



6386
TWIN TRIODE
Five-Star Tube
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6386
ET-T1113
Page 1
8-54

FOR REMOTE-CUTOFF CASCODE-AMPLIFIER APPLICATIONS

REMOTE-CUTOFF CHARACTERISTIC
9-PIN MINIATURE

SHOCK, VIBRATION RATINGS
HEATER-CYCLING RATING

MEDIUM-MU

DESCRIPTION AND RATING

The 6386 is a miniature medium-mu twin triode in which each section exhibits a remote-cutoff characteristic. It is designed primarily for use as a cascode radio-frequency amplifier, intermediate-frequency amplifier, or mixer in circuits to which it is desired to apply automatic-gain-control. When used in cascode applications, the performance of the 6386 is characterized by high gain, low noise figure, and low higher-order harmonic distortion.

The 6386 is a special-quality tube intended for use in critical industrial and military applications in which operational dependability is of primary importance. Features of the tube include a high degree of mechanical strength and a heater-cathode construction capable of withstanding many-thousand cycles of intermittent operation. When used in on-off control applications, the tube will maintain its emission capabilities after long periods of operation under cutoff conditions.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC $6.3 \pm 10\%$ Volts

Heater Current 0.35 Amperes

Direct Interelectrode Capacitances*

Grid to Plate, Each Section $1.2 \mu\mu\text{f}$

Input, Each Section $2.0 \mu\mu\text{f}$

Output, Each Section $1.1 \mu\mu\text{f}$

Heater to Cathode, Each Section $2.6 \mu\mu\text{f}$

Grid to Grid $0.003 \mu\mu\text{f}$

Plate to Plate $0.11 \mu\mu\text{f}$

*Without external shield.

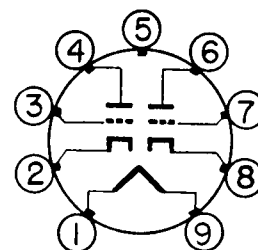
MECHANICAL

Mounting Position—Any

Envelope—T-6 1/2, Glass

Base—E9-1, Small Button 9-Pin

BASING DIAGRAM



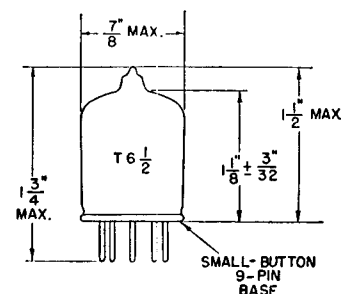
RETMA 8CJ

TERMINAL CONNECTIONS

- Pin 1—Heater
- Pin 2—Cathode (Section 2)
- Pin 3—Grid (Section 2)
- Pin 4—Plate (Section 2)
- Pin 5—Internal Shield†
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Cathode (Section 1)
- Pin 9—Heater

† It is recommended that Pin 5 be grounded.

PHYSICAL DIMENSIONS



RETMA 6-1

MAXIMUM RATINGS

DESIGN-CENTER VALUES, EACH SECTION

Plate Voltage	300 Volts
Plate Dissipation	1.5 Watts
DC Cathode Current	18 Milliamperes
Heater-Cathode Voltage†	
Heater Positive with Respect to Cathode	90 Volts
Heater Negative with Respect to Cathode	90 Volts

† When the 6386 is used as a cascode amplifier and the two sections are connected in series, the heater-cathode voltage of the grounded-grid stage may be as high as 250 volts maximum with the heater negative with respect to the cathode.

CHARACTERISTICS AND TYPICAL OPERATION

CLASS A₁ AMPLIFIER, EACH SECTION

Plate Voltage	100 Volts
Cathode-Bias Resistor	200 Ohms
Amplification Factor	17
Plate Resistance, approximate	4250 Ohms
Transconductance	4000 Micromhos
Plate Current	9.6 Milliamperes
Grid Voltage, approximate	
Gm = 100 Micromhos	— 16 Volts

CASCODE AMPLIFIER—SEE CIRCUIT DIAGRAM

Plate-Supply Voltage	300	200 Volts
Plate Load Resistor	10000	0 Ohms
Voltage-Divider Supply Voltage	250	200 Volts
Grid-Supply Voltage	—5	—2 Volts
Cascode Transconductance	...	4000 Micromhos
Cascode Plate Current	...	10.5 Milliamperes
Third Harmonic Distortion		
Esig = 1.0 Volts, Peak	0.5	 Percent

SPECIAL TESTS AND RATINGS

Inoperatives Control

Minimum continuous operating time under life-test conditions or equivalent for all tubes prior to characteristics testing 46 Hours

Heater-Cycling Rating

Cycles of Intermittent Operation, minimum 2000 Cycles
 Ef = 7.5 volts cycled for one minute on and one minute off. Eb = Ec = 0 volts. Ehk = 135 volts with heater positive with respect to cathode.

