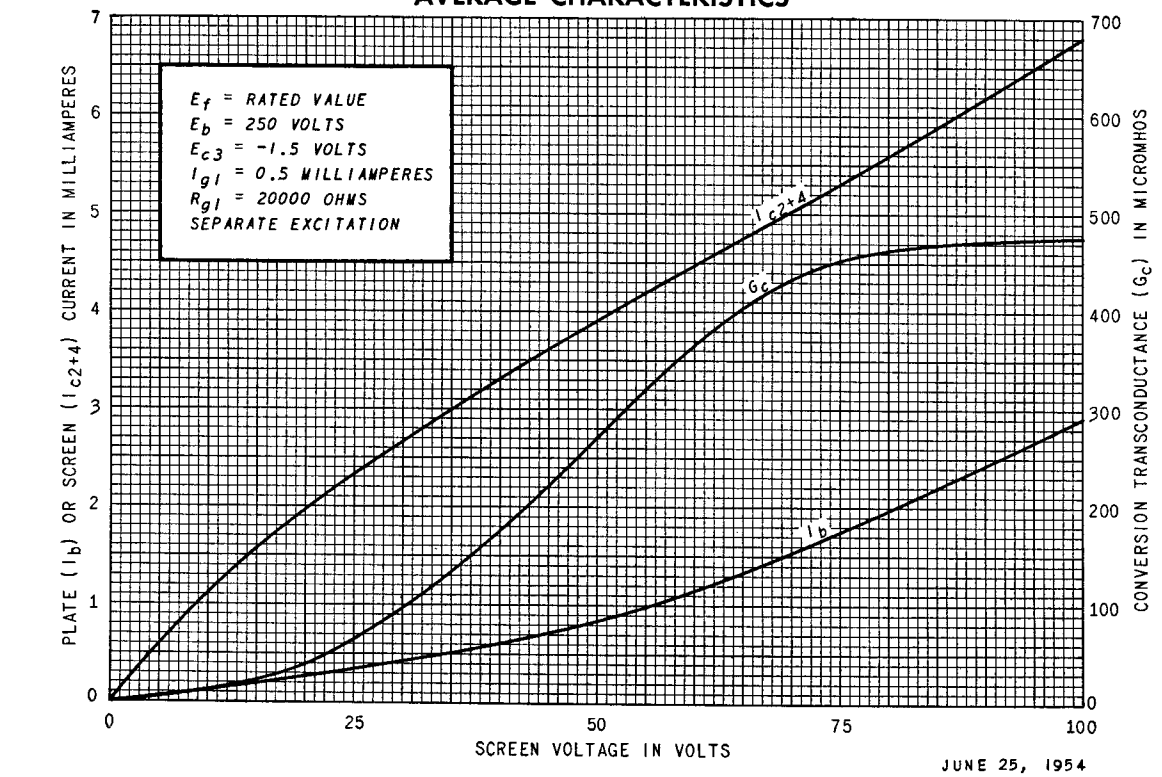


JUNE 25, 1954

AVERAGE TRANSFER CHARACTERISTICS



AVERAGE CHARACTERISTICS



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