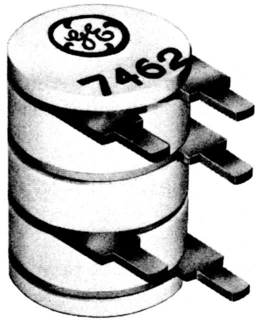
ELECTRONIC INNOVATIONS IN ACTION

TUBES

7462
METAL-CERAMIC TRIODE



DESCRIPTION AND RATING

The 7462 is a high-mu triode of ceramic-and-metal planar construction primarily intended for radio-frequency amplifier service from low frequencies into the ultra-high-frequency range. It is similar to the 7077 in characteristics but differs in having terminal lugs for use in print-board circuits.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC*	6.3 ± 0.3	Volts
Heater Current†	0.24	Amperes
Direct Interelectrode Capacitances‡		
Grid to Plate: (g to p)	1.25	pf
Input: g to (h+k)	1.8	pf
Output: p to (h+k)	0.032	pf
Heater to Cathode (h to k)	1.5	pf

MECHANICAL

Mounting Position—Any

See Outline Drawing on page 2 for dimensions and electrical connections.

MAXIMUM RATINGS

ABSOLUTE-MAXIMUM VALUES

Plate Voltage	250	Volts
Positive Peak and DC Grid Voltage	0	Volts
Negative Peak and DC Grid Voltage	50	Volts
Plate Dissipation	1.1	Watts
DC Cathode Current	11	Milliamperes
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode	50	Volts
Heater Negative with Respect to Cathode	50	Volts
Grid-Circuit Resistance, with Fixed Bias§	0.01	Megohms
Bulb Temperature at Hottest Point¶	250	C

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

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

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

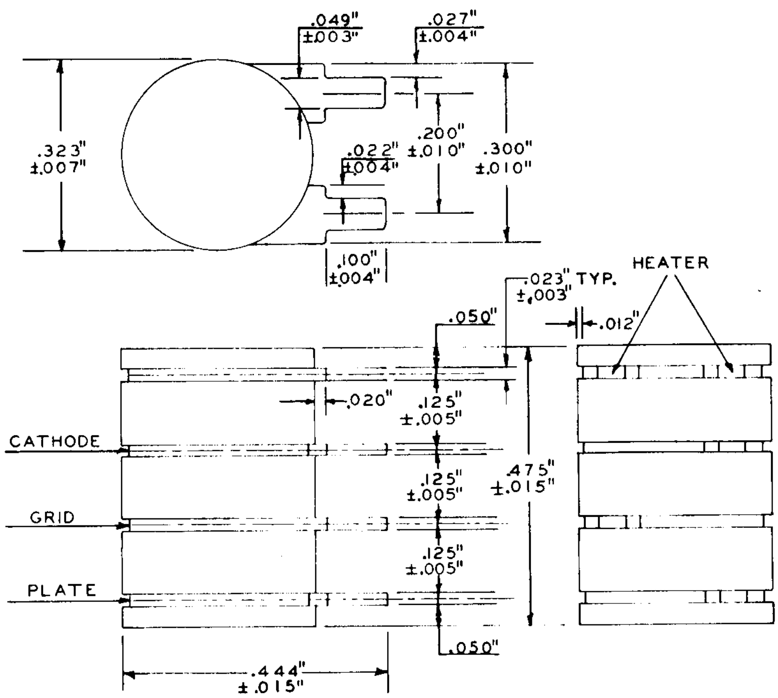
Plate Voltage	150	Volts
Grid Voltage	+6.0	Volts
Cathode-Bias Resistor	910	Ohms
Amplification Factor	94	
Plate Resistance, approximate	9000	Ohms
Transconductance	10500	Micromhos
Plate Current	7.2	Milliamperes
Grid Voltage, approximate		
Ib = 100 Microamperes	−2.4	Volts

GENERAL ELECTRIC

Supersedes 7462 D & R sheet ET-T1540A, dated 2-60

FOOTNOTES

* The equipment designer should design the equipment so that heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.
† Heater current of a bogey tube at Ef = 6.3 volts.
‡ Without external shield.
§ If a cathode bias resistor is used, the grid-circuit resistance may be as high as (10,000 + 100 Rk + R_L) ohms, where Rk is the value of the cathode-bias resistor in ohms and R_L is the value of the plate-load resistor in ohms.
¶ For applications where long life is a primary consideration, it is recommended that the envelope temperature be maintained below 175 C.



