RCA TUBE
HANDBOOK
HB-3

RECEIVING-TYPE INDUSTRIAL TUBE SECTION

This Section contains data on "special red" tubes; premium tubes; tubes for computer and "on-off" control applications; low-microphonic amplifier tubes; and similar special types.

For further Technical Information, write to Commercial Engineering, Tube Division, Radio Corporation of America, Harrison, N. J.

1. AF Amplifier
2. Automatic Gain Control
3. Balanced Modulator/ Balanced Mixer
4. Cathode-Coupled, Direct-Drive (RF)
5. Cathode Drive (RF) (Grounded Grid)
6. Cathode Follower
7. Clipper
8. Converter
9. DC Amplifier
10. Delay Circuit
11. Demodulator
12. Detector, Audio
13. Driver
14. Frequency Converter
15. Frequency Divider
16. Frequency Multiplier
17. Gated Amplifier
18. Grid-Controlled Rectifier
19. Indicator, Voltage
20. IF Amplifier
21. Inverter
22. Limiter
23. Low-Plate-Voltage Nuvistor Type
24. Mixer
25. Modulator
26. Multivibrator
27. Oscillator, RF
28. "On-Off" Control
29. Phase Inverter
30. Pulse Amplifier
31. Pulse Modulator
32. RF Power Amplifier
33. RF Voltage Amplifier
34. Rectifier
35. Relay
36. Sweep-Circuit Oscillator
37. Switching
38. Transducer
39. Tubes Operating from Battery Supplies
40. Video Amplifier
41. Voltage Reference
42. Voltage Regulator
43. Voltage Regulator, Series
44. Volume-Expander-Compressor

1 *AF Amplifier*

CLASS - A_1

Twin Diode—Med.-Mu Triodes

12SW7	26C6

High-Mu Triode - 5719

Power Triodes

955	5718	9002

Medium-Mu Twin Triodes

▲5670	5692	▲6189
5687	6072	

High-Mu Twin Triodes

6112	6681/12AX7A

Twin Power Triode - 3A5

Sharp-Cutoff Pentodes

6AH6WA	1620

Power Pentodes

3A4	5672
6AG7Y	6677/6CL6
6AK6	7054
1621	8077/7054

Beam Power Tubes

12A6	▲6005
1622	6550
5686	6550/V1
5824	6669/6AQ5A
5881	7061
5902	

Twin Beam Power Tube
26A7GT

Pentogrid Amplifier - 1612

Beam-Deflection Tube - 7360

CLASS – AB_1

Medium-Mu Twin Triode
▲5670

Beam Power Tubes

1614	6669/6AQ5A
1619	7551
▲6005	7558

Twin Beam Power Tube
26A7GT

CLASS – B

Twin Power Triode – 1635

2 Automatic Gain Control

Remote-Cutoff Pentode
▲5749

3 Balanced Modulator/ Balanced Mixer

Beam-Deflection Tube
7360

4 Cathode-Coupled, Direct-Drive (RF)

Medium-Mu Twin Triodes
6DJ8/ECC88
6922/E88CC

5 Cathode Drive (RF) (Grounded Grid)

High-Mu Triodes

6J4	▲8532
■8058	

6 Cathode Follower

Medium-Mu Triodes

6814	■8056

Medium-Mu Twin Triodes

▲5670	6350	7044
5687	6922/E88CC	7308
5965		

7 Clipper

Twin Diodes

▲5726	70

8 Converter

Pentogrid Converters

12SY7	26D6	5750

9 DC Amplifier

Sharp-Cutoff Pentode – 5693

Medium-Mu Twin Triode – 5692

High-Mu Twin Triode – 5691

10 Delay Circuit

Sharp-Cutoff Pentodes

6AS6	▲5725
5636	

11 Demodulator

Beam-Deflection Tube – 7360

12 Detector Audio

Twin Diode — Med.-Mu Triode

12SW7	26C6

VHF

Twin Diodes

▲5726	6663/6AL5	7055
5896	6887	

UHF

Diodes

9005	9006

13 Driver

Beam Power Tubes

5763 7551 7905
6417 7558

14 Frequency Converter

High-Mu Triode - 6664/6AB4

High-Mu Twin Triode

6679/12AT7

Beam-Deflection Tube - 7360

15 Frequency Divider

Medium-Mu Twin Triodes

▲5670 5964 6350
5687 6211 7044
5963

Power Pentode - 6197

16 Frequency Multiplier

FREQUENCY DOUBLER

High-Mu Triode

■8808

Power Triode

■8203 ■8627

Twin Tetrode - 6360A

Power Pentodes

7054 8077/7054

Beam Power Tubes

5763 7551 7905
6417 7558

FREQUENCY TRIPLER

Beam Power Tubes

5763 6417 7905

Twin Power Pentode - 6939

17 Gated Amplifier

Sharp-Cutoff Pentodes

6AS6 ▲5725
5636

Pentagrid Amplifier - 5915

18 Grid-Controlled Rectifier

Triodes (Thyratron)

6D4 884

Tetrodes (Thyratron)

2D21 2050A ▲5727
2050 5696 6012

19 Indicator, Voltage

Electron-Ray Tubes

1629 6977

20 IF Amplifier

VHF

Medium-Mu Triodes

■7586 ■8056

Medium-Mu Twin Triodes

5687 6922/E88CC
6386 7308

Sharp-Cutoff Pentodes

▲6AU6WB‡ 6676/6CB6A
▲5654 7056

Remote-Cutoff Pentodes
▲5749 6660/6BA6

Sharp-Cutoff Tetrode - ■7587

High-Mu Triode - ■7895

UHF

Sharp-Cutoff Pentodes
5840 ▲6186

Semiremote-Cutoff Pentodes
5899 6206

Remote-Cutoff Pentode - 9003

21 *Inverter*

Medium-Mu Triode - 6814

Medium-Mu Twin Triodes
6350 7044

22 *Limiter*

High-Mu Twin Triode - 7898

23 *Low-Plate-Voltage Nuvistor Type for Hybrid Equipment*

Medium-Mu Triode - ■8056

24 *Mixer*

VHF

Medium-Mu Twin Triodes
407A ▲5814A 6922/E88CC
▲5670 6386

High-Mu Twin Triodes
▲12AT7WA‡ 7898
▲12AT7WB‡

Medium-Mu Triode–Sharp-Cutoff Pentodes
6678/6U8A 7059

Sharp-Cutoff Tetrode - ■7587

Sharp-Cutoff Pentodes
6A56 ▲5725

Pentagrid Converters
12SY7 26D6 5750

UHF

Diode - 9005

Medium-Mu Twin Triode
▲6J6WA

Sharp-Cutoff Pentodes
5636 9001

Remote-Cutoff Pentode - 9003

25 *Modulator*

Twin Tetrode - 6360A

Beam Power Tubes
7551 7558

Power Pentodes
7054 8077/7054

26 *Multivibrator*

Medium-Mu Twin Triodes
407A ▲6189
▲5670 6350
5687 6680/12AU7A
5692 6922/E88CC
▲5814A 7044

High-Mu Twin Triodes
▲12AT7WA‡ ▲5751

27 *Oscillator, RF*

VHF

Power Triode - ■8203

High-Mu Triode - 6664/6AB4

Medium-Mu Twin Triodes

407A ▲5814A 6680/12AU7A
▲5670 6111

High-Mu Twin Triodes

▲12AT7WA‡ 7898

▲12AT7WB‡

Medium-Mu Triode—
Sharp-Cutoff Pentodes

6678/6U8A 7059

Twin Tetrode - 6360A

Beam Power Tubes

3B4WA‡ 5763 7558
1614 6417 7905
1619 7551

Power Pentodes

1613 7054 8077/7054

Medium-Mu Triode—
Power Pentode

7060

Pentagrid Converters

12SY7 26D6 5750

UHF

Medium-Mu Triodes

6F4 ■8056 ■8393
■7586

High-Mu Triodes

■7895 ■8058 ■8808

Power Triodes

955 ■8627 9002
5718

Medium-Mu Twin Triodes

▲6J6WA‡ 6021

Sharp-Cutoff Tetrode - ■7587

Twin Power Pentode - 6939

28 *"On-Off" Control*

(Involving Long
Periods of Operation
Under Cutoff Conditions)

Twin Diode - 6887

Medium-Mu Triode - 6814

Medium-Mu Twin Triodes

5844 5965 6922/E88CC
5963 6211 7044
5964 6350

Sharp-Cutoff Pentode - 6AS6

Power Pentode - 6197

Pentagrid Amplifier - 5915

29 *Phase Inverter*

Medium-Mu Triode - 6814

Medium-Mu Twin Triodes

▲5670 6350
5687 6680/12AU7A
▲5814A 6922/E88CC
▲6189 7044

High-Mu Twin Triodes

5691 7058
▲5751

30 *Pulse Amplifier*

Medium-Mu Triode - 6814

Medium-Mu Twin Triodes

▲5670 6350 7044
5687

31 *Pulse Modulator*

Twin Diode

▲5726

32 *RF Power Amplifier*

VHF

Power Triode - ■8203

Twin Power Triode - 3A5

Beam Power Tubes

3B4WA‡	5686	7551
1614	5763	7558
1619	6417	7905

Medium-Mu Triode–Power Pentode

7060

Power Pentodes

3A4	6AN5	7054
6AG7Y	1613	8077/7054

UHF

High-Mu Triode

■8808

Power Triodes

955	■8627	9002
5718		

Twin Power Tetrode - 6360A

Twin Power Pentode - 6939

33 *RF Voltage Amplifier*

VHF

Medium-Mu Triodes

5842/417A ■8056 ■8393
■7586

High-Mu Triodes

6664/6AB4 ■7895 ■8628

Medium-Mu Twin Triodes

6DJ8/ECC88	6386
407A	6922/E88CC
6111	7057

High-Mu Twin Triode

6679/12AT7

Sharp-Cutoff Tetrodes

■7587 7717/6CY5

Sharp-Cutoff Pentodes

1L4	5693
6AC7W	5847/404A
6AH6WA	▲6186
▲6AU6WB	6661/6BH6
6SJ7Y	6676/6CB6A
408A	6688A
▲5654	7056
5678	

Remote-Cutoff Pentodes

26A6	6660/6BA6
▲5749	6662/6BJ6

Medium-Mu Triode–Power Pentode

7060

UHF

High-Mu Triodes

6J4 ▲8532
■8058

Sharp-Cutoff Pentodes

959 5840 9001

Semiremote-Cutoff Pentodes

5899 6206

Remote-Cutoff Pentode - 9003

34 *Rectifier*

POWER

Full-Wave Gas Type - 83

Full-Wave Vacuum Types

5R4GYB	2076/5R4GYB
6X4W	6202

LOW CURRENT

Twin Diodes

▲5726	6663/6AL5
5896	7055

Single Diodes

9005 9006

PULSE

Half-Wave Vacuum Type - 5642

35 *Relay*

Glow-Discharge (Cold-Cathode) Tubes

OA4G 1C21 5823

Triodes (Thyratron)

6D4 884

Tetrodes (Thyratron)

2D21 5663 ▲5727
2050 5696 6012
2050A

36 *Sweep-Circuit Oscillator*

Triode (Thyratron) - 884

37 *Switching*

Twin Diode - 6887

Beam-Deflection Tube - 7360

38 *Transducer*

Mechano-Electronic Transducer
5734

39 *Tubes Operating from Battery Supplies*

NOMINAL-12-VOLT STORAGE BATTERY SYSTEMS

Twin Diode - 7055

Twin Diode – High-Mu Triode
7724/14GT8

Medium-Mu Twin Triode - 7057

High-Mu Twin Triodes
7058 7898

Medium-Mu Triode – Sharp-Cutoff Pentodes
7059 7258

Medium-Mu Triode – Power Pentode
7060

Sharp-Cutoff Pentode - 7056

Power Pentodes
7054 8077/7054

Beam Power Tubes
7061 7551

NOMINAL-6-VOLT STORAGE BATTERY SYSTEMS

Twin Diode - 6663/6AL5

High-Mu Triode - 6664/6AB4

Medium-Mu Twin Triode
6680/12AU7A

High-Mu Twin Triodes
6679/12AT7
6681/12AX7A

Medium-Mu Triode – Sharp-Cutoff Pentode
6678/6U8A

Twin Tetrode - 6360A

Remote-Cutoff Pentodes
6660/6BA6 6662/6BJ6

Sharp-Cutoff Pentodes
6661/6BH6 6676/6CB6A

Power Pentode - 6677/6CL6

Beam Power Tubes
6669/6AQ5A 7905

NOMINAL-24-VOLT STORAGE BATTERY SYSTEMS

Twin Diode-Medium-Mu Triode
26C6

Twin Power Triode - 6082

Remote-Cutoff Pentode - 26A6

Pentagrid Converter - 26D6

Twin Beam Power Tube
26A7GT

FILAMENTARY-CATHODE TYPES OPERATING FROM DRY-CELL BATTERY SUPPLIES

Half-Wave Vacuum Rectifier
5642

Twin Power Triode - 3A5

Sharp-Cutoff Pentode - 1L4

Power Pentode - 3A4

Beam Power Tube - 1619

40 Video Amplifier

Sharp-Cutoff Tetrode - 7587

Sharp-Cutoff Pentode - 5639

Power Pentodes

6AG7Y 6677/6CL6
6AN5

41 Voltage Reference

Glow Discharge (Cold-Cathode) Tubes

5651A ▲5651WA‡ 5783

42 Voltage Regulator

Glow Discharge (Cold-Cathode) Tubes

OA2 ‡	OC2	6073
▲OA2WA‡	OC3	6073/OA2
OA3	OC3A	6074
OA3A	OD3	6074/OB2
OB2 ‡	OD3A	6626/
▲OB2WA‡	991	OA2WA

43 Voltage Regulator, Series

Low-Mu Twin Triodes

6AS7G ▲6080WA 6336A
6080 6082

Beam Power Tube - 5902

44 Volume Expander-Compressor

Pentagrid Mixer - 1612

▲ Premium Type. Premium types are subjected to more rigorous tests and controls than other types.

■ Nuvistor Type.

‡ For data on this type, refer to Military Specification. A copy of the applicable Military Specification may be obtained from: Specification Division, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa. 19120.

Note:

For data on types in this guide which do not appear in the *Index of Types*, refer to RCA publication RIT-104G. A copy of this publication may be obtained from: RCA Commercial Engineering, Harrison, N.J. 07029.

Socket & Connector Information for RCA Nuvistor Tubes

The sockets listed below by manufacturer's or distributor's part number have contacts and an annular groove designed to mate, respectively, with the base pins and the 2 indexing lugs of the bases utilized on RCA nuvistor tubes. Information on sockets having different casting materials, contact materials, or finishes may be obtained from the manufacturers.

Sockets having mechanical and electrical characteristics comparable to those listed may be available from other component manufacturers.

Socket Description			Manufacturer or Distributor and Part No.		
Application	Mounting	For Types Having JEDEC Base No.	Cinch Mfg. Co.[a]	Cinch-Jones Sales Division[b] Distributors	Industrial Electronic Hardware Corp.[c]
General Purpose	Crimp	E5-65 E5-79	133 65 10 001	5NS	MSN 0905-1 MSN 0905-2 MSN 0905-3
	Flange	E5-65 E5-79	133 65 10 003	5NS-1	-
	Printed board ("Stand-off")	E5-65 E5-79	133 65 10 009	5NS-2	-
UHF (Heat-Dissipating)	Crimp	E5-65 E5-79	133 65 10 041	5NS-3	-
UHF	Crimp	E7-77	133 67 90 040	5NS-4	-
	Crimp	E7-83	-	-	MSN 0907-1 MSN 0707-1

Connector (Top Caps)

RCA Double-Ended Nuvistor Tubes: These types utilize a JEDEC No. C1-44 top cap. Cinch Mfg. Co. Part Nos. 6005 or 422 03 22 017, 6014 or 422 03 22 024, or equivalent "1/4-inch" connectors, may be used.

[a] 1026 South Homan Avenue, Chicago 24, Illinois.
[b] Cinch-Jones Sales Division of Cinch Mfg. Co.
[c] 109 Prince Street, New York 12, N.Y.

IL4

R-F AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.008 max.	μμf
Input	3.6	μμf
Output	7.5	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base ▲		Miniature Button 7-Pin

Pin 1 {Filament – / Internal Shield}
Pin 2 – Plate
Pin 3 – Screen
Pin 4 – No Connection
Pin 5 {Filament –, / Internal Shield}
Pin 6 – Grid
Pin 7 – Filament +

BOTTOM VIEW (6AR)

RCA Socket — Stock No. 9914
Mounting Position — Any

Maximum And Minimum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	110 max. volts
Screen Voltage	90 max. volts
Screen Supply Voltage	110 max. volts
Grid Voltage	0 min. volts
Total Cathode Current	6.5 max. ma.

Typical Operation and Characteristics – Class A_1 Amplifier

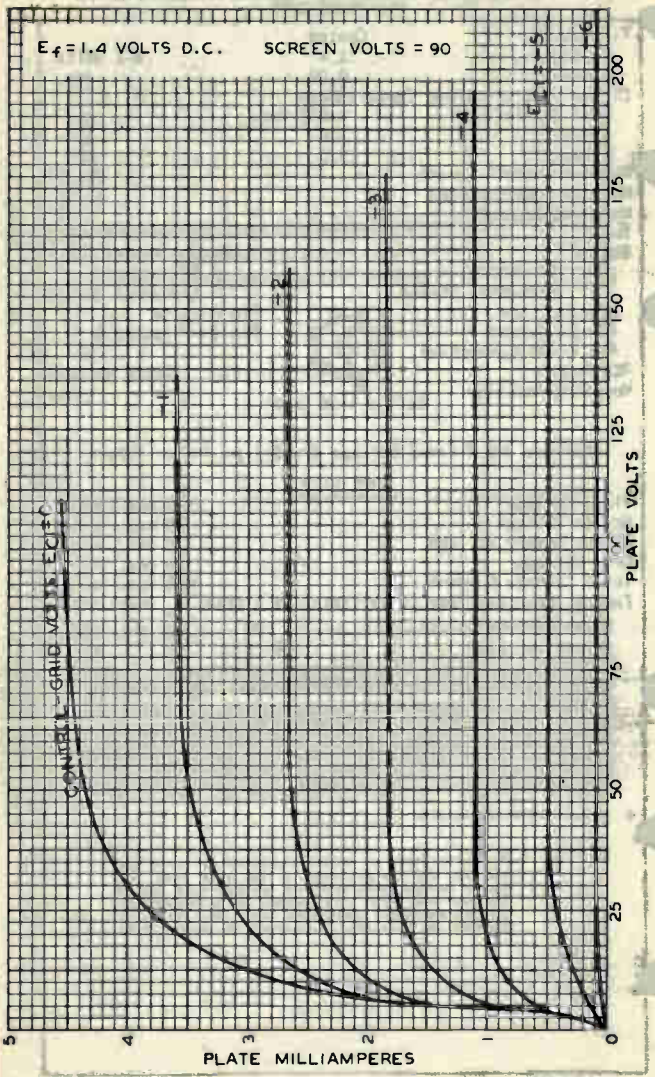
Plate Voltage	90	90	volts
Screen Voltage	67.5	90	volts
Grid Voltage	0	0	volts
Plate Resistance	0.6	0.35	megohm
Transconductance	925	1025	μmhos
Grid Bias for Plate Current = 10 μ amp.	-6	-8	volts
Plate Current	2.9	4.5	ma.
Screen Current	1.2	2.0	ma.

° With no external shield.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

IL4

AVERAGE PLATE CHARACTERISTICS



3A4

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series* *	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.1	0.2	amp.
Direct Interelectrode Capacitances:°			
Grid to Plate	0.34 max.		µµf
Input	4.8		µµf
Output	4.2		µµf
Maximum Overall Length			2-1/8"
Maximum Seated Height			1-7/8"
Maximum Diameter			3/4"
Bulb			T-5-1/2
Base▲			Miniature Button 7-Pin
Pin 1 - Fil. (- series)			Pin 5 {Fil. Mid-Tap (- parallel)
Pin 2 - Plate			
Pin 3 - Screen			Pin 6 - Plate
Pin 4 - Grid			Pin 7 - Filament +
RCA Socket			Stock No. 9914
Mounting Position	BOTTOM VIEW (7BB)		Any

Maximum Ratings Are Design-Center Values

A-F POWER AMPLIFIER

Plate Voltage	150 max. volts
Screen Voltage	90 max. volts
Plate Dissipation	2.0 max. watts
Screen Dissipation	0.4 max. watt
Total Zero-Sig. Cathode Current■	18 max. ma.

Typical Operation and Characteristics-Class A_1 Amplifier:●

Filament Arrangement	*Parallel* **		
Plate Voltage	135	150	volts
Screen Voltage	90	90	volts
Grid Voltage	-7.5	-8.4	volts
Peak A-F Grid Voltage	7.5	8.4	volts
Zero-Sig. Plate Current	14.8	13.3	ma.
Max.-Sig. Plate Current	14.9	14.1	ma.
Zero-Sig. Screen Current	2.6	2.2	ma.
Max.-Sig. Screen Current	3.5	3.5	ma.
Plate Resistance	90000	100000	ohms
Transconductance	1900	1900	µmhos
Load Resistance	8000	8000	ohms
Total Harmonic Distortion	5	6	%
Max.-Sig. Power Output	600	700	mw

R-F POWER AMPLIFIER

D-C Plate Voltage	150 max. volts
D-C Screen Voltage	135 max. volts
D-C Grid Voltage	-30 max. volts
D-C Plate Current	20 max. ma.
D-C Grid Current	0.25 max. ma.
Total D-C Cathode Current■	25 max. ma.
Plate Input	3 max. watts
Screen Input	0.9 max. watt
Plate Dissipation	2 max. watts

*, **, °, ▲, ■, ●: See next page.

← Indicates a change.

3A4

POWER AMPLIFIER PENTODE

(continued from preceding page)

*Typical Operation at 10 Mc with Parallel Filament Arrangement:***

D-C Plate Voltage	150	volts
D-C Screen Voltage	135	volts
Grid Resistor	0.2	megohm
D-C Plate Current	18.3	ma.
D-C Screen Current	6.5	ma.
D-C Grid Current	0.13	ma.
Power Output (approx.)	1.2	watts

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid voltage is referred to pin No.1.

** Filament voltage applied across the two sections in parallel between pin No.5 and pins No.1 and No.7 connected together. Grid voltage is referred to pin No.5.

° With no external shield.

■ For series-filament operation. A shunting resistor must be connected across the section between pins No.1 and No.5 to by-pass excess cathode current in this section. The value of the shunting resistor should be adjusted to make the voltage across the shunted section equal to the voltage across the section between pins No.5 and No.7. When other tubes in series-filament arrangement contribute to the filament current of the 3A4, an additional shunting resistor may be required between pins No.1 and No.7.

● Typical operating values for the 3A4 with filament sections in series will be approximately the same as those shown for parallel-filament operation.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

← Indicates a change.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

3A4

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series* *	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.1	0.2	amp.
Direct Interelectrode Capacitances:°			
Grid to Plate	0.34 max.		µµf
Input	4.8		µµf
Output	4.2		µµf
Maximum Overall Length			2-1/8"
Maximum Seated Height			1-7/8"
Maximum Diameter			3/4"
Bulb			T-5-1/2
Base▲			Miniature Button 7-Pin
Pin 1 - Fil. (- series)			Pin 5 {Fil. Mid-Tap (- parallel)
Pin 2 - Plate			
Pin 3 - Screen			Pin 6 - Plate
Pin 4 - Grid			Pin 7 - Filament +
RCA Socket			Stock No. 9914
Mounting Position	BOTTOM VIEW (7BB)		Any

Maximum Ratings Are Design-Center Values

A-F POWER AMPLIFIER

Plate Voltage	150 max. volts
Screen Voltage	90 max. volts
Plate Dissipation	2.0 max. watts
Screen Dissipation	0.4 max. watt
Total Zero-Sig. Cathode Current■	18 max. ma.

Typical Operation and Characteristics-Class A1 Amplifier:●

Filament Arrangement	*Parallel* **		
Plate Voltage	135	150	volts
Screen Voltage	90	90	volts
Grid Voltage	-7.5	-8.4	volts
Peak A-F Grid Voltage	7.5	8.4	volts
Zero-Sig. Plate Current	14.8	13.3	ma.
Max.-Sig. Plate Current	14.9	14.1	ma.
Zero-Sig. Screen Current	2.6	2.2	ma.
Max.-Sig. Screen Current	3.5	3.5	ma.
Plate Resistance	90000	100000	ohms
Transconductance	1900	1900	µmhos
Load Resistance	8000	8000	ohms
Total Harmonic Distortion	5	6	%
Max.-Sig. Power Output	600	700	mw

R-F POWER AMPLIFIER

D-C Plate Voltage	150 max. volts
D-C Screen Voltage	135 max. volts
D-C Grid Voltage	-30 max. volts
D-C Plate Current	20 max. ma.
D-C Grid Current	0.25 max. ma.
Total D-C Cathode Current ■	25 max. ma.
Plate Input	3 max. watts
Screen Input	0.9 max. watt
Plate Dissipation	2 max. watts

*, **, °, ▲, ■, ●: See next page.

← indicates a change.

3A4

POWER AMPLIFIER PENTODE

(continued from preceding page)

*Typical Operation at 10 Mc with Parallel Filament Arrangement:***

D-C Plate Voltage	150	volts
D-C Screen Voltage	135	volts
Grid Resistor	0.2	megohm
D-C Plate Current	18.3	ma.
D-C Screen Current	6.5	ma.
D-C Grid Current	0.13	ma.
Power Output (approx.)	1.2	watts

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid voltage is referred to pin No.1.

** Filament voltage applied across the two sections in parallel between pin No.5 and pins No.1 and No.7 connected together. Grid voltage is referred to pin No.5.

° With no external shield.

■ For series-filament operation. A shunting resistor must be connected across the section between pins No.1 and No.5 to by-pass excess cathode current in this section. The value of the shunting resistor should be adjusted to make the voltage across the shunted section equal to the voltage across the section between pins No.5 and No.7. When other tubes in series-filament arrangement contribute to the filament current of the 3A4, an additional shunting resistor may be required between pins No.1 and No.7.

● Typical operating values for the 3A4 with filament sections in series will be approximately the same as those shown for parallel-filament operation.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

← indicates a change.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

3A4

AVERAGE PLATE CHARACTERISTICS

3A5

H-F TWIN TRIODE
MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series**	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.11	0.22	amp.

Direct Interelectrode Capacitances:°

	Triode Unit T_2	*Triode Unit T_1*	
Grid to Plate	3.2	3.2	μμf
Grid to Filament	0.9	0.9	μμf
Plate to Filament	1.0	1.0	μμf
Plate to Plate	0.32		μμf

Maximum Overall Length	2-1/8"
Maximum Seated Height	1-7/8"
Maximum Diameter	3/4"
Bulb	T-5-1/2"

Base▲ — Miniature Button 7-Pin

Pin 1 - Filament -
Pin 2 - Plate T_2
Pin 3 - Grid T_2
Pin 4 - Fil. Mid-Tap ((+ parallel)
Pin 5 - Grid T_1
Pin 6 - Plate T_1
Pin 7 - Fil. (+ Series)

BOTTOM VIEW (7BC)

RCA Socket — Stock No.9914
Mounting Position — Any

For convenience, one triode unit is identified as T_1; the other as T_2

Maximum Ratings Are Design-Center Values

A-F POWER AMPLIFIER

Plate Voltage	135 max.	volts
Plate Current	5 max.	ma.
Plate Dissipation	0.5 max.	watt

Characteristics - Class A, Amplifier:

Plate Voltage	90	volts
Grid Voltage	-2.5	volts
Amplification Factor	15	
Plate Resistance	8300	ohms
Transconductance	1800	μmhos
Plate Current	3.7	ma.

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation

D-C Plate Voltage	135 max.	volts
D-C Grid Voltage	-30 max.	volts
D-C Plate Current (per unit)	15 max.	ma.
D-C Grid Current (per unit)	2.5 max.	ma.
Plate Input (per unit)	2.0 max.	watts
Plate Dissipation (per unit)	1.0 max.	watt

Typical Operation At 40 Mc With Both Units In Push-Pull:

D-C Plate Voltage	135	volts
D-C Grid Voltage •	-20	volts
	4000	ohms
	570	ohms
Peak R-F Grid-to-Grid Voltage	90	volts
D-C Plate Current	30	ma.
D-C Grid Current (approx.)	5	ma.
Driving Power (approx.)	0.2	watt
Power Output (approx.)	2	watts

•, **, °, ▲, see next page.

3A5

H-F TWIN TRIODE

(continued from preceding page)

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid voltage is referred to Pin No.1. For series filament operation, a shunting resistor must be connected across the section between pins No.1 and No.4. to by-pass excess cathode current in this section. The value of the shunting resistor should be adjusted to make the voltage across the shunted section equal to the voltage across the section between pins No.4 and No.7. When other tubes in series-filament arrangement contribute to the filament current of the 3A5, an additional shunting resistor may be required between pins No.1 and No.7.

** Filament voltage applied across the two sections in parallel between pin No.4 and pins No.1 and No.7 connected together. Grid voltage is referred to pins No.1 and No.7 tied together.

o With no external shield

● Obtained by grid resistor (8000), cathode resistor (670), or fixed supply.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

3A5

H-F TWIN TRIODE
MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series**	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.11	0.22	amp.

Direct Interelectrode Capacitances:*

	Triode Unit T_1	*Triode Unit T_2*	
Grid to Plate	3.2	3.2	μμf
Grid to Filament	0.9	0.9	μμf
Plate to Filament	1.0	1.0	μμf
Plate to Plate	0.32		μμf

Maximum Overall Length	2-1/8"
Maximum Seated Height	1-7/8"
Maximum Diameter	3/4"
Bulb	T-5-1/2"

Base▲ — Miniature Button 7-Pin

Pin 1 - Filament -
Pin 2 - Plate T_2
Pin 3 - Grid T_2
Pin 4 - {Fil. Mid-Tap ((+ parallel)
Pin 5 - Grid T_1
Pin 6 - Plate T_1
Pin 7 - Fil. (+ Series)

BOTTOM VIEW (7BC)

RCA Socket — Stock No.9914
Mounting Position — Any

For convenience, one triode unit is identified as T_1; the other as T_2

Maximum Ratings Are Design-Center Values

A-F POWER AMPLIFIER

Plate Voltage	135 max.	volts
Plate Current	5 max.	ma.
Plate Dissipation	0.5 max.	watt

Characteristics - Class A, Amplifier:

Plate Voltage	90	volts
Grid Voltage	-2.5	volts
Amplification Factor	15	
Plate Resistance	8300	ohms
Transconductance	1800	μmhos
Plate Current	3.7	ma.

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation

D-C Plate Voltage	135 max.	volts
D-C Grid Voltage	-30 max.	volts
D-C Plate Current (per unit)	15 max.	ma.
D-C Grid Current (per unit)	2.5 max.	ma.
Plate Input (per unit)	2.0 max.	watts
Plate Dissipation (per unit)	1.0 max.	watt

Typical Operation At 40 Mc With Both Units In Push-Pull:

D-C Plate Voltage	135	volts
D-C Grid Voltage •	-20 4000 570	volts ohms ohms
Peak R-F Grid-to-Grid Voltage	90	volts
D-C Plate Current	30	ma.
D-C Grid Current (approx.)	5	ma.
Driving Power (approx.)	0.2	watt
Power Output (approx.)	2	watts

*, **, ○, ◎, ▲, : see next page

3A5

H-F TWIN TRIODE

(continued from preceding page)

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid voltage is referred to Pin No.1. For series filament operation, a shunting resistor must be connected across the section between pins No.1 and No.4, to by-pass excess cathode current in this section. The value of the shunting resistor should be adjusted to make the voltage across the shunted section equal to the voltage across the section between pins No.4 and No.7. When other tubes in series-filament arrangement contribute to the filament current of the 3A5, an additional shunting resistor may be required between pins No.1 and No.7.

** Filament voltage applied across the two sections in parallel between pin No.4 and pins No.1 and No.7 connected together. Grid voltage is referred to pins No.1 and No.7 tied together.

o With no external shield

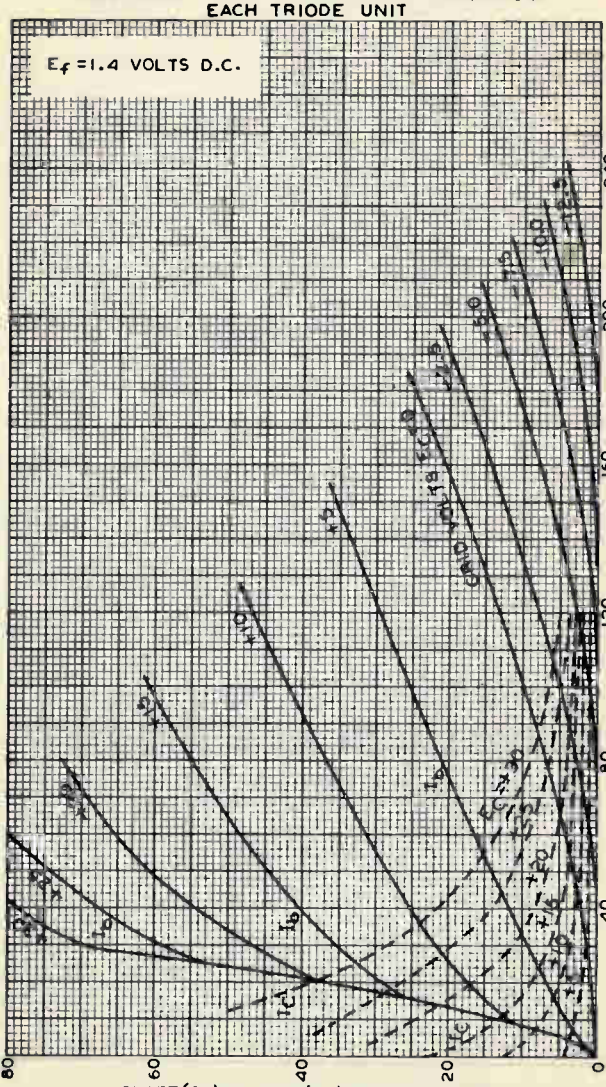
● Obtained by grid resistor (4000), cathode resistor (570), or fixed supply.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip of the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

3A5

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



Full-Wave Vacuum Rectifier

For Industrial & Military Applications

GENERAL DATA

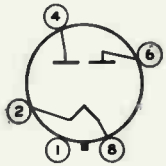
Electrical:

Filament, Coated:[a]	
Voltage (AC or DC)	5 volts
Current	2 amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 2 and 4 in vertical plane
Maximum Overall Length	4-1/4"
Maximum Seated Length	3-11/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 5-Pin Micanol with External Barriers, Style B, Arrangement 1 (JEDEC Group 1, No. B5-121)
Basing Designation for BOTTOM VIEW	5T

Pin 1 – No Connection
Pin 2 – Filament



Pin 4 – Plate No. 2
Pin 6 – Plate No. 1
Pin 8 – Filament

FULL-WAVE RECTIFIER

Maximum Ratings, *Absolute-Maximum Values:*

For altitudes up to	*40000*	*20000*	*feet*
PEAK INVERSE PLATE VOLTAGE	2650 max.	3100 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load)	See *Rating Chart I*		
PEAK PLATE CURRENT PER PLATE	715 max.	715 max.	ma
DC OUTPUT CURRENT, PER PLATE	See *Rating Chart I*		
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE	[b]	[b]	
BULB TEMPERATURE (At hottest point on bulb surface)	230 max.	230 max.	°C

Typical Operation:

With capacitor-input filter

For altitudes up to	*40000*	*20000*	*feet*
AC-Plate-to-Plate Supply Voltage (RMS, without load)	1400	1500	2000 volts
Filter-Input Capacitor	20	20	20 μf
Total Effective Plate Supply Impedance Per Plate[c]	225	250	375 ohms

DC Output Voltage (Approx.) at Input to Filter:				
At half-load ma. =				
75.	–	910	1210	volts
125	750	–	–	volts
At full-load ma. =				
150	–	800	1040	volts
250	605	–	–	volts
Voltage Regulation (Approx.): Half-load to full-load current	145	110	170	volts
DC Output Current	250	150	150	ma

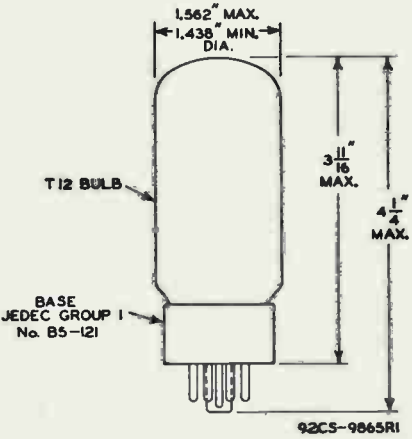
With choke-input filter

For altitudes up to	*40000*	*20000*	*feet*
AC Plate-to-Plate Supply Voltage (RMS, without load) .	1500	1900	volts
Filter-Input Choke.	5	10	henrys
DC Output Voltage (Approx.) at Input to Filter for dc output ma. =			
87.5.	–	800	volts
125	600	–	volts
175	–	760	volts
250	560	–	volts
Voltage Regulation (Approx.): Half-load to full-load current	40	40	volts
DC Output Current	250	175	ma

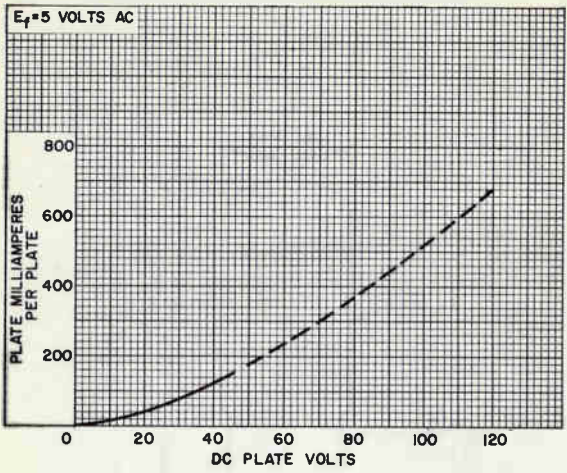
[a] See accompanying chart *Operating Areas for Simultaneous and Delayed Application of Plate Voltage* for conditions necessitating delay in application of plate voltage until filament has reached operating temperature.

[b] If hot-switching is required in operation, choke-input circuits are recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current. When capacitor-input circuits are used, a maximum value of 3 amperes should not be exceeded.

[c] Indicated values for conditions shown will limit peak plate current to the maximum-rated value. When a filter-input capacitor larger than 20 μf is used, it may be necessary to increase plate-supply impedance to a higher value than that shown in the data to limit the peak plate current to the maximum-rated value.


1.562" MAX.
1.438" MIN. DIA.
T12 BULB
3 11/16" MAX.
4 1/4" MAX.
BASE
JEDEC GROUP 1
No. B5-121
92CS-9865RI

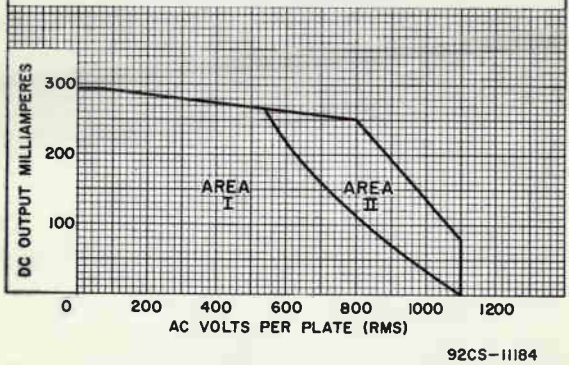
AVERAGE PLATE CHARACTERISTIC



92CS-11183

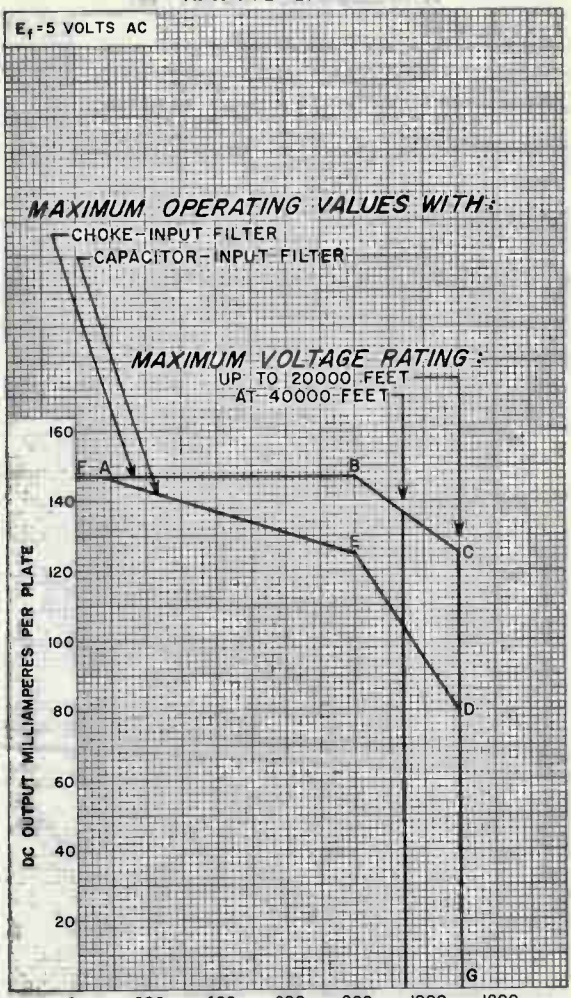
OPERATING AREAS FOR SIMULTANEOUS AND DELAYED APPLICATION OF PLATE VOLTAGE

FULL-WAVE RECTIFIER SERVICE WITH CAPACITOR-INPUT FILTER.
AREA I—FILAMENT AND PLATE VOLTAGE MAY BE APPLIED SIMULTANEOUSLY.
AREA II—FILAMENT SHOULD BE ALLOWED TO REACH OPERATING TEMPERATURE BEFORE PLATE VOLTAGE IS APPLIED. FOR AVERAGE CONDITIONS, THE DELAY IS APPROXIMATELY 10 SECONDS.



92CS-11184

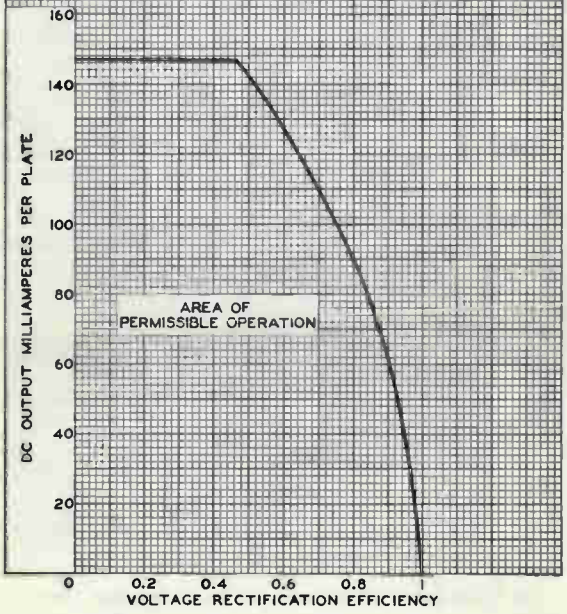
RATING CHART I



92CM-9943RI

RATING CHART II
With Capacitor-Input Filter

E_f = 5 VOLTS AC
MAXIMUM PEAK PLATE CURRENT PER PLATE = 715 MA.
VOLTAGE RECTIFICATION EFFICIENCY = $\frac{\bar{E}}{1.41\,E_S}$
WHERE $\bar{E}$ = DC OUTPUT VOLTS AT INPUT TO FILTER
E_S = AC PLATE SUPPLY VOLTS (RMS) PER PLATE



92CM-9953RI

RATING CHART III
With Capacitor-Input Filter

E_f = 5 VOLTS AC

MAXIMUM HOT-SWITCHING AMPERES = 3

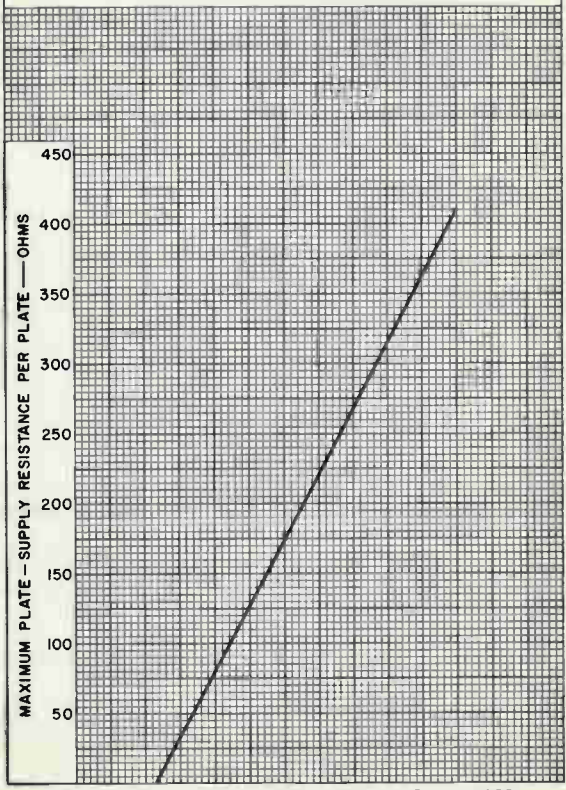
PLATE-SUPPLY RESISTANCE PER PLATE = $R_{SEC.} + N^2 R_{PRI.} + R_A$

WHERE $R_{SEC.}$ = DC RESISTANCE OF TRANSFORMER SECONDARY PER SECTION

$R_{PRI.}$ = DC RESISTANCE OF TRANSFORMER PRIMARY

R_A = DC RESISTANCE OF ADDED SERIES RESISTANCE PER PLATE

N = TRANSFORMER-VOLTAGE STEP-UP RATIO PER SECTION



92CM-6416R4

6AK6

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.) ●		
Grid to Plate	0.12	μμf
Input	3.6	μμf
Output	4.2	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Length from Base Seat to Bulb Top (excluding tip)		1-1/2" ± 3/32"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base ▲		Miniature Button 7-Pin
Pin 1 - Grid No. 1		Pin 5 - Plate
Pin 2 - Grid No. 3		Pin 6 - Grid No. 2
Pin 3 - Heater		Pin 7 - Cathode
Pin 4 - Heater		
RCA Socket		Stock No. 9914
Mounting Position	BOTTOM VIEW (7BK)	Any

Maximum Ratings Are Design-Center Values

A-F AMPLIFIER

Plate Voltage	300 max. volts
Screen Voltage (Grid No. 2)	250 max. volts
Plate Dissipation	2.75 max. watts
Screen Dissipation	0.75 max. watt
D-C Heater-Cathode Potential	100 max. volts
Typical Operation and Characteristics - Class A, Amplifier:	
Plate Voltage	180 volts
Suppressor (Grid No. 3)	Connected to cathode at socket
Screen Voltage	180 volts
Grid Voltage (Grid No. 1) ♦	-9 volts
Peak A-F Grid Voltage	9 volts
Zero-Signal Plate Current	15 ma.
Zero-Signal Screen Current	2.5 ma.
Plate Resistance	0.2 megohm
Transconductance	2300 μmhos
Load Resistance	10000 ohms
Total Harmonic Distortion	10 %
Max.-Sig. Power Output	1.1 watts

● With no external shield.

♦ The d-c resistance in the grid circuit under maximum rated conditions should not exceed 0.5 megohm for cathode-bias operation and 0.1 megohm for fixed-bias operation.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

6AK6

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AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION

AUG. 11, 1943

RCA VICTOR DIVISION

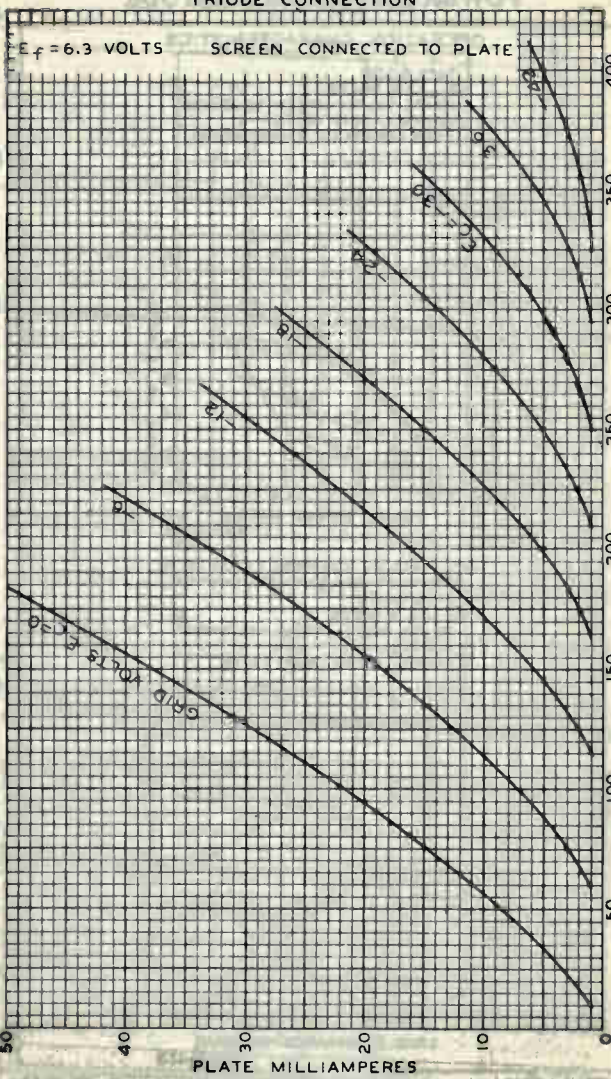
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-6450

6AK6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



AUG. 1, 1943

RCA VICTOR DIVISION

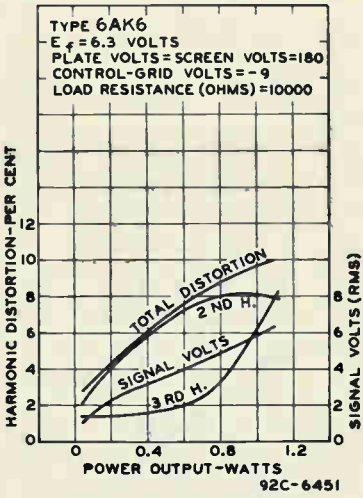
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92C-6449

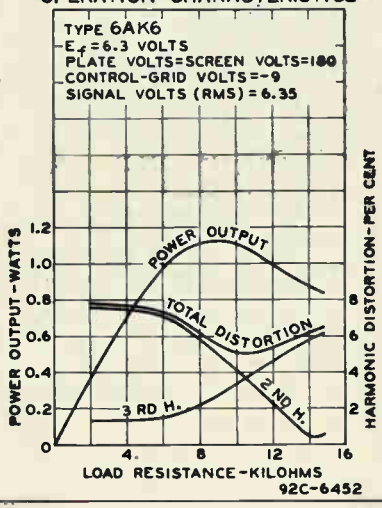
6AK6

POWER AMPLIFIER PENTODE

OPERATION CHARACTERISTICS



OPERATION CHARACTERISTICS



RCA

6AS6

SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc	volts
Current	0.175		amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield No.316*	
Grid No.1 to Plate	0.025 max.	0.02 max.	μμf
Input	3.9	4.0	μμf
Output	2.2	3.0	μμf
Grid No.1 to Grid No.3	0.15 max.	0.15 max.	μμf
Grid No.3 to Plate	0.7 max.	0.7 max.	μμf
Grid No.3 to All Other Electrodes	3.3	3.4	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	$7CM_1$

Pin 1 – Grid No.1
Pin 2 – Cathode
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Grid No.3

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	180	max.	volts
GRID-No.3 VOLTAGE	27	max.	volts
GRID-No.2 VOLTAGE	140	max.	volts
CATHODE CURRENT	18	max.	ma
PLATE DISSIPATION	1.7	max.	watts
GRID-No.2 INPUT	0.75	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	90	max.	volts
Heater positive with respect to cathode	90	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120	max.	°C

Characteristics:

Plate Voltage	120	120	volts

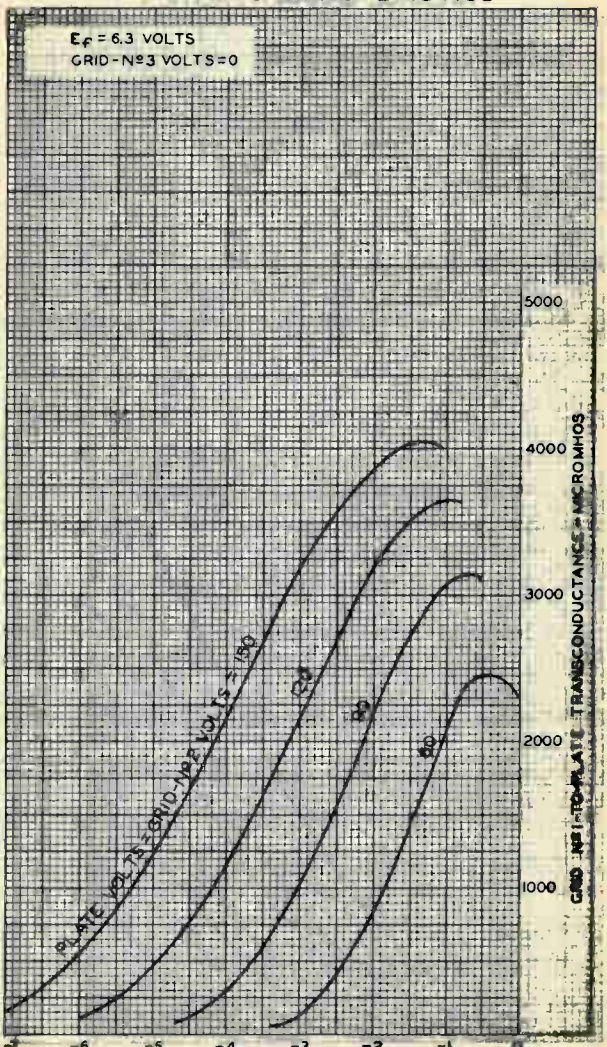
6AS6

SHARP-CUTOFF PENTODE

Grid-No.3 Voltage.	-3	0	volts
Grid-No.2 Voltage.	120	120	volts
Grid-No.1 Voltage.	-2	-2	volts
Plate Resistance (Approx.)	-	0.15	megohm
Transconductance, Grid No.1 to Plate. . . .	1850	3200	μmhos
Transconductance, Grid No.3 to Plate. . . .	810	470	μmhos
Plate Current.	3.6	5.2	ma
Max. Plate Current for Grid-No.1 Volts = -10. . . .	-	100	μamp
Max. Plate Current for Grid-No.3 Volts = -15. . . .	-	20	μamp
Grid-No.2 Current.	4.8	3.5	ma

6AS6

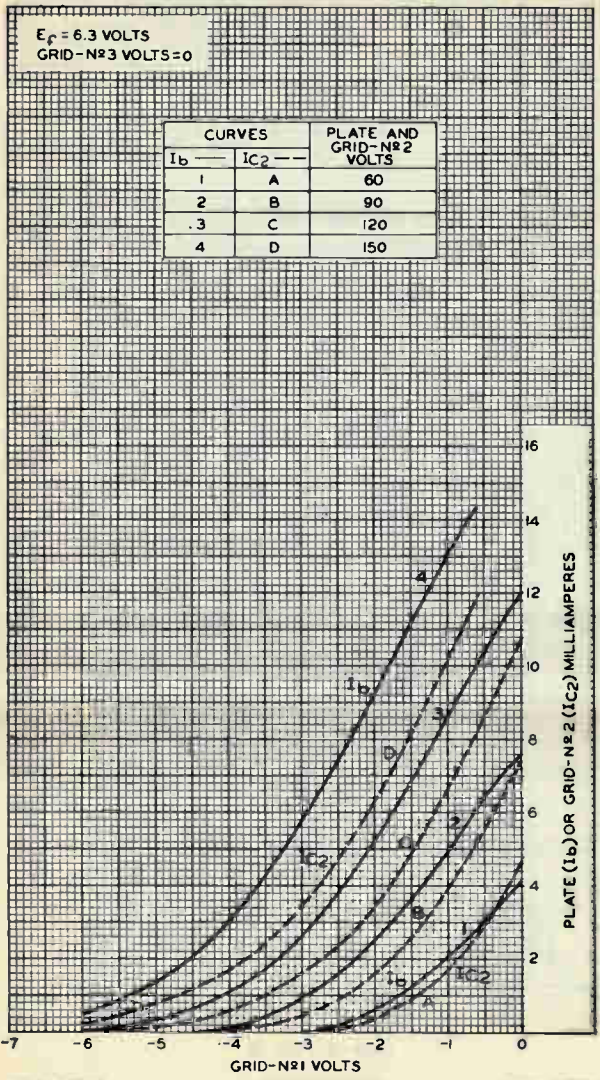
AVERAGE CHARACTERISTICS



RCA

6AS6

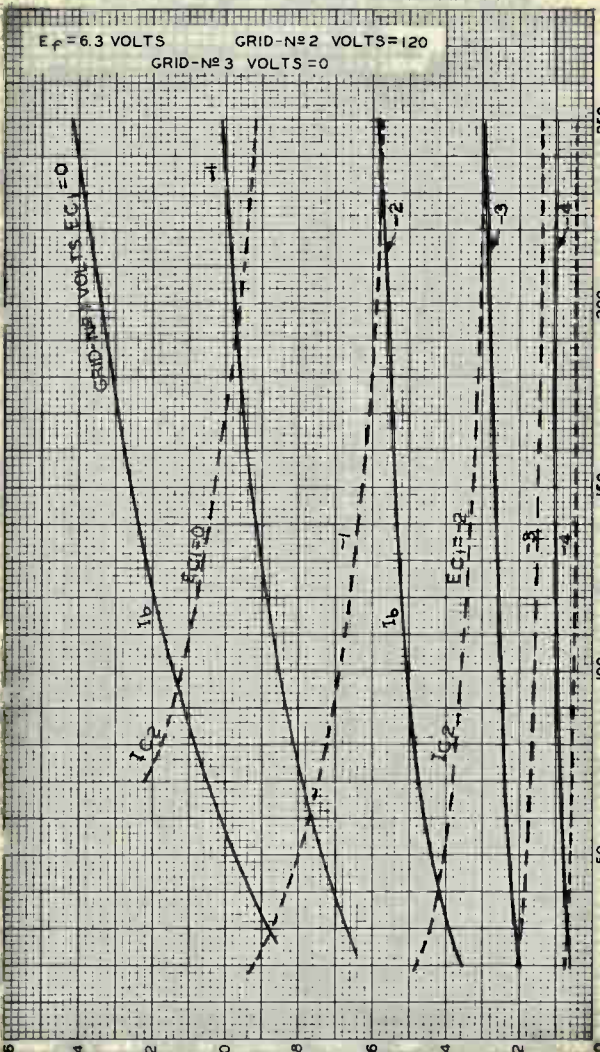
AVERAGE CHARACTERISTICS



RCA

6AS6

AVERAGE PLATE CHARACTERISTICS

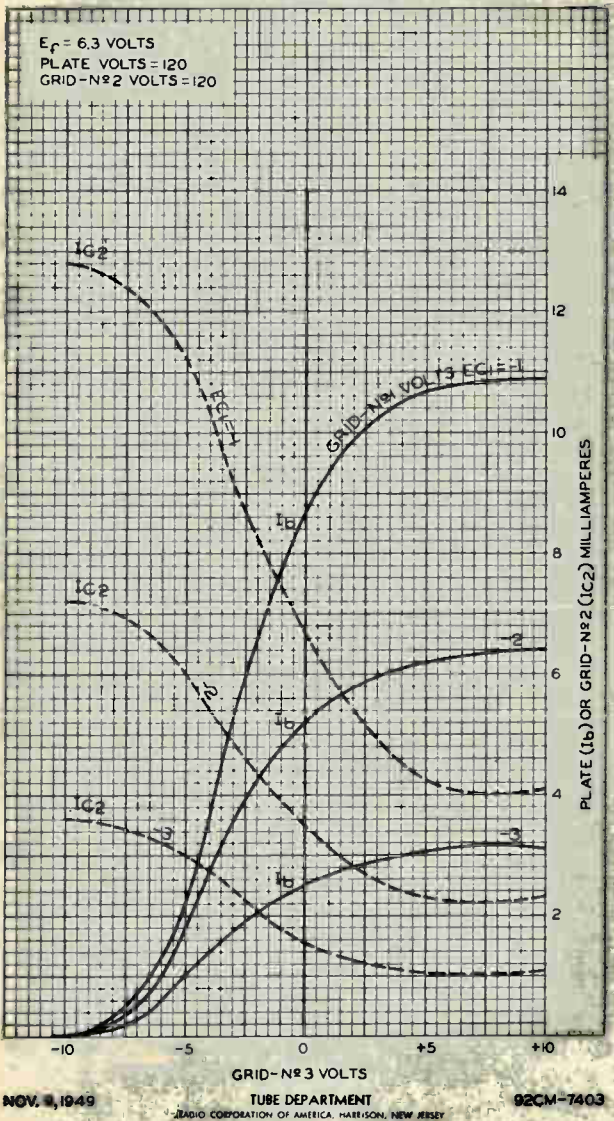


6AS6

RCA

6AS6

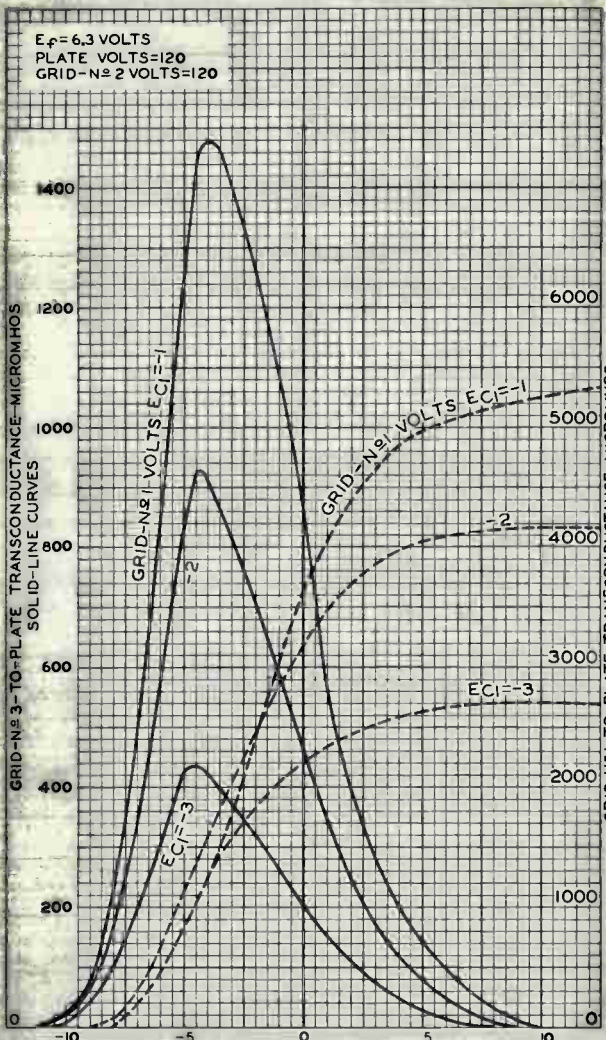
AVERAGE CHARACTERISTICS



RCA

6AS6

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7404R1

6AS7-G

LOW-MU TWIN POWER TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	2.5	amp
Direct Interelectrode Capacitances (Approx., each unit):[o]		
Grid to plate	10.5	μμf
Grid to heater and cathode	6.8	μμf
Plate to heater and cathode	2.3	μμf
Heater to cathode	11.0	μμf
Grid of unit No.1 to grid of unit No.2	0.70	μμf
Plate of unit No.1 to plate of unit No.2	1.65	μμf

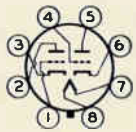
Characteristics, Class A_1 Amplifier (Each unit):

Plate-Supply Voltage	135	volts
Cathode-Bias Resistor■	250	ohms
Amplification Factor	2	
Plate Resistance (Approx.)	280	ohms
Transconductance	7000	μmhos
Plate Current	125	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-5/16"
Maximum Seated Length	4-3/4"
Maximum Diameter	2-1/16"
Bulb	ST-16
Base	Medium-Shell Octal 8-Pin (JETEC No.B8-11)
Basing Designation for BOTTOM VIEW	8BD

Pin 1 – Grid of Unit No.2
Pin 2 – Plate of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Grid of Unit No.1
Pin 5 – Plate of Unit No.1
Pin 6 – Cathode of Unit No.1
Pin 7 – Heater
Pin 8 – Heater



DC AMPLIFIER

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
PLATE CURRENT	125 max.	ma
PLATE DISSIPATION	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts

[o] Without external shield.
■ Operation with fixed bias is not recommended.

→ Indicates a change.

6AS7-G

LOW-MU TWIN POWER TRIODE

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:

For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation	Not recommended	

BOOSTER SCANNING SERVICE

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

For operation in a 525-line, 30-frame system[□]

PEAK NEGATIVE-PULSE PLATE VOLTAGE[●]	1700 max.	volts
DC PLATE CURRENT	125 max.	ma
PLATE DISSIPATION.	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	300 max.	volts
Heater positive with respect to cathode .	300 max.	volts

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:

For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation	Not recommended	

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

● The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

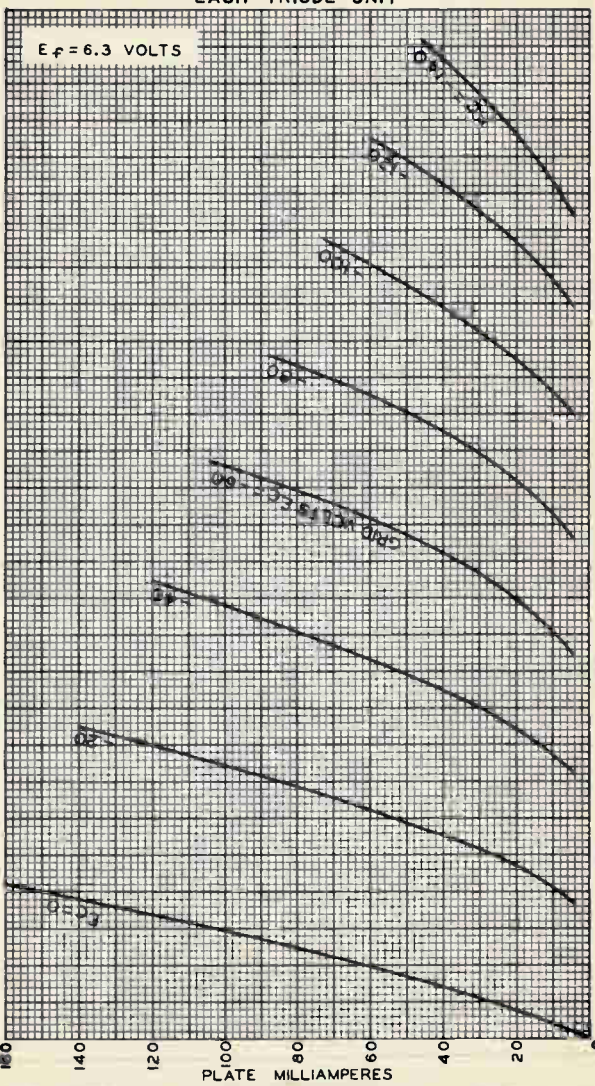
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AS7-G

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



6F4
OSCILLATOR TRIODE
ACORN TYPE

For use at frequencies up to 1200 Mc approx.

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.225	amp.
Direct Interelectrode Capacitances:[o]		
Grid to Plate	1.9	μμf
Grid to Cathode & Heater	2.0	μμf
Plate to Cathode & Heater	0.6	μμf
Overall Length		1-7/32" ± 5/32"
Overall Diameter (including radial pins)		1-3/32" ± 1/16"
Bulb	*See Outline in General Section*	T-4½
Base	*See Outline in General Section*	Small Radial 7-Pin
Pin 1 - Heater		Pin 5 - Grid
Pin 2 - Grid		Pin 6 - Heater
Pin 3 - Plate		Pin 7 - Cathode
Pin 4 - Plate		
Mounting Position		Any

BOTTOM VIEW (7BR)

Maximum Ratings Are Design-Center Values

A-F AMPLIFIER

Plate Voltage	150 max.	volts
Plate Supply Voltage	300 max.	volts
Plate Current	15 max.	ma.
Plate Dissipation	2 max.	watts
D-C Heater-Cathode Potential	80 max.	volts
Characteristics - Class A_1 Amplifier:		
Plate Voltage	80	volts
Cathode-Bias Resistor[□]	150	ohms
Amplification Factor	17	
Plate Resistance	2900	ohms
Transconductance	5800	μmhos
Plate Current	13	ma.

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

D-C Plate Voltage	150 max.	volts
D-C Plate Supply Voltage	300 max.	volts
D-C Grid Voltage	-50 max.	volts
D-C Plate Current	20 max.	ma.
D-C Grid Current	8 max.	ma.
Plate Dissipation	2 max.	watts
D-C Heater-Cathode Potential	80 max.	volts
Typical Operation at Moderate Frequencies:[●]		
D-C Plate Voltage	150	volts
D-C Grid Voltage[♦]	-15	volts
	550	ohms
	2000	ohms
D-C Plate Current	20	ma.
D-C Grid Current (Approx.)[●]	7.5	ma.
Driving Power (Approx.)[●]	0.2	watt
Power Output (Approx.)	1.8	watts

o, □, ●, ♦, ⊖: see next page.

6F4

OSCILLATOR TRIODE

(continued from preceding page)

○ with no external shield.

