

JOINT ELECTRON DEVICE ENGINEERING COUNCIL



2260 SALMON TOWER  
11 WEST FORTY-SECOND STREET  
NEW YORK 36, N. Y.  
TELEPHONE: LONGACRE 5-0717

Announcement

of

Electron Device Type Reregistration

Release No. 1300E FINAL

June 27, 1960

The Joint Electron Device Engineering Council announced the registration of the following electron device designation

6Y6GA

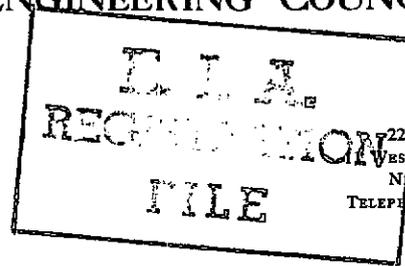
on May 2, 1960, Release No. 1300E, under the sponsorship of Radio Corporation of America, Harrison, New Jersey.

On May 30, 1960, in Release No. 1300E, this proposed reregistration was held in abeyance because of industry objection received. The objection has now been withdrawn.

This letter is notice that the proposed reregistration covered by Release No. 1300E dated May 2, 1960, may be considered "Final" with the following modification:

<u>ITEM</u>	<u>AS REGISTERED</u>	<u>AS PROPOSED</u>
Under <u>ELECTRICAL DATA</u>		
Grid No. 1 to plate	none	<u>0.7</u> uuf

JOINT ELECTRON DEVICE ENGINEERING COUNCIL



2260 SALMON TOWER  
WEST FORTY-SECOND STREET  
NEW YORK 36, N. Y.  
TELEPHONE: LONGACRE 5-0717

Announcement

of

Electron Device Type Reregistration

Release No. 1300E (Tentative)

May 30, 1960

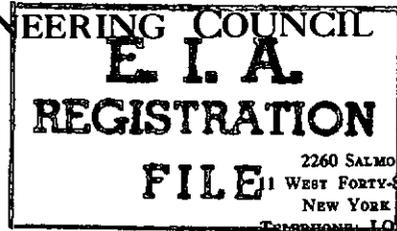
The Joint Electron Device Engineering Council announced the proposed reregistration of the following electron device designation

6Y6GA

on May 2, 1960, in Release No. 1300E, under the sponsorship of Radio Corporation of America, Harrison, New Jersey.

Due to industry objection, this proposed reregistration is not to be considered "final" until further notice.

JOINT ELECTRON DEVICE ENGINEERING COUNCIL



Announcement  
of  
Electron Device Type Reregistration

Release No. 1300E (Tentative)\*

May 2, 1960

The Joint Electron Device Engineering Council announced the registration of the following electron device designation

6Y6GA

on April 16, 1954, Release No. 1300, under the sponsorship of Sylvania Electric Products Inc., New York, New York.

The Radio Corporation of America, Harrison, New Jersey, now proposes reregistration based on the following data:

<u>ITEM</u>	<u>AS REGISTERED</u>	<u>AS PROPOSED</u>
<u>Under ELECTRICAL DATA</u>		
Direct Interelectrode Capacitances:		Direct Interelectrode Capacitances (approx.)
Grid # 1 to plate	none	0.66 uuf
Grid # 1 to cathode & beam plates, grid # 2 and heater	none	12 uuf
Plate to cathode & beam plates, grid # 2 and heater	none	7.5 uuf
<u>Under Ratings</u>		
Maximum grid #2 dissipation	1.75	delete watts
Maximum grid #2 input:		
For grid #2 voltages up to 100 volts	--	1.75 watts
For grid #2 voltages between 100 and 200 volts	--	See J5-C4-2

\*Unless valid objection to this reregistration is lodged with the EIA Standards Laboratory prior to June 2, 1960, this reregistration will be made and this information will be considered "FINAL" WITHOUT FURTHER NOTICE!

# JOINT ELECTRON DEVICE ENGINEERING COUNCIL



650 SALMON TOWER  
11 WEST FORTY-SECOND STREET  
NEW YORK 36, N. Y.  
TELEPHONE: LONGACRE 5-3450

Announcement  
of  
Electron Device Type Reregistration  
Release No. 1300D (Tentative)\*

March 7, 1960

The Joint Electron Device Engineering Council announced the registration of the following electron device designation

6L6GB

on April 16, 1954, Release No. 1300, under the sponsorship of Sylvania Electric Products Inc., New York, New York.

The Radio Corporation of America, Harrison, New Jersey, now proposes reregistration based on the attached data sheet.

\*Unless valid objection to this reregistration is lodged with the EIA Standards Laboratory prior to April 7, 1960, this reregistration will be made and this information will be considered "FINAL" WITHOUT FURTHER NOTICE!