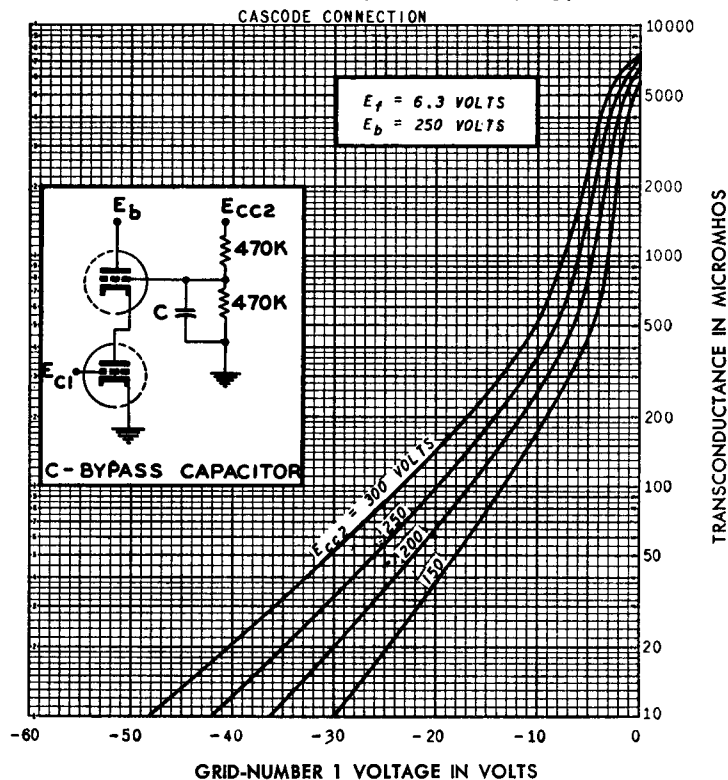
Shock Rating

Impact Acceleration in Any Direction 600 G
 Forces as applied by the Navy-type, High Impact (flyweight) Shock Machine for Electronic Devices or its equivalent.

