



Amperex[®] ELECTRONIC CORPORATION

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

The Amperex 8643 is a radiation cooled beam power twin tetrode incorporating the new wide range cathode. It is especially designed for satisfactory operation throughout the supply voltage range of from 10 to 16 volts which is normally encountered in mobile service. This tube employs an oxide coated unipotential cathode and is designed for use as an RF power amplifier, oscillator and frequency multiplier up to 175 MHz with maximum power input. It, however, may be operated at frequencies up to 500 MHz at reduced ratings. Built-in cross neutralization is effective throughout the entire operating band. It is capable of providing 137 watts useful power from 5.3 watts drive as a 174 MHz amplifier under Push-to-Talk conditions.

TYPICAL CHARACTERISTICS

| Frequency MHz | Class C Telegraphy | |
|------------------|--------------------|-----------|
| | E_b (V) | P_o (W) |
| 175 | 750 | 137 |

GENERAL CHARACTERISTICS

MECHANICAL

| | |
|--------------------------------|---|
| Dimensions | see outline drawing |
| Mounting Position | any |
| Net Weight | 2.6 ounces |
| Base | 7 pin Septar, JEDEC |
| Cooling ¹ | Radiation and Convection |
| Maximum Operating Temperatures | |
| Base Pin Seal | 180°C |
| Anode Pin Seal | 220°C CCS, ICAS, 250°C PTTS |
| Bulb | 250°C |
| Socket | E. J. Johnson Co. 122-105 or equivalent |

ELECTRICAL

| | | | |
|--|------------------|------------------|----|
| Cathode | unipotential | | |
| Heater | <u>Series</u> | <u>Parallel</u> | |
| Voltage ² | 13.5 | 6.75 | |
| Current at $E_f = 12.6/6.3$ volts | 1 amp | 2 amps | |
| Maximum Heater to Cathode Voltage | 150 volts | | |
| Amplification Factor, Grid No. 1 to Grid No. 2 | 7 | | |
| I_b per unit = 30 ma | | | |
| Direct Interelectrode Capacitance | <u>Each Unit</u> | <u>Push-Pull</u> | |
| Input | 10 | 6.7 | pf |
| Output | 3.4 | 2.1 | pf |
| Grid to Plate | 0.1 | -- | pf |



Amperex

¹Sufficient cooling must be applied to the bulb and seals to avoid exceeding rated maximum temperature under the worst possible combination of environment and electrical conditions to be encountered.

²A nominal heater voltage of 13.5/6.75 volts is recommended for mobile service where power will be supplied by an automotive battery electrical system. The tube will operate satisfactorily in such service with heater voltage excursions from 10 volts to 16 volts. For base station use, a nominal heater voltage of 12.6/6.3 volts is recommended.

RF POWER AMPLIFIER AND OSCILLATOR DATA
(Class C Telephony or FM Telephony)

MAXIMUM RATINGS - ABSOLUTE VALUES

Connections (Parallel/Push-Pull)

Frequency

DC Plate Voltage

DC Grid #2 Voltage

DC Grid #1 Voltage

DC Plate Current

Grid #2 Dissipation

DC Grid #1 Current

Plate Dissipation

Plate Input

PTTS³

PP

175

MHz

800

volts

300

volts

-175

volts

2x135

ma

8

watts

2x5

ma

2x38

watts

200

watts

TYPICAL OPERATION

Connections (Parallel/Push-Pull)

Frequency

DC Plate Voltage

DC Grid #2 Voltage

DC Grid #1 Voltage

DC Plate Current

DC Grid #2 Current

DC Grid #1 Current

Driving Power⁴Useful Power Output⁵PTTS³

PP

175

MHz

750

volts

300

volts

-90

volts

266

ma

9.5

ma

9.9

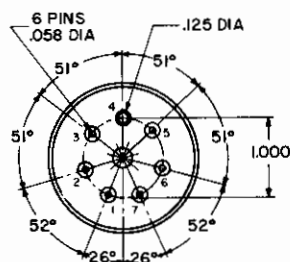
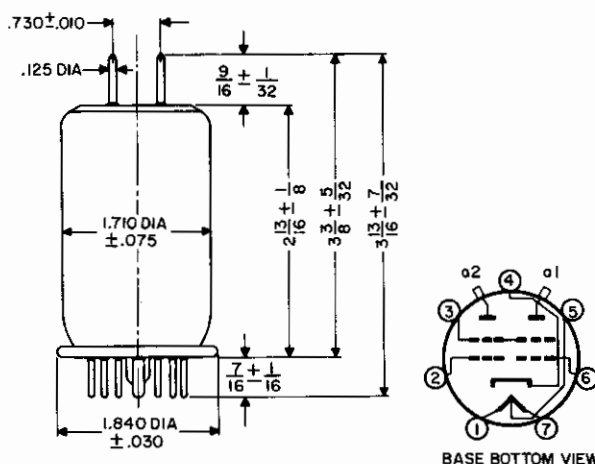
ma

5.3

watts

137

watts

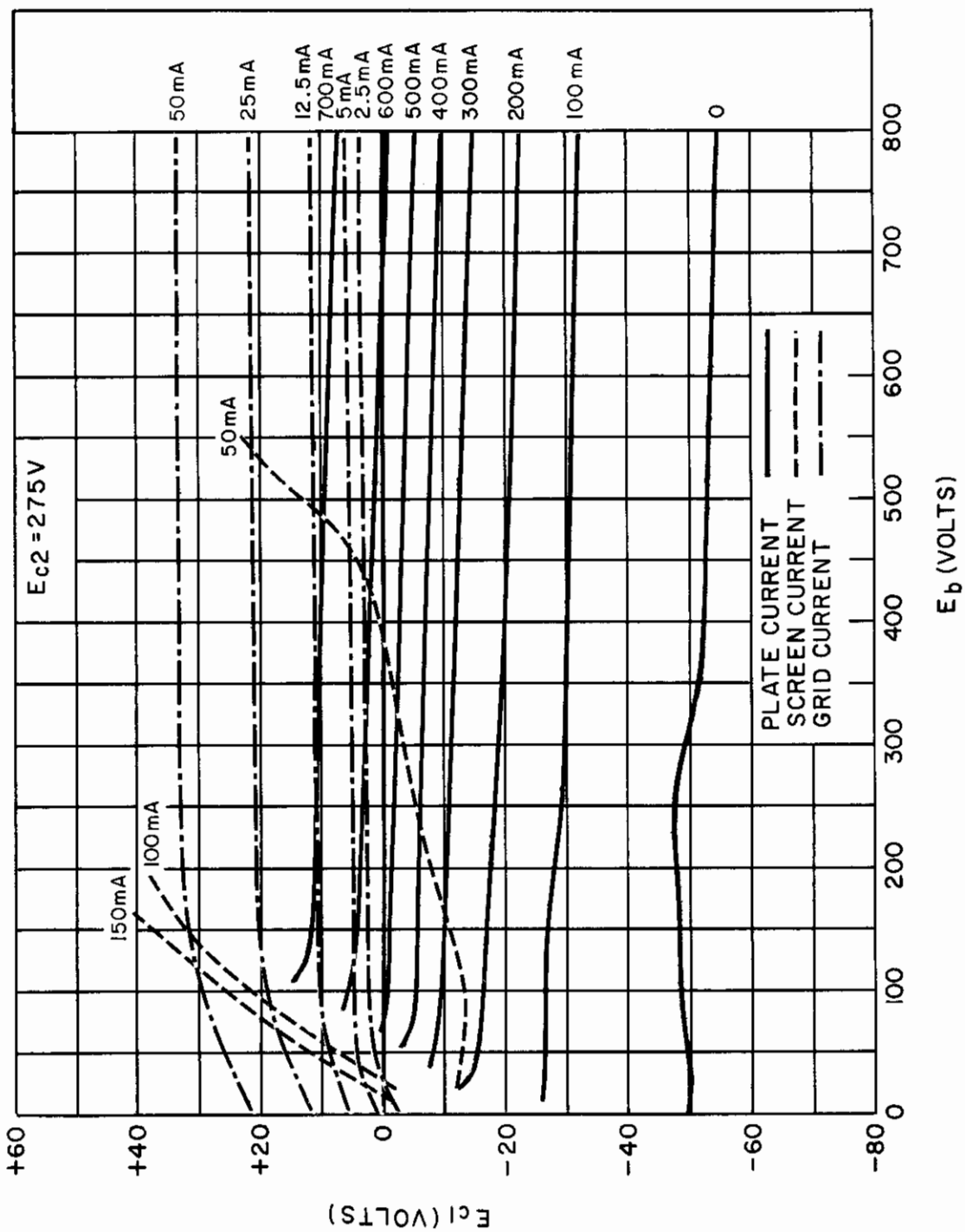


PIN 1 - HEATER
 PIN 2 - GRID NO. 1 OF UNIT NO. 2
 PIN 3 - GRID NO. 2
 PIN 4 - CATHODE & INTERNAL SHIELD
 PIN 5 - HEATER CENTER TAP
 PIN 6 - GRID NO. 1 OF UNIT NO. 1
 PIN 7 - HEATER
 a1 - ANODE OF UNIT NO. 1
 a2 - ANODE OF UNIT NO. 2

³Push-to-Talk Service (PTTS) is defined as an operating cycle of one minute (maximum) ON time and four minutes (minimum) OFF time which does not impair the long useful life of the tube.

⁴Includes circuit losses as measured in a laboratory test amplifier.

⁵Actual measured power delivered to a load.



Constant Current Characteristics (per section)

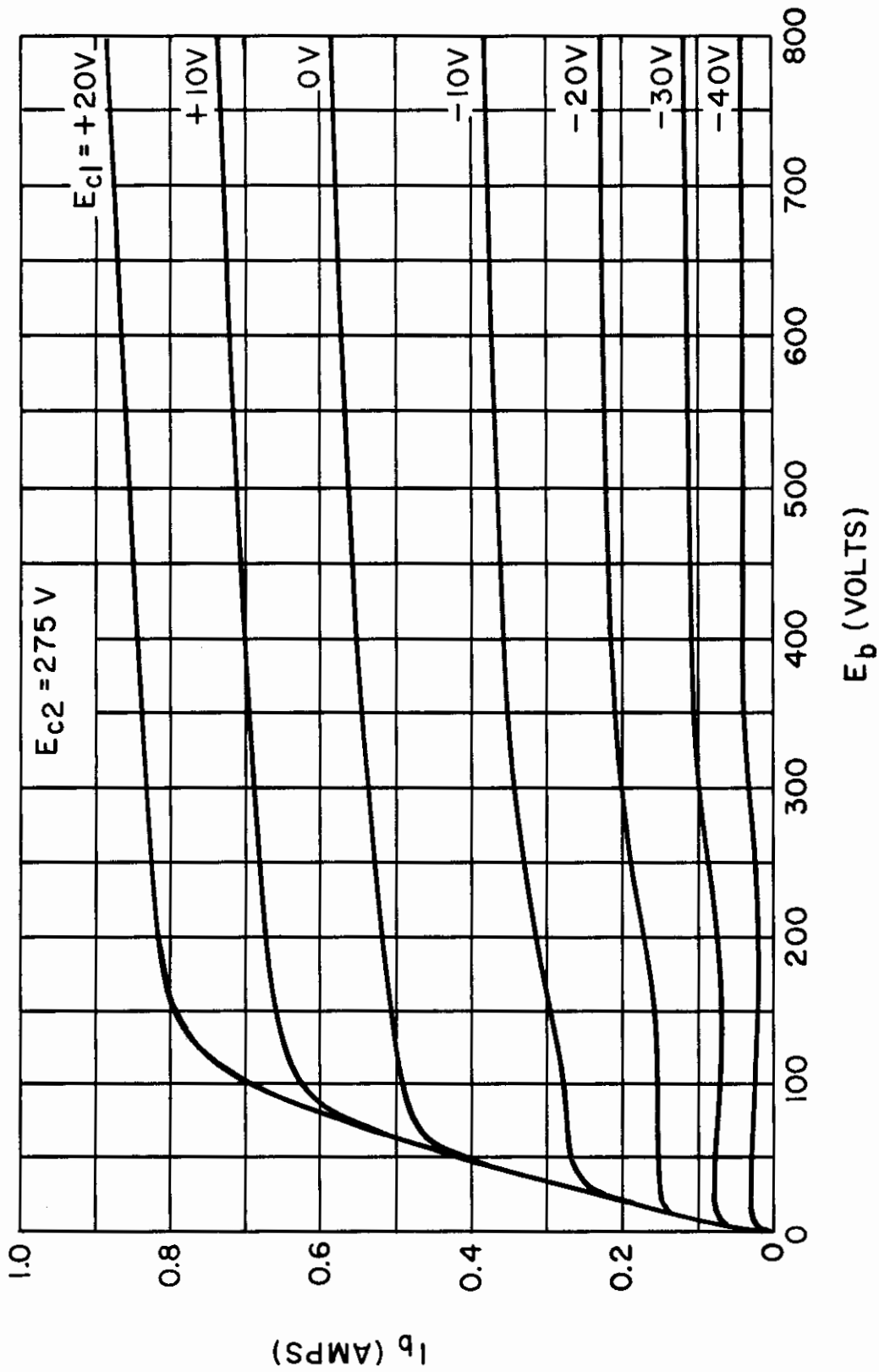
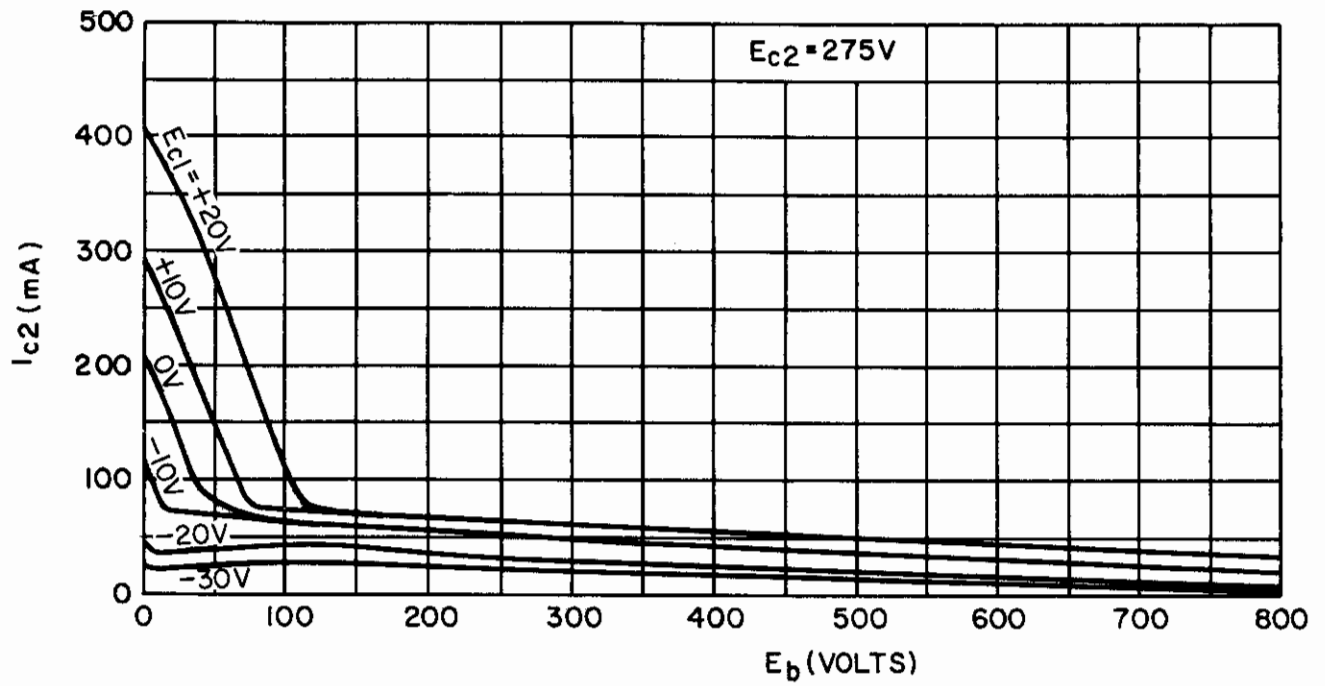
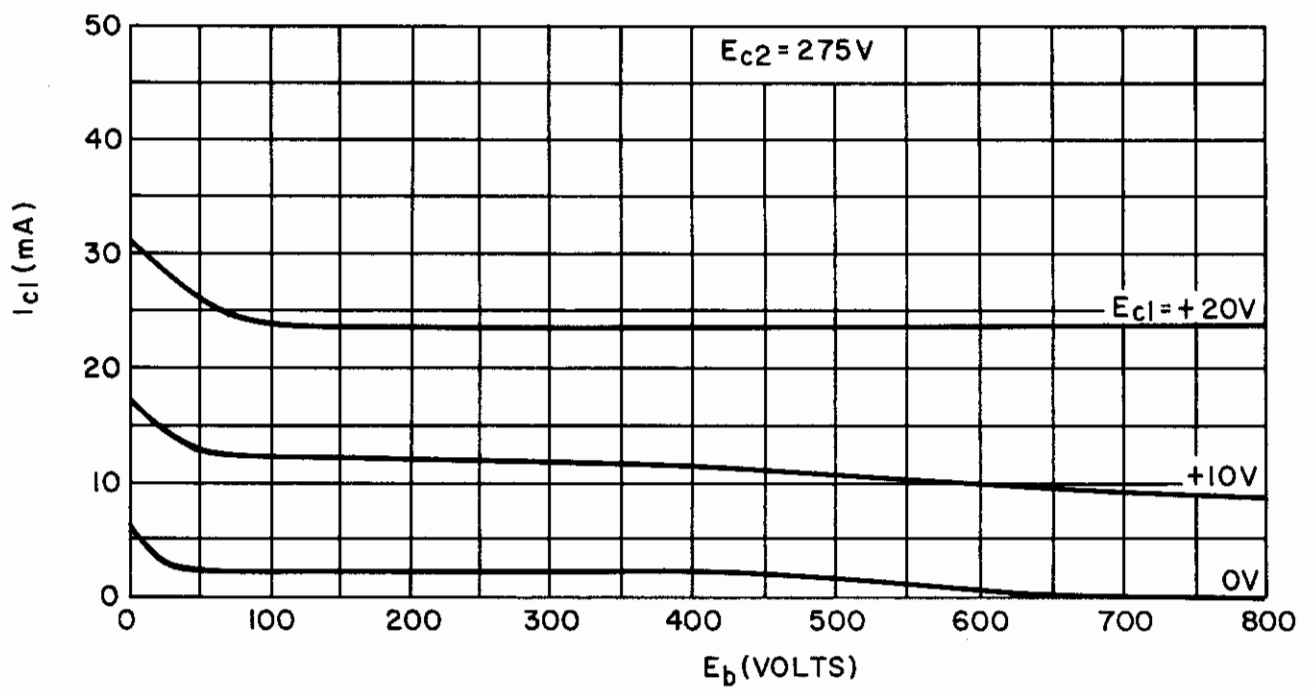


Plate Characteristics (per Section)



Screen Characteristics (per Section)



Grid Characteristics (per Section)