TYPE 6L6-GB

ITEM

AS REGISTERED

AS PROPOSED

On Basis of  
Design-Center  
Rating System

On Basis of  
Design-Maximum  
Rating System

Under ELECTRICAL DATA

Heater Characteristics

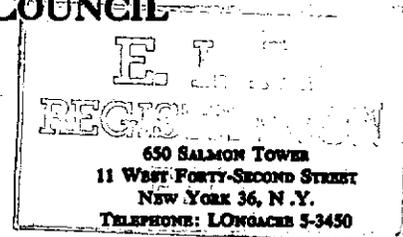
Heater voltage (AC or DC) . . .	6.3 max.	6.3 ± 10%	volts
Heater-cathode voltage:			
Heater negative with respect to cathode . . . .	180 max.	delete	volts
Heater positive with respect to cathode . . . .	180 max..	delete	volts
Heater-cathode voltage:			
Heater negative with respect to cathode:			
Total DC and peak. . . .	none	200 max.	volts
Heater positive with respect to cathode:			
Total DC and peak. . . .	none	200 max.	volts
DC . . . . .	none	100 max.	volts

Under Ratings

	Triode*	Pentode	Triode*	Pentode	
Plate voltage	275 max.	360 max.	300 max.	400 max.	volts
Grid-No.2 voltage	-	270 max.	-	300 max.	volts
Plate dissipation	19 max.	19 max.	22 max.	22 max.	watts
Grid-No.2 dissipation	-	2.5 max.	-	2.8 max.	watts

\* Grid #2 connected to plate.

# JOINT ELECTRON TUBE ENGINEERING COUNCIL



Announcement

of

Electron Device Type Reregistration

Release No. 1300C (Tentative)\*

December 15, 1958

The Joint Electron Device Engineering Council announced the registration of the following electron device designation

6BZ6

on April 16, 1954, in Release No. 1300 under the sponsorship of Sylvania Electric Products, Inc., Emporium, Pennsylvania.

The attached material has been prepared by JTC-5, Committee on Low Power Vacuum Tubes, in accordance with accepted procedures of the Joint Electron Device Engineering Council. Upon expiration of the thirty day approval period, this data will supersede all previously registered specifications.

\*Unless valid objection to this reregistration is lodged with the EIA Engineering Office prior to January 15, 1959, this reregistration will be made and this information will be considered "FINAL" WITHOUT FURTHER NOTICE!



ELECTRICAL DATA (Continued)

Typical operating conditions and characteristics, class A<sub>1</sub> amplifier

Plate voltage. . . . .	125	volts
Grid #2 voltage. . . . .	125	volts
Grid #3 voltage. . . . .	.pin 7 connected to pin 2 at socket	
Cathode bias resistor. . . . .	56	ohms
Plate resistance (approx.) . . . . .	0.26	megohm
Transconductance . . . . .	8000	$\mu$ hos
Plate current. . . . .	14	ma
Grid #2 current. . . . .	3.6	ma
Grid #1 voltage (approx.) for $G_m = 50 \mu$ hos. . . . .	-19	volts
Transconductance ( $E_{c1} = -4.5$ V., $R_k = 0$ ) . . . . .	700	$\mu$ hos

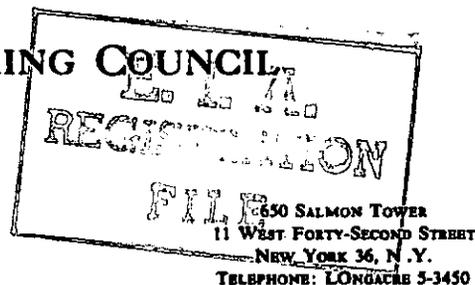
§Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron device of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

The device manufacturer chooses these values to provide acceptable serviceability of the device, taking responsibility for the effects of changes in operating conditions due to variations in device characteristics.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey device under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, and environmental conditions.

Refer to "Interpretation of Receiving Tube Ratings"

# JOINT ELECTRON TUBE ENGINEERING COUNCIL



Announcement  
of  
Electron Device Type Reregistration

Release No. 1300B (Tentative)\*

February 18, 1957

The Joint Electron Tube Engineering Council announced registration of the following JETEC tube type designation

6L6GB

on April 16, 1954, in Release No. 1300 under the sponsorship of Sylvania Electric Products, Inc., Emporium, Pennsylvania

The Sponsor now proposes reregistration on the basis of the following modification:

<u>ITEM</u>	<u>AS REGISTERED</u>	<u>AS PROPOSED</u>
JETEC Outline designation	None	12-15
Maximum Seated Height	3-13/16"	3-11/16"
Maximum Overall Height	4-3/8"	4-1/4"

\*Unless valid objection to this reregistration is lodged with the RETMA Engineering Office prior to March 18, 1957, this reregistration will be made and this information will be considered "FINAL" WITHOUT FURTHER NOTICE!

JOINT ELECTRON TUBE ENGINEERING

COUNCIL A  
REGISTRATION  
FILE  
630 SALMON TOWER  
11 WEST FORTY-SECOND STREET  
NEW YORK 36, N. Y.  
TELEPHONE: LONGACRE 5-3450



Announcement  
of  
Electron Device Type Reregistration

Release No. 1300A (Tentative)\*

June 25, 1956

The Joint Electron Tube Engineering Council announced registration of the following JETEC tube type designation

6BZ6

on April 16, 1954, in Release No. 1300 under the sponsorship of Sylvania Electric Products, Inc., Emporium, Pa.

The attached material has been prepared by JTC-5, Committee on Receiving Tubes, in accordance with accepted procedures of the Joint Electron Tube Engineering Council. Upon expiration of the thirty day approval period, this data will supersede all previously registered specifications.

\*Unless valid objection to this reregistration is lodged with the RETMA Engineering Office prior to July 25, 1956 this reregistration will be made and this information will be considered "FINAL WITHOUT FURTHER NOTICE!"

