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MEDIUM-MU TRIODE—POWER PENTODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems. The pentode unit is useful in class-C-amplifier and frequency-multiplier applications at frequencies up to 40 Mc. The triode unit is useful as a reactance modulator.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage range	12 to 15	ac or dc volts
Current (Approx.) at 13.5 volts	0.28	amp
Direct Interelectrode Capacitances:°		
Triode Unit:		
Grid to plate	2.2	μμf
Grid to cathode and heater	2.4	μμf
Plate to cathode and heater	0.22	μμf
Pentode Unit:		
Grid No.1 to plate	0.044	μμf
Grid No.1 to all other electrodes except plate	7.1	μμf
Plate to all other electrodes except grid No.1	2.5	μμf
Triode grid to pentode plate	0.022 max.	μμf
Pentode grid No.1 to triode plate	0.015 max.	μμf
Pentode plate to triode plate	0.16 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Heater Voltage	13.5	13.5	volts
Plate-Supply Voltage	150	200	volts
Grid-No.2 (Screen-Grid) Supply Voltage	–	125	volts
Cathode Resistor	150	82	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	8200	150000	ohms
Transconductance	4900	7000	μmhos
Plate Current	9	15	ma
Grid-No.2 Current	–	3.4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	−6.5	−8	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2

°: See next page.

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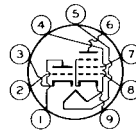
MEDIUM-MU TRIODE—POWER PENTODE

Base. . . . . .Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. 9DA

Pin 1 – Triode Plate
Pin 2 – Triode Grid
Pin 3 – Triode Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Plate
Pin 7 – Pentode Grid No.2



Pin 8 – Pentode Grid No.1
Pin 9 – Pentode Grid No.3, Pentode Cathode, Internal Shield

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	300 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 150 volts	–	1 max.	watt
For grid-No.2 voltages between 150 and 300 volts .	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	2.5 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode.	120 max.	120 max.	volts
Heater positive with respect to cathode.	120 max.	120 max.	volts

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance: For fixed-bias operation. . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. .	1 max.	1 max.	megohm

°: See next page.

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MEDIUM-MU TRIODE—POWER PENTODE

RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy■
and
RF POWER AMPLIFIER — Class C FM Telephony

Pentode Unit

Maximum CCS● Ratings, *Absolute Values:*

DC PLATE VOLTAGE	300 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	150 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
DC PLATE CURRENT	20 max.	ma
DC GRID-No.2 CURRENT	7 max.	ma
DC GRID-No.1 CURRENT	3 max.	ma
GRID-No.2 INPUT	0.8 max.	watt
PLATE DISSIPATION	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	120 max.	volts
Heater positive wmth respect to cathode	120 max.	volts

Typical Operation:

At frequencies up to 40 Mc

Heater Voltage	13.5	13.5	13.5	volts
DC Plate Voltage	200	250	300	volts
DC Grid-No.2 Voltage	85	105	125	volts
DC Grid-No.1 Voltage	-7	-9	-11	volts
DC Plate Current	11	15	20	ma
DC Grid-No.2 Current	3.2	4.5	6	ma
DC Grid-No.1 Current (Approx.)	0.9	1.2	1.6	ma
Driving Power (Approx.)	9	15	25	mw
Power Output	1.3	2.1	3.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.1 max.	megohm

° Without external shield.

■ Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

● Continuous Commercial Service.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Heater Current	1	0.26	0.3	amp
Amplification Factor (Triode unit)	1,2	32	48	
Transconductance (Triode unit)	1,2	3800	6000	μmhos
Plate Current (Triode unit)	1,3	6.5	11.5	ma
Transconductance (Pentode unit)	1,4	5200	8800	μmhos

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MEDIUM-MU TRIODE—POWER PENTODE

	Note	Min.	Max.	
Plate Current (Pentode unit) . .	1,5	11.2	22.8	ma
Grid-No.2 Current (Pentode unit).	1,5	2.2	4.6	ma
Direct Interelectrode Capacitance:				
Grid No.1 to plate (Pentode unit).	6	0.035	0.053	μμf
Reverse Grid-No.1 Current (Total—both units)	1,7	–	-2	μa
Heater-Cathode Leakage Current (Each unit):				
Heater negative with respect to cathode.	1,8	–	30	μa
Heater positive with respect to cathode.	1,8	–	30	μa
Leakage Resistance (Each unit):				
Between grid No.1 and all other electrodes of both units tied together	1,9	50	–	megohms
Between plate and all other electrodes of both units tied together	1,10	50	–	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With dc plate-supply volts = 150, cathode resistor (ohms) = 150, and cathode-bypass capacitor (μf) = 1000.

Note 3: With dc plate-supply volts = 150, and cathode resistor (ohms) = 150.