Fatigue Rating

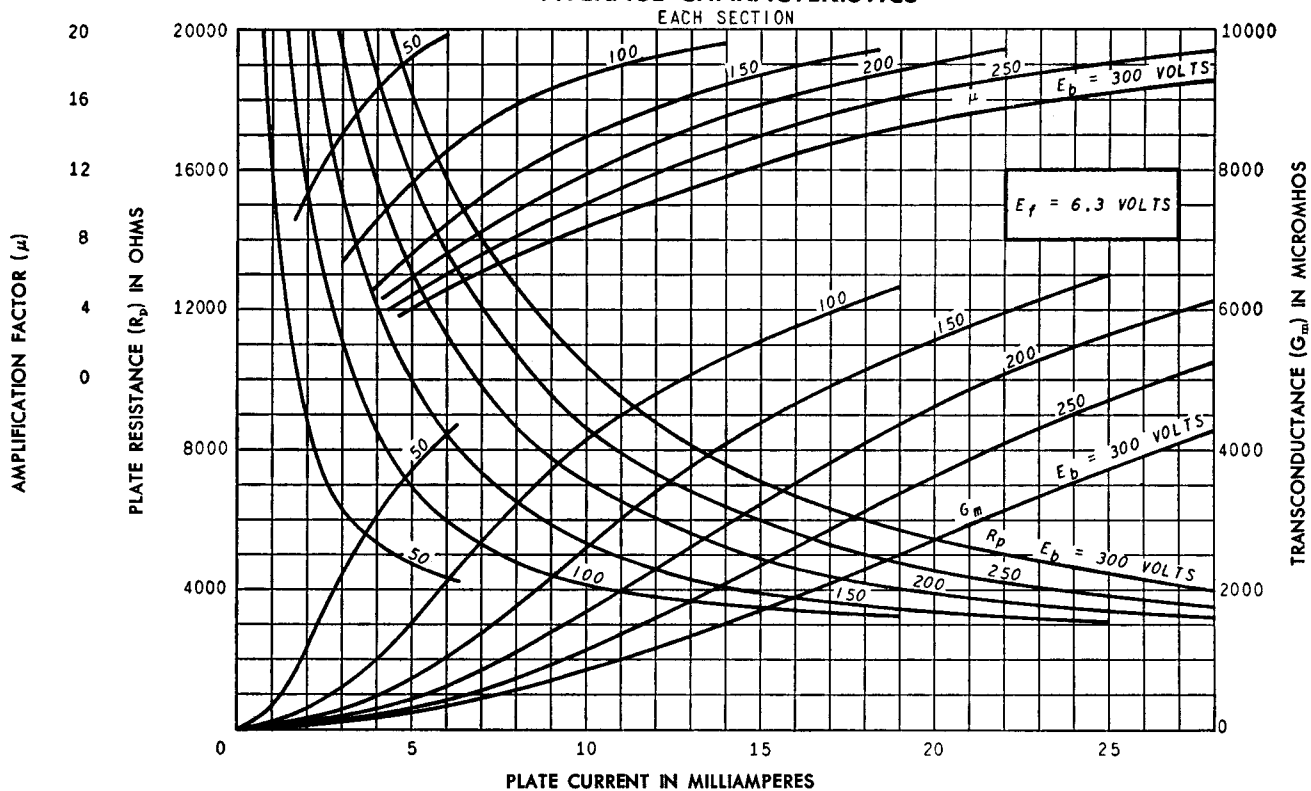
Vibrational Acceleration in Any Direction 2.5 G
 Vibrational forces for a period of at least 100 hours at a frequency of 25 cycles per second.

AVERAGE TRANSFER CHARACTERISTICS



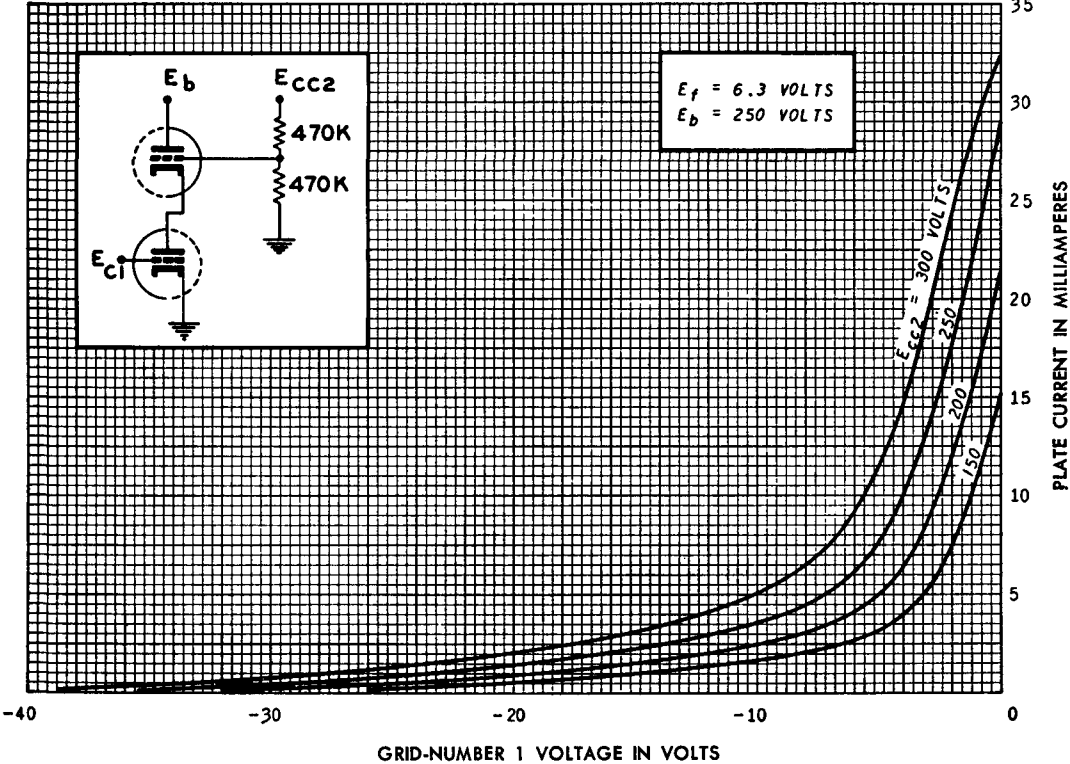
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AVERAGE CHARACTERISTICS