□ Fixed-bias operation is not recommended. Under maximum rated conditions, the d-c resistance in the grid circuit should not exceed 0.5 megohm.

● Approximately 45 milliwatts can be obtained when the 6F4 is used at 1200 megacycles as an oscillator with 100 volts on plate, maximum rated plate dissipation, and grid resistor of 2000 ohms.

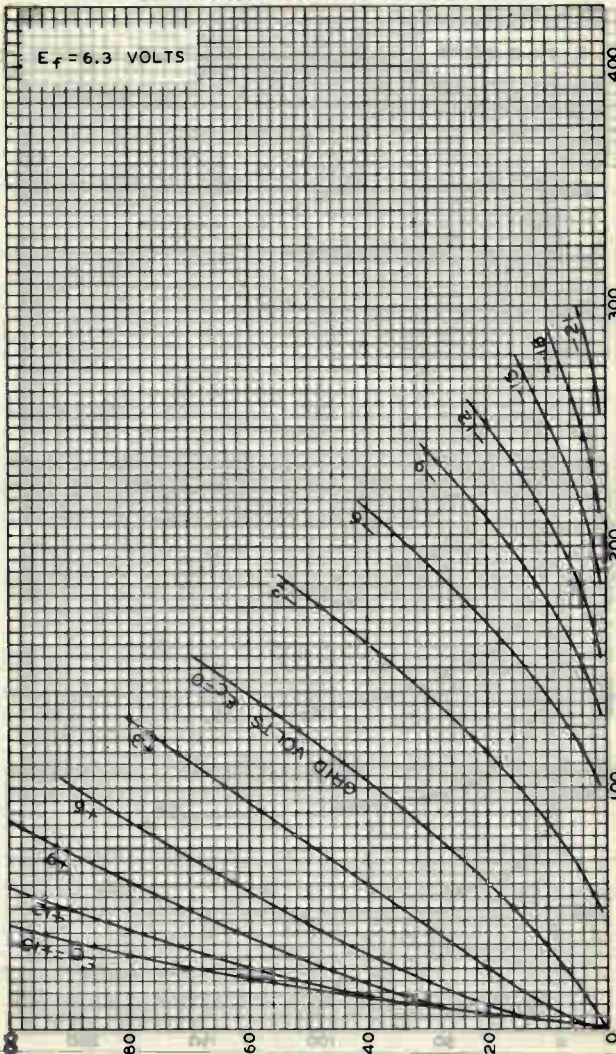
◆ Obtained from fixed supply, or by cathode resistor (550), grid resistor (2000), or partial self-bias methods.

⊖ Subject to wide variations as explained under TUBE RATINGS in General Section.

The *socket* for the 6F4 should be electrically and mechanically compact, and be made with an insulating material having a loss factor not exceeding 0.035 to permit operation of the 6F4 at high frequencies. For most satisfactory performance of the 6F4, it is essential that the inductance of connections between tube and circuit be kept as low as possible.

6F4

AVERAGE PLATE CHARACTERISTICS

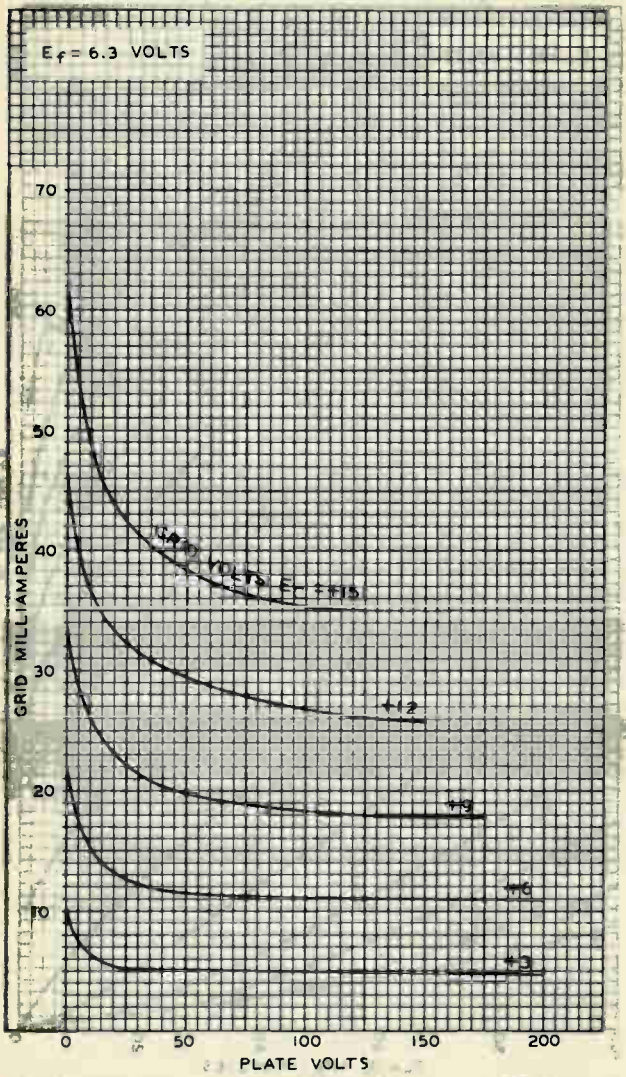


RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6F4

6F4

TYPICAL CHARACTERISTICS



6J4

U-H-F AMPLIFIER TRIODE

GROUNDED-GRID, MINIATURE TYPE

For use at frequencies up to 500 Mc. approx.

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.4	amp.
Direct Interelectrode Capacitances (Approx.);°		
Plate to Cathode & Heater	0.24 max.	μμf
Grid to Cathode & Heater	5.5	μμf
Grid to Plate	4	μμf
Heater to Cathode	2.8	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Length from Base Seat to Bulb Top (excluding tip)		1-1/2" ± 3/32"
Maximum Diameter		3/4"
Bulb		T-5-1/2"
Base▲		Miniature Button 7-Pin
Pin 1 - Grid		Pin 5 - Grid
Pin 2 - Cathode		Pin 6 - Grid
Pin 3 - Heater		Pin 7 - Plate
Pin 4 - Heater		
RCA Socket		Stock No. 9914
Mounting Position		Any

BOTTOM VIEW (7BQ)

Maximum Ratings Are Design-Center Values

GROUNDED-GRID AMPLIFIER

Plate Voltage	150 max.	volts
Plate Dissipation	2.25 max.	watts
Plate Current	20 max.	ma.
D-C Heater-Cathode Potential	90 max.	volts

Typical Operation and Characteristics - Class A_1 Amplifier:

Plate Voltage	100	150	volts
Cathode-Bias Resistor* (Suitably by-passed)	100	100	ohms
Amplification Factor	55	55	
Plate Resistance	5000	4500	ohms
Transconductance	11000	12000	μmhos
Plate Current	10	15	ma.

° With close-fitting shield connected to grid.

* The 6J4 should always be used with a cathode-bias resistor suitably by-passed. The d-c resistance in the grid circuit under maximum rated conditions should be limited to 0.25 megohm.

▲*The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

6J4

U-H-F AMPLIFIER TRIODE

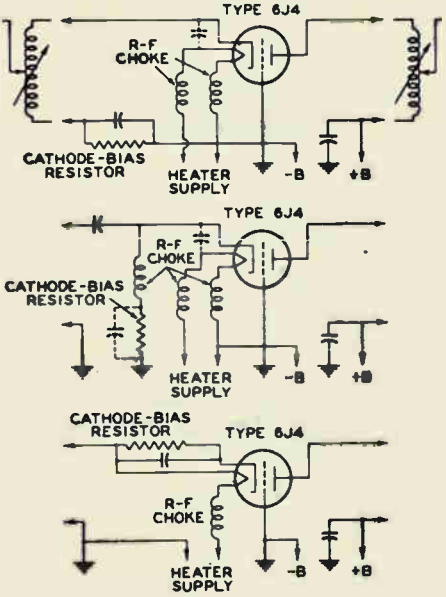
(continued from preceding page)

NOTE:

For grounded-grid operation, all three grid terminals should be grounded to minimize the effects of grid-lead inductance on u-h-f performance.

In arranging the circuit for the 6J4 used as a grounded-grid r-f amplifier or mixer, it is preferable to have the heater operate at the same r-f potential as the cathode, so that the cathode-heater capacitance will not be added across the input-circuit capacitance. Placing r-f chokes in series with the heater leads is suggested as a suitable method of operating heater and cathode at the same r-f potential.

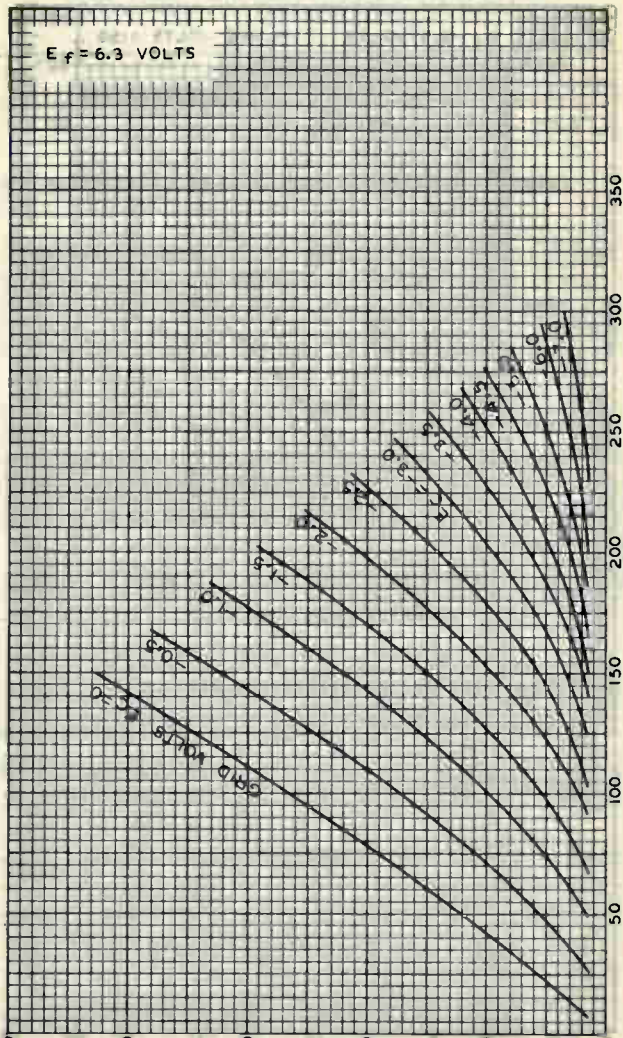
TYPICAL GROUNDED-GRID CIRCUITS
Having Heater at R-F Cathode Potential



92CM-6550

6J4

AVERAGE PLATE CHARACTERISTICS

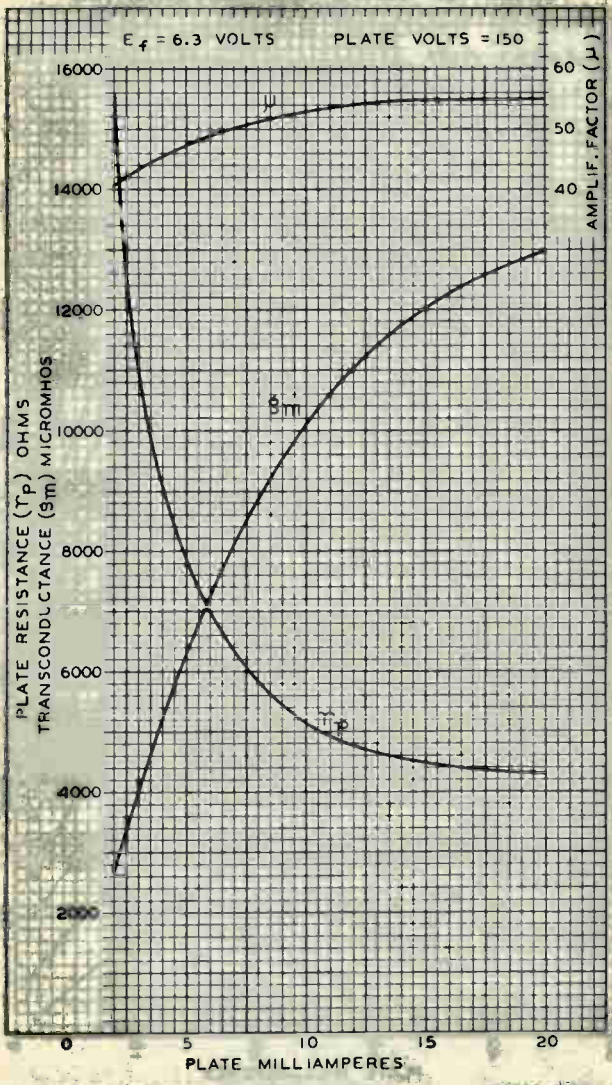


6J4

RCA

6J4

AVERAGE CHARACTERISTICS



MARCH 21, 1944

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6549

12A6

BEAM POWER AMPLIFIER

Heater#	Coated Unipotential Cathode	
Voltage	12.6	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.):°		
Grid to Plate	0.3	μμf
Input	9.0	μμf
Output	9.0	μμf
Maximum Overall Length		3-1/4"
Maximum Seated Height		2-11/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 7-Pin
Pin 1 - Shell		Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		
Mounting Position		Any

BOTTOM VIEW (7AC)

Maximum Ratings Are Design-Center Values

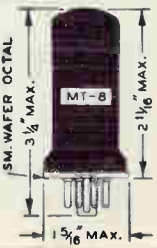
AMPLIFIER

Plate Voltage	250 max.	volts
Screen Voltage	250 max.	volts
Plate Dissipation	7.5 max.	watts
Screen Dissipation	1.5 max.	watts
Operating Conditions and Characteristics-Class A_1 Amplifier:		
Plate	250	volts
Screen	250	volts
Grid *	-12.5	volts
Peak A-F Grid Voltage	12.5	volts
Zero-Signal Plate Current	30	ma.
Max.-Signal Plate Current	32	ma.
Zero-Signal Screen Current	3.5 approx.	ma.
Max.-Signal Screen Current	5.5 approx.	ma.
Plate Resistance	70000 approx.	ohms
Transconductance	3000	μmhos
Load Resistance	7500	ohms
Total Harmonic Distortion	7	%
Max.-Signal Power Output	3.4	watts

In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

* The d-c resistance in the grid circuit should not exceed 0.1 megohm when fixed bias is used, or 0.5 megohm when cathode bias is used.

° With shell connected to cathode.



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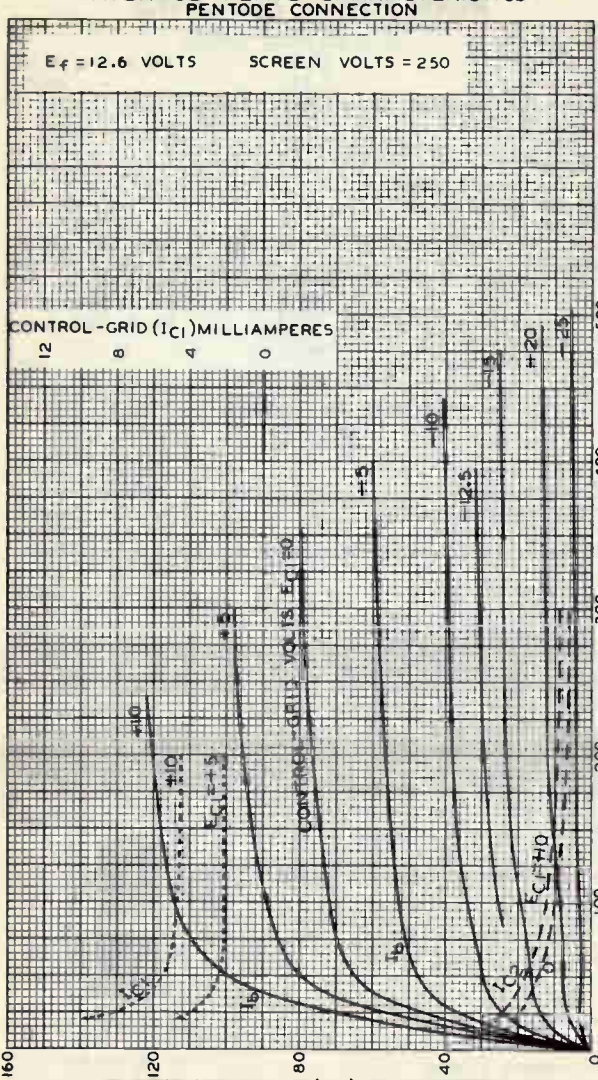
12A6

12A6

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



12A6

BEAM POWER AMPLIFIER

Heater#	Coated Unipotential Cathode	
Voltage	12.6	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.):°		
Grid to Plate	0.3	μμf
Input	9.0	μμf
Output	9.0	μμf
Maximum Overall Length		3-1/4"
Maximum Seated Height		2-11/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 7-Pin
Pin 1 - Shell		Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		
Mounting Position		Any

BOTTOM VIEW (7AC)

Maximum Ratings Are Design-Center Values

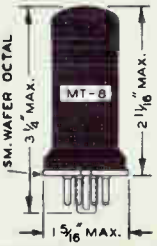
AMPLIFIER

Plate Voltage	250 max.	volts
Screen Voltage	250 max.	volts
Plate Dissipation	7.5 max.	watts
Screen Dissipation	1.5 max.	watts
Operating Conditions and Characteristics-Class A_1 Amplifier:		
Plate	250	volts
Screen	250	volts
Grid *	-12.5	volts
Peak A-F Grid Voltage	12.5	volts
Zero-Signal Plate Current	30	ma.
Max.-Signal Plate Current	32	ma.
Zero-Signal Screen Current	3.5 approx.	ma.
Max.-Signal Screen Current	5.5 approx.	ma.
Plate Resistance	70000 approx.	ohms
Transconductance	3000	μmhos
Load Resistance	7500	ohms
Total Harmonic Distortion	7	%
Max.-Signal Power Output	3.4	watts

In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

* The d-c resistance in the grid circuit should not exceed 0.1 megohm when fixed bias is used, or 0.5 megohm when cathode bias is used.

° With shell connected to cathode.

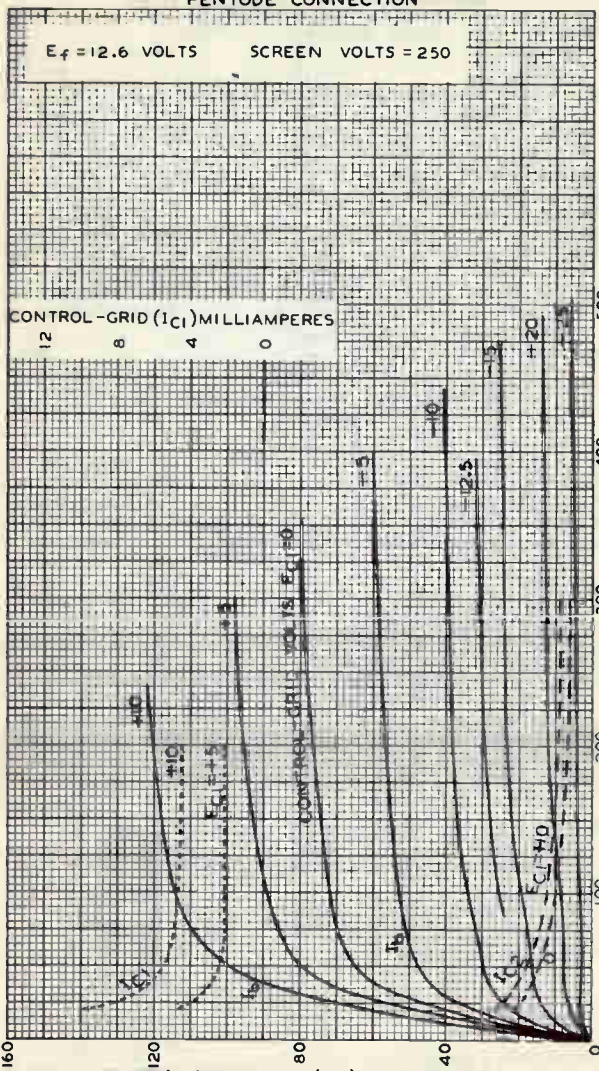


— Indicates a change

12A6

12A6

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



OCT. 14, 1941

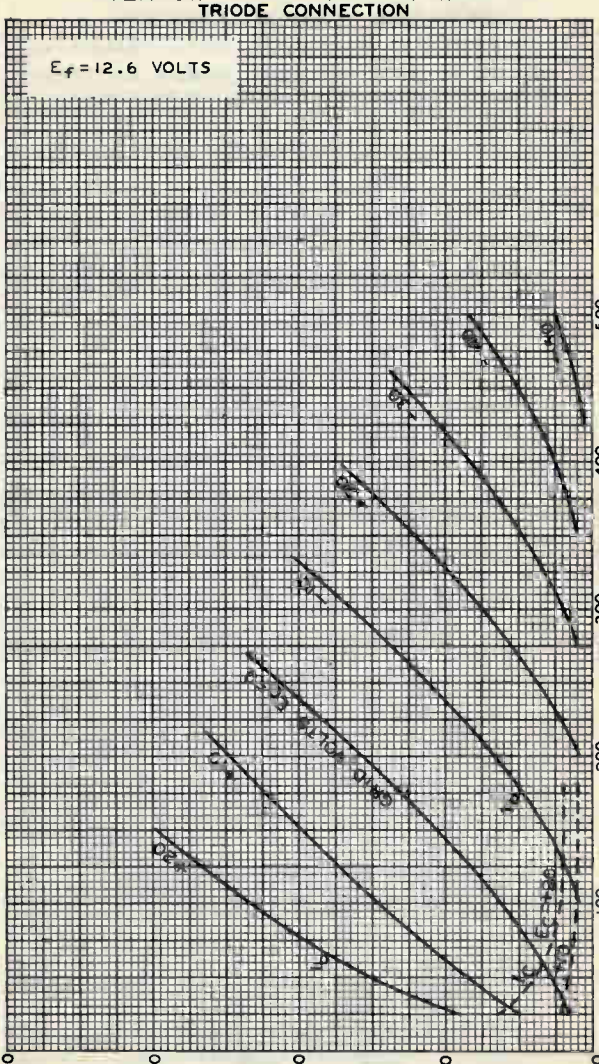
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6329

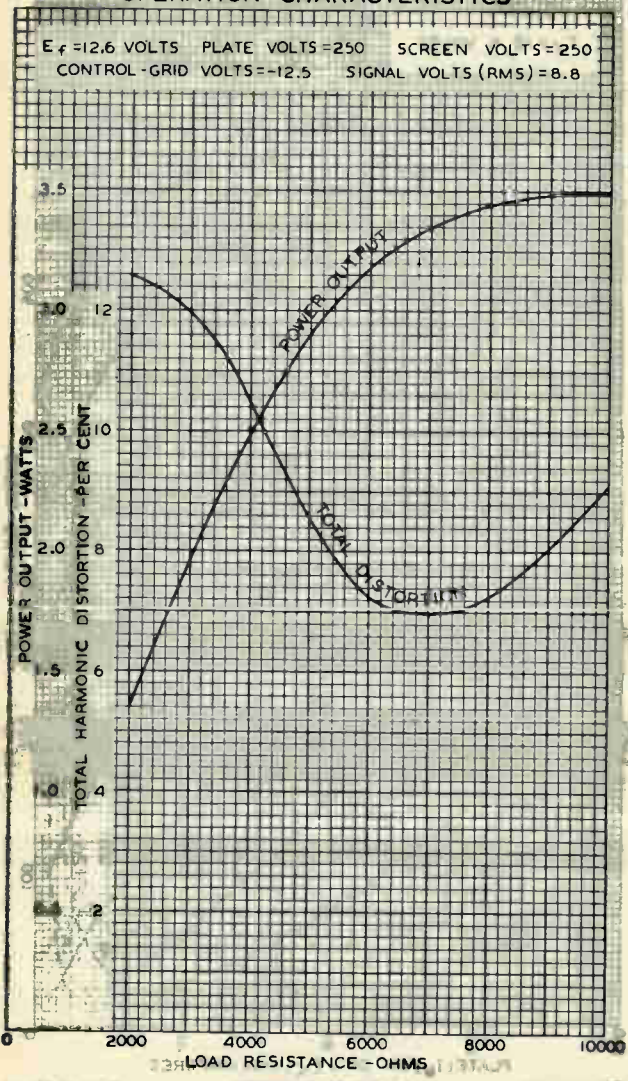
12A6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



OPERATION CHARACTERISTICS



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

12L8-GT

TWIN-PENTODE POWER AMPLIFIER

Heater	Coated Unipotential Cathode		
Voltage	12.6		a-c or d-c volts
Current	0.15		amp.

Direct Interelectrode Capacitances (Approx.):°

	Pentode Unit P_1		*Pentode Unit P_2*	
Grid to Plate	0.7		0.7	μμf
Input	5.0		5.0	μμf
Output	6.0		6.0	μμf
Grid to Grid		0.08		μμf
Plate to Plate		1.5		μμf
Grid P_1 to Plate P_2		0.2		μμf
Grid P_2 to Plate P_1		0.1		μμf

Maximum Overall Length	3-5/16"
Maximum Seated Height	2-3/4"
Maximum Diameter	1-5/16"
Bulb	T-9
Base	Intermediate Shell Octal 8-Pin

Pin 1 - Grid P_1
Pin 2 - {Cathode, Suppressor P_1 & P_2}
Pin 3 - Grid P_2

BOTTOM VIEW (8BU)

Pin 4 - Plate P_2
Pin 5 - Screen P_1 & P_2
Pin 6 - Heater
Pin 7 - Heater
Pin 8 - Plate P_1

Mounting Position: Any

For convenience, one pentode unit is identified as P_1; the other as P_2.

Maximum Ratings Are Design-Center Values

AMPLIFIER - Each Unit

Plate Voltage	180 max.	volts
Screen Voltage	180 max.	volts
Plate Dissipation	2.5 max.	watts
Screen Dissipation	1.0 max.	watt
D-C Heater-Cathode Potential	100 max.	volts

Typical Operation and Characteristics - Class A_1 Amplifier:

Plate Voltage	180	volts
Screen Voltage	180	volts
Grid Voltage (Grid No.1)	-9	volts
Peak A-F Grid Voltage	9	volts
Zero-Sig. Plate Cur.	13	ma.
Max.-Sig. Plate Cur.	13.5	ma.
Zero-Sig. Screen Cur.	2.8	ma.
Max.-Sig. Screen Cur.	4.6	ma.
Plate Resistance	0.16	megohm
Transconductance	2150	μmhos
Load Resistance	10000	ohms
Power Output (Total harmonic dist. 10%)	1.0	watt

° With no external shield.

12L8-GT

12L8-GT

AVERAGE PLATE CHARACTERISTICS
EACH PENTODE UNIT

12SW7

DUPLEX-DIODE TRIODE

For use with 12-cell storage-battery supply

GENERAL DATA

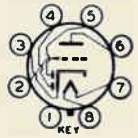
Electrical:

Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp.
Direct Interelectrode Capacitances—Triode Unit:°		
Grid to Plate	2.4	μμf
Grid to Cathode	3.0	μμf
Plate to Cathode	2.8	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-1/16"
Maximum Diameter	1-5/16"
Bulb	Metal Shell, MT8G
Base	Small Wafer Octal 8-Pin
Basing Designation for BOTTOM VIEW	8Q

Pin 1 – Shell
Pin 2 – Triode Grid
Pin 3 – Cathode
Pin 4 – Diode Plate No.2
Pin 5 – Diode Plate No.1
Pin 6 – Triode Plate
Pin 7 – Heater
Pin 8 – Heater



CLASS A_1 AMPLIFIER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250 max. volts
PLATE DISSIPATION	2.5 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode	90 max. volts
Heater positive with respect to cathode	90 max. volts

Characteristics:

Plate Voltage	26.5	250	volts
Grid Voltage:			
From a fixed supply of	–	-9	volts
From a grid resistor of	2	–	megohms
Amplification Factor	17	16	
Plate Resistance	15500	8500	ohms
Transconductance	1100	1900	μmhos
Plate Current	1.1	9.5	ma.

Typical Operation with Resistance Coupling:

See RESISTANCE-COUPLED AMPLIFIER CHART, Type 6R7.

° With shell connected to cathode. Values are approximate.

12SW7

DUPLEX-DIODE TRIODE

DIODE UNITS - Two

The two diode plates are placed around a cathode, the sleeve of which is common to the triode unit. Each diode plate has its own base pin. Diode curves in the front of the RECEIVING TUBE SECTION apply to the 12SW7.

Additional curves applying to the 12SW7 are shown under Types 6R7, and 6SR7

12SY7

PENTAGRID CONVERTER

SINGLE-ENDED METAL TYPE

For use with 12-cell storage-battery supply

GENERAL DATA

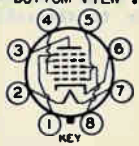
Electrical:

Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances:		
Grid No.3 to All Other Electrodes (RF Input)	9.5●	μμf
Plate to All Other Electrodes (Mixer Output)	12●	μμf
Grid No.1 to All Other Electrodes (Osc. Input)	7●	μμf
Grid No.3 to Plate	0.13 max.●	μμf
Grid No.1 to Grid No.3	0.15 max.●	μμf
Grid No.1 to Plate	0.06 max.●	μμf
Grid No.1 to Shell, Grid No.5, and All Other Electrodes Except Cathode	4.4	μμf
Grid No.1 to Cathode	2.6	μμf
Cathode to Shell, Grid No.5, and All Other Electrodes Except Cathode	5	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-1/16"
Maximum Diameter	1-5/16"
Bulb	Metal Shell, MT-8G
Base	Small Wafer Octal 8-Pin
Basing Designation for BOTTOM VIEW	8R

Pin 1 – Shell, Grid No.5
Pin 2 – Heater
Pin 3 – Plate
Pin 4 – Grids No.2 & No.4
Pin 5 – Grid No.1
Pin 6 – Cathode
Pin 7 – Heater
Pin 8 – Grid No.3



CONVERTER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max. volts
GRIDS-No.2 and No.4 (SCREEN) VOLTAGE	100 max. volts
GRIDS-No.2 and No.4 SUPPLY VOLTAGE	300 max. volts
PLATE DISSIPATION	1.0 max. watt
GRIDS-No.2 & No.4 DISSIPATION	1.0 max. watt
TOTAL CATHODE CURRENT	14 max. ma.
GRID-No.3 (CONTROL GRID) VOLTAGE:	
Negative bias value	50 max. volts
Positive bias value	0 max. volts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode	90 max. volts
Heater positive with respect to cathode	90 max. volts

● With shell connected to cathode.

12SY7

12SY7

PENTAGRID CONVERTER

Characteristics – *Separate Excitation*: *				
Plate Voltage.	26.5	100	250	volts
Grids-No.2 & No.4 Voltage	26.5	100	100	volts
Grid-No.3 Voltage.	-1	-2	-2	volts
Grid-No.1 (Oscillator Grid) Resistor	20000	20000	20000	ohms
Plate Resistance (Approx.)	–	0.5	1.0	megohm
Conversion Transconductance	250	425	450	μmhos
Conversion Transconductance (Approx.)	8◆	2□	2□	μmhos
Plate Current.	0.45	3.3	3.5	ma.
Grids-No.2 & No.4 Current	1.7	8.5	8.5	ma.
Grid-No.1 Current.	0.1	0.5	0.5	ma.
Total Cathode Current. . .	2.25	12.3	12.5	ma.

NOTE: The transconductance between grid No.1 and grids No.2 and No.4 connected to plate (not oscillating) is approximately 4500 μmhos under the following conditions: grids No.1, No.3, No.5 and shell at 0 volts; grids No.2 and No.4 and plate at 100 volts. Under the same conditions, the plate current is 27 milliamperes, and the amplification factor is 13.

* The characteristics shown with separate excitation correspond very closely with those obtained in a self-excited oscillator circuit operating with zero bias.

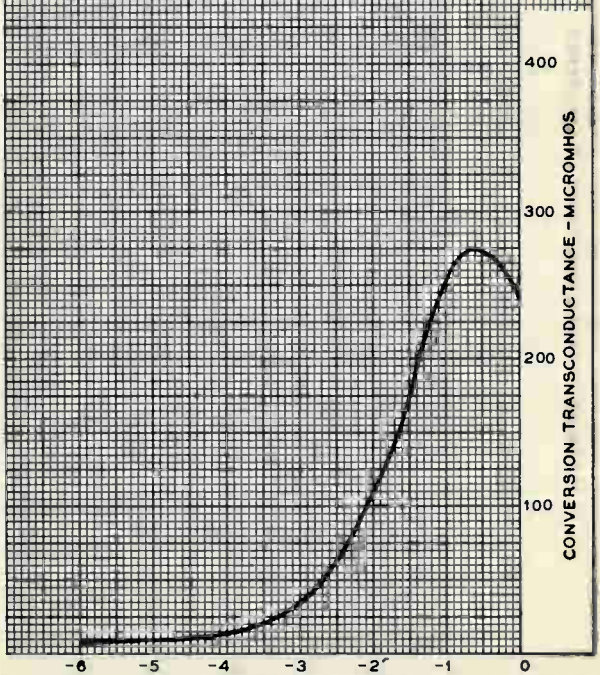
◆ With grid-No.3 bias of -6 volts.

□ With grid-No.3 bias of -35 volts.

The curves under Type 6SA7 also apply to the 12SY7.

12SY7
OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION

E_f = 12.6 VOLTS
PLATE VOLTS = 26.5
GRIDS - Nº 2 & Nº 4 VOLTS = 26.5
GRID - Nº 1 MILLIAMPERES = 0.1
GRID - Nº 1 RESISTOR - OHMS = 20000



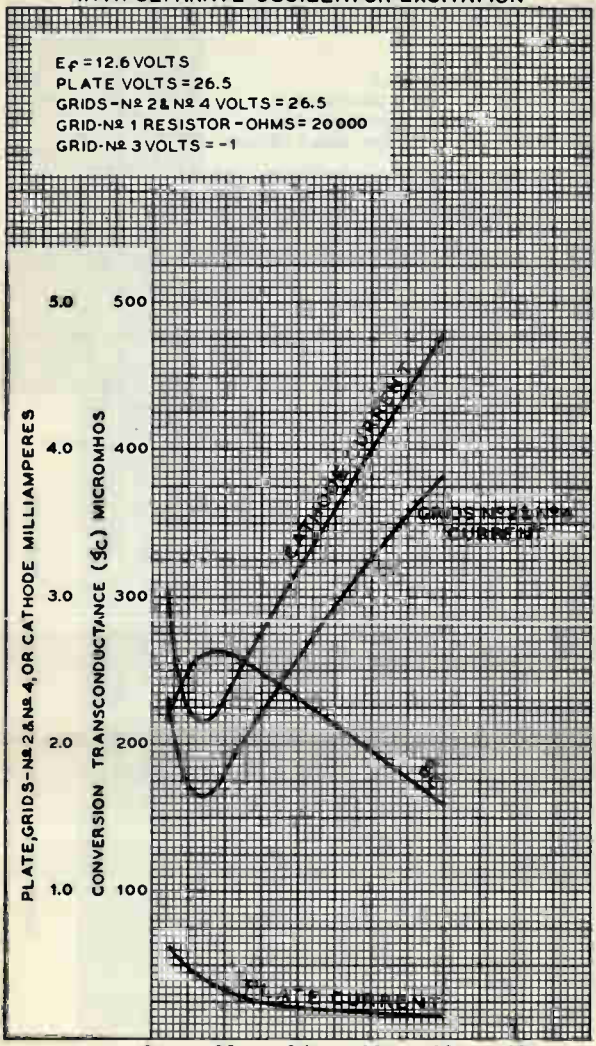
12SY7

RCA

12SY7

OPERATION CHARACTERISTICS

WITH SEPARATE OSCILLATOR EXCITATION



JULY 30,1946

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6787

RCA

26A6

R-F AMPLIFIER PENTODE

MINIATURE REMOTE-CUTOFF TYPE

For use with 12-cell storage-battery supply

GENERAL DATA

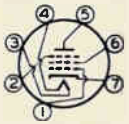
Electrical:

Heater, for Unipotential Cathode:		
Voltage	26.5	ac or dc volts
Current	0.07	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.0035 max.	μμf
Input	6.0	μμf
Output	5.0	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length from Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Miniature Button 7-Pin
Basing Designation for BOTTOM VIEW	$7BK_1$

Pin 1 – Grid No.1
Pin 2 – Grid No.3, Internal Shield
Pin 3 – Heater



Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Cathode

CLASS A_1 AMPLIFIER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	100 max.	volts
GRID-No.2 SUPPLY VOLTAGE	250 max.	volts
PLATE DISSIPATION	3 max.	watts
GRID-No.2 DISSIPATION	0.4 max.	watt
GRID-No.1 (CONTROL GRID) VOLTAGE:		
Negative bias value	50 max.	volts
Positive bias value	0 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

Plate Voltage	26.5	250	volts
Grid No.3 (Suppressor)	Connected to cathode at socket		
Grid-No.2 Voltage	26.5	100	volts
Grid-No.1 Voltage:			
From a grid-No.1 resistor of	2	–	megohms
From a cathode resistor of	–	125	ohms

° with external shield connected to cathode.

26A6

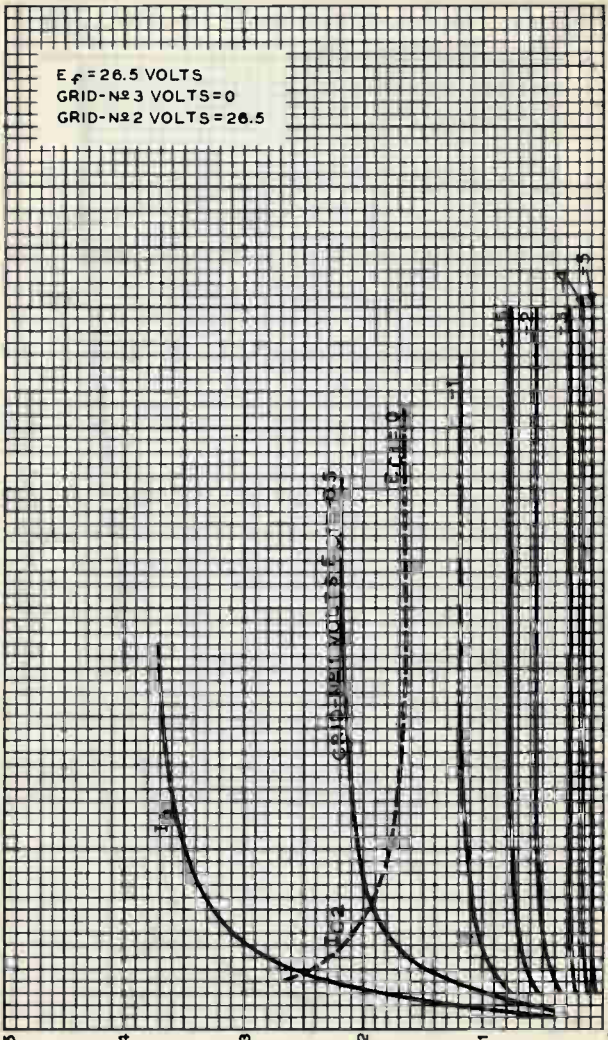
R-F AMPLIFIER PENTODE

Plate Resistance (Approx.)	0.25	1.0	megohm
Transconductance	2000	4000	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 40 μmhos	-	-25	volts
Grid-No.1 Bias (Approx.) for transconductance of 20 μmhos	-8	-	volts
Plate Current	1.7	10.5	ma.
Grid-No.2 Current	0.7	4.0	ma.

RCA

26A6

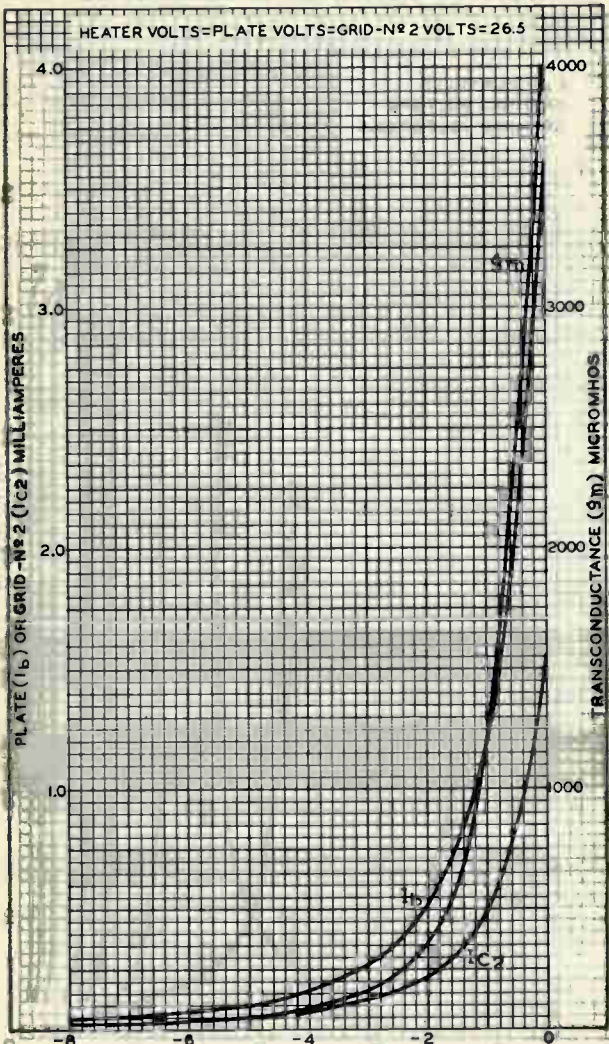
AVERAGE PLATE CHARACTERISTICS



RCA

26A6

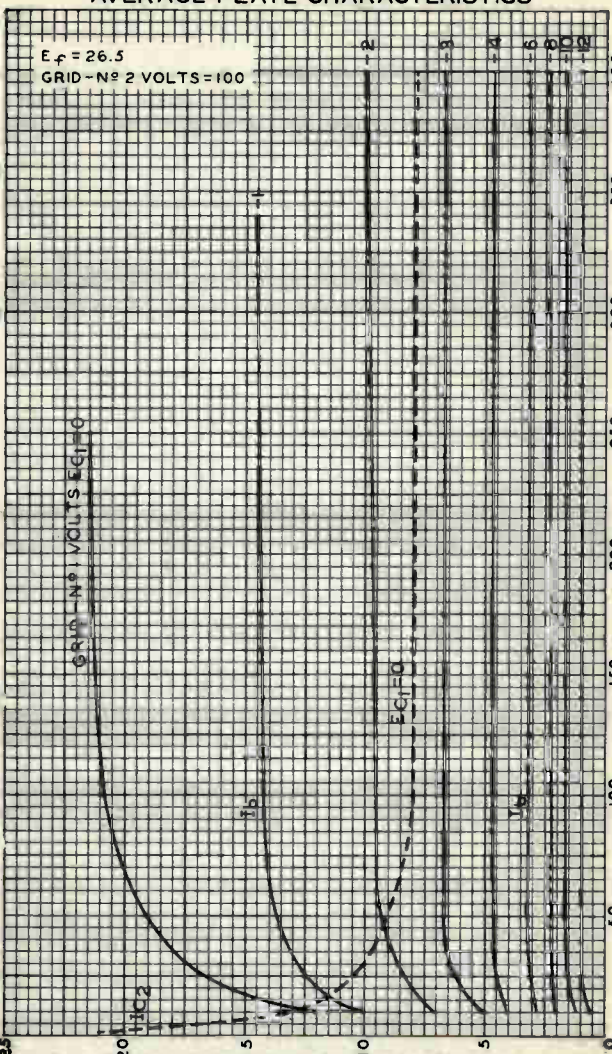
AVERAGE CHARACTERISTICS



RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

26A6

AVERAGE PLATE CHARACTERISTICS



26A7-GT

TWIN BEAM POWER TUBE

GENERAL DATA

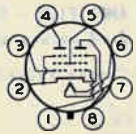
Electrical:

Heater, for Unipotential Cathode:		
Voltage	26.5	ac or dc volts
Current	0.6	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to plate▲	1.2	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater▲	16	μμf
Plate to cathode & grid No.3, grid No.2, and heater▲	13	μμf
Grid No.1 of unit No.1 to grid No.1 of unit No.2	0.2	μμf
Plate of unit No.1 to plate of unit No.2	0.2	μμf
Grid No.1 of unit No.1 to plate of unit No.2	0.2	μμf
Grid No.1 of unit No.2 to plate of unit No.1	0.2	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Intermediate-Shell Octal 8-Pin (JETEC No.B8-6), or Short Intermediate-Shell Octal 8-Pin (JETEC No.B8-58)
Basing Designation for BOTTOM VIEW	8BU

Pin 1 – Grid No.1 of Unit No.1
Pin 2 – Cathode, Grid No.3 of Units No.1 & No.2
Pin 3 – Grid No.1 of Unit No.2



Pin 4 – Plate of Unit No.2
Pin 5 – Grid No.2 of Units No.1 & No.2
Pin 6 – Heater
Pin 7 – Heater
Pin 8 – Plate of Unit No.1

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, ***Design-Center Values:***

PLATE VOLTAGE	50 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	50 max.	volts
PLATE DISSIPATION	2 max.	watts

° Without external shield.
▲ Each unit.

→ Indicates a change.

26A7-GT

TWIN BEAM POWER TUBE

GRID-No.2 INPUT	0.5 max.	watt
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

→ **Typical Operation and Characteristics (Each unit):**

Plate Voltage	26.5	volts
Grid-No.2 Voltage	26.5	volts
Grid-No.1 (Control-Grid) Voltage	-4.5	volts
Peak AF Grid-No.1 Voltage	4.5	volts
Zero-Signal Plate Current	20	ma
Max.-Signal Plate Current	20.5	ma
Zero-Signal Grid-No.2 Current	1.9	ma
Max.-Signal Grid-No.2 Current	5.5	ma
Transconductance	5700	μmhos
Load Resistance	1500	ohms
Total Harmonic Distortion	7	%
Max.-Signal Power Output	180	mw

→ **Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:		
For maximum rated conditions:		
With cathode bias	0.5 max.	megohm
With fixed bias	0.1 max.	megohm
For conditions where the maximum design values of plate voltage and grid-No.2 voltage do not exceed 26.5 volts:		
With grid-resistor bias	0.5 max.	megohm

AF POWER AMPLIFIER - Class AB_1

Unless otherwise specified, values are on a Per-Tube Basis

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	50 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	50 max.	volts
PLATE DISSIPATION (Per unit)	2 max.	watts
GRID-No.2 INPUT (Per unit)	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Push-Pull Operation:

Plate Voltage	26.5	volts
Grid-No.2 Voltage	26.5	volts
Grid-No.1 (Control-Grid) Voltage	-7	volts
Peak AF Grid-No.1-to-Grid No.1 Voltage	14	volts
Zero-Signal Plate Current	19	ma

→ Indicates a change.

26A7-GT

TWIN BEAM POWER TUBE

Max.-Signal Plate Current	30		ma
Zero-Signal Grid-No.2 Current (Approx.)	2		ma
Max.-Signal Grid-No.2 Current (Approx.)	8.5		ma
Effective Load Resistance (Plate to plate)	2500		ohms
Total Harmonic Distortion	5		%
Max.-Signal Power Output	500		mw

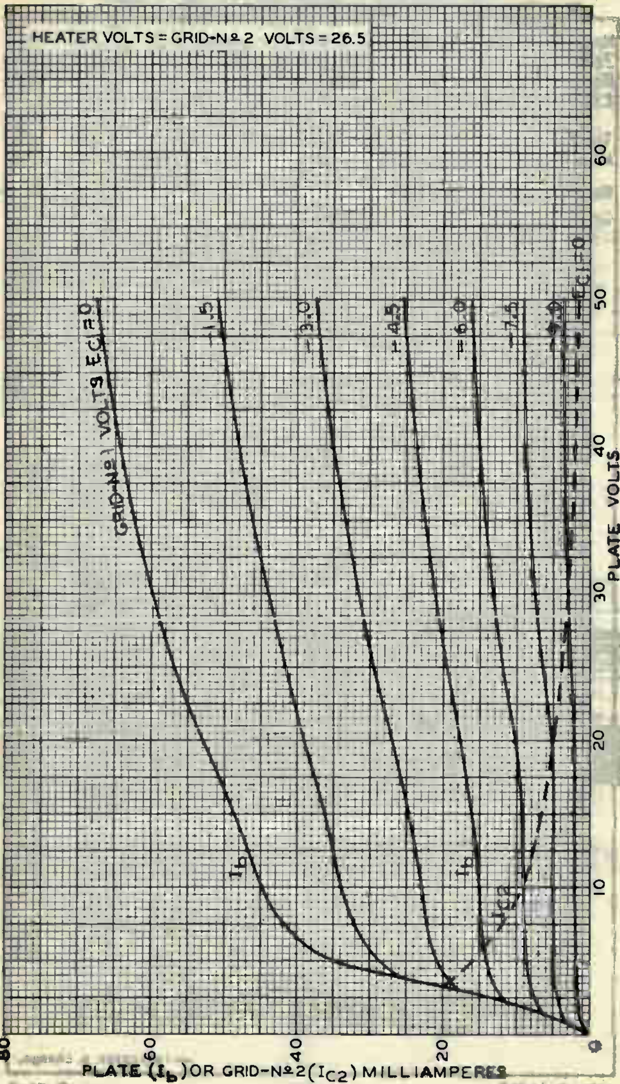
Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For maximum rated conditions:			
With cathode bias	0.5	max.	megohm
With fixed bias	0.1	max.	megohm
For conditions where the maximum design values of plate voltage and grid-No.2 voltage do not exceed 26.5 volts:			
With grid-resistor bias	0.5	max.	megohm

→Indicates a change.

26A7-GT

26A7-GT
AVERAGE PLATE CHARACTERISTICS
EACH UNIT-PENTODE CONNECTION



JAN. 1, 1955 | TUBE DIVISION | 92CM-8509R1

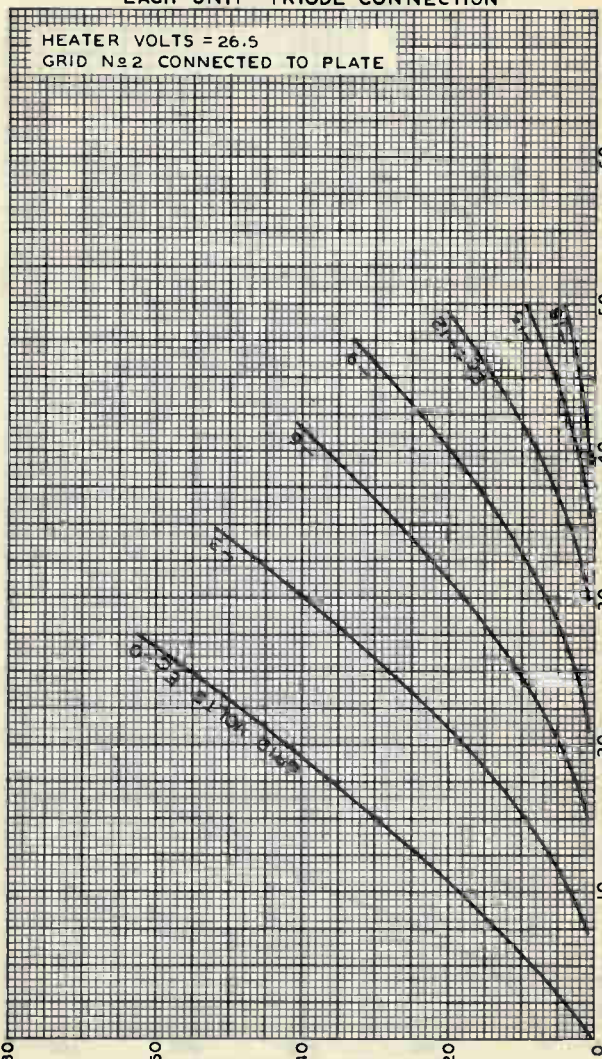
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

26A7-GT

AVERAGE PLATE CHARACTERISTICS

EACH UNIT - TRIODE CONNECTION



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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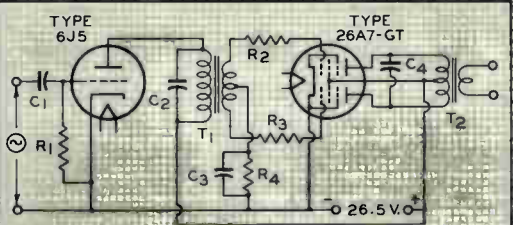
26A7-GT

OPERATION CHARACTERISTICS

PUSH-PULL CIRCUIT

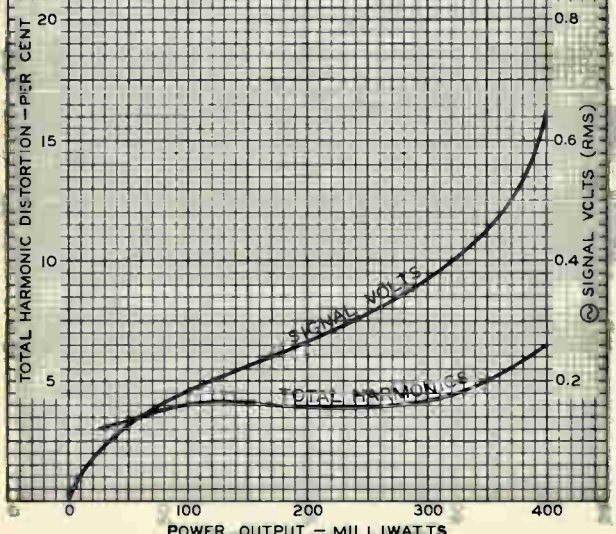
HEATER VOLTS = 26.5



C_1, C_4 = 0.01 μf
C_2 = 0.002 μf
C_3 = 1.0 μf
R_1 = 2.2 MEGOHMS
R_2, R_3 = 100 OHMS
R_4 = 0.2 MEGOHM

T_1 = INTERSTAGE COUPLING TRANSFORMER: TURNS RATIO (PRIMARY TO ½ SECONDARY) = 3:1

T_2 = OUTPUT TRANSFORMER: PLATE-TO-PLATE LOAD, 2000 OHMS



26C6
DUPLEX-DIODE TRIODE

MINIATURE TYPE

For use with 12-cell storage-battery supply

GENERAL DATA

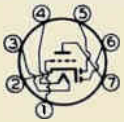
Electrical:

Heater, for Unipotential Cathode:		
Voltage	26.5	ac or dc volts
Current	0.07	amp
Direct Interelectrode Capacitances:[o]		
Triode Unit: Grid to Plate	2.0	µµf
Grid to Cathode & Heater	1.8	µµf
Plate to Cathode & Heater	1.4	µµf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length from Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Miniature Button 7-Pin
Basing Designation for BOTTOM VIEW	7BT

Pin 1 – Triode Grid
Pin 2 – Cathode
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Diode Plate No.2
Pin 6 – Diode Plate No.1
Pin 7 – Triode Plate



TRIODE UNIT – Class A_1 AMPLIFIER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250 max.	volts
PLATE DISSIPATION	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Characteristics:

Plate Voltage	26.5	250	volts
Grid Voltage:			
From a fixed supply of	–	-9	volts
From a grid resistor of	2.0	–	megohms
Amplification Factor	17	16	
Plate Resistance	15500	8500	ohms
Transconductance	1100	1900	µmhos
Plate Current	1.1	9.5	ma.

Typical Operation with Resistance Coupling:

See RESISTANCE-COUPLED AMPLIFIER CHART, Type 6R7.

[o] with external shield connected to cathode. Values are approximate.

26C6

DUPLEX-DIODE TRIODE

DIODE UNITS – Two

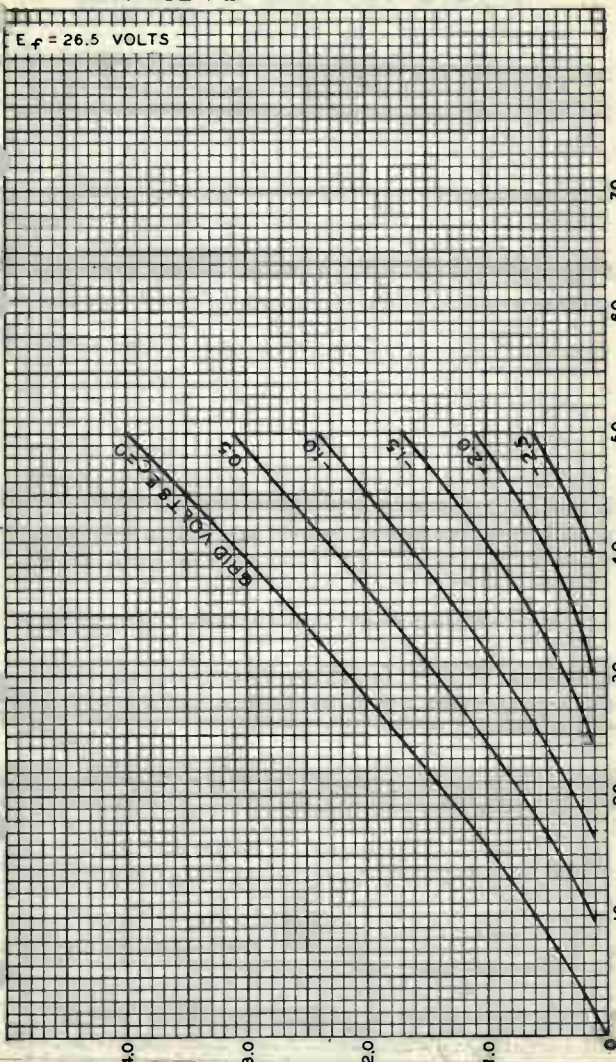
The two diode plates are placed around a cathode, the sleeve of which is common to the triode unit. Each diode plate has its own base pin. Diode curves in the front of the RECEIVING TUBE SECTION apply to the 26C6.

Additional curves applying to the 26C6 are shown under Types 6R7, and 6SR7

RCA

26C6

AVERAGE PLATE CHARACTERISTICS



JUNE 10,1948
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-6772

26D6

PENTAGRID CONVERTER

MINIATURE TYPE

For use with 12-cell storage-battery supply

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	26.5	ac or dc volts
Current	0.07	amp
Direct Interelectrode Capacitances:		
Grid #3 to All Other Electrodes (RF Input)	7.5●	μμf
Plate to All Other Electrodes (Mixer Output)	14●	μμf
Grid #1 to All Other Electrodes (Osc. Input)	5.8●	μμf
Grid #3 to Plate	0.30 max.●	μμf
Grid #1 to Grid #3	0.15 max.●	μμf
Grid #1 to Plate	0.03 max.●	μμf
Grid #1 to External Shield and All Other Electrodes Except Cathode & Grid No.5	2.9	μμf
Grid #1 to Cathode & Grid #5	2.8▲	μμf
Cathode to External Shield and All Other Electrodes Except Grid #1	15.5	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length from Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Miniature Button 7-Pin
Basing Designation for BOTTOM VIEW	7CH

Pin 1 – Grid No.1
Pin 2 – Cathode, Grid No.5
Pin 3 – Heater
Pin 4 – Heater

Pin 5 – Plate
Pin 6 – Grid No.2, Grid No.4
Pin 7 – Grid No.3

CONVERTER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max. volts
GRIDS-No.2 & No.4 (SCREEN) VOLTAGE	100 max. volts
GRIDS-No.2 & No.4 SUPPLY VOLTAGE	300 max. volts
PLATE DISSIPATION	1.0 max. watt
GRIDS-No.2 & No.4 DISSIPATION	1.0 max. watt
TOTAL CATHODE CURRENT	14 max. ma.
GRID-No.3 (CONTROL GRID) VOLTAGE:	
Negative bias value	50 max. volts
Positive bias value	0 max. volts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode	90 max. volts
Heater positive with respect to cathode	90 max. volts

● with external shield connected to cathode.
▲ with external shield connected to other electrodes.

RCA

26D6

PENTAGRID CONVERTER

Characteristics – *Separate Excitation*:□				
Plate Voltage	26.5	100	250	volts
Grids-No.2 & No.4 Voltage	26.5	100	100	volts
Grid-No.3 Voltage	-0.5	-1.5	-1.5	volts
Grid-No.1 (Oscillator-Grid) Resistor	20000	20000	20000	ohms
Plate Resistance (Approx.)	–	0.5	1.0	megohm
Conversion Transconductance	270	455	475	μmhos
Conversion Transconductance (Approx.)*	–	4	4	μmhos
Conversion Transconductance (Approx.)**	8	–	–	μmhos
Plate Current	0.45	2.8	3.0	ma.
Grids-No.2 & No.4 Current	1.6	8.0	7.8	ma.
Grid-No.1 Current	0.1	0.5	0.5	ma.
Total Cathode Current	2.15	11.3	11.3	ma.

Characteristics of Oscillator Section:▲			
Plate Voltage	26.5	100	volts
Grids-No.2 & No.4 Voltage	26.5	100	volts
Grid-No.3 Voltage	0	0	volts
Grid-No.1 Voltage	0	0	volts
Amplification Factor	–	22	
Transconductance	4500	7200	μmhos
Plate Current	5.5	27	ma.

□ The characteristics shown with separate excitation correspond very closely with those obtained in a self-excited oscillator circuit operating with zero bias.

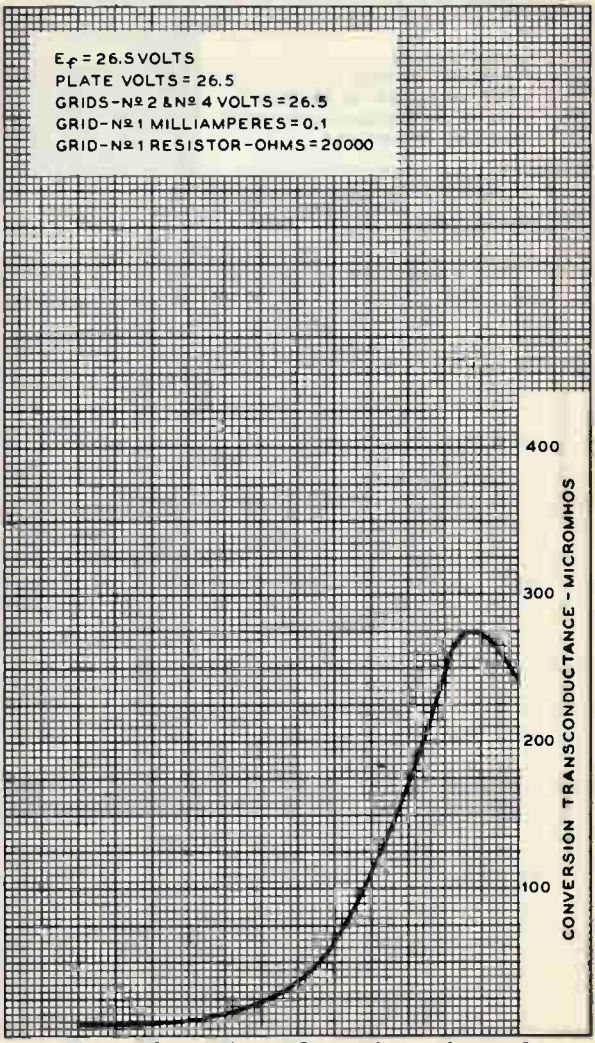
* With grid-No.3 bias of -30 volts.

** With grid-No.3 bias of -6 volts.

▲ Measured between grid No.1 and grids No.2 and No.4 connected to plate (not oscillating).

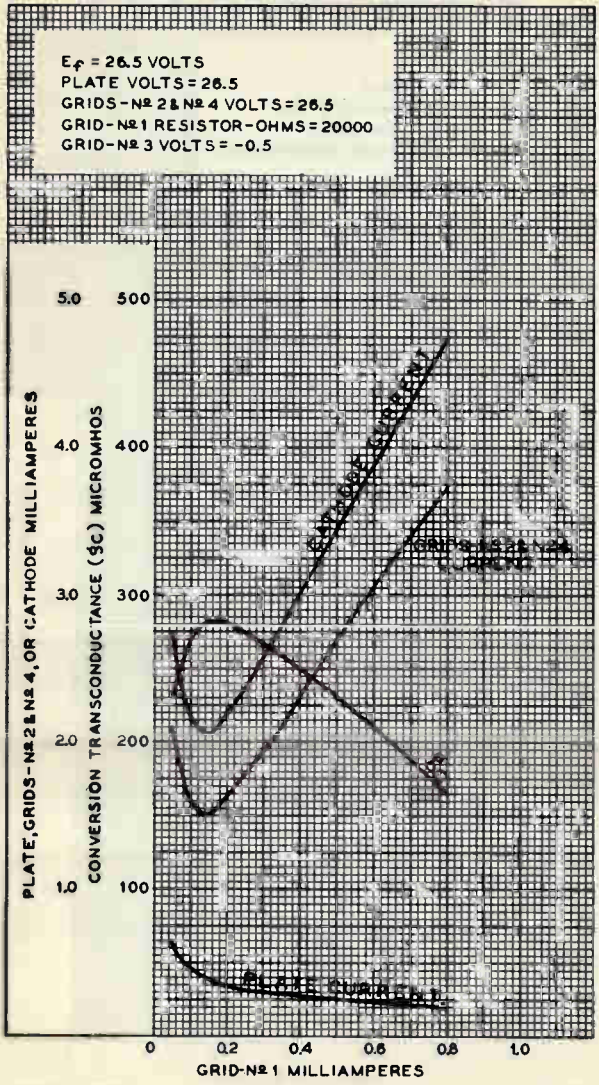
The curves under Type 6BE6 also apply to the 26D6

26D6
OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



26D6

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



Full-Wave Mercury-Vapor Rectifier

For DC Power Supplies Having Large Current Requirements

GENERAL DATA

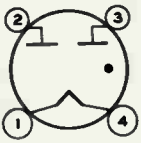
Electrical:

Filament, Coated:		
Voltage (AC or DC)	5.0	volts
Current	3.000	amp

Mechanical:

Operating Position	Vertical, base down
Maximum Overall Length	5-3/8"
Maximum Seated Length	4-3/4"
Maximum Diameter	2-1/16"
Bulb	ST-16
Base	Medium 4-Pin
Basing Designation for BOTTOM VIEW	4C

Pin 1 – Filament
Pin 2 – Plate of Unit No. 2



Pin 3 – Plate of Unit No. 1
Pin 4 – Filament

FULL-WAVE RECTIFIER

Maximum and Minimum Ratings:

PEAK INVERSE VOLTAGE	1550 max.	volts
PEAK PLATE CURRENT PER PLATE	1 max.	amp
CONDENSED MERCURY TEMPERATURE RANGE	20 – 60	°C
With Capacitor-Input Filter		
AC PLATE VOLTAGE PER PLATE (RMS)	450 max.	volts
TOTAL EFFECTIVE PLATE-SUPPLY IMPEDANCE PER PLATE[a]	50 min.	ohms
DC OUTPUT CURRENT	225 max.	ma
With Choke-Input Filter		
AC PLATE VOLTAGE PER PLATE (RMS)	550 max.	volts
INPUT-CHOKE INDUCTANCE	3 min.	henries
DC OUTPUT CURRENT	225 max.	ma

Characteristics:

Tube Voltage Drop (Approx.)	15	volts

[a] When a filter-input capacitor larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

HALF-WAVE RECTIFIER

As a half-wave rectifier, the 83 is operated with plates connected in parallel. Two 83's so connected in a full-wave circuit can supply twice the output current of a single tube. Both plates within the same tube should be connected to the same terminal of the plate transformer. To equalize the current distribution between plates, a resistor of not less than 50 ohms should be connected in series with each plate.

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Heater-section arrangement	*Series*	*Parallel*	
Voltage (AC or DC)	40.0 ± 2.0	20.0 ± 1.0	volts
Current	0.050[a]	0.100[b]	amp
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	100 max.		volts
Heater positive with respect to cathode	100 max.		volts
Direct Interelectrode Capacitances:[c]			
Grid to plate (Each unit)	1.1		pf
Grid to cathode, internal shield, and heater (Each unit)	2.2		pf
Plate to cathode, internal shield, and heater (Each unit)	1.0		pf
Plate to plate	0.1 max.		pf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	150	volts
Cathode Resistor	240	ohms
Amplification Factor	35	
Plate Resistance (Approx.)	6350	ohms
Transconductance	5500	μmhos
Plate Current	8.2	ma
Grid Voltage for maximum plate μa =45	-10	volts

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

BOTTOM VIEW

Pins 1&5 – Heater of Unit No.2
Pin 2 – Cathode of Unit No.2
Pin 3 – Grid of Unit No.2
Pin 4 – Plate of Unit No.2
Pin 5 – Heater Tap, Internal Shield
Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pins 9&5 – Heater of Unit No.1

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, ***Absolute-Maximum Values:***

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
CATHODE CURRENT	18 max.	ma
GRID CURRENT	3 max.	ma
PLATE DISSIPATION	1.35 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm

[a] At heater volts = 40.0.
[b] At heater volts = 20.0.
[c] Without external shield.

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	20.0 ± 1.0	volts
Current at heater volts = 20.0	0.050	amp
Peak heater–cathode voltage:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.01	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4.0	pf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.8	pf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	120	volts
Grid–No.2 Supply Voltage	120	volts
Cathode Resistor[b]	200	ohms
Plate Resistance (Approx.)	0.34	megohm
Transconductance	5000	μmhos
Plate Current	7	ma
Grid–No.2 Current	2.2	ma
Grid–No.1 Voltage for maximum plate μa = 200	–10	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ±3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BD

Pin 1 – Grid No.1
Pin 2 – Cathode, Grid No.3
Pin 3 – Heater
Pin 4 – Heater

Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Cathode, Grid No.3

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute-Maximum Values:*

PLATE VOLTAGE	180 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	180 max.	volts
GRID-No.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value	0 max.	volts
GRID-No. 2 INPUT:		
For grid-No.2 voltages up to 90 volts.	0.5 max.	watt
For grid-No.2 voltages between 90 and 180 volts.	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	1.7 max.	watts

[a] With external shield JEDEC No.316 connected to cathode.
[b] Fixed-bias operation is not recommended.

