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# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For "on-off" control applications involving long periods of operation under cutoff conditions.

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement . . . . .	Series	Parallel	
Voltage (AC or DC) . . . . .	12.6 ± 5%	6.3 ± 5%	volts
Current . . . . .	0.225	0.45	amp

Direct Interelectrode Capacitances (Approx.):\*

Grid to plate (Each unit) . . . . .	3.0	μμf
Grid to cathode and heater (Each unit) . . . . .	3.8	μμf
Plate to cathode and heater (Unit No.1) . . . . .	0.5	μμf
Plate to cathode and heater (Unit No.2) . . . . .	0.38	μμf
Plate of unit No.1 to plate of unit No.2 . . . . .	0.5	μμf

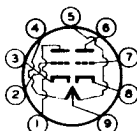
Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Supply Voltage . . . . .	150	volts
Cathode-Bias Resistor . . . . .	220	ohms
Amplification Factor . . . . .	47	
Plate Resistance . . . . .	7250	ohms
Transconductance . . . . .	6500	μmhos
Plate Current . . . . .	8.2	ma
Grid Voltage (Approx.) for plate current of 150 μamp . . . . .	-5.5	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length from Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9A

- Pin 1 - Plate of Unit No.2
- Pin 2 - Grid of Unit No.2
- Pin 3 - Cathode of Unit No.2
- Pin 4,9 - Heater of Unit No.2
- Pin 5,9 - Heater of Unit No.1



- Pin 6 - Plate of Unit No.1
- Pin 7 - Grid of Unit No.1
- Pin 8 - Cathode of Unit No.1
- Pin 9 - Heater Mid-Tap

\* Without external shield.

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**MEDIUM-MU TWIN TRIODE**

**FREQUENCY DIVIDER IN COMPUTER SERVICE  
and "ON-OFF" CONTROL SERVICE**

*Values are for Each Unit*

**Maximum Ratings, Absolute Values:**

PLATE VOLTAGE . . . . .	330 max.	volts
GRID VOLTAGE:		
Negative bias value . . . . .	150 max.	volts
PLATE DISSIPATION . . . . .	2.4 max.	watts
Total for both units . . . . .	4.4 max.	watts
DC CATHODE CURRENT . . . . .	16.5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200*max.	volts
Heater positive with respect to cathode .	200*max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	165 max.	°C

**Typical Operation in Computer Service:**

	<i>Cutoff Condition</i>	<i>Conduction Condition</i>	
Plate Supply Voltage . . . . .	150	150	volts
Plate Load Resistor . . . . .	7200	7200	ohms
Plate Current . . . . .	-	10.5	ma
Grid Voltage (Approx.) for grid current of 140 $\mu$ amp . .	-	less than 1	volt
Grid Voltage (Approx.) for plate current of 150 $\mu$ amp . .	-5.5	-	volts
Difference in Grid Voltage Between Units (For plate current of 150 $\mu$ amp per unit)	1.5	-	volts

**Maximum Circuit Values:**

Grid-Circuit Resistance:		
For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	<i>Note</i>	<i>Min.</i>	<i>Max.</i>	
Heater Current . . . . .	1	0.207	0.243	amp
Amplification Factor (Each Unit) . . . . .	1,2	39	55	
Grid Voltage for plate current of 150 $\mu$ amp (Each Unit) . . . . .	1,3	-	-7.5	volts
Difference in Grid Voltage Between Units (For plate current of 150 $\mu$ amp per unit)	-	-	1.5	volts
Plate Current 1 (Each Unit) . . . . .	1,2	6	10.4	ma

\* The dc component must not exceed 100 volts.



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## MEDIUM-MU TWIN TRIODE

	Note	Min.	Max.	
Plate Current 2 (Each Unit) . .	1,4	9.75	-	ma
Reverse Grid Current (Each Unit)	1,5	-	1	$\mu$ amp
Heater-Cathode Leakage Current:				
Heater negative with respect				
to cathode . . . . .	1,6	-	20	$\mu$ amp
Heater positive with respect				
to cathode . . . . .	1,6	-	20	$\mu$ amp
Transconductance . . . . .	1,2	5100	7900	$\mu$ mhos

- Note 1: With 12.6 volts ac or dc on heater (series connected).
- Note 2: With plate supply voltage of 150 volts and cathode resistor for each cathode of 220 ohms adequately bypassed for a signal frequency of 60 cps. Each unit tested separately. Unit not under test biased to cutoff.
- Note 3: With plate supply voltage of 150 volts, grid supply voltage adjusted to give dc plate current of 150 microamperes, and plate load resistor of 7200 ohms. Each unit tested separately. Unit not under test biased to cutoff.
- Note 4: With plate supply voltage of 150 volts, grid supply voltage adjusted to give dc grid current of 140 microamperes, and plate load resistor of 7200 ohms. Each unit tested separately. Unit not under test biased to cutoff.
- Note 5: With plate supply voltage of 150 volts, cathode resistor for each cathode of 220 ohms, and grid-circuit resistance of 0.5 megohm. Each unit tested separately. Unit not under test biased to cutoff.
- Note 6: With 100 volts dc between heater and cathode and units connected in parallel.

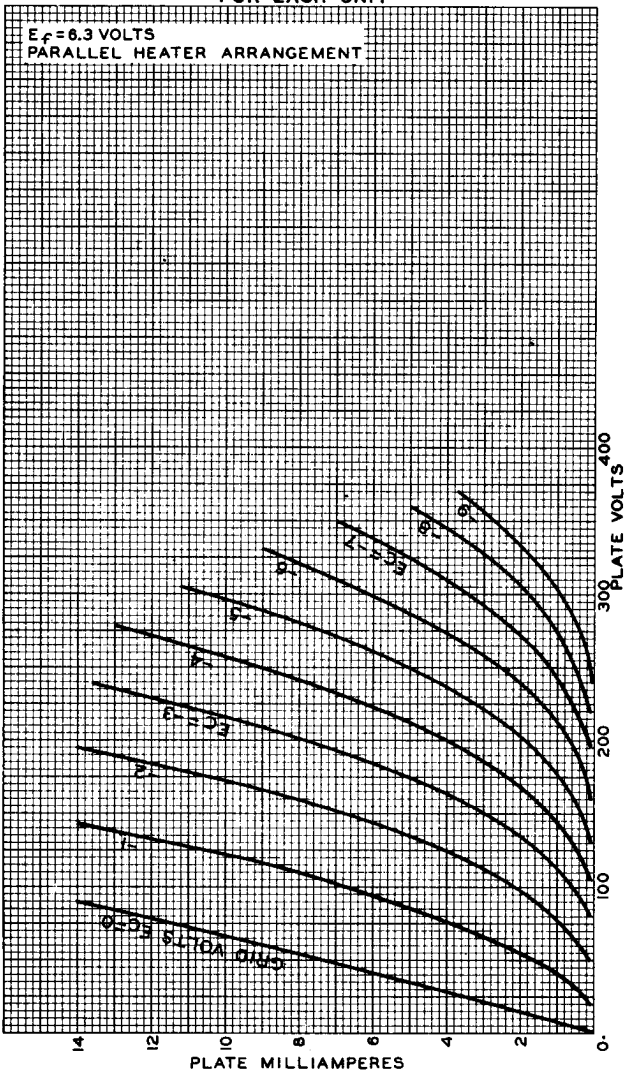
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### AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$  VOLTS  
PARALLEL HEATER ARRANGEMENT



MAR. 4, 1954

TUBE DIVISION

92CM-8261

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



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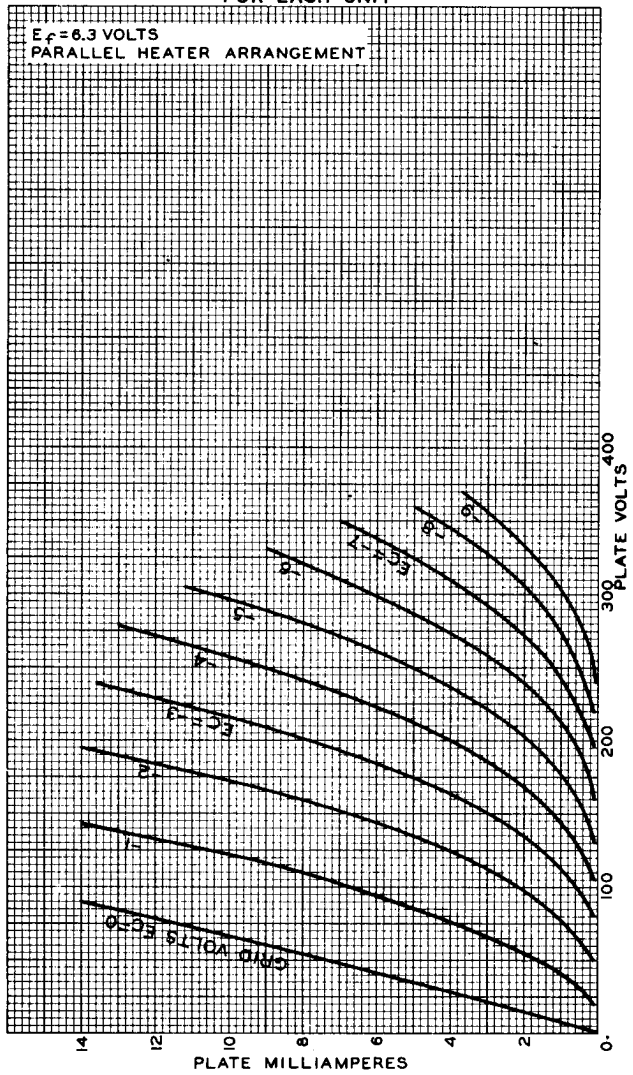
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### AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$  VOLTS  
PARALLEL HEATER ARRANGEMENT



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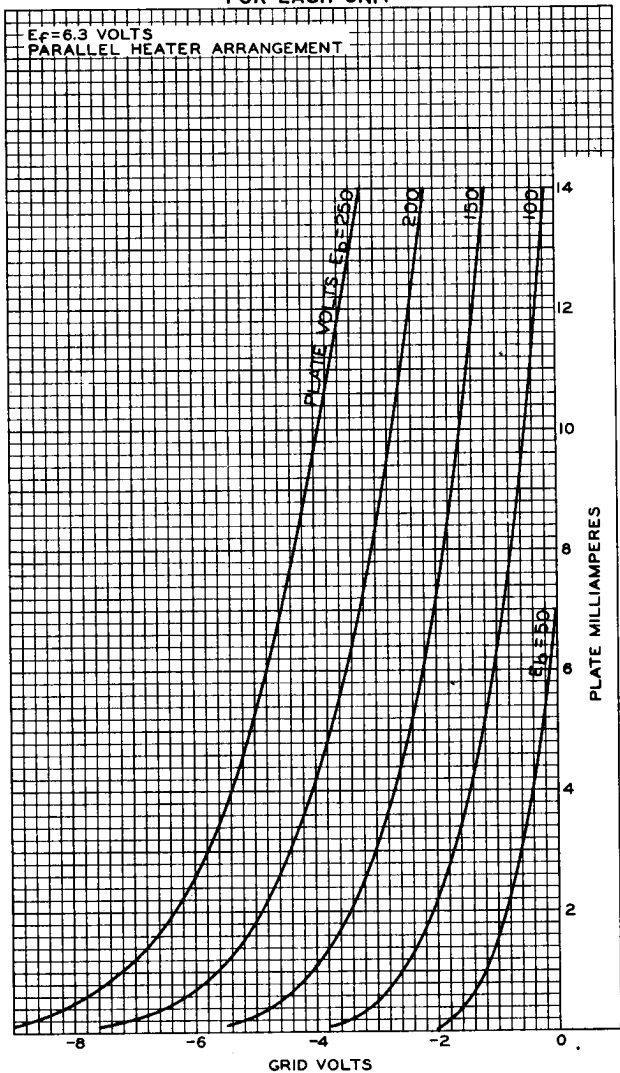
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### AVERAGE CHARACTERISTICS FOR EACH UNIT



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### AVERAGE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 150  
PARALLEL HEATER ARRANGEMENT