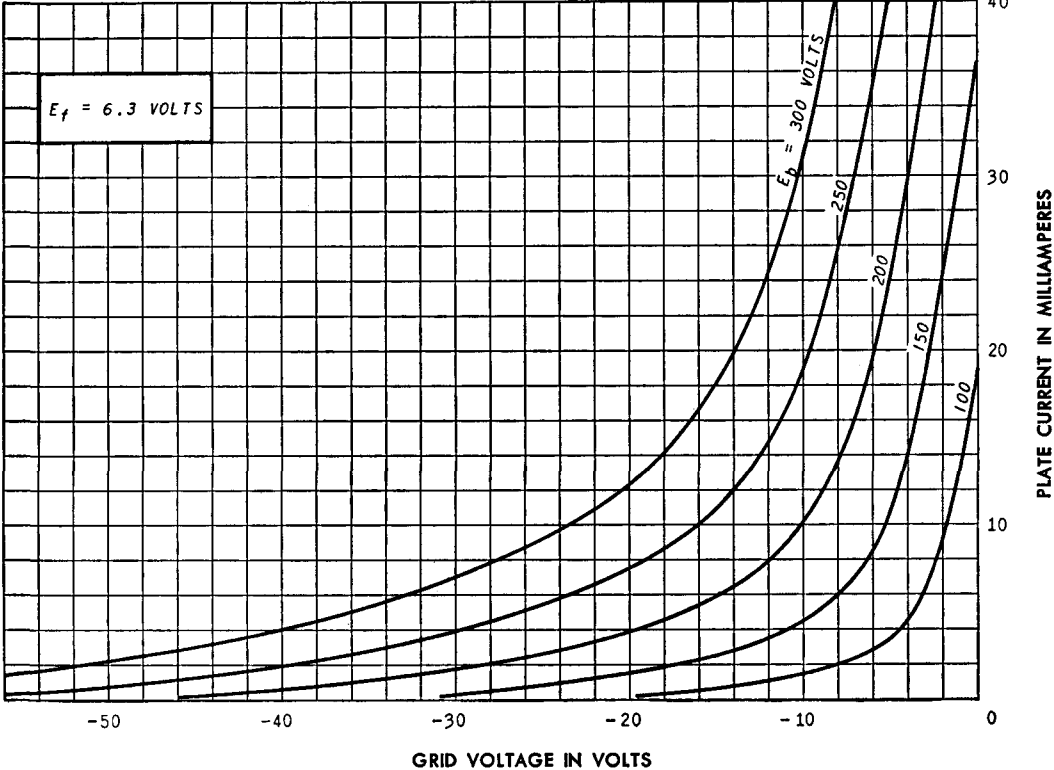
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AVERAGE TRANSFER CHARACTERISTICS
CASCODE CONNECTION