955

DETECTOR, AMPLIFIER, OSCILLATOR

ACORN TYPE

Especially for wavelengths between 0.5 meter and 5 meters

Heater	Coated Unipotential Cathode		
Voltage	6.3	a-c or d-c	volts
Current	0.15		amp.
Direct Interelectrode Capacitances:•			
Grid to Plate	1.4		μμf
Grid to Cathode	1.0		μμf
Plate to Cathode	0.6		μμf
Overall Length		1-7/32"	± 5/32"
Overall Diameter		1-3/32"	± 1/16"
Bulb	*See Outline in GENERAL SECTION*		T-4½
Base			Small Radial 5-Pin ←
Pin 1 - Heater			Pin 4 - Heater
Pin 2 - Plate			Pin 5 - Cathode
Pin 3 - Grid			
RCA Socket			Stock No. 9925
Mounting Position			Any

Short Part of Bulb: Bottom

BOTTOM VIEW (5BC)

Maximum Ratings Are Design-Center Values

A-F AMPLIFIER

D-C Plate Voltage	250 max.	volts
Plate Dissipation	1.6 max.	watts
D-C Heater-Cathode Potential	80 max.	volts ←

Typical Operation and Characteristics— Class A_1 Amplifier:

D-C Plate Voltage	90	135	180	250	volts
D-C Grid Voltage*	-2.5	-3.75	-5	-7	volts
Amplification Factor	25	25	25	25	
Plate Resistance	14700	13200	12500	11400	ohms
Transconductance	1700	1900	2000	2200	μmhos
D-C Plate Current	2.5	3.5	4.5	6.3	ma.
Load Resistance	-	-	20000	-	ohms
Second Harmonic Dist.	-	-	5	-	%
Power Output	-	-	135	-	mw

Typical Operation with Resistance-Coupling:

Plate-Supply Voltage°	180	volts
D-C Grid Voltage*	-3.5	volts
Load Resistance	250000	ohms
Plate Current	0.42	ma.
Second Harmonic Distortion	5	%
Voltage Output	45 RMS	volts
Voltage Gain	20 approx.	

R-F POWER AMPLIFIER & OSCILLATOR - Class C

Plate Modulated or C.W.

D-C Plate Voltage	180 max.	volts
D-C Plate Current	8 max.	ma.
D-C Grid Current	2 max.	ma.
D-C Heater-Cathode Potential	80 max.	volts ←
Typical Operation:		
D-C Plate Voltage	180	volts
D-C Grid Voltage	-35 approx.	volts
D-C Plate Current	7	ma.

•, *, °: See next page.] ← Indicates a change.

955

DETECTOR, AMPLIFIER, OSCILLATOR

(continued from preceding page)

D-C Grid Current	1.5 approx. ma.
Power Output**	0.5 approx. watt

Typical Operation:	DETECTOR *Biased*	DETECTOR *Grid-Leak*	
Plate-Supply Voltage°	180	45	volts
Grid Voltage	−7 approx.	Grid Return to Cathode	volts
Load Resistance	0.25	—	megohm
Plate Current	Adjusted to 0.2 ma. approx. with no input signal.	—	ma.
Cathode Resistor	50000 approx.	—	ohms
Grid Leak	—	1 to 5	megohms
Grid Condenser	—	0.00025	µf

● With no external shield.

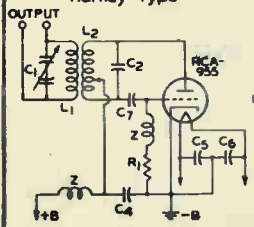
* Under maximum rated conditions, the resistance in the grid circuit should not exceed 0.1 megohm with fixed bias, or 0.5 megohm with cathode bias.

° This is a plate-supply voltage value. The voltage effective at plate will be plate-supply voltage minus the voltage drop in load caused by plate current.

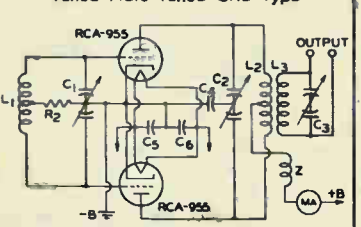
** At 5 meters. Only moderate reduction in this value will be found for wavelengths as low as 1 meter. Below 1 meter, the power output decreases as the wavelength is decreased.

R-F grounding by means of condensers placed close to the tube pins is required if the full capabilities of the 955 for ultra-high-frequency uses are to be obtained.

U-H-F OSCILLATOR
Hartley Type



PUSH-PULL U-H-F OSCILLATOR
Tuned-Plate Tuned-Grid Type



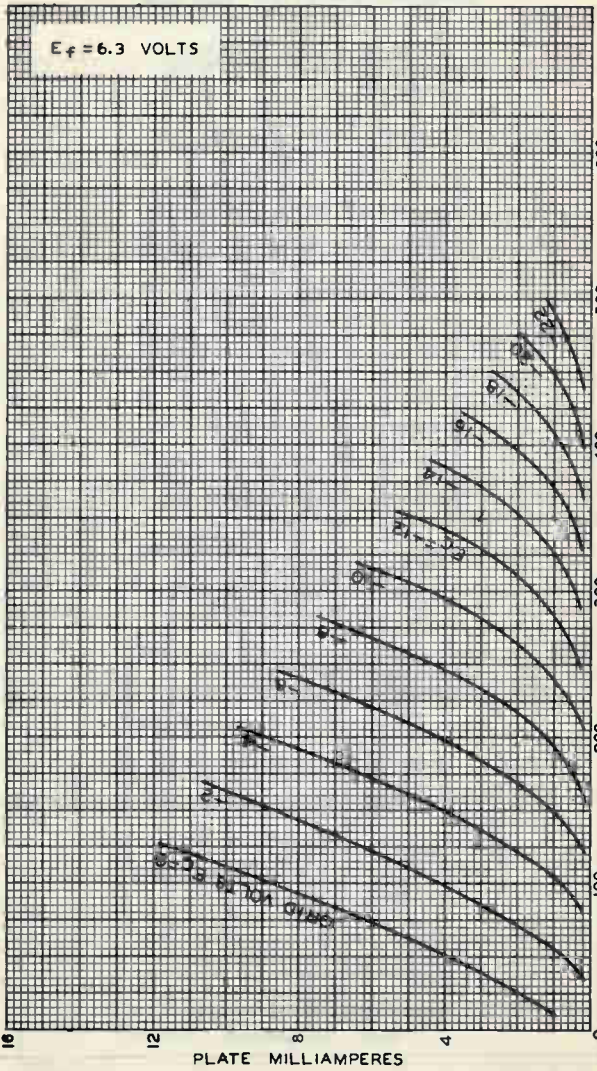
L_1C_1, L_2C_2, L_3C_3 = DEPEND ON FREQUENCY RANGE DESIRED
C_4, C_5, C_6 = 100 µµf
C_7 = 50 µµf
R_1 = 20000 TO 25000 OHMS, 1/2 WATT
R_2 = 10000 TO 12500 OHMS, 1/2 WATT
Z = R-F CHOKE

92CM-6558

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

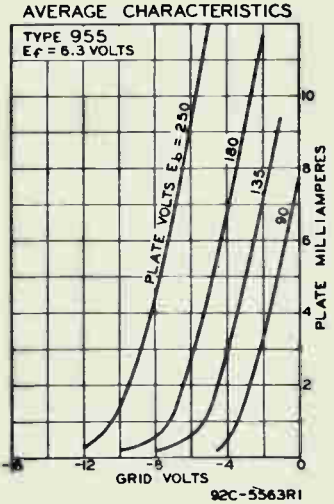
955

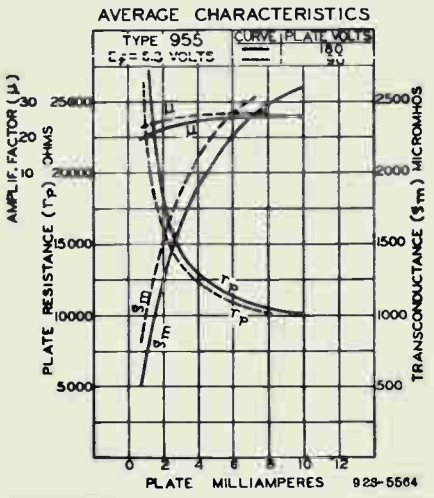
AVERAGE PLATE CHARACTERISTICS



955

CHARACTERISTICS CURVES



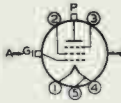


959

DETECTOR AMPLIFIER PENTODE

ACORN TYPE

Filament	Coated	
Voltage	1.25	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:		
Grid to Plate[o]	0.015 max.	μμf
Input	1.8	μμf
Output	2.5	μμf
Overall Length		1-11/16" ± 3/16"
Overall Diameter		1-3/32" ± 1/16"
Bulb	*See Outline in GENERAL SECTION*	T-4½
End Terminals		Two
Base		Small Radial 5-Pin ←
Pin 1 - Filament		P - Plate
Pin 2 - Grid No.2		G_1 - Grid No.1
Pin 3 - Grid No.3		AA' - Plane of Electrodes
Pin 4 - Filament -		
Pin 5 - Filament -		
RCA Socket		Stock No. 9925
RCA Grid & Plate Clips		Stock No. 9939
Mounting Position		Vertical◊



P is on Long Part of Bulb: Top
G_1 is on Short Part of Bulb: Bottom

BOTTOM VIEW (5BE)

Maximum Ratings are Design-Center Values

AMPLIFIER

D-C Plate Voltage	145 max.	volts
D-C Screen (Grid No.2) Voltage	67.5 max.	volts ←
Characteristics — Class A_1 Amplifier:		
D-C Plate Voltage	135	volts
Suppressor (Grid No.3)	Connected to filament(-) at socket	
D-C Screen Voltage	67.5	volts
D-C Grid (No.1) Voltage #	-3	volts
Plate Resistance	0.8 approx.	megohm
Transconductance	600	μmhos
D-C Plate Current	1.7	ma.
D-C Screen Current	0.4	ma.

[o] with shield baffle.

◊ Horizontal operation permitted if plane of electrodes is vertical (plate on edge).

Under maximum rated conditions, the resistance in the grid circuit should not exceed 0.1 megohm with fixed bias, or 0.5 megohm with cathode bias.

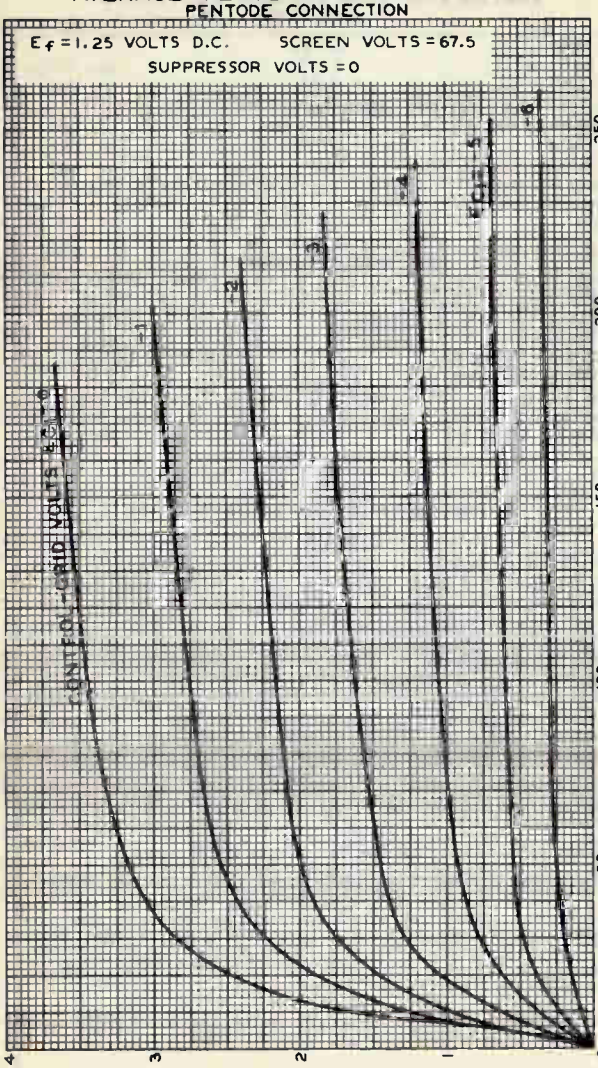
R-f grounding by means of condensers placed close to the tube terminals is required if the full capabilities of the 959 for ultra-high-frequency uses are to be obtained. It is important in the cases of the plate and control-grid circuits that separate r-f grounding returns be made to a common point in order to avoid r-f inter-action through common return circuits. It may also be advisable in some applications to supplement the action of the by-pass condensers by r-f chokes placed close to the condensers in the return or supply lead for the grid, the screen, the suppressor, the plate, and the filament.

←Indicates a change.

959

959

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



1609

AMPLIFIER PENTODE

For applications critical as to microphonics

Filament	Coated	
Voltage	1.1	d-c volts
Current	0.25	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	1.0	μμf
Input	7	μμf
Output	7	μμf
Maximum Overall Length		4-3/16"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 5-Pin
Pin 1 - Filament +		Pin 4 - Screen
Pin 2 - Plate		Pin 5 - Filament -
Pin 3 - Grid		
Mounting Position		Any

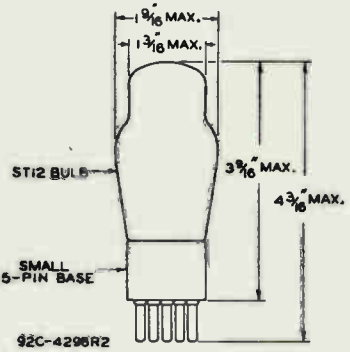
BOTTOM VIEW

Maximum Ratings Are Absolute Values

A-F AMPLIFIER

Plate Voltage	135 max.	volts
Screen Voltage	67.5 max.	volts
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	135	volts
Screen	67.5	volts
Grid *	-1.5	volts
Plate Res.	0.4 approx.	megohm
Transcond.	725	μmhos
Plate Cur.	2.5	ma.
Screen Cur.	0.65	ma.

° Without shield.
* The d-c resistance in the grid circuit of the 1609 should not exceed 0.5 megohm for fixed-bias conditions.



→ Indicates a change.

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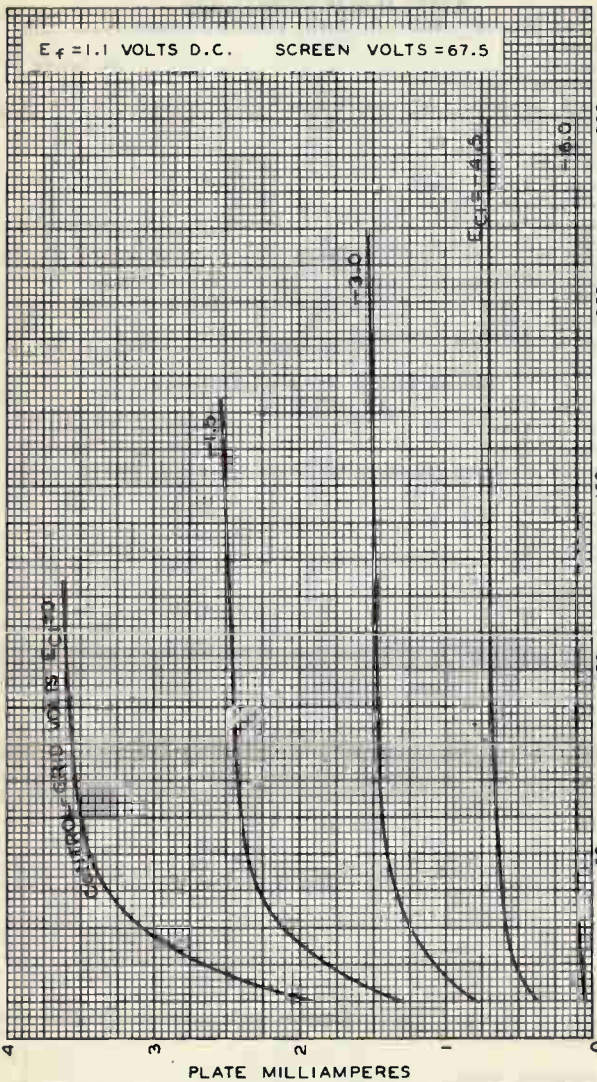
1609

1609

AVERAGE PLATE CHARACTERISTICS



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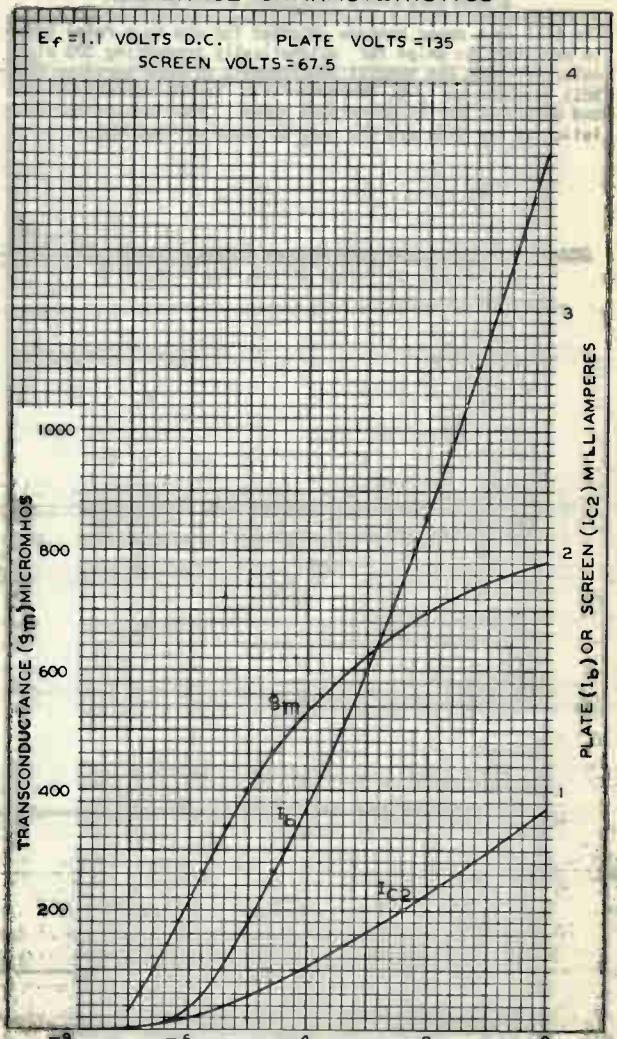
1609

AVERAGE CHARACTERISTICS



1611

POWER AMPLIFIER PENTODE

The 1611 is a power pentode intended for use as a relay tube in equipment on ships for automatically announcing SOS signals. To meet the special requirements of such service, the 1611 features an i_p–e_g characteristic having suitable slope and minimized variation between tubes. Physical characteristics of the 1611 are the same as those of Type 6F6.

RCA-1611 is available only through Radiomarine Corporation of America, 75 Varick Street, New York, N. Y.

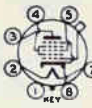
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1612

PENTAGRID AMPLIFIER

For applications critical as to microphonics

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:°		
Grid #1 to Grid #3	0.20 max.	μμf
Grid #1 to Plate	0.001 max.	μμf
Grid #3 to Plate	0.10 max.	μμf
Grid #1 to All Other Electrodes	7.5	μμf
Grid #3 to All Other Electrodes	10	μμf
Plate to All Other Electrodes	11	μμf
Maximum Overall Length		3-1/8"
Maximum Seated Height		2-9/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Cap		Miniature
Base		Small Wafer Octal 7-Pin
Pin 1 - Shell		Pin 5 - Grid #3
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Grids #2 & #4		Cap - Grid #1
Mounting Position	BOTTOM VIEW	Any



Maximum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	250 max.	volts
Screen Voltage	100 max.	volts
Plate Dissipation	1.5 max.	watts ←
Screen Dissipation	1.0 max.	watt ←
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	250	volts
Screen (Grids #2 & #4)	100	volts
Control Grid (Grid #1)	-3	volts
Control Grid (Grid #3)	-3	volts
Plate Res.	0.6	megohm ←
Transcond. (Grid #1 - Plate)	1100	μmhos
Transcond. (Grid #1 - Plate)*	5 approx.	μmhos
Plate Cur.	5.3	ma.
Screen Cur.	6.5	ma.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

° With shell connected to cathode.

* With Grid #1 bias = -15 volts; Grid #3 bias = -15 volts.

Curves under Type 6L7 also apply to the 1612.

← Indicates a change.

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1620

1620

TRIPLE-GRID DETECTOR AMPLIFIER

For applications critical as to microphonics

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:○		
Pentode Connection		
Grid to Plate	0.005 max.	μμf
Input	7.0	μμf
Output	12.0	μμf
Maximum Overall Length		3-1/8"
Maximum Seated Height		2-9/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Cap		Miniature
Base		Small Wafer Octal 7-Pin
Pin 1 - Shell		Pin 5 - Suppressor
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		Cap - Grid
Mounting Position	BOTTOM VIEW	Any

Maximum Ratings Are Design-Center Values

AMPLIFIER - Pentode Connection

Plate Voltage	250 max.	volts
Screen Voltage	100 max.	volts

Typical Operation and Characteristics - Class A_1 Amplifier:

Plate	100	250	volts
Screen	100	100	volts
Grid #	-3	-3	volts
Suppressor	Connected to cathode at socket		
Plate Res.	1.0	▲	megohm
Transcond.	1185	1225	μmhos
Grid Bias for cathode current cut-off	-7	-7	volts
Plate Cur.	2.0	2.0	ma.
Screen Cur.	0.5	0.5	ma.

AMPLIFIER - Triode Connection○○

Plate Voltage	250 max. volts

Typical Operation and Characteristics - Class A_1 Amplifier:

Plate	180	250	volts
Grid #	-5.3	-8	volts
Amp. Fact.	20	20	
Plate Res.	11000	10500	ohms
Transcond.	1800	1900	μmhos
Plate Cur.	5.3	6.5	ma.

■ For cathode-bias operation of the 1620 a minimum cathode-resistor by-pass condenser of 25 μf is recommended to minimize hum, particularly in circuits where the 1620 is followed by high-gain stages. When a 25 μf condenser or larger is used, the voltage difference between heater and cathode is not critical, but it should be kept as low as possible. If less than a 25 μf condenser is used, positive or negative biasing of the heater with respect to the cathode is required, but the bias value chosen for minimum hum should be within the range of +5 to +50 volts or -5 to -50 volts.

○ with shell connected to cathode.

\# Under maximum rated conditions, the d-c resistance in the grid circuit should not exceed 1.0 megohm.

▲ Greater than 1.0 megohm.

○○ Screen and suppressor tied to plate.

→ Indicates a change.

OUTLINE DIMENSIONS for the 1620 are the same as for 1612.

Curves under Type 6J7 also apply to the 1620.

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1621

POWER AMPLIFIER PENTODE

For applications requiring continuity of service

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.7	amp.
Direct Interelectrode Capacitances (Approx.): ◇		
Grid to Plate	0.20	μμf
Input	7.5	μμf
Output	11.5	μμf
Maximum Overall Length		3-1/4"
Maximum Seated Height		2-11/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 7-Pin
Pin 1 - Shell		Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		
Mounting Position	BOTTOM VIEW	Any

Maximum Ratings Are Design-Center Values

PUSH-PULL AMPLIFIER - Triode Connection†

Recommended with Cathode-Bias Operation only.

Plate Voltage	300 max.	volts
Plate Dissipation	8.3 max.	watts

Typical Operation - Class A_1 Amplifier:

Unless otherwise specified, values are for 2 tubes

Plate Supply *	327.5	volts
Cathode Resistor ▲	500	ohms
Peak A-F Grid-to-Grid Voltage	54	volts
Zero-Sig. Plate Current	55	ma.
Max.-Sig. Plate Current	59	ma.
Load Resistance (plate-to-plate)	5000	ohms
Total Harmonic Distortion	1	%
Power Output	2	watts

* Actual voltage between cathode and plate will be plate-supply voltage minus drop in cathode resistor.

▲ Type of input coupling used should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. The grid circuit may have a resistance as high as, but not greater than, 0.5 megohm provided the heater voltage is not allowed to rise more than 10% above rated value under any condition of operation.

PUSH-PULL AMPLIFIER - Pentode Connection

Plate Voltage	300 max.	volts
Screen Voltage	300 max.	volts
Plate Dissipation	7.9 max.	watts
Screen Input	1.9 max.	watts

Typical Operation - Class A_1 Amplifier:

Unless otherwise specified, values are for 2 tubes

Plate	300	volts
Screen	300	volts
D-C Grid Voltage ‡	-30	volts
Peak A-F Grid-to-Grid Voltage	60	volts
Zero-Sig. Plate Current	38	ma.
Max.-Sig. Plate Current	69	ma.

■, †, ‡, ◇: See next page.

* indicates a change.

1621

POWER AMPLIFIER PENTODE

(continued from preceding page)

Zero-Sig. Screen Current	6.5	ma.
Max.-Sig. Screen Current	13	ma.
Load Resistance (plate-to-plate)	4000	ohms
Total Harmonic Distortion	3	%
Power Output	5	watts

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
o With shell connected to cathode.
† Screen connected to plate.
# Type of input coupling used should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.05 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance as high as, but not greater than, 0.5 megohm provided the heater voltage is not allowed to rise more than 10% above rated value under any conditions of operation.

OUTLINE DIMENSIONS for the 1621 are the same as those for Type 12A6.

Curves under Type 6F6 also apply to the 1621.

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1622

BEAM POWER AMPLIFIER

For applications requiring continuity of service

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.9	amp.
Direct Interelectrode Capacitances (approx.):°		
Grid to Plate	0.4	μμf
Input	10	μμf
Output	12	μμf
Maximum Overall Length		4-5/16"
Maximum Seated Height		3-3/4"
Maximum Diameter		1-9/16" ±1/16" →
Bulb		Metal Shell, MT-10
Base		Small Wafer Octal 7-Pin
Pin 1 - Shell		Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		
Mounting Position	BOTTOM VIEW (7AC)	Any

Maximum Ratings Are Design-Center Values

PUSH-PULL AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	250 max.	volts
Plate Dissipation	13.8 max.	watts
Screen Dissipation	1.4 max.	watts

Typical Operation - Class A_1 Amplifier:

Unless otherwise specified, values are for 2 tubes

Plate Voltage	300	volts
Screen Voltage	250	volts
D-C Grid Voltage #	-20	volts
Peak A-F Grid-to-Grid Voltage	40	volts
Zero-Sig. Plate Current	86	ma.
Max.-Sig. Plate Current	125	ma.
Zero-Sig. Screen Current	4	ma.
Max.-Sig. Screen Current	10.5	ma.
Load Resistance (plate to plate)	4000	ohms
Total Harmonic Distortion	1	%
Power Output	10	watts

■ The heater voltage should never fluctuate so that it exceeds 7 volts. The potential difference between heater and cathode should be kept as low as possible.

\# The type of input coupling used should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.1 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance not to exceed 0.5 megohm, provided the heater voltage is not allowed to rise more than 10% above the rated value under any condition of operation.

° With shell connected to cathode.

Curves under Type 6L6 also apply to the 1622 within the limitations of its maximum ratings.

→ Indicates a change.

1629

ELECTRON-RAY TUBE

INDICATOR TYPE WITH TRIODE UNIT

Heater	Coated Unipotential Cathode	
Voltage	12.6	a-c or d-c volts
Current	0.15	amp.
Overall Length		3-15/16" ± 3/16"
Seated Height		3-3/8" ± 3/16" ←
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Small Shell Octal 7-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Target		
Mounting Position		Any▲ ←

BOTTOM VIEW (7AL)

Maximum and Minimum Ratings Are Design-Center Values

INDICATOR SERVICE

Plate-Supply Voltage		250 max.	volts
Target Voltage		250 max.	volts
		125 min.	volts ←
D-C Heater-Cathode Potential		90 max.	volts ←
Typical Operation:			←
Plate and Target Supply Voltage	200	250	volts
Series Triode Plate Resistor□	1	1	megohm
Target Current † ◊	3	4	ma.
Triode-Plate Current◊	0.19	0.24	ma.
Triode-Grid Voltage (Approx.)			
For shadow angle of 0°	-6.5	-8.0	volts
For shadow angle of 90°	0	0	volts

□ Designated as R in the circuit diagram under Type 6E8, in the Receiving Tube Section.

† Subject to wide variation.

◊ For triode-grid bias of 0 volts.

▲ The plane of the ray-control electrode passes through the tube axis and base key.

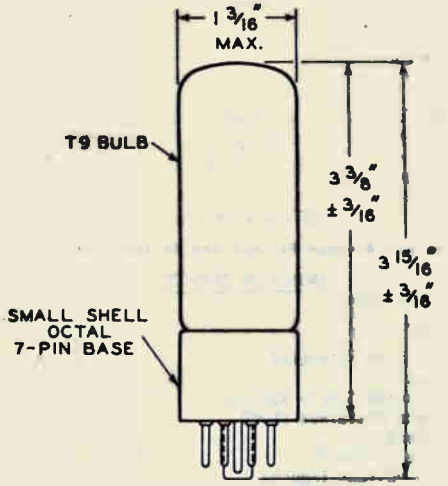
Curves for Type 16sp are the same as for the 6E5 in the Receiving-Tube Section.

← Indicates a change.

1629

1629

ELECTRON-RAY TUBE



92CM-6554

1635

HIGH-MU TWIN POWER TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.6	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-5/16"
Bulb	T-9
Base	Intermediate-Shell Octal 8-Pin
Basing Designation for BOTTOM VIEW	G-8B

Pin 1 – No Connection
Pin 2 – Heater
Pin 3 – Plate of Unit No.2
Pin 4 – Grid of Unit No.2

Pin 5 – Grid of Unit No.1
Pin 6 – Plate of Unit No.1
Pin 7 – Heater
Pin 8 – Cathode

AF POWER AMPLIFIER – Class B

Maximum Ratings, *Design-Center Values:*

DC PLATE VOLTAGE	300 max.	volts
PEAK PLATE CURRENT (per plate)	90 max.	ma.
PLATE DISSIPATION (per plate)	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation:

Values are for 2 units unless otherwise specified

DC Plate Voltage	300	300	volts
DC Grid Voltage	0	0	volts
Peak AF Grid-to-Grid Voltage	70	108*	volts
Zero-Signal DC Plate Current	6.6	6.6	ma.
Max.-Signal DC Plate Current	54	54	ma.
Peak Grid Current (per unit)	38	39	ma.
Plate-Supply Impedance	0	1000*	ohms
Effective Load Resistance (plate-to-plate)	12000	12000	ohms
Effective Grid-Circuit Impedance (per unit)	0	516**	ohms
Total Harmonic Distortion	4	5	%
Max.-Signal Power Output	10.4	10.4	watts

*, **: See next page.

← Indicates a change.

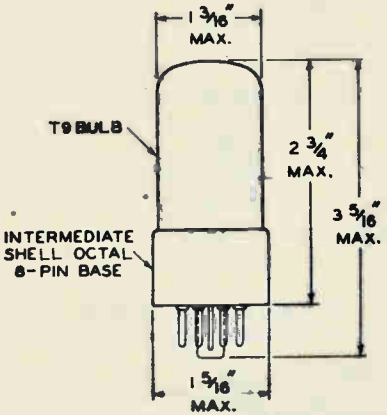
1635

HIGH-MU TWIN POWER TRIODE

● Includes peak voltage drop through the grid-circuit impedance.

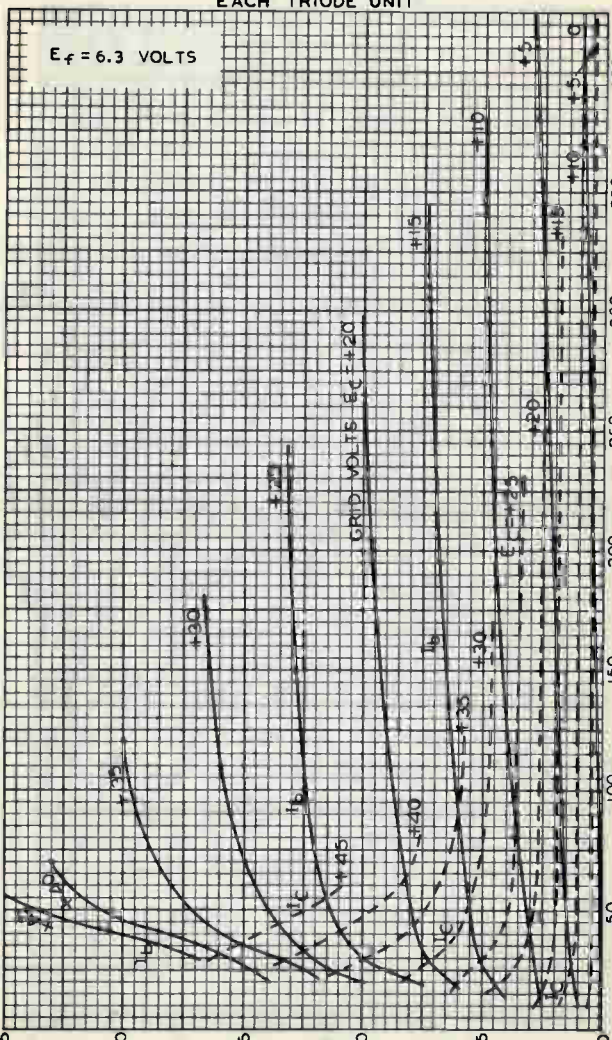
▪ Practical design value.

▪▪ At 400 cycles for class B stage in which the effective resistance per grid circuit is 500 ohms, and the leakage reactance of the coupling transformer is 50 millihenrys. The driver stage should be capable of supplying the grids of the class B stage with the specified values at low distortion.



1635

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



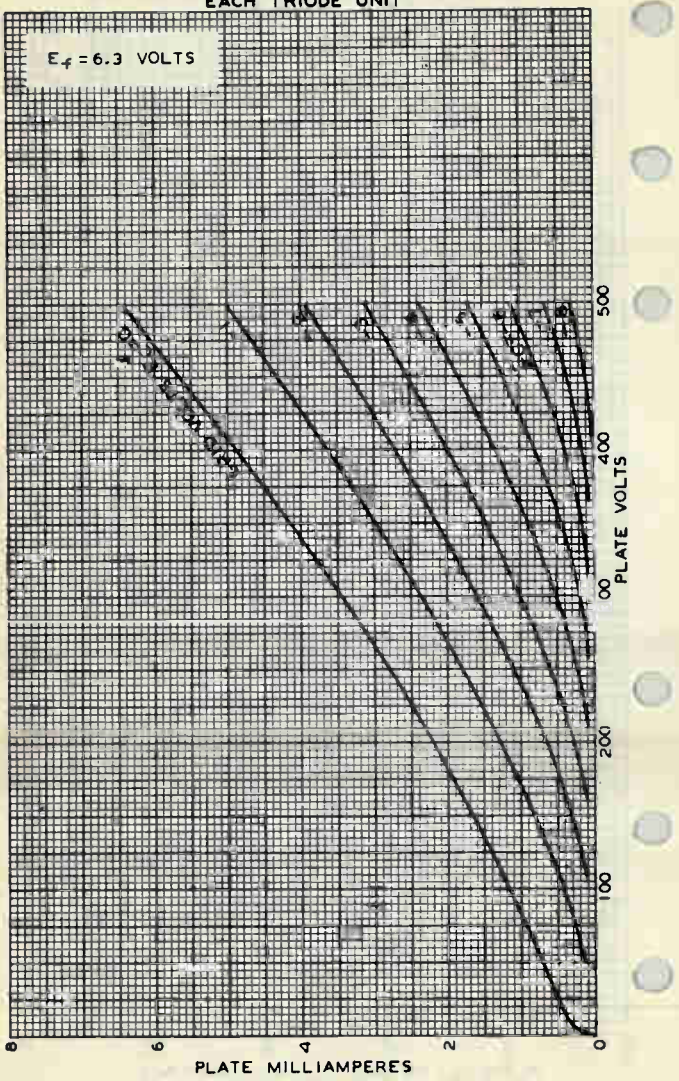
FEB. 26, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6358

1635

1635
AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



FEB. 27, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6389

5636

SHARP-CUTOFF PENTODE

SUBMINIATURE TYPE

Intended for applications at altitudes up to 60,000 feet where dependable performance under shock and vibration is paramount

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathode:
Voltage . . . . . 6.3 . . . . . ac or dc volts
Current . . . . . 0.150 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield*	
Grid No.1 to plate.	0.034 max.	0.02 max.	μμf
Grid No.1 to all other electrodes.	4	4	μμf
Grid No.3 to all other electrodes.	3.8	4	μμf
Plate to all other electrodes .	1.9	3.4	μμf
Grid No.1 to grid No.3.	0.17 max.	0.15 max.	μμf
Grid No.3 to plate.	1.1 max.	1.1 max.	μμf

Characteristics, Class A_1 Amplifier:

Plate-Supply Voltage.	100	100	volts
Grid No.3	♦	–	
Grid-No.3 Supply Voltage.	–	-1	volt
Grid-No.2 Supply Voltage.	100	100	volts
Cathode Resistor.	150	150	ohms
Plate Resistance (Approx.).	0.11	0.05	megohm
Transconductance:			
Grid No.1 to plate.	3200	1950	μmhos
Grid No.3 to plate.	500	950	μmhos
Plate Current	5.6	4	ma
Grid-No.2 Current	4	5.8	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μa.	-7.5	–	volts
Grid-No.3 Voltage (Approx.) for plate current of 10 μa.	–	-8	volts

Mechanical:

Mounting Position . . . . . Any
Maximum Length (Excluding flexible leads) . . . . . 1-3/8"
Length, Bulb Seat to Bulb Top (Excluding tip). 1.075" ± 0.060"
Diameter. . . . . 0.366" to 0.400"
Dimensional Outline . . . . . *See General Section*
Bulb. T3
Leads, Flexible 8
Length. . . . . 1-1/2" to 1-3/4"
Orientation and diameter. . . . . *See Dimensional Outline*

* With external shield having inside diameter of 0.405" connected to lead 8.

♦ Connected to cathode at socket.

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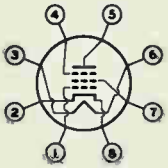
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5636

SHARP-CUTOFF PENTODE

BOTTOM VIEW



Lead 1 – Grid No.1
Lead 2 – Cathode
Lead 3 – Heater
Lead 4 – Grid No.3
Lead 5 – Plate
Lead 6 – Heater
Lead 7 – Grid No.2
Lead 8 – Cathode

AMPLIFIER – Class A_1

Maximum Ratings, *Absolute Values:*

For Operation at Altitudes up to 50,000 Feet

PLATE VOLTAGE	165 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE:		
Positive bias value	30 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	155 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	55 max.	volts
Positive bias value	0 max.	volts
PLATE CURRENT	11 max.	ma
GRID-No.2 CURRENT	7 max.	ma
GRID-No.2 INPUT	0.7 max.	watt
PLATE DISSIPATION	1.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Characteristics as Mixer:■

Plate-Supply Voltage	100	volts
Grid-No.3 Supply Voltage (RMS)	15	volts
Grid-No.2 Supply Voltage	100	volts
Cathode Resistor	150	ohms
Plate Resistance (Approx.)	0.32	megohm
Conversion Transconductance	1280	μmhos
Plate Current	3.5	ma
Grid-No.2 Current	5.7	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For cathode-bias operation	1.1 max.	megohms

■ With local oscillator injection to grid No.3. DC grid-No.3-circuit resistance should be kept as low as possible at high frequencies.

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5636

SHARP-CUTOFF PENTODE

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

Values are Initial, Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	0.140	0.160	amp
Direct Interelectrode Capacitances:				
Grid No.1 to all other electrodes	2	3.5	4.5	μμf
Grid No.3 to all other electrodes	2	3.5	4.5	μμf
Plate to all other electrodes	2	2.9	3.9	μμf
Plate Current (1)	1,3	3.7	6.9	ma
Plate Current (2)	1,4	-	100	μa
Plate Current (3)	1,5	-	100	μa
Grid-No.2 Current	1,3	2.8	5.4	ma
Transconductance, Grid No.1 to Plate:				
Range with heater volts = 6.3	3	2700	4000	μmhos
Change with heater volts = 5.7	3	-	15	%
Change at end of 500 hours with heater volts = 6.3	3	-	20	%
Change at end of 500 hours with heater volts = 5.7	3	-	15	%
Difference between average transconductance initially, and average after 500 hours, expressed as a percentage of the initial average	1,3	-	15	%
Transconductance, Grid No.3 to Plate	1,6	500	1800	μmhos
Reverse Grid-No.1 Current	1,7	-	0.3	μa
Reverse Grid-No.1 Current at 500 hours	1,7	-	0.9	μa
Grid-No.1 Emission Current	8	-	0.5	μa
Heater-Cathode Leakage Current:				
Heater 100 volts negative with respect to cathode	1,3	-	5	μa
Heater 100 volts positive with respect to cathode	1,3	-	5	μa
Heater-Cathode Leakage Current at 500 hours:				
Heater 100 volts negative with respect to cathode	1,3	-	10	μa

*, Notes 1 to 8: See next page.

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5636

SHARP-CUTOFF PENTODE

	Note	Min.	Max.	
Heater 100 volts positive with respect to cathode. . . .	1,3	–	10	
Leakage Resistance:				
Grid No.1 to all other electrodes	1,9	100	–	megohms
Plate to all other electrodes	1,10	100	–	megohms
Leakage Resistance at 500 hours:				
Grid No.1 to all other electrodes	1,9	50	–	megohms
Plate to all other electrodes	1,10	50	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With external shield having inside diameter of 0.405" connected to lead 8.

Note 3: With plate-supply volts = 100, grid No.3 connected to cathode, grid-No.2 supply volts = 100, and cathode resistor (ohms) = 150.

Note 4: With plate volts = 100, grid No.3 connected to cathode, grid-No.2 volts = 100, and grid-No.1 volts = -7.5.

Note 5: With plate-supply volts = 100, grid-No.3 supply volts = -8, grid-No.2 supply volts = 100, and cathode resistor (ohms) = 150.

Note 6: With plate-supply volts = 100, grid-No.3 supply volts = -1, grid-No.2 supply volts = 100, and cathode resistor (ohms) = 150.

Note 7: With plate-supply volts = 100, grid No.3 connected to cathode, grid-No.2 supply volts = 100, cathode resistor (ohms) = 150, and grid-No.1-circuit resistance (megohms) = 1.

Note 8: With ac or dc heater volts = 7.5, plate volts = 100, grid-No.3 volts = 0, grid-No.2 volts = 100, grid-No.1 volts = -7.5, and grid-No.1-circuit resistance (megohms) = 1.

Note 9: With grid No.1 100 volts negative with respect to all other electrodes connected together.

Note 10: With plate 300 volts negative with respect to all other electrodes connected together.

• Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life-test conditions.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration. . . . . 450 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are tested in four different positions. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5636

SHARP-CUTOFF PENTODE

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 60 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: heater volts = 6.3, plate-supply volts = 100, grid No.3 connected to cathode, grid-No.2 supply volts = 100, cathode resistor (ohms) = 150, cathode-bypass capacitor (μf) = 1000, plate-load resistance (ohms) = 10,000, and vibrational acceleration of 15 g at 40 cycles per second.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . 2000 min. cycles

Under the following conditions: heater volts = 7 cycled one minute on and one minute off, heater 140 volts rms with respect to cathode, and all other electrodes connected to ground.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage . . . . . 70 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: heater volts = 6.3, plate-supply volts = 100, grid No.3 connected to cathode, grid-No.2 supply volts = 19, cathode resistor (ohms) = 150, grid-No.1-circuit resistance (megohms) = 0.1, grid-No.2-circuit resistance (ohms) = 1000, plate-load resistance (megohms) = 0.2, and cathode-bypass capacitor (μf) = 1000. The output voltage of a tube, when tapped, will not cause a reading on a vu meter greater than that produced when a calibrating signal of 70 millivolts rms is applied to the plate of the tube.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid-No.1 current in excess of 1.0 microampere under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid-No.1 current.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5636

SHARP-CUTOFF PENTODE

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. Tubes are checked for transconductance under conditions specified under 500-Hour Intermittent Life Performance. At the end of 1 hour, the value of transconductance is read. The variation in transconductance from the 0-hour reading will not exceed 15 per cent.

100-Hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run under conditions specified under 500-Hour Intermittent Life Performance to insure a low percentage of early inoperatives. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit or a grid-No.1-to-plate transconductance of less than 2350 micromhos under the conditions specified in CHARACTERISTICS RANGE VALUES.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: heater volts = 6.3, plate-supply volts = 100, grid No.3 connected to cathode, grid-No.2 supply volts = 100, heater 200 volts positive with respect to cathode, cathode resistor (ohms) = 150, grid-No.1-circuit resistance (megohms) = 1, and bulb temperature (°C) = 220. At the end of 500 hours, tube will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass established initial limits of heater current, grid-No.1-to-plate transconductance change, grid-No.3-to-plate transconductance, and 500-hour limits for reverse grid-No.1 current, heater-cathode leakage current, leakage resistance, and the difference in the grid-No.1-to-plate transconductance between the initial value and the average value shown under CHARACTERISTICS RANGE VALUES.

OPERATING CONSIDERATIONS

The *heater supply* should be well regulated because life and reliability of the 5636 are adversely affected by departures from the 6.3-volt value. The extent to which life is affected is a function of the amount of these departures and their durations.

The *flexible leads* of the 5636 are usually soldered to the circuit elements. Soldering of the connections should be made as far as possible from the glass button. If this precaution is not followed, the heat of the soldering operation may crack the glass seals of the leads and damage the tube.

ELECTRON TUBE DIVISION
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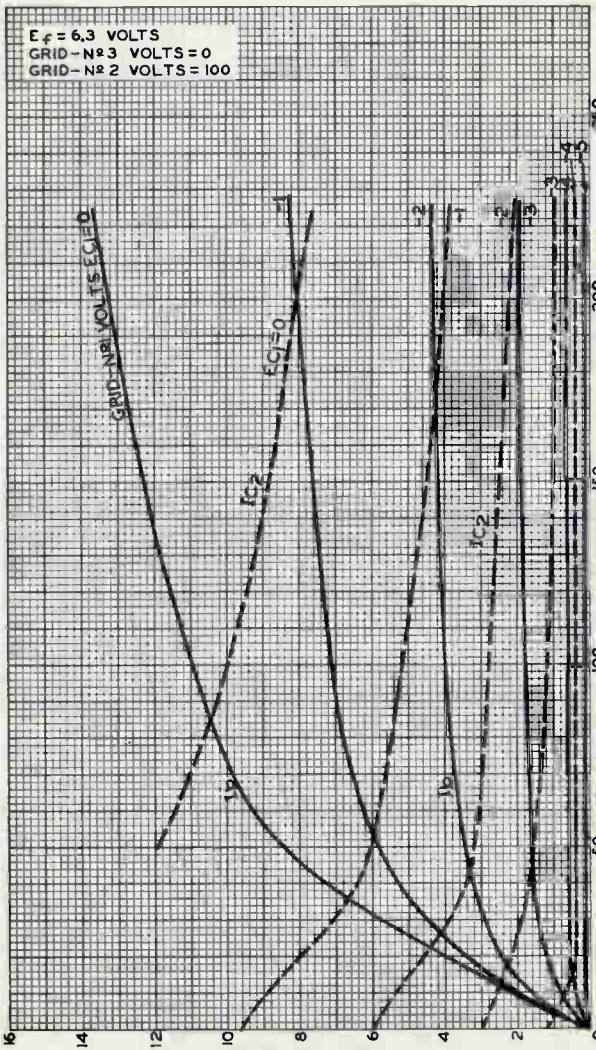
5636

AVERAGE CHARACTERISTICS



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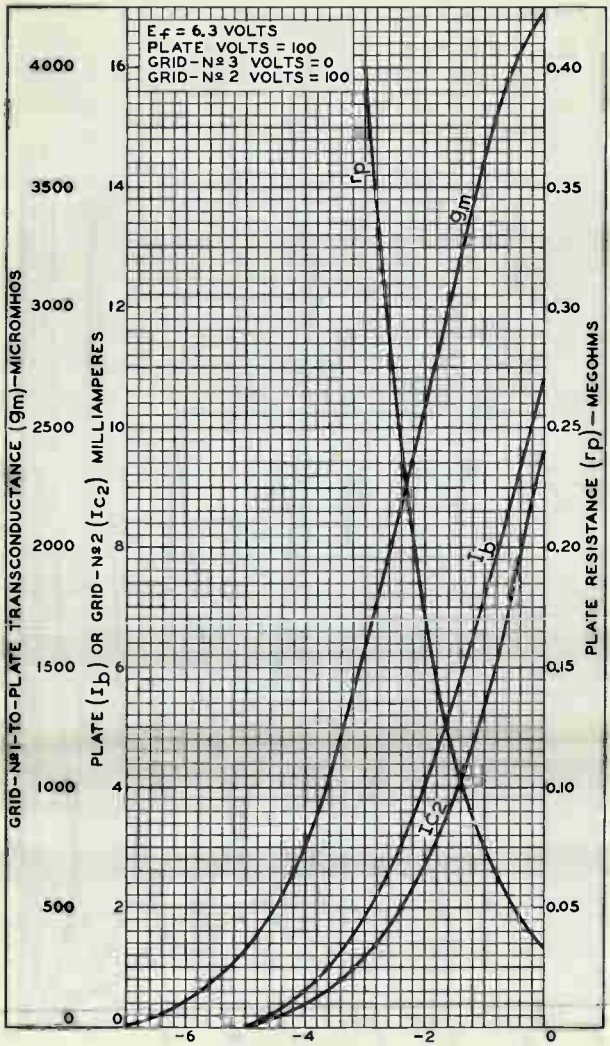
92CM-9212

5636

RCA

5636

AVERAGE CHARACTERISTICS



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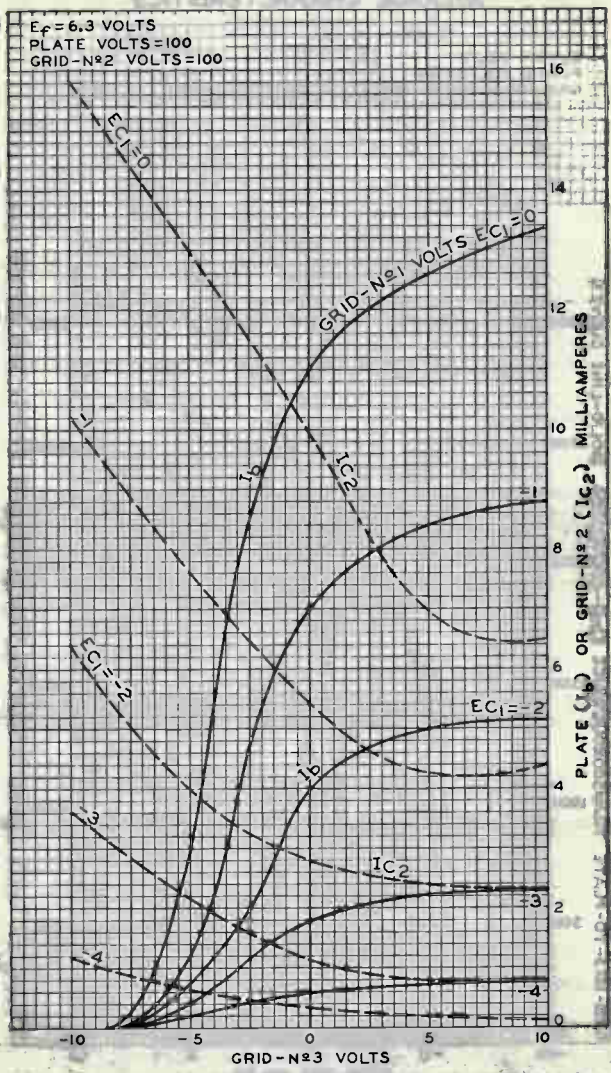
92CM-9207

5636

AVERAGE CHARACTERISTICS

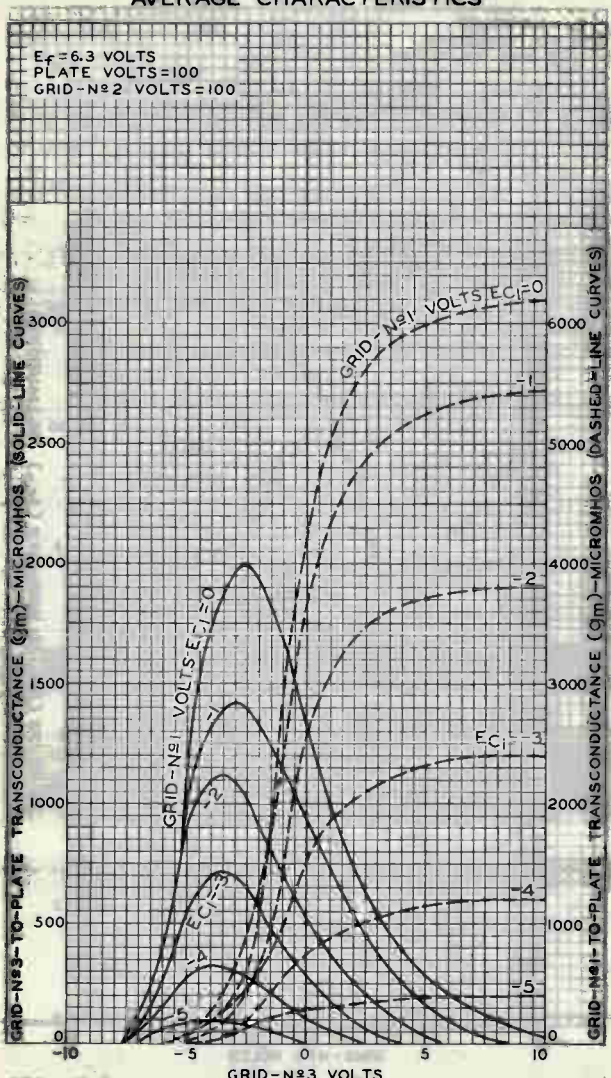


5636

RCA

5636

AVERAGE CHARACTERISTICS

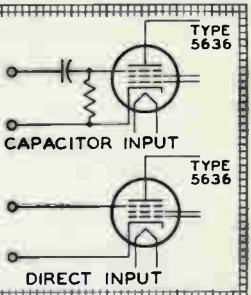


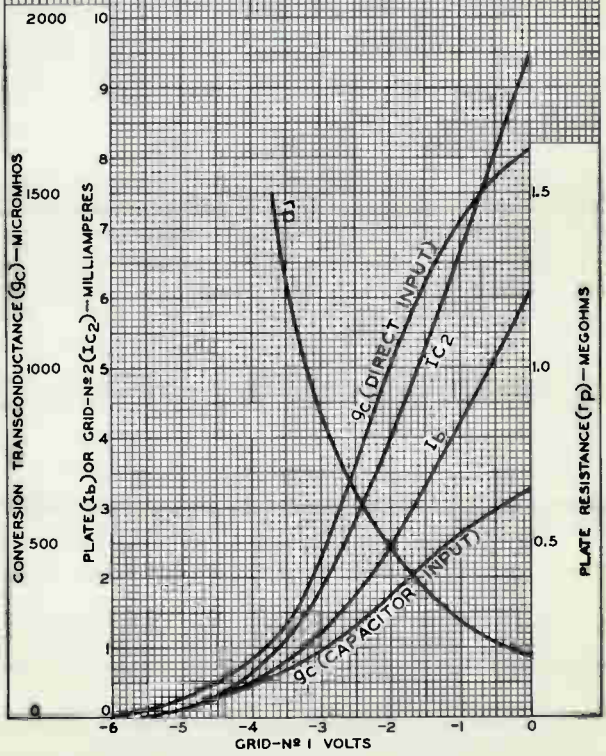
RCA

5636

AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
PLATE VOLTS = 100
GRID-№ 3 VOLTS (RMS) — WITH DIRECT INPUT OR CAPACITOR INPUT = 15
GRID-№ 2 VOLTS = 100
I_b, I_{C_2}, & r_p CURVES ARE FOR DIRECT INPUT.





5642

HALF-WAVE VACUUM RECTIFIER

SUBMINIATURE TYPE

For compact, portable high-voltage-rectifier applications

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	1.25	ac or dc volts
Current	0.2	amp
Direct Interelectrode Capacitance (Approx.):[o]		
Plate to filament	0.6	μμf

Mechanical:

Operating Position	Any
Maximum Length (Excluding flexible leads)	2.380"
Length, Base Seat to Bulb Top (Excluding tip)	1.700" ± 0.060"
Diameter	0.366" to 0.400"
Bulb	T3
Plate Terminal:	
Minimum length	0.250"
Leads, Flexible, Tinned	2
Minimum length	1.5"
Orientation and diameter	*See Dimensional Outline*
Maximum untinned distance from base seat	0.050"
Base	Special 2-Lead

P—Plate Terminal

F—Filament Lead

PULSED-RECTIFIER SERVICE

Maximum and Minimum Ratings, *Design-Center Values:*

For operation in a 525-line, 30-frame system[□]

PEAK INVERSE PLATE VOLTAGE	10000 max.	volts
PEAK PLATE CURRENT	5 max.	ma
DC PLATE CURRENT	0.25 max.	ma
FREQUENCY OF SUPPLY VOLTAGE	5 min.	kc

Typical Operation:

Peak-Pulse Plate Voltage[●]	8000	volts
DC Output Voltage (2 tubes)	12000	volts
DC Output Current	0.15	ma

Characteristics:

Plate Current for plate volts = 30	4	ma

o, □, ●: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

5642

HALF-WAVE VACUUM RECTIFIER

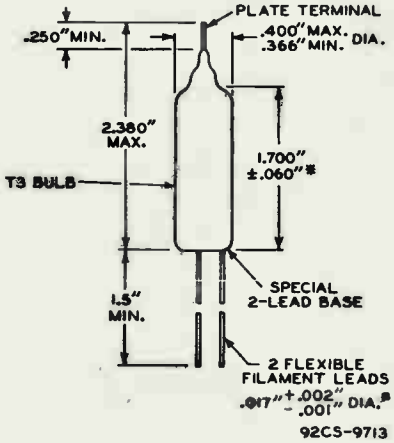
○ Without external shield.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

● The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

OPERATING CONSIDERATIONS

The *flexible leads* of the 5642 are usually soldered to the circuit elements. Soldering of the connections should be made as far as possible from the glass button and the glass tip. If this precaution is not followed, the heat of the soldering operation will crack the glass seals of the leads and damage the tube.



* Measured from base seat to bulb-top line as determined by a ring gauge of 0.210" ± 0.001" inside diameter.

■ The specified lead diameter applies only in the zone between 0.050" and 0.250" from the base seat. Between 0.250" and 1.500", a maximum diameter of 0.021" is held. Outside of these zones, the lead diameter is not controlled.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

5654
PREMIUM TYPE

5654

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Intended for RF and IF Broad-Band Applications where dependable performance under shock and vibration are paramount. The 5654 is a "premium" version of the 6AK5.

GENERAL DATA

Electrical:

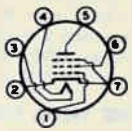
Heater, Pure Tungsten, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.175	amp
Direct Interelectrode Capacitances:▲		
Grid No.1 to Plate	0.020 max.	μμf
Input	4.0	μμf
Output	2.85	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length from Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)

BOTTOM VIEW

Pin 1 - Grid No.1
Pin 2 - Cathode, Grid No.3, Int. Shield
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Cathode, Grid No.3, Int. Shield

AMPLIFIER - Class A_1

Maximum Ratings, *Absolute Values*:

PLATE VOLTAGE	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	155 max.	volts
PLATE DISSIPATION	1.85 max.	watts
GRID-No.2 INPUT	0.55 max.	watt
CATHODE CURRENT	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater positive with respect to cathode	100 max.	volts
Heater negative with respect to cathode	100 max.	volts

Typical Operation and Characteristics:

Plate Voltage	120	180	volts
Grid-No.2 Voltage	120	120	volts

▲ According to RTMA Standard ET-109A with external shield No.316.

5654

SHARP-CUTOFF PENTODE

Cathode-Bias Resistor	180	180	ohms
Plate Resistance (Approx.)	0.30	0.50	megohm
Transconductance	5000	5100	μmhos
Plate Current	7.5	7.7	ma
Grid-No.2 Current	2.5	2.4	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-8.5	-8.5	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . . 0.5 max. megohm

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 500 max. g

Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 500 g impact acceleration.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours.

Heater Cycling Life Performance:

Cycles of Intermittent Operation . . . 2000 min. cycles

Under the following conditions: With heater voltage of 7.5 volts cycled 1 minute on and 1 minute off, heater positive with respect to cathode by +100 volts dc, and plate, grid-No.2, and grid-No.1 voltage = 0 volts.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.160	0.190	amp
Grid-No.1-to-Plate Capacitance	-	-	0.020	μμf
Input Capacitance	-	3.4	4.6	μμf
Output Capacitance	-	2.45	3.25	μμf
Plate Current	1,2	3.0	12.0	ma
Transconductance	1,2	3500	6500	μmhos
Reverse Grid Current	1,3	-	0.1	μamp

Note 1: With 6.3 volts ac on heater.

Note 2: With plate voltage of 120 volts, grid-No.2 voltage of 120 volts, and grid-No.1 voltage of -2 volts.

Note 3: With plate voltage of 120 volts, grid-No.2 voltage of 120 volts, grid-No.1 voltage of -2 volts, and grid-No.1 resistor of 0.1 megohm.

CURVES
are the same as shown for Type 6AK5
In the Receiving Tube Section

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

SHOCK AND VIBRATION RATINGS — LOW MICROPHONISM

LIFE PERFORMANCE DATA — RCA DARK HEATER

"Command" Type for a Wide Variety of Applications Including: Mixers, Oscillators and Amplifiers up through the VHF Region; Multivibrators, Synchronizing Amplifiers and Industrial Control Circuits; and Mobile, Military, and Aircraft Equipment at Altitudes up to 80,000 Feet

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.350	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
Direct Interelectrode Capacitances:[a]		
Grid to plate (Each unit)	1.1	pf
Grid to cathode and heater (Each unit)	2.2	pf
Plate to cathode and heater (Each unit)	1.0	pf
Plate to plate	0.1 max.	pf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	150	volts
Cathode Resistor	240	ohms
Amplification Factor	35	
Plate Resistance (Approx.)	6400	ohms
Transconductance	5500	μmhos
Plate Current	8.2	ma
Grid Voltage (Approx.) for plate μa = 10	−8	volts

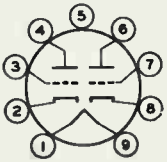
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)

5670

Basing Designation for BOTTOM VIEW. 8CJ

Pin 1 – Heater
Pin 2 – Cathode of Unit No. 2
Pin 3 – Grid of Unit No. 2
Pin 4 – Plate of Unit No. 2
Pin 5 – Internal Shield[b]



Pin 6 – Plate of Unit No. 1
Pin 7 – Grid of Unit No. 1
Pin 8 – Cathode of Unit No. 1
Pin 9 – Heater

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
CATHODE CURRENT	18 max.	ma
GRID CURRENT	3 max.	ma
PLATE DISSIPATION	1.35 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	165 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm

PUSH-PULL AMPLIFIER — Class AB_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

Same as for **AMPLIFIER — Class A_1**

Typical Operation:

Values are for Both Units

Plate Supply Voltage	300	volts
Cathode Resistor (Common to both units)	800	ohms
Peak AF Grid-to-Grid Voltage	19.8	volts
Zero-Signal Plate Current	9.8	ma
Max.-Signal Plate Current	12.6	ma
Effective Load Resistance (Plate-to-plate)	27000	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output (Approx.)	1	watt

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm

[a] Without external shield.
[b] Pin 5 should be connected to ground.

CHARACTERISTICS RANGE VALUES

Values are For Each Unit and Are Initial Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current.	1	330	370	ma
Heater Current at 500 Hours . .	1	330	375	ma
Heater Current at 1000 Hours. .	1	330	380	ma
Direct Interelectrode Capacitances:				
Grid to plate	2	0.8	1.4	pf
Grid to cathode and heater. .	2	1.7	2.7	pf
Plate to cathode and heater .	2	0.7	1.3	pf
Plate to plate.	2	-	0.10	pf
Amplification Factor.	1,3	26	44	
Plate Current (1)	1,3	5.9	10.5	ma
Plate-Current Difference Between Units	1,3	-	1.8	ma
Plate Current (2)	1,4	-	45	μa
Plate Current (3)	1,11	5	-	μa
Transconductance:				
With heater volts = 6.3 . . .	3	4500	6500	μmhos
Change with heater volts = 5.7	3	-	15	%
Change at end of 500 hours with heater volts = 6.3 . .	3	-	20	%
Change at end of 1000 hours with heater volts = 6.3 . .	3	-	25	%
Change at end of 500 hours from heater volts = 6.3 to heater volts = 5.7 . . .	3	-	15	%
Transconductance Change: Difference between average transconductance initially and average transconductance after 500 hours expressed as a percentage of the initial average	1,3	-	15	%
Reverse Grid Current.	1,5	-	0.3	μa
Reverse Grid Current at end of 500 hours.	1,5	-	0.3	μa
Reverse Grid Current at end of 1000 hours	1,5	-	0.3	μa
Grid Emission Current	6,7	-	0.5	μa
Heater-Cathode Leakage Current: Heater negative with respect to cathode.	1,8	-	7	μa
Heater positive with respect to cathode.	1,8	-	7	μa
Heater-Cathode Leakage Current at end of 500 hours: Heater negative with respect to cathode.	1,8	-	7	μa
Heater positive with respect to cathode.	1,8	-	7	μa

	Note	Min.	Max.	
Heater–Cathode Leakage Current at end of 1000 Hours:				
Heater negative with respect to cathode.	1,8	–	7	μa
Heater positive with respect to cathode.	1,8	–	7	μa
Leakage Resistance:				
Between grid and all other electrodes tied together. .	1,9	100	–	megohms
Between plate and all other electrodes tied together. .	1,10	100	–	megohms
Leakage Resistance at the end of 500 hours:				
Between grid and all other electrodes tied together. .	1,9	50	–	megohms
Between plate and all other electrodes tied together. .	1,10	50	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With no external shield.

Note 3: With dc plate supply voltage of 150 volts, cathode resistor of 240 ohms, and cathode bypass capacitor of 1000 μf. Each unit is tested separately. Electrodes of units not under test are grounded.

Note 4: With dc plate voltage of 150 volts, plate load resistance of 0.25 megohm, and dc grid voltage of −10 volts. Each unit is tested separately. Electrodes of unit not under test are grounded.

Note 5: With dc plate supply voltage of 150 volts, grid resistor of 0.5 megohm, cathode resistor of 240 ohms, and cathode bypass capacitor of 1000 μf. Each unit is tested separately. Electrodes of unit under test are grounded.

Note 6: With 7.5 volts ac or dc on heater.

Note 7: With dc plate voltage of 150 volts, grid resistor of 0.5 megohm, and dc grid voltage of −10 volts. Each unit is tested separately. Electrodes of unit not under test are grounded.

Note 8: With 100 volts dc between heater and cathode.

Note 9: With grid 100 volts negative with respect to all other electrodes tied together.

Note 10: With plate 300 volts negative with respect to all other electrodes tied together.

Note 11: With dc plate voltage of 150 volts and dc grid voltage of −4 volts.

SPECIAL TESTS & PERFORMANCE DATA

600-g Shock Test:

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are subjected in four different positions to an impact acceleration of 600 g. At the end of this test, tubes will not show permanent or temporary shorts, or open circuits, and are required to meet established limits for low frequency vibration, heater cathode leakage current, transconductance, and reverse grid current.

Fatigue Test:

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and are subjected to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours in each of three positions. At the end of this test,

tubes will not show permanent or temporary shorts, or open circuits, and are required to meet established limits for low frequency vibration, heater-cathode leakage current, transconductance, and reverse grid current.

Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions: Plate of unit No.1 tied to plate of unit No.2, grid of unit No.1 tied to grid of unit No.2, ac heater volts = 6.3, plate supply volts =150, dc grid volts = -3, plate load resistor (ohms) = 2000 and vibrational acceleration = 10 g at 40 cycles per second. The rms output voltage across the plate load resistor as a result of vibration of the tube must not exceed 130 millivolts.

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. Tubes will withstand a minimum of 2000 cycles of intermittent operation under the following conditions: ac heater voltage of 7.5 volts cycled one minute on, one minute off, with heater at a potential of +135 volts with respect to cathode, all other elements disconnected. At the end of this test, tubes will not show open heaters, open cathodes, heater-cathode shorts or excessive heater-cathode leakage.

Audio-Frequency Noise and Microphony Performance:

This test is performed on a sample lot of tubes from each production run, under the following conditions: Plate of unit No.1 tied to plate of unit No.2, grid of unit No.1 to plate of unit No.2, ac heater volts = 6.3, cathode resistor (ohms) = 240, plate supply volts = 250, and plate load resistor (ohms) = 10,000. The output voltage must be less than 200 mv ac when the tube is tapped.

Shorts and Continuity Test (Thyratron-Type Detector Circuit):

This test, in addition to a 100% factory test, is performed on a sample lot of tubes from each production run. A tube is considered inoperative if either unit shows a permanent or temporary short or open circuit or a value of reverse grid current in excess of 1 microampere under the conditions specified in the *Characteristics Range Values* for reverse grid current.

Grid-Pulse Emission Test:

This test is performed on a sample lot of tubes from each production run, under the following conditions: ac heater volts = 6.3, plate volts = 150, grid driven 30 volts positive, from a cutoff bias of -30 volts dc, with a 10 microsecond pulse at a pulse repetition rate of 1000 pulses per second. Tubes must meet a minimum peak current value of 270 milliamperes.