JETEC DATA  
 JOINT ELECTRON TUBE ENGINEERING COUNCIL  
 COMMITTEE ON RECEIVING TUBES

JETEC TYPE 6BZ6  
 Release 1300A

JETEC TYPE 6BZ6

PENTODE

MECHANICAL DATA

Coated unipotential cathode . . . . .

Outline drawing. . . . .	5-2	Bulb . . . . .	.T 5-1/2
Base . . . . .			.E7-1 miniature button 7-pin
Maximum diameter . . . . .			3/4"
Maximum overall length . . . . .			2-1/8"
Maximum seated height. . . . .			1-7/8"
Pin connections. . . . .			Basing 7CM

Pin 1 - Grid #1	Pin 5 - Plate
Pin 2 - Cathode	Pin 6 - Grid #2
Pin 3 - Heater	Pin 7 - Grid #3, internal shield
Pin 4 - Heater	

Mounting position. . . . . Any

ELECTRICAL DATA

<u>Direct Interelectrode Capacitances</u>	<u>With Shield*</u>	<u>Without Shield</u>	
Grid to plate: (g1 to p) max. . . . .	.015	.025	µuf
Input: g1 to (h+k+g2+g3+i.s.) . . . . .	7.0	7.0	µuf
Output: p to (h+k+g2+g3+i.s.) . . . . .	3.0	2.0	µuf

\*External shield #316 connected to pin #2.

Heater Characteristics

Heater voltage (ac or dc). . . . .	6.3±10% volts
Heater current . . . . .	300 ma

Ratings (Design Maximum Rating System)§

Maximum plate voltage. . . . .	330 volts
Maximum grid #2 voltage. . . . .	See J5-C4-2
Maximum grid #2 supply voltage . . . . .	330 volts
Maximum plate dissipation. . . . .	2.3 watts
Maximum grid #2 dissipation. . . . .	0.55 watt
Maximum positive DC grid #1 voltage. . . . .	0 volts
Maximum heater-cathode voltage	
Heater negative with respect to cathode: Total DC and peak. . . . .	200 volts
Heater positive with respect to cathode: DC . . . . .	100 volts
Total DC and peak. . . . .	200 volts

Continued on page 2

ELECTRICAL DATA (Continued)

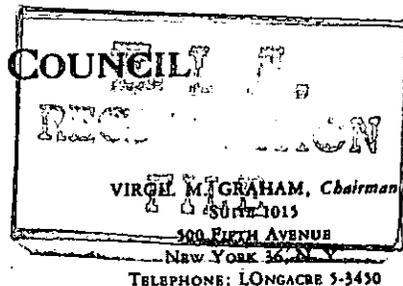
Typical operating conditions and characteristics, class A<sub>1</sub> amplifier

Plate voltage. . . . .	125	volts
Grid #2 voltage. . . . .	125	volts
Grid #3 voltage. . . . .	pin 7 connected to pin 2 at socket	
Cathode bias resistor. . . . .	56	ohms
Plate resistance (approx.) . . . . .	0.26	megohm
Transconductance . . . . .	8000	μhos
Plate current. . . . .	14	ma
Grid #2 current. . . . .	3.6	ma
Grid #1 voltage (approx.) for G <sub>m</sub> = 50 μhos. . . . .	-19	volts
Transconductance (E <sub>c1</sub> = -4.5 V., R <sub>k</sub> = 0) . . . . .	700	μhos

§Design Maximum Ratings are the limiting values expressed with respect to bogie tubes at which satisfactory tube life can be expected to occur in the types of service for which the tube is rated. Therefore, the equipment designer must establish the circuit design so that initially and throughout equipment life 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.

Refer to "Interpretation of Receiving Tube Ratings"

JOINT ELECTRON TUBE ENGINEERING COUNCIL



Release No. 1300

April 16, 1954

To Tube Engineers:

The Joint Electron Tube Engineering Council announces the registration of the following tube type designations

6BZ6  
5V4GA  
6BY5GA  
6L6GB  
6Y6GA

according to the ratings and characteristics in the enclosed data sheets on the application of

Sylvania Electric Products Inc.  
1740 Broadway  
New York, New York

Very truly yours,

A handwritten signature in cursive script that reads 'Virgil M. Graham'.

Virgil M. Graham  
Associate Director  
RETMA Engineering Department



MECHANICAL DATA

Coated unipotential cathode  
 Outline drawing . . . . . none at present Bulb . . . . . T-12  
 Base . . . . . B7-12 medium shell octal 7-Pin  
 or, short medium shell octal 7-Pin  
 Maximum diameter . . . . . 1 9/16"  
 Maximum overall length . . . . . 3 7/8 "  
 Maximum seated height . . . . . 3 5/16"  
 Pin connections . . . . . Basing 7AC  
 Pin 1 - No connection Pin 5 - Grid #1  
 Pin 2 - Heater Pin 7 - Heater  
 Pin 3 - Plate Pin 8 - Cathode, beam plates  
 Pin 4 - Grid #2  
 Mounting position . . . . . any

ELECTRICAL DATA

Heater characteristics

Heater voltage . . . . . 6.3 volts  
 Heater current . . . . . 1.25 amps  
 Maximum heater-cathode voltage  
 Heater negative with respect to cathode . . . . . 180 volts  
 Heater positive with respect to cathode . . . . . 180 volts