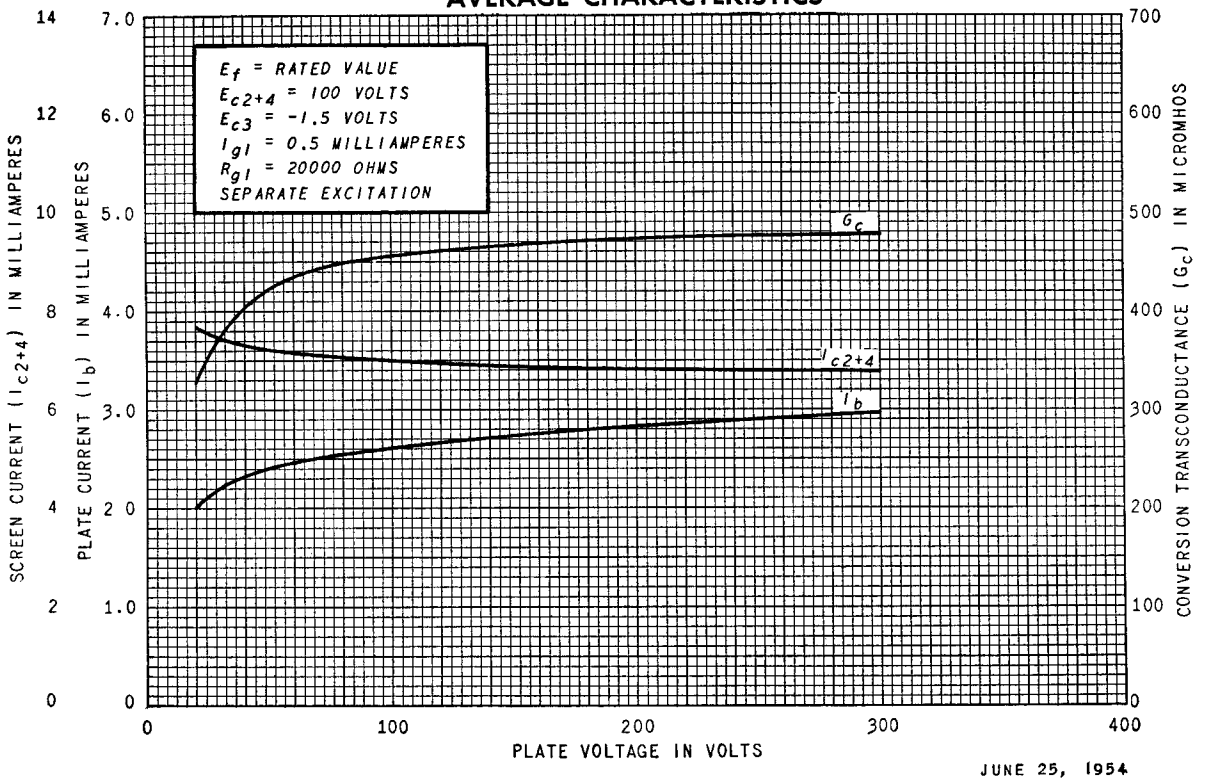

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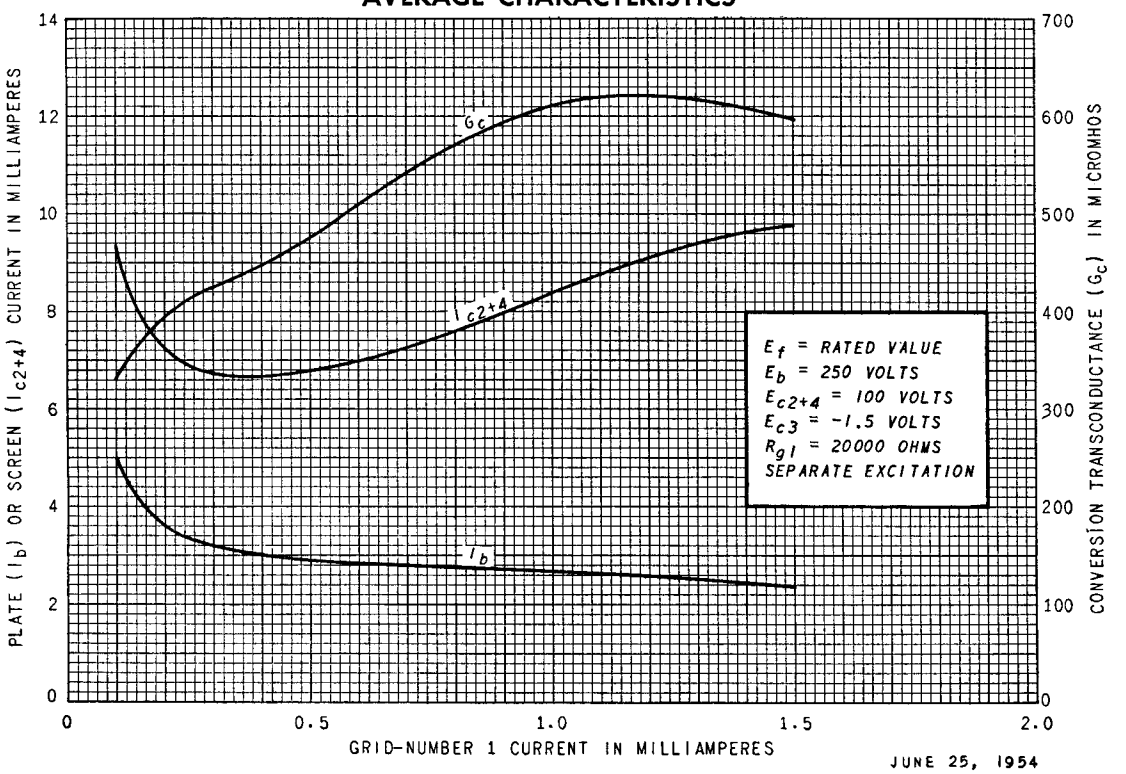

JUNE 25, 1954