AC Emission Test:

This test is performed on a sample lot of tubes from each production run under the following conditions: ac heater volts = 5.0, plate volts = 100, and grid volts (rms) = 5.0. Tubes must meet a limit dc plate current of 11 milliamperes.

production run, under the following conditions: ac heater volts = 6.3, plate supply volts = 150, cathode resistor each unit (ohms) = 240, grid resistor each unit (megohm) = 0.5, dc heater to cathode voltage of 135 volts (heater positive with respect to cathode), and room temperature. The value of transconductance measured at the end of two and twenty hours, must be within 10 per cent of the initial reading.

100-hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run to insure a low percentage of early inoperatives. The conditions are the same as for the two and twenty hour Stability Life Performance except that the heater is switched off once every two hours and the tube cools with electrode potentials applied. A tube is considered inoperative at the end of 100 hours total heater-on time if it shows a permanent short, open circuit, or a value of reverse grid current in excess of 1 microampere measured under the conditions specified in *Characteristics Range Values* for reverse grid current. Tube must also meet minimum gm limit.

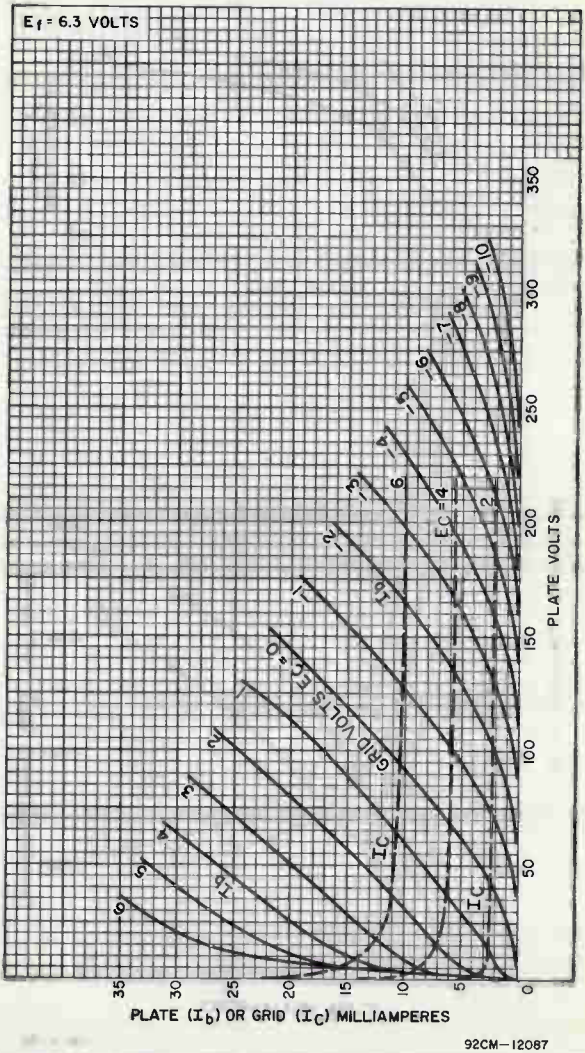
500-hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. The conditions for life test are as given above for the two and twenty hour Stability Life Performance Test except that the bulb temperature is maintained at 165° C. At the end of 500 hours total heater-on time tubes must not show any shorts or open circuits and must pass the established 500 hours limits of heater current, reverse grid current, heater cathode leakage current, transconductance changes and leakage resistance shown under *Characteristics Range Values*.

1000-hour Intermittent Life Performance:

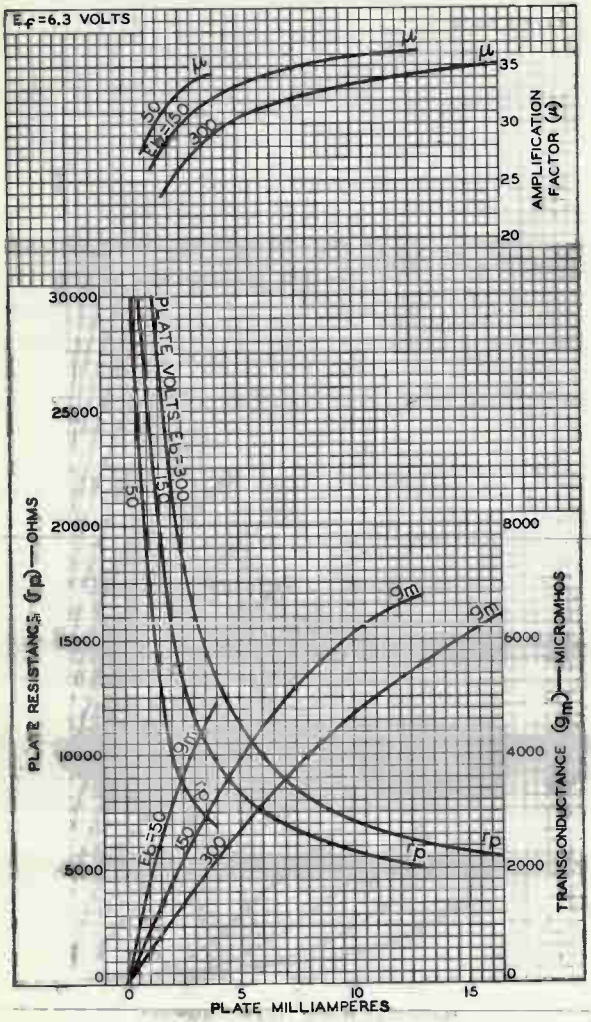
This test is performed on a minimum of one production run per month under the same condition as the 500 hour Intermittent Life Performance. At the end of 1000 hours total heater-on time, tubes must not show permanent or temporary shorts or open circuits and must pass the established 1000-hour limits for heater current, transconductance change, reverse grid current and heater cathode leakage current shown under the *Characteristics Range Values*.

AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-12087

AVERAGE CHARACTERISTICS



92CM-12088

RCA

5686

PREMIUM TYPE 5686

BEAM POWER TUBE

9-PIN MINIATURE TYPE

For af or rf power-amplifier applications at frequencies up to 160 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
- Voltage . . . . . 6.3 . . . . . ac or dc volts
- Current . . . . . 0.35 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.11 max.	0.08 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater.	6.4	6.5	μμf
Plate to cathode & grid No.3, grid No.2, and heater.	4	6.5	μμf

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 2-3/16"
Maximum Seated Length. . . . . 1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . 1-9/16" ± 3/32"
Diameter . . . . . 0.750" to 0.875"
Dimensional Outline. . . . . *See General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW 9G

Pin 1 - Cathode, Grid No.3
Pin 2 - Grid No.1
Pin 3 - Cathode, Grid No.3
Pin 4 - Heater

Pin 5 - Heater
Pin 6 - Grid No.2
Pin 7 - Plate
Pin 8 - Cathode, Grid No.3
Pin 9 - Grid No.2

AUDIO-FREQUENCY POWER AMPLIFIER — Class A_1

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE.	275 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	275 max.	volts
GRID-No.2 INPUT.	3.3 max.	watts
PLATE DISSIPATION.	8.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

Typical Operation and Characteristics:

Plate Voltage.	250	volts
Grid-No.2 Voltage.	250	volts

°: See next page.

RCA

5686

BEAM POWER TUBE

Grid-No.1 (Control-Grid) Voltage. . . .	-12.5	volts
Peak AF Grid-No.1 Voltage	12.5	volts
Zero-Signal Plate Current	27	ma
Zero-Signal Grid-No.2 Current	3	ma
Plate Resistance (Approx.).	45000	ohms
Transconductance.	3100	μmhos
Load Resistance	9000	ohms
Max.-Signal Power Output.	2.7	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.5 max.	megohm

RADIO-FREQUENCY POWER AMPLIFIER — Class C

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	275 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	275 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE.	-165 max.	volts
PLATE CURRENT	44 max.	ma
GRID-No.2 CURRENT	16.5 max.	ma
GRID-No.1 CURRENT	3.3 max.	ma
PLATE INPUT	11 max.	watts
GRID-No.2 INPUT	3.3 max.	watts
PLATE DISSIPATION	8.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

Typical Operation:

	At frequencies up to 160 Mc		
Plate Voltage	250	250	volts
Grid-No.2 Voltage	180	250	volts
Grid-No.1 Voltage	-30	-50	volts
From grid-No.1 resistor of. . .	15000	25000	ohms
Peak RF Grid-No.1 Voltage	50	75	volts
Plate Current	30	40	ma
Grid-No.2 Current (Approx.) . . .	6.5	10.5	ma
Grid-No.1 Current (Approx.) . . .	2	2	ma
RF Grid-No.1 Driving Power (Approx.)	0.1	0.15	watt
Power Output (Approx.).	5	6.5	watts
Useful Power Output at 125 Mc . .	-	5.25	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance. . .	50000 max.	ohms

[D] With external shield JEDEC No.315 connected to cathode & grid No.3.

5686

BEAM POWER TUBE

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are subjected in four different positions to an impact acceleration of 450 g.

Fatigue Rating:

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected to 2.5 g vibrational acceleration at a fixed frequency of 25 cycles per second for 100 hours in each of three positions.

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. Tubes will withstand a minimum of 2000 cycles of intermittent operation under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 100 volts positive with respect to cathode, and all other elements connected to ground.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5687

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:				
Heater arrangement	*Series*	*Parallel*		
Voltage	12.6	6.3	ac or dc	volts
Current	0.45	0.9		amp
Direct Interelectrode Capacitances (Approx.):[o]				
Grid to plate (Each unit)			4	μμf
Grid to cathode and heater (Each unit)			4	μμf
Plate to cathode and heater:				
Unit No.1			0.6	μμf
Unit No.2			0.5	μμf
Heater to cathode (Each unit)			7	μμf
Grid to grid			0.025	μμf
Plate to plate			0.75	μμf

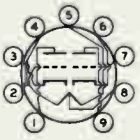
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	120	180	250	volts
Grid Voltage	-2	-7	-12.5	volts
Amplification Factor	18	17	16	
Plate Resistance (Approx.)	1560	2000	3000	ohms
Transconductance	11500	8500	5400	μmhos
Plate Current	36	23	12	ma
Grid Voltage (Approx.) for plate μa = 100	-9	-14	-19	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9H

Pin 1 - Plate of Unit No.2
Pin 2 - Grid of Unit No.2
Pin 3 - Cathode of Unit No.2
Pins 4 & 8 - Heater of Unit No.2
Pins 5 & 8 - Heater of Unit No.1



Pin 6 - Cathode of Unit No.1
Pin 7 - Grid of Unit No.1
Pin 8 - Heater Mid-Tap
Pin 9 - Plate of Unit No.1

[o]: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

5687

MEDIUM-MU TWIN TRIODE

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	330 max.	volts
GRID CURRENT	6.6 max.	ma
PLATE DISSIPATION:		
Either plate	4.2 max.	watts
Both plates (Both units operating)	7.5 max.	watts
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

Grid–Circuit Resistance	1 max.	megohm

° Without external shield.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

5691 SPECIAL RED TUBE

5691
HIGH-MU TWIN TRIODE

Intended for critical ~~industrial~~ applications where 10,000-hour life, extreme uniformity, rigid construction, and exceptional stability are paramount. Within its ratings, the 5691 may be used to replace its receiving-tube counterpart, type 6SL7-GT, where heater transformer will carry increased current.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3 ± 5%*	ac or dc volts
Current	0.6	amp

Direct Interelectrode Capacitances:°

	Min.	Av.	Max.	
Triode No.1:				
Grid to Plate	3.1	3.6	4.1	μμf
Grid to Cathode	1.9	2.4	2.9	μμf
Plate to Cathode	1.8	2.3	2.8	μμf
Triode No.2:				
Grid to Plate	3.1	3.6	4.1	μμf
Grid to Cathode	2.2	2.7	3.2	μμf
Plate to Cathode	2.1	2.6	3.1	μμf
Plate of Triode No.1 to Plate of Triode No.2	0.27	0.32	0.37	μμf

* May deviate ±10% from rated value provided such deviation occurs for less than 2% of the operating time.

° With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-7/8"
Maximum Seated Length	2-5/16"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 8-Pin, Non-Hygroscopic
Basing Designation for BOTTOM VIEW	8BD

Pin 1 - Grid of Triode No.2
Pin 2 - Plate of Triode No.2
Pin 3 - Cathode of Triode No.2
Pin 4 - Grid of Triode No.1

Pin 5 - Plate of Triode No.1
Pin 6 - Cathode of Triode No.1
Pin 7 - Heater
Pin 8 - Heater

(continued on next page)

5691

5691
HIGH-MU TWIN TRIODE

INDUSTRIAL SERVICE

Includes applications such as dc and audio amplifiers

Values are for each unit

Maximum Ratings, *Absolute Values*:

DC PLATE VOLTAGE		275 max.	volts
DC PLATE-SUPPLY VOLTAGE		330 max.	volts
GRID VOLTAGE:			
Negative bias range	1• min. to	100 max.	volts
Negative peak value		200 max.	volts
DC GRID CURRENT		2 max.	ma
DC CATHODE CURRENT		10 max.	ma
PLATE DISSIPATION		1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode		100 max.	volts
Heater positive with respect to cathode		100 max.	volts
AMBIENT TEMPERATURE RANGE		-55 to +90	°C

• For resistance-coupled amplifier applications, the negative bias may be as low as 0.5 volt.

Maximum Circuit Value (for any operating condition):

Grid-Circuit Resistance	2 max.	megohms

Characteristics and Range Values:

Heater Volts, 6.3; Plate Volts, 250; Grid Volts, -2

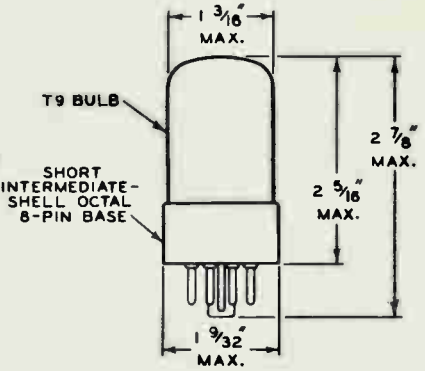
	Min.	Av.	Max.	
Heater Current	0.55	0.6	0.65	amp
Heater-Cathode Current with heater-cathode voltage of ± 100 volts	–	–	5	μamp
Plate Current	1.7	2.3	2.9	ma
Difference in Plate Current between triode units	–	–	0.9	ma
Plate Current for grid voltage of -5.5 volts	–	–	15	μamp
Reverse Grid Current	–	–	0.2	μamp
Amplification Factor	60	70	80	
Plate Resistance	–	44000	–	ohms
Transconductance	1300	1600	1900	μmhos

Typical Operation as Resistance-Coupled Amplifier (Each Unit)

See RESISTANCE-COUPLED AMPLIFIER CHART No. 7 at front of Receiving Tube Section.

5691

HIGH-MU TWIN TRIODE

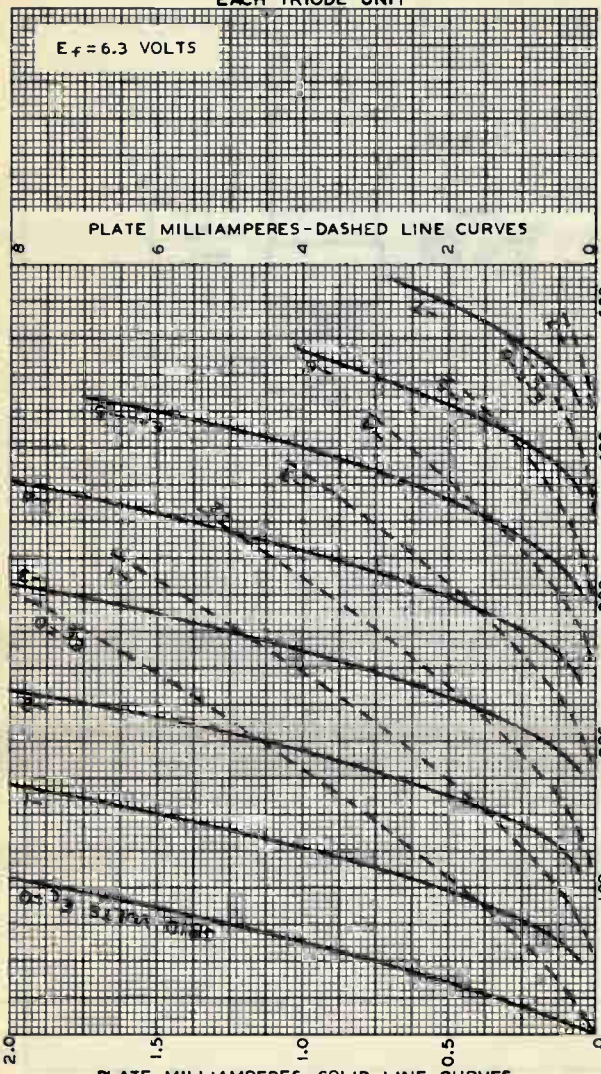


5691

RCA

5691

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



JUNE 16, 1941

TUBE DEPARTMENT

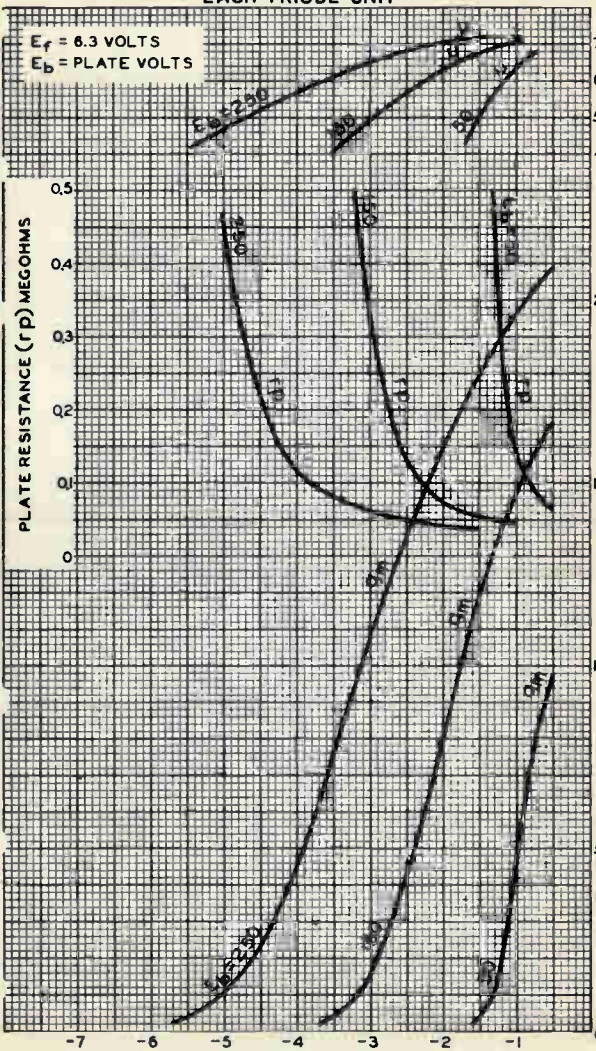
92C-6296

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

5691

AVERAGE CHARACTERISTICS
EACH TRIODE UNIT



RCA

5692

SPECIAL RED 5692 TUBE

MEDIUM-MU TWIN TRIODE

Intended for critical industrial applications where 10,000-hour life, extreme uniformity, rigid construction, and exceptional stability are paramount. Within its ratings, the 5692 may be used to replace its receiving-tube counterpart, type 6SN7-GT.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3 ± 5%*	ac or dc volts
Current	0.6	amp

Direct Interelectrode Capacitances:°

	Min.	Av.	Max.	
Triode No.1:				
Grid to Plate	3.0	3.5	4.0	μμf
Grid to Cathode	1.8	2.3	2.8	μμf
Plate to Cathode	2.0	2.5	3.0	μμf
Triode No.2:				
Grid to Plate	2.8	3.3	3.8	μμf
Grid to Cathode	2.1	2.6	3.1	μμf
Plate to Cathode	2.2	2.7	3.2	μμf
Plate of Triode No.1 to Plate of Triode No.2	0.27	0.32	0.37	μμf

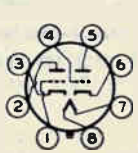
* Heater voltage may deviate ± 10% from rated value, provided such deviation occurs for less than 2% of the operating time.

° With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-7/8"
Maximum Seated Length	2-5/16"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 8-Pin, Non-Hygroscopic
Basing Designation for BOTTOM VIEW	8BD

Pin 1 - Grid of Triode No.2
Pin 2 - Plate of Triode No.2
Pin 3 - Cathode of Triode No.2
Pin 4 - Grid of Triode No.1



Pin 5 - Plate of Triode No.1
Pin 6 - Cathode of Triode No.1
Pin 7 - Heater
Pin 8 - Heater

(continued on next page)

5692

5692
MEDIUM-MU TWIN TRIODE

INDUSTRIAL SERVICE

Including applications such as dc amplifiers, audio amplifiers, and relaxation oscillators.
Values are for each unit

Maximum Ratings, *Absolute Values*:

DC PLATE VOLTAGE	275 max.	volts
DC PLATE-SUPPLY VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative bias range	1● min. to 100 max.	volts
Negative peak value	200 max.	volts
DC GRID CURRENT	2 max.	ma
DC CATHODE CURRENT	15 max.	ma
PLATE DISSIPATION	1.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
AMBIENT TEMPERATURE RANGE	−55 to +90	°C

● For resistance-coupled amplifier applications, the negative bias may be as low as 0.5 volt.

Maximum Circuit Value (for any operating condition):

Grid-Circuit Resistance	2 max.	megohms

Characteristics and Range Values:

Heater Volts, 6.3; Plate Volts, 250; Grid Volts, -9

	Min.	Av.	Max.	
Heater Current	0.55	0.6	0.65	amp
Heater-Cathode Current with heater-cathode voltage of ± 100 volts	–	–	5	μamp
Plate Current	4.8	6.5	8.2	ma
Difference in Plate Current between triode units	–	–	2.0	ma
Plate Current for grid voltage of −24 volts	–	–	15	μamp
Reverse Grid Current	–	–	0.2	μamp
Amplification Factor	18	20	22	
Plate Resistance	–	9100	–	ohms
Transconductance	1825	2200	2575	μmhos

Typical Operation as Resistance-Coupled Amplifier (Each Unit)

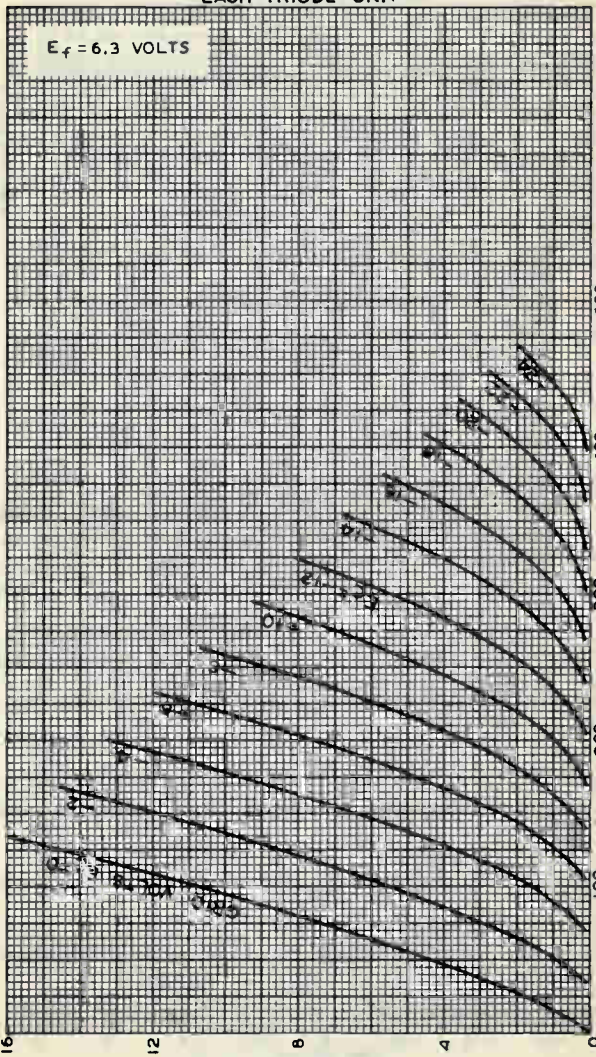
See RESISTANCE-COUPLED AMPLIFIER CHART No. 13 at front of Receiving Tube Section.

OUTLINE DIMENSIONS for the 5692 are the same as those shown for type 5691

RCA

5692

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



FEB. 21, 1941

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6257

5692

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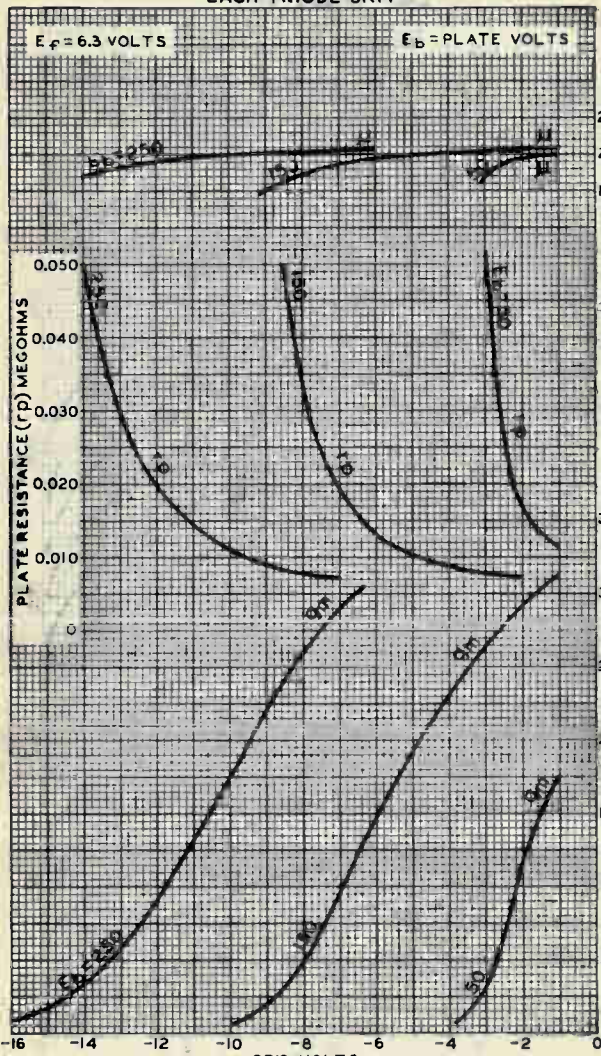
5692

AVERAGE CHARACTERISTICS
EACH TRIODE UNIT



5693 SPECIAL RED TUBE

5693

SHARP-CUTOFF PENTODE

Intended for critical industrial applications where 10,000-hour life, extreme uniformity, rigid construction, and exceptional stability are paramount. Within its ratings, the 5693 may be used to replace its receiving-tube counterpart, type 6SJ7.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 5%*	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances:°

	Min.	Av.	Max.	
Grid to Plate	–	–	0.005	μμf
Input	4.8	5.3	5.8	μμf
Output	5.6	6.2	6.8	μμf

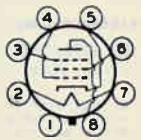
* May deviate ± 10% from rated value provided such deviation occurs for less than 2% of the operating time.

° With shell connected to cathode.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Seated Length	1-31/32" ± 3/32"
Maximum Diameter	1-5/16"
Bulb	Metal Shell MT-8
Base	Small-Wafer Octal 8-Pin, Non-Hygroscopic

Basing Designation for BOTTOM VIEW 8N



Pin 1 – Shell
Pin 2 – Heater
Pin 3 – Grid No.3
Pin 4 – Grid No.1
Pin 5 – Cathode
Pin 6 – Grid No.2
Pin 7 – Heater
Pin 8 – Plate

INDUSTRIAL SERVICE

Includes applications such as dc and resistance-coupled amplifiers

Maximum Ratings, *Absolute Values*:

DC PLATE VOLTAGE	300 max.	volts
DC PLATE-SUPPLY VOLTAGE	330 max.	volts
DC GRID-No.3 (SUPPRESSOR) VOLTAGE:		
Negative bias value	0 min.	volts
	-100 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE▲	125 max.	volts
DC GRID-No.2-SUPPLY VOLTAGE	330 max.	volts

▲: See next page.

5693

5693
SHARP-CUTOFF PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias range	−1[a] min. to	−50 max.	volts
Negative peak value		−50 max.	volts
DC CATHODE CURRENT		10 max.	ma
PLATE DISSIPATION		2 max.	watts
GRID-No.2 DISSIPATION		0.3 max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode		100 max.	volts
Heater positive with respect to cathode		100 max.	volts
AMBIENT TEMPERATURE RANGE		−55 to +90	°C

Maximum Circuit Value:

See curve on a following page giving maximum values of the grid-No.1 resistor.

Characteristics and Range Values:

Heater volts, 6.3; Plate Volts, 250; Grid-No.3 Volts, 0; Grid-No.2 Volts, 100; Grid-No.1 Volts, -3.

	Min.	Av.	Max.	
Heater Current	0.275	0.300	0.325	amp
Heater-Cathode Current with heater-cathode voltage of ± 100 volts	–	–	5	μamp
Plate Current	2.3	3.0	3.7	ma
Plate Current for grid-No.1 voltage of −7.5 volts	2	30	80	μamp
Plate Current for grid-No.3 voltage of −70 volts	150	450	750	μamp
Grid-No.2 Current	0.60	0.85	1.10	ma
Reverse Grid-No.1 Current	–	–	0.1	μamp
Plate Resistance	1.0	–	–	megohm
Transconductance	1400	1650	1900	μmhos

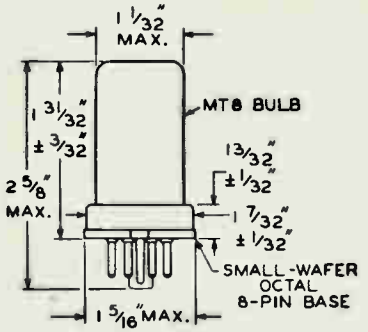
Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.20 at front of Receiving Tube Section.

▲ The 5693 may be operated at a grid-No.2 voltage as high as the rated grid-No.2 supply voltage when the grid-No.2 dissipation rating is not exceeded for any signal condition and when a resistor is used in series with grid-No.2 and its supply voltage.

■ For resistance-coupled amplifier applications, the grid-No.1 negative bias may be as low as −0.5 volt.

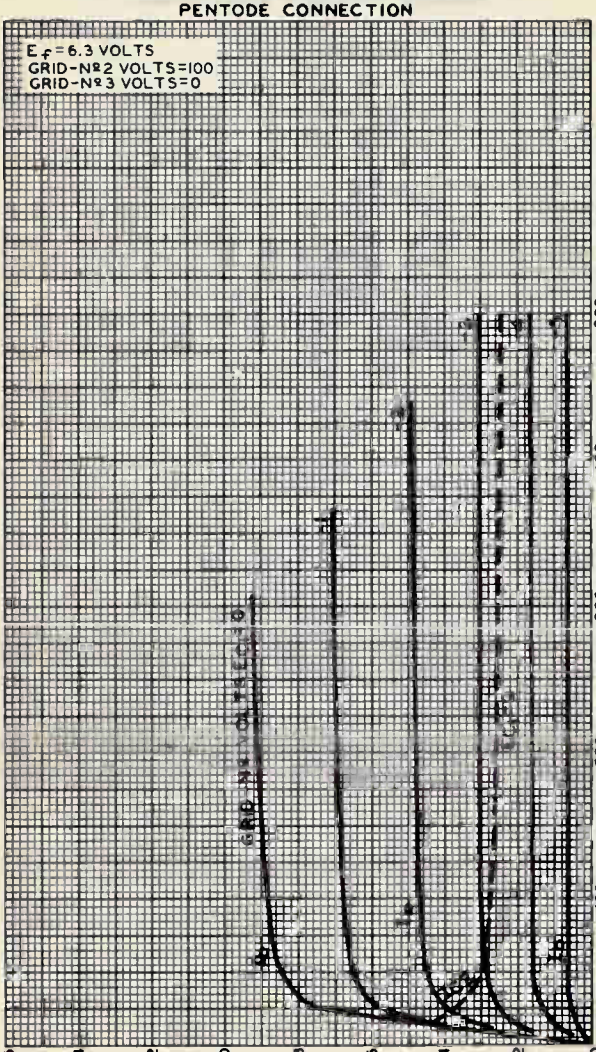
5693
SHARP-CUTOFF PENTODE



5693

5693

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



RCA

5693

OPERATION CHARACTERISTICS

E_f = 6.3 VOLTS PLATE VOLTS = 300 GRID-№ 3 VOLTS = 0

CURVE	GRID-№2 RESISTOR	GRID-№ 2 SUPPLY VOLTS
1	0 MEG.	100
2	0.25 MEG.	300
3	0.5 MEG.	300
4	0.75 MEG.	300

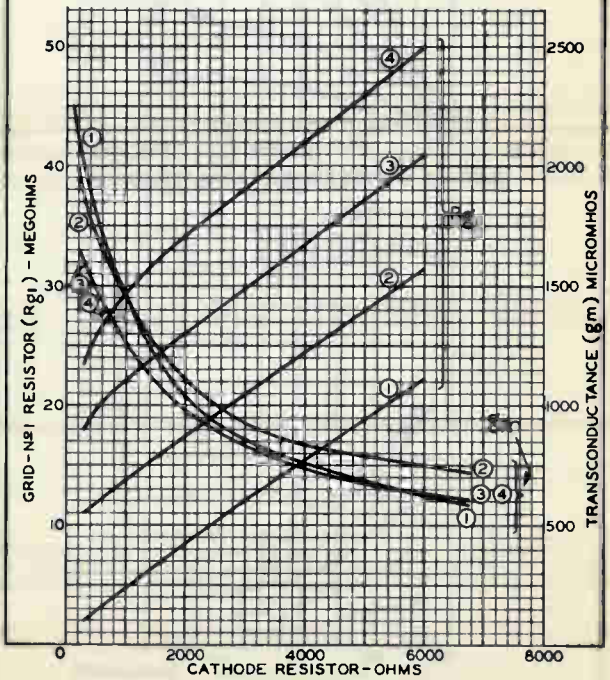
THESE CURVES ARE BASED ON THE FOLLOWING VALUES: ΔI_K=300μAMP, ΔIg_1 = 0.1 μAMP

EXPRESSING THESE VALUES AS A RATIO, WE HAVE:

$$\frac{\Delta I_K}{\Delta Ig_1} = \frac{300}{0.1} \text{ OR } 3000$$

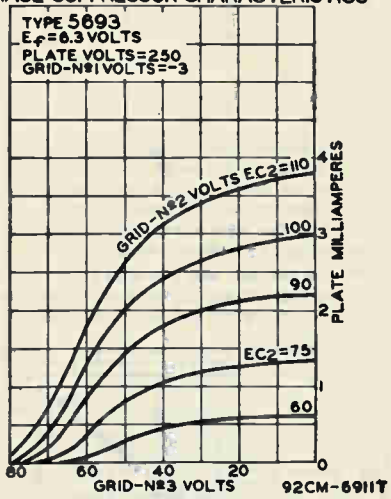
FOR THOSE APPLICATIONS PERMITTING OTHER VALUES OF ΔI_K, A NEW RATIO OF $\Delta I_K/\Delta Ig_1$ CAN BE CALCULATED. THE VALUES OF Rg_1 AS READ FROM THE CURVE MUST BE MULTIPLIED BY A FACTOR WHICH IS THE QUOTIENT OF THE NEW RATIO DIVIDED BY THE OLD RATIO. FOR EXAMPLE, IF THE NEW RATIO IS 6000 THE MULTIPLYING FACTOR IS 6000/3000, OR 2, AND VALUES OF Rg_1 AS READ FROM THE CURVE ARE THEREFORE MULTIPLIED BY 2.

NOTE: TRANSCONDUCTANCE CURVES WERE OBTAINED WITH GRID-№2 RESISTOR AND CATHODE RESISTOR SUITABLY BYPASSED.

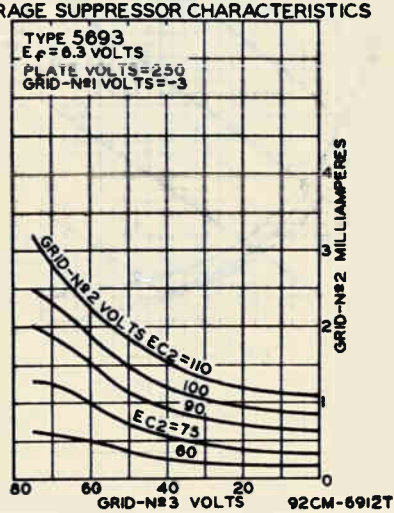


5693
SHARP-CUTOFF PENTODE

AVERAGE SUPPRESSOR CHARACTERISTICS



AVERAGE SUPPRESSOR CHARACTERISTICS



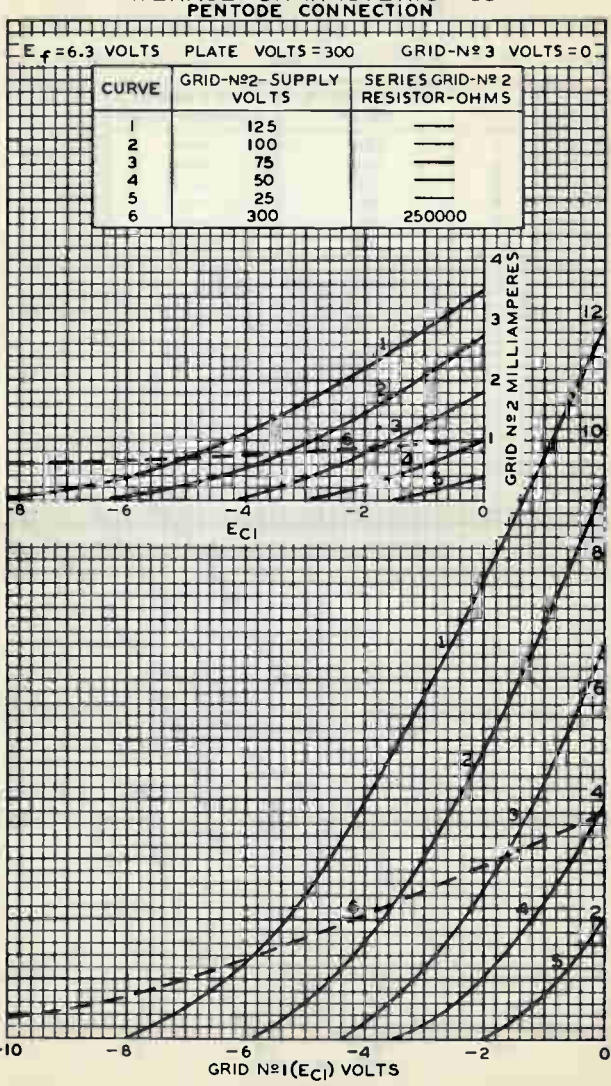
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5693

AVERAGE CHARACTERISTICS
PENTODE CONNECTION

E_f = 6.3 VOLTS PLATE VOLTS = 300 GRID-№3 VOLTS = 0

CURVE	GRID-№2-SUPPLY VOLTS	SERIES GRID-№2 RESISTOR-OHMS
1	125	—
2	100	—
3	75	—
4	50	—
5	25	—
6	300	250000



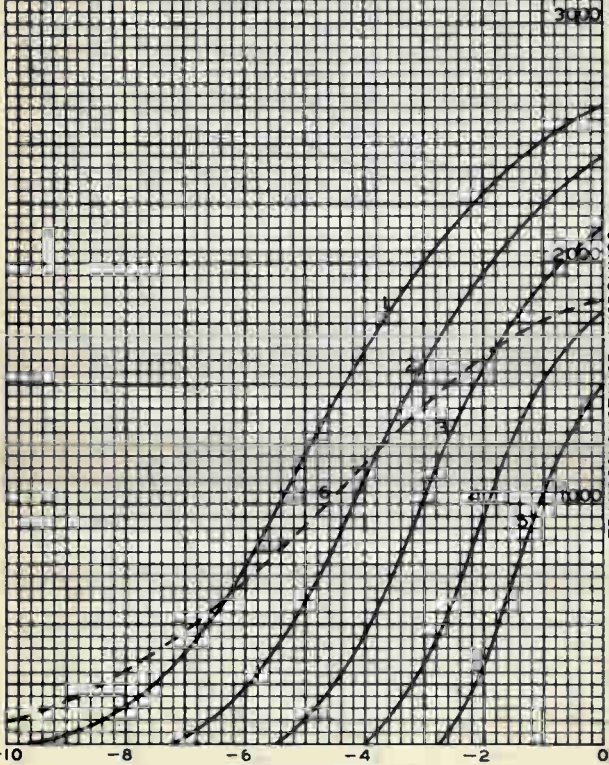
5693

5693

AVERAGE CHARACTERISTICS
PENTODE CONNECTION

E_f = 6.3 VOLTS PLATE VOLTS = 300 GRID-№3 VOLTS = 0

CURVE	GRID-№2-SUPPLY VOLTS	SERIES GRID-№2 RESISTOR-OHMS
1	125	—
2	100	—
3	75	—
4	50	—
5	25	—
6	300	250000



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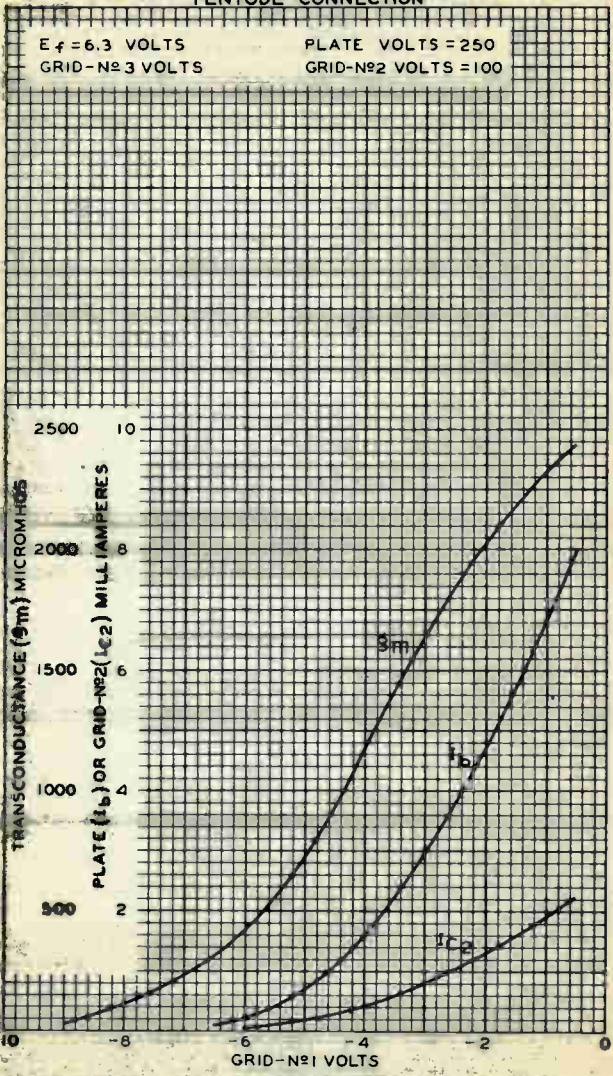
5693

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



RADIO CORPORATION OF AMERICA, HARRISON, N. J.

RCA

5718

5718 PREMIUM TYPE

MEDIUM-MU TRIODE

SUBMINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 5%	ac or dc volts
Current	0.150	amp

Direct Interelectrode Capacitances:

	With External Shield°	*Without External Shield*	
Grid to Plate	1.3	1.4	μμf
Input	2.4	2.2	μμf
Output	2.4	0.7	μμf

° Having inside diameter of 0.405" and connected to lead No.5.

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	100	150	volts
Cathode Resistor	150	180	ohms
Amplification Factor	27	27	
Plate Resistance	4650	4150	ohms
Transconductance	5800	6500	μmhos
Plate Current	8.5	13.0	ma
Grid Volts (Approx.) for plate current of 10 μamp	-7	-11	volts

Mechanical:

Operating Position	Any
Maximum Bulb Length	1-3/8"
Length from Button Seal to Bulb Top (Excluding tip)	1.075" ± 0.060"
Diameter	0.383" ± 0.017"
Bulb	T-3
Leads, Flexible	8
Length	1-1/2" to 1-3/4"
Orientation and Diameter	See Dimensional Outline

BOTTOM VIEW

Lead No.1 – Grid
Lead No.2 – No Conn.
Lead No.3 – Heater
Lead No.4 – No Conn.
Lead No.5 – Cathode
Lead No.6 – Heater
Lead No.7 – No Conn.
Lead No.8 – Anode

AMPLIFIER - Class A_1

Maximum Ratings, *Absolute Values*:

DC PLATE VOLTAGE	165 max. volts

RCA

5718

MEDIUM-MU TRIODE

PLATE DISSIPATION	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

Maximum Circuit Values:

Grid-Circuit Resistance:
For cathode-bias operation . . . . . 1.2 max. megohms
For fixed-bias operation . . . . . Not recommended

Cathode-Bias Resistance - An adequate value of cathode-bias resistor should be used to protect the tube in event of temporary failure of excitation and resultant loss in developed bias.

RF AMPLIFIER and OSCILLATOR - Class C

Operation with full input is permissible up to 1000 Mc.

Maximum Ratings, *Absolute Values*:

DC PLATE VOLTAGE	165 max.	volts
DC GRID VOLTAGE	-55 max.	volts
DC PLATE CURRENT	22 max.	ma
DC GRID CURRENT	5.5 max.	ma
PLATE DISSIPATION	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:
For cathode-bias operation . . . . . 1.2 max. megohms
For fixed-bias operation . . . . . Not recommended

Cathode-Bias Resistance - An adequate value of cathode-bias resistor should be used to protect the tube in event of temporary failure of excitation and resultant loss in developed bias.

5718

MEDIUM-MU TRIODE

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

	Note	Min.	Max.	
Heater Current	1	0.138	0.162	amp
Grid-to-Plate Capacitance	2	1.1	1.8	μμf
Input Capacitance	2	1.6	2.8	μμf
Output Capacitance	2	0.5	0.9	μμf
Amplification Factor	1,3	23	31	
Plate Current	1,3	6.0	11.0	ma
Plate Current	1,4	–	100	μamp
Transconductance	1,3	4800	6800	μmhos
Transconductance	5,3	4500	–	μmhos
Grid Current	1,6	–	±0.4	μamp
Heater–Cathode Leakage Current:				
Heater negative with respect to cathode	1,7	–	7.0	μamp
Heater positive with respect to cathode	1,7	–	7.0	μamp
Leakage Resistance:				
Between Grid and All Other Electrodes Tied	1,8	100	–	megohms
Between Plate and All Other Electrodes Tied	1,9	100	–	megohms
Useful Power Output	1,10	600	–	mw

* Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With external shield.

Note 3: With dc plate supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode bypass capacitor of 1000 microfarads.

Note 4: With dc plate voltage of 100 volts, and dc grid voltage of −7 volts.

Note 5: With 5.5 volts ac or dc on heater.

Note 6: With dc plate supply voltage of 100 volts, cathode resistor of 150 ohms, and grid resistor of 0.5 megohm.

Note 7: With 100 volts dc between heater and cathode.

Note 8: With grid 100 volts negative with respect to all other electrodes tied together.

Note 9: With plate 300 volts negative with respect to all other electrodes tied together.

Note 10: In self-excited oscillator with dc plate voltage of 150 volts, grid resistor and feedback optimized to give useful power output at a plate current of 20 ma. and frequency of 500 Mc.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 450 max. g

Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.

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5718

MEDIUM-MU TRIODE

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

Uniform Acceleration Rating . . . . . 1000 max. g

Tubes are subjected in each of three positions to a gradually applied uniform acceleration up to 1000 g.

High-Frequency Vibration Performance:

RMS Output Voltage . . . . . 60 max. mv

Under the following conditions: A 100-volt plate and grid-No.2 voltage supply having an impedance not exceeding that of a 40-μf capacitor, plate load resistance of 10000 ohms, grid-No.1 resistor of 0.1 megohm, cathode resistor of 150 ohms, cathode bypass capacitor of 1000 μf, and vibrational acceleration of 15 g at 40 cps.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . 2500 max. cycles

Under the following conditions: With heater voltage of 7.0 volts cycled 1 minute on and 4 minutes off, heater-cathode voltage of 140 volts (rms), and plate, grid-No.2, and grid-No.1 voltage = 0 volts.

Average Life Performance:

The average life performance based on a 500-hour test at 175°C ambient temperature is not less than 450 hours. This life test is made on sample lot of tubes with heater voltage of 6.3 volts; plate supply voltage of 100 volts; grid-No.2 supply voltage of 100 volts; dc heater-cathode voltage (heater positive with respect to cathode) of 200 volts; cathode resistor of 150 ohms; and grid-No.1 resistor of 1 megohm.

The 500-hour end-point limits for the 5840 with heater voltage of 6.3 volts, plate supply voltage of 100 volts, grid-No.2 supply voltage of 100 volts, cathode resistor of 150 ohms bypassed by capacitor having a maximum reactance of 3 ohms, and dc heater-cathode voltage of 100 volts with heater either positive or negative with respect to cathode are: transconductance, 3250 micromhos minimum; heater-cathode leakage current, 20 microamperes maximum; and grid-No.1 current, +0.9 microampere maximum or −0.9 microampere maximum.

5718

MEDIUM-MU TRIODE

OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER

Plate-Supply Voltage	100						volts
Plate Load Resistor	0.047		0.10		0.27		meg
Grid-No.1 Resistor[o]	0.10	0.27	0.27	0.47	0.27	0.47	meg
Cathode Resistor	1000	1200	2200	2700	6800	8200	ohms
Sig. Input Volt. (rms)	0.5	0.5	0.5	0.5	0.5	0.5	volt
Output Voltage (rms)	8.2	8.5	8.2	8.2	7.3	7.4	volts
Voltage Gain[▲]	16.4	17.0	16.4	16.4	14.6	14.8	
Distortion	3.9	3.2	3.0	2.7	3.4	2.8	%
Sig. Input Volt. (rms)[*]	0.59	0.70	0.67	0.81	0.75	0.86	volt
Output Voltage (rms)	9.7	11.75	11.0	13.1	11.0	12.7	volts
Voltage Gain[▲]	16.4	16.8	16.4	16.2	14.6	14.8	
Distortion	4.5	4.7	4.1	4.6	5.0	5.0	%

Plate-Supply Voltage	200						volts
Plate Load Resistor	0.047		0.10		0.27		meg
Grid-No.1 Resistor[o]	0.10	0.27	0.27	0.47	0.27	0.47	meg
Cathode Resistor	820	1000	1800	2200	4700	5600	ohms
Sig. Input Volt. (rms)	1.0	1.0	1.0	1.0	1.0	1.0	volt
Output Voltage (rms)	19.0	19.5	18.6	18.1	16.2	16.2	volts
Voltage Gain[▲]	19.0	19.5	18.6	18.1	16.2	16.2	
Distortion	4.0	3.3	3.2	3.1	3.8	3.2	%
Sig. Input Volt. (rms)[*]	1.23	1.45	1.43	1.56	1.34	1.58	volts
Output Voltage (rms)	23.4	28.0	26.0	28.2	21.6	25.0	volts
Voltage Gain[▲]	19.0	19.3	18.2	18.1	16.1	15.8	
Distortion	5.0	5.0	4.9	5.0	5.1	5.1	%

[o] of following stage.

[▲] Ratio of signal output to signal input.

[*] Maximum value to swing the grid of resistance-coupled amplifier tube to the point where its grid No.1 starts to draw current.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.

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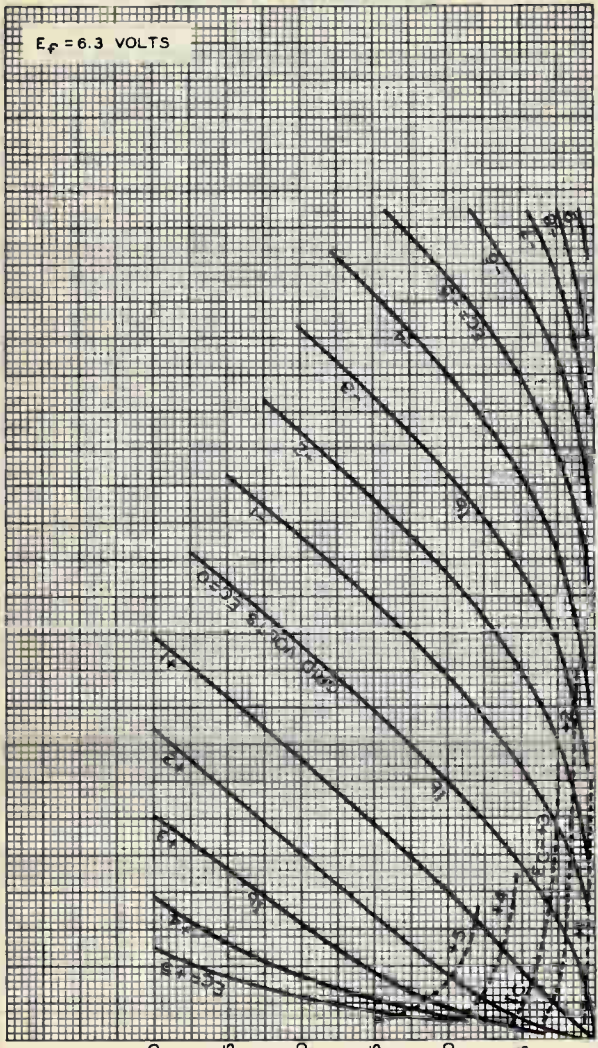
5718

AVERAGE PLATE CHARACTERISTICS



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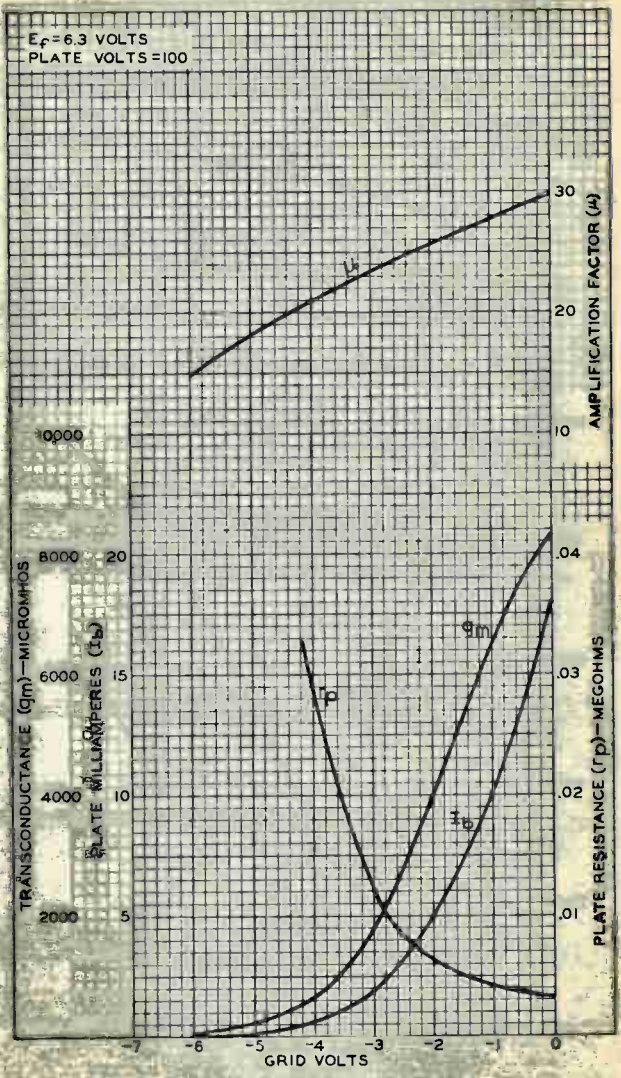
5718

AVERAGE CHARACTERISTICS



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5718

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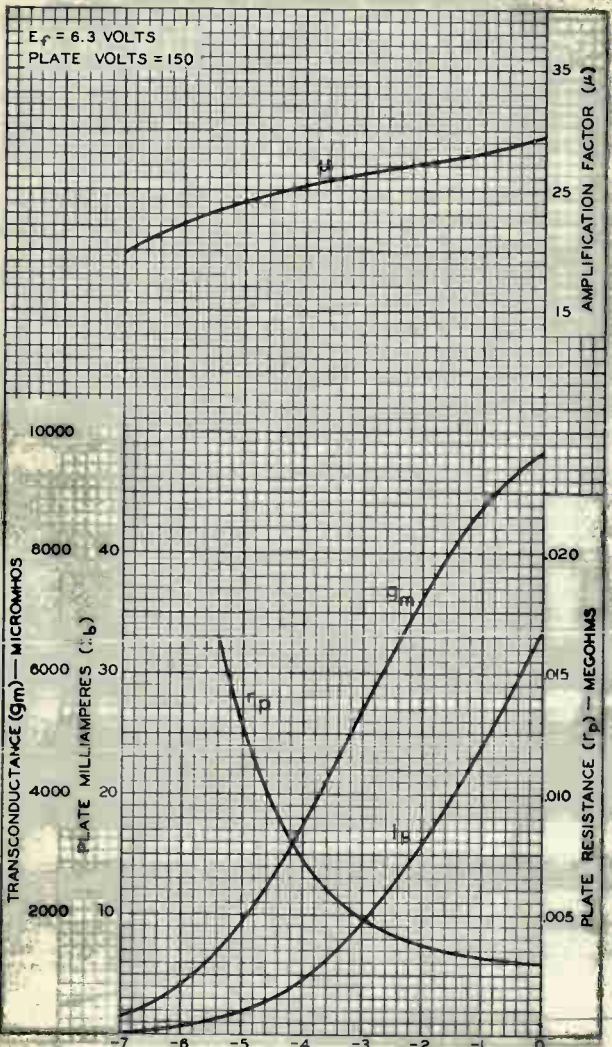
5718

AVERAGE CHARACTERISTICS



APRIL 22, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7851R1

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5719

PREMIUM TYPE 5719

HIGH-MU TRIODE

SUBMINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 5%	ac or dc volts
Current	0.150	amp

Direct Interelectrode Capacitances:

	With External Shield°	Without External Shield	
Grid to Plate	0.8	0.8	μμf
Input	1.9	1.7	μμf
Output	2.2	0.6	μμf

° Having inside diameter of 0.405" and connected to cathode.

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	100	150	volts
Cathode Resistor	1500	680	ohms
Amplification Factor	70	70	
Plate Resistance	41000	30500	ohms
Transconductance	1700	2300	μmhos
Plate Current	0.73	1.85	ma
Grid volts (Approx.) for plate current of 10 μamp	-2.5	-3.8	volts

Mechanical:

Operating Position	Any
Maximum Bulb Length	1-3/8"
Length from Button Seal to Bulb Top (Excluding tip)	1.075" ± 0.060"
Diameter	0.383" ± 0.017"
Bulb	T-3
Leads, Flexible	8
Length	1-1/2" to 1-3/4"
Orientation and Diameter	See Dimensional Outline in GENERAL SECTION

BOTTOM VIEW

Lead No.1 – Grid
Lead No.2 – No Conn.
Lead No.3 – Heater
Lead No.4 – No Conn.
Lead No.5 – Cathode
Lead No.6 – Heater
Lead No.7 – No Conn.
Lead No.8 – Plate

AMPLIFIER – Class A_1

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	165 max.	volts

5719

HIGH-MU TRIODE

GRID VOLTAGE	-55 max.	volts
PLATE CURRENT	3.3 max.	ma
PLATE DISSIPATION	0.55 max.	watt
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	1.2 max.	megohms
For fixed-bias operation	Not recommended	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

	Note	Min.	Max.	
Heater Current	1	0.138	0.162	amp
Grid-to-Plate Capacitance	2	0.6	1.0	μμf
Input Capacitance	2	1.2	2.2	μμf
Output Capacitance	2	0.4	0.8	μμf
Amplification Factor	1,3	60	80	
Plate Current	1,3	0.5	0.9	ma
Plate Current	1,4	–	50	μamp
Transconductance	1,3	1400	2000	μmhos
Transconductance	5,3	1300	–	μmhos
Grid Current	1,6	–	±0.3	μamp
Heater–Cathode Leakage Current:				
Heater negative with respect to cathode	1,7	–	7.0	μamp
Heater positive with respect to cathode	1,7	–	7.0	μamp
Leakage Resistance:				
Between Grid and All Other Electrodes Tied Together	1,8	100	–	megohms
Between Plate and All Other Electrodes Tied Together	1,9	100	–	megohms

* Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield.

Note 3: With plate supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode bypass capacitor of 1000 microfarads.

5719

HIGH-MU TRIODE

Note 4: With dc plate voltage of 100 volts, and dc grid voltage of −2.5 volts.

Note 5: With 5.7 volts ac or dc on heater.

Note 6: With plate supply voltage of 100 volts, cathode resistor of 1500 ohms, cathode bypass capacitor of 1000 microfarads and grid resistor of 0.1 megohm.

Note 7: With 100 volts dc between heater and cathode.

Note 8: With grid 100 volts negative with respect to all other electrodes tied together.

Note 9: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 450 max. g

Tubes are held rigid in three different positions in a Navy Type, High Impact (Flyweight) Shock Machine and are subjected to 450 g impact acceleration.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

Uniform Acceleration Rating: . . . . . 1000 max. g

Tubes are subjected in each of three positions to a gradually applied uniform acceleration up to 1000 g.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 25 max. mv

Under the following conditions: A 150-volt plate voltage supply having an impedance not exceeding that of a 40 μf capacitor, plate load resistance of 10000 ohms, grid resistor of 0.1 megohm, cathode resistor of 1500 ohms, cathode bypass capacitor of 1000 μf, and vibrational acceleration of 15 g at 40 cps.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . . 2500 min. cycles

Under the following conditions: With heater voltage of 7.0 volts cycled 1 minute on and 4 minutes off, heater-cathode voltage of 140 volts (rms), and plate and grid voltage = 0 volts.

Average Life Performance:

The average life performance based on a 500-hour test at 175°C ambient temperature is not less than 450 hours. This life test is made on sample lot of tubes with heater voltage of 6.3 volts; plate supply voltage of 100 volts; dc heater-cathode voltage (heater positive with respect to cathode) of 200 volts; cathode resistor of 1500 ohms; and grid resistor of 1 megohm.

The 500-hour end-point limits for the 5719 with heater voltage of 6.3 volts, plate supply voltage of 100 volts, cathode resistor of 680 ohms bypassed by capacitor having a maximum reactance of 3 ohms, and dc heater-cathode voltage of 100 volts with heater either positive or negative with respect to cathode are: transconductance, 1000 micromhos minimum; heater-cathode leakage current, 20 microamperes maximum; and grid current, +0.9 microampere maximum or −0.9 microampere maximum.

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5719

HIGH-MU TRIODE

OPERATING CONDITIONS AS RE-

Cathode-Bias

Plate Supply Voltage	100				
Plate Load Resistor	0.1	0.1	0.27	0.27	0.47
Grid Resistor[O]	0.27	0.47	0.47	1.0	0.47
Cathode Resistor	2700	2700	5600	6800	10000
Signal Input Volts (rms)	0.1	0.1	0.1	0.1	0.1
Output Volts (rms)	3.7	3.9	4.1	4.2	3.95
Gain[Δ]	37	39	41	42	39.5
Distortion	2.4	2.1	2.1	1.8	2.4
Signal Input Volts (rms)[*]	0.20	0.20	0.20	0.26	0.20
Output Volts (rms)	7.3	7.7	8.1	10.7	7.8
Gain[Δ]	36.5	38.5	40.5	41.2	39
Distortion	5.0	4.5	4.3	4.9	5.0

Zero-Bias

Plate-Supply Voltage	100				
Plate Load Resistor	0.1	0.1	0.27	0.27	0.47
Grid Resistor[O]	0.27	0.47	0.47	1.0	0.47
Signal Input Volts (rms)	0.1	0.1	0.1	0.1	0.1
Output Volts (rms)	3.8	4.0	4.3	4.55	4.2
Gain[Δ]	38	40	43	45.5	42
Distortion	2.2	2.0	1.9	1.6	2.1
Signal Input Volts (rms)[*]	0.2	0.21	0.22	0.26	0.2
Output Volts (rms)	7.25	7.9	8.95	11	7.9
Gain[Δ]	36.2	37.6	40.6	42.4	39.5
Distortion	5.0	4.8	4.9	4.8	4.8

Note 1: Coupling capacitors should be selected to give desired frequency response. Cathode resistor should be adequately bypassed.

[O] of following stage.

5719

HIGH-MU TRIODE

SISTANCE-COUPLED AMPLIFIER

Operation

			200				volts
0.47	0.1	0.1	0.27	0.27	0.47	0.47	megohm
1.0	0.27	0.47	0.47	1.0	0.47	1.0	megohm
10000	1500	1800	3300	3900	5600	6800	ohms
0.1	0.1	0.1	0.1	0.1	0.1	0.1	volt
4.3	4.4	4.6	4.9	5.0	4.8	5.0	volts
43	44	46	49	50	48	50	
1.7	0.7	0.7	0.9	0.7	0.9	0.7	per cent
0.25	0.51	0.61	0.50	0.59	0.49	0.64	volt
10.7	22	27	24.2	29	23.2	31.6	volts
42.8	43.1	44.3	48.4	49.2	47.3	49.4	
4.5	3.9	5.0	4.5	4.5	5.0	5.0	per cent

Operation

			200				volts
0.47	0.1	0.1	0.27	0.27	0.47	0.47	megohm
1.0	0.27	0.47	0.47	1.0	0.47	1.0	megohm
0.1	0.1	0.1	0.1	0.1	0.1	0.1	volt
4.55	4.7	4.9	5.35	5.4	5.2	5.4	volts
45.5	47	49	53.5	54	52	54	
1.6	0.4	0.4	0.8	0.7	0.9	0.7	per cent
0.27	0.59	0.63	0.54	0.65	0.5	0.63	volt
11.3	25	27.7	25.8	31.5	23.5	30.5	volts
41.8	42.4	43.9	47.7	48.5	47	48.4	
5.0	4.9	5.0	4.9	5.0	5.0	4.8	per cent

* Maximum value to swing the grid of resistance-coupled amplifier tube to the point where its grid starts to draw current.

▲ Ratio of signal output to signal input.

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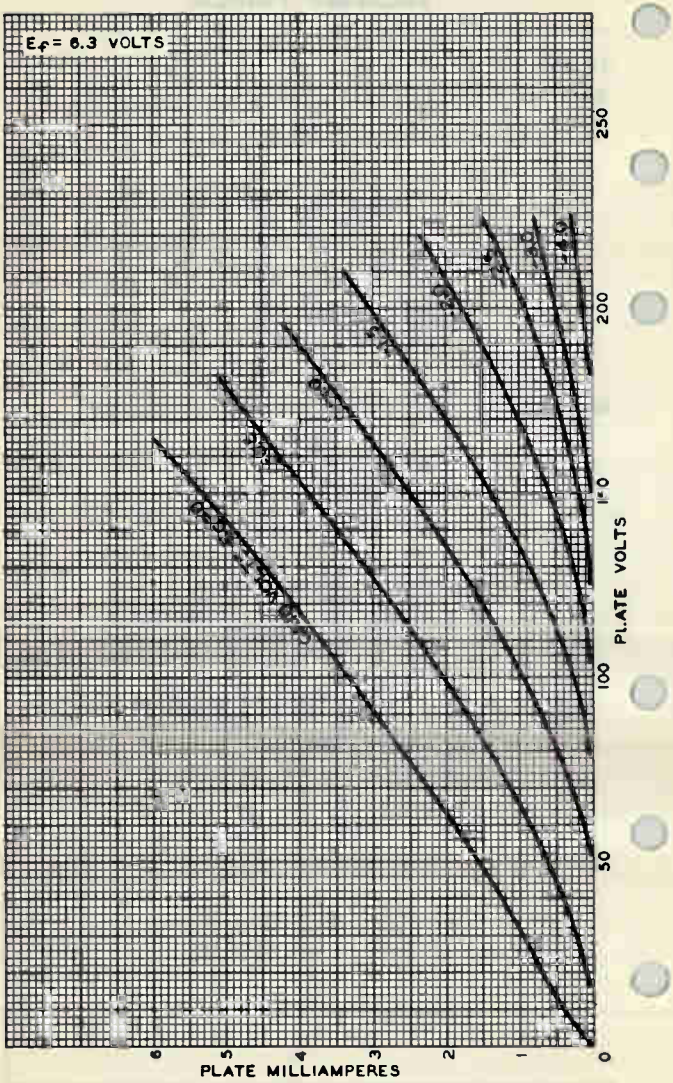
5719

AVERAGE PLATE CHARACTERISTICS



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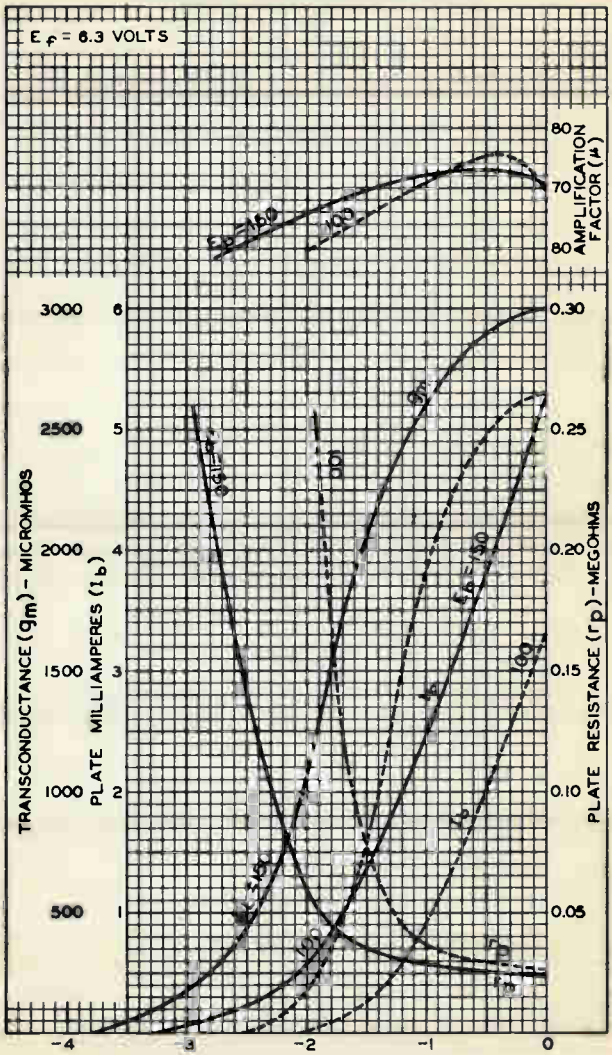
5719

AVERAGE CHARACTERISTICS



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5725

PREMIUM TYPE 5725

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount. This "premium" type is similar to the 6AS6.

