

TWIN TRIODE

FOR MOBILE COMMUNICATIONS EQUIPMENT

**HIGH-MU
SEPARATE CATHODES**

**HEATER-CYCLING RATING
PROTOTYPE—12AT7**

DESCRIPTION AND RATING

The 6679 is a miniature high-mu twin triode suitable for use as a grounded-grid amplifier or as a frequency converter at frequencies below approximately 300 megacycles. Its electrical characteristics are essentially equivalent to those of the 12AT7.

Intended specifically for use in mobile communications equipment, the 6679 may be operated without serious degradation under normal variations in supply voltage as encountered with automotive electrical systems. Also consistent with the requirements of this equipment, the tube is capable of withstanding appreciable on-off cycling.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential	Series	Parallel
Heater Voltage, AC or DC.....	12.6*	6.3* Volts
Heater Current.....	0.15	0.3 Amperes
Direct Interelectrode Capacitances		
	With Shield †	Without Shield
Grid to Plate, Each Section.....	1.5	1.5 μf
Input, Each Section.....	2.2	2.2 μf
Output, Section 1.....	1.2	0.5 μf
Output, Section 2.....	1.5	0.4 μf
Heater to Cathode, Each Section.....	2.4 ‡	2.4 μf
Plate to Cathode, Each Section.....	0.2	0.2 μf
Grounded Grid Input, Each Section.....	4.6	4.6 μf
Grounded Grid Output, Each Section.....	2.6	1.8 μf

MECHANICAL

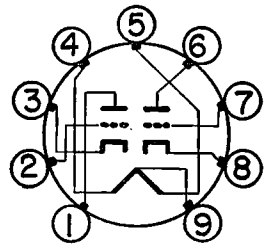
Mounting Position—Any
Envelope—T-6½, Glass
Base—E9-1, Small Button 9-Pin

* When operated from automotive electrical systems, the heater may be subjected to voltage variations as great as ± 20 percent. Although such extremes in heater voltage may be tolerated for short periods, increased equipment reliability can be achieved with improved supply-voltage regulation.

† With external shield (RETMA 315) connected to heater unless otherwise specified.

‡ With external shield (RETMA 315) connected to ground.

BASING DIAGRAM

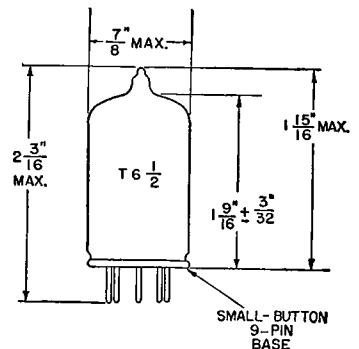


RETMA 9A

TERMINAL CONNECTIONS

- Pin 1—Plate (Section 2)
- Pin 2—Grid (Section 2)
- Pin 3—Cathode (Section 2)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Cathode (Section 1)
- Pin 9—Heater Center Tap

PHYSICAL DIMENSIONS



RETMA 6-2

MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES, EACH SECTION§

Plate Voltage	330 Volts
Positive DC Grid Voltage.....	0 Volts
Negative DC Grid Voltage	55 Volts
Plate Dissipation.....	2.8 Watts
Heater-Cathode Voltage	
Heater Positive with Respect to Cathode.....	100 Volts
Heater Negative with Respect to Cathode	100 Volts

§ Design-Maximum Ratings are the limiting values, expressed with respect to bogie tubes, at which satisfactory tube life can be expected to occur. To obtain satisfactory circuit performance, therefore, the equipment designer must establish the circuit design so that no design-maximum value is exceeded with a bogie tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, and environmental conditions.

CHARACTERISTICS AND TYPICAL OPERATION

CLASS A₁ AMPLIFIER, EACH SECTION

Plate Voltage	250 Volts
Cathode-Bias Resistor.....	200 Ohms
Amplification Factor	60
Plate Resistance, approximate.....	10,900 Ohms
Transconductance	5500 Micromhos
Plate Current.....	10 Milliamperes
Grid Voltage, approximate	
I _b = 10 Microamperes.....	-12 Volts

CLASS A RESISTANCE-COUPLED AMPLIFIER

EACH SECTION

LOW IMPEDANCE DRIVE (APPROXIMATELY 200 OHMS)										
R _L	R _{gf}	E _{bb} = 90 Volts			E _{bb} = 180 Volts			E _{bb} = 300 Volts		
		R _k	E _o	Gain	R _k	E _o	Gain	R _k	E _o	Gain
0.10	0.10	1600	5.3	26	1100	12	31	1000	22	32
0.10	0.24	1800	7.8	29	1400	17	33	1200	30	33
0.24	0.24	3800	7.2	28	2800	16	32	2300	28	34
0.24	0.51	4200	9.4	30	3300	20	33	2800	35	33
0.51	0.51	8000	8.3	28	5600	18	31	4900	31	33
0.51	1.0	9600	10	29	6700	23	32	6000	38	33