Ratings

Maximum plate voltage . . . . . 200 volts  
 Maximum grid #2 supply voltage . . . . . 200 volts  
 Maximum grid #2 voltage . . . . . See J5 - C4  
 Maximum plate dissipation . . . . . 12.5 watts  
 Maximum grid #2 dissipation . . . . . 1.75 watts  
 Maximum grid #1 circuit resistance  
 Fixed bias . . . . . 0.1 megohm  
 Self bias . . . . . 0.5 megohm

Typical operating conditions and characteristics, class A1 amplifier

Plate voltage . . . . .	135	200	volts
Grid #2 voltage . . . . .	135	135	volts
Grid #1 voltage . . . . .	-13.5	-14	volts
Peak A-F grid #1 voltage . . . . .	13.5	14	volts
Zero signal plate current . . . . .	58	61	ma
Maximum signal plate current . . . . .	60	66	ma
Zero signal grid #2 current . . . . .	3.5	2.2	ma
Maximum signal grid #2 current . . . . .	11.5	9	ma
Transconductance . . . . .	7000	7100	umhos
Plate resistance (approx.) . . . . .	9300	18300	ohms
Load resistance . . . . .	2000	2600	ohms
Maximum signal power output . . . . .	3.6	6	watts
Total harmonic distortion (approx.) . . . . .	10	10	%

MECHANICAL DATA

Coated unipotential cathode  
 Outline drawing . . . . . none at present Bulb . . . . . T-12  
 Base . . . . . B7-12 medium shell octal 7-Pin  
 or, short medium shell octal 7-Pin  
 Maximum diameter . . . . . 1 9/16 "  
 Maximum overall length . . . . . 4 3/8 "  
 Maximum seated height . . . . . 3 13/16"  
 Pin connections . . . . . Basing 7AC  
 Pin 1 - No connection Pin 5 - Grid #1  
 Pin 2 - Heater Pin 7 - Heater  
 Pin 3 - Plate Pin 8 - Cathode, beam plates  
 Pin 4 - Grid #2  
 Mounting position . . . . . any

ELECTRICAL DATA

Direct interelectrode capacitances (approx.)

Grid to plate: (g1 to p) . . . . .	0.9	uuf
Input: g1 to (h + k + g2 + b.p.) . . . . .	11.5	uuf
Output: p to (h + k + g2 + b.p.) . . . . .	9.5	uuf

Heater characteristics

Heater voltage (ac or dc) . . . . .	6.3	volts
Heater current . . . . .	900	ma
Heater-cathode voltage		
Heater negative with respect to cathode . . . . .	180	volts
Heater positive with respect to cathode . . . . .	180	volts

Ratings

	<u>Triode*</u>	<u>Pentode</u>	
Maximum plate voltage . . . . .	275	360	volts
Maximum grid #2 voltage . . . . .	---	270	volts
Maximum plate dissipation . . . . .	19	19	watts
Maximum grid #2 dissipation . . . . .	---	2.5	watts
Maximum grid #1 circuit resistance			
Fixed bias	0.1	0.1	megohm
Self bias	0.5	0.5	megohm

\* Grid #2 connected to plate

TYPE 6L6GB

Typical operating conditions & characteristics, class A1 amplifier (single tube)

	Triode*		Pentode		
	250	250	300	350	
Plate Voltage . . . . .	250	250	300	350	volts
Grid #2 voltage . . . . .	---	250	200	250	volts
Grid #1 voltage . . . . .	-20	-14	-12.5	-18	volts
Peak A-F grid #1 voltage . . . . .	20	14	12.5	18	volts
Zero signal plate current . . . . .	40	72	48	54	ma
Maximum signal plate current . . . . .	44	79	55	66	ma
Zero signal grid #2 current . . . . .	---	5	2.5	2.5	ma
Maximum signal grid #2 current . . . . .	---	7.3	4.7	7.0	ma
Transconductance . . . . .	4700	6000	5300	5200	umhos
Plate resistance . . . . .	1700	22500	35000	33000	ohms
Amplification factor . . . . .	8	---	---	---	ohms
Load resistance . . . . .	5000	2500	4500	4200	ohms
Maximum signal power output . . . . .	1.4	6.5	6.5	10.8	watts
Total harmonic distortion (approx.) . . . . .	5	10	11	15	%

\* Grid #2 connected to plate

Typical operating conditions & characteristics, push pull amplifier \*\*

	Class A1		Class AB1		Class AB2		
	250	270	360	360	360	360	
Plate voltage . . . . .	250	270	360	360	360	360	volts
Grid #2 voltage . . . . .	250	270	270	270	225	270	volts
Grid #1 voltage . . . . .	-16	-17.5	-22.5	-22.5	-18	-22.5	volts
Peak A-F grid to grid voltage . . . . .	32	35	45	45	52	72	volts
Zero signal plate current . . . . .	120	134	88	88	78	88	ma
Maximum signal plate current . . . . .	140	155	132	140	142	205	ma
Zero signal grid #2 current . . . . .	10	11	5	5	3.5	5	ma
Maximum signal grid #2 current . . . . .	16	17	15	11	11	16	ma
Transconductance (each tube) . . . . .	5500	5700	---	---	---	---	umhos
Plate resistance (each tube) . . . . .	24500	23500	---	---	---	---	ohms
Load resistance . . . . .	5000	5000	6600	3800	6000	3800	ohms
Power output . . . . .	14.5	17.5	26.5	18	31	47	watts
Total harmonic distortion . . . . . (approx.)	2	2	2	2	2	2	%

\*\* Values for two tubes.