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.175	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to plate	0.02 max.	μμf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	3.9	μμf
Plate to cathode & internal shield, grid No.3, grid No.2, and heater	3	μμf
Grid No.1 to grid No.3	0.15 max.	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	120	volts
Grid-No.3 (Suppressor-Grid) Voltage	0	volts
Grid-No.2 (Screen-Grid) Voltage	120	volts
Grid-No.1 (Control-Grid) Voltage	-2	volts
Transconductance:		
Grid No.1 to plate	3200	μmhos
Grid No.3 to plate	470	μmhos
Plate Current	5.2	ma
Grid-No.2 Current	3.5	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CM

Pin 1 - Grid No.1
Pin 2 - Cathode, Internal Shield
Pin 3 - Heater

Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Grid No.3

AMPLIFIER - Class A_1

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	200 max.	volts

[o] With external shield JETEC No.316 connected to cathode.

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5725

SHARP-CUTOFF PENTODE

GRID-No.3 (SUPPRESSOR-GRID VOLTAGE):			
Positive bias value		30 max.	volts
Negative bias value		55 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE		155 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value		0 max.	volts
Negative bias value		55 max.	volts
GRID-No.3 CURRENT		0.2 max.	ma
CATHODE CURRENT		20 max.	ma
GRID-No.2 INPUT		0.55 max.	watt
PLATE DISSIPATION		1.65 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode		100 max.	volts
Heater positive with respect to cathode		100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)		165 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance		0.1 max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN•

Values are Initial, Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	160	190	ma
Direct Interelectrode Capacitances:				
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	2	3.5	4.5	μμf
Plate to cathode & internal shield, grid No.3, grid No.2, and heater	2	2.6	3.4	μμf
Plate Current (1)	1,3	2.5	9	ma
Plate Current (2)	1,4	–	200	μa
Plate Current (3)	1,5	5	–	μa
Plate Current (4)	1,6	–	200	μa
Plate Current (5)	1,7	5	–	μa
Grid-No.2 Current	1,3	1.5	5.5	ma
Transconductance (1), Grid No.1 to Plate	1,3	2500	4500	μmhos
Transconductance (1), at 500 hours	1,3	2200	4500	μmhos
Transconductance (2), Grid No.1 to Plate	1,8	700	1700	μmhos
Transconductance (3), Grid No.3 to Plate	1,9	400	1150	μmhos
Transconductance Change	10	–	15	%

• Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Notes 1 to 10: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5725

SHARP-CUTOFF PENTODE

	Note	Min.	Max.	
Transconductance Change at 500 hours.	10	–	15	%
Reverse Grid Current.	1,11	–	0.1	μa
Reverse Grid Current at 500 hours.	1,11	0	0.1	μa
Grid Emission Current	12	–	1	μa
Heater–Cathode Leakage Current:				
Heater 100 volts negative with respect to cathode . .	1	–	10	μa
Heater 100 volts positive with respect to cathode . .	1	–	10	μa
Heater–Cathode Leakage Current at 500 hours:				
Heater 100 volts negative with respect to cathode . .	1	–	10	μa
Heater 100 volts positive with respect to cathode . .	1	–	10	μa
Leakage Resistance:				
Between grid No.1 and all other electrodes tied together.	1,13	100	–	megohms
Between grid No.3 and all other electrodes tied together.	1,14	100	–	megohms
Between plate and all other electrodes tied together.	1,15	100	–	megohms
Leakage Resistance at 500 hours:				
Between grid No.1 and all other electrodes tied together.	1,13	50	–	megohms
Between grid No.3 and all other electrodes tied together.	1,14	50	–	megohms
Between plate and all other electrodes tied together.	1,15	50	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With external shield JETEC No.316 connected to cathode.

Note 3: With plate volts = 120, grid–No.3 volts = 0, grid–No.2 volts = 120, and grid–No.1 volts = –2.

Note 4: With plate volts = 120, grid–No.3 volts = –10, grid–No.2 volts = 120, and grid–No.1 volts = –3.

Note 5: With plate volts = 120, grid–No.3 volts = –6, grid–No.2 volts = 120, and grid–No.1 volts = –3.

Note 6: With plate volts = 120, grid–No.3 volts = 0, grid–No.2 volts = 120, and grid–No.1 volts = –8.

Note 7: With plate volts = 120, grid–No.3 volts = 0, grid–No.2 volts = 120, and grid–No.1 volts = –6.

Notes 8 to 15: See next page.

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5725

SHARP-CUTOFF PENTODE

Note 8: With plate volts = 120, grid-No.3 volts = -5, grid-No.2 volts = 120, and grid-No.1 volts = -2.

Note 9: With plate volts = 120, grid-No.3 volts = -3, grid-No.2 volts = 120, and grid-No.1 volts = -2.

Note 10: With 5.7 volts ac or dc on heater, plate volts = 120, grid-No.3 volts = 0, grid-No.2 volts = 120, and grid-No.1 volts = -2.

Note 11: With plate volts = 120, grid-No.3 volts = 0, grid-No.2 volts = 120, grid-No.1 volts = -2, and grid-No.1-circuit resistance (megohms) = 0.1.

Note 12: With 7.5 volts ac or dc on heater, plate volts = 120, grid-No.3 volts = 0, grid-No.2 volts = 120, grid-No.1 volts = -10, and grid-No.1-circuit resistance (megohms) = 0.1.

Note 13: With grid-No.1 volts = -100, and all other electrodes connected to ground.

Note 14: With grid-No.3 volts = -100, and all other electrodes connected to ground.

Note 15: With plate volts = -300, and all other electrodes connected to ground.

SPECIAL RATINGS AND PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 450 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are tested in four different positions. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for reverse grid current, low-frequency vibration, heater-cathode leakage current, and transconductance.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 150 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: heater voltage of 6.3 volts ac or dc, plate volts = 120, grid-No. 3 volts = 0, grid-No.2 volts = 120, grid-No.1 volts = -2, plate load resistance (ohms) = 10,000, and vibrational acceleration of 2.5 g at 25 cycles per second.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5725

SHARP-CUTOFF PENTODE

Heater-Cycling Life Performance:

Cycles of Intermittent Operation. . . . 2000 min. cycles

Under the following conditions: heater voltage of 7.5 volts cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other electrodes connected to ground.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage. . . . . 175 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: heater voltage of 6.3 volts ac or dc, plate-supply volts = 200, grid-No.3 supply volts = 0, grid-No.2 supply volts = 200, grid-No.1 volts = 0, plate load resistance (megohms) = 0.1, grid-No.2-circuit resistance (megohms) = 0.5, cathode resistor (ohms) = 1000, grid-No.2 bypass capacitor (μf) = 2, and cathode bypass capacitor (μf) = 1000. The output voltage of a tube, when tapped, will not cause a reading on a VU output meter greater than that produced when a calibrating signal of 175 millivolts RMS is applied to the plate of the tube.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1 microampere under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid current.

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. Tubes are checked for transconductance under conditions of maximum rated plate dissipation. At the end of 1 hour, the value of transconductance is read. The variation in transconductance from the 0-hour reading will not exceed 10 per cent.

100-Hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run under conditions of maximum rated plate dissipation to insure a low percentage of early inoperatives. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, a value of reverse grid current in excess of 1 microampere, or a transconductance (1) value of less than 2200 micromhos under the conditions specified in CHARACTERISTICS RANGE VALUES.

500-Hour Intermittent Life Performance:

This test is made on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: heater voltage of 6.3 volts ac or dc, plate-supply volts = 180, grid-No.3 supply volts = 0, grid-No.2 supply volts = 125, grid-No.1 volts = 0, grid-No.1-circuit resistance (megohms) = 0.1, cathode resistor (ohms) = 130, heater 135 volts positive with respect to cathode, and bulb temperature (^{o}C) = 165. At the end of 500 hours, tubes will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass the established initial limits for heater current, reverse grid current and heater-cathode leakage current, and 500-hour limits for transconductance (1), transconductance change, and leakage resistance as shown under CHARACTERISTICS RANGE VALUES.

Curves shown under Type 6AS6 also apply to the 5725

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5726 PREMIUM TYPE

5726

TWIN DIODE

MINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount.

The 5726 is a "premium" version of the 6AL5W.

GENERAL DATA

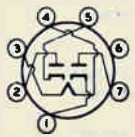
Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.3	amp
Resonant Frequency (Each unit, approx.)	700	Mc
Direct Interelectrode Capacitances (With external shield JETEC No.316):		
Unit No.1:		
Plate to Cathode + External Shield, Heater, and Internal Shield	3.2	μμf
Cathode to Plate + External Shield, Heater, and Internal Shield	3.9	μμf
Unit No.2:		
Plate to Cathode + External Shield, Heater, and Internal Shield	3.2	μμf
Cathode to Plate + External Shield, Heater, and Internal Shield	3.9	μμf
Plate of Unit No.1 to Plate of Unit No.2*	0.026 max.	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)

BOTTOM VIEW



Pin 1 – Cathode of Diode Unit No.1
Pin 2 – Plate of Diode Unit No.2
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Cathode of Diode Unit No.2
Pin 6 – Internal Shield
Pin 7 – Plate of Diode Unit No.1

HALF-WAVE RECTIFIER

Maximum Ratings, *Absolute Values*:

PEAK INVERSE PLATE VOLTAGE	360 max.	volts
PEAK PLATE CURRENT PER PLATE	60 max.	ma

* With external and internal shield connected to ground.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5726

5726

TWIN DIODE

HOT-SWITCHING TRANSIENT PLATE CURRENT		
For duration of 0.2 second maximum . . .	350 max.	ma
DC OUTPUT CURRENT PER PLATE	10 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	360 max.	volts
Heater positive with respect to cathode	360 max.	volts

Typical Operation:

The two units may be used separately or in parallel

AC Plate-Supply Voltage Per Plate (RMS)	117	volts
Minimum Total Effective Plate-Supply Impedance Per Plate	300	ohms
DC Output Current Per Plate	9	ma

Shock and Vibration Tests:

These tests are made as indicated in the JAN Specifications: JAN 1-A for Electron Tubes, May 1946 under the section as follows:

Section F6b (9e) Shock Test:		
Instantaneous Impact Acceleration . .	700 max.	g
Section F6b (9f) Vibration Test:		
Vibrational Acceleration	2.5 max.	g

Heater Cycling Life Test:

This test is made as indicated in the JAN Specifications JAN 1-A for Electron Tubes for type 5726/6AL5W.

Cycles of Intermittent Operation:		
At a heater voltage of 7.5 volts . . .	2000 min.	cycles

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.275	0.325	amp
Direct Interelectrode Capacitances (With external shield JETEC No.316):				
Unit No.1:				
Plate to Cathode + External Shield, Heater, and Internal Shield	-	2.4	4.0	μμf
Cathode to Plate + External Shield, Heater, and Internal Shield	-	2.8	4.4	μμf
Unit No.2:				
Plate to Cathode + External Shield, Heater, and Internal Shield	-	2.4	4.0	μμf
Cathode to Plate + External Shield, Heater, and Internal Shield	-	2.8	4.4	μμf

5726

TWIN DIODE

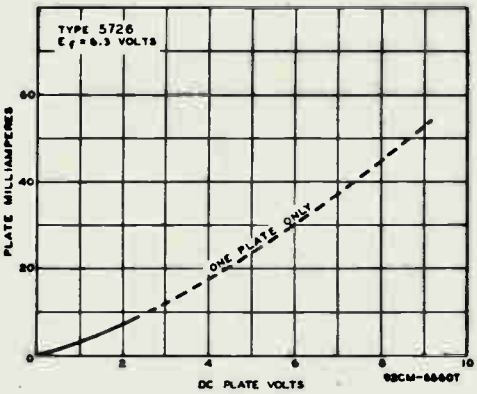
	Note	Min.	Max.	
Plate of Unit No.1 to Plate of Unit No.2	2	–	0.026	μμf
Plate Current (Per Plate) . . .	1,3	40	–	ma

Note 1: With 6.3 volts ac on heater.

Note 2: With external and internal shield connected to ground.

Note 3: With dc plate voltage = 10 volts. Each unit tested separately with electrodes of opposite unit grounded.

AVERAGE PLATE CHARACTERISTIC



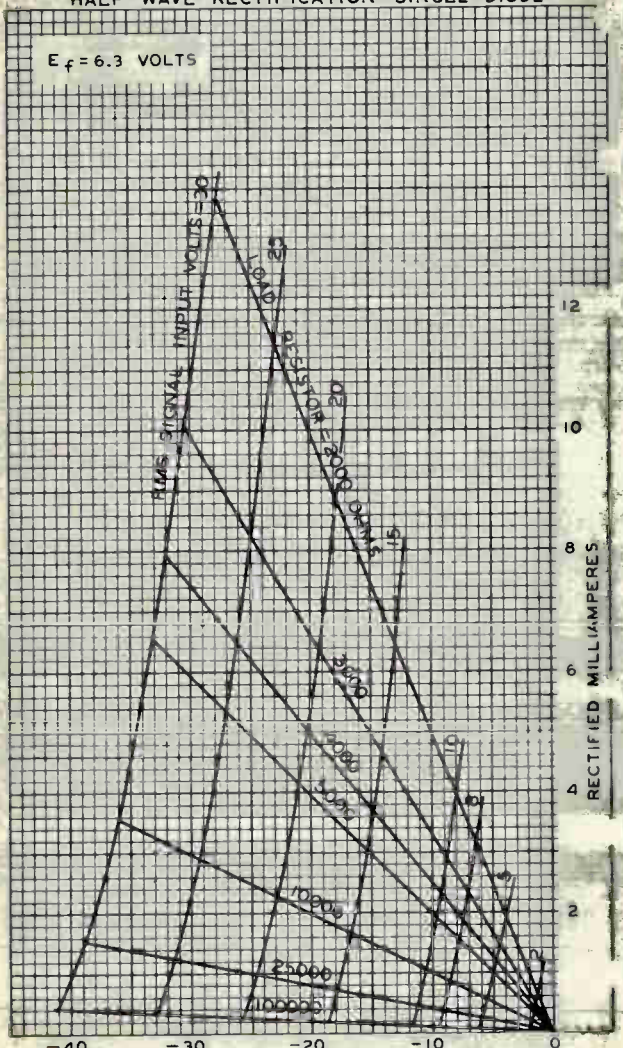
5726

RCA

5726

AVERAGE CHARACTERISTICS

HALF-WAVE RECTIFICATION - SINGLE DIODE



5734
MECHANO-ELECTRONIC TRANSDUCER

TRIODE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
Voltage . . . . . 6.3 . . . . . ac or dc volts
Current . . . . . 0.15 . . . . . amp

Mechanical:

Mounting Position . . . . . Any
Maximum Angular Deflection of Plate Shaft . . . . ±0.5 degree
Maximum Overall Length (Excluding flexible leads) . . . . . 1.300"
Maximum Diameter . . . . . 0.328"
Envelope . . . . . Metal Shell MT-2-1/4
Terminal Connections, BOTTOM VIEW

Lead 4 – Heater
Lead 5 – Grid
Lead 6 – Heater

Lead 7 – Cathode, Internal Shield
Shell – Plate

Maximum Ratings, *Design-Center Values*:

DC PLATE-SUPPLY VOLTAGE	300	max.	volts
DC PLATE CURRENT	5	max.	ma
PLATE DISSIPATION	0.4	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	90	max.	volts
Heater positive with respect to cathode	90	max.	volts

Typical Operation:

DC Plate-Supply Voltage	300	volts
DC Grid Voltage	0	volts
Amplification Factor▲	20	
Plate Resistance▲	72000	ohms
Transconductance▲	275	micromhos
DC Plate Current▲	1.5	ma
Load Resistance	75000	ohms
Deflection Sensitivity♦	40 2300	volts/degree volts/radian
Moment of Inertia of Plate●	3.4	milligram cm²
Rotational Compliance of Diaphragm●	0.0013×10^{-3} 0.075	radian/dyne cm degree/gram cm

▲ For plate shaft in undeflected position.

♦ Average change in voltage across 75000-ohm plate-load resistor when the plate shaft is deflected from −0.5 to +0.5 degree. The plane of deflection of the plate shaft must coincide with the plane through terminal No.5 and the axis of the tube.

● Based on external plate-shaft length of 1/8" and the center of the diaphragm as pivot.

5734

RCA

5734

MECHANO-ELECTRONIC TRANSDUCER

OPERATING PRINCIPLES

The plate shaft extends through the center of a thin metal diaphragm. Angular displacement of the plate shaft changes the distance between the fixed grid and the plate and results in a change in the plate current. The plane of deflection of the plate shaft coincides with the plane through terminal No.5 and the axis of the tube.

The part of the plate shaft within the tube has a minimum free cantilever resonance of 12000 cycles per second permitting, with suitable mechanical coupling to the external end of the plate shaft, measurements of vibration up to 12000 cycles per second.

OPERATING NOTES

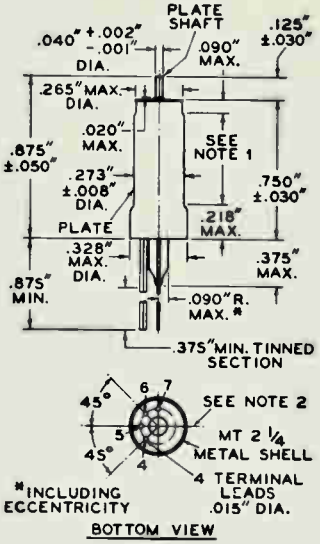
The 5734 may be mounted by means of a supporting clamp which should firmly grip the metal shell of the tube within the designated clamping space indicated on the Outline Drawing. It is essential, however, that the pressure exerted on the shell by the clamp be held to a minimum to prevent possible fracture of the seals.

Under no circumstances should the plate shaft be displaced from its normal position by more than 0.5 degree. A larger displacement of the plate shaft will distort the flexible diaphragm and may damage the tube electrodes.

A non-corrosive flux must be used in soldering the actuating stylus to the plate shaft. Unless this precaution is observed, the plate shaft and the diaphragm will be damaged.

5734

MECHANO-ELECTRONIC TRANSDUCER



BOTTOM VIEW

NOTE 1: TUBE SUPPORTING CLAMP ON METAL SHELL MUST BE WITHIN THIS SPACE, AND SHOULD BE FASTENED ONLY TIGHT ENOUGH TO INSURE GOOD CONTACT FOR THE PLATE CONNECTION.

NOTE 2: THE PLANE OF DEFLECTION OF THE PLATE SHAFT WILL COINCIDE WITH THE PLANE THROUGH TERMINAL LEAD No. 5 AND THE AXIS OF THE TUBE.

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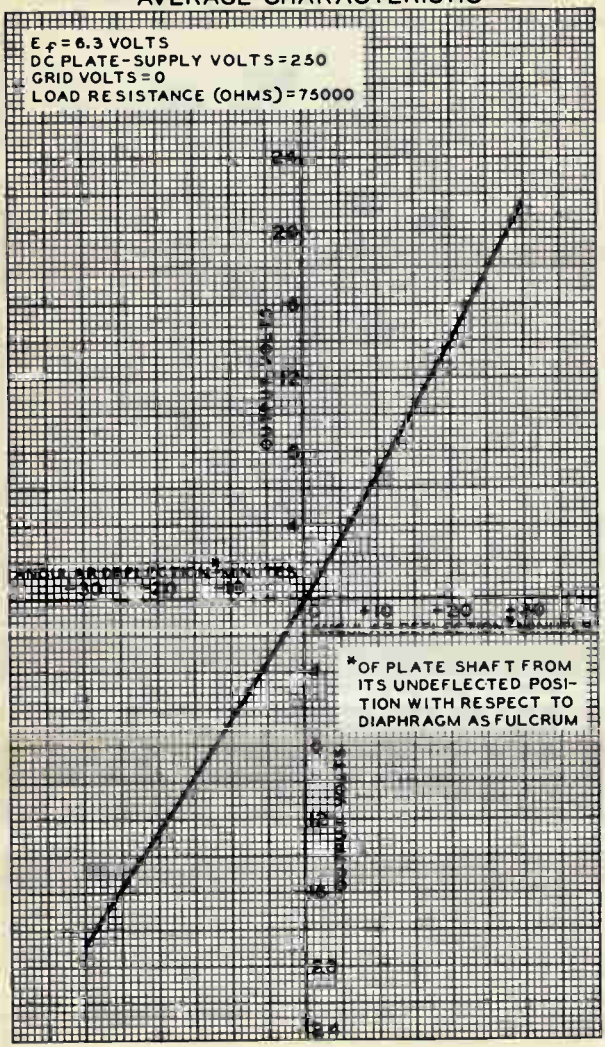
RCA

5734

AVERAGE CHARACTERISTIC



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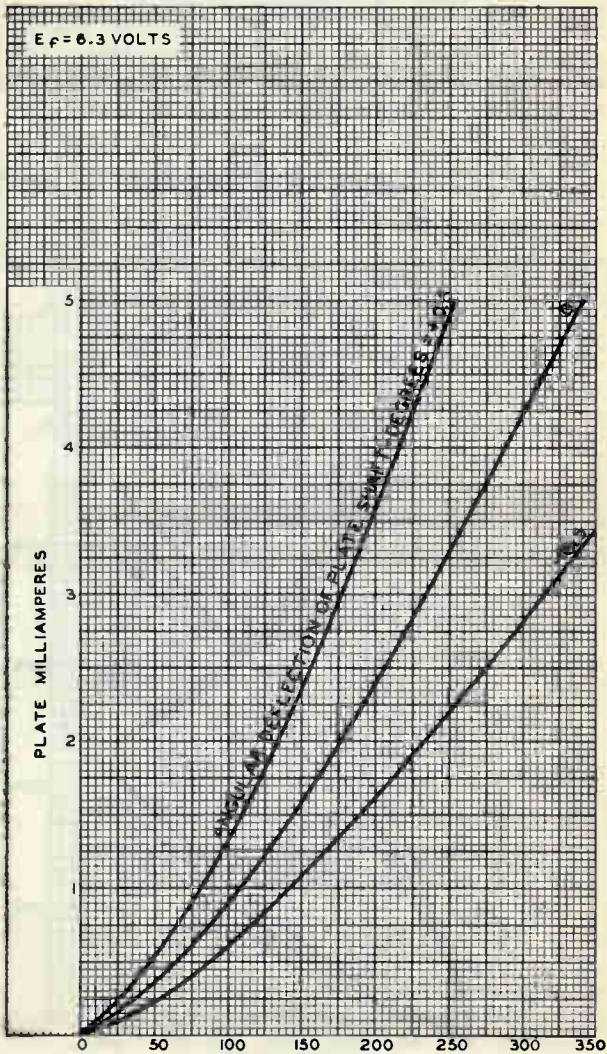
5734

AVERAGE CHARACTERISTICS



5734

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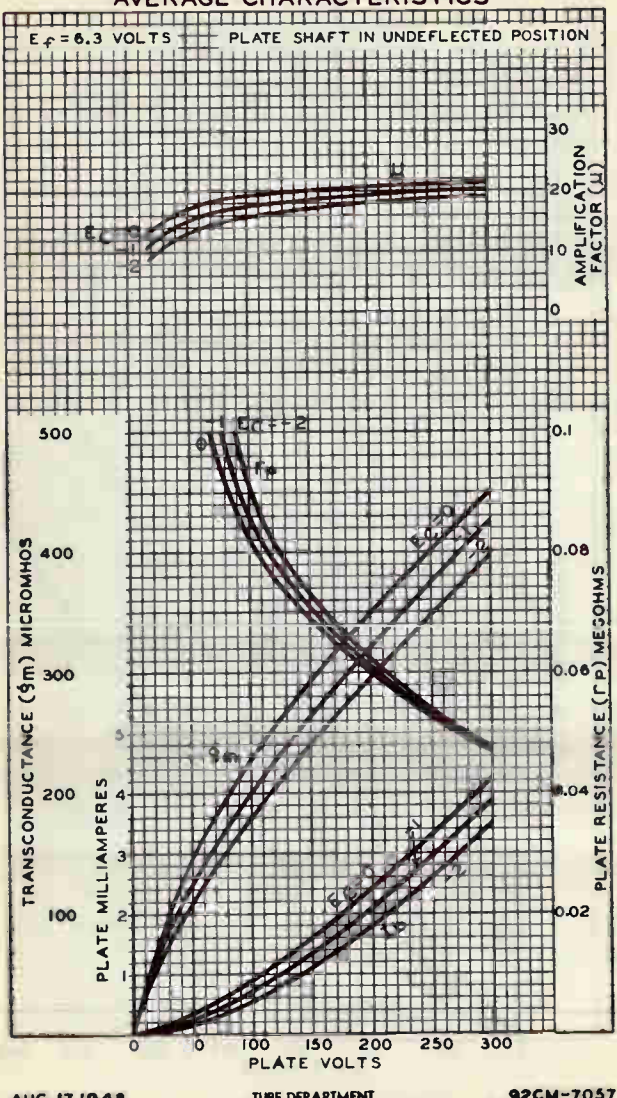
5734

AVERAGE CHARACTERISTICS



RCA

5750

PREMIUM TYPE 5750

PENTAGRID CONVERTER

7-PIN MINIATURE TYPE

For use as a combined mixer and oscillator tube particularly in mobile and aircraft communications receivers in which dependability is paramount. This "premium" type is similar to the 6BE6.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:[o]		
Grid No.3 to all other electrodes (RF input)	7.1	μμf
Plate to all other electrodes (Mixer input)	7.6	μμf
Grid No.1 to all other electrodes (Oscillator input)	5.5	μμf
Grid No.3 to plate	0.3 max.	μμf
Grid No.3 to grid No.1	0.15 max.	μμf
Grid No.1 to cathode & grid No.5	3	μμf
Cathode & grid No.5 to all other electrodes except grid No.1	15	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CH

Pin 1 - Grid No.1
Pin 2 - Cathode, Grid No.5
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2, Grid No.4
Pin 7 - Grid No.3

CONVERTER

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
GRIDS-No.2 & No.4 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts

[o]: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5750

5750

PENTAGRID CONVERTER

GRIDS-No.2 & No.4 VOLTAGE	110 max.		volts
TOTAL CATHODE CURRENT	15.5 max.		ma
GRIDS-No.2 & No.4 INPUT	1.1 max.		watts
PLATE DISSIPATION	1.1 max.		watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	100 max.		volts
Heater positive with respect to cathode	100 max.		volts
BULB TEMPERATURE (At hottest point on bulb surface)	165 max.		°C

Characteristics:

	With Separate Excitation[*]		
Plate Voltage	100	250	volts
Grids-No.2 & No.4 Voltage	100	100	volts
Grid-No.3 Voltage	-1.5	-1.5	volts
RMS Grid-No.1 (Oscillator-grid) Voltage	10	10	volts
Grid-No.1 Resistor	20000	20000	ohms
Plate Resistance (Approx.)	0.4	1	megohm
Conversion Transconductance	455	475	μmhos
Plate Current	2.6	2.6	ma
Grids-No.2 & No.4 Current	7.5	7.5	ma
Grid-No.1 Current	0.5	0.5	ma
Total Cathode Current	10.6	10.6	ma
Grid-No.3 Voltage (Approx.) for conversion transconductance of:			
10 μmhos	-30	-30	volts
100 μmhos	-6	-6	volts

Oscillator Characteristics (Not Oscillating):[■]

Plate & Grids-No.2 & No.4 Voltage	100	volts
Grid-No.3 Voltage	0	volts
Grid-No.1 Voltage	0	volts
Amplification Factor[§]	22.5	
Oscillator Transconductance[§]	7800	μmhos
Cathode Current	25	ma
Grid-No.1 Voltage (Approx.) for plate μa. = 10	-11	volts

[○] Without external shield.

[*] The characteristics shown with separate excitation correspond very closely with those obtained in a self-excited oscillator circuit operating with zero bias.

[■] With grids No.2 & No.4 connected to plate.

[§] Between grid No.1 and grids No.2 & No.4 connected to plate.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration	450 max.	g

This test is performed in a Navy-Type, High-Impact (fly-

5750

PENTAGRID CONVERTER

weight) Shock Machine.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g
This test is performed for a period of 100 hours minimum at a frequency of 25 cycles per second.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . . 2000 min. cycles
Under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground.

CURVES
shown under Type 6BE6 in the Receiving-Tube Section also apply to the 5750

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

5751

PREMIUM TYPE 5751

HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

	Series	*Parallel*	
Heater Arrangement			
Voltage (AC or DC)	12.6 ± 10%	6.3 ± 10%	volts
Current	0.175	0.35	amp

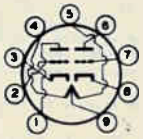
Characteristics, Class A_1 Amplifier:

Plate Voltage	100	250	volts
Grid Voltage	-1	-3	volts
Amplification Factor	70	70	
Plate Resistance	58000	58000	ohms
Transconductance	1200	1200	μmhos
Plate Current	0.9	1.0	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)

BOTTOM VIEW



Pin 1 - Plate of Unit No.2
Pin 2 - Grid of Unit No.2
Pin 3 - Cathode of Unit No.2
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Plate of Unit No.1
Pin 7 - Grid of Unit No.1
Pin 8 - Cathode of Unit No.1
Pin 9 - Heater Mid-Tap

AMPLIFIER - Class A_1

Values are for each unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative bias value	55 max.	volts
Positive bias value	0 max.	volts
PLATE DISSIPATION	0.8 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	165 max.	°C

5751

5751

HIGH-MU TWIN TRIODE

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

	Note	Min.	Max.	
Heater Current	1	0.160	0.190	amp
Amplification Factor	1,2	55	85	
Plate Current	1,2	0.4	1.8	ma
Plate Current	1,3	–	10.5	μamp
Transconductance	1,2	900	1600	μmhos
Reverse Grid Current	1,4	–	0.4	μamp
Heater–Cathode Leakage Current:				
Heater negative with respect to cathode	1,5	–	10	μamp
Heater positive with respect to cathode	1,5	–	10	μamp
Leakage Resistance:				
Between Grid and All Other Electrodes Tied Together	1,6	500	–	megohms
Between Plate and All Other Electrodes Tied Together	1,7	500	–	megohms

* Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Note 1: With 12.6 volts ac or dc on heater (series connected).

Note 2: With dc plate voltage of 250 volts and dc grid voltage of −9 volts. Each unit is tested separately. Electrodes of unit not under test are grounded.

Note 3: With dc plate voltage of 250 volts, plate load resistance of 0.1 megohm, and dc grid voltage of −10.5 volts. Each unit is tested separately. Electrodes of unit not under test are grounded.

Note 4: With dc plate voltage of 250 volts, grid resistor of 1.0 megohm, and dc grid voltage of −9 volts. Each unit is tested separately. Electrodes of unit not under test are grounded.

Note 5: With 100 volts dc between heater and cathode, and units connected in parallel.

Note 6: With grid 100 volts negative with respect to all other electrodes tied together.

Note 7: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 600 max. g

Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 600 g impact acceleration.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

5751

HIGH-MU TWIN TRIODE

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 100 max. mv
Under the following conditions and with units connected in parallel; heater voltage of 12.6 volts (series connected), dc plate voltage of 250 volts, dc grid voltage of -3 volts, plate load resistance of 2000 ohms, and vibrational acceleration of 2.5 g at 25 cycles per second.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . . 2000 min. cycles
Under the following conditions and with parallel heater arrangement: heater voltage of 7.5 volts cycled one minute on and one minute off, heater 100 volts positive with respect to cathode, and plate and grid voltage = 0 volts.

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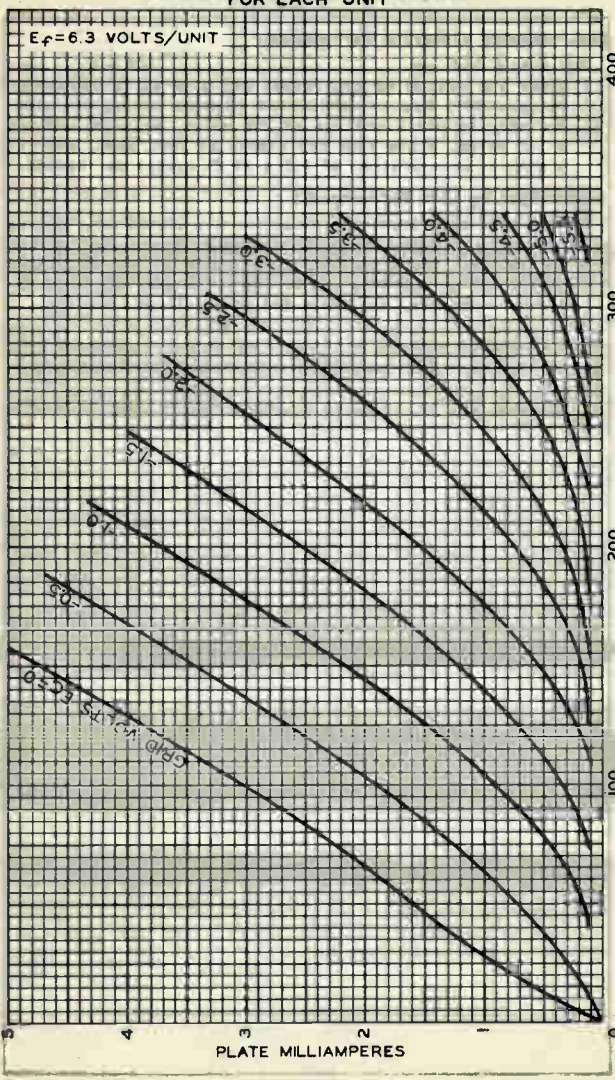
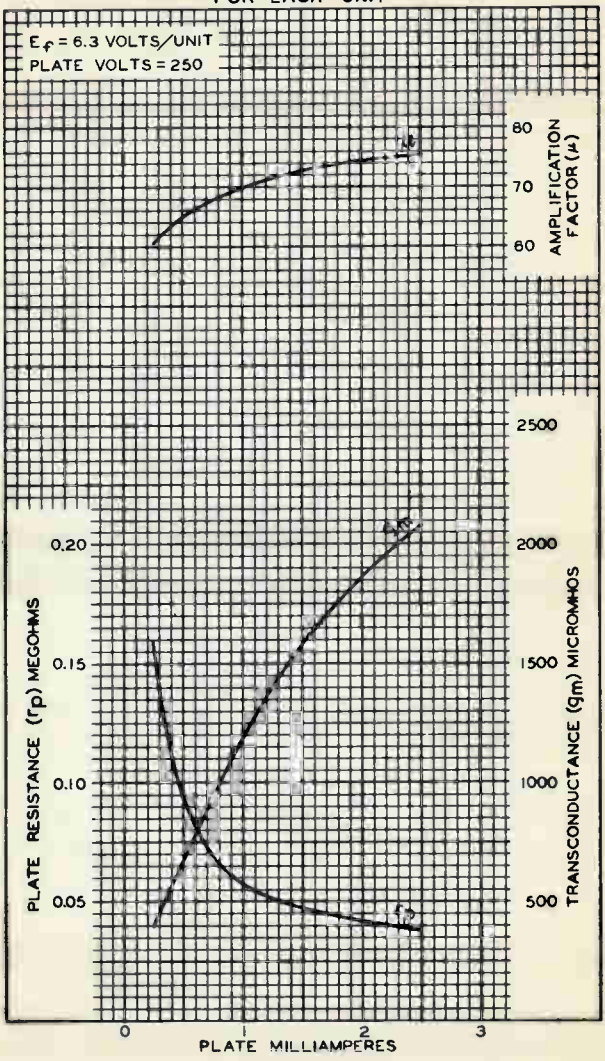
5751

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



5751

AVERAGE CHARACTERISTICS
FOR EACH UNIT



5823

GLOW-DISCHARGE TRIODE

COLD-CATHODE; MINIATURE TYPE

GENERAL DATA

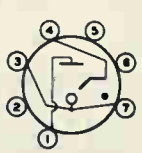
Electrical:

Cathode	Cold	
Ionization Time (Approx.):		
For conditions: Instantaneous anode volts = 185; peak positive starter-electrode pre-firing volts = 70; peak positive starter-electrode triggering volts = 50; anode-circuit series resistor (ohms) = 820; starter-electrode series resistor (ohms) = 100000	20	μsec
Deionization Time (Approx.):		
For conditions: (Same as for *Ionization Time*)	500	μsec
Anode Voltage Drop	62	volts
Starter-Electrode Voltage Drop	61	volts
Anode Breakdown Voltage	290	volts
Starter-Electrode Breakdown Voltage	80	volts
Required Transfer Current (DC or Instantaneous AC) for transition of discharge to anode at 140 volts peak	50	μamp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (excluding tip)	1-1/2" ±3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	4CK

Pin 1 - Anode
Pin 2 - Internal Connection - Do Not Use
Pin 3 - Cathode
Pin 4 - Starter Electrode
Pin 5 - Internal Connection - Do Not Use
Pin 6 - Internal Connection - Do Not Use
Pin 7 - Cathode



Maximum Ratings▲, *Absolute Values*:

For First-Quadrant Operation Only

PEAK ANODE AND STARTER-ELECTRODE VOLTAGE:		
Inverse	200 max.	volts
Forward	200 max.	volts

▲ These ratings apply to the 5823 when it is operated from a power supply having a frequency of 60 cycles per second. If a contemplated application involves higher supply frequencies, please write, stating the proposed operating frequency, to the attention of Commercial Engineering, RCA, Harrison, New Jersey for information as to required changes in maximum ratings and characteristics.

5823

5823
GLOW-DISCHARGE TRIODE

CATHODE CURRENT:		
Peak	100 max.	ma
Average*	25 max.	ma
PEAK STARTER-ELECTRODE CURRENT:		
With starter-electrode voltage positive	100 max.	ma
AMBIENT TEMPERATURE	-60 to +75	°C

Typical Operating Conditions:

For Relay Service with 60-Cycle AC Supply

AC Anode Supply Voltage (RMS)	117	volts
AC Starter-Electrode Voltage:		
Max. Peak Positive Pre-Firing Voltage	70	volts
Min. Peak Positive Triggering Voltage	35	volts
Min. Firing Voltage (Sum of In-Phase Instantaneous Pre-Firing Voltage and Instantaneous Triggering Voltage)	105	volts

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

For First-Quadrant Operation Only

	Note	Min.	Max.	
Anode Breakdown Voltage	1	200	-	volts
Starter-Electrode Breakdown Voltage	2	73	105□	volts
Required Transfer Current (DC or Instantaneous AC) for transition of discharge to anode at 140 volts peak	3	-	400□	μamp
Anode Voltage Drop	4	-	85□	volts
Starter-Electrode Voltage Drop	5	-	75□	volts

Note 1: With a variable dc anode voltage, dc starter-electrode voltage of 0 volts, anode-circuit series resistance of 3000 ohms, and starter-electrode series resistance of 50000 ohms.

Note 2: With dc anode voltage of 0 volts, variable dc starter-electrode voltage, anode-circuit series resistance of 3000 ohms, and starter-electrode series resistance of 50000 ohms.

Note 3: With a variable dc starter-electrode voltage, anode-circuit series resistance of 3000 ohms, and starter-electrode series resistance of 2 megohms.

Note 4: With dc anode voltage of 230 volts, dc starter-electrode voltage of 91 volts, dc cathode current of 50 milliamperes, anode-circuit series resistance of 3000 ohms, and starter-electrode series resistance of 50000 ohms.

Note 5: With dc anode voltage of 0 volts, variable dc starter-electrode voltage, dc starter-electrode current of 10 milliamperes, and starter-electrode series resistance of 3000 ohms.

* Averaged over any interval of 15 seconds maximum.

□ Maximum individual tube values during life.

5823

GLOW-DISCHARGE TRIODE

OPERATING NOTES

RCA-5823 is recommended for operation only in that part of the breakdown characteristic designated by Quadrant I. Operation in Quadrant II is satisfactory but changes in tube ratings are necessary. Operation in Quadrants III and IV is not recommended, because the anode and starter electrode are not designed for efficient cathode operation; their use in this manner will result in unstable operation and shorter tube life. The information given for Quadrants III and IV is of value to the equipment designer in that it indicates the need for precautions to be taken in order that the peak inverse voltage rating is not exceeded.

Because of the asymmetrical shape of its anode characteristic the 5823 can be used as a rectifier. When so used (with starter electrode connected through 50000-ohm resistor to anode), the 5823 has a maximum peak inverse anode voltage rating of 200 volts, a maximum peak cathode current of 100 milliamperes, and a maximum dc cathode current of 25 milliamperes. Operation at values of dc cathode current less than 8 milliamperes is not recommended because of resulting instability.

5823

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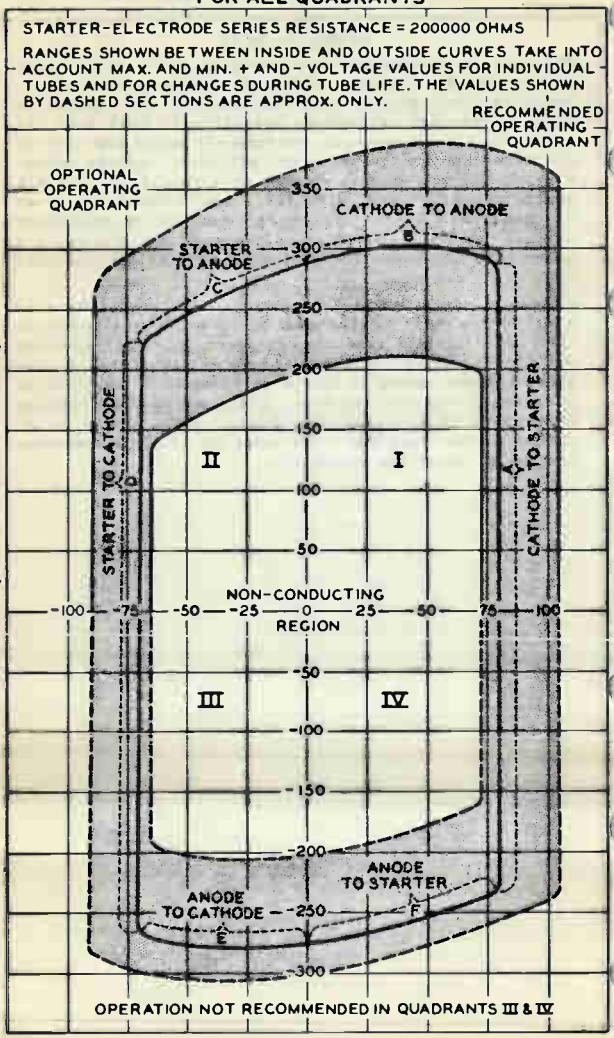
5823

BREAKDOWN CHARACTERISTICS
FOR ALL QUADRANTS



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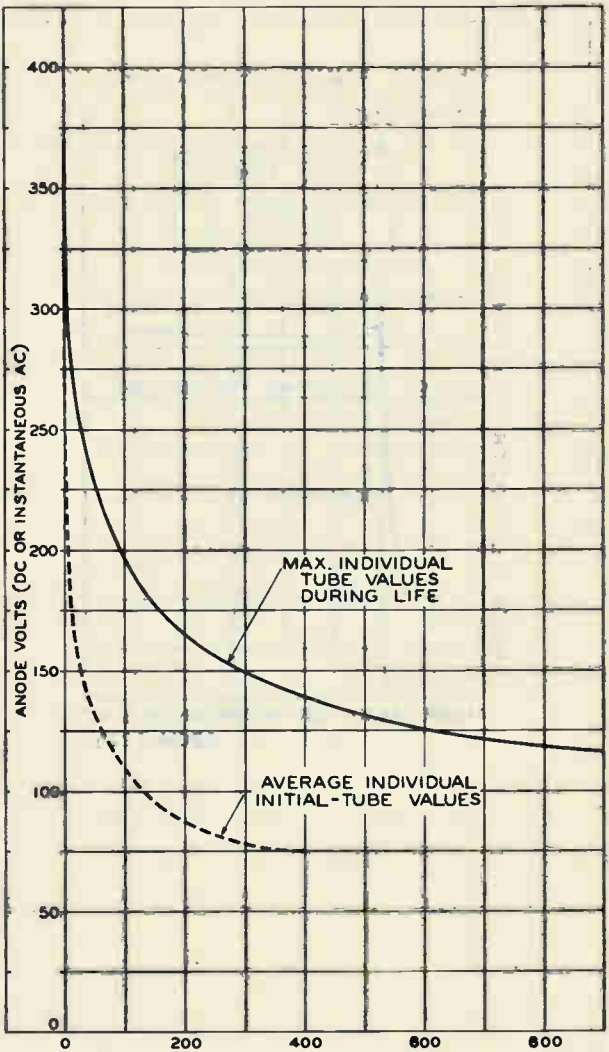
5823

TRANSITION CHARACTERISTIC



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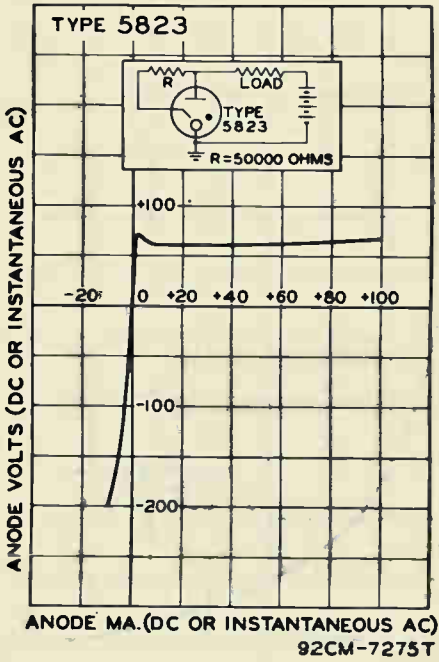
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7282

AVERAGE ANODE CHARACTERISTIC



92CM-7275T

RCA

5814-A PREMIUM TYPE

5814-A

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount. The 5814-A, a "premium" version of the 12AU7, supersedes type 5814.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	*Series*	*Parallel*	
Voltage	12.6 ± 10%	6.3 ± 10%	ac or dc volts
Current	0.175	0.35	amp

Direct Interelectrode Capacitances (Approx.):°

	Unit No. 1	*Unit No. 2*	
Grid to plate	1.5	1.5	μμf
Grid to cathode and heater	1.6	1.6	μμf
Plate to cathode and heater	0.5	0.4	μμf

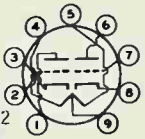
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	100	250	volts
Grid Voltage	0	-8.5	volts
Amplification Factor	19.5	17	
Plate Resistance (Approx.)	6250	7700	ohms
Transconductance	3100	2200	μmhos
Plate Current	11.8	10.5	ma
Grid Voltage (Approx.) for plate current of 10 μamp	-	-22	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW	9A

Pin 1 - Plate of Unit No.2
Pin 2 - Grid of Unit No.2
Pin 3 - Cathode of Unit No.2
Pins 4 & 9 - Heater of Unit No.2
Pins 5 & 9 - Heater of Unit No.1



Pin 6 - Plate of Unit No.1
Pin 7 - Grid of Unit No.1
Pin 8 - Cathode of Unit No.1
Pin 9 - Heater Mid-Tap

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	330 max.	volts

° without external shield.

5814-A

MEDIUM-MU TWIN TRIODE

CATHODE CURRENT	22 max.	ma
PLATE DISSIPATION	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	165 max.	°C

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1.0 max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

Values are for Each Unit and are Initial, Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	0.160	0.190	amp
Direct Interelectrode Capacitances:				
Grid to plate	2	1.2	1.8	μμf
Grid to cathode and heater	2	1.25	1.95	μμf
Plate to cathode and heater (Unit No.1)	2	0.3	0.7	μμf
Plate to cathode and heater (Unit No.2)	2	0.2	0.6	μμf
Amplification Factor	1,3	15.5	18.5	
Plate Current (1)	1,3	6.5	14.5	ma
Plate-Current Difference Between Units	1,3	-	3.5	ma
Plate Current (2)	1,4	-	20	μamp
Transconductance (1)	1,3	1750	2650	μmhos
Transconductance (2)	1,5	2500	3700	μmhos
Transconductance (2) at 500 hours	1,5	2000	3700	μmhos
Transconductance (3)	5,6	2250	-	μmhos
Transconductance Change: Difference between average transconductance (2) initially, and average after 500 hours, expressed as a percentage of the initial average	1,5	-	15	%

*, Notes 1 to 6: See next page.

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5814-A

MEDIUM-MU TWIN TRIODE

	Note	Min.	Max.	
Reverse Grid Current	1,7	–	0.5	μamp
Grid Emission Current	8,9	–	1.5	μamp
Heater–Cathode Leakage Current:				
Heater negative with respect to cathode	1,10	–	10	μamp
Heater positive with respect to cathode	1,10	–	10	μamp
Leakage Resistance:				
Between grid and all other electrodes tied together	1,11	–	500	megohms
Between plate and all other electrodes tied together	1,12	–	500	megohms
Leakage Resistance at 500 hours:				
Between grid and all other electrodes tied together	1,11	–	250	megohms
Between plate and all other electrodes tied together	1,12	–	250	megohms

Note 1: With 12.6 volts ac or dc on heater (series connection).

Note 2: Without external shield and with unit not under test connected to ground.

Note 3: With dc plate volts = 250, and dc grid volts = −8.5. Each unit tested separately. Unit not under test connected to ground.

Note 4: With dc plate-supply volts = 250, plate load resistance (megohms) = 0.5, and dc grid volts = −30. Each unit tested separately. Unit not under test connected to ground.

Note 5: With dc plate volts = 100, and dc grid volts = 0. Each unit tested separately. Unit not under test connected to ground.

Note 6: With 11.0 volts ac or dc on heater (series connection).

Note 7: With dc plate volts = 250, grid-circuit resistance (megohms) = 0.5, and dc grid volts = −8.5. Each unit tested separately. Unit not under test connected to ground.

Note 8: With 15.0 volts ac or dc on heater (series connection).

Note 9: With dc plate volts = 250, grid-circuit resistance (megohms) = 0.5, and dc grid volts = −30. Each unit tested separately. Unit not under test connected to ground.

Note 10: With 100 volts dc between heater and cathode and units connected in parallel.

Note 11: With grid 100 volts negative with respect to all other electrodes tied together.

Note 12: With plate 300 volts negative with respect to all other electrodes tied together.

● Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

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RCA

5814-A

MEDIUM-MU TWIN TRIODE

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration. . . . . 600 max. g

This test is performed on a sample lot of tubes from each production run in a Navy Type, High-Impact (flyweight) Shock Machine. Tubes are held rigid in four different positions and are subjected to 20 blows at the specified maximum impact acceleration. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for vibrational acceleration, heater-cathode leakage current, and transconductance.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for impact acceleration, heater-cathode leakage current, and transconductance (1).

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 100 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: plate of unit No.1 tied to plate of unit No.2, grid of unit No. 1 tied to grid of unit No.2, heater volts = 12.6, dc plate volts = 250, dc grid volts = -8.5, plate load resistance (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cycles per second.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . 2000 min. cycles

Under the following conditions and with the heaters of unit No.1 and unit No.2 connected in parallel: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and plate and grid volts = 0.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage . . . . . 100 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: plate of unit No.1 tied to plate of unit No.2, grid of unit No.1 tied to grid of unit No.2, dc heater volts = 12.6, plate-supply volts = 300, cathode resistor (ohms) = 1500 common to both units, and plate load resistance (ohms) = 50,000.

5814-A

MEDIUM-MU TWIN TRIODE

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid current.

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. With both units operating, each unit is checked for variation in transconductance (1) under conditions of maximum rated plate dissipation. At the end of 1 hour, the value of transconductance is read. The variation in transconductance from the 0-hour reading will not exceed 10 per cent.

100-Hour Life Performance:

This test is performed on a sample lot of tubes from each production run under the conditions of maximum rated plate dissipation to insure a low percentage of early inoperatives. At the end of 100 hours a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in CHARACTERISTICS RANGE VALUES for reverse grid current.

500-Hour Average Life Performance:

This 500-hour test is made on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. With both units operating, each unit is life tested separately at room temperature under the following conditions: heater volts = 12.6 ac or dc (series connection), plate volts = 250, grid volts = -8.5, grid-circuit resistance (megohms) = 0.5, heater 135 volts positive with respect to cathode, and bulb temperature (°C) = 165. At the end of 500 hours, tube will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass the established initial limits for heater current, reverse grid current, heater-cathode leakage current, and 500-hour limits for transconductance (2), transconductance change, and leakage resistance are shown under CHARACTERISTICS RANGE VALUES.

5814-A

MEDIUM-MU TWIN TRIODE

OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER
(Each Unit)

Plate-Supply Voltage	90			volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	3400	9400	22000	ohms
Peak Output Voltage	16	19	20	volts
Voltage Gain▲	12	12	12	
Plate-Supply Voltage	180			volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	2800	8400	20000	ohms
Peak Output Voltage	32	37	42	volts
Voltage Gain▲	13	13	13	
Plate-Supply Voltage	300			volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	2600	7000	18000	ohms
Peak Output Voltage	44	52	58	volts
Voltage Gain▲	14	13	13	

▲ At 2 volts (rms) output.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.

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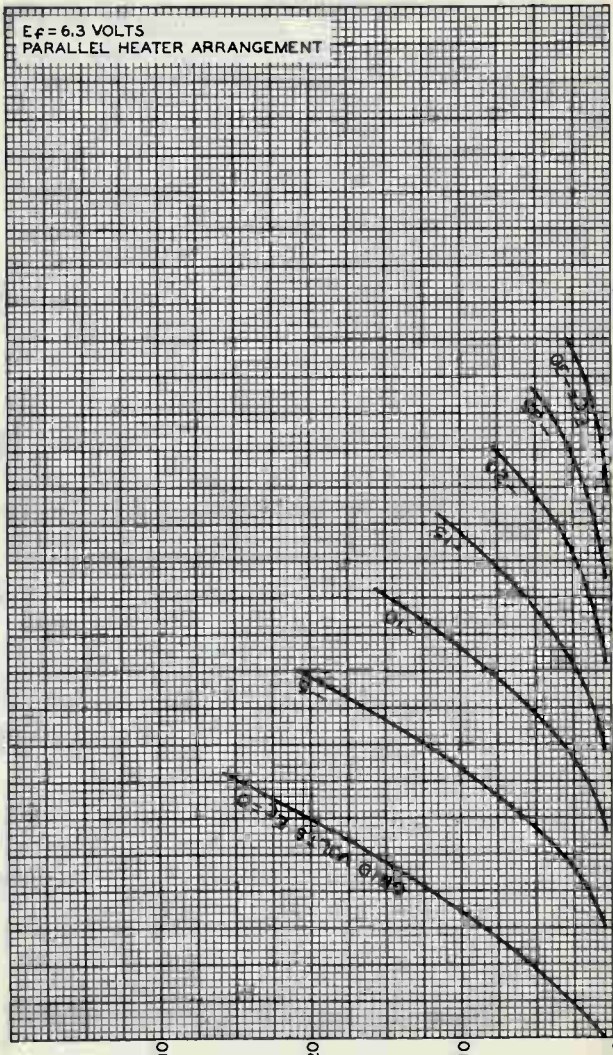
5814-A

AVERAGE PLATE CHARACTERISTICS

EACH UNIT



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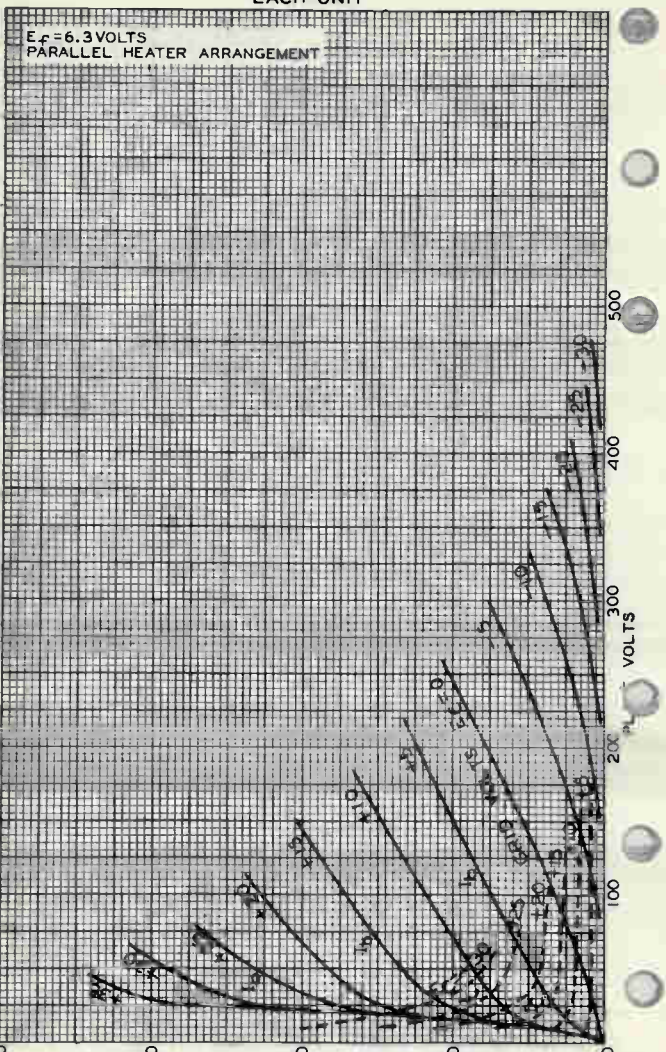
92CM-7939

5814-A

5814-A
AVERAGE CHARACTERISTICS
EACH UNIT



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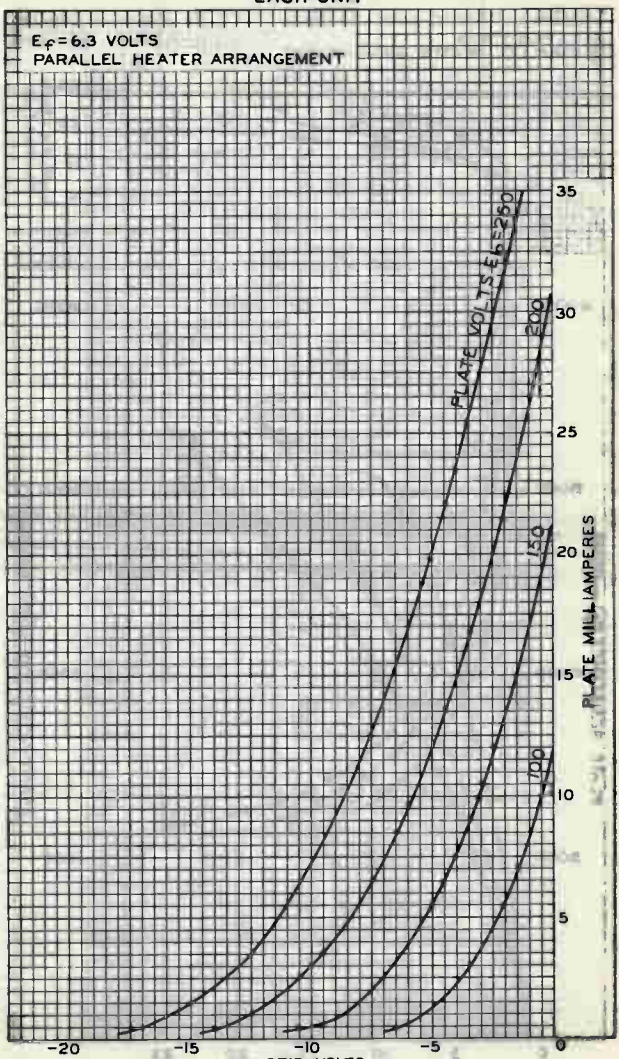
92CM-7938RI

RCA

5814-A

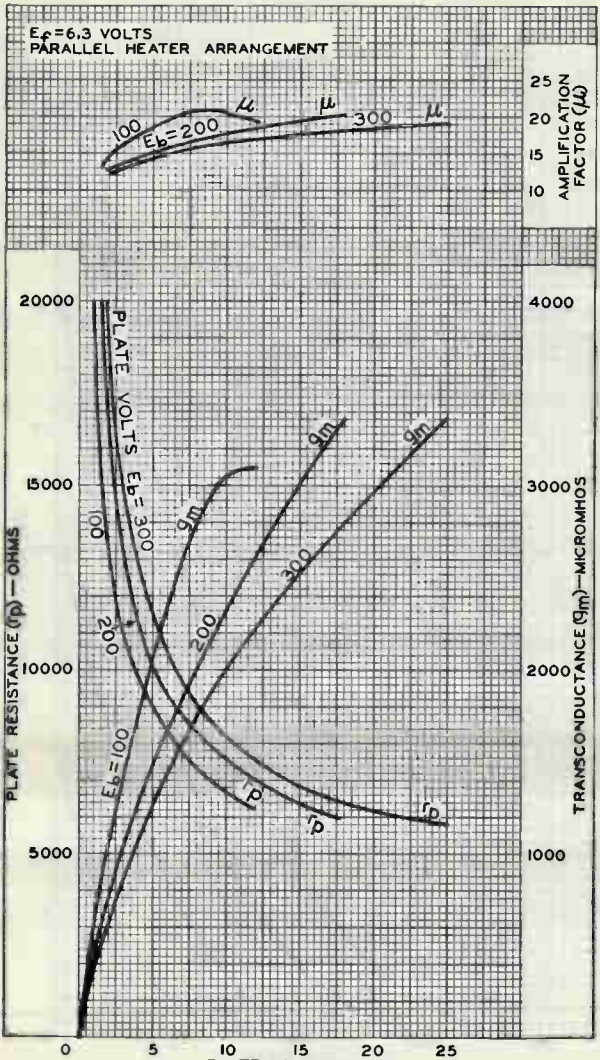
AVERAGE CHARACTERISTICS

EACH UNIT



5814-A

5814-A
AVERAGE CHARACTERISTICS
EACH UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9096

PREMIUM TYPE 5840

5840

SHARP-CUTOFF PENTODE

SUBMINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 5%	ac or dc volts
Current	0.150	amp

Direct Interelectrode Capacitances:

	With External Shield[a]	*Without External Shield*	
Grid No.1 to Plate	0.015 max.	0.03 max.	μμf
Input	4.2	4.0	μμf
Output	3.4	1.9	μμf

[a] Having inside diameter of 0.405" and connected to cathode.

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	100	volts
Grid-No.2 Supply Voltage	100	volts
Cathode Resistor	150	ohms
Plate Resistance	260000	ohms
Transconductance	5000	μmhos
Plate Current	7.5	ma
Grid-No.2 Current	2.4	ma
Grid-No.1 Volts (Approx.) for plate current of 10 μamp	-2	volts

Mechanical:

Operating Position	Any
Maximum Bulb Length	1-3/8"
Length from Button Seal to Bulb Top (Excluding tip)	1.075" ± 0.060"
Diameter	0.383" ± 0.017"
Bulb	T-3
Leads, Flexible	8
Length	1-1/2" to 1-3/4"
Orientation and Diameter	See Dimensional Outline in GENERAL SECTION

BOTTOM VIEW

Lead No.1 – Grid No.1
Lead No.2 – Cathode, Grid No.3
Lead No.3 – Heater
Lead No.4 – Cathode, Grid No.3
Lead No.5 – Plate
Lead No.6 – Heater
Lead No.7 – Grid No.2
Lead No.8 – Cathode, Grid No.3

AMPLIFIER – Class A_1

Maximum Ratings, *Absolute Values*:

DC PLATE VOLTAGE	165 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	155 max.	volts

5840

5840

SHARP-CUTOFF PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias value	55	max.	volts
PLATE DISSIPATION	1.1	max.	watts
GRID-No.2 INPUT	0.55	max.	watt
DC CATHODE CURRENT	16.5	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250	max.	°C

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For cathode-bias operation	1.2 max.	megohms
For fixed-bias operation	Not recommended	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

	Note	Min.	Max.	
Heater Current	1	0.138	0.162	amp
Grid-No.1-to-Plate Capacitance	2	–	0.015	μμf
Input Capacitance	2	3.5	4.9	μμf
Output Capacitance	2	2.9	3.9	μμf
Plate Current	1,3	5.5	9.5	ma
Plate Current	1,4	–	50	μamp
Transconductance	1,3	4100	5900	μmhos
Transconductance	5,3	3750	–	μmhos
Grid-No.1 Current	1,6	–	±0.3	μamp
Grid-No.2 Current	1,3	0.5	3.5	ma
Plate Resistance	1,7	0.175	–	megohm
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,8	–	7.0	μamp
Heater positive with respect to cathode	1,8	–	7.0	μamp
Leakage Resistance:				
Between Grid No.1 and All Other Electrodes Tied Together	1,9	100	–	megohms
Between Plate and All Other Electrodes Tied Together	1,10	100	–	megohms

* See next page.

5840

SHARP-CUTOFF PENTODE

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With external shield having inside diameter of 0.405" and connected to cathode.

Note 3: With plate supply voltage of 100 volts, grid-No.2 supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode bypass capacitor of 1000 microfarads.

Note 4: With dc plate voltage of 100 volts, dc grid-No.2 voltage of 100 volts, and dc grid-No.1 voltage of −9 volts.

Note 5: With 5.7 volts ac or dc on heater.

Note 6: With plate supply voltage of 100 volts, grid-No.2 supply voltage of 100 volts, cathode resistor of 150 ohms, cathode bypass capacitor of 1000 microfarads, and grid-No.1 resistor of 0.1 megohm.

Note 7: With plate supply voltage of 100 volts, grid-No.2 supply voltage of 100 volts, cathode resistor of 150 ohms bypassed by capacitor having a maximum reactance of 3 ohms.

Note 8: With 100 volts dc between heater and cathode.

Note 9: With grid No.1 100 volts negative with respect to all other electrodes tied together.

Note 10: With plate 300 volts negative with respect to all other electrodes tied together.

* Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 450 max. g

Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

Uniform Acceleration Rating . . . . . 1000 max. g

Tubes are subjected in each of three positions to a gradually applied uniform acceleration up to 1000 g.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 60 max. mv

Under the following conditions: A 100-volt plate and grid-No.2 voltage supply having an impedance not exceeding that of a 40-μf capacitor, plate load resistance of 10000 ohms, grid-No.1 resistor of 0.1 megohm, cathode resistor of 150 ohms, cathode bypass capacitor of 1000 μf, and vibrational acceleration of 15 g at 40 cps.

5840

SHARP-CUTOFF PENTODE

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . 2500 min. cycles
Under the following conditions: With heater voltage of 7.0 volts cycled 1 minute on and 4 minutes off, heater-cathode voltage of 140 volts (rms), and plate, grid-No.2, and grid-No.1 voltage = 0 volts.

Average Life Performance:

The average life performance based on a 500-hour test at 175°C ambient temperature is not less than 450 hours. This life test is made on sample lot of tubes with heater voltage of 6.3 volts; plate supply voltage of 100 volts; grid-No.2 supply voltage of 100 volts; dc heater-cathode voltage (heater positive with respect to cathode) of 200 volts; cathode resistor of 150 ohms; and grid-No.1 resistor of 1 megohm.

The 500-hour end-point limits for the 5840 with heater voltage of 6.3 volts, plate supply voltage of 100 volts, grid-No.2 supply voltage of 100 volts, cathode resistor of 150 ohms bypassed by capacitor having a maximum reactance of 3 ohms, and dc heater-cathode voltage of 100 volts with heater either positive or negative with respect to cathode are: transconductance, 3250 micromhos minimum; heater-cathode leakage current, 20 microamperes maximum; and grid-No.1 current, +0.9 microampere maximum or −0.9 microampere maximum.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5840

SHARP-CUTOFF PENTODE

OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER

Plate-Supply Voltage	100						volts
Plate Load Resistor	0.10	0.10	0.27	0.27	0.47	0.47	meg
Grid-No.2 Resistor	0.22	0.22	0.68	0.68	1.2	1.2	meg
Grid-No.1 Resistor[o]	0.27	0.47	0.47	1.0	0.47	1.0	meg
Cathode Resistor	820	820	2200	2200	3300	3300	ohms
Sig. Input Volt. (rms)	0.1	0.1	0.1	0.1	0.1	0.1	volt
Output Voltage (rms)	8.2	9.0	9.5	11.8	9.2	11.7	volts
Voltage Gain[▲]	82	90	95	118	92	117	
Distortion	2.8	3.8	2.5	3.0	3.1	2.3	%
Sig. Input Volt. (rms)[*]	0.23	0.22	0.15	0.16	0.12	0.14	volt
Output Voltage (rms)	17.7	18.6	13.6	17	11	16	volts
Voltage Gain[▲]	77	85	91	106	92	114	
Distortion	4.9	4.8	4.7	4.4	4.8	5.0	%

Plate-Supply Voltage	150						volts
Plate Load Resistor	0.10	0.10	0.27	0.27	0.47	0.47	meg
Grid-No.2 Resistor	0.27	0.27	0.82	0.82	1.5	1.5	meg
Grid-No.1 Resistor[o]	0.27	0.47	0.47	1.0	0.47	1.0	meg
Cathode Resistor	560	560	1500	1500	2200	2200	ohms
Sig. Input Volts. (rms)	0.1	0.1	0.1	0.1	0.1	0.1	volt
Output Voltage (rms)	11.5	12.5	13.2	15.5	13	16.7	volts
Voltage Gain[▲]	115	125	132	155	130	167	
Distortion	1.5	2.2	2.4	2.4	3.7	3.0	%
Sig. Input Volt. (rms)[*]	0.20	0.18	0.16	0.16	0.11	0.14	volt
Output Voltage (rms)	21.7	21.7	20.5	24	14	22.2	volts
Voltage Gain[▲]	109	120	128	150	127	159	
Distortion	4.8	5.0	4.9	4.8	4.2	4.8	%

[o] Of following stage.

