

# Amperex<sup>®</sup> ELECTRONIC CORPORATION

HICKSVILLE, L. I., N. Y., 11802

TUBE TYPE

**8637**

The Amperex 8637 is a radiation cooled beam power twin tetrode having high thermal inertia anodes capable of handling the peak dissipation encountered under PTTS service. It is designed for use as an RF power amplifier, oscillator and frequency multiplier in mobile and base station equipment up to 175 MHz. It uses a glass envelope and an indirectly heated cathode. Built in cross neutralization is effective over the entire operating band. It is capable of producing 63 watts from 2.2 watts drive power as a 175 MHz amplifier under PTTS conditions. The 8637 is also rated for class AB<sub>1</sub> SSB service.

## TYPICAL OPERATING CHARACTERISTICS

Frequency MHz	Class C Telegraphy		Class C Telephony		Class AB <sub>1</sub> (SSB)	
	Eb(V)	Po(W)	Eb(V)	Po(W)	Eb(V)	Po(WPEP)
7 PTTS	--	--	--	--	600	60*
175 PTTS	560	63	450	42	--	--

\*Third order IM Distortion = -34 db

## GENERAL CHARACTERISTICS

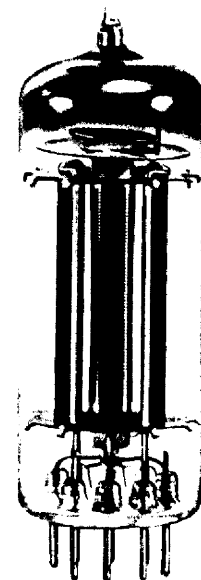
### MECHANICAL

Dimensions	see outline drawing
Mounting Position	any
Net Weight	1.4 ounces
Base	9 pin magnoval
Cooling <sup>1</sup>	radiation and convection
Absolute Maximum Operating Temperature	
Pin Seals	180°C
Bulb	225°C
Accessory - Socket	Amperex #S-331911 or equivalent <sup>2</sup>

### ELECTRICAL

Cathode	coated unipotential
Heater	
Voltage	13.5 volts
Current	.80 amperes
Maximum Heater to Cathode Voltage	±100 volts
Amplification Factor (Grid #1 to Grid #2)	
Each unit at I <sub>b</sub> = 30 ma	7
Direct Interelectrode Capacitance	each unit
Input	9.3 pf
Output	4.2 pf
Grid to Plate - Maximum	0.2 pf

1. Sufficient cooling must be applied to the bulb and seals to avoid exceeding rated maximum temperature. The use of a closed can closer to the bulb than 1/2 inch is not recommended.
2. Socket number listed is for mounting on top of chassis. Socket #B8.702.16 is for mounting on bottom of chassis.



**Amperex**

RF POWER AMPLIFIER AND OSCILLATOR DATA

(Class C Telegraphy or FM Telephony)

(Two Units - Push Pull)

MAXIMUM RATINGS - Absolute values

	<u>CCS</u>	<u>ICAS</u>	<u>PTTS</u> <sup>3</sup>	
Frequency	175	175	175	MHz
DC Plate Voltage	400	450	600	volts
DC Grid #2 Voltage	300	300	300	volts
DC Grid #1 Voltage	-150	-150	-150	volts
DC Plate Current	2x110	2x120	2x120	mA
DC Grid #1 Current	2x5	2x5	2x5	mA
Grid #2 Dissipation	7	8	8	watts
Plate Dissipation	2x7.5	2x10	2x25	watts
Plate Input	2x44	2x54	2x72	watts

TYPICAL OPERATION

	<u>PTTS</u>	<u>PTTS</u> <sup>3</sup>	
Frequency	50	174	MHz
DC Plate Voltage	600	560	volts
DC Grid #2 Voltage	154	164	volts
DC Grid #1 Voltage	-50	-50	volts
DC Plate Current	210	200	mA
DC Grid #2 Current	25	18.4	mA
DC Grid #1 Current	7.1	5.0	mA
Drive Power	0.86	2.2	watts
Useful Power Output	84	63	watts