# tentative data service

SYLVANIA

6BZ6

## MECHANICAL DATA

Bulb	T-5 1/2
Base	E7-1, Miniature Button, 7-Pin
Outline	5-2
Basing	7CM
Cathode	Coated Unipotential
Mounting Position	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	300 Ma

### DIRECT INTERELECTRODE CAPACITANCES

	Shielded <sup>1</sup>	Unshielded	
Grid to Plate (g <sub>1</sub> to P)	.015	.02 μmf	Max.
Input (g <sub>1</sub> to h+k+g <sub>2</sub> +g <sub>3</sub> +I.S.)	7.5	7.5 μmf	
Output (P to h+k+g <sub>2</sub> +g <sub>3</sub> +I.S.)	2.8	1.8 μmf	

### RATINGS (Design Center Values)

Plate Voltage	300 Volts	Max.
Grid No. 2 Voltage	(See Rating Chart)	
Plate Dissipation	2.5 Watts	Max.
Grid No. 2 Dissipation	0.5 Watt	Max.
Grid No. 2 Supply Voltage	300 Volts	Max.
Heater Cathode Voltage <sup>2</sup>	±200 Volts	Max.
Grid No. 1 Circuit Resistance		
Fixed Bias	0.25 Megohm	Max.
Self Bias	1.0 Megohm	Max.

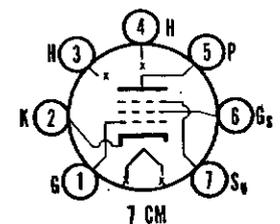
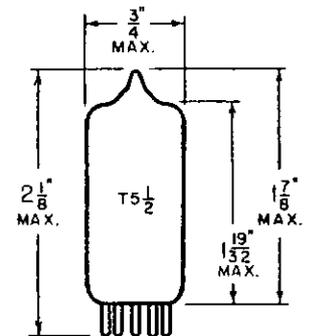
### CHARACTERISTICS AND TYPICAL OPERATION

#### Class A<sub>1</sub> Amplifier

Plate Voltage	200 Volts
Grid No. 2 Voltage	150 Volts
Grid No. 3 Voltage	Pin 7 Connected to Pin 2 at Socket
Cathode Bias Resistor	180 Ohms
Plate Resistance (approx.)	0.6 Megohm
Transconductance	6100 μmhos
Plate Current	11.0 Ma
Grid No. 2 Current	2.6 Ma
Grid No. 1 Voltage (approx.) For gm of 50 μmhos	-23 Volts

## QUICK REFERENCE DATA

The Sylvania Type 6BZ6 is a high gm, semi-remote cutoff, pentode amplifier. It is designed for service as an automatic gain controlled I F Amplifier in television receivers.



SYLVANIA ELECTRIC  
PRODUCTS INC.

Prepared and Released By The  
TECHNICAL PUBLICATIONS SECTION  
EMPORIUM, PENNSYLVANIA

March 30, 1954

SYLVANIA

6BZ6

NOTES:

1. External Shield No. 316 connected to Pin No. 2 (cathode) at socket.
2. The D C Component, Heater Positive With Respect to Cathode, must not exceed 100 volts.