[▲] Ratio of signal output to signal input.

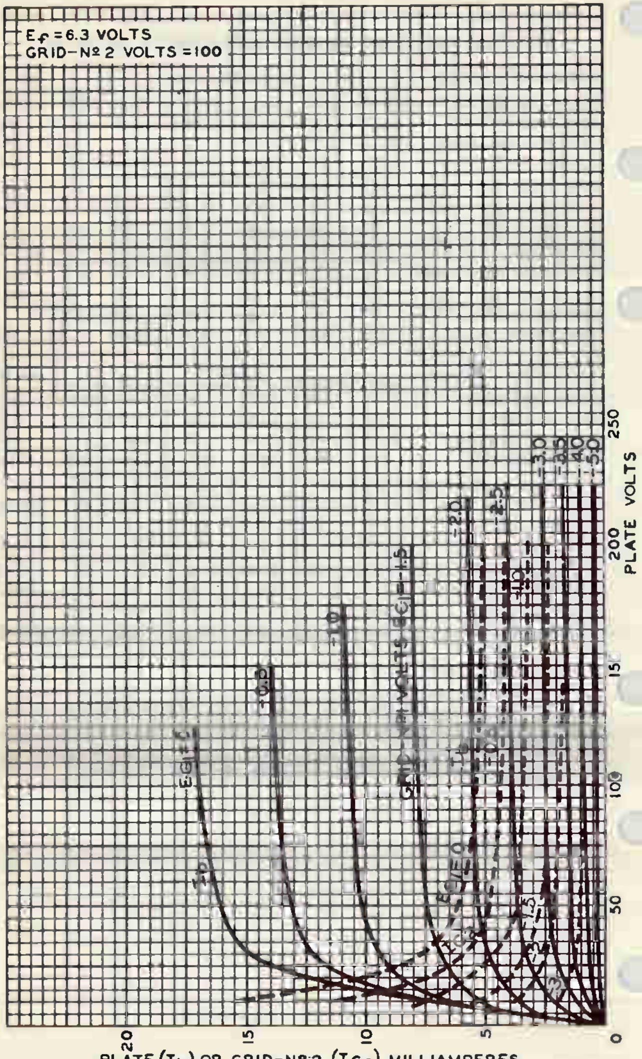
[*] Maximum value to swing the grid of resistance-coupled amplifier tube to the point where its grid No.1 starts to draw current.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.

5840

5840

AVERAGE PLATE CHARACTERISTICS



JAN. 8, 1953

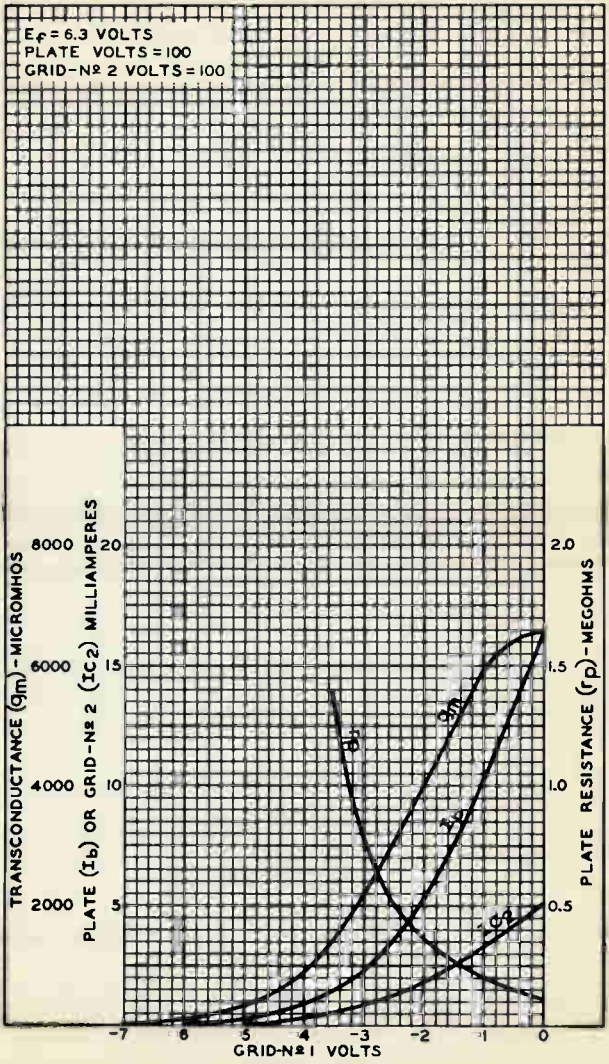
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7893

5840

AVERAGE CHARACTERISTICS



Medium-Mu Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Absolute-Maximum Values)*:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.300		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	55	max.	volts
Heater positive with respect to cathode	55	max.	volts
Direct Interelectrode Capacitances (Approx.):[a]			
Plate to cathode and heater	0.55		μμf
Cathode to grid and heater	9		μμf
Plate to grid and heater	1.8		μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	130	150	volts
Grid Voltage[b]	9	–	volts
Cathode Resistor	360	60	ohms
Amplification Factor	43	43	
Plate Resistance (Approx.)	1600	1700	ohms
Transconductance	27000	25000	μmhos
Plate Current	27	25	ma

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9V

Pin 1 – Plate
Pin 2 – No Internal Connection
Pin 3 – Heater
Pin 4 – Grid

Pin 5 – Grid
Pin 6 – Cathode
Pin 7 – Grid
Pin 8 – Grid
Pin 9 – Heater

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute-Maximum Values:*

PLATE VOLTAGE	200 max.	volts
CATHODE CURRENT	38 max.	ma

PLATE DISSIPATION.	4.5 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface).	160 max.	°C

[a] Without external shield.
[b] Measured with respect to the negative end of the cathode resistor.

5847/404A

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Absolute-Maximum Values)*:			
Voltage (AC or DC)		6.3 ± 0.6	volts
Current at heater volts = 6.3		0.300	amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode		55 max.	volts
Heater positive with respect to cathode		55 max.	volts
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield*[a]	
Grid No.1 to plate	0.05 max.	0.04 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7	7.1	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.5	2.9	μμf
Characteristics, Class A_1 Amplifier:		[b]	
Plate Supply Voltage	150	160	volts
Grid-No.2 Supply Voltage	150	160	volts
Grid-No.1 Voltage	–	8.5	volts
Cathode Resistor	110	600	ohms
Transconductance	12500	12500	μmhos
Plate Current	13	13	ma
Grid-No.2 Current	4.5	4.5	ma

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2

5847/404A

Base. . . . . .Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW. 9X

Pin 1 – Grid No.1
Pin 2 – No Internal Connection
Pin 3 – Heater
Pin 4 – Cathode, Grid No.3, Internal Shield

Pin 5 – No Internal Connection
Pin 6 – Plate
Pin 7 – No Internal Connection
Pin 8 – Grid No.2
Pin 9 – Heater

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute-Maximum Values:*

PLATE VOLTAGE	200 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	165 max.	volts
CATHODE CURRENT	40 max.	ma
GRID-No.2 INPUT	0.85 max.	watt
PLATE DISSIPATION	3.3 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance.	0.1 max.	megohm

[a] With external shield JEDEC No.315 connected to cathode.
[b] Operating conditions to minimize gain variations due to supply-voltage fluctuations.

RCA

5915

PENTAGRID AMPLIFIER

FOR "ON-OFF" CONTROL APPLICATIONS INVOLVING
LONG PERIODS OF OPERATION UNDER CUTOFF CONDITIONS

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.3	amp
Microphonism		Not Tested
Direct Interelectrode Capacitances (Approx.):o		
Grid No.1 to Plate	0.08 max.	μμf
Grid No.3 to Plate	0.35 max.	μμf
Grid No.1 to Grid No.3	0.15 max.	μμf
Grid No.1 to All Other Electrodes and Heater	5.4	μμf
Grid No.3 to All Other Electrodes and Heater	6.9	μμf
Plate to All Other Electrodes and Heater	7.6	μμf

o with no external shield.

Characteristics, Class A Amplifier:

Plate Voltage	67.5	67.5	volts
Grids-No.2 and No.4 Voltage	67.5	67.5	volts
Grid-No.3 Voltage	0	-4	volts
Grid-No.1 Voltage	0	0	volts
Grid-No.1-to-Plate Transconductance	2000	-	μmhos
Grid-No.3-to-Plate Transconductance	-	1100	μmhos

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	7CH

Pin 1 - Grid No.1
Pin 2 - Cathode, Grid No.5
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2, Grid No.4
Pin 7 - Grid No.3

GATED AMPLIFIER IN COMPUTER SERVICE
& "ON-OFF" CONTROL SERVICE

Maximum Ratings, *Absolute Values*:

PLATE VOLTAGE	250 max.	volts

GRIDS—No.2 and No.4 VOLTAGE	See Curve	
GRIDS—No.2 and No.4 SUPPLY VOLTAGE	250 max.	volts
GRID—No.3 SUPPLY VOLTAGE:		
Negative bias value	100 max.	volts
Positive bias value	0 max.	volts
Peak negative value	200 max.	volts
Peak positive value	90 max.	volts
GRID—No.1 SUPPLY VOLTAGE:		
Negative bias value	100 max.	volts
Positive bias value	0 max.	volts
Peak negative value	200 max.	volts
Peak positive value: Limited in any application by the peak cathode current and the grid—No.1 input		
PLATE DISSIPATION	1 max.	watt
GRID—No.3 INPUT	0.5 max.	watt
GRIDS—No.2 and No.4 INPUT	1 max.	watt
GRID—No.1 INPUT	0.5 max.	watt
DC CATHODE CURRENT	20 max.	ma
PEAK CATHODE CURRENT	70 max.	ma
PEAK HEATER—CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120 max.	°C

Typical Operation:

	CUTOFF CONDITION		*ZERO-BIAS CONDITION*	
	Grid-No.1 Control	*Grid-No.3 Control*		
Plate-Supply Voltage	150	150	150	volts
Grid-No.3 Supply Voltage	0	−10	0	volts
Grids-No.2 & No.4 Supply Voltage	75	75	75	volts
Grid-No.1 Supply Voltage	−10	0	0	volts
Plate-Circuit Resistance	20000	20000	20000	ohms
Grid-No.3-Circuit Resistance	47000	47000	47000	ohms
Grids-No.2 & No.4 Series Resistor	470	470	470	ohms
Grid-No.1-Circuit Resistance	47000	47000	47000	ohms
Plate Current	0	0	5.8	ma
Grids-No.2 & No.4 Current	0	14	9	ma

5915

PENTAGRID AMPLIFIER

Maximum Circuit Values:

Grid–No.1 or Grid–No.3–Circuit Resistance:

For fixed–bias operation . . . . . 0.5 max. megohm

For cathode–bias operation . . . . . 1.0 max. megohm

RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Cutoff Condition				
Plate Current. . . .	1a and 1b	–	0.2	ma
Zero–Bias Condition				
Plate Current. . . .	2	5.0	6.5	ma

Note 1a: For conditions with grid No.1 as control electrode: 6.3 volts on heater, plate–supply volts = 150, grid–No.3 supply volts = 0, grids–No.2 & No.4 supply volts = 75, grid–No.1 supply volts = –10, plate–circuit resistance (ohms) = 20000, grid–No.3 circuit resistance (ohms) = 47000, grids–No.2 & No.4 series resistor (ohms) = 470, and grid No.1–circuit resistance (ohms) = 47000.

Note 1b: For conditions with grid No.3 as control electrode: values are same as for Note 1a except that grid–No.3 supply volts = –10 and grid–No.1 supply volts = 0.

Note 2: For conditions with 6.3 volts on heater, plate–supply volts = 150, grids–No.2 and No.4 supply volts = 75, grid–No.3 supply volts = 0, grid No.1 supply volts = 0, plate–circuit resistance (ohms) = 20000, grid–No.3–circuit resistance (ohms) = 47000, grids–No.2 and No.4 series resistor (ohms) = 470, and grid–No.1–circuit resistance (ohms) = 47000.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5915

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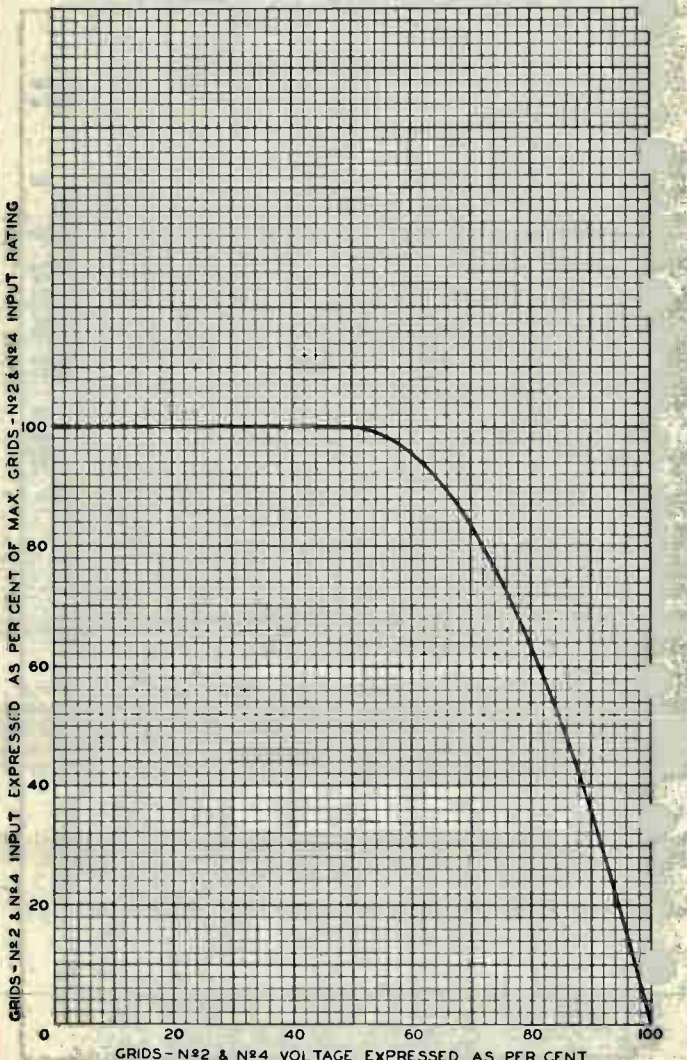
5915

GRIDS - Nº 2 & Nº 4 INPUT RATING CURVE



JUNE 8, 1950 TUBE DEPARTMENT 92CM-7500
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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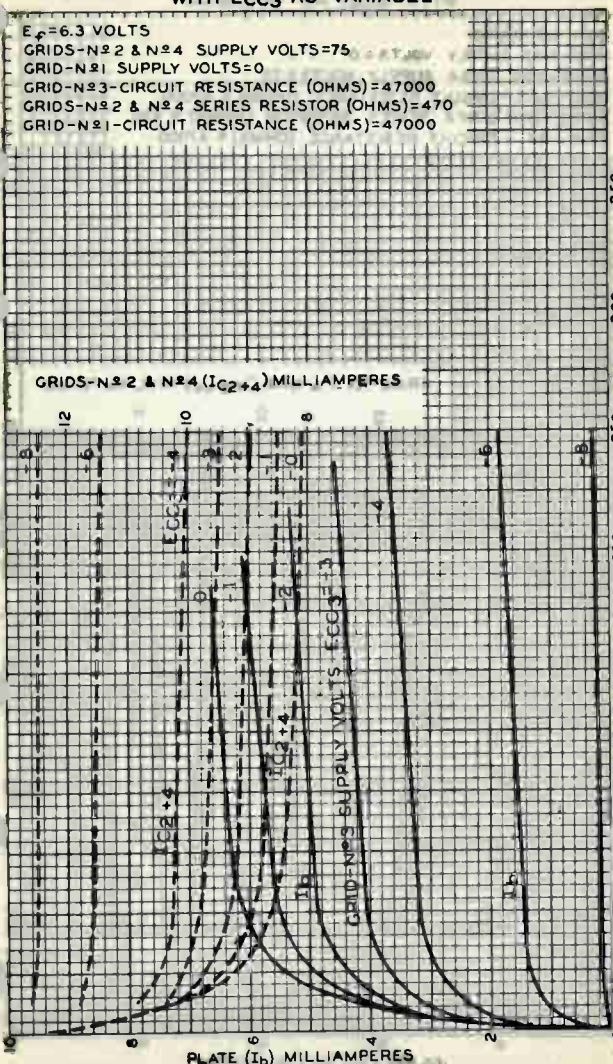
5915

AVERAGE OPERATION CHARACTERISTICS WITH E_{CC3} AS VARIABLE

E_f=6.3 VOLTS
GRIDS-N°2 & N°4 SUPPLY VOLTS=75
GRID-N°1 SUPPLY VOLTS=0
GRID-N°3-CIRCUIT RESISTANCE (OHMS)=47000
GRIDS-N°2 & N°4 SERIES RESISTOR (OHMS)=470
GRID-N°1-CIRCUIT RESISTANCE (OHMS)=47000



JUNE 8, 1950

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7499

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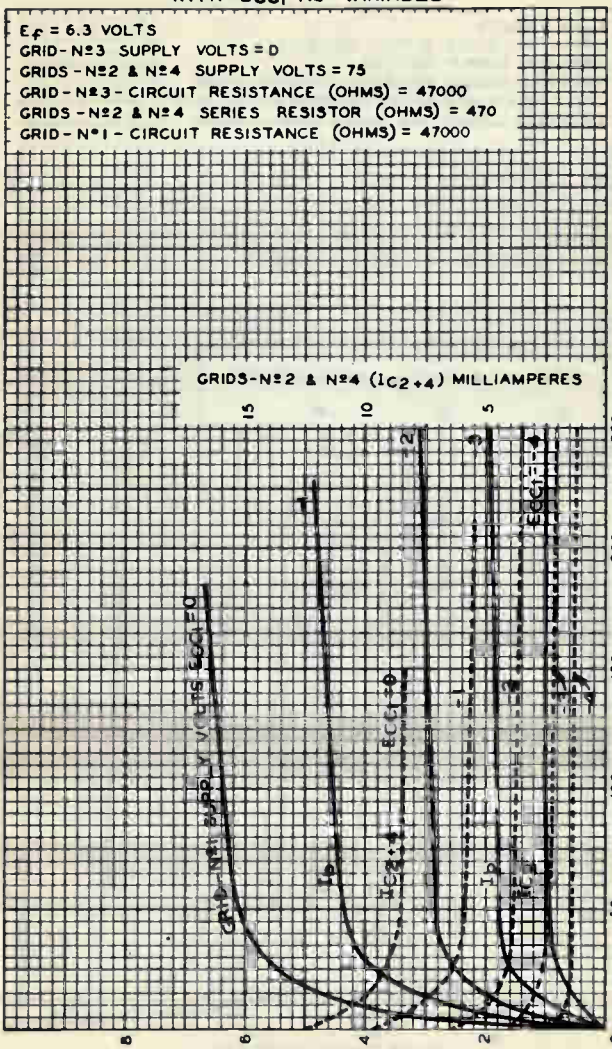
AVERAGE OPERATION CHARACTERISTICS

WITH E_{CC1} AS VARIABLE

E_f = 6.3 VOLTS
GRID-№3 SUPPLY VOLTS = 0
GRIDS-№2 & №4 SUPPLY VOLTS = 75
GRID-№3-CIRCUIT RESISTANCE (OHMS) = 47000
GRIDS-№2 & №4 SERIES RESISTOR (OHMS) = 470
GRID-№1-CIRCUIT RESISTANCE (OHMS) = 47000



RCA

5963

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For "on-off" control applications involving long periods of operation under cutoff conditions

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

	Series	*Parallel*	
Heater arrangment			
Voltage	12.6 ± 10%	6.3 ± 10%	ac or dc volts
Current	0.15	0.3	amp

Microphonism . . . . . Not Tested

Direct Interelectrode Capacitances (Approx.):[1]

	Unit No.1	*Unit No.2*	
Grid to plate	1.5	1.5	μμf
Grid to cathode and heater	1.9	1.9	μμf
Plate to cathode and heater	0.5	0.35	μμf
Grid of unit No.1 to grid of unit No.2	0.1 max.		μμf

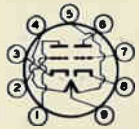
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	67.5	volts
Grid Voltage	0	volts
Amplification Factor	21	
Plate Resistance (Approx.)	6600	ohms
Transconductance	3200	μmhos
Plate Current	8.5	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-5/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ±3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9A

Pin 1 - Plate of Unit No.2
Pin 2 - Grid of Unit No.2
Pin 3 - Cathode of Unit No.2
Pins 4 & 9 - Heater of Unit No.2
Pins 5 & 9 - Heater of Unit No.1
Pin 6 - Plate of Unit No.1
Pin 7 - Grid of Unit No.1
Pin 8 - Cathode of Unit No.1
Pin 9 - Heater Mid-Tap



[1] Without external shield.

→ Indicates a change.

MEDIUM-MU TWIN TRIODE

FREQUENCY DIVIDER IN COMPUTER SERVICE and "ON-OFF" CONTROL SERVICE

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	250 max.	volts
GRID VOLTAGE:		
Negative bias value	100 max.	volts
Positive bias value	0 max.	volts
Peak negative value	200 max.	volts
PLATE DISSIPATION	2.5 max.	watts
GRID INPUT	0.5 max.	watt
CATHODE CURRENT:		
Peak	100 max.	ma
DC	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120 max.	°C

Typical Operation as Frequency Halfer:

	Cutoff Condition	*Zero-Bias Condition*	
Plate-Supply Voltage	150	150	volts
Grid Voltage	-15	0	volts
Plate-Circuit Resistance	20000	20000	ohms
Grid-Circuit Resistance	47000	47000	ohms
Plate Current	0	5.1	ma

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.5 max.	megohm
For cathode-bias operation	1.0 max.	megohm

→ **CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	Note	*Min.*	*Max.*	
Cutoff Condition				
Plate Current	1	-	50	μamp
Difference in Plate Current Between Units	-	-	50	μamp
Zero-Bias Condition				
Plate Current	2	4.6	5.4	ma
Difference in Plate Current Between Units	-	-	0.8	ma

Note 1: For conditions with 12.6 volts on heater, plate-supply volts = 150, grid-supply volts = -15, plate-circuit resistance (ohms) = 20000, and grid-circuit resistance (ohms) = 47000.

Note 2: Conditions are same as for Note 1 except that grid-supply volts = 0.

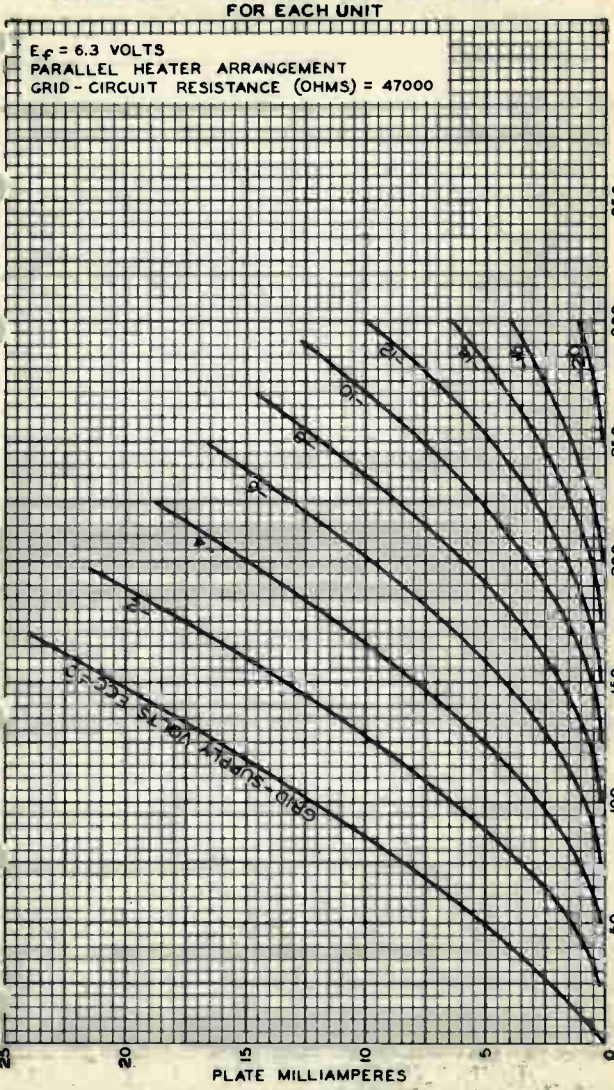
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

5963

AVERAGE OPERATION CHARACTERISTICS
FOR EACH UNIT



RCA

5964

MEDIUM-MU TWIN TRIODE

FOR "ON-OFF" CONTROL APPLICATIONS INVOLVING
LONG PERIODS OF OPERATION UNDER CUTOFF CONDITIONS

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.45	amp
Microphonism		Not Tested
Direct Interelectrode Capacitances (Approx.):°		
Each Unit:		
Grid to Plate	1.3	μμf
Grid to Cathode and Heater	2.1	μμf
Plate to Cathode and Heater	0.4	μμf
Grid of Unit No.1 to Grid of Unit No.2	0.4 max.	μμf

° With no external shielding.

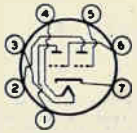
Characteristics, Class A Amplifier (Each Unit, with both units operating):

Plate Voltage	100	volts
Cathode-Bias Resistor●	50	ohms
Amplification Factor	39	
Plate Resistance	6500	ohms
Transconductance	6000	μmhos
Plate Current	9.5	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	7BF

Pin 1 - Plate of Triode No.2
Pin 2 - Plate of Triode No.1
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Grid of Triode No.1
Pin 6 - Grid of Triode No.2
Pin 7 - Cathode



FREQUENCY DIVIDER IN COMPUTER SERVICE
& "ON-OFF" CONTROL SERVICE

Values are for each unit

Maximum Ratings, *Absolute Values*:

PLATE VOLTAGE	250 max.	volts

● Common to both units.

5964

5964

MEDIUM-MU TWIN TRIODE

GRID VOLTAGE:		
Negative bias value	100 max.	volts
Positive bias value	0 max.	volts
Peak negative value	200 max.	volts
PLATE DISSIPATION	1.5 max.	watts
GRID INPUT	0.1 max.	watt
DC CATHODE CURRENT*	15 max.	ma
PEAK CATHODE CURRENT*	75 max.	ma
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	150 max.	°C

Typical Operation as Frequency Halfer (Each Unit):

	Cutoff Condition	*Zero-Bias Condition*	
Plate-Supply Voltage	150	150	volts
Plate-Circuit Resistance	20000	20000	ohms
Grid-Supply Voltage	-10	0	volts
Grid-Circuit Resistance	47000	47000	ohms
Plate Current	0	5	ma

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.5 max.	megohm
For cathode-bias operation	1.0 max.	megohm

RANGE VALUES FOR EQUIPMENT DESIGN

Cutoff Condition	*Note*	*Min.*	*Max.*	
Plate Current (Each Unit)	1	–	0.2	ma
Difference in Plate Current Between Units	–	–	0.2	ma
Zero-Bias Condition				
Plate Current (Each Unit)	2	4.3	5.7	ma
Difference in Plate Current Between Units	–	–	1.4	ma

Note 1: For conditions with 6.3 volts on heater, plate-supply volts = 150, plate-circuit resistance (ohms) = 20000, grid-supply volts = -10, and grid-circuit resistance (ohms) = 47000.

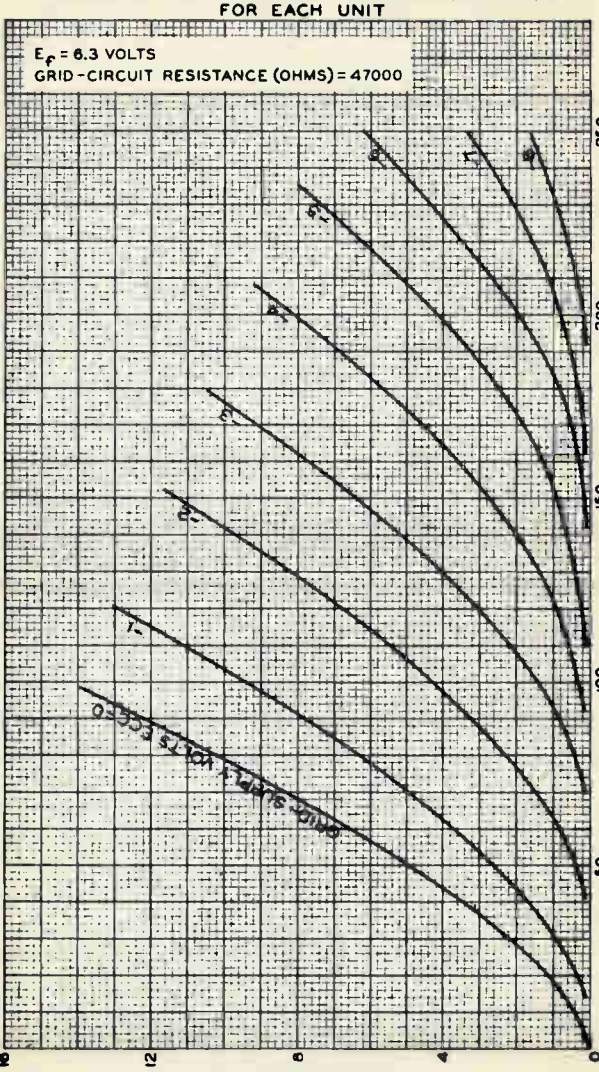
Note 2: Conditions are same as for Note 1 except that grid-supply volts = 0.

* With both units operating, the dc cathode current should not exceed 30 milliamperes, and the peak cathode current should not exceed 150 milliamperes.

RCA

5964

AVERAGE OPERATION CHARACTERISTICS
FOR EACH UNIT



MAY 31, 1950

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7495

RCA

6021

MEDIUM-MU TWIN TRIODE

SUBMINIATURE TYPE

Intended for applications at altitudes up to 60,000 feet where dependable performance under shock and vibration is paramount

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield[o]	
Grid to plate (Each unit)	1.5	1.4	μμf
Grid to cathode and heater (Each unit)	2.4	2.1	μμf
Plate to cathode and heater (Unit No.1)	0.28	1.3	μμf
Plate to cathode and heater (Unit No.2)	0.32	1.4	μμf
Grid to grid	0.013 max.	0.011 max.	μμf
Plate to plate	0.52 max.	0.33 max.	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate-Supply Voltage	100	volts
Cathode Resistor	150	ohms
Amplification Factor	35	
Plate Resistance (Approx.)	6500	ohms
Transconductance	5400	μmhos
Plate Current	6.5	ma
Grid Voltage (Approx.) for plate current of 10 μa	-6.5	volts

Mechanical:

Operating Position	Any
Maximum Length (Excluding flexible leads)	1-3/8"
Length, Bulb Seat to Bulb Top (Excluding tip)	1.075" ± 0.060"
Diameter	0.366" to 0.400"
Dimensional Outline	*See General Section*
Bulb	T3
Leads, Flexible	8
Length	1-1/2" to 1-3/4"
Orientation and diameter	*See Dimensional Outline*

BOTTOM VIEW

Lead 1 - Plate of Unit No.2
Lead 2 - Grid of Unit No.2
Lead 3 - Heater
Lead 4 - Cathode of Unit No.2
Lead 5 - Cathode of Unit No.1
Lead 6 - Heater
Lead 7 - Grid of Unit No.1
Lead 8 - Plate of Unit No.1

[o]: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6021

6021

MEDIUM-MU TWIN TRIODE

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

For Operation at Altitudes up to 60,000 Feet

PLATE VOLTAGE	165 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
Negative bias value	55 max.	volts
PLATE CURRENT	22 max.	ma
GRID CURRENT	5.5 max.	ma
PLATE DISSIPATION	1.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:
For cathode-bias operation . . . . . 1.1 max. megohms

° With external shield having inside diameter of 0.405" connected to cathode of unit under test.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values are for Each Unit (Other unit connected to ground) and are Initial, Unless Otherwise Indicated

	Note	Min.	Max.	
Heater Current	1	0.28	0.32	amp
Heater Current at 500 hours	1	0.276	0.328	amp
Direct Interelectrode Capacitances:				
Grid to plate	2	1.2	1.8	μμf
Grid to cathode and heater	2	1.8	3	μμf
Plate to cathode and heater (Unit No.1)	2	0.2	0.36	μμf
Plate to cathode and heater (Unit No.2)	2	0.22	0.42	μμf
Grid to grid	3	–	0.013	μμf
Plate to plate	3	–	0.52	μμf
Amplification Factor	1,4	30	40	
Plate Current (1)	1,4	4.5	8.5	ma
Plate-Current Difference Between Units	1,4	–	1.6	ma
Plate Current (2)	1,5	–	100	μa
Transconductance (1)	1,4	4450	6350	μmhos

Notes 1 to 5: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA I

6021

MEDIUM-MU TWIN TRIODE

	Note	Min.	Max.	
Transconductance (1) Change:				
With heater voltage reduced to 5.7 volts. .	4	–	15	%
Individual at 500 hours .	1,4	–	25	%
Average at 500 hours. . .	1,4	–	15	%
Average at 500 hours: With heater voltage reduced to 5.7 volts. .	4	–	15	%
Reverse Grid Current. . . .	1,6	–	0.3	μa
Reverse Grid Current at 500 hours	1,6	–	0.9	μa
Grid Emission Current . . .	7	–	-0.5	μa
Heater-Cathode Leakage Current:				
Heater 100 volts negative with respect to cathode.	1	–	5	μa
Heater 100 volts positive with respect to cathode.	1	–	5	μa
Heater-Cathode Leakage Current at 500 hours:				
Heater 100 volts negative with respect to cathode.	1	–	10	μa
Heater 100 volts positive with respect to cathode.	1	–	10	μa
Leakage Resistance:				
Between grid and all other electrodes tied together.	1,3,8	100	–	megohms
Between plate and all other electrodes tied together.	1,3,9	100	–	megohms
Leakage Resistance at 500 hours:				
Between grid and all other electrodes tied together.	1,3,8	50	–	megohms
Between plate and all other electrodes tied together.	1,3,9	50	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield.

Note 3: Other electrodes connected to ground.

Note 4: With dc plate-supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode-resistor bypass capacitor of 1000 μf.

Note 5: With dc plate voltage of 100 volts and grid voltage of -6.5 volts.

Note 6: With dc plate-supply voltage of 150 volts, cathode resistor of 300 ohms, and grid resistor of 1 megohm.

Note 7: With ac or dc heater voltage of 7.5 volts, dc plate voltage of 150 volts, grid voltage of -7.5 volts, and grid resistor of 1 megohm.

Note 8: With grid voltage of -100 volts.

Note 9: With dc plate voltage of -300 volts.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6021

MEDIUM-MU TWIN TRIODE

SPECIAL RATINGS AND PERFORMANCE DATA

Shock Rating:

Impact Acceleration. . . . . 450 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are tested in four different positions. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

Fatigue Ratings:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

Variable-Frequency Vibration Performance:

This test is performed on a sample lot from each production run. Tubes are vibrated over the frequency range of 5 to 50 cps at a total excursion of 0.08" for 3 minutes. At the end of this test, tubes are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 50 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: Heater voltage of 6.3 volts, plate-supply voltage of 100 volts, cathode resistor of 150 ohms, plate load resistor of 10000 ohms and vibrational acceleration of 15 g at 40 cps.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . 2000 min. cycles

Under the following conditions: Heater voltage of 7.0 volts cycled one minute on and four minutes off, heater 140 volts rms with respect to both cathodes tied together.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage . . . . . 65 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: Heater voltage of 6.3 volts, plate-supply voltage of 100 volts, cathode resistor of 75 ohms, grid-No.1 resistor of 0.1

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

megohm, plate load resistor of 0.01 megohm, and cathode-bypass capacitor of 1000 μf. Units are connected in parallel. The output voltage of a tube, when tapped, will not cause a reading on a vu meter greater than that produced when a calibrating signal of 65 millivolts rms is applied to the plates of the tube.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in the Characteristics Range Values for reverse grid current.

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. Conditions of life testing are specified under 500-Hour Intermittent Life Performance, except test run at room temperature. Tubes are initially read for transconductance (1). At the end of 1 hour, the value of transconductance (1) is read. The variation in transconductance (1) from the 0-hour reading will not exceed 15 per cent under the conditions specified in Characteristics Range Values.

100-Hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run to insure a low percentage of early inoperatives. Conditions of life testing are specified under 500-Hour Intermittent Life Performance, except test run at room temperature. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, reverse grid current in excess of 1.0 microampere, or a transconductance (1) of less than 4000 micromhos under the conditions specified in Characteristics Range Values.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: Heater voltage of 6.3 volts, plate-supply voltage of 100 volts, heater-cathode voltage of 200 volts (heater positive with respect to cathode), cathode resistor of 150 ohms, grid resistor of 1 megohm and bulb temperature of 220° C. At the end of 500 hours, tube will not show permanent shorts or open circuits and will be criticized for the total number of

6021

MEDIUM-MU TWIN TRIODE

defects in the sample lot and for the number of tubes failing to pass established initial limits of heater current, individual, average, and 5.7-heater-voltage transconductance change, reverse grid current and heater-cathode leakage current shown under Characteristics Range Values.

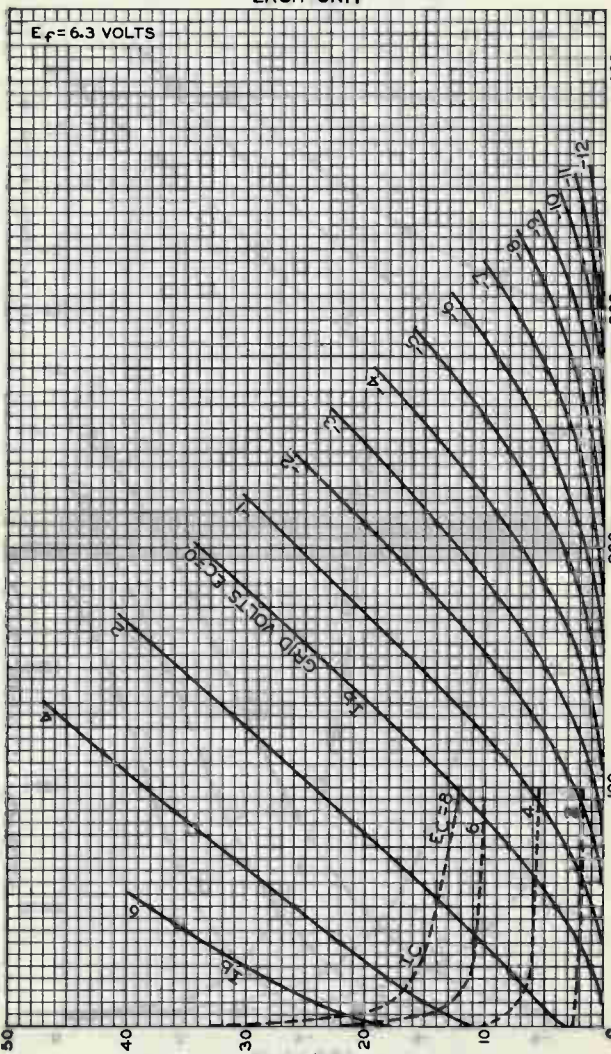
OPERATING CONSIDERATIONS

The *heater supply* should be well regulated because life and reliability of the 6021 are adversely affected by departures from the 6.3-volt value. The extent to which life is affected is a function of the amount of these departures and their durations.

The *flexible leads* of the 6021 are usually soldered to the circuit elements. Soldering of the connections should be made as far as possible from the glass button. If this precaution is not followed, the heat of the soldering operation may crack the glass seals of the leads and damage the tube.

6021

AVERAGE CHARACTERISTICS
EACH UNIT



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92CM-9436

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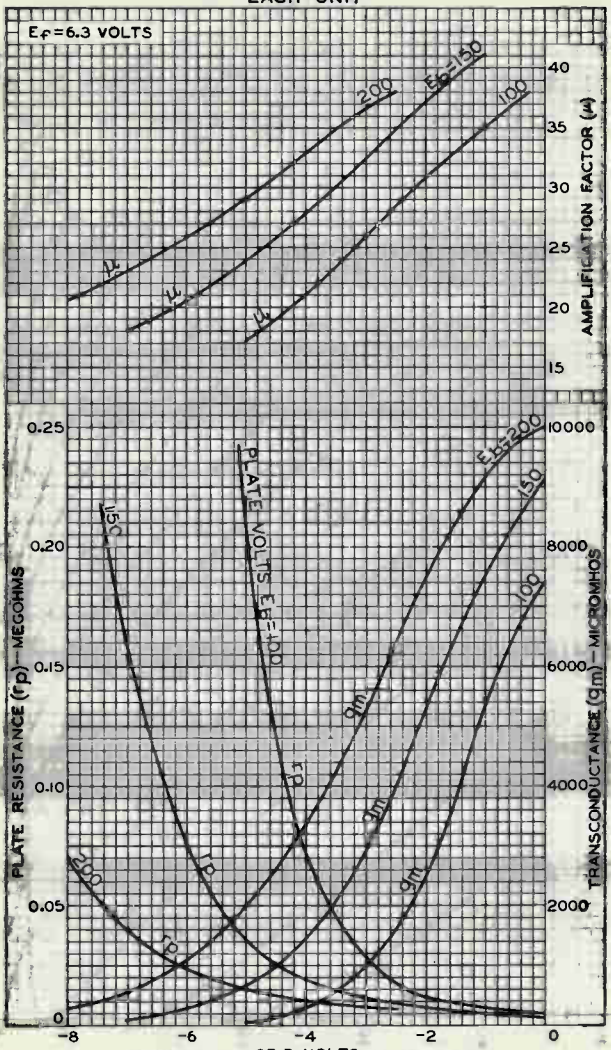
6021

AVERAGE CHARACTERISTICS
EACH UNIT



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6072

6072 PREMIUM TYPE

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in industrial and military applications critical as to microphonics and in which dependability is paramount. Characteristics are similar to those of the 12AY7.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Heater arrangement	*Series*	*Parallel*	
Voltage	12.6	6.3	ac or dc volts
Current	0.175	0.35	amp
Direct Interelectrode Capacitances (Approx.):[o]			
Grid to plate (Each unit)		1.4	μμf
Grid to cathode and heater (Each unit)		1.5	μμf
Plate to cathode and heater:			
Unit No.1		0.5	μμf
Unit No.2		0.38	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	250	volts
Grid Voltage	−4	volts
Amplification Factor	44	
Plate Resistance (Approx.)	25000	ohms
Transconductance	1750	μmhos
Plate Current	3	ma
Grid Voltage (Approx.) for plate μa = 10	−8	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9A

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 9 – Heater of Unit No.2
Pins 5 & 9 – Heater of Unit No.1

Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Heater Mid-Tap

[o] Without external shield.

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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 1

RCA

6072

MEDIUM-MU TWIN TRIODE

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts
PLATE DISSIPATION	1.65 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	165 max.	°C

Typical Operation:

In low-level stages of high-gain af amplifier with parallel-heater arrangement

Plate-Supply Voltage	150	volts
Plate-Load Resistor	20000	ohms
Grid Resistor	0.1	megohm
Cathode Resistor	2700	ohms
Cathode Capacitor	40	μf
Voltage Gain	12.5	

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 600 max. g

Tubes are held rigid in four different positions in a Navy-Type, High-Impact (flyweight) Shock Machine and are subjected to 20 blows at a hammer angle of 42° (equivalent to the specified maximum impact acceleration).

Fatigue Rating:

Vibrational Acceleration. . . . . 2.5 max. g

This test is performed for a period of 100 hours minimum at a frequency of 25 cycles per second.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation. . . . 2000 min. cycles

Under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground.

6072

MEDIUM-MU TWIN TRIODE

OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER
(Each Unit)

With Effective Source Impedance of 200 ohms (Approx.)

Plate-Supply Voltage		90		volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	2100	4800	10000	ohms
Peak Output Voltage	14	16	16	volts
Voltage Gain▲	25	27	27	
Plate-Supply Voltage		180		volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	1500	3100	7200	ohms
Peak Output Voltage	34	35	35	volts
Voltage Gain▲	28	28	29	
Plate-Supply Voltage		300		volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	1300	2700	6000	ohms
Peak Output Voltage	64	64	64	volts
Voltage Gain▲	29	31	31	

With Effective Source Impedance of 0.1 Megohm (Approx.)

Plate-Supply Voltage		90		volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	3000	6200	12000	ohms
Peak Output Voltage	17	18	20	volts
Voltage Gain▲	23	25	26	
Plate-Supply Voltage		180		volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	1900	4100	8100	ohms
Peak Output Voltage	38	41	44	volts
Voltage Gain▲	27	28	29	

▲ At 2 volts (rms) output.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.

6072

MEDIUM-MU TWIN TRIODE

Plate-Supply Voltage	300			volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	1600	3400	6700	ohms
Peak Output Voltage	68	72	76	volts
Voltage Gain▲	28	30	30	

▲ At 2 volts (rms) output.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.

6080

LOW-MU TWIN POWER TRIODE

GENERAL DATA

Heater, for Unipotential Cathodes:		
Voltage	6.3 ± 10%	ac or dc volts
Current	2.5	amp
Direct Interelectrode Capacitances (Approx.): ←		
(Each Unit, without external shield)		
Grid to Plate	8	μμf
Input	6	μμf
Output	2.2	μμf
Heater to Cathode:		
Triode Unit No.1	6.5	μμf
Triode Unit No.2	6	μμf
Grid of Unit No.1 to Grid of Unit No.2	0.5	μμf
Plate of Unit No.1 to Plate of Unit No.2	2	μμf

Characteristics, Amplifier Class A_1 (Each Unit):

Plate-Supply Voltage	135	volts
Cathode-Bias Resistor	250	ohms
Amplification Factor	2	
Plate Resistance	280	ohms
Transconductance	7000	μmhos
Plate Current	125	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-1/16" ←
Maximum Seated Length	3-1/2" ←
Maximum Diameter	1-23/32"
Bulb	T-12
Base	Large-Wafer Octal 8-Pin with Sleeve and External Barriers (JETEC No.B8-98) ←
Basing Designation for BOTTOM VIEW	8BD

Pin 1 - Grid of Unit No.2
Pin 2 - Plate of Unit No.2
Pin 3 - Cathode of Unit No.2
Pin 4 - Grid of Unit No.1

Pin 5 - Plate of Unit No.1
Pin 6 - Cathode of Unit No.1
Pin 7 - Heater
Pin 8 - Heater

DC AMPLIFIER

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	250 max.	volts
PLATE CURRENT	125 max.	ma
PLATE DISSIPATION	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts

← Indicates a change

RCA

6080

LOW-MU TWIN POWER TRIODE

BULB TEMPERATURE[●]	200 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation[□]	0.1 max.	megohm
For combined fixed and cathode-bias operation[▲]	0.1 max.	megohm

BOOSTER SCANNING SERVICE

Values are for Each Unit

Maximum Ratings, *Absolute Values*:

For operation in a 525-line, 30-frame system[▲]

PEAK NEGATIVE-PULSE PLATE VOLTAGE[●]	3000 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	2300 max.	volts
DC PLATE CURRENT	125 max.	ma
PLATE DISSIPATION	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode[●]	300 max.	volts
Heater positive with respect to cathode.	300 max.	volts
BULB TEMPERATURE[●]	200 max.	°C

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:		
For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation	not recommended	

→ **CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	Note	*Min.*	*Max.*	
Heater Current	1	2.26	2.74	amp
Amplification Factor (Each Unit)	1,2	1.4	2.6	
Plate Current (Each Unit)	1,2	100	150	ma
Transconductance (Each Unit)	1,2	5800	8200	μmhos
Reverse Grid Current (Units in Parallel)	1,3	-	4	μamp

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With plate-supply voltage of 135 volts, and cathode-bias resistor of 250 ohms in each cathode (both triode units operating).

Note 3: With plate-supply voltage of 135 volts, grid resistor of 1 megohm in each grid and cathode-bias resistor of 250 ohms in each cathode (both triode units operating).

● At hottest point on bulb surface.

□ When fixed bias is used, the plate circuit should contain a protective resistance to provide a minimum drop of 15 volts dc at the normal operating conditions.

*,▲,●,●: See next page.

→ indicates a change

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6080

LOW-MU TWIN POWER TRIODE

★ When combined fixed- and cathode-bias is used, the cathode-bias portion should have a minimum value of 7.5 volts dc at the normal operating conditions.

▲ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

● The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

● Operation of this tube is not recommended with a damper pulse between heater and cathode.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 450 max. g

Tubes are held rigid in four different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.

Fatigue Rating:

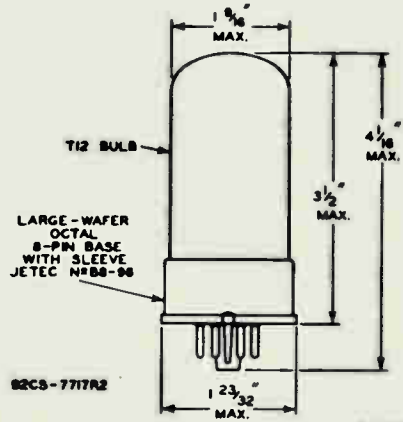
Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 200 max. mv

Under the following conditions and with units connected in parallel: Heater voltage of 6.3 volts, plate voltage supply of 135 volts, dc grid voltage of −7 volts, plate load resistance of 2000 ohms, and vibrational acceleration of 2.5 g at 25 cycles per second.



← Indicates a change

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6080

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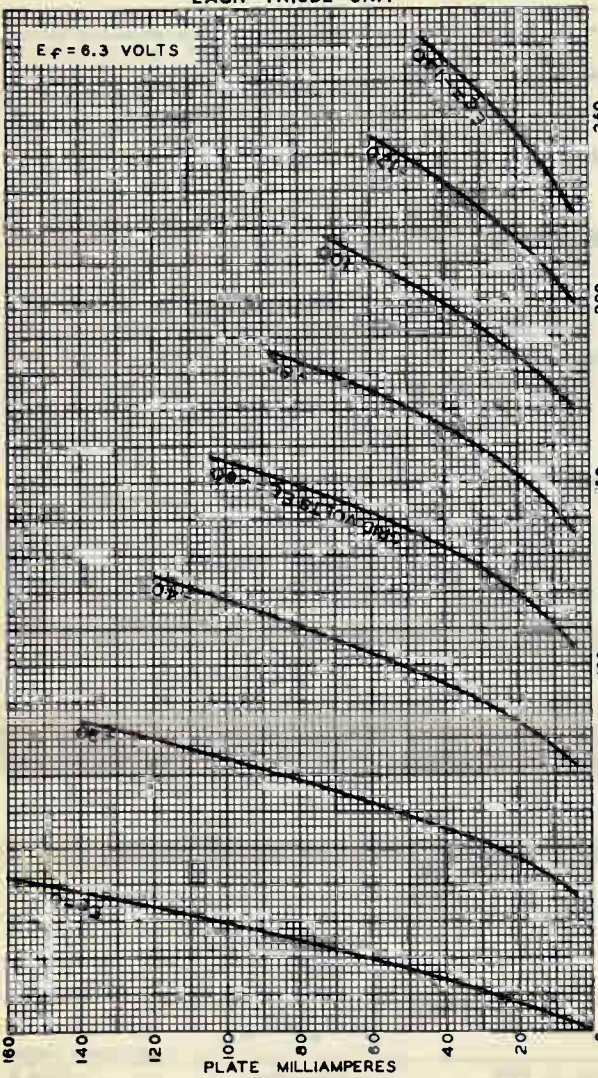
AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



OCT. 19, 1951

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7695

6082

LOW-MU TWIN POWER TRIODE

GENERAL DATA

Heater, for Unipotential Cathodes:		
Voltage	26.5 ± 10%	ac or dc volts
Current	0.6	amp
Direct Interelectrode Capacitances (Approx.):		←
(Each Unit, without external shield)		
Grid to Plate	8	μμf
Input	6	μμf
Output	2.2	μμf
Heater to Cathode:		
Triode Unit No.1	13	μμf
Triode Unit No.2	13	μμf
Grid of Unit No.1 to Grid of Unit No.2	0.5	μμf
Plate of Unit No.1 to Plate of Unit No.2	2	μμf

Characteristics, Amplifier Class A_1 (Each Unit):

Plate-Supply Voltage	135	volts
Cathode-Bias Resistor	250	ohms
Amplification Factor	2	
Plate Resistance	280	ohms
Transconductance	7000	μmhos
Plate Current	125	ma

Mechanical:

Mounting Position		Any
Maximum Overall Length		4-1/16" ←
Maximum Seated Length		3-1/2" ←
Maximum Diameter		1-23/32"
Bulb		T-12
Base		Large-Wafer Octal 8-Pin with Sleeve and External Barriers (JETEC No.B8-98) ←
Basing Designation for BOTTOM VIEW		8BD

Pin 1 - Grid of Unit No.2
Pin 2 - Plate of Unit No.2
Pin 3 - Cathode of Unit No.2
Pin 4 - Grid of Unit No.1
Pin 5 - Plate Unit No.1
Pin 6 - Cathode of Unit No.1
Pin 7 - Heater
Pin 8 - Heater

DC AMPLIFIER

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	250 max.	volts
PLATE CURRENT	125 max.	ma
PLATE DISSIPATION	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts

← Indicates a change

RCA

6082

LOW-MU TWIN POWER TRIODE

BULB TEMPERATURE●	200 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation□	0.1 max.	megohm
For combined fixed- and cathode-bias operation*	0.1 max.	megohm

→ **CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	Note	Min.	Max.	
Heater Current	1	0.55	0.65	amp
Amplification Factor (Each Unit)	1,2	1.4	2.6	
Plate Current (Each Unit) . . .	1,2	100	150	ma
Transconductance (Each Unit)	1,2	5800	8200	μmhos
Reverse Grid Current (Units in Parallel).	1,3	-	4	μamp

Note 1: With 26.5 volts ac or dc on heater.

Note 2: With plate-supply voltage of 135 volts, and cathode-bias resistor of 250 ohms in each cathode (both triode units operating).

Note 3: With plate-supply voltage of 135 volts, grid resistor of 1 megohm in each grid and cathode-bias resistor of 250 ohms in each cathode (both triode units operating).

● At hottest point on bulb surface.

□ When fixed bias is used, the plate circuit should contain a protective resistance to provide a minimum drop of 15 volts dc at the normal operating conditions.

* When combined fixed- and cathode-bias is used, the cathode-bias portion should have a minimum value of 7.5 volts dc at the normal operating conditions.

→ **SPECIAL RATINGS & PERFORMANCE DATA**

Shock Rating:

Impact Acceleration . . . . . 450 max. g

Tubes are held rigid in four different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 200 max. mv

Under the following conditions and with units connected in parallel: Heater voltage of 26.5 volts, plate voltage

→ Indicates a change

6082

LOW-MU TWIN POWER TRIODE

supply of 135 volts, dc grid voltage of -7 volts, plate load resistance of 2000 ohms, and vibrational acceleration of 2.5 g at 25 cycles per second.

Outline Drawing and Average Plate Characteristics Curve for the 6082 are the same as shown for Type 6080

RCA

6101

PREMIUM TYPE 6101

MEDIUM-MU TWIN TRIODE

MINIATURE TYPE

Intended for applications at altitudes up to 55000 feet and where dependable performance under shock and vibration is paramount.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances (Each Unit, approx.)*:		
Grid to Plate	1.5	μμf
Input	2.0	μμf
Output	0.4	μμf
Heater to Cathode	6.0	μμf

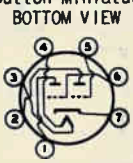
Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	100	volts
Cathode-Bias Resistor	50#	ohms
Amplification Factor	38	
Plate Resistance	6300	ohms
Transconductance	6000	μmhos
Plate Current	8.5	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No. E7-1)

BOTTOM VIEW



Pin 1 - Plate of Unit No.2
Pin 2 - Plate of Unit No.1
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Grid of Unit No.1
Pin 6 - Grid of Unit No.2
Pin 7 - Cathode

AMPLIFIER - Class A_1

Values are for each unit

Maximum Ratings, *Absolute Values:*

	*For Pressures Down to 55 ± 5 mm of Hg***
PLATE VOLTAGE	330 max. volts

* With no external shield.
** Corresponds to altitude of about 55000 feet.
# Value is common to both units operating at the specified conditions.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

MEDIUM-MU TWIN TRIODE

PLATE DISSIPATION		0.85 max.	watt
PEAK HEATER–CATHODE VOLTAGE:			
Heater negative with respect to cathode .		180 max.	volts
Heater positive with respect to cathode .		180 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)		165 max.	°C

Maximum Circuit Values (For maximum rated conditions):

Grid–Circuit Resistance:		
For fixed–bias operation	Not recommended	
For cathode–bias operation	0.5 max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.420	0.480	amp
Grid–to–Plate Capacitance (Each Unit).	2	1.2	1.8	μμf
Grid–to–Cathode Capacitance (Each Unit).	2	1.4	2.8	μμf
Plate–to–Cathode Capacitance (Unit No.1).	2	0.25	0.65	μμf
Plate–to–Cathode Capacitance (Unit No.2).	2	0.25	0.55	μμf
Heater–to–Cathode Capacitance .	2	4.0	8.0	μμf
Amplification Factor	1,3	28	48	
Plate Current (1)	1,4	6.5	11.5	ma
Plate Current (2)	1,5	–	200	μamp
Plate Current (3)	1,7	5	–	μamp
Transconductance (1).	1,4	4500	7500	μmhos
Transconductance (2).	6,4	♠	–	μmhos
Reverse Grid Current (1). . . .	1,8	–	0.5	μamp
Reverse Grid Current (2). . . .	9,10	–	1.0	μamp
Heater–Cathode Leakage Current:				
Heater negative with respect to cathode . . .	1,11	–	10	μamp
Heater positive with respect to cathode . . .	1,11	–	10	μamp
Leakage Resistance Per Unit:				
Between Grid and All Other Electrodes Tied Together	1,12	100	–	megohms
Between Plate and All Other Electrodes Tied Together	1,13	100	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With no external shield.

Note 3: With plate supply voltage of 100 volts, cathode–bias resistor of 50 ohms common to both units, and a cathode bypass capacitor of 1000 μf. Each unit tested separately and with both units operating.

Note 4: With plate supply voltage of 100 volts and cathode–bias resistor of 50 ohms common to both units. Each unit tested separately and with both units operating.

MEDIUM-MU TWIN TRIODE

Note 5: With dc plate voltage of 250 volts, and dc grid voltage of −14.5 volts. Each unit tested separately and with both units operating.

Note 6: With 5.7 volts ac or dc on heater.

Note 7: With plate supply voltage of 250 volts and dc grid voltage of −10.5 volts. Each unit tested separately and with both units operating.

Note 8: With plate supply voltage of 250 volts, grid-circuit resistance of 1.0 megohm common to both units, and cathode-bias resistor of 500 ohms common to both units. Plate of unit No.1 tied to plate of unit No.2; grid of unit No.1 tied to grid of unit No.2.

Note 9: With 7.0 volts ac or dc on heater.

Note 10: With plate supply voltage of 100 volts, grid-circuit resistance of 1 megohm common to both units and cathode-bias resistor of 50 ohms common to both units. Plate of unit No.1 tied to plate of unit No.2; grid of unit No.1 tied to grid of unit No.2.

Note 11: With 100 volts dc between heater and cathode.

Note 12: With grid 100 volts negative with respect to all other electrodes tied together.

Note 13: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 500 max. g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified impact acceleration. Tubes are held rigid in four different positions in a Navy Type, High-Impact (flyweight) Shock Machine and are subjected to 20 blows at a hammer angle of 30° (equivalent to the specified maximum impact acceleration). At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for vibration, heater-cathode leakage current, and transconductance.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified vibrational acceleration. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for fatigue, heater-cathode leakage current, and transconductance.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 25 max. millivolts

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand low-frequency vibration of its elements with consequent

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6101

MEDIUM-MU TWIN TRIODE

generation of audio noise as determined by the measured rms output voltage. Plate of unit No.1 tied to plate of unit No.2 and grid of unit No.1 tied to grid of unit No.2; dc plate voltage of 250 volts, dc grid voltage of −8 volts, plate load resistance of 20000 ohms, and vibrational acceleration of 2.5 g at 25 cps.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage . . . . . 70 max. millivolts

This test is performed on a sample lot of tubes from each production run to determine susceptibility of tube to movement of its elements when tapped and consequent generation of audio noise as determined by the measured rms output voltage. Plate of unit No.1 tied to plate of unit No.2, grid of unit No.1 tied to grid of unit No.2, plate supply voltage of 100 volts, grid-circuit resistance of 0.1 megohm common to both units, cathode-bias resistor of 50 ohms common to both units, and plate load resistance of 10000 ohms.

Glass Strain Test:

This test is performed on a sample lot of tubes from each production run to check for tubes which may have been improperly processed. Tubes are completely submerged in boiling water (97°C to 100°C) for a period of 15 seconds and then immediately submerged in ice water (0°C to 3°C). Tubes will withstand this treatment without loss of vacuum.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid current (1).

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. With both units operating, each unit is checked for variation in transconductance under conditions of maximum rated plate dissipation. At the end of 1 hour, the value of transconductance of each unit is read. The variation in transconductance from the 0-hour reading will not exceed 12 per cent.

100-Hour Life Performance:

This test is performed on a sample lot of tubes from each production run under conditions of maximum rated plate dissipation to insure a low percentage of early inopera-

6101

MEDIUM-MU TWIN TRIODE

tives. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in CHARACTERISTICS RANGE VALUES for reverse grid current (1).

500-Hour Average Life Performance:

This 500-hour test is made on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. With both units operating, each unit is life tested separately at room temperature under the following conditions: heater voltage of 6.3 volts ac or dc, plate supply voltage of 100 volts, dc heater-cathode voltage (heater positive with respect to cathode) of 180 volts, and cathode bias resistor (common to both units) of 50 ohms. At the end of 500 hours, the tubes will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass the established limits of heater current, transconductance with 6.3 volts ac or dc on heater, transconductance with 5.7 volts ac or dc on heater, plate current (1), reverse grid current (2), heater-cathode leakage current, and leakage resistance per unit.

6101

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6101

AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$ VOLTS

PLATE VOLTS

100 200 300 400 500

80 60 40 20 0

PLATE (I_b) OR GRID (I_c) MILLIAMPERES

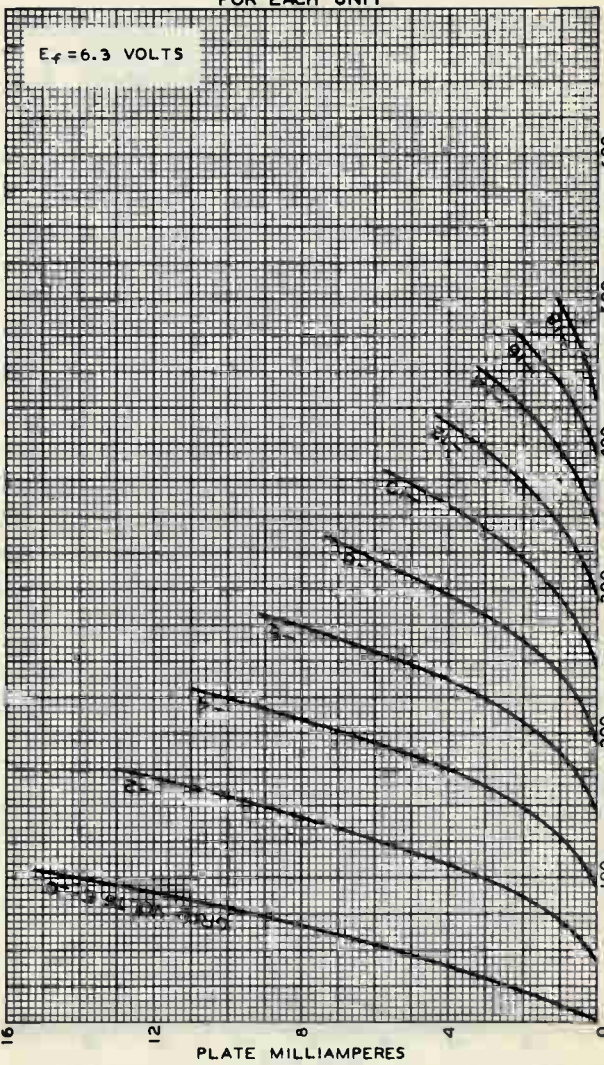
JULY 13, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8034

6101
AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT

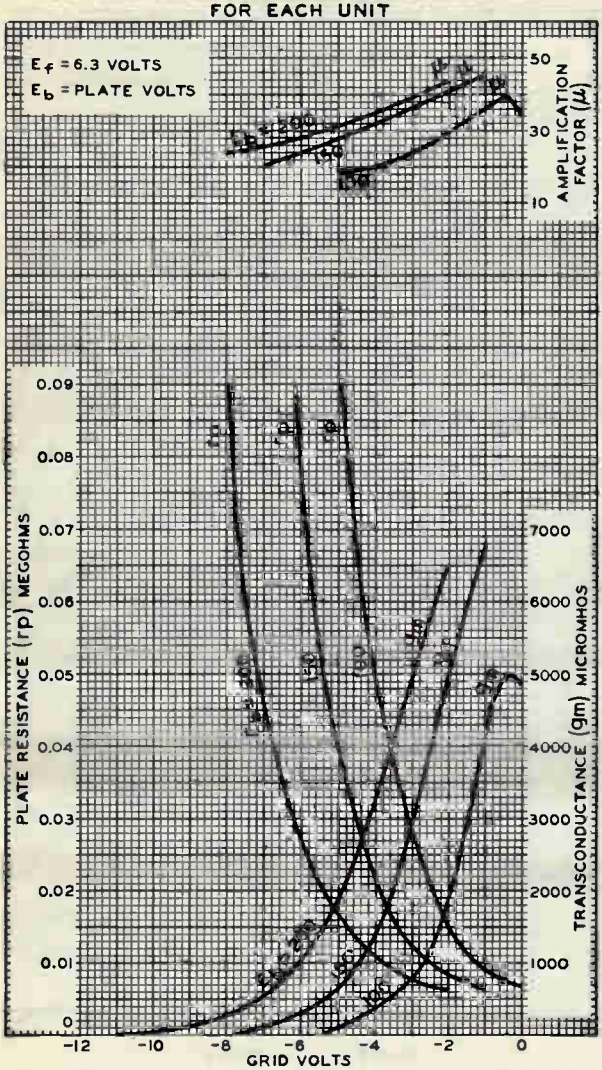


JULY 13, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8033

FOR EACH UNIT



JULY 13, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8032

6111

MEDIUM-MU TWIN TRIODE

SUBMINIATURE TYPE

Intended for applications at altitudes up to 60,000 feet where dependable performance under shock and vibration is paramount

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield*	
Grid to plate (Each unit)	1.5	1.4	μμf
Grid to cathode and heater (Each unit)	1.9	2.1	μμf
Plate to cathode and heater (Unit No.1)	0.28	1.3	μμf
Plate to cathode and heater (Unit No.2)	0.32	1.4	μμf
Grid of unit No.1 to grid of unit No.2	0.011 max.	0.01 max.	μμf
Plate of unit No.1 to plate of unit No.2	0.5 max.	0.3 max.	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate-Supply Voltage	100	volts
Cathode Resistor	220	ohms
Amplification Factor	20	
Plate Resistance (Approx.)	4000	ohms
Transconductance	5000	μmhos
Plate Current	8.5	ma
Grid Voltage (Approx.) for plate current of 10 μa	-9	volts

Mechanical:

Operating Position	Any
Maximum Length (Excluding flexible leads)	1-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	1.075" ± 0.060"
Diameter	0.366" to 0.400"
Dimensional Outline	*See General Section*
Bulb	T3
Leads, Flexible, Tinned	8
Minimum length	1.5"
Orientation and diameter	*See Dimensional Outline*
Maximum untinned distance from base seat	0.050"

*: See next Page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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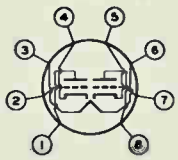
6111

MEDIUM-MU TWIN TRIODE

Base. . . . . .JETEC No.E8-10

BOTTOM VIEW



Lead 1 – Plate of Unit No.2
Lead 2 – Grid of Unit No.2
Lead 3 – Heater
Lead 4 – Cathode of Unit No.2
Lead 5 – Cathode of Unit No.1
Lead 6 – Heater
Lead 7 – Grid of Unit No.1
Lead 8 – Plate of Unit No.1

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

For operation at altitudes up to 60,000 feet

PLATE VOLTAGE	165 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
Negative bias value	55 max.	volts
PLATE DISSIPATION	1.1 max.	watts
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	1.2 max.	megohms

* With external shield having inside diameter of 0.405" connected to cathode of unit under test.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values are for Each Unit and are Initial, Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	280	320	ma
Direct Interelectrode Capacitances:				
Grid to plate	2	1.2	1.8	μμf
Grid to cathode and heater	2	1.4	2.4	μμf
Plate to cathode and heater (Unit No.1)	2	0.2	0.36	μμf
Plate to cathode and heater (Unit No.2)	2	0.22	0.42	μμf
Grid of unit No.1 to grid of unit No.2	2	–	0.011	μμf

Notes 1 and 2: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 1

6111

MEDIUM-MU TWIN TRIODE

	Note	Min.	Max.	
Plate of unit No.1 to plate of unit No.2	2	-	0.5	μμf
Amplification Factor	1,3	17	23	
Plate Current (1)	1,3	6	11	ma
Plate-Current Difference Between Units	1,3	-	2	ma
Plate Current (2)	1,4	-	100	μa
Transconductance:				
With heater volts = 6.3	3	4100	5900	μmhos
Individual change from 0 to 500 hours	1,3	-	20	%
Individual change at end of 500-hour life test with heater voltage reduced to 5.7 volts	3	-	15	%
Difference between average transconductance initially, and average after 500-hours, expressed as a percentage of the initial average	1,3	-	15	%
Reverse Grid Current	1,5	-	0.3	μa
Grid-Emission Current	6,7	-	-0.5	μa
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,8	-	5	μa
Heater positive with respect to cathode	1,8	-	5	μa
Heater-Cathode Leakage Current at 500 hours:				
Heater negative with respect to cathode	1,8	-	10	μa
Heater positive with respect to cathode	1,8	-	10	μa
Leakage Resistance:				
Grid to all other electrodes tied together	1,9	100	-	megohms
Plate to all other electrodes tied together	1,10	100	-	megohms
Leakage Resistance at 500 hours:				
Grid to all other electrodes tied together	1,9	50	-	megohms
Plate to all other electrodes tied together	1,10	50	-	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield.