NOTE: Maximum eccentricity of insulators 0.010 in. from center line.

INITIAL CHARACTERISTICS LIMITS

	Min.	Bogey	Max.	
Heater Current				
Ef = 6.3 volts	222	240	258	Milliamperes
Plate Current				
Ef = 6.3 volts, Eb = 150 volts, Rk = 82 ohms (bypassed)	4.5	7.5	11	Milliamperes
Transconductance				
Ef = 6.3 volts, Eb = 150 volts, Ec = +6 volts, Rk = 910 ohms (bypassed)	8000	10500	13000	Micromhos
Amplification Factor				
Ef = 6.3 volts, Eb = 150 volts, Ec = +6 volts, Rk = 910 ohms (bypassed)	65	94	115	

INITIAL CHARACTERISTICS LIMITS (Continued)

	Min.	Bogey	Max.	
Transconductance Change with Heater Voltage Difference between transconductance at Ef = 6.3 volts and transconductance at Ef = 6.0 volts (other conditions the same) expressed as a percentage of transconductance at Ef = 6.3 volts	.....	.....	15	Percent
Grid Voltage Cutoff Ef = 6.3 volts, Eb = 150 volts, Ib = 100 μa	.....	−2.4	−4.5	Volts
Interelectrode Capacitances				
Grid to Plate: (g to p)	1.05	1.25	1.45	pf
Input: g to (h+k)	1.25	1.8	2.25	pf
Output: p to (h+k)	0.013	0.032	0.045	pf
Heater to Cathode: (h to k)	1.1	1.5	1.9	pf
Heater-Cathode Leakage Current Ef = 6.3 volts, Ehk = 100 volts				
Heater Positive with Respect to Cathode	.....	.....	20	Microamperes
Heater Negative with Respect to Cathode	.....	.....	20	Microamperes
Interelectrode Leakage Resistance Ef = 6.3 volts. Polarity of applied d-c interelectrode voltage is such that no cathode emission results.				
Grid to All of 100 volts d-c	100	.....	.....	Megohms
Plate to All at 300 volts d-c	100	.....	.....	Megohms
Grid Emission Current Ef = 7.0 volts, Eb = 100 volts, Ecc = −10 volts, Rg = 0.1 meg	.....	.....	2.0	Microamperes

SPECIAL PERFORMANCE TESTS

Low Frequency Vibrational Output Statistical sample is subjected to vibration in each of two planes at 40 cps, with peak acceleration 15 G. Tube is operated with Ef = 6.3 volts, Ebb = 150 volts, Rk = 82 ohms (bypassed), R_L = 10000 ohms	.....	.....	10	Millivolts RMS
Variable Frequency Vibrational Output Statistical sample is subjected to vibration according to the procedure given below. Tube is operated with Ef = 6.3 volts, Ebb = 150 volts, Rk = 82 ohms (bypassed) R_L = 10000 ohms	.....	.....	15	Millivolts RMS

The variable-frequency vibration test shall be performed as follows:

1. The frequency shall be increased from 100 to 2000 cps with approximately logarithmic progression in 3 ± 1 minutes. The return sweep (2000 to 100 cps) is not required.
2. The tube shall be vibrated with simple harmonic motion in each of two planes: first, parallel to the cylindrical axis; second, perpendicular to the cylindrical axis and parallel to a line through the major axis of a terminal lug. At all frequencies from 100 to 2000 cps, the total harmonic distortion of the acceleration waveform shall be less than 5%.
3. The peak acceleration shall be maintained at 10 ± 1.0 G throughout the test.
4. The value of the alternating voltage produced across the load resistor (R_L), as a result of the vibration, shall be measured with a suitable device having a response to the RMS value of the voltage to within ±0.5 db of the response at 400 cps for the frequency range of 100 to 3000 cps, and having a band-pass filter with an attenuation rate of 24 db per octave below the low frequency cutoff point of 50 cps and above the high frequency cutoff point of 5000 cps. The meter shall have a dynamic response characteristic equivalent to or faster than a VU meter (operated in accordance with ASA Standard No. C16.5-1954).