APPLICATION DATA

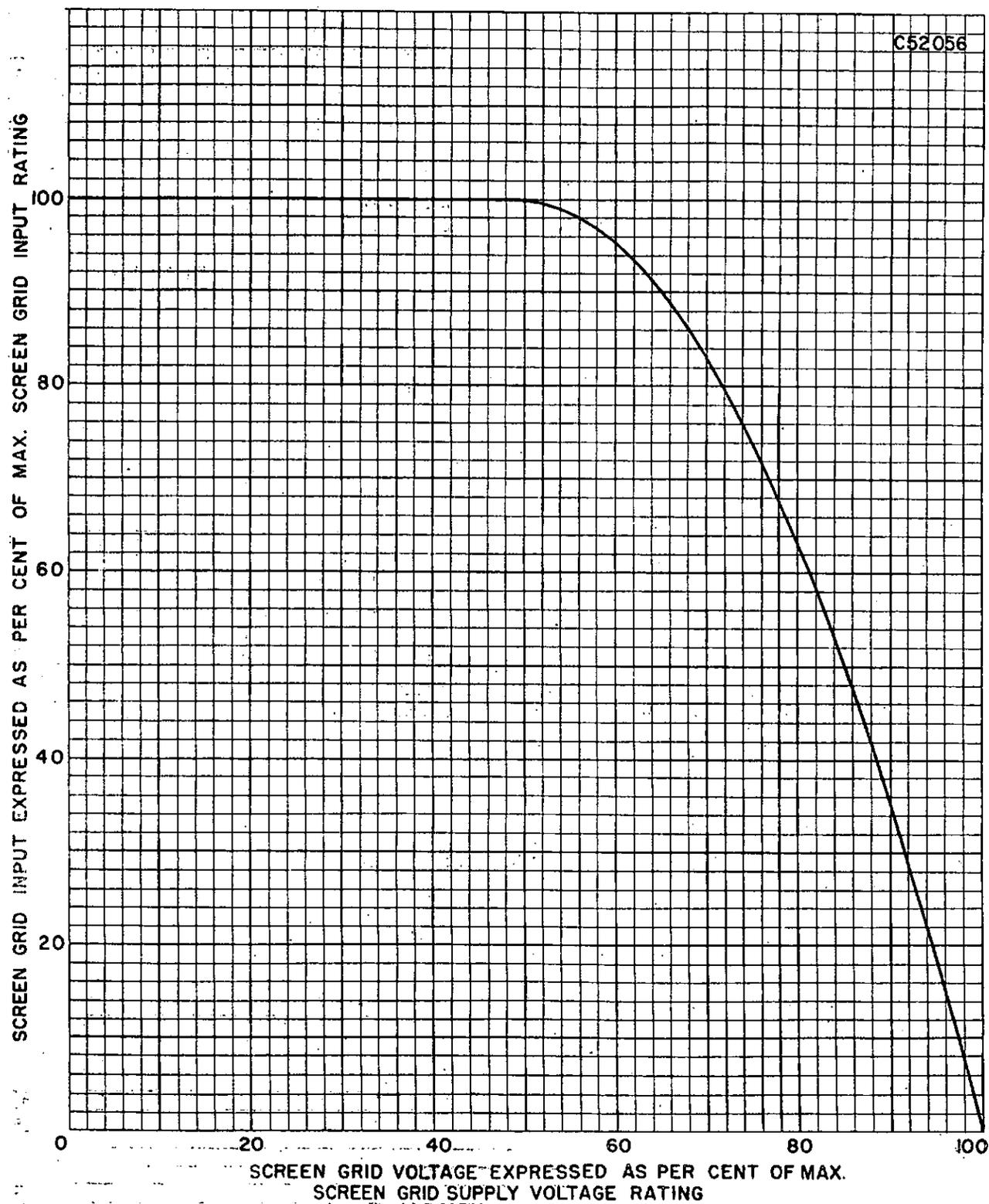
The Sylvania Type 6BZ6 is designed for application as a gain control I F amplifier in television receivers.

The semi-remote cutoff characteristic of the 6BZ6 eliminates possible distortion resulting from high signal levels, as well as distortion caused by AGC time delay. This tube also features high transconductance, thus providing maximum gain in low signal areas.