Note 3: With plate-supply volts = 100, cathode resistor (ohms) = 220, and cathode-bypass capacitor (μf) = 1000. Each unit tested separately. Unit not under test connected to ground.

Notes 4 to 10: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6111

MEDIUM-MU TWIN TRIODE

Note 4: With plate volts = 100 and grid volts = −9. Each unit testad separately. Unit not under test connected to ground.

Note 5: With plate volts = 100, grid resistor (megohms) = 1, and cathoda resistor (ohms) = 200. Each unit tested separately. Unit not under test connected to ground.

Note 6: With 7.5 volts dc on heater.

Note 7: With plate volts = 100, grid resistor (megohms) = 1, and grid volts = −9. Preheated prior to testing for 5 minutes at heater volts = 7.5 ac or dc, plate volts = 100, grid resistor (megohms) = 1, and cathode resistor (ohms) = 220.

Note 8: With 100 volts between heater and cathode. Each unit tested separately. Unit not under test connected to ground.

Note 9: With grid 100 volts negative with respect to all other electrodes tied together.

Note 10: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS AND PERFORMANCE DATA

Values are for Each Unit, Unless Otherwise Specified

Shock Rating:

Impact Acceleration . . . . . 450 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are tested in four different positions. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, and transconductance change.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 100 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: Heater volts = 6.3, plate-supply volts = 100, cathode resistor (ohms) = 220, cathode-bypass capacitor (μf) = 1000, plate load resistor (ohms) = 10,000, and vibrational acceleration of 15 g at 40 cps.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . . 2000 min. cycles

Under the following conditions: Heater volts = 7 cycled one minute on and four minutes off, heater 140 volts

rms with respect to cathode, and all other elements connected to ground. At the end of this test, tubes will not show heater-cathode shorts or open circuits.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage. . . . . 65 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: Units connected in parallel, heater volts = 6.3, plate-supply volts = 100, cathode resistor (ohms) = 100, plate load resistor (megohms) = 0.01, and cathode-bypass capacitor (μf) = 1000. The output voltage of a tube, when tapped, will not cause a reading on a vu meter greater than that produced when a calibrating signal of 65 millivolts rms is applied to the plates of the tube.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1 microampere under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid current.

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. Life-test conditions are the same as those specified under 500-Hour Intermittent Life Performance, except that the test run at room temperature. At the end of 1 hour, the value of transconductance is read. The variation in transconductance from the 0-hour reading will not exceed 10 per cent.

100-Hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run to insure a low percentage of early inoperatives. Life test conditions are the same as those specified under 500-Hour Intermittent Life Performance, except that the test run at room temperature. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit or a value of reverse grid current in excess of 1 microampere under the conditions specified in CHARACTERISTICS RANGE VALUES.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: Heater volts = 6.3, plate-supply volts = 100, heater-cathode volts = 200 (heater positive with

respect to cathode), cathode resistor (ohms) = 220, grid resistor (megohms) = 1, and bulb temperature (°C) = 220. At the end of 500 hours, tube will not show permanent shorts or open circuits, and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass established initial limits of heater current, individual transconductance change, transconductance change with heater volts = 5.7, and 500-hour limits for reverse grid current, heater-cathode leakage current, leakage resistance, and the difference in transconductance between the initial value and average value shown under CHARACTERISTICS RANGE VALUES.

OPERATING CONSIDERATIONS

The *heater supply* should be well regulated because life and reliability of the 6111 are adversely affected by departures from the 6.3-volt value. The extent to which life is affected is a function of the amount of these departures and their durations.

The *flexible leads* of the 6111 are usually soldered to the circuit elements. Soldering of the connections should be made as far as possible from the glass button. If this precaution is not followed, the heat of the soldering operation will crack the glass seals of the leads and damage the tube.

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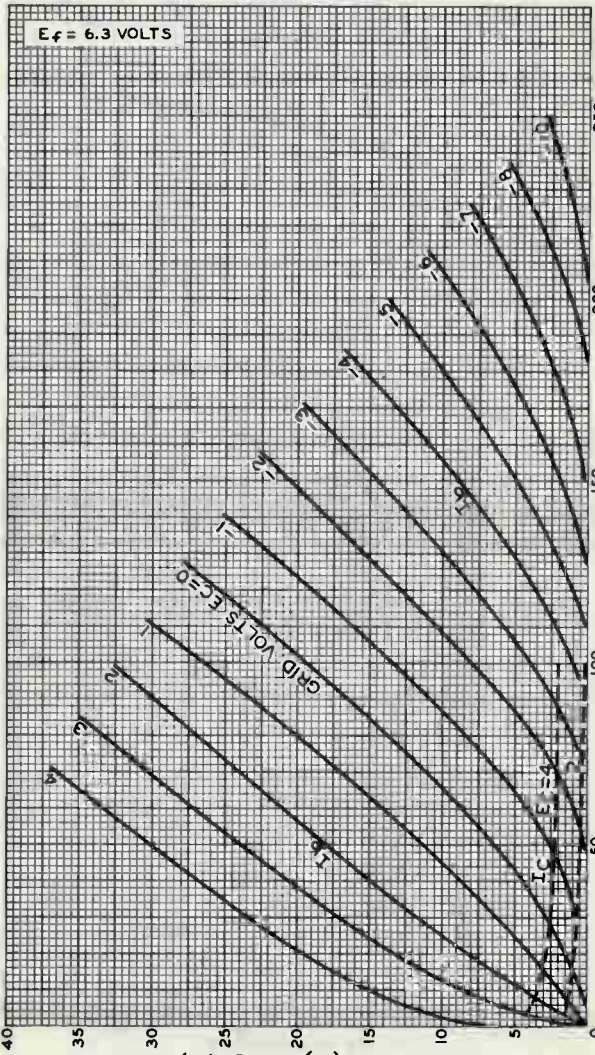
RCA

6111

AVERAGE CHARACTERISTICS
EACH UNIT



ELECTRON TUBE DIVISION
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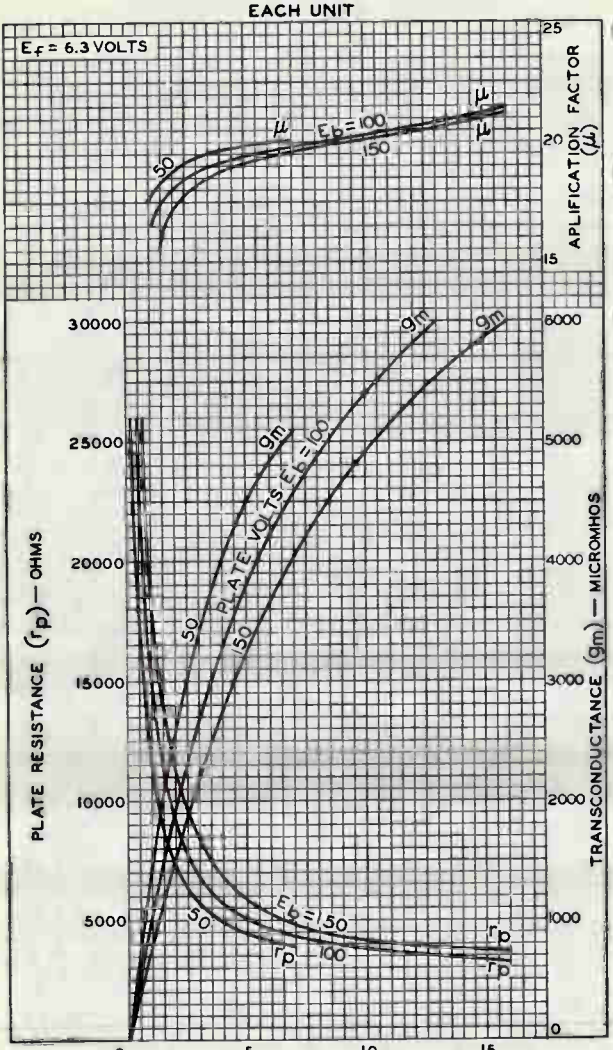
92CM-9444

6111

RCA

6111

AVERAGE CHARACTERISTICS
EACH UNIT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9443

RCA

6136

PREMIUM TYPE 6136

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount. This "premium" type is similar to the 6AU6

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to plate	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5	μμf

Characteristics, Class A_1 Amplifier:

Plate-Supply Voltage	100	250	volts
Grid No.3 (Suppressor Grid)	♦	♦	
Grid-No.2 (Screen-Grid) Supply Voltage	100	150	volts
Cathode Resistor	150	68	ohms
Plate Resistance (Approx.)	0.5	1	megohm
Transconductance	3900	5200	μmhos
Plate Current	5	10.6	ma
Grid-No.2 Current	2.1	4.3	ma
Grid-No.1 (Control-Grid) Voltage (Approx.) for plate current of 10 μa	-4.2	-6.5	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BK

Pin 1 – Grid No.1
Pin 2 – Grid No.3, Internal Shield
Pin 3 – Heater

Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Cathode

AMPLIFIER — Class A_1

Maximum Ratings, ***Absolute Values:***

PLATE VOLTAGE	330 max.	volts

°,♦: See next page.

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GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE	0 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	165 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
GRID-No.2 INPUT	0.7 max.	watt
PLATE DISSIPATION	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	165 max.	°C

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	0.5 max.	megohm

○ Without external shield.
◆ Connected to cathode at socket.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values are Initial, Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	0.275	0.325	amp
Direct Interelectrode Capacitances:				
Grid No.1 to plate	2	–	0.0035	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	2	4.8	7.2	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2	3.9	5.9	μμf
Plate Current (1)	1,3	8	13.5	ma
Plate Current (2)	1,4	–	35	μa
Grid-No.2 Current	1,3	2.6	6	ma
Transconductance, Grid No.1 to Plate:				
With heater volts = 6.3	3	4150	6250	μmhos
With heater volts = 5.5	3	3900	–	μmhos
At 500 hours with heater volts = 6.3	3	3600	6250	μmhos

Notes 1 to 4: See next page.

6136

SHARP-CUTOFF PENTODE

	Note	Min.	Max.	
Difference between average transconductance initially, and average after 500 hours, expressed as a percentage of the initial average	1,3	–	17	%
Reverse Grid-No.1 Current.	1,5	–	1	μa
Reverse Grid-No.1 Current at 500 hours.	1,5	–	1	μa
Grid-No.1-Emission Current	6	–	-2	μa
Heater-Cathode Leakage Current:				
Heater 100 volts negative with respect to cathode. . . .	1	–	10	μa
Heater 100 volts positive with respect to cathode. . . .	1	–	10	μa
Heater-Cathode Leakage Current at 500 hours:				
Heater 100 volts negative with respect to cathode. . . .	1	–	10	μa
Heater 100 volts positive with respect to cathode. . . .	1	–	10	μa
Leakage Resistance:				
Grid No.1 to all other electrodes	1,7	100	–	megohms
Plate to all other electrodes. .	1,8	100	–	megohms
Leakage Resistance at 500 hours:				
Grid No.1 to all other electrodes	1,7	50	–	megohms
Plate to all other electrodes. .	1,8	50	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield.

Note 3: With plate-supply voltage of 250 volts, grid-No.2 supply voltage of 150 volts, cathode resistor of 68 ohms, cathode-bypass capacitor of 1000 μf, and grid No.3 tied to cathode.

Note 4: With plate voltage of 250 volts, grid-No.2 voltage of 150 volts, grid-No.1 voltage of -9 volts, plate load resistor of 0.1 megohm, and grid No.3 tied to cathode.

Note 5: With plate voltage of 250 volts, grid-No.3 voltage of 0 volts, grid-No.2 voltage of 150 volts, grid-No.1 voltage of -1 volt, and grid-No.1 resistor of 0.25 megohm.

Note 6: With 7.5 volts ac or dc on heater, plate voltage of 250 volts, grid-No.3 voltage of 0 volts, grid-No.2 voltage of 150 volts, grid-No.1 voltage of -10 volts, and grid-No.1 resistor of 0.25 megohm.

Note 7: With grid No.1 100 volts negative with respect to all other electrodes tied together.

Note 8: With plate 300 volts negative with respect to all other electrodes tied together.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 2

6136

SHARP-CUTOFF PENTODE

SPECIAL RATINGS AND PERFORMANCE DATA

Shock Rating:

Impact Acceleration. . . . . 450 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are tested in four different positions. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, reverse grid-No.1 current and transconductance.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for low-frequency vibration, heater-cathode leakage current, reverse grid-No.1 current, and transconductance.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . . 300 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: Heater voltage of 6.3 volts, plate-supply voltage of 250 volts, grid No.3 tied to cathode, grid-No.2 supply voltage of 150 volts, cathode resistor of 68 ohms, cathode-bypass capacitor of 1000 μf, plate load resistor of 2000 ohms and vibrational acceleration of 2.5 g at 25 cps.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . 2000 min. cycles

Under the following conditions: Heater voltage of 7.5 volts cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid-No.1 current in excess of 1.0 microampere under the conditions specified in the Characteristics Range Values for reverse grid-No.1 current.

6136

SHARP-CUTOFF PENTODE

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. Tubes are checked for transconductance under conditions specified under 500-Hour Intermittent Life Performance. At the end of 1 hour, the value of transconductance is read. The variation in transconductance from the 0-hour reading will not exceed 10 per cent.

100-Hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run under conditions specified under 500-Hour Intermittent Life Performance to insure a low percentage of early inoperatives. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit or a value of reverse grid-No.1 current in excess of 1.0 microampere under the conditions specified in Characteristics Range Values.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: Heater voltage of 6.3 volts, plate-supply voltage of 300 volts, grid No.3 tied to cathode, grid-No.2 supply voltage of 150 volts, heater-cathode voltage of 135 volts (heater positive with respect to cathode), cathode resistor of 80 ohms and grid-No.1 resistor of 0.5 megohm. At the end of 500 hours, tube will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass established initial limits of heater current, and 500 hour limits for reverse grid-No.1 current, heater-cathode leakage current, leakage resistance, transconductance range, and the difference in transconductance between the initial value and average value shown under Characteristics Range Values.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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6136

SHARP-CUTOFF PENTODE

OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER

Plate-Supply Voltage	90			volts
Plate Load Resistor	0.1	0.22	0.47	megohm
Grid-No.2 Resistor	0.09	0.26	0.75	megohm
Grid-No.1 Resistor (Of following stage)	0.22	0.47	1	megohm
Cathode Resistor	2100	3200	6500	ohms
Peak Output Voltage●	32	32	32	volts
Voltage Gain■	72	99	126	
Plate-Supply Voltage	180			volts
Plate Load Resistor	0.1	0.22	0.47	megohm
Grid-No.2 Resistor	0.15	0.43	1	megohm
Grid-No.1 Resistor (Of following stage)	0.22	0.47	1	megohm
Cathode Resistor	900	1700	3400	ohms
Peak Output Voltage●	82	67	65	volts
Voltage Gain■	116	171	232	
Plate-Supply Voltage	300			volts
Plate Load Resistor	0.1	0.22	0.47	megohm
Grid-No.2 Resistor	0.24	0.5	1.1	megohm
Grid-No.1 Resistor (Of following stage)	0.22	0.47	1	megohm
Cathode Resistor	600	1000	1900	ohms
Peak Output Voltage●	103	108	105	volts
Voltage Gain■	145	230	318	

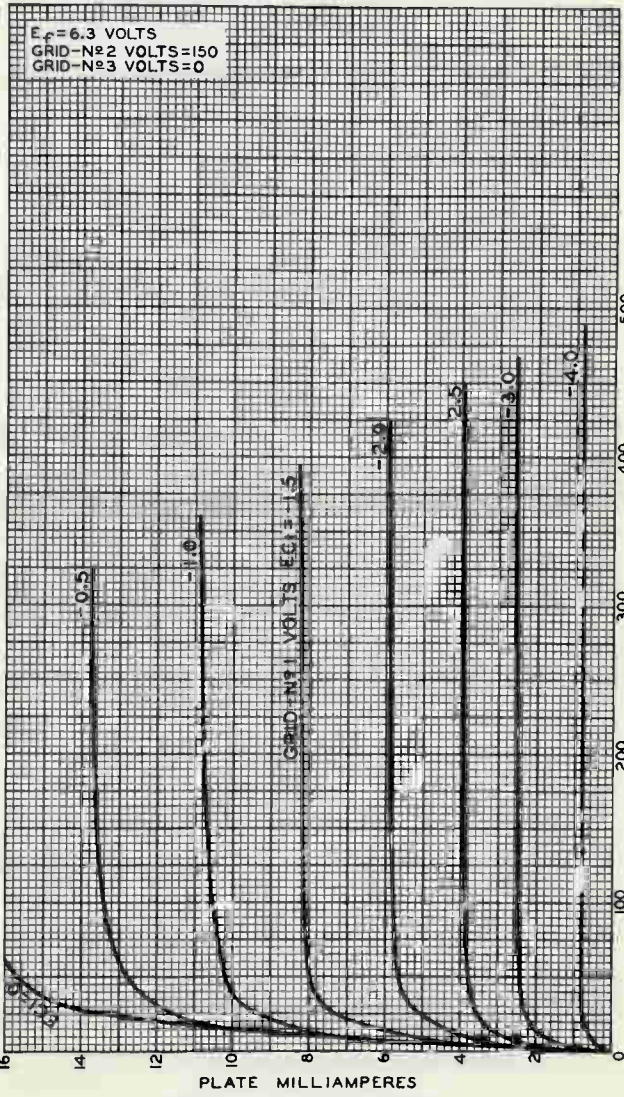
● Obtained across grid-No.1 resistor of following stage and is for the condition where the signal level is adequate to swing the grid-No.1 of the resistance-coupled amplifier tube to the point where its grid-No.1 starts to draw current.

■ At 5 volts (RMS) output.

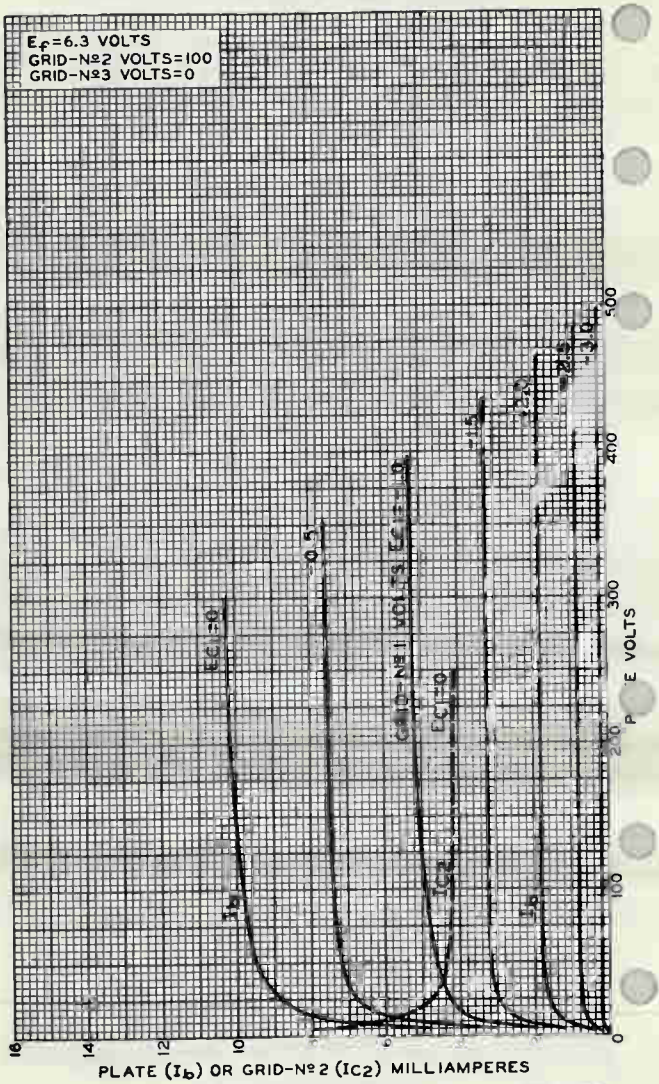
Note: Coupling capacitors should be selected to give desired frequency response. Cathode and grid-No.2 resistors should be adequately bypassed.

6136

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



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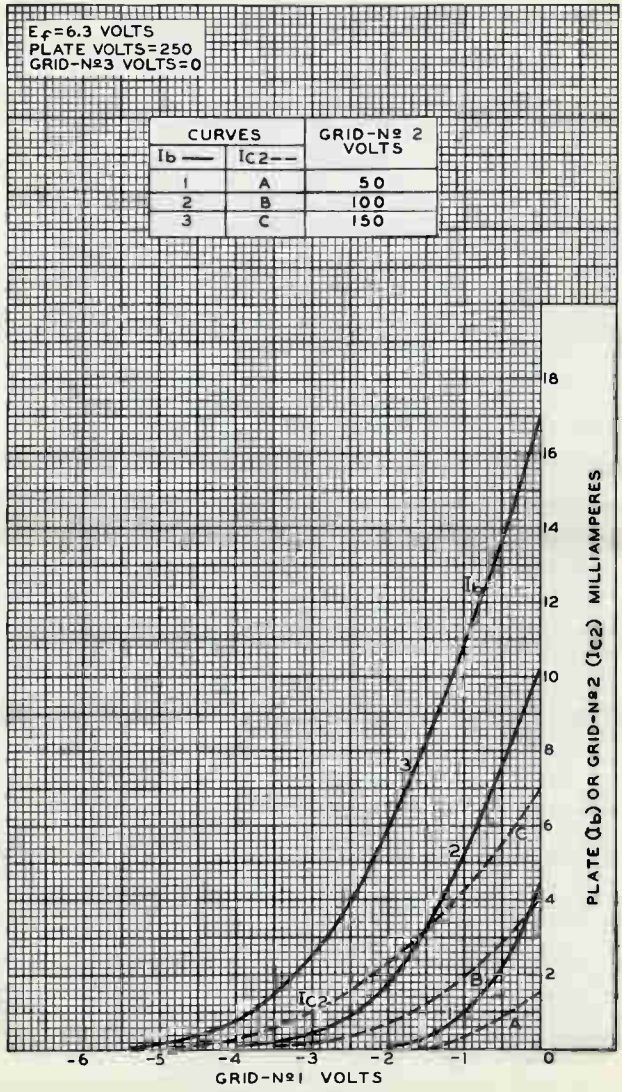
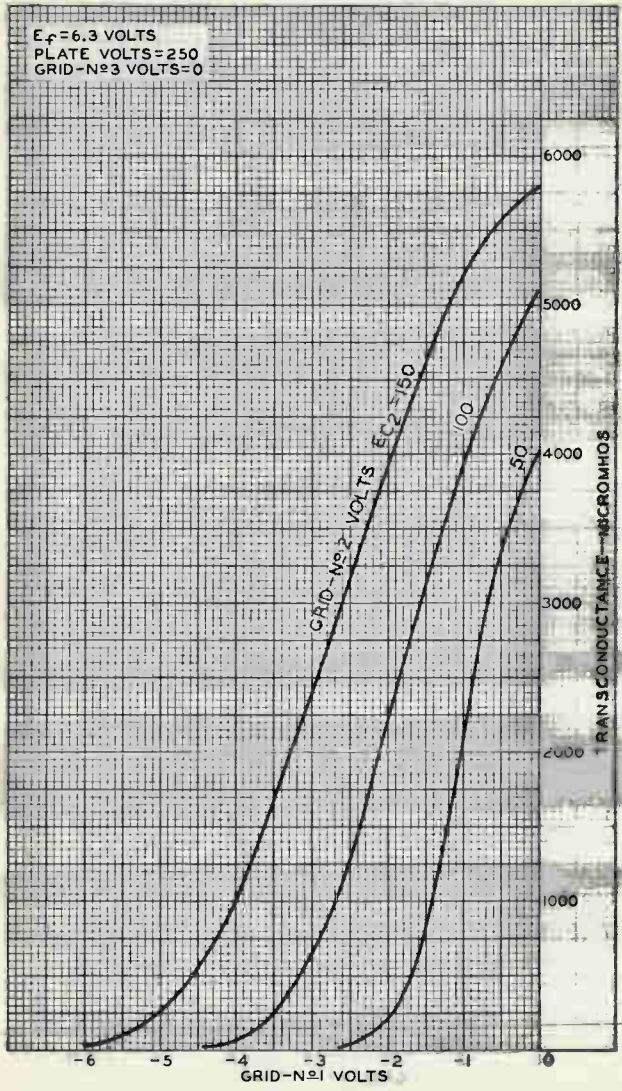
92CM-6611

6136

AVERAGE CHARACTERISTICS




E_f=6.3 VOLTS
PLATE VOLTS=250
GRID-№3 VOLTS=0
6000
5000
4000
3000
2000
1000
0
TRANSCONDUCTANCE-MICROMHOS
GRID-№2 VOLTS
EC2=150
100
50
-6
-5
-4
-3
-2
-1
0
GRID-№1 VOLTS

6173
UHF DIODE

"PENCIL" TYPE

For use in pulse-detection and pulse-power-measuring service at frequencies up to 3300 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.135	amp
Resonant Frequency (Approx.)	1600	Mc
Direct Interelectrode Capacitance (Approx.):[○]		
Plate to cathode	1.1	μμf

Mechanical:

Operating Position	Any
Dimensions	*See Dimensional Outline*
Socket	Cinch No.54A16325, or equivalent
Terminal Connections *(See Dimensional Outline)*:	

H—Heater Leads
P—Plate Terminal (Adjacent to pinch-off)

K—Cathode Terminal (Adjacent to heater leads)

PULSE-DETECTION and PULSE-POWER-MEASURING SERVICE[△]

Maximum Ratings, *Absolute Values:*

PEAK INVERSE PLATE VOLTAGE	1000 max.	volts
PEAK PULSE PLATE VOLTAGE	150 max.	volts
PEAK PULSE PLATE CURRENT	1 max.	amp
DC PLATE CURRENT	1 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
SEAL TEMPERATURE (Plate or cathode)	175 max.	°C

HALF-WAVE RECTIFIER

Maximum Ratings, *Absolute Values:*

PEAK INVERSE PLATE VOLTAGE	375 max.	volts
PEAK PLATE CURRENT	50 max.	ma
HOT-SWITCHING TRANSIENT PLATE CURRENT:[●]		
For duration of 0.2 second maximum	250 max.	ma
DC OUTPUT CURRENT	5.5 max.	ma

○,△,●: See next page.

6173

UHF DIODE

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode .	90 max.	volts
Heater positive with respect to cathode .	90 max.	volts
SEAL TEMPERATURE (Plate or cathode)	175 max.	°C

° Without external shield.

▲ In this class of service, the heater should be allowed to warm up for a minimum of 60 seconds before plate voltage is applied in order to allow the cathode to reach normal operating temperature and to be able to supply the high peak plate currents encountered in this class of service.

● A minimum plate-load impedance (including the source impedance) of 300 ohms is required to limit the hot-switching transient plate current and thereby prevent damage to the tube when the plate voltage is applied.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current.	1	0.127	0.143	amp
Direct Interelectrode Capacitance:				
Plate to cathode.	2	0.8	1.4	μμf
Tube Voltage Drop	1,3	-	15	volts

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield.

Note 3: With peak plate current of 50 milliamperes provided by an applied dc voltage. Tube drop is measured by a voltmeter connected between plate and cathode.

OPERATING CONSIDERATIONS

Connections to the cathode terminal and the plate terminal should be made by flexible spring contacts only. The connectors must make firm, large-surface contact, yet must be sufficiently flexible so that no part of the tube is subjected to strain. Unless this recommendation is observed, the glass-to-metal seals may be damaged.

The *heater leads* should not be soldered to the circuit elements. The heat of the soldering operation may crack the glass seals of the heater leads and damage the tube.

The accompanying *Pulse Rating Chart* represents graphically the relationships between pulse duration, pulse-repetition rate, and peak-pulse plate current. This Chart gives the equipment designer a wide choice of operating parameters within the tube's ratings.

Dotted boundary line "ABC" is the locus of the maximum peak-pulse-plate-current values for various pulse durations. In most applications, two of the three parameters shown in the Pulse Rating Chart are known. Knowing any two parameters, the equipment designer can select from the Chart the maximum allowable value of the third parameter. For example, if an application requires a 1-microsecond pulse and a pulse-repetition rate of 1000 pulses per second, the maximum allowable peak-pulse plate current is 1 ampere. Since the pulse-repetition rate of 1000 is a maximum value for a pulse duration

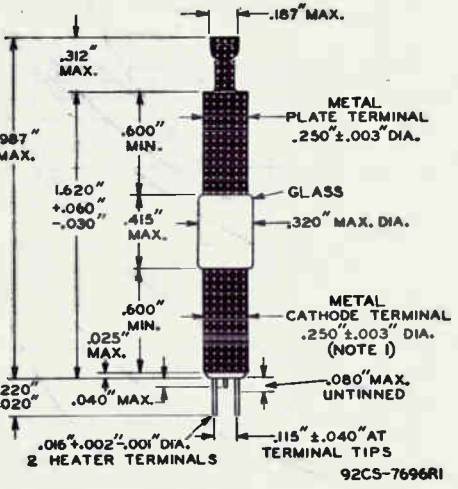
→ Indicates a change.

6173

UHF DIODE

of 1 microsecond, it follows that any pulse-repetition rate up to 1000 may be used under these conditions. If a longer pulse duration is required, e.g., 1.5 microseconds, and the same pulse-repetition rate of 1000 is required, the maximum allowable peak-pulse plate current is 0.67 ampere.

In applications where groups of pulses are employed, the equipment designer can total the pulse duration of the individual pulses in any one group and then treat the pulse duration of the group as a single wide pulse.



NOTE 1: THE MAXIMUM ECCENTRICITY OF THE CATHODE TERMINAL WITH RESPECT TO THE PLATE TERMINAL IS 0.008". ECCENTRICITY IS MEASURED BY CHUCKING THE PLATE TERMINAL 0.050" TO 0.100" FROM THE GLASS MID-SECTION, ROTATING THE TUBE, AND MEASURING ONE-HALF THE TOTAL TRAVEL DISTANCE OF THE CATHODE TERMINAL AT A POINT 0.080" FROM THE FREE END OF THE CATHODE TERMINAL.

6173

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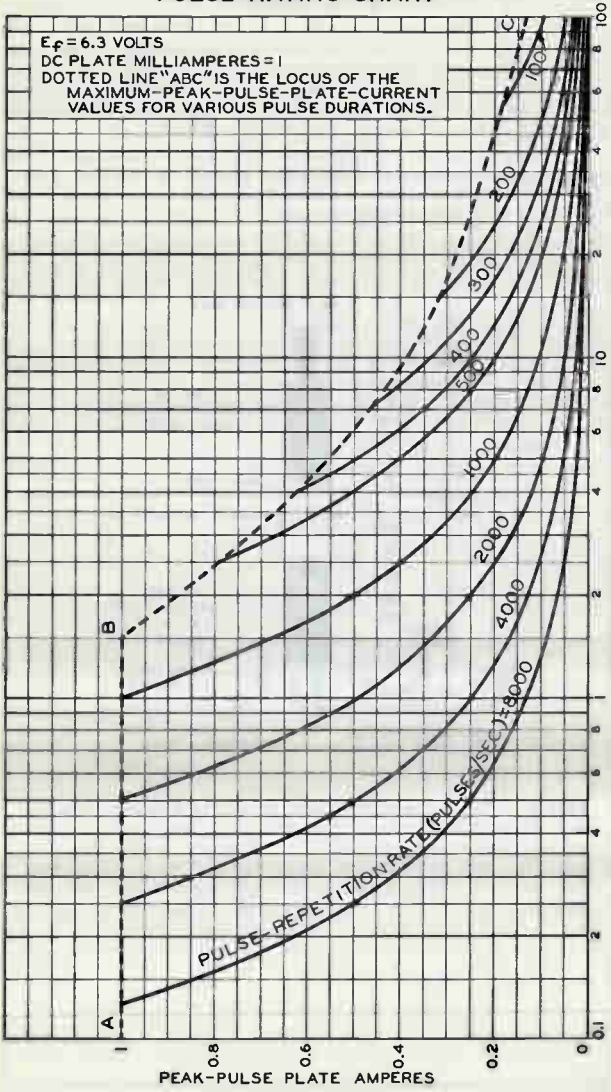
6173

PULSE RATING CHART



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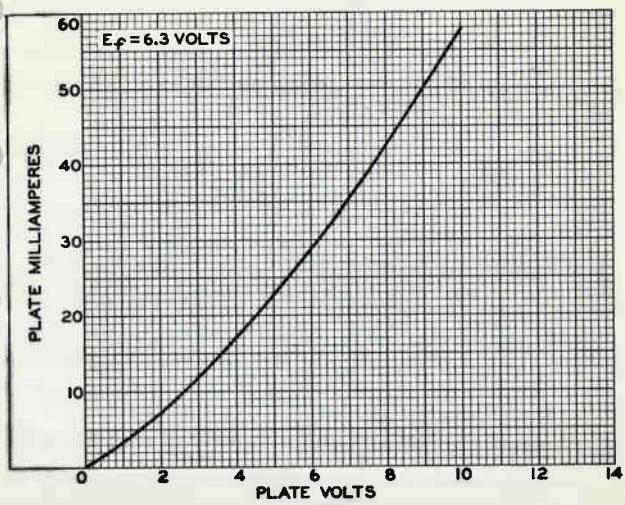
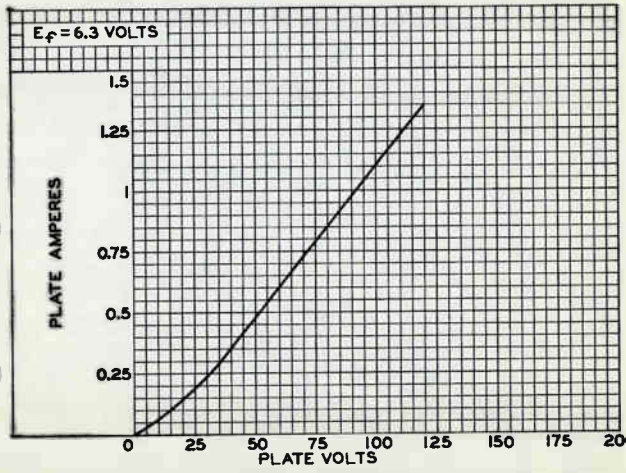
92CM-7727RI

6173

AVERAGE PLATE CHARACTERISTICS



92CS-9638



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CS-9637

6197

POWER PENTODE

FOR "ON-OFF" CONTROL APPLICATIONS INVOLVING
LONG PERIODS OF OPERATION UNDER CUTOFF CONDITIONS

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathode:		
Voltage	6.3 ± 5%	ac or dc volts
Current at 6.3 volts	0.65	amp
Direct Interelectrode Capacitances (Approx. with no external shield):		
Grid No.1 to Plate	0.125	μμf
Grid No.1 to Cathode and Heater	11.5	μμf
Plate to Cathode and Heater	5.0	μμf
Heater to Cathode	8.5	μμf

Characteristics, Class A_1 Amplifier:

Heater Voltage	6.3	volts
Plate Voltage	250	volts
Grid No.3	Connected to Cathode at Socket	
Grid-No.2 Voltage	150	volts
Grid-No.1 Voltage	−3	volts
Mu-Factor, Grid No.2 to Grid No.1	22	
Plate Resistance	90000	ohms
Transconductance	11000	μmhos
Plate Current	30	ma
Grid-No.2 Current	7	ma
Maximum Plate Current for grid-No.1 voltage of −12 volts	100	μamp

Mechanical:

Mounting Position	Vertical; Horizontal operation permitted if pins No.9 and No.8 are in a vertical plane
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Exeluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)

BOTTOM VIEW

Pin 1: Cathode
Pin 2: Grid No.1
Pin 3: Grid No.2
Pin 4: Heater
Pin 5: Heater
Pin 6: Plate
Pin 7: Grid No.3, Int. Shield
Pin 8: Grid No.2
Pin 9: Grid No.1

FREQUENCY DIVIDER IN COMPUTER SERVICE and "ON-OFF" CONTROL SERVICE

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0 max.	volts

6197

RCA

6197

POWER PENTODE

GRID-No.2 (SCREEN) VOLTAGE	250 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE	-50 max.	volts
PLATE DISSIPATION	7.5 max.	watts
GRID-No.2 INPUT	2.5 max.	watts
CATHODE CURRENT	50 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180• max.	volts
Heater positive with respect to cathode	180• max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	200 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.61	0.69	amp
Mu-Factor, Grid No.2 to Grid No.1	1,2	19	25	
Plate Current (1)	1,3	26	46	ma
Plate Current (2)	1,4	20	40	ma
Plate Current (3)	1,5	-	100	μamp
Grid-No.2 Current	1,4	5	9	ma
Reverse Grid-No.1 Current	1,6	-	2	μamp
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,7	-	40	μamp
Heater positive with respect to cathode	1,7	-	40	μamp
Transconductance	1,4	9000	13000	μmhos

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With grid No.3 tied to cathode, grid No.2 tied to plate, plate voltage of 150 volts, grid-No.2 voltage of 150 volts, and grid-No.1 voltage of -3 volts.

Note 3: With plate voltage of 50 volts, grid No.3 tied to cathode, grid No.2 voltage of 100 volts, and grid-No.1 voltage of 0 volts.

Note 4: With plate voltage of 250 volts, grid No.3 connected to cathode, grid-No.2 voltage of 150 volts, and grid-No.1 voltage of -3 volts.

Note 5: With plate voltage of 250 volts, grid No.3 connected to cathode, grid-No.2 voltage of 150 volts, and grid-No.1 voltage of -12 volts.

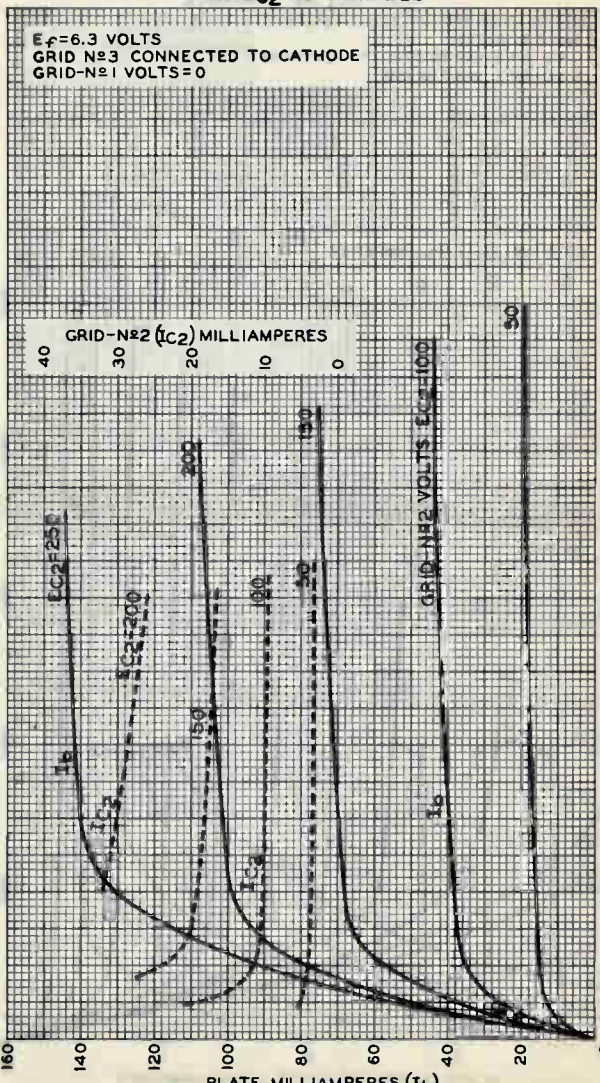
Note 6: With plate voltage of 250 volts, grid No.3 connected to cathode, grid-No.2 voltage of 150 volts, grid-No.1 supply voltage of -3 volts, and grid-No.1 resistor of 0.25 megohm.

Note 7: With 90 volts dc between heater and cathode.

• DC component must not exceed 90 volts.

6197

AVERAGE PLATE CHARACTERISTICS
WITH E_{C2} AS VARIABLE



DEC. 8, 1953

TUBE DEPARTMENT

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92CM-8150

6197

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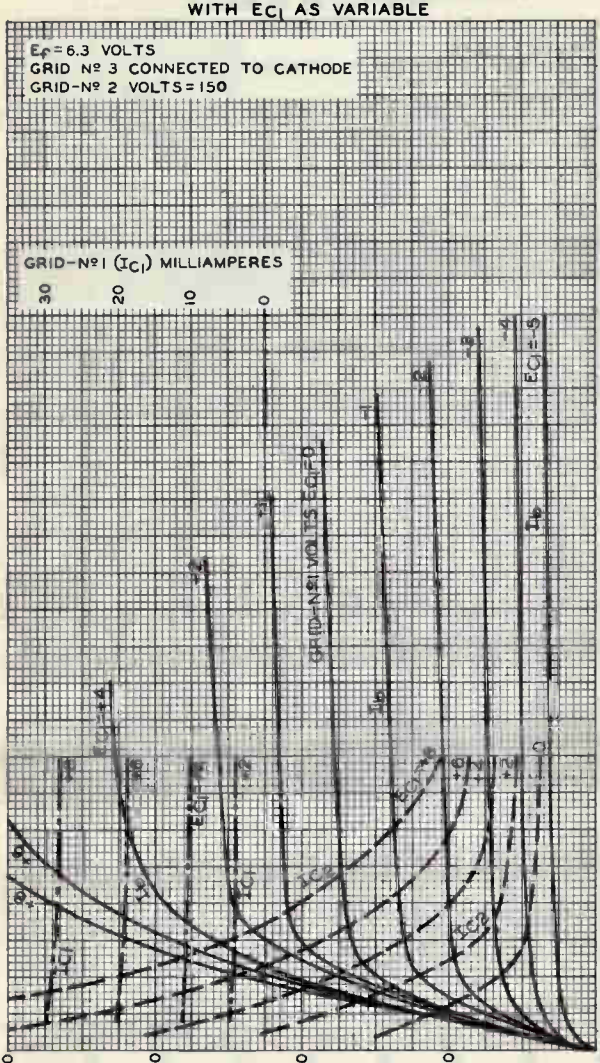
6197

AVERAGE PLATE CHARACTERISTICS
WITH E_{C_1} AS VARIABLE



DEC. 4, 1953 TUBE DEPARTMENT 92CM-8285

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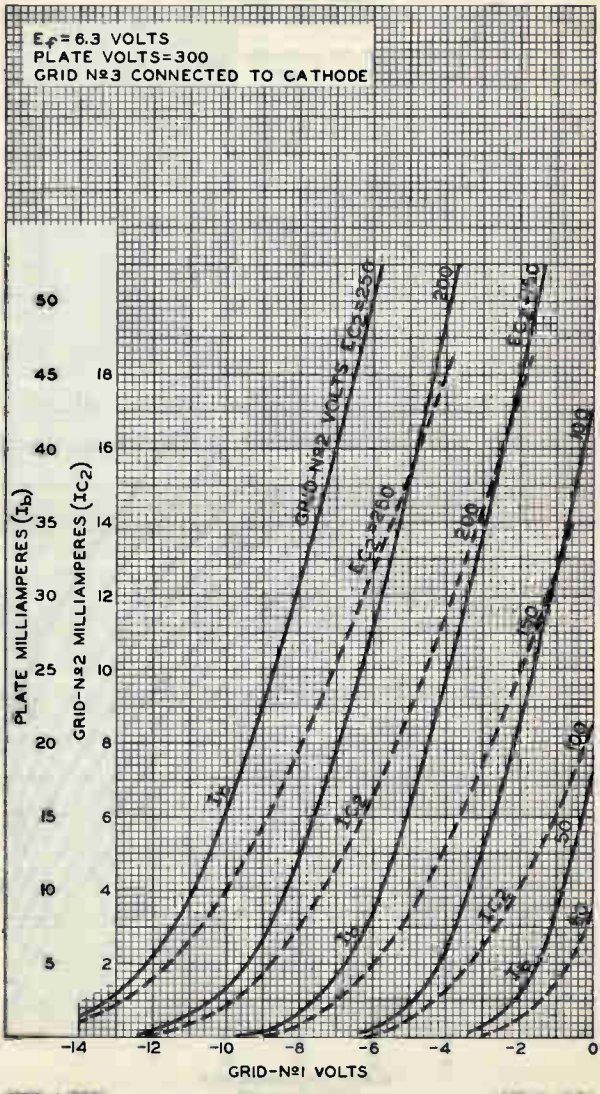
6197

AVERAGE CHARACTERISTICS



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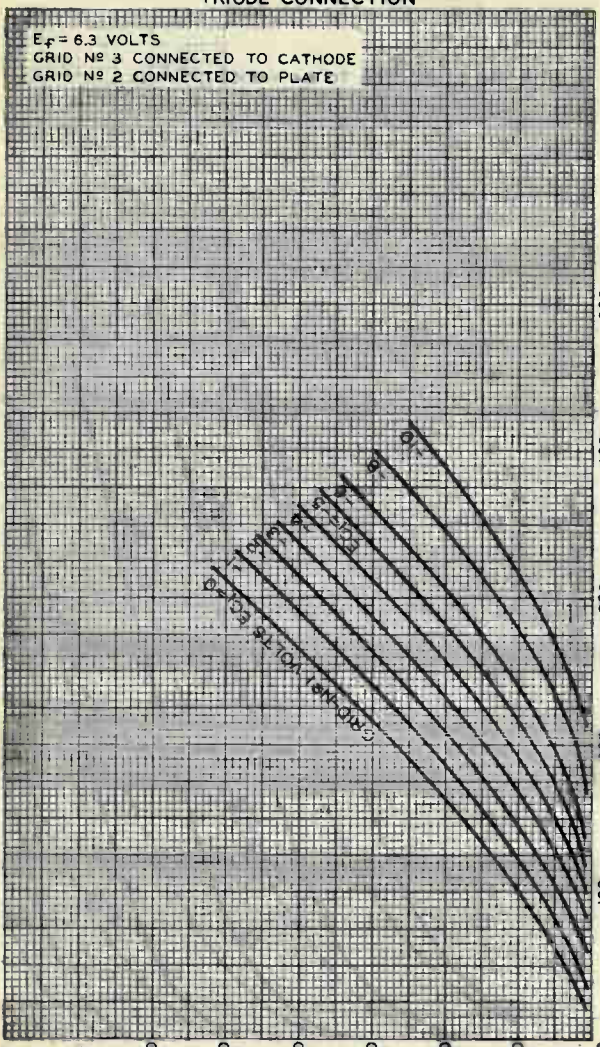
AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6201

HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for applications where dependable performance under shock and vibration is paramount, and for "on-off" control applications involving long periods of operation under cutoff conditions. The 6201, a "premium" version of the 12AT7, may be used at frequencies up to 300 Mc.

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

Heater arrangement	*Series*	*Parallel*	
Voltage.	12.6 ± 10%	6.3 ± 10%	ac or dc volts
Current.	0.15	0.3	amp

Direct Interelectrode Capacitances (Approx.):

Grid-Drive Operation:	*Without External Shield*	*With External Shield**	
Grid to plate (Each unit). .	1.6	1.6	μμf
Grid to cathode and heater (Each unit)	2.5	2.5	μμf
Plate to cathode and heater (Unit No.1)	0.45	1.2	μμf
Plate to cathode and heater (Unit No.2)	0.38	1.3	μμf
Heater to cathode (Each unit).	2.8	2.8	μμf
Plate to plate	0.24	-	μμf
Cathode-Drive Operation:	***Without External Shield***	***With External Shield****	
Plate to cathode (Unit No.1).	0.2	0.18	μμf
Plate to cathode (Unit No.2).	0.24	0.2	μμf
Cathode to grid and heater (Each unit)	5	5	μμf
Plate to grid and heater (Unit No.1).	1.9	2.7	μμf
Plate to grid and heater (Unit No.2).	1.8	2.7	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate-Supply Voltage	100	250	volts
Cathode Resistor	270	200	ohms
Amplification Factor	57	60	
Plate Resistance (Approx.) . . .	14300	10900	ohms
Transconductance	4000	5500	μmhos
Plate Current.	3.3	10	ma
Grid Voltage (Approx.) for plate current of 10 μamp . . .	-5	-12	volts

*,●: See next page.

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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T-6-1/1
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9A

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 9 – Heater of Unit No.2
Pins 5 & 9 – Heater of Unit No.1

Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Heater Mid-Tap

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, ***Absolute Values:***

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative bias value	55 max.	volts
Positive bias value	0 max.	volts
PLATE DISSIPATION	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	180 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1.0 max.	megohm

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

* With external shield JETEC No.315 connected to cathode of unit under test.

● With external shield JETEC No.315 connected to grid of unit under test.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6201

HIGH-MU TWIN TRIODE

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

Values Are For Each Unit and are Initial, Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	0.138	0.162	amp
Direct Interelectrode Capacitances:				
Grid to plate	2	1.3	1.9	μμf
Grid to cathode and heater	2	2	3	μμf
Plate to cathode and heater (Unit No.1)	2	0.2	0.7	μμf
Plate to cathode and heater (Unit No.2)	2	0.16	0.6	μμf
Heater to cathode	2	2.1	3.5	μμf
Plate to plate	3	0.15	0.33	μμf
Amplification Factor	1,4	50	70	
Plate Current (1)	1,4	7	14	ma
Plate-Current Difference Between Units	1,4	-	3.2	ma
Plate Current (2)	1,5	-	100	μamp
Transconductance (1)	1,4	4500	6500	μmhos
Transconductance (1) at 500 Hours	1,4	3800	6500	μmhos
Transconductance (2)	3,6	4100	-	μmhos
Transconductance Change: Difference between average transconductance (1) initially, and average after 500 hours, expressed as a percentage of the initial average	1,4	-	15	%
Reverse Grid Current	1,7	-	0.7	μamp
Grid Emission Current	8,9	-	1.5	μamp
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,10	-	10	μamp
Heater positive with respect to cathode	1,10	-	10	μamp
Leakage Resistance: Between grid and all other electrodes tied together	1,11	100	-	megohms

*Each tube is stabilized before characteristics testing by continous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Notes 1 to 11: See next page.

RCA

6201

HIGH-MU TWIN TRIODE

	Note	Min.	Max.	
Leakage Resistance:				
Between plate and all other electrodes tied together.	1,12	100	-	megohms
Leakage Resistance at 500 Hours:				
Between grid and all other electrodes tied together.	1,11	50	-	megohms
Between plate and all other electrodes tied together.	1,12	50	-	megohms

Note 1: With 12.6 volts ac or dc on heater (series connection).

Note 2: Without external shield and with unit not under test connected to ground.

Note 3: Without external shield.

Note 4: With dc plate-supply volts = 250, cathode resistor (ohms) = 200, and cathode bypass capacitor of 1000 μf. Each unit tested separately. Unit not under test connected to ground.

Note 5: With dc plate-supply volts = 250, plate load resistance (megohms) = 0.1, and dc grid volts = -20. Each unit tested separately. Unit not under test connected to ground.

Note 6: With 11.0 volts ac or dc on heater (series connection).

Note 7: With dc plate-supply volts = 250, grid-circuit resistance (megohms) = 0.5, cathode resistor (ohms) = 200, and cathode bypass capacitor of 1000 μf. Each unit tested separately. Unit not under test connected to ground.

Note 8: With 15.0 volts ac or dc on heater (series connection).

Note 9: With dc plate volts = 250, grid-circuit resistance (megohms) = 0.5, and dc grid volts = -20. Each unit tested separately.

Note 10: With 100 volts dc between heater and cathode and units connected in parallel.

Note 11: With grid 100 volts negative with respect to all other electrodes tied together.

Note 12: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration. . . . . 600 max. g

This test is performed on a sample lot of tubes from each production run in a Navy Type, High-Impact (flyweight) Shock Machine. Tubes are held rigid in four different positions and are subjected to 20 blows at the specified maximum impact acceleration. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for vibrational acceleration, heater-cathode leakage current, and transconductance.

Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

HIGH-MU TWIN TRIODE

production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for impact acceleration, heater-cathode leakage current, and transconductance.

Low-Frequency Vibration Performance:

RMS Output Voltage. . . . . 100 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: plate of unit No.1 tied to plate of unit No.2, grid of unit No. 1 tied to grid of unit No.2, heater volts = 12.6, dc plate volts = 250, dc grid volts = -3, plate load resistance (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cycles per second.

Heater-Cycling Life Performance:

Cycles of Intermittent Operation. . . . . 2000 min. cycles

Under the following conditions and with the heaters of unit No.1 and unit No.2 connected in parallel: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and plate and grid volts = 0.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage. . . . . 100 max. mv

This test is performed on a sample lot of tubes from each production run under the following conditions: plate of unit No.1 tied to plate of unit No.2, grid of unit No.1 tied to grid of unit No.2, dc heater volts = 12.6, plate-supply volts = 300, cathode resistor (ohms) = 200 common to both units, and plate load resistance (ohms) = 10,000.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.4 microamperes under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid current.

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. With both units operating, each unit is checked for variation in transconductance under conditions of maximum rated plate dissipation. At the end of 1 hour, the value of transconductance is read. The variation in transconductance from the 0-hour reading will not exceed 10 per cent.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

100-Hour Life Performance:

This test is performed on a sample lot of tubes from each production run under the conditions of maximum rated plate dissipation to insure a low percentage of early inoperatives. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.4 microamperes under the conditions specified in CHARACTERISTICS RANGE VALUES for reverse grid current.

500-Hour Average Life Performance:

This 500-hour test is made on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. With both units operating, each unit is life tested separately at room temperature under the following conditions: heater volts = 12.6 ac or dc (series connection), plate-supply volts = 250, cathode resistor (ohms) = 200, grid-circuit resistance (megohms) = 0.5, heater 135 volts positive with respect to cathode, and bulb temperature (^{o}C) = 180. At the end of 500 hours, tube will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass the established initial limits for heater current, reverse grid current, heater-cathode leakage current, and 500-hour limits for transconductance (1), transconductance change, and leakage resistance as shown under CHARACTERISTICS RANGE VALUES.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6201

HIGH-MU TWIN TRIODE

OPERATING CONSIDERATIONS AS RESISTANCE-COUPLED AMPLIFIER (Each Unit)				
Plate-Supply Voltage	90			volts
Plate Load Resistor	0.1	0.24	.0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	2400	5300	11000	ohms
Peak Output Voltage	13	15	16	volts
Voltage Gain▲	27	28	28	
Plate-Supply Voltage	180			volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	1400	3600	7100	ohms
Peak Output Voltage	28	31	33	volts
Voltage Gain▲	33	33	32	
Plate-Supply Voltage	300			volts
Plate Load Resistor	0.1	0.24	0.51	megohm
Grid Resistor (Of following stage)	0.24	0.51	1	megohm
Cathode Resistor	1200	2900	6400	ohms
Peak Output Voltage	47	52	55	volts
Voltage Gain▲	33	34	34	

▲ At 2 volts (rms) output.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.

6201

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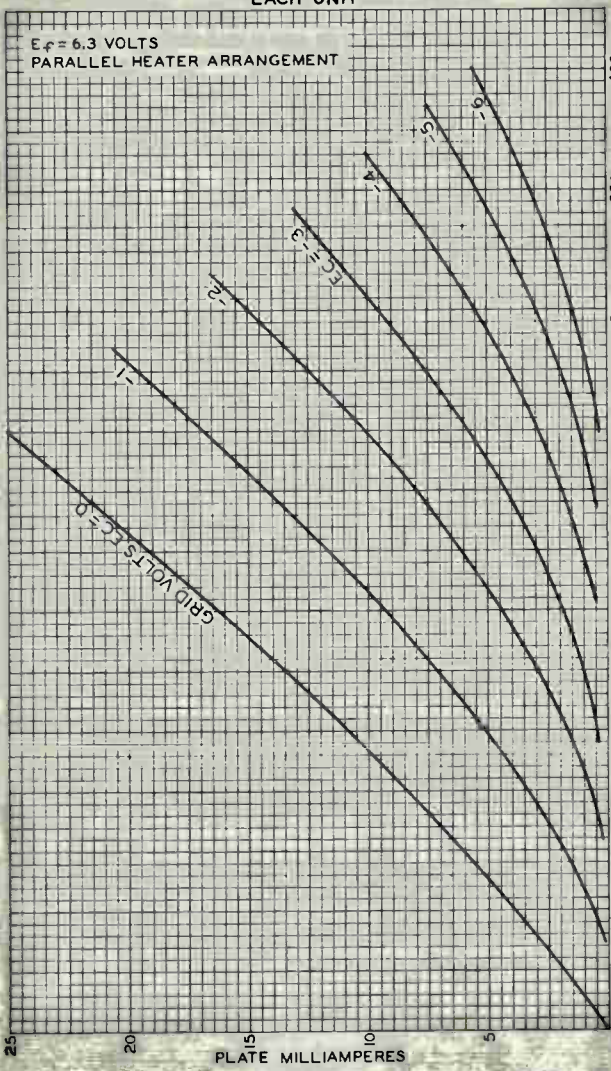
AVERAGE PLATE CHARACTERISTICS

EACH UNIT



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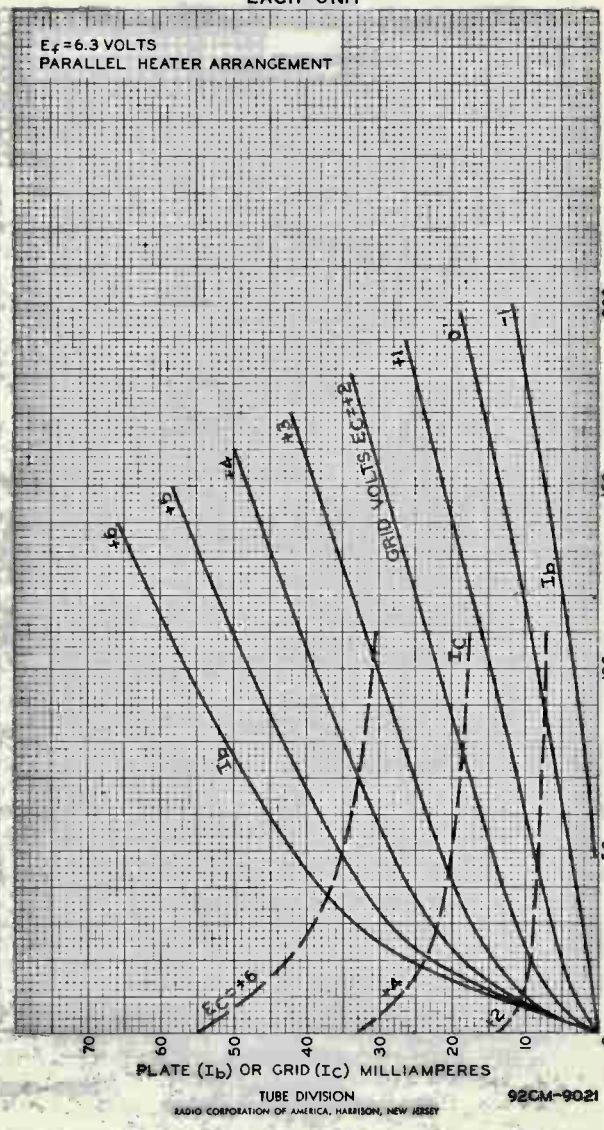
92CM-9020

AVERAGE CHARACTERISTICS
EACH UNIT



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92CM-9021

6201

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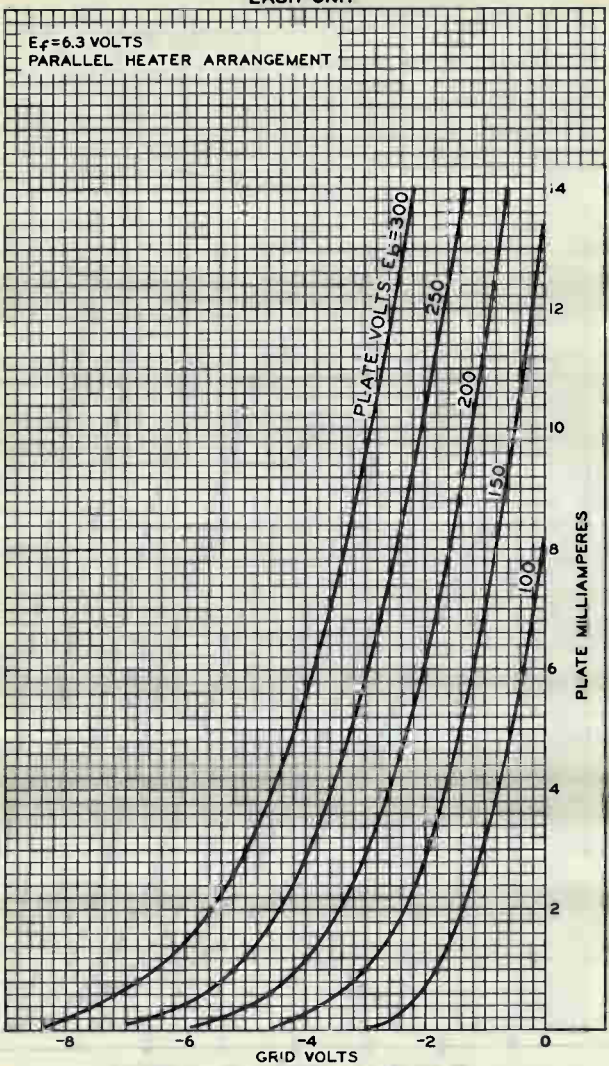
AVERAGE CHARACTERISTICS
EACH UNIT



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92CM-9023

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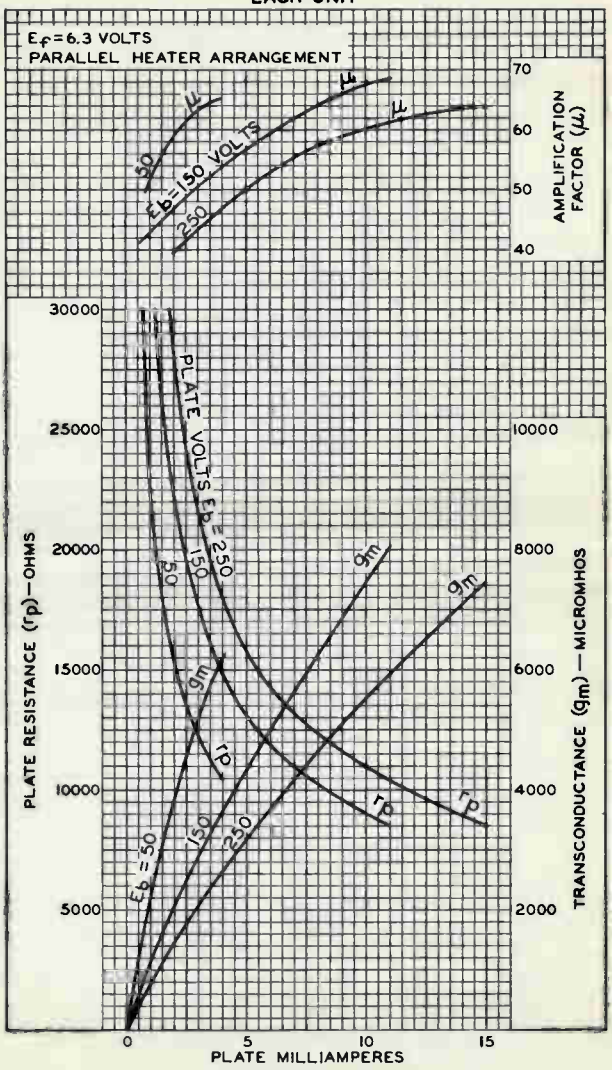
AVERAGE CHARACTERISTICS

EACH UNIT



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9022

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6211

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For "on-off" control applications involving long periods of operation under cutoff conditions

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

	Series	Parallel	
Heater arrangement			
Voltage	12.6 ± 5%	6.3 ± 5%	ac or dc volts
Current	0.15	0.3	amp

Direct Interelectrode Capacitances:[o]

	Unit No.1	Unit No.2	
Grid to plate	2.22	2.22	μμf
Grid to cathode and heater	2.90	2.90	μμf
Plate to cathode and heater	0.54	0.46	μμf
Heater to cathode	3.25	3.25	μμf ←
Plate of unit No.1 to plate of unit No.2	0.56		μμf
Grid of unit No.1 to grid of unit No.2	0.06 max.		μμf

Characteristics, Class A1 Amplifier (Each Unit):

Plate-Supply Voltage	100	volts
Cathode Resistor	470	ohms
Amplification Factor	27	
Plate Resistance (Approx.)	7500	ohms
Transconductance	3600	μmhos
Plate Current	4.6	ma
Grid Voltage (Approx.) for plate voltage of 150 volts and plate current of 100 μamp	-8	volts ←

Mechanical:

Mounting Position . . . . . Vertical, base up or down, ← or Horizontal with pins 1 and 5 in vertical plane

Maximum Overall Length . . . . . 2-3/16"

Maximum Seated Length . . . . . 1-5/16"

Length, Base Seat to Bulb Top (Excluding tip) . 1-9/16" ± 3/32"

Maximum Diameter . . . . . 7/8"

Dimensional Outline . . . . . *See General Section*

Bulb T-6-1/2

Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)

Basing Designation for BOTTOM VIEW 9A

Pin 1 – Plate of Unit No.2
Pin 2 – Grid Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 9 – Heater of Unit No.2
Pins 5 & 9 – Heater of Unit No.1

Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Heater Mid-Tap

o Without external shield.

← Indicates a change.

FREQUENCY DIVIDER IN COMPUTER SERVICE and "ON-OFF" CONTROL SERVICE

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	200 max.	volts
GRID VOLTAGE:		
Negative bias value	100 max.	volts
→ Positive bias value	1 max.	volt
→ DC POSITIVE GRID CURRENT	2 max.	ma
→ DC CATHODE CURRENT	16 max.	ma
PLATE DISSIPATION	1 max.	watt
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180▲max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

→ **CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	Note	*Min.*	*Max.*	
Heater Current	1	0.138	0.162	amp
Plate Current (Each unit)	1,2	4.8	5.5	ma
Plate Current (Each unit)	1,3	3.6	5.6	ma
Plate Current (Each unit)	1,2,4	–	100	μamp
Transconductance	1,2,3	2700	4500	μmhos
Reverse Grid Current (Units in parallel)	1,5	–	1	μamp
Leakage Resistance (Each unit):				
Between grid and all other electrodes	1,6	100	–	megohms
Between plate and all other electrodes	1,7	100	–	megohms
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,8	–	20	μamp
Heater positive with respect to cathode	1,8	–	20	μamp
Difference in Grid Voltage Between Units	1,2,9	–	1	volt
Contact Potential	1,10	–	1	volt
Amplification Factor (Each unit)	1,2	23	31	

Note 1: With 12.6 volts ac or dc on heater (series arrangement).

▲ The dc component must not exceed 90 volts.

→ Indicates a change.

MEDIUM-MU TWIN TRIODE

Note 2: With plate-supply volts = 150, plate-circuit resistance (ohms) = 20,000, and grid-circuit resistance (ohms) = 47,000. Each unit tested separately. Unit not under test connected to ground.

Note 3: With plate-supply volts = 100, cathode resistor (ohms) = 470, and cathode bypass capacitor of 1000 μf. Each unit tested separately. Unit not under test connected to ground.

Note 4: With grid volts = −10.

Note 5: With plate-supply volts = 150, cathode resistor (ohms) = 470, and grid-circuit resistance (megohm) = 0.5.

Note 6: With grid 100 volts negative with respect to all other electrodes tied together.

Note 7: With plate 300 volts negative with respect to all other electrodes tied together.

Note 8: With 100 volts dc between heater and cathode and units connected in parallel.

Note 9: With grid voltage adjusted for plate current of 100 μamp.

Note 10: With plate volts = 100, grid current (μamp) = 0.1, and grid-circuit resistance (megohm) = 0.1. Each unit tested separately. Unit not under test connected to ground.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

Cycles of Intermittent Operation. . . . . 2000 min. cycles

For conditions: Series heater arrangement, heater volts = 17, cycled 1 minute on and 4 minutes off, heater positive with respect to cathode by +100 volts dc, plate volts = 0, and grid volts = 0.

→ indicates a change.

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6211

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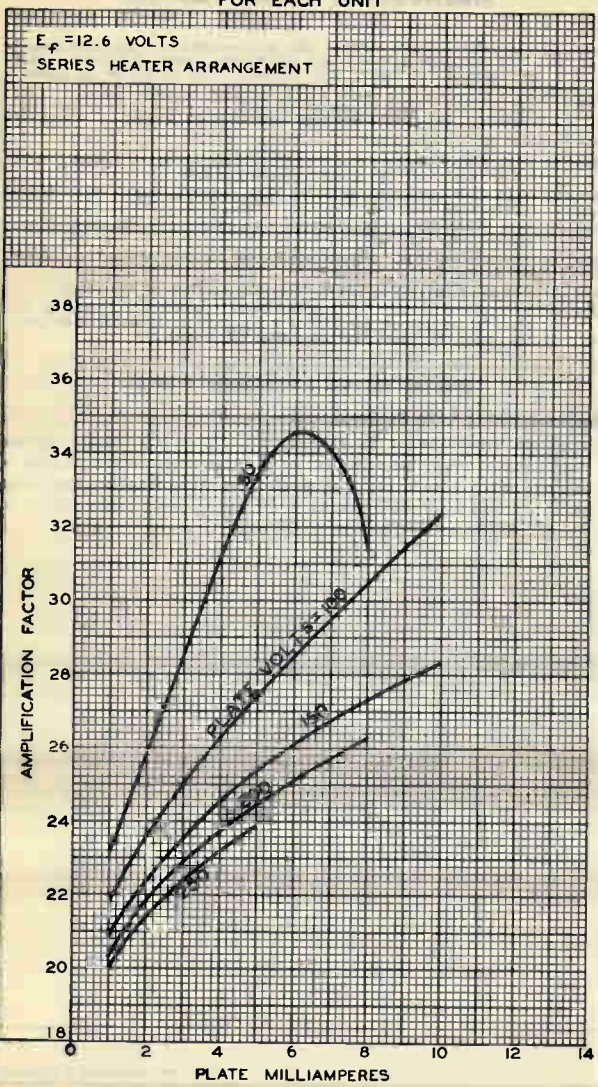
6211

AVERAGE CHARACTERISTICS
FOR EACH UNIT



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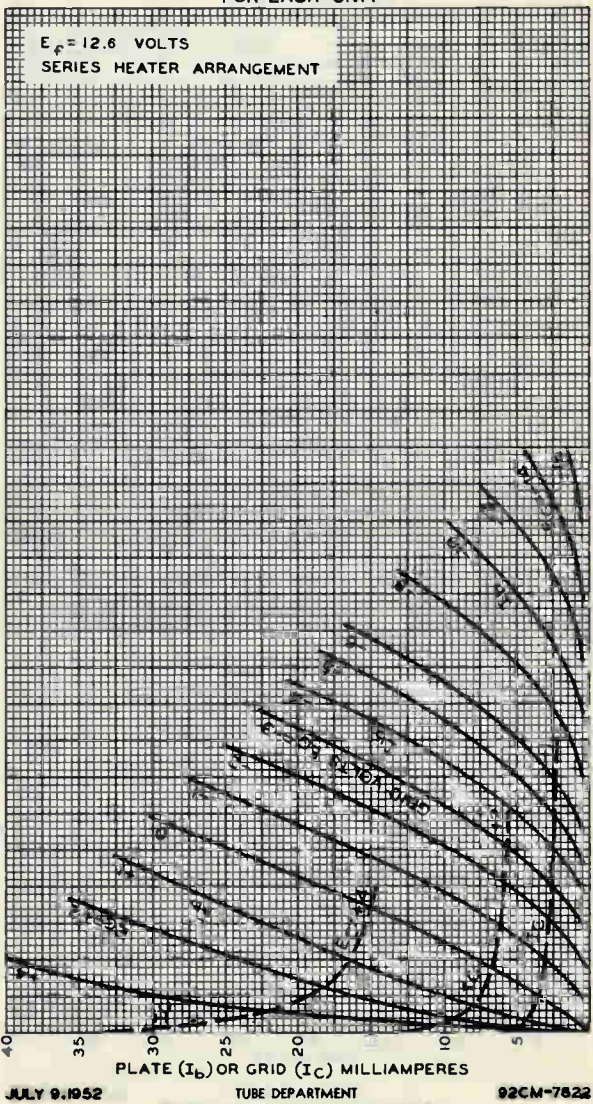
AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



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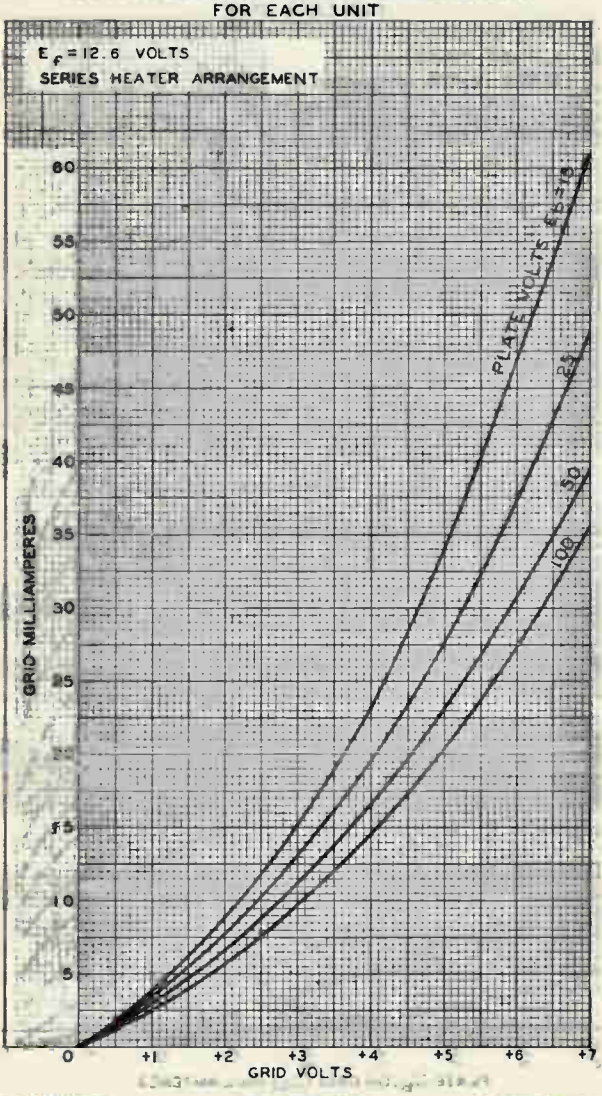
AVERAGE CHARACTERISTICS

FOR EACH UNIT



RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Low-Mu Twin Triode

For Use as a Series-Regulator Tube in Regulated DC Power Supplies

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Absolute-Maximum Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	5.000	amp
Peak heater–cathode voltage (Each Unit):		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts
Cathode Warm-Up Time (Minimum)	30	sec
Direct Interelectrode Capacitances:		
Grid to plate (Each Unit)	21.8	μμf
Grid to cathode (Each Unit)	16.7	μμf
Plate to cathode (Each Unit)	3.8	μμf
Heater to cathode (Each Unit)	15	μμf
Plate to plate	0.6	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	190	volts
Cathode Resistor	200	ohms
Amplification Factor	2.7	
Plate Resistance (Approx.)	200	ohms
Transconductance	13500	μmhos

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 1 and 4 in vertical plane
Type of Cathodes	Coated Unipotential
Maximum Overall Length	4.750"
Maximum Seated Length	4.188"
Maximum Diameter	2.070"
Bulb	TT16
Base	Large-Wafer Octal 8-Pin with External Barriers and Sleeve (JEDEC Group 7, No.B8-98)
Basing Designation for BOTTOM VIEW	8BD

Pin 1 – Grid of Unit No.2
Pin 2 – Plate of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Grid of Unit No.1

Pin 5 – Plate of Unit No.1
Pin 6 – Cathode of Unit No.1
Pin 7 – Heater
Pin 8 – Heater

SERIES-REGULATOR SERVICE

Values are for Each Unit

Maximum Ratings, *Absolute-Maximum Values:*

For operation at altitudes up to 60,000 feet[a]

PLATE VOLTAGE	400 max.	volts
GRID VOLTAGE:		
Negative-bias value	300 max.	volts
Positive-bias value	0 max.	volts
PLATE CURRENT	400 max.	ma
PLATE DISSIPATION	30 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:[b]

For fixed-bias operation	0.2 max.	megohm
For cathode-bias operation	0.5 max.	megohm

[a] Cooling must be provided to keep bulb temperature within ratings at altitudes above 10,000 feet.

[b] Minimum resistance per cathode should be 27 ohms or that resistance necessary to provide 10 per cent of the grid bias voltage, whichever is greater.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	4.75	5.25	amp
Amplification Factor (Each Unit)	1,2	2	3.4	
Plate Current (Each Unit)	1,2	165	200	ma
Plate Current (Each Unit)	1,3	0	10	ma
Transconductance (Each Unit)	1,2	11000	16000	μmhos

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With plate supply voltage of 190 volts, grid resistor of 500 ohms (each grid), and cathode resistor of 200 ohms (each cathode), both triode units operating.

Note 3: With plate voltage of 200 volts, and a grid-No.1 voltage of -100 volts (both triode units operating).

SPECIAL RATINGS AND PERFORMANCE DATA

Shock Rating:

Impact Acceleration	720 max.	g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified impact acceleration. Tubes are held rigid in four different positions in a Navy Type, High-Impact (Flyweight) Shock Machine and are subjected to 20 blows at a hammer angle of 48°. At the end of this test, tubes will be considered inoperative if they do not have a minimum plate current per unit of 150 milliamperes, a minimum transconductance per unit of 9000 micromhos, a maximum heater-to-cathode leakage current (both units) of 100 microamperes, and a maximum reverse grid current (both units) of 8 microamperes.

Variable-Frequency-Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions: Heater voltage of 6.3 volts, plate supply voltage of 190 volts, grid resistor of 500 ohms in each grid, cathode resistor of 200 ohms in each cathode (both units operating), and a plate load resistance of 2000 ohms per unit. During operation, tubes are vibrated through the frequency range from 10 to 50 cycles per second with a constant vibrational acceleration of 10 g. During the test, tubes will not show an rms output voltage across the plate load resistor in excess of 200 millivolts.

1000-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: Heater voltage of 6.3 volts, plate supply voltage of 190 volts, grid resistor of 500 ohms in each grid, and cathode resistor of 200 ohms in each cathode (both units operating).

At the end of 1000 hours, tubes will be considered inoperative if they do not have a minimum plate current per unit of 150 milliamperes, a minimum transconductance per unit of 9000 micromhos, a maximum heater-to-cathode leakage current (both units) of 100 microamperes, and a maximum reverse grid current (both units) of 8 microamperes.

OPERATING CONSIDERATIONS

Operating conditions for the 6336A should be selected to assure that there is always some voltage drop across the tube. In addition, bias voltage provided by the drop across the plate load resistor of the amplifier tube should not be less than 5 volts to allow for variations in the characteristics of individual 6336A's. A grid resistor of approximately 1000 ohms should be used to prevent parasitic oscillations.

6350

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For "on-off" control applications involving long periods of operation under cutoff conditions

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

Heater arrangement	*Series*	*Parallel*	
Voltage	12.6 ± 5%	6.3 ± 5%	ac or dc volts
Current	0.3	0.6	amp

Direct Interelectrode Capacitances:[o]

Grid to plate (Each unit)	3.2	μμf
Grid to cathode and heater (Each unit)	3.6	μμf
Plate to cathode and heater (Each unit)	0.6	μμf
Heater to cathode (Each unit)	4.6	μμf
Grid to grid	0.042 max.	μμf
Plate to plate	1 max.	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	150	volts
Grid Voltage	-5	volts
Amplification Factor	18	
Plate Resistance (Approx.)	3900	ohms
Transconductance	4600	μmhos
Plate Current	11	ma
Grid Voltage (Approx.) for plate voltage of 150 volts and plate current of 100 μa	-11	volts
Grid Voltage (Approx.) for plate voltage of 200 volts and plate current of 1 ma	-12	volts

Mechanical:

Operating Position	Any, but for the utmost in service, tube should be Vertical with base up or down, or Horizontal with pins 6 and 9 in vertical plane
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9CZ

Pin 1 - Plate of Unit No.2
Pin 2 - Cathode of Unit No.2
Pin 3 - Grid of Unit No.2
Pins 4 & 9 - Heater of Unit No.2
Pins 5 & 9 - Heater of Unit No.1

Pin 6 - Plate of Unit No.1
Pin 7 - Cathode of Unit No.1
Pin 8 - Grid of Unit No.1
Pin 9 - Heater Mid-Tap

[o] Without external shield.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6350

MEDIUM-MU TWIN TRIODE

COMPUTER SERVICE and "ON-OFF" CONTROL SERVICE

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, *Absolute Values:*

DC PLATE VOLTAGE	330	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE*	1000	max.	volts
DC GRID VOLTAGE:			
Negative bias value	80	max.	volts
Positive bias value	4	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE*	440	max.	volts
PEAK POSITIVE-PULSE GRID VOLTAGE*	14	max.	volts
DC GRID CURRENT	5.5	max.	ma
PEAK GRID CURRENT*	110	max.	ma
DC CATHODE CURRENT	45	max.	ma
PEAK CATHODE CURRENT*	350	max.	ma
PLATE DISSIPATION:			
Either plate	4	max.	watts
Both plates (Both units operating)	7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	220	max.	volts
Heater positive with respect to cathode	220▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120	max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation	0.1	max.	megohm
For cathode-bias operation	0.5	max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Unless Otherwise Specified, Values are for Each Unit

	Note	Min.	Max.	
Heater Current	1	0.275	0.325	amp
Plate Current (1)	1,2	6	16	ma
Plate Current (2)	1,3	–	1	ma
Plate Current (3)	1,4	–	100	μa
Transconductance	1,2	3200	6000	μmhos
Amplification Factor	1,2	15	21	
Reverse Grid Current (Units in parallel)	1,5	–	2.5	μa
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,6	–	15	μa
Heater positive with respect to cathode	1,6	–	15	μa

* Under the following conditions: rectangular pulse; pulse duration, 0.08 microsecond; pulse-repetition rate, 1 x 10⁶ pps; and duty factor, 0.08.

▲ The dc component must not exceed 110 volts.

Notes 1 to 6: See next page.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6350

MEDIUM-MU TWIN TRIODE

	Note	Min.	Max.	
Grid-Voltage Difference Between Units	1,7	-	2.5	volts
Leakage Resistance:				
Between grid and all other electrodes tied together	1,8	100	-	megohms
Between plate and all other electrodes tied together	1,9	100	-	megohms

Note 1: With 12.6 volts ac or dc on heater (series arrangement).

Note 2: With plate volts = 150 and grid volts = -5. Each unit tested separately. Unit not under test connected to ground.

Note 3: With plate volts = 200 and grid volts = -15. Each unit tested separately. Unit not under test connected to ground.

Note 4: With plate volts = 150 and grid volts = -15. Each unit tested separately. Unit not under test connected to ground.

Note 5: With plate volts = 180, grid volts = -5, and grid-circuit resistance (megohms) = 0.1.

Note 6: With 100 volts dc between heater and cathode.

Note 7: With plate volts = 200 and grid voltage adjusted for plate current of 1 milliampere.

Note 8: With grid 100 volts negative with respect to all other electrodes tied together.

Note 9: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . . . 2000 min. cycles

Under the following conditions: heater volts = 7.5 cycled one minute on and four minutes off, heater 180 volts positive with respect to cathode, and all other elements connected to ground.

ELECTRON TUBE DIVISION
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6350

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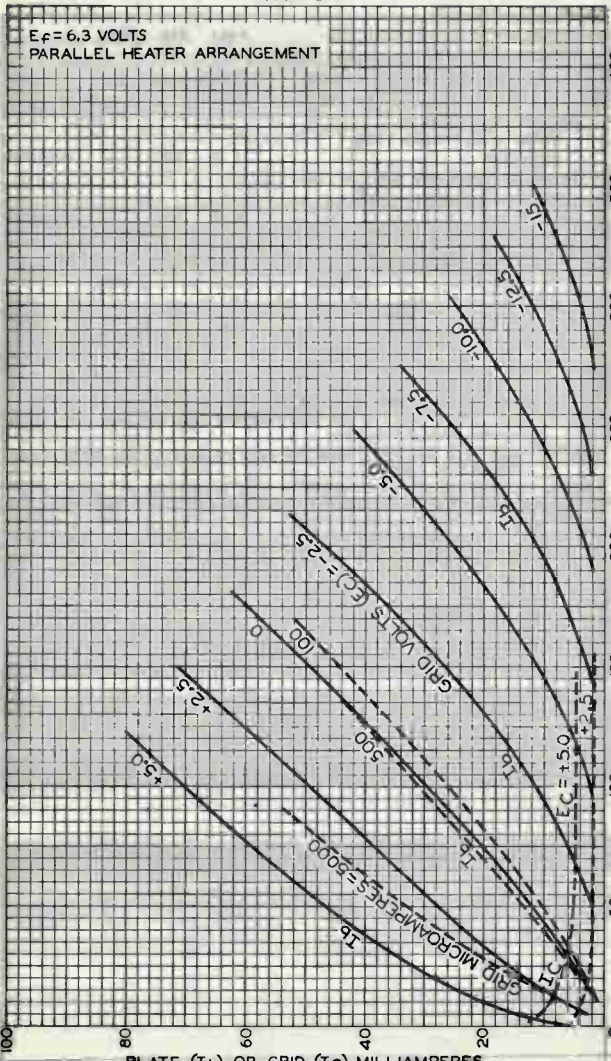
6350

AVERAGE CHARACTERISTICS

EACH UNIT



ELECTRON TUBE DIVISION

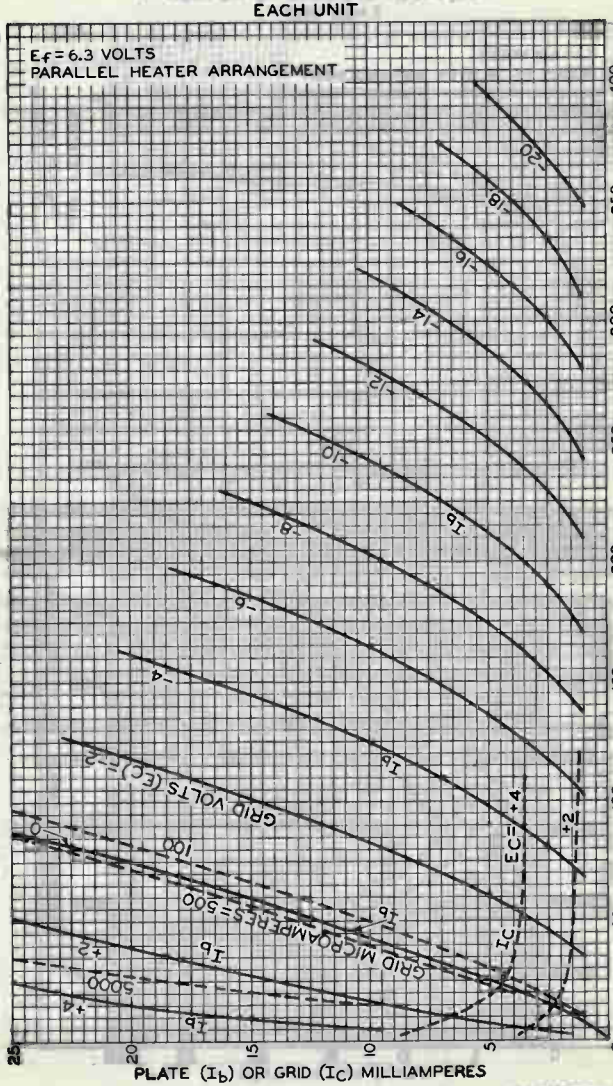
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9273

RCA

6350

AVERAGE CHARACTERISTICS
EACH UNIT



92CM-9272

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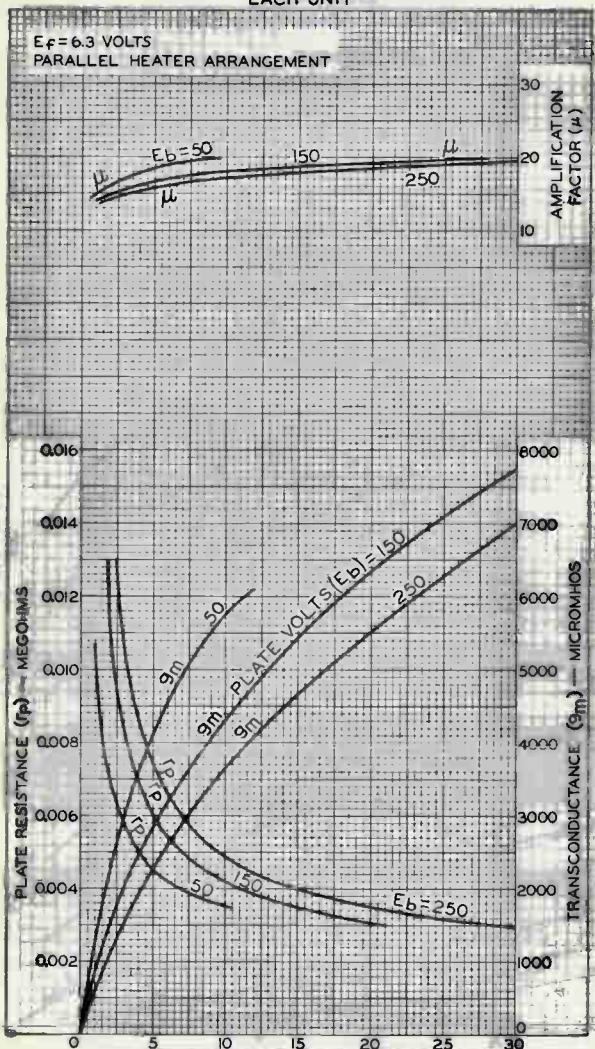
6350

RCA

6350

AVERAGE CHARACTERISTICS

EACH UNIT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-927I

Beam Power Tube

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.600	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	300[a] max.	volts
Heater positive with respect to cathode	200[b] max.	volts
Direct Interelectrode Capacitances (Approx.):[c]		
Grid No.1 to plate	0.85	μμf
Grid No.1 to cathode & grid No.3, grid No.2, base sleeve, and heater	14.0	μμf
Plate to cathode & grid No.3, grid No.2, base sleeve, and heater	12.0	μμf

Characteristics, Class A$_1$ Amplifier:

	Triode Connection[d]			
Plate Voltage	250	450	400	volts
Grid-No.2 Voltage	250	450	225	volts
Grid-No.1 Voltage	-14	-46	-16.5	volts
Amplification Factor	8	7.5	–	
Plate Resistance (Approx.)	12000	–	27000	ohms
Transconductance	11000	–	9000	μmhos
Plate Current	140	150	87	ma
Grid-No.2 Current	12	–	4	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-40	–	-35	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	4-3/4"
Maximum Seated Length	4-3/16"
Maximum Diameter	2-1/16"
Bulb	ST16
Base	Large-Wafer Octal 8-Pin with Sleeve (JEDEC Group 1, No.B8-86)
Basing Designation for BOTTOM VIEW	7S

Pin 1 – Base Sleeve
Pin 2 – Heater
Pin 3 – Plate
Pin 4 – Grid No.2
Pin 5 – Grid No.1

Pin 6 – No Internal Connection
Pin 7 – Heater
Pin 8 – Cathode, Grid No.3

AF POWER AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	600 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	400 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	300 max.	volts
Positive-bias value	0 max.	volts
CATHODE CURRENT	175 max.	ma
GRID-No.2 INPUT	6 max.	watts
PLATE DISSIPATION	35 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Typical Operation and Characteristics:

Plate Voltage	250	400	volts
Grid-No.2 Voltage	250	225	volts
Grid-No.1 Voltage	-14	-16.5	volts
Peak AF Grid-No.1 Voltage	14	16.5	volts
Zero-Signal Plate Current	140	87	ma
Max.-Signal Plate Current	150	105	ma
Zero-Signal Grid-No.2 Current	12	4	ma
Max.-Signal Grid-No.2 Current	28	18	ma
Plate Resistance (Approx.)	12000	27000	ohms
Transconductance	11000	9000	μmhos
Load Resistance	1500	3000	ohms
Total Harmonic Distortion	7	13.5	%
Max.-Signal Power Output	12.5	20	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.05 max.	megohm
For cathode-bias operation	0.25 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

Same as for AF POWER AMPLIFIER — Class A_2

Typical Operation and Characteristics:

Values are for 2 tubes

	Fixed Bias		*Cathode Bias*	
Plate Supply Voltage	400	600	400	volts
Grid-No.2 Supply Voltage	275	300	300	volts
Grid-No.1 Voltage	-23	-31	-	volts
Cathode Resistor	-	-	140	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	46	62	53	volts
Zero-Signal Plate Current	180	115	166	ma
Max.-Signal Plate Current	270	273	190	ma
Zero-Signal Grid-No.2 Current	9	4	7.5	ma
Max.-Signal Grid-No.2 Current	44	41	39	ma
Effective Load Resistance (Plate to plate)	3500	5000	4500	ohms

Total Harmonic Distortion	3	2.5	4	%
Max.-Signal Power Output	55	100	41	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.05 max.	megohm
For cathode-bias operation	0.25 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class A1

Triode Connection[d]

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	495 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	440 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	330 max.	volts
Positive-bias value	0 max.	volts
CATHODE CURRENT	192.5 max.	ma
GRID-No.2 INPUT	6.6 max.	watts
PLATE DISSIPATION	44 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Typical Operation and Characteristics:

Values are for 2 tubes

Plate Voltage	450	volts
Grid No.1 Voltage	-46	volts
Peak AF Grid-No.1-to-Grid-No.1-Voltage	92	volts
Zero-Signal Plate Current	150	ma
Max.-Signal Plate Current	220	ma
Effective Load Resistance (Plate to plate)	4000	ohms
Total Harmonic Distortion	2.5	%
Max.-Signal Power Output	28	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.05 max.	megohm
For cathode-bias operation	0.25 max.	megohm

[a] The dc component must not exceed 300 volts.
[b] The dc component must not exceed 100 volts
[c] Without external shield.
[d] Grid No.2 connected to plate.

6660/6BA6

REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3 ± 20%*		ac or dc volts
Current at 6.3 volts	0.3		amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	5.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5	5.5	μμf

Characteristics, Class A_1 Amplifier:

Heater Voltage	6.3	6.3	volts
Plate Supply Voltage	100	250	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Supply Voltage	100	100	volts
Cathode Resistor	68	68	ohms
Plate Resistance (Approx.)	0.25	1	megohm
Transconductance	4300	4400	μmhos
Plate Current	10.8	11	ma
Grid-No.2 Current	4.4	4.2	ma
Grid-No.1 Voltage (Approx.) for transconductance = 40 μmhos	-20	-20	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7BK

Pin 1 - Grid No.1
Pin 2 - Grid No.3 Internal Shield
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Cathode

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts	0.65 max.	watt
For grid-No.2 voltages between 165 and 330 volts.	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

° With external shield JEDEC No.316 connected to cathode.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value . . . . . 3500 μmhos

With heater volts = 5, plate supply volts = 250, grid No.3 connected to cathode at socket, grid-No.2 supply volts = 100, and cathode resistor (ohms) bypassed = 68.

6661/6BH6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
Voltage. . . . . 6.3 ± 20%* . . . . ac or dc volts
Current at 6.3 volts . . 0.15 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater. . .	5.4	5.4	μμf
Plate to cathode, grid No.3 & internal shield, grid No. 2, and heater.	4.4	4.4	μμf

Characteristics, Class A_1 Amplifier:

Heater Voltage.	6.3	volts
Plate Supply Voltage.	250	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage.	150	volts
Cathode Resistor.	100	ohms
Plate Resistance (Approx.).	1.4	megohms
Transconductance.	4600	μmhos
Plate Current	7.4	ma
Grid-No.2 Current	2.6	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-7.7	volts

Mechanical:

Operating Position.	Any
Maximum Overall Length.	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter.	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb.	T5-1/2
Base. . . . . Small-Button Miniature 7-Pin (JEDEC No. E7-1)	
Basing Designation for BOTTOM VIEW.	7CM

Pin 1 - Grid No.1
Pin 2 - Cathode
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate

Pin 6 - Grid No.2
Pin 7 - Grid No.3, Internal Shield

6661/6BH6

SHARP-CUTOFF PENTODE

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

° With external shield JEDEC No.316 connected to cathode.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value	3600	μmhos

With heater volts = 5, plate supply volts = 250, grid No.3 connected to cathode at socket, grid-No.2 supply volts = 150, and cathode resistor (ohms) bypassed = 100.

6662/6BJ6

REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
Voltage. . . . . 6.3 ± 20%* . . . . ac or dc volts
Current at 6.3 volts . . 0.15 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater. . .	4.5	4.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	5.5	μμf

Characteristics, Class A_1 Amplifier:

Heater Voltage.	6.3	6.3	volts
Plate Supply Voltage.	100	250	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Supply Voltage.	100	100	volts
Cathode Resistor.	80	80	ohms
Plate Resistance (Approx.).	0.25	1.3	megohms
Transconductance.	3650	3600	μmhos
Plate Current	9	9.2	ma
Grid-No.2 Current	3.5	3.3	ma
Grid-No.1 Voltage (Approx.) for transconductance = 10 μmhos	-20	-20	volts

Mechanical:

Operating Position. . . . . Any
Maximum Overall Length. . . . . 2-1/8"
Maximum Seated Length . . . . . 1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) 1-1/2" ± 3/32"
Diameter. . . . . 0.650" to 0.750"
Dimensional Outline . . . . . *See General Section*
Bulb. T5-1/2
Base. . . . . Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW. 7CM

Pin 1 - Grid No.1
Pin 2 - Cathode
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate

Pin 6 - Grid No.2
Pin 7 - Grid No.3
Internal Shield

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6662/6BJ6

REMOTE-CUTOFF PENTODE

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts	0.65 max.	watt
For grid-No.2 voltages between 165 and 330 volts.	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

° With external shield JEDEC No.316 connected to cathode.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value	2900	μmhos

With heater volts = 5, plate supply volts = 250, grid No.3 connected to cathode at socket, grid-No.2 supply volts = 100, and cathode resistor (ohms) bypassed = 80.

6663/6AL5
TWIN DIODE

7-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage	6.3 ± 20%*		ac or dc volts
Current at 6.3 volts	0.3		amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield°*	
Plate to cathode, internal shield, and heater (Each unit)	2.5	3.2	μμf
Cathode to plate, internal shield, and heater (Each unit)	3.4	3.6	μμf
Plate of unit No.1 to plate of unit No.2	0.068 max.	0.026 max.	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW	6BT

Pin 1 - Cathode of Unit No.1
Pin 2 - Plate of Unit No.2
Pin 3 - Heater
Pin 4 - Heater

Pin 5 - Cathode of Unit No.2
Pin 6 - Internal Shield
Pin 7 - Plate of Unit No.1

RECTIFIER

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

PEAK INVERSE PLATE VOLTAGE	275 max.	volts
PEAK PLATE CURRENT	60 max.	ma
PEAK PLATE CURRENT (For pulse duration of 0.1 second maximum)	350 max.	ma
DC PLATE CURRENT	10 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	275 max.	volts
Heater positive with respect to cathode	100 max.	volts

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6663/6AL5
TWIN DIODE

Characteristics:

Heater Voltage	6.3	volts
Plate Voltage	10	volts
Plate Current	60	ma

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

° With external shield JEDEC No.316 connected to pin 6.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

6664/6AB4

High-Mu Triode

7-PIN MINIATURE TYPE

For Mobile-Communications Equipment

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Absolute-Maximum Values)*:			
Voltage (AC or DC)	6.3[a]		volts
Current at heater volts = 6.3	0.150		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	100	max.	volts
Heater positive with respect to cathode	100	max.	volts

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield*[b]	
Grid to plate	1.5	1.5	μμf
Grid to cathode and heater	2.2	2.2	μμf
Plate to cathode and heater	0.5	1.4	μμf
Cathode to plate	0.24	0.20[c]	μμf
Cathode to grid and heater	5.0	5.2[d]	μμf
Plate to grid and heater	1.7	2.6[d]	μμf
Heater to cathode	2.9	2.9[c]	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	100	250	volts
Cathode Resistor	270	200	ohms
Amplification Factor	60	60	
Plate Resistance (Approx.)	15000	10900	ohms
Transconductance	4000	5500	μmhos
Plate Current	3.7	10	ma
Grid Voltage (Approx.) for plate μa = 10	-5	-12	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See *General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)

6664/6AB4

Basing Designation for BOTTOM VIEW. 5CE

Pin 1 – Plate
Pin 2 – No Internal Connection
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – No Internal Connection
Pin 6 – Grid
Pin 7 – Cathode

AMPLIFIER — Class A[1]

Maximum Ratings, ***Absolute-Maximum Values:***

PLATE VOLTAGE.	330 max.	volts
GRID VOLTAGE:		
Negative-bias value.	55 max.	volts
Positive-bias value.	0 max.	volts
PLATE DISSIPATION.	2.9 max.	watts

[a] When operated from storage-battery systems, the heater may be subjected to voltage variations as great as ± 20 per cent. Although such extremes in heater voltage may be tolerated for short periods, increased equipment reliability can be achieved with improved supply-voltage regulation.

[b] With external shield JEDEC No.316 connected to cathode except as noted.

[c] With external shield JEDEC No.316 connected to ground.

[d] With external shield JEDEC No.316 connected to grid.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling:

Cycles of Intermittent Operation . . . . . 2000 min. cycles

This test is performed on a sample lot of tubes from each production run under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value. . . . . 3200 μmhos

With heater volts = 5.0, plate supply volts = 250, and cathode resistor (ohms) bypassed = 200.

6669/6AQ5-A
BEAM POWER TUBE

7-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 20%*	ac or dc volts
Current at 6.3 volts	0.45	amp
Direct Interelectrode Capacitances (Approx.):◇		
Grid No.1 to plate	0.4	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	.8	μμf
Plate to cathode & grid No.3, grid No.2, and heater	8.5	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BZ

Pin 1 - Grid No.1
Pin 2 - Cathode, Grid No.3
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Grid No.1

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*		
PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	250 max.	volts
GRID-No.2 INPUT	2 max.	watts
PLATE DISSIPATION	12 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	225 max.	°C

Typical Operation and Characteristics:		
Heater Voltage	6.3	volts
Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-grid) Voltage	-12.5	volts
Peak AF Grid-No.1 Voltage	12.5	volts

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6669/6AQ5-A

BEAM POWER TUBE

Zero-Signal Plate Current	45	ma
Max.-Signal Plate Current	47	ma
Zero-Signal Grid-No.2 Current	4.5	ma
Max.-Signal Grid-No.2 Current	7	ma
Plate Resistance (Approx.)	52000	ohms
Transconductance	4100	μmhos
Load Resistance	5000	ohms
Total Harmonic Distortion	8	%
Max.-Signal Power Output	4.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

AMPLIFIER — Class AB_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	250 max.	volts
GRID-No.2 INPUT	2 max.	watts
PLATE DISSIPATION	12 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	225 max.	°C

Typical Push-Pull Operation:

Unless otherwise specified, values are for 2 tubes

Heater Voltage	6.3	volts
Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-grid) Voltage	-15	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	30	volts
Zero-Signal Plate Current	70	ma
Max.-Signal Plate Current	79	ma
Zero-Signal Grid-No.2 Current	5	ma
Max.-Signal Grid-No.2 Current	13	ma
Effective Load Resistance (Plate to plate)	10000	ohms
Total Harmonic Distortion	5	%
Max.-Signal Power Output	10	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

6669/6AQ5-A

BEAM POWER TUBE

[o] Without external shield.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Power Output at Reduced Heater Voltage:

Average Value. . . . . 4.1 watts

With heater volts = 5, plate volts = 250, grid-No.2 volts = 250, grid-No.1 volts = -12.5, rms signal volts = 8.8, and load resistance (ohms) = 5000.

6676/6CB6A

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Mobile-Communications Equipment

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Absolute-Maximum Values)*:			
Voltage (AC or DC)	6.3[a]		volts
Current at heater volts = 6.3	0.300		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[c]	
Grid No.1 to plate	0.025 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	6.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.0	3.0	μμf

Characteristics, Class A$_1$ Amplifier:

Plate Supply Voltage	125	125	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Supply Voltage	125	125	volts
Grid-No.1 Voltage	-3	-	volts
Cathode Resistor	-	56	ohms
Plate Resistance (Approx.)	-	0.28	megohm
Transconductance	-	8000	μmhos
Plate Current	2.8	13	ma
Grid-No.2 Current	-	3.7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-	-6.5	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See *General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)

6676/6CB6A

Basing Designation for BOTTOM VIEW. 7CM

Pin 1 – Grid No.1
Pin 2 – Cathode
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate

Pin 6 – Grid No.2
Pin 7 – Grid No.3
Internal Shield

AMPLIFIER — Class A[a]

Maximum Ratings, ***Absolute-Maximum Values:***

PLATE VOLTAGE . . . . . 330 max. volts
GRID No.3 (SUPPRESSOR GRID) . . . *Connect to cathode at socket*
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE. . . 330 max. volts
GRID-No.2 VOLTAGE . . . . . See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section
GRID-No.1 (CONTROL-GRID) VOLTAGE:
  Positive-bias value . . . . . 0 max. volts
GRID-No.2 INPUT:
  For grid-No.2 voltages up to 165 volts . . . . . 0.55 max. watt
  For grid-No.2 voltages between 165 and 330 volts . See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section
PLATE DISSIPATION . . . . . 2.3 max. watts

[a] When operated from storage-battery systems, the heater may be subjected to voltage variations as great as ± 20 per cent. Although such extremes in heater voltage may be tolerated for short periods, increased equipment reliability can be achieved with improved supply-voltage regulation.

[b] The dc component must not exceed 100 volts.

[c] With external shield JEDEC No.316 connected to cathode.

SPECIAL RATINGS & PERFORMANCE DATA

Heater Cycling:

Cycles of Intermittent Operation. . . . . 2000 min. cycles

This test is performed on a sample lot of tubes from each production run under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value . . . . . 7100 μmhos

With heater volts = 5.0, plate supply volts = 125, grid-No.3 connected to cathode at socket, grid-No.2 supply volts = 125, and cathode resistor (ohms) bypassed = 56.

6677/6CL6
POWER PENTODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 20%*	ac or dc volts
Current at 6.3 volts	0.65	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to plate	0.12 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	11	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9BV

Pin 1 - Cathode
Pin 2 - Grid No.1
Pin 3 - Grid No.2
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Plate

Pin 7 - Grid No.3, Internal Shield
Pin 8 - Grid No.2
Pin 9 - Grid No.1

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts	2 max.	watts
For grid-No.2 voltages between 165 and 330 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	

6677

6677/6CL6

POWER PENTODE

PLATE DISSIPATION	8.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210 max.	°C

Typical Operation and Characteristics:

Heater Voltage	6.3	volts
Plate Voltage	250	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Voltage	150	volts
Grid-No.1 Voltage	-3	volts
Peak AF Grid-No.1 Voltage	3	volts
Zero-Signal Plate Current	30	ma
Max.-Signal Plate Current	31	ma
Zero-Signal Grid-No.2 Current	7	ma
Max.-Signal Grid-No.2 Current	7.2	ma
Plate Resistance (Approx.)	0.15	megohm
Transconductance	11000	μmhos
Load Resistance	7500	ohms
Total Harmonic Distortion	8	%
Max.-Signal Power Output	2.8	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

° Without external shield.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value	8800	μmhos

With heater volts = 5, plate volts = 250, grid No.3 connected to cathode at socket, grid-No.2 volts = 150, and grid-No.1 volts = -3.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6678/6U8-A
MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
Voltage . . . . . 6.3 ± 20%* . . . ac or dc volts
Current at 6.3 volts . . 0.45 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield[a]	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode and heater	2.5	2.5	μμf
Plate to cathode and heater	0.4	1	μμf
Pentode Unit:			
Grid No.1 to plate	0.01 max.	0.006 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5	5	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	3.5	μμf
Heater to cathode (Each unit)	3	3[a]	μμf

Characteristics, Class A_1 Amplifier:

With heater voltage of 6.3 volts

	Triode Unit	Pentode Unit	
Plate Supply Voltage	150	250	volts
Grid-No.2 (Screen-grid) Supply Voltage	-	110	volts
Cathode Resistor	56	68	ohms
Amplification Factor	40	-	
Plate Resistance (Approx.)	5000	400000	ohms
Transconductance	8500	5200	μmhos
Plate Current	18	10	ma
Grid-No.2 Current	-	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-12	-10	volts

Mechanical:

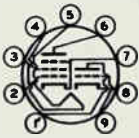
Operating Position . . . . . Any
Maximum Overall Length . . . . . 2-3/16"
Maximum Seated Length . . . . . 1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . 1-9/16" ± 3/32"
Diameter . . . . . 0.750" to 0.875"

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

MEDIUM-MU TRIODE—
SHARP-CUTOFF PENTODE

Dimensional Outline. . . . . *See General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW 9AE

Pin 1—Triode Plate
Pin 2—Pentode Grid No.1
Pin 3—Pentode Grid No.2
Pin 4—Heater
Pin 5—Heater
Pin 6—Pentode Plate



Pin 7—Pentode Cathode, Pentode Grid No.3, Internal Shield
Pin 8—Triode Cathode
Pin 9—Triode Grid

CONVERTER SERVICE

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit as Osc.	*Pentode Unit as Mixer*	
PLATE VOLTAGE.	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	—	330 max.	volts
GRID-No.2 VOLTAGE.	—	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value. . . .	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	—	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts.	—	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION.	3 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . .	200▲ max.	200▲ max.	volts

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

° With external shield JEDEC No.316 connected to cathode of unit under test except as noted.

● With external shield JEDEC No.315 connected to ground.

▲ The dc component must not exceed 100 volts.

6678/6U8-A

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 7.5 cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Triode Unit:

Average value. . . . . 6800 μmhos

With heater volts = 5, plate supply volts = 150, and cathode resistor (ohms) bypassed = 56.

Pentode Unit:

Average value. . . . . 4100 μmhos

With heater volts = 5, plate supply volts = 250, grid-No. 2 supply volts = 110, and cathode resistor (ohms) bypassed = 68.

6679/12AT7

HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

	Series	*Parallel*	
Heater, for Unipotential Cathodes:			
Heater arrangement			
Voltage	12.6 ± 20%*	6.3 ± 20%*	ac or dc volts
Current:			
At 12.6 volts	0.15	–	amp
At 6.3 volts	–	0.3	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield[c]*	
Grid-Drive Operation:			
Grid to plate (Each unit)	1.5	1.5	μμf
Grid to cathode and heater (Each unit)	2.2	2.2	μμf
Plate to cathode and heater:			
Unit No.1	0.5	1.2	μμf
Unit No.2	0.4	1.5	μμf
Cathode-Drive Operation:			
Plate to cathode (Each unit)	0.2	0.2	μμf
Cathode to grid and heater (Each unit)	4.6	4.6	μμf
Plate to grid and heater (Each unit)	1.8	2.6	μμf
Heater to cathode (Each unit)	2.4	2.4[e]	μμf

Characteristics, Class A₁ Amplifier (Each Unit):

Heater Voltage:		
For series connection	12.6	volts
For parallel connection	6.3	volts
Plate Supply Voltage	250	volts
Cathode Resistor	200	ohms
Amplification Factor	60	
Plate Resistance (Approx.)	10900	ohms
Transconductance	5500	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate μa = 10	−12	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6679/12AT7

HIGH-MU TWIN TRIODE

Basing Designation for BOTTOM VIEW 9A

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 9 – Heater of Unit No.2
Pins 5 & 9 – Heater of Unit No.1
Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Heater Mid-Tap

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
PLATE DISSIPATION	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

○ With external shield JEDEC No.315 connected to heater except as noted.

● With external shield JEDEC No.315 connected to ground.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 15 (Series connection) cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value (Each unit) . . . . . 4400 μmhos

With heater volts = 10 (Series connection), plate supply volts = 250, and cathode resistor (ohms) bypassed = 200

6680/12AU7-A

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Heater arrangement	*Series*	*Parallel*	
Voltage	12.6 ± 20%*	6.3 ± 20%*	ac or dc volts
Current:			
At 12.6 volts	0.15	–	amp
At 6.3 volts	–	0.3	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield°*	
Grid to plate (Each unit)	1.5	1.5	μμf
Grid to cathode and heater (Each unit)	1.6	1.8	μμf
Plate to cathode and heater:			
Unit No.1	0.4	2	μμf
Unit No.2	0.32	2	μμf

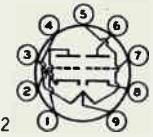
Characteristics, Class A1 Amplifier (Each Unit):

Heater Voltage:			
For series connection	12.6	12.6	volts
For parallel connection	6.3	6.3	volts
Plate Voltage	100	250	volts
Grid Voltage	0	-8.5	volts
Amplification Factor	20	17	
Plate Resistance (Approx.)	6500	7700	ohms
Transconductance	3100	2200	μmhos
Plate Current	11.8	10.5	ma
Grid Voltage (Approx.) for plate μa = 10	–	-24	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9A

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 9 – Heater of Unit No.2
Pins 5 & 9 – Heater of Unit No.1



Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Heater Mid-Tap

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6680/12AU7-A

MEDIUM-MU TWIN TRIODE

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*			
PLATE VOLTAGE	330	max.	volts
GRID VOLTAGE:			
Positive-bias value	0	max.	volts
PLATE DISSIPATION	3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Maximum Circuit Values:			
Grid-Circuit Resistance:			
For fixed-bias operation	0.25	max.	megohm
For cathode-bias operation	1	max.	megohm

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

○ With external shield JEDEC No. 315 connected to cathode of unit under test.

▲ The dc component must not exceed 100 volts.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 15 (Series connection) cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Transconductance at Reduced Heater Voltage:

Average Value (Each unit) . . . . . 1750 μmhos

With heater volts = 10 (Series connection), plate volts = 250, and grid volts = −8.5.

6681/12AX7

HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment

GENERAL DATA

Electrical:

	Series	Parallel	
Heater, for Unipotential Cathodes:			
Heater arrangement			
Voltage	12.6 ± 20%*	6.3 ± 20%*	ac or dc volts
Current:			
At 12.6 volts	0.15	–	amp
At 6.3 volts	–	0.3	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield[a]	
Grid to plate (Each unit)	1.7	1.7	μμf
Grid to cathode and heater (Each unit)	1.6	1.8	μμf
Plate to cathode and heater:			
Unit No.1	0.46	1.9	μμf
Unit No.2	0.34	1.9	μμf

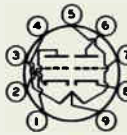
Characteristics, Class A$_1$ Amplifier (Each Unit):

Heater Voltage:			
For series connection	12.6	12.6	volts
For parallel connection	6.3	6.3	volts
Plate Voltage	100	250	volts
Grid Voltage	-1	-2	volts
Amplification Factor	100	100	
Plate Resistance (Approx.)	0.08	0.0625	megohm
Transconductance	1250	1600	μmhos
Plate Current	0.5	1.2	ma

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 2-3/16"
Maximum Seated Length . . . . . 1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . 1-9/16" ± 3/32"
Diameter . . . . . 0.750" to 0.875"
Dimensional Outline . . . . . *See General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW 9A

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 9 – Heater of Unit No.2
Pins 5 & 9 – Heater of Unit No.1



Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Heater Mid-Tap

6681/12AX7

HIGH-MU TWIN TRIODE

AMPLIFIER — Class A1

Values are for Each Unit

Maximum Ratings, ***Design-Maximum Values:***

PLATE VOLTAGE	330	max.	volts
GRID VOLTAGE:			
Negative-bias value	55	max.	volts
Positive-bias value	0	max.	volts
PLATE DISSIPATION	1.1	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

* When the heater is operated from storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. Although such variation in heater voltage is permissible for short periods, reliability can be increased with improved supply-voltage regulation.

○ With external shield JEDEC No. 315 connected to cathode of unit under test.

▲ The dc component must not exceed 100 volts.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 15 (Series connection) cycled one minute on and one minute off, heater 135 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

6887

TWIN DIODE

7-PIN MINIATURE TYPE

For switching applications in electronic computers

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.2	amp
Direct Interelectrode Capacitances (Each unit, approx.):[o]		
Plate to cathode	1.4	μμf
Plate to cathode, internal shield, and heater	2.2	μμf
Cathode to plate, internal shield, and heater	3.5	μμf
Heater to cathode	2.1	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-5/8"
Maximum Seated Length	1-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	1" ± 3/32"
Maximum Diameter	3/4"
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	6BT

Pin 1 – Cathode of Unit No.1
Pin 2 – Plate of Unit No.2
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Cathode of Unit No.2
Pin 6 – Internal Shield
Pin 7 – Plate of Unit No.1

SWITCHING SERVICE

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PEAK INVERSE PLATE VOLTAGE	360 max.	volts
PEAK PLATE CURRENT■	30 max.	ma
DC PLATE CURRENT	10 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	150 max.	volts
Heater positive with respect to cathode	150 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	120 max.	°C

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Heater Current	1	180	220	ma

Note 1: With 6.3 volts ac or dc on heater.

o Without external shield.

■: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6887

TWIN DIODE

	Note	Min.	Max.	
Direct Interelectrode Capacitance (Each unit):				
Plate to cathode.	2	-	2	μμf
Plate Current (Each unit)	1,3	3	9	ma
Heater-Cathode Leakage Current (Each unit):				
Heater negative with respect to cathode.	1,4	-	20	μa
Heater positive with respect to cathode.	1,4	-	20	μa
Leakage Resistance between plate and all other electrodes tied together (Each unit)	1,5	100	-	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield and with electrodes of unit not under test connected to ground.

Note 3: With dc plate volts = 1.2. Electrodes of unit not under test connected to ground.

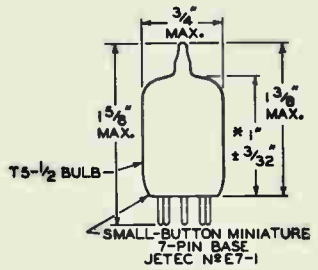
Note 4: With 150 volts dc between heater and cathode.

Note 5: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

Cycles of Intermittent Operation. . . . 2000 min. cycles
Under the following conditions: heater volts = 7.5 cycled one minute on and four minutes off, heater 180 positive with respect to cathode, and plate volts = 0.



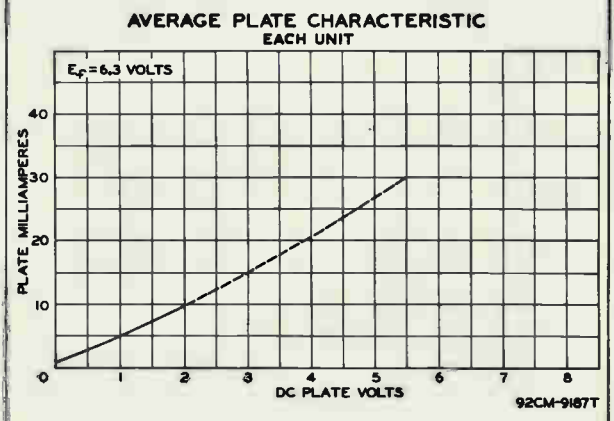
■ Under the following conditions: rectangular pulse; pulse duration, 10 microseconds; pulse-repetition rate, 1000 pps; duty factor, 0.01 ± 0.1 per cent; rise time, less than 1 microsecond; fall time, less than 2 microseconds; overshoot, less than 5 per cent; and droop, less than 10 per cent.

* Measured from base seat to bulb-top line as determined by ring gauge of 7/16" I.D.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6887

TWIN DIODE



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.300	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	60 max.	volts
Heater positive with respect to cathode	120 max.	volts

Direct Interelectrode Capacitances:[a]

	Unit No.1	*Unit No.2*	
Grid to plate	1.4	1.4	μμf
Grid to cathode, internal shield, and heater	3.1	3.1	μμf
Plate to cathode, internal shield, and heater	1.75	1.65	μμf
Heater to cathode	2.6	2.7	μμf

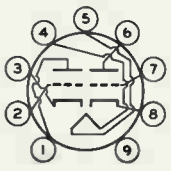
Characteristics, Class A1 Amplifier (Each Unit):[b]

Plate Supply Voltage	100	90	volts
Grid Supply Voltage	9	0	volts
Cathode Resistor	680	120	ohms
Amplification Factor	33	–	
Transconductance	12500	11500	μmhos
Plate Current	15	12	ma

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AJ

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Heater
Pin 5 – Heater



Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Internal Shield

AMPLIFIER — Class A[1]

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE:		
With plate dissipation = 0.8 watt or greater	220 max.	volts
With plate dissipation less than 0.8 watt	250 max.	volts
With plate ma. = 0.	400 max.	volts
With cathode ma. = 0.	550 max.	volts
GRID VOLTAGE:		
Negative-bias value	100 max.	volts
Peak-negative value[c]	200 max.	volts
CATHODE CURRENT:		
Peak[c]	100 max.	ma
Average	20 max.	ma
GRID INPUT	0.03 max.	watt
PLATE DISSIPATION:		
~~Either plate~~	1.5 max.	watts
Both plates (Both units operating)	2 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	170 max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:	
For fixed-bias operation	Permitted only when plate ma. < 5
For cathode-bias operation	1 max. megohm

[a] Without external shield.

[b] Operation under conditions listed in left-hand column is recommended because of the small spread in characteristics.

[c] Pulse duration (microseconds) = 200 max., duty factor = 0.10 max.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration	500 max.	g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified impact acceleration. Tubes are held rigid in four different positions in a Navy Type, High-impact (Flyweight) Shock Machine and are subjected to 5 blows at a hammer angle of 30°.

Fatigue Rating:

Vibrational Acceleration	2.5 max.	g

This test is performed on a sample lot of tubes to determine ability of tube to withstand the specified vibrational acceleration. Tubes are rigidly mounted and are subjected for 32 hours to 2.5-g vibrational acceleration at 50 cycles per second in each of three directions.

Twin Power Pentode

9-PIN MINIATURE TYPE
INTERNALLY NEUTRALIZED FOR PUSH-PULL AMPLIFIER SERVICE
14 WATTS CW INPUT (ICAS) UP TO 500 Mc

For Communications Equipment Operating at Frequencies up to 500 Mc as a Push-Pull RF-Power-Amplifier or as a Frequency-Multiplier Tube

GENERAL DATA

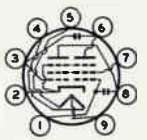
Electrical:

Heater, for Unipotential Cathode:	*Series*	*Parallel*	
Heater arrangement			
Voltage (AC or DC)	12.6 ± 10%	6.3 ± 10%	volts
Current	0.3	0.6	amp
Transconductance (Each Unit) for dc plate volts = 150, dc grid-No.2 volts = 150, and dc plate ma. = 25	10500		μmhos
Mu-Factor, Grid No.2 to Grid No.1 (Each Unit) for dc plate volts = 150, dc grid No.2 volts = 150, and dc plate ma. = 25	31		
Direct Interelectrode Capacitances (Approx., Each Unit):▲			
Grid No.1 to plate	0.15		μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	6.4		μμf
Plate to cathode & grid No.3, grid No.2, and heater	1.6		μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9HL

Pin 1 - Grid No.1 of Unit No.2
Pin 2 - Cathode, Grid No.3
Pin 3 - Grid No.1 of Unit No.1
Pin 4 - Heater



Pin 5 - Heater
Pin 6 - Plate of Unit No.2
Pin 7 - Grid No.2
Pin 8 - Plate of Unit No.1
Pin 9 - Heater Tap

and

PUSH-PULL RF POWER AMPLIFIER — Class C FM Telephony

Values are on a per-tube basis unless otherwise specified

Maximum Ratings, *Absolute-Maximum Values:*

	Up to 500 Mc		
	*CCS**	*ICAS*♦	
DC PLATE VOLTAGE	250 max.	250 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	200 max.	200 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-100 max.	-100 max.	volts
DC PLATE CURRENT	90 max.	100 max.	ma
DC GRID-No.1 CURRENT	6 max.	8 max.	ma
DC CATHODE CURRENT	100 max.	120 max.	ma
PLATE INPUT	12 max.	14 max.	watts
GRID-No.2 INPUT	3 max.	3.5 max.	watts
GRID-No.1 INPUT	0.2 max.	0.24 max.	watt
PLATE DISSIPATION	6 max.	7.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	100 max.	100 max.	volts
Heater positive with respect to cathode	100 max.	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	225 max.	225 max.	°C

Typical Operation:

	At 500 Mc		
DC Plate Voltage	180	200	volts
DC Grid-No.2 Voltage	180	200	volts
DC Grid-No.1 Voltage	-20	-20	volts
From grid resistor for each grid No.1 of	27000	27000	ohms
Peak-to-Peak RF Grid-No.1 Voltage	50	50	volts
DC Plate Current	55	60	ma
DC Grid-No.2 Current	12.5	14	ma
DC Grid-No.1 Current	1.5	1.5	ma
Driver Power Output (Approx.)	1.2	1.2	watts
Useful Power Output (Approx.)	5	6	watts

PLATE-MODULATED PUSH-PULL RF POWER AMPLIFIER — Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1

Values are on a per-tube basis

Maximum Ratings, *Absolute-Maximum Values:*

	Up to 500 Mc		
	*CCS**	*ICAS♦*	
DC PLATE VOLTAGE	200 max.	200 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	200 max.	200 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-100 max.	-100 max.	volts
DC PLATE CURRENT	64 max.	80 max.	ma
DC GRID-No.1 CURRENT	6 max.	8 max.	ma
DC CATHODE CURRENT	80 max.	96 max.	ma
PLATE INPUT	8 max.	10 max.	watts
GRID-No.2 INPUT	2 max.	2.3 max.	watts
GRID-No.1 INPUT	0.2 max.	0.24 max.	watt
PLATE DISSIPATION	4 max.	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	100 max.	100 max.	volts
Heater positive with respect to cathode	100 max.	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	225 max.	225 max.	°C

Typical Operation:

	At 500 Mc		
DC Plate Voltage	180	180	volts
DC Grid-No.2 Voltage	180	180	volts
DC Grid-No.1 Voltage	-20	-20	volts
From grid resistor for each grid No.1 of	68000	27000	ohms
Peak-to-Peak RF Grid-No.1 Voltage	45	50	volts
DC Plate Current	40	55	ma
DC Grid-No.2 Current	9.5	12.5	ma
DC Grid-No.1 Current	0.6	1.5	ma
Driver Power Output (Approx.)	1	1.2	watts
Useful Power Output (Approx.)♦	3.5	5	watts

FREQUENCY TRIPLER — Class C

Values are on a per-tube basis

Maximum Ratings, *Absolute-Maximum Values:*

	Up to 500 Mc		
	*CCS**	*ICAS♦*	
DC PLATE VOLTAGE	250 max.	250 max.	volts

6939

	CCS★	ICAS◆	
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	200 max.	200 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-100 max.	-100 max.	volts
DC PLATE CURRENT	60 max.	80 max.	ma
DC GRID-No.1 CURRENT	6 max.	8 max.	ma
DC CATHODE CURRENT	70 max.	80 max.	ma
PLATE INPUT	8 max.	10 max.	watts
GRID-No.2 INPUT	3 max.	3.5 max.	watts
GRID-No.1 INPUT	0.2 max.	0.24 max.	watt
PLATE DISSIPATION	6 max.	7.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	100 max.	100 max.	volts
Heater positive with respect to cathode	100 max.	100 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	225 max.	225 max.	°C
Typical Operation:			
	Up to 500 Mc		
DC Plate Voltage	180	200	volts
DC Grid-No.2 Voltage (Approx.)	180	190	volts
Through resistor of	1200	1200	ohms
DC Grid-No.1 Voltage	-74	-74	volts
From grid resistor for each grid No.1 of	82000	82000	ohms
Peak-to-Peak RF Grid-No.1 Voltage	165	165	volts
DC Plate Current	40	46	ma
DC Grid-No.2 Current	9.7	11	ma
DC Grid-No.1 Current	1.8	1.8	ma
Driver Power Output (Approx.)	1.1	1.1	watts
Useful Power Output (Approx.)●	1.8	2.2	watts

▲ Without external shield.

● Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

★ Contiruous Commercial Service.

◆ Intermittent Commercial and Amateur Service.

● This value of useful power is measured at load of output circuit.

OPERATING CONSIDERATIONS

Shielding of the 6939 in "straight-through" rf-amplifier service may be required for stable operation. To minimize external feedback from the plate to grid No.1, a grounded shield crossing the terminal end of the tube socket through the space between pins 4 and 5 and the space between pins 1 and 9, is generally adequate for this purpose.

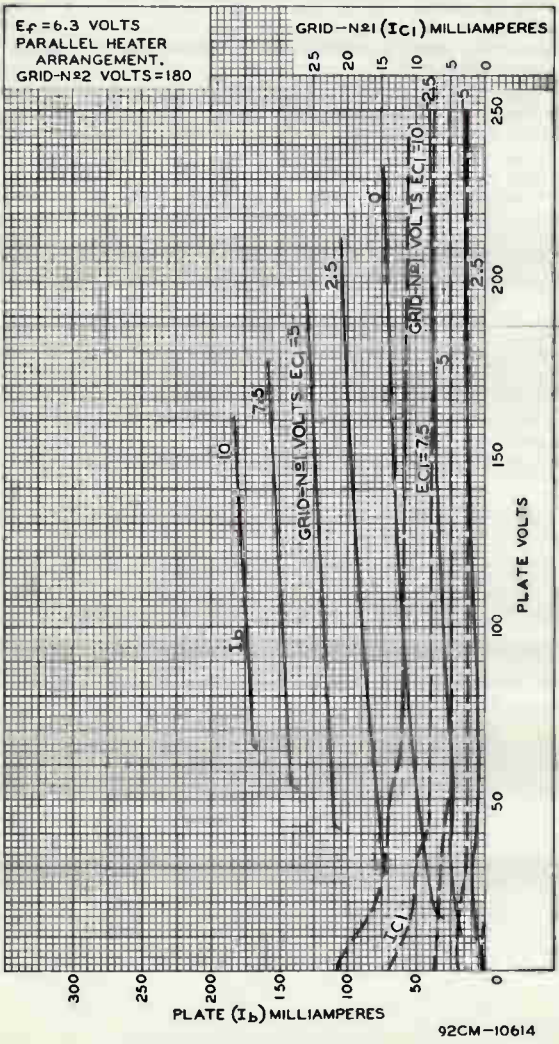
The *heater may be effectively bypassed* by grounding one heater pin at the tube socket and bypassing the other heater pin to ground with a low inductance capacitor. If further isolation of the ungrounded heater pin is required a suitable rf choke followed by another low inductance bypass capacitor, is recommended.

The *cathode* of the 6939 should be grounded by means of the shortest possible connection to reduce the effect of cathode-lead inductance.

The *rf impedance between grid No.2 and the cathode* must be kept low, usually by means of a suitable bypass capacitor. In telephony service when grid No.2 is modulated, a smaller bypass capacitor than is used for telegraphy service may be required in order to avoid excessive af bypassing. However, if the capacitance value is too small, rf feedback may occur between plate and grid No.1, depending on the circuit layout, operating frequency, and power gain of the stage. AF bypassing difficulties can usually be eliminated if the grid-No.2 bypass capacitor is replaced by a series-resonant circuit which is tuned to resonate at the operating frequency. This circuit presents a high impedance to audio frequencies but a very low impedance to its resonant frequency.

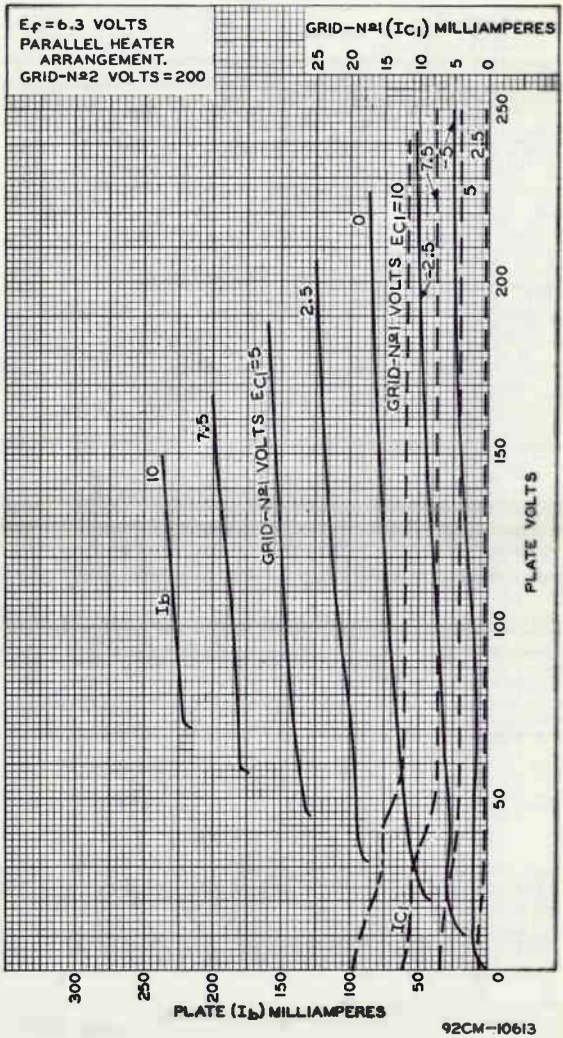
To *prevent generation of parasitic oscillations*, it is recommended that a 100-ohm resistor be connected in series with grid No.2 as close to the socket as possible.

AVERAGE CHARACTERISTICS
Each Unit

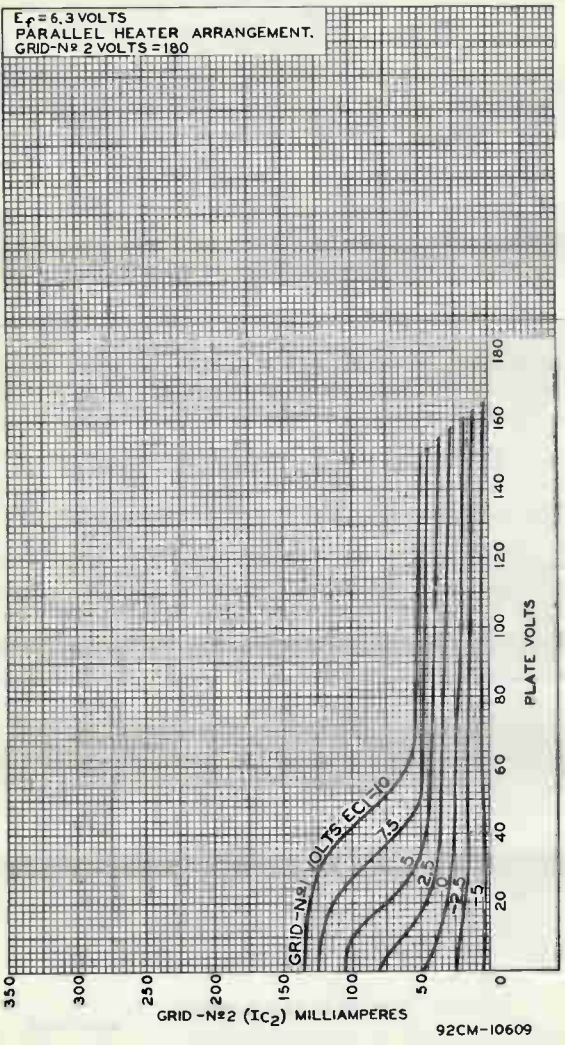


92CM-10614

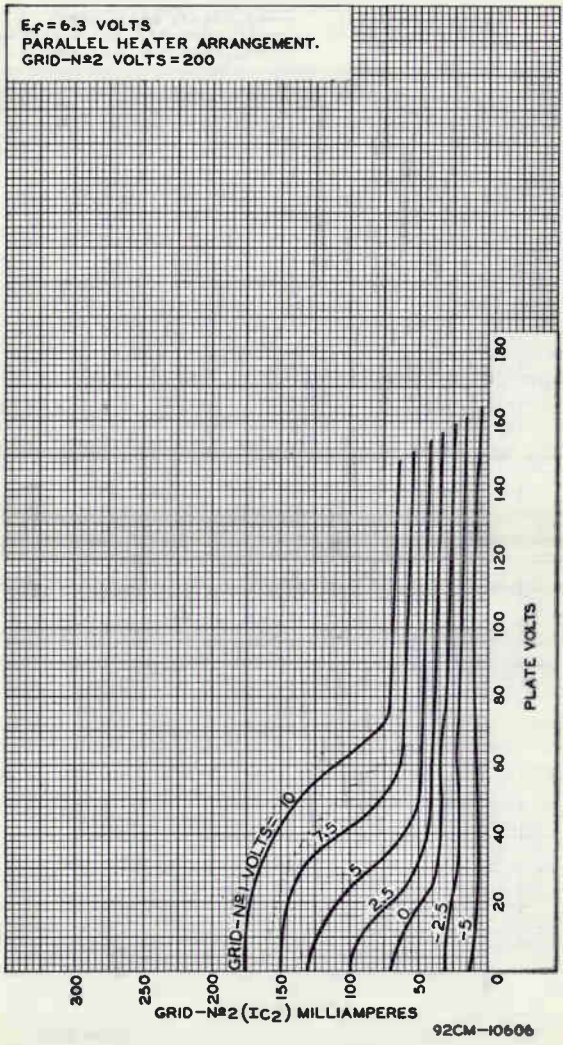
AVERAGE CHARACTERISTICS
Each Unit



AVERAGE CHARACTERISTICS
Each Unit