TYPICAL OPERATION

	<u>CCS</u> <sub>1</sub>	<u>CCS</u>	<u>ICAS</u>	<u>ICAS</u>	
Frequency	50	174	50	174	MHz
DC Plate Voltage	375	300	450	350	volts
DC Grid #2 Voltage	103	132	110	130	volts
DC Grid #1 Voltage	-50	-42	-50	-42	volts
DC Plate Current	100	110	112	130	mA
DC Grid #2 Current	14	10	14	11	mA
DC Grid #1 Current	5.3	2.6	6.6	3.0	mA
Drive Power	.67	1.4	.82	1.6	watts
Useful Power Output	25	18	34	26	watts

3. Push-To-Talk (PTTS) Service describes an operating cycle of one minute ON (Maximum) and four minutes OFF (Minimum) without impairing the long useful life of this tube. This tube is also capable of being continuously operated under these conditions for reasonably extended periods of time to permit equipment tuning and adjustment.

RF POWER AMPLIFIER AND OSCILLATOR DATA  
 (Class C Telephony 100% Plate & Screen Modulation)  
 (Two Units - Push Pull)

MAXIMUM RATINGS - Absolute Values

	<u>CCS</u>	<u>ICAS</u>	<u>PTTS</u>	
Frequency	175	175	175	MHz
DC Plate Voltage	320	360	480	volts
DC Grid #2 Voltage	300	300	300	volts
DC Grid #1 Voltage	-150	-150	-150	volts
DC Plate Current	2x91.5	2x100	2x100	mA
DC Grid #1 Current	2x5	2x5	2x5	mA
Grid #2 Dissipation	4.7	5.3	5.3	watts
Plate Dissipation	2x5	2x6.7	2x16.7	watts
Plate Input	2x29	2x36	2x48	watts

TYPICAL OPERATION

	<u>CCS</u>	<u>CCS</u>	<u>ICAS</u>	<u>ICAS</u>	
Frequency	50	174	50	174	MHz
DC Plate Voltage	300	240	360	280	volts
DC Grid #2 Voltage	85	91.5	90	109	volts
DC Grid #1 Voltage	-50	-42	-50	-42	volts
DC Plate Current	83	91.5	93	107	mA
DC Grid #2 Current	12	8.2	12	9	mA
DC Grid #1 Current	5.3	2.6	6.6	3.0	mA
Drive Power	.67	1.4	.82	1.6	watts
Useful Power Output	16.7	12	23	17.4	watts

TYPICAL OPERATION

	<u>PTTS</u>	<u>PTTS</u>	
Frequency	50	174	MHz
DC Plate Voltage	480	450	volts
DC Grid #2 Voltage	126	134	volts
DC Grid #1 Voltage	-50	-50	volts
DC Plate Current	175	166	mA
DC Grid #2 Current	20	15	mA
DC Grid #1 Current	7.1	5.0	mA
Drive Power	0.86	2.2	watts
Useful Power Output	56	42	watts

LINEAR RF POWER AMPLIFIER  
(Class AB<sub>1</sub>, SSB Suppressed Carrier Operation)  
(Parallel Connected)

MAXIMUM RATINGS - Absolute Values

	<u>CCS</u>	<u>ICAS</u>	<u>PTTS</u> <sup>5</sup>	
Frequency	90	90	90	MHz
DC Plate Voltage	400	450	600	volts
DC Grid #2 Voltage	300	300	300	volts
DC Grid #1 Voltage	-150	-150	-150	volts
DC Plate Current	2x110	2x120	2x120	mA
Plate Dissipation	2x7.5	2x10	2x25	watts
Grid #2 Dissipation	7	7	8	watts

TYPICAL OPERATION

	<u>CCS</u>	<u>ICAS</u>	<u>PTTS</u>	
Frequency	7	7	7	MHz
DC Plate Voltage	375	400	600	volts
DC Grid #2 Voltage	180	200	200	volts
DC Grid #1 Voltage <sup>4</sup>	-27	-30	-26	volts
Effective RF Load Resistance	2025	1965	1940	ohms

Zero Signal Conditions

Zero Signal DC Plate Current	35	40	80	mA
Zero Signal DC Grid #2 Current	1.5	2	4	mA

Single Tone Modulation

Peak RF Grid Voltage	27	30	26	volts
DC Plate Current	115	137	175	mA
DC Grid #2 Current	28	32	25	mA
Plate Input Power	43	55	105	watts
Useful Power Output	31	41	60	watts
Efficiency	72	74	57	%

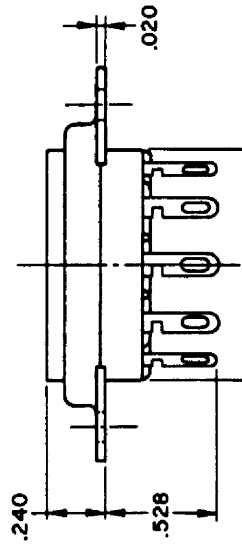
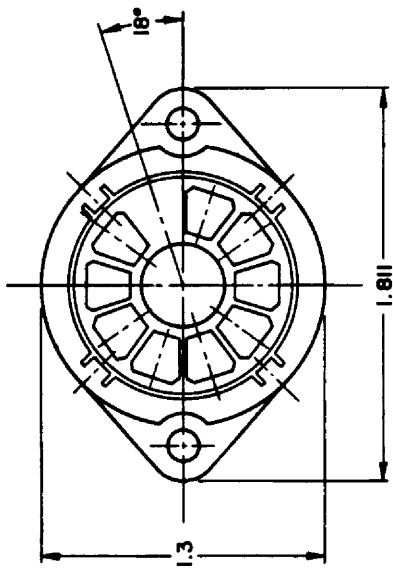
Two-Tone Modulation

Peak RF Grid Voltage	27	30	36	volts
Average DC Plate Current	83	99	125	mA
Average DC Grid #2 Current	15	20	16	mA
Average Plate Input Power	31	40	76	watts
Useful Average Power Output	16	21	30	watts
Useful Peak Envelope Power Output	32	42	60	watts
Efficiency	43	52	40	%
Intermodulation Distortion				
Third Order	-30	-29	-34	db
Fifth Order	-44	-41	-47	db

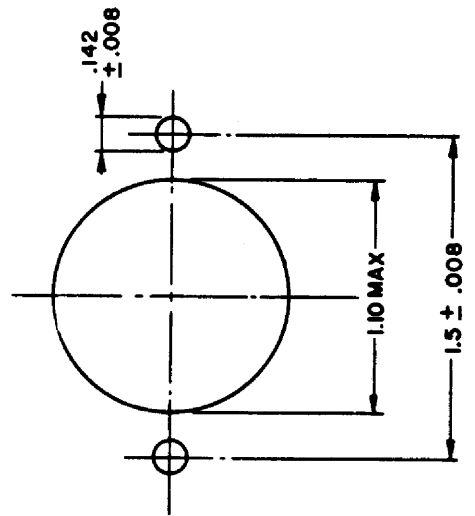
<sup>4</sup> Approximate value. Voltage used should be that which results in specified zero signal plate current.

<sup>5</sup> Push-to-talk (PTTS) Service describes an operating cycle of one minute ON (maximum) time and four minutes (minimum) OFF time which does not impair the long useful life of the tube. OFF time refers to the condition where no cathode current is flowing within the tube and not to the zero signal condition. A method of accomplishing this would be the use of "vox" or similar circuitry.

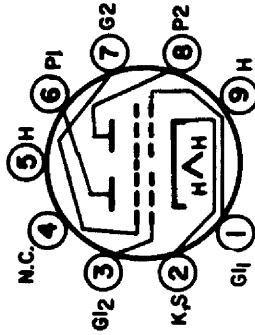
TUBE SOCKET MAGNOVAL 9 PINS  
PART NUMBER S331911



TUBE SOCKET \_\_\_\_\_ CERAMIC  
CONTACT SPRINGS \_\_\_\_\_ SILVER PLATED PHOSPHOR BRONZE  
S331911 \_\_\_\_\_ CADMIUM PLATED STEEL  
RIM \_\_\_\_\_  
COLOR \_\_\_\_\_ WHITE

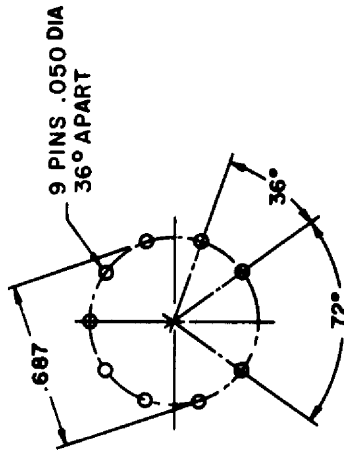
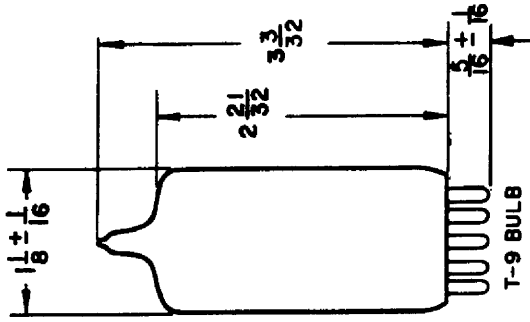


MOUNTING HOLES

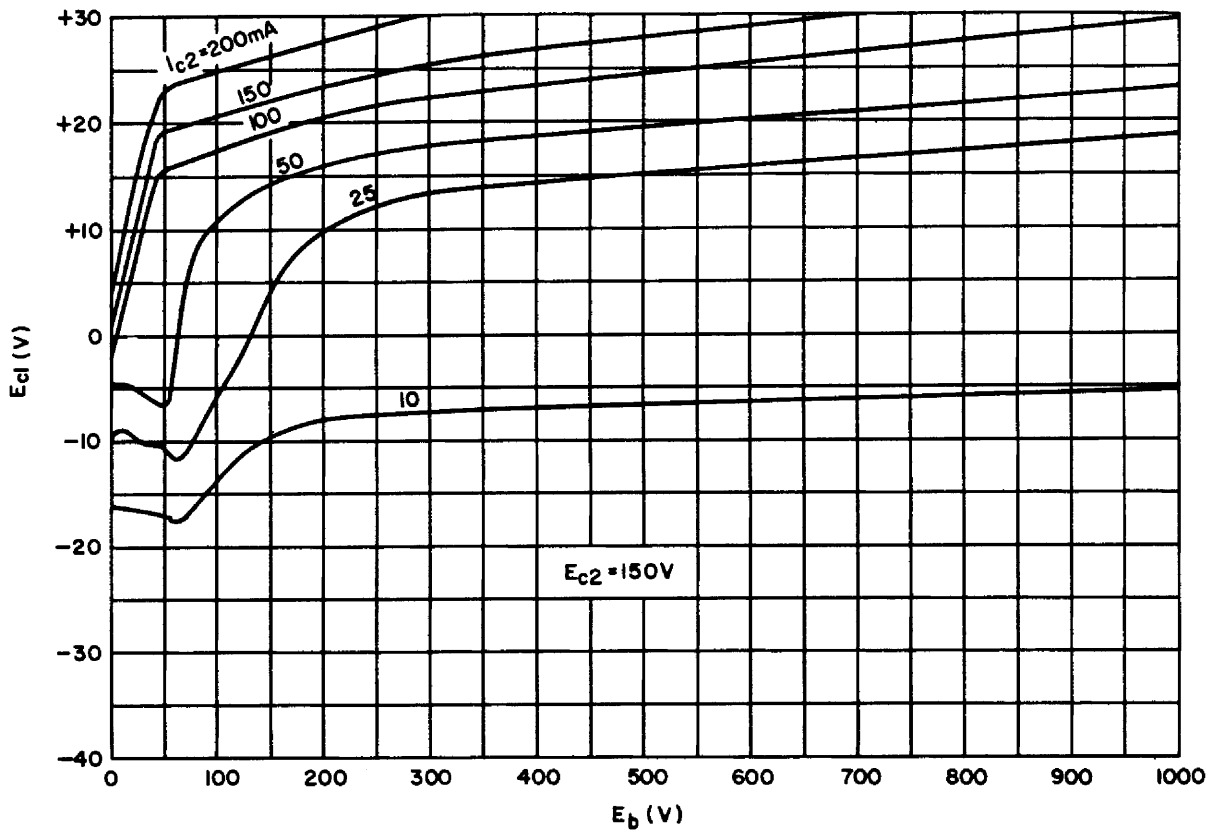


**PIN CONNECTIONS**

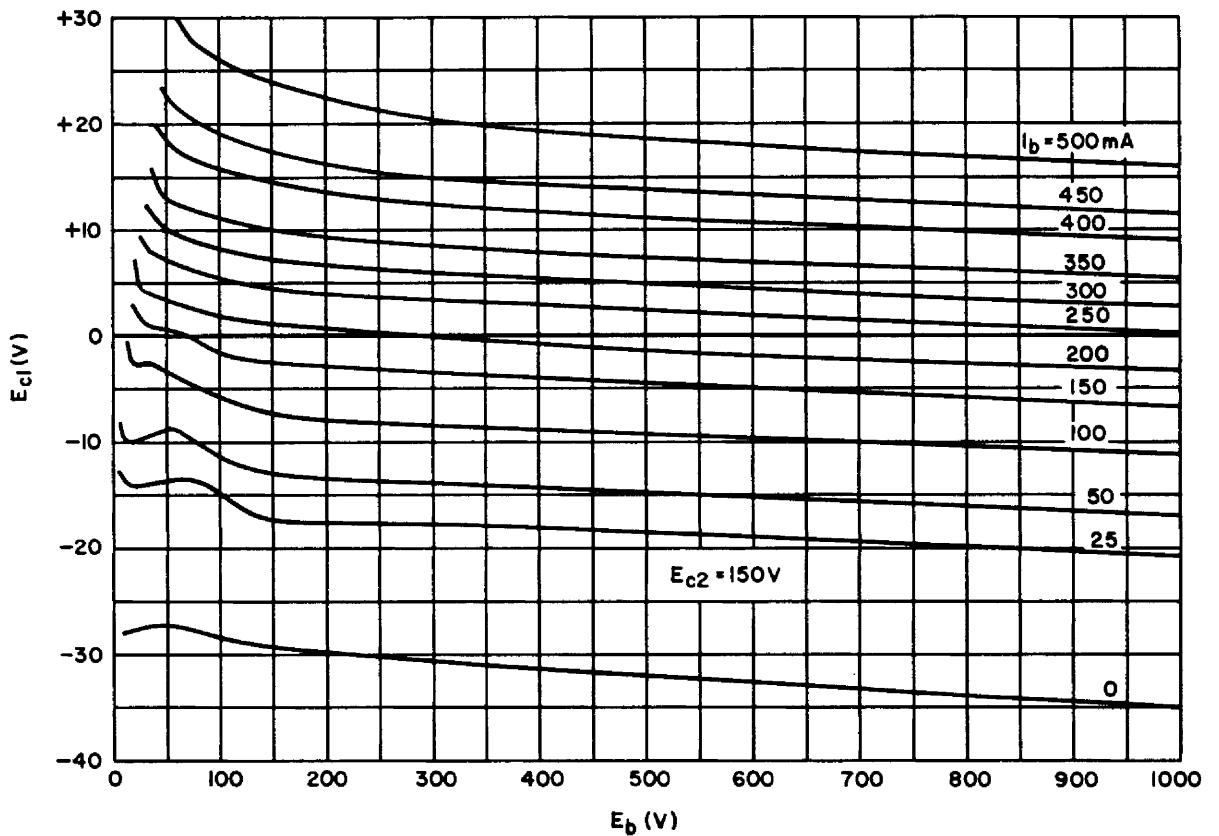
1. GRID NO.1, SIDE NO.1
2. CATHODE AND BEAM PLATE
3. GRID NO.1, SIDE NO.2
4. NO CONNECTION
5. HEATER
6. PLATE, SIDE NO.1
7. GRID NO.2
8. PLATE, SIDE NO.2
9. HEATER



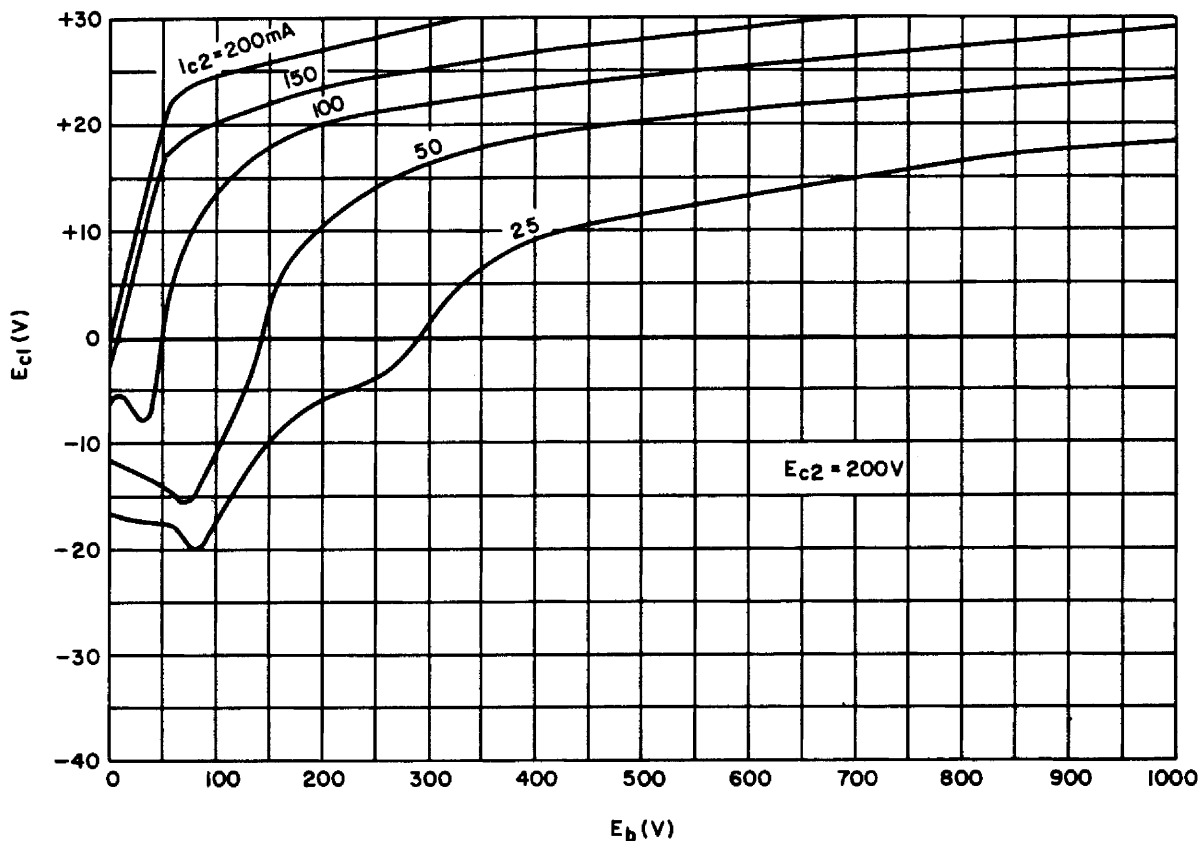
MAGNOVAL BASE  
E9-75



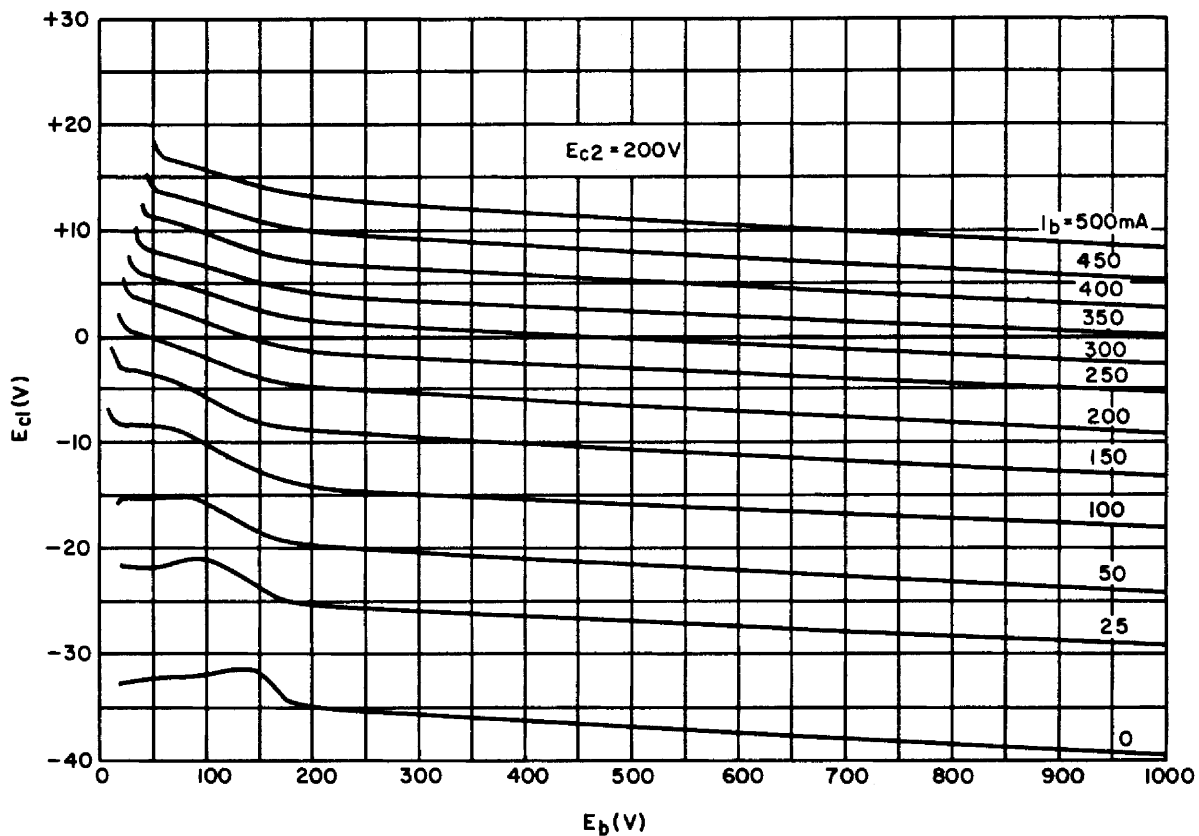
Constant Grid No 2 Current Characteristics (Per Section)



Constant Plate Current Characteristics (Per Section)



Constant Grid No. 2 Current Characteristics (Per Section)



Constant Plate Current Characteristics (Per Section)