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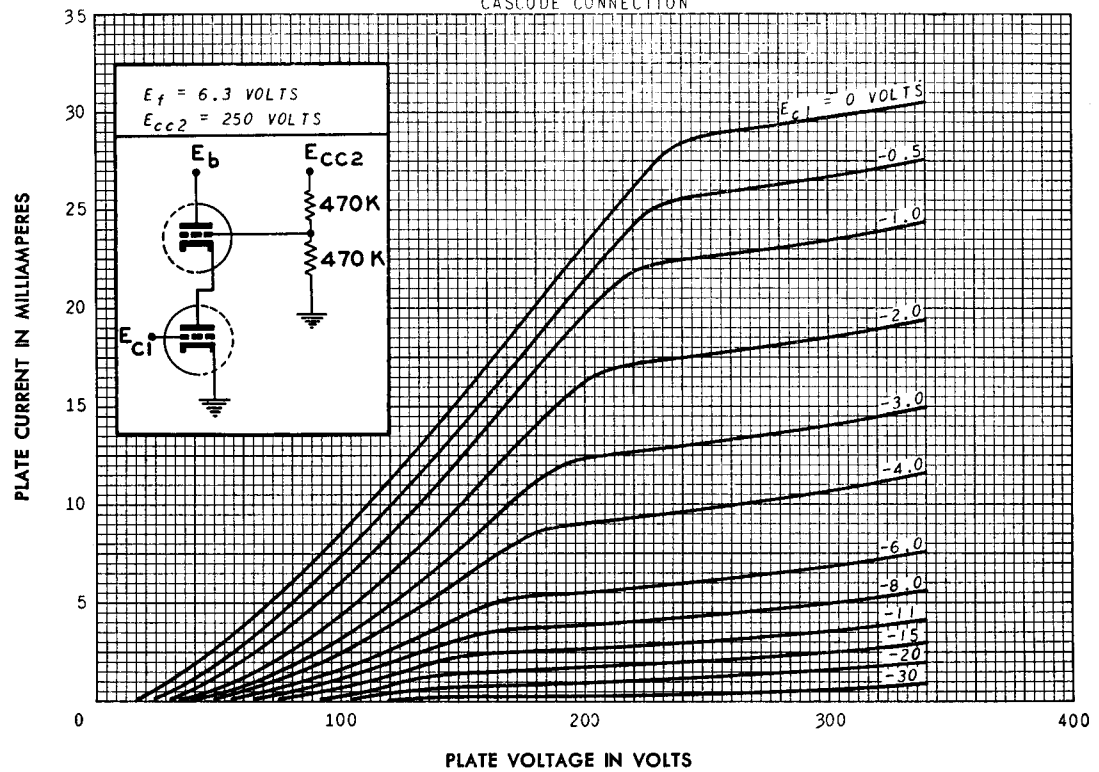
AVERAGE TRANSFER CHARACTERISTICS
EACH SECTION



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AVERAGE PLATE CHARACTERISTICS