SYLVANIA

6BZ6

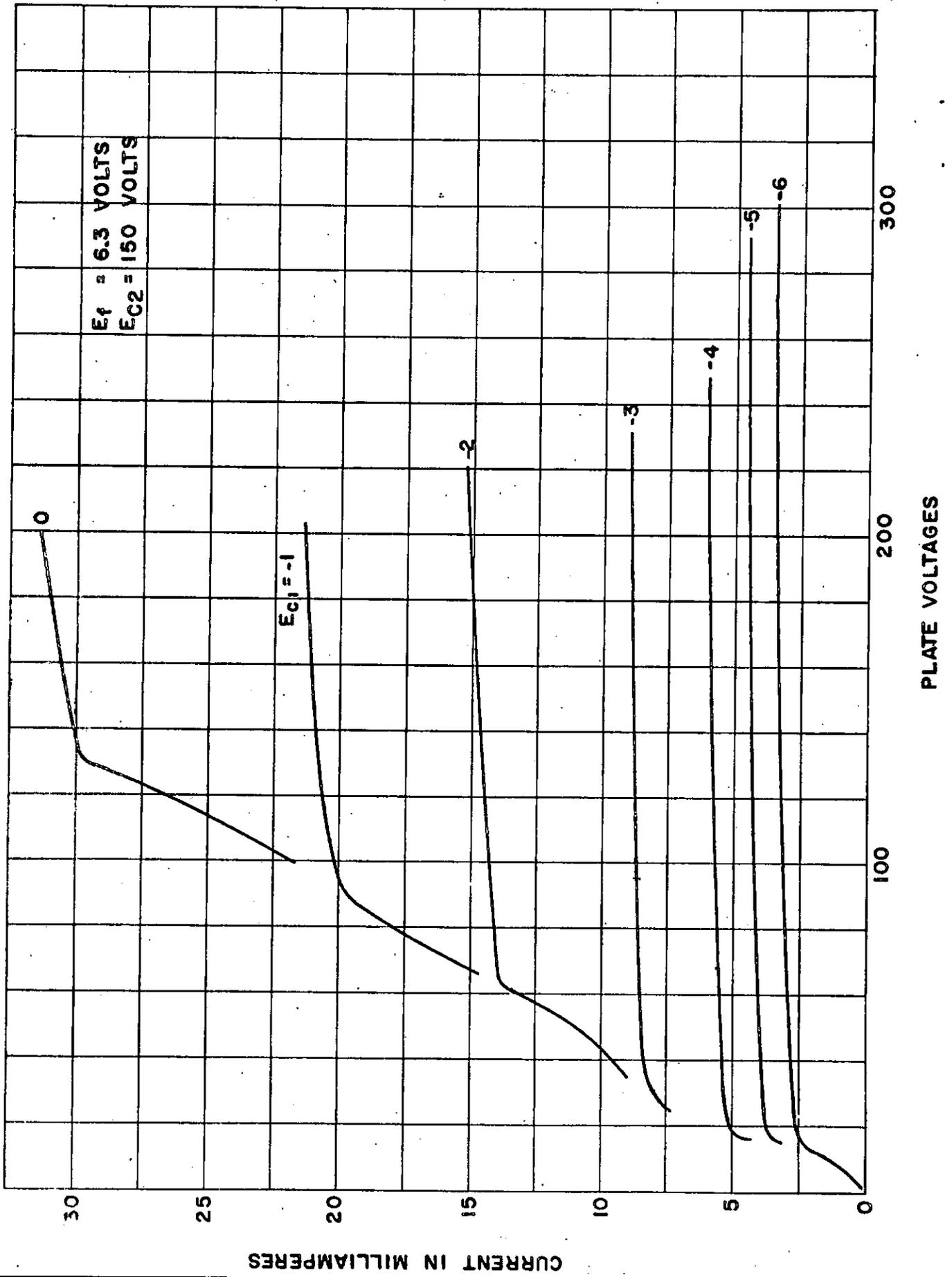
SCREEN GRID RATING CURVE



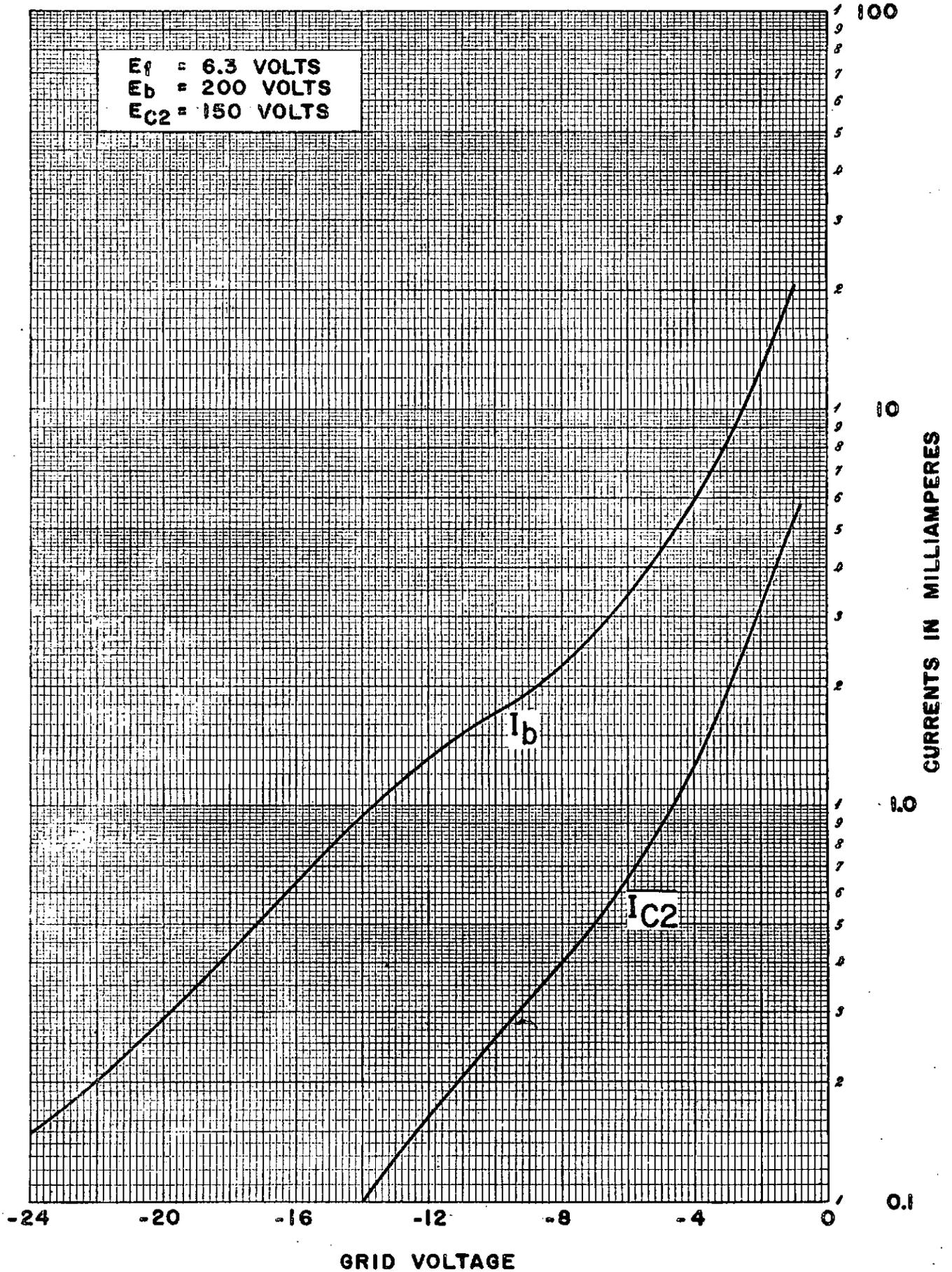
SYLVANIA

6BZ6

### AVERAGE PLATE CHARACTERISTICS



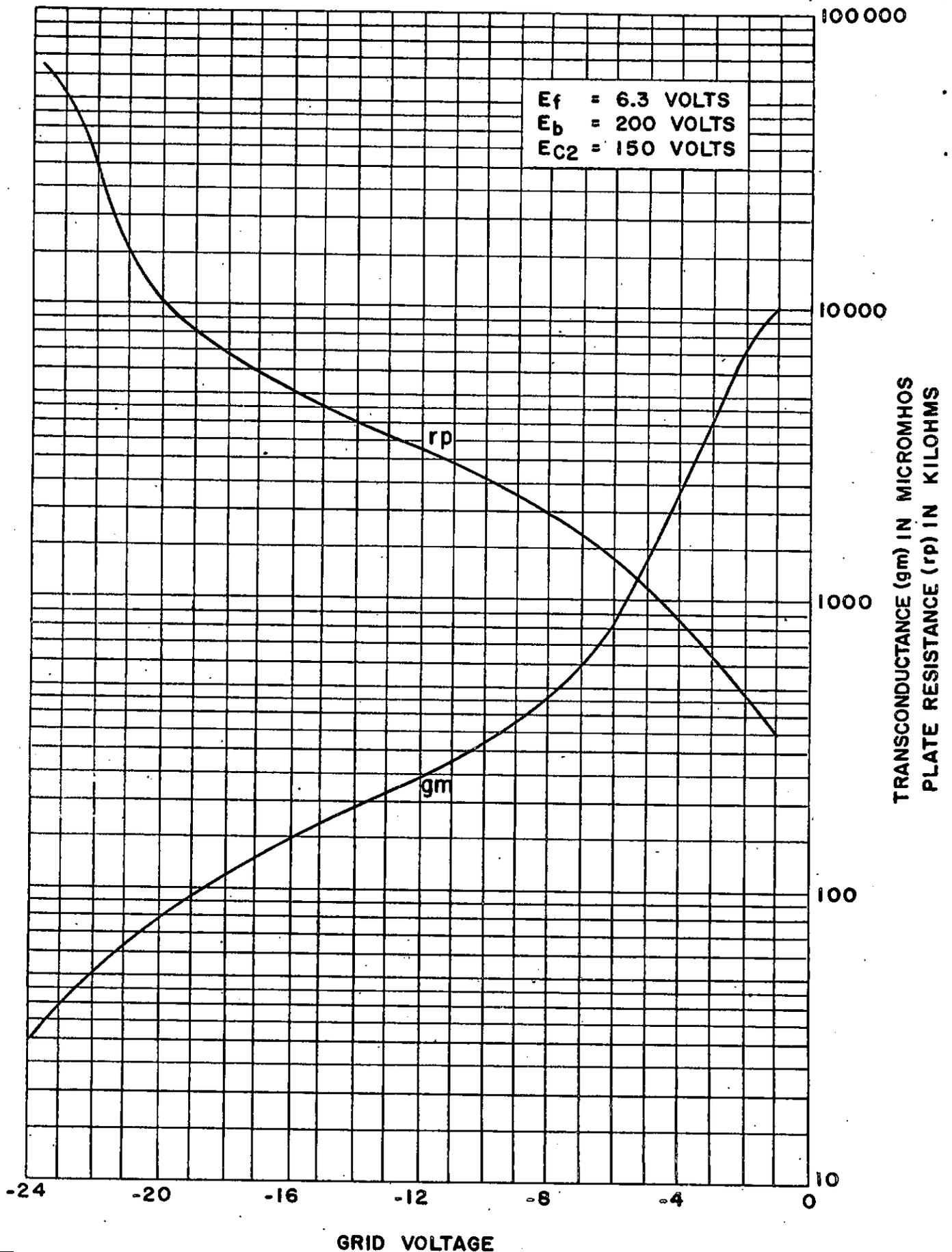
### AVERAGE TRANSFER CHARACTERISTICS



SYLVANIA

6BZ6

### AVERAGE TRANSFER CHARACTERISTICS



MECHANICAL DATA

Coated unipotential cathodes  
 Outline drawing . . . . . none at present Bulb . . . . . T-12  
 Base . . . . . B7-12 medium shell octal 7-Pin  
 or, short medium shell octal 7-Pin  
 Maximum diameter . . . . . 1 9/16"  
 Maximum overall length . . . . . 3 7/8 "  
 Maximum seated height . . . . . 3 5/16"  
 Pin connections . . . . . Basing 6CN  
 Pin 1 - #2 Cathode Pin 5 - #1 Plate  
 Pin 2 - Heater Pin 7 - Heater  
 \*Pin 3 - No connection Pin 8 - #1 Cathode  
 Pin 4 - #2 Plate  
 Mounting position . . . . . any

ELECTRICAL DATA

Average characteristics

Heater voltage . . . . . 6.3 volts  
 Heater current . . . . . 1.6 amps  
 Tube voltage drop (tube conducting 175 ma each plate) . . . . . 32 volts

Ratings # Damper diode ##

Maximum peak inverse voltage (absolute maximum)  
 Rectifier service . . . . . 1400 volts  
 Damper service . . . . . 3000 volts  
 Maximum heater-cathode voltage  
 Heater negative with respect to cathode . . . . . 450 volts  
 Heater positive with respect to cathode . . . . . 100 volts  
 Maximum D.C. output current . . . . . 175 ma  
 Maximum steady state peak plate current each plate . . . . . 525 ma

\* Socket terminal number 3 shall not be used as a tie point.

# All values are evaluated on design center system except where absolute maximum is stated.

## For operation in a 525 line, 30 frame system as described in "Standards of Good Engineering Practice for Television Stations; Federal Communications Commission". The duty cycle of the horizontal voltage pulse not to exceed 15% of a scanning cycle.