Note 4: With dc plate-supply volts = 200, grid-No.2 supply volts = 125, cathode resistor (ohms) = 82, and cathode-bypass capacitor (μf) = 1000.

Note 5: With dc plate-supply volts = 200, grid-No.2 supply volts = 125, and cathode resistor (ohms) = 82.

Note 6: Without external shield.

Note 7: With pentode dc plate-supply volts = 150, grid-No.2 supply volts = 180, pentode cathode resistor (ohms) = 120, pentode grid-No.1 resistor (megohms) = 1, triode dc plate-supply volts = 180, triode cathode resistor (ohms) = 75, and triode grid resistor (megohms) = 0.5.

Note 8: With 100 volts dc between heater and cathode.

Note 9: With grid No.1 100 volts negative with respect to all other electrodes of both units tied together.

Note 10: With plate 300 volts negative with respect to all other electrodes of both units tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one minute on and four minutes off, heater 135 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

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Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions:

Triode Unit:

Heater volts = 13.5, plate-supply volts = 150, grid volts = −1.5, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 150 millivolts.

Pentode Unit:

Heater volts = 13.5, plate-supply volts = 200, grid-No.2 volts = 125, grid-No.1 volts = −2, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 250 millivolts.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate dissipation and grid-No.2 input.

RCA

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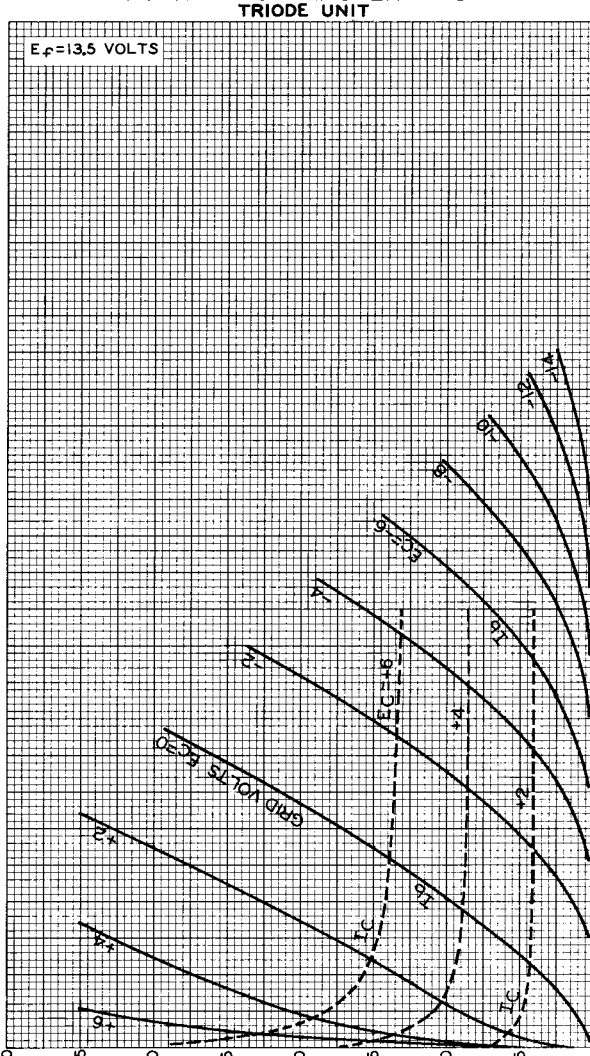
AVERAGE CHARACTERISTICS
TRIODE UNIT



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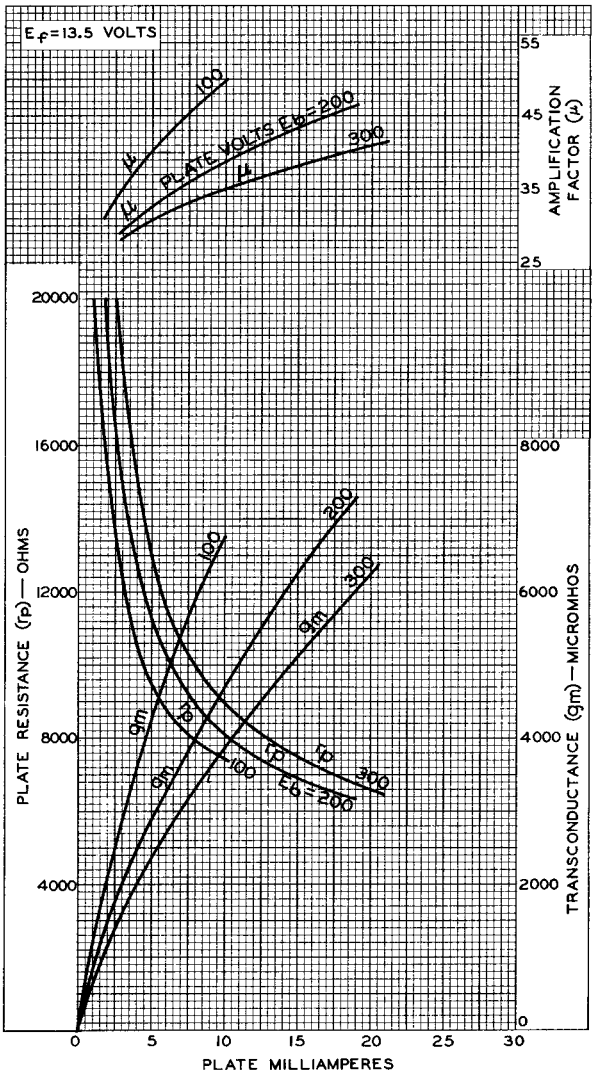
AVERAGE CHARACTERISTICS