HIGH IMPEDANCE DRIVE (APPROXIMATELY 100K OHMS)										
R _L	R _{gf}	E _{bb} = 90 Volts			E _{bb} = 180 Volts			E _{bb} = 300 Volts		
		R _k	E _o	Gain	R _k	E _o	Gain	R _k	E _o	Gain
0.10	0.10	2000	9.9	25	1200	17	31	900	35	33
0.10	0.24	2400	13	27	1400	28	33	1200	47	33
0.24	0.24	4700	12	27	2900	25	32	2300	42	34
0.24	0.51	5300	15	28	3600	31	33	2900	52	34
0.51	0.51	9300	13	27	6000	27	31	5000	45	33
0.51	1.0	11000	16	28	7100	33	32	6400	55	34

Notes:

1. E_o is maximum RMS voltage output for approximately five percent total harmonic distortion.
2. Gain is measured for an output voltage of two volts RMS.
3. R_k is in ohms; R_L and R_{gf} are in megohms.
4. Coupling capacitors (C) should be selected to give desired frequency response. R_k should be adequately by-passed.

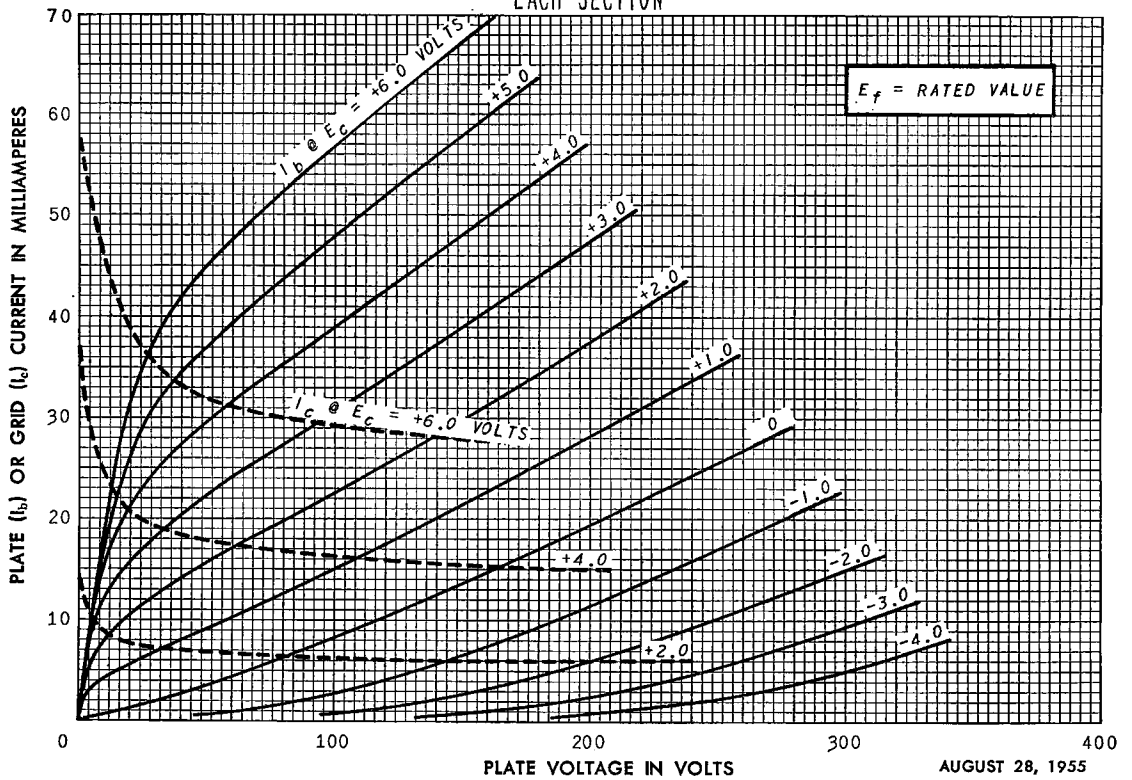
SPECIAL TESTS AND RATINGS

Heater-Cycling Life Test

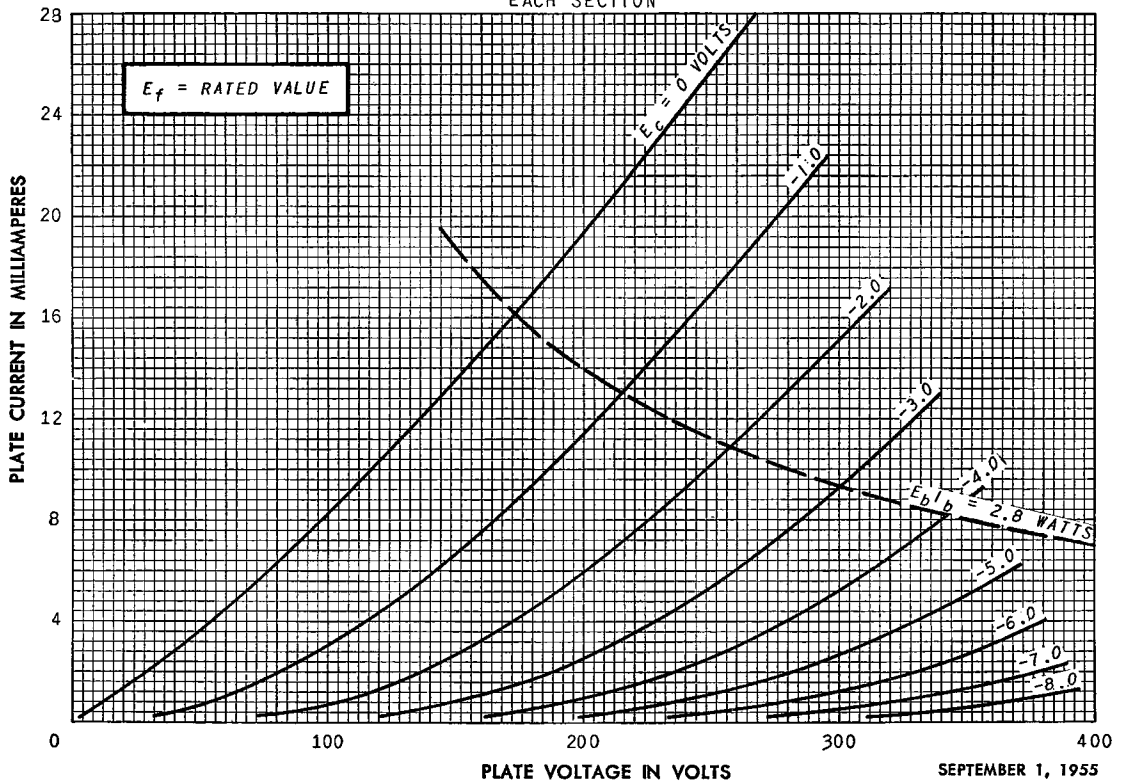
Statistical sample operated for 2000 cycles minimum to evaluate and control heater-cathode defects. Conditions of test include $E_f = 15.0$ volts (series-heater connection) cycled for one minute on and one minute off, $E_b = E_c = 0$ volts, and $E_{hk} = 135$ volts with heater positive with respect to cathode.

Average Transconductance at Reduced Heater Voltage, Each Section 4400 Micromhos
 $E_f = 10.0$ volts, $E_b = 250$ volts, $R_k = 200$ ohms (bypassed)