Low Pressure Voltage Breakdown Test
Statistical sample tested for voltage breakdown at a pressure of 8 mm Hg, to simulate an altitude of 100,000 feet. Tubes shall not give visual evidence of flashover or corona when 300 volts RMS, 60 cps, is applied between the plate and grid terminals.

DEGRADATION RATE TESTS

Fatigue

Statistical sample vibrated for a total of six hours, three hours in each of two planes, at a peak acceleration of 10 G. Frequency is continuously varied from 30 cps to 2000 cps and back to 30 cps, with a period of ten minutes. Tubes are operated during the test with Ef = 6.3 volts, Eb = 150 volts, and Rk = 82 ohms. Following the test, tubes are evaluated for low frequency vibrational output, heater-cathode leakage, heater current, and transconductance.

Shock

Statistical sample subjected to 5 impact accelerations of approximately 450 G in each of four positions. The accelerating forces are applied by the Navy-type, High Impact (flyweight) Shock Machine using a 30° hammer angle. Tubes are operated during the test with Ef = 6.3 volts, Eb = 150 volts, Ehk = +100 volts, Rg = 0.1 meg, and Rk = 82 ohms. Following the test, tubes are evaluated for low frequency vibrational output, heater-cathode leakage, heater current, and transconductance.

Stability Life Test

The statistical sample subjected to the Intermittent Life Test is evaluated for percent change in transconductance of individual tubes, from the initial reading to readings following 2 hours and 20 hours of the life test.

Survival Rate Life Test

The statistical sample subjected to the Intermittent Life Test is evaluated for shorted and open elements, and transconductance, following approximately 100 hours of life test.

Intermittent Life Test

Statistical sample operated 1000 hours under the following conditions: Ef = 6.3 volts, Eb = 150 volts, Ecc = +6 volts, Ehk = −70 volts, Rk = 910 ohms, Rg = 0.1 meg. Heater voltage is cycled (on 1¾ hours, off ¼ hour). Tubes are evaluated, following 500 and 1000 hours of life test, for shorted or open elements, heater current, transconductance, heater-cathode leakage, and interelectrode leakage resistance.

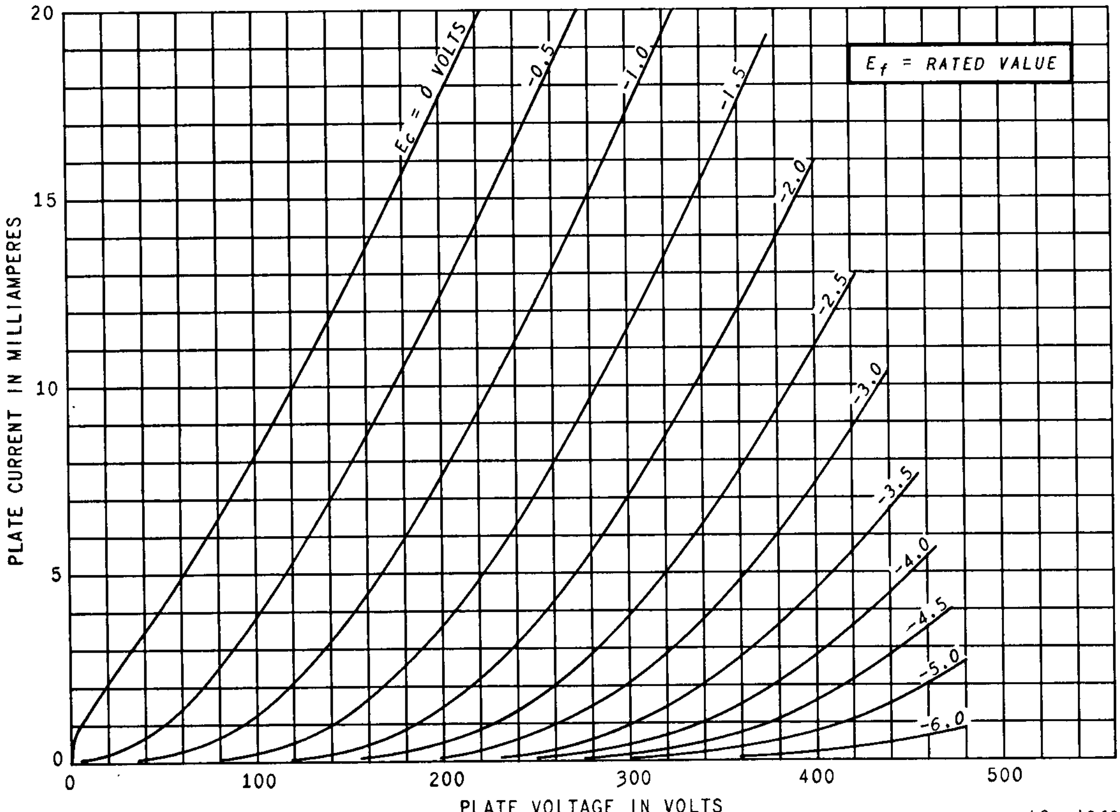
Interface Life Test

Statistical sample operated for 500 hours with Ef = 6.6 volts, no other voltages applied, and evaluated for cathode interface resistance following the life test.

Heater-Cycling Life Test

Statistical sample operated for 2000 cycles minimum to evaluate and control heater-cathode defects. Conditions of test include Ef = 7.0 volts cycled for one minute on and one minute off, Eb = Ec = 0 volts, and Ehk = 70 volts with heater positive with respect to cathode. Following the test, tubes are evaluated for open heaters, heater-cathode shorts, and heater-cathode leakage.

AVERAGE PLATE CHARACTERISTICS



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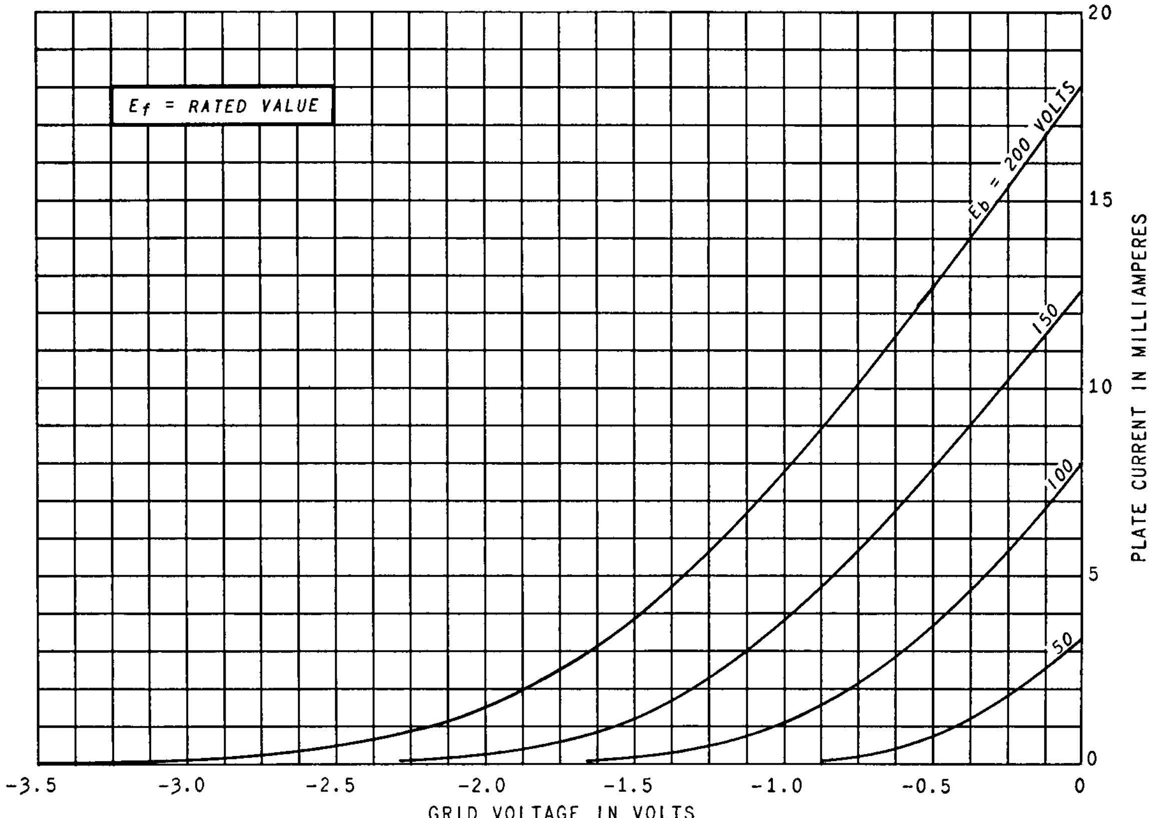
FEBRUARY 12, 1960

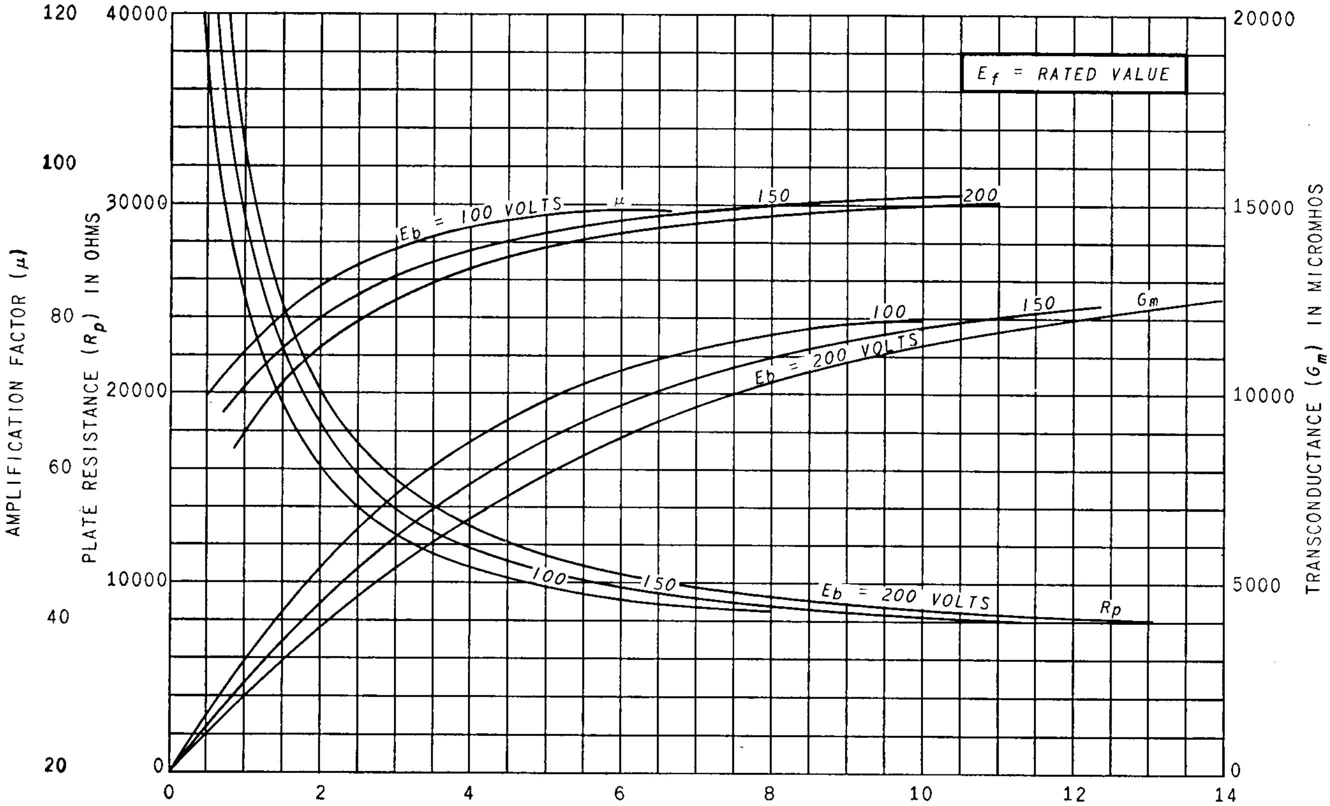
AVERAGE TRANSFER CHARACTERISTICS



K-55611-TD100-2

FEBRUARY 12, 1960

AVERAGE CHARACTERISTICS



K-55611-TD100-3

FEBRUARY 12, 1960