TRIODE UNIT



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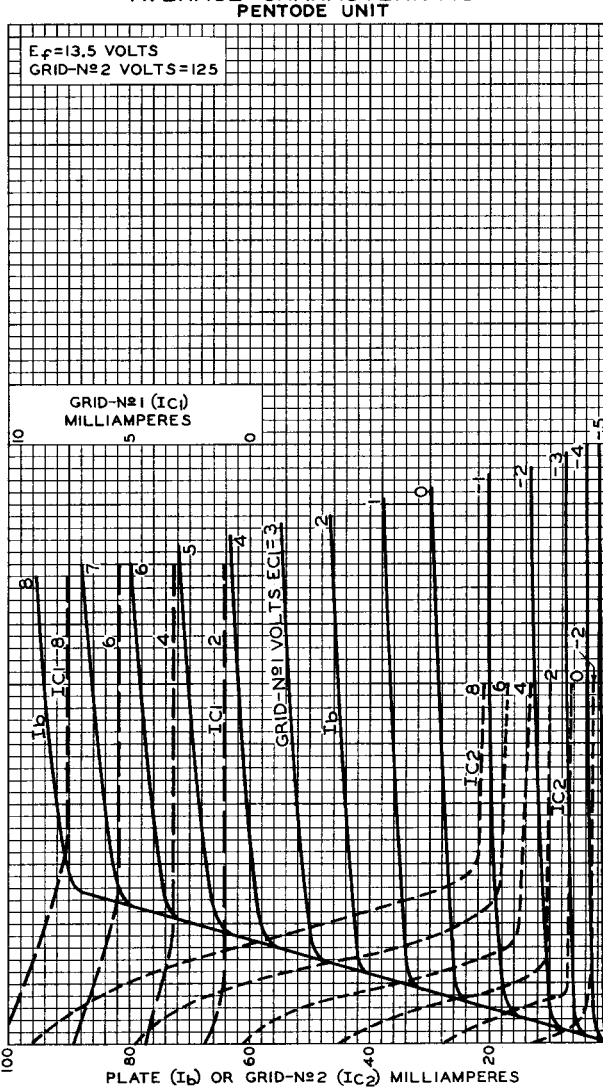
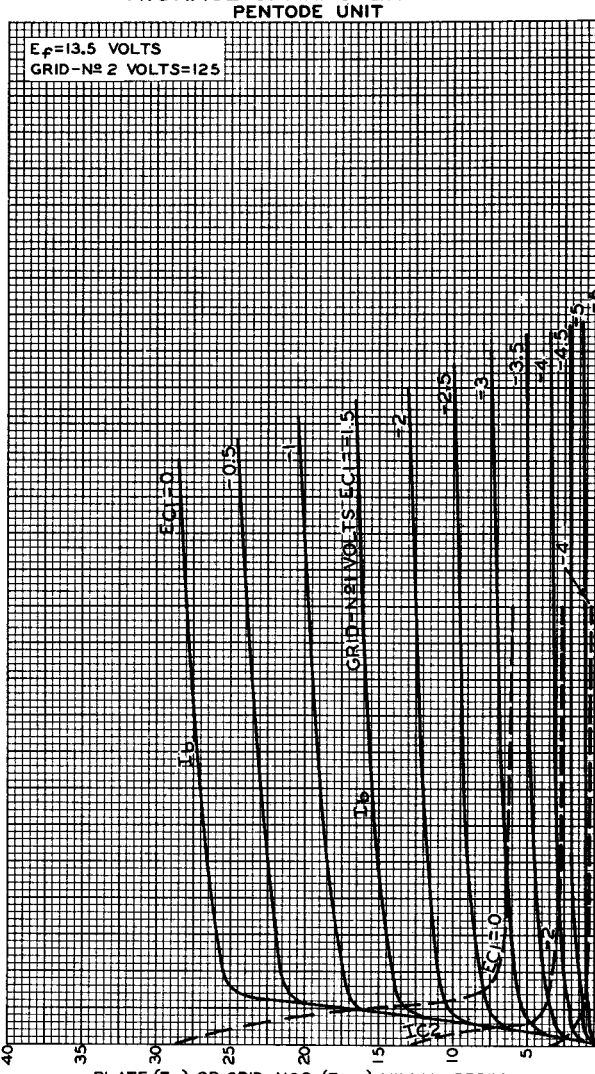
AVERAGE CHARACTERISTICS
PENTODE UNIT



AVERAGE CHARACTERISTICS

PENTODE UNIT



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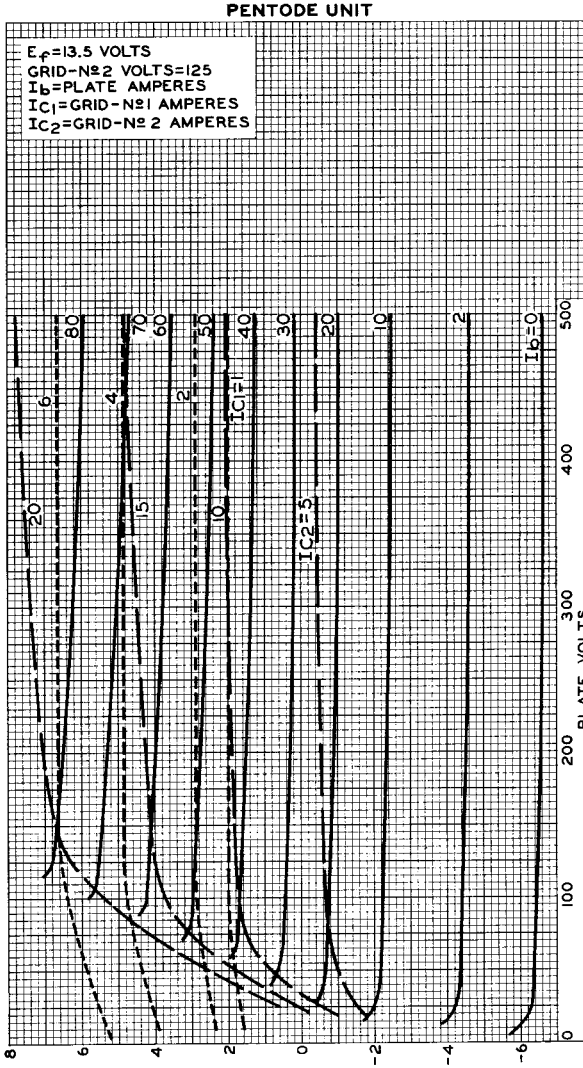
AVERAGE CONSTANT-CURRENT CHARACTERISTICS

PENTODE UNIT



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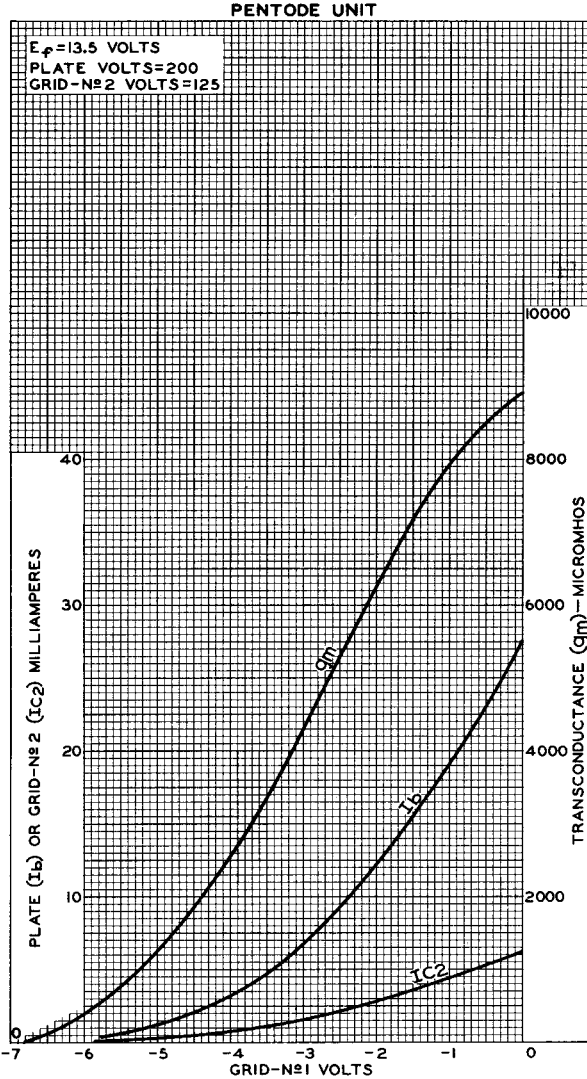
AVERAGE CHARACTERISTICS
PENTODE UNIT



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