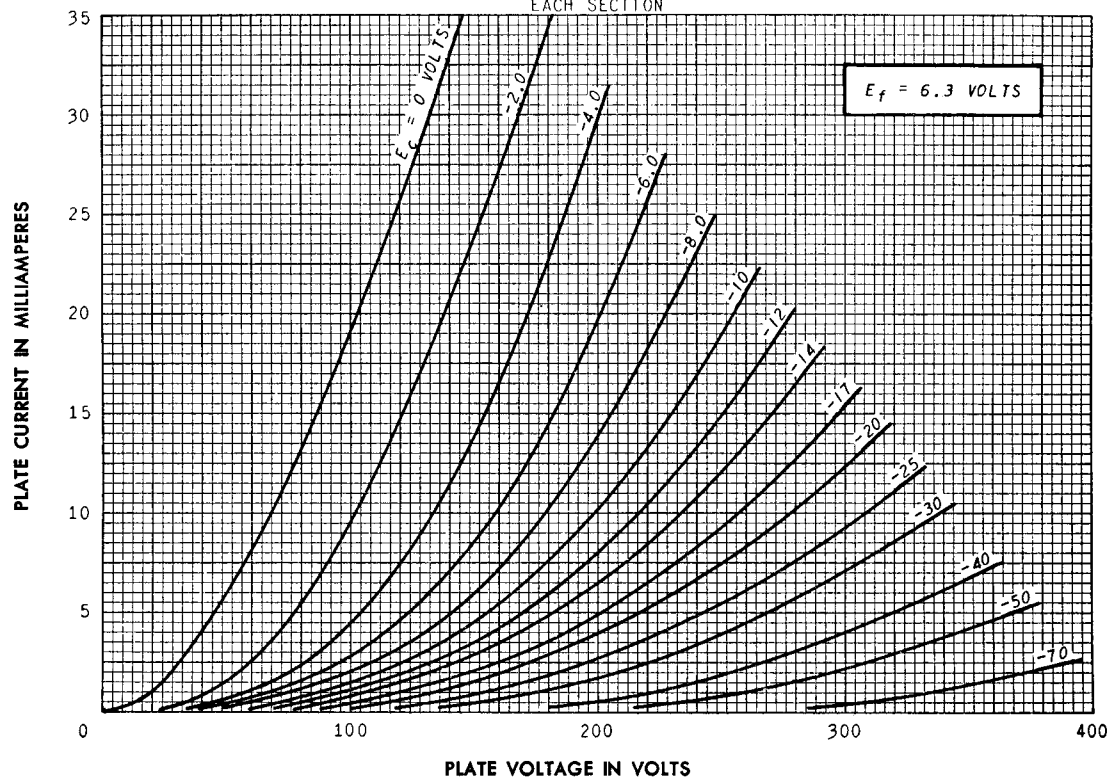
CASCADE CONNECTION



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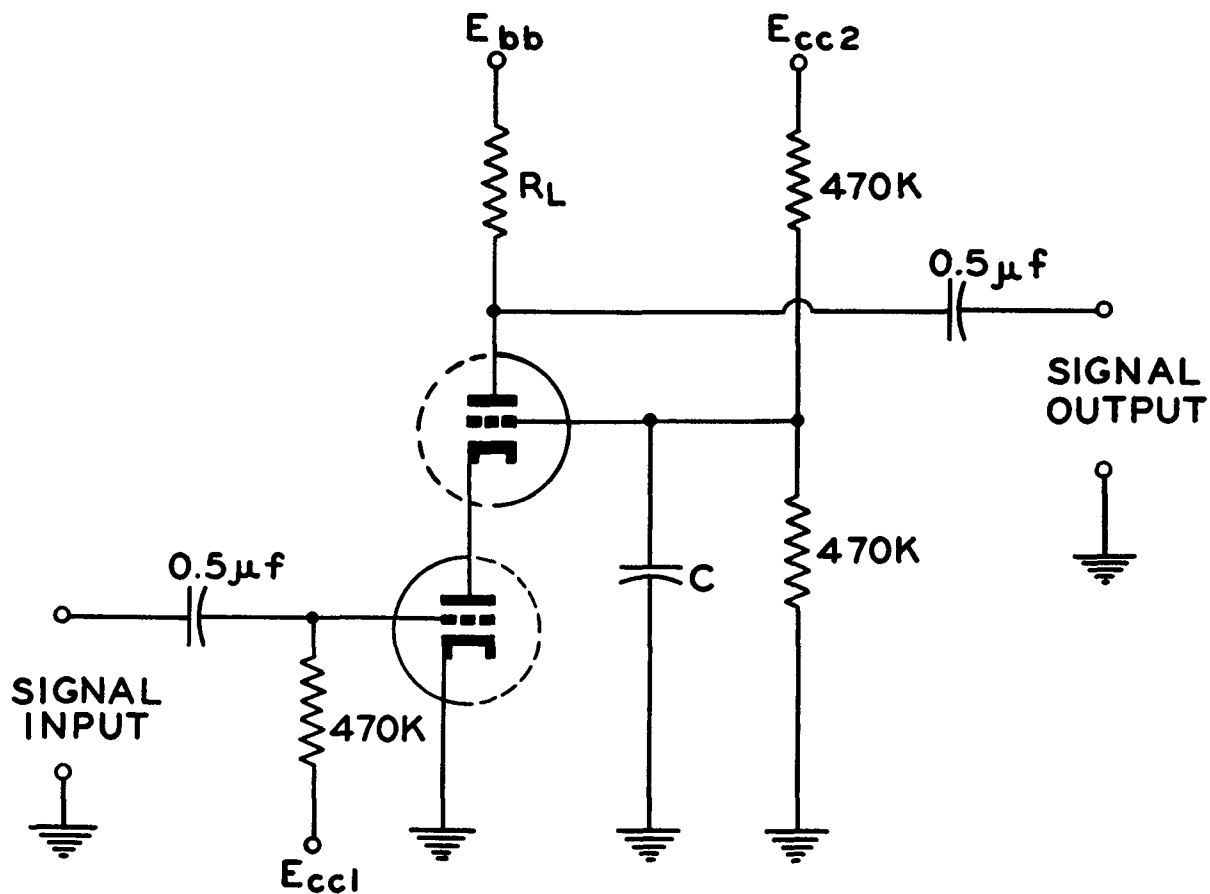
AVERAGE PLATE CHARACTERISTICS

EACH SECTION



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TYPICAL CIRCUIT FOR CASCODE OPERATION



C - BYPASS CAPACITOR