AVERAGE PLATE CHARACTERISTICS
 EACH SECTION

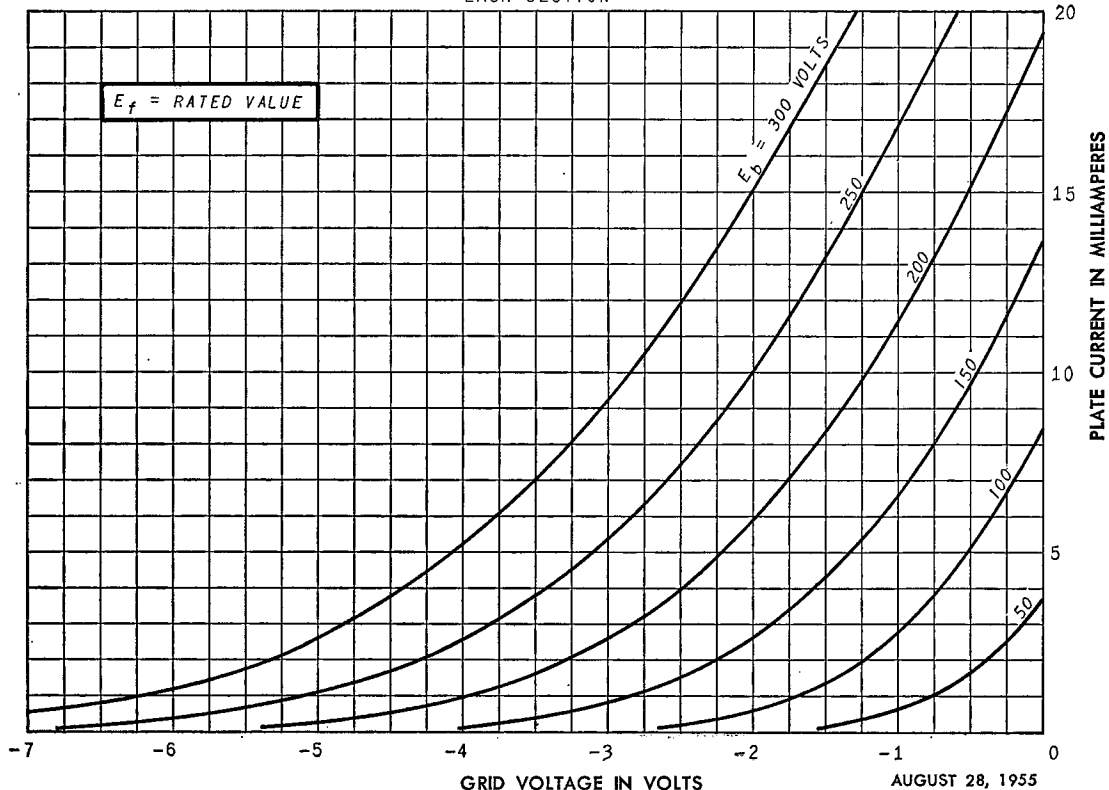


AVERAGE PLATE CHARACTERISTICS
 EACH SECTION



AVERAGE TRANSFER CHARACTERISTICS

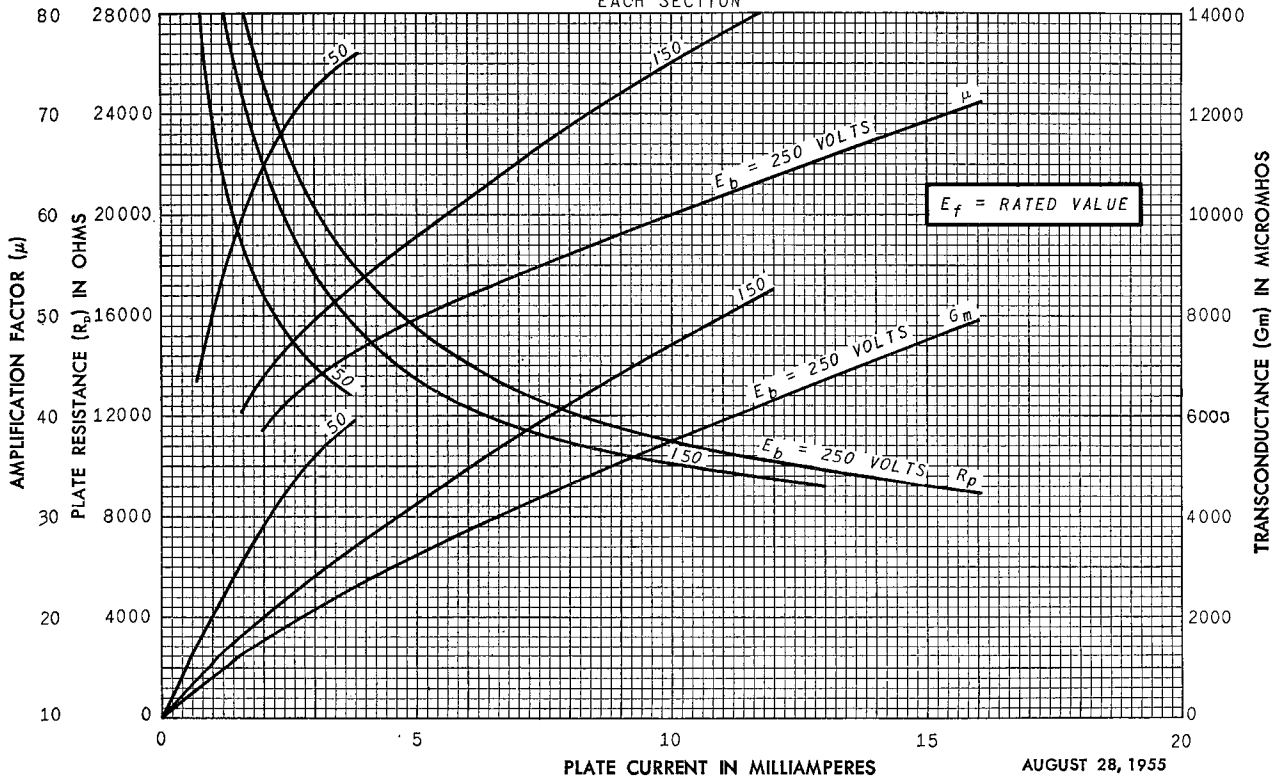
EACH SECTION



AUGUST 28, 1955

AVERAGE CHARACTERISTICS

EACH SECTION



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TUBE DEPARTMENT
GENERAL  **ELECTRIC**
Schenectady 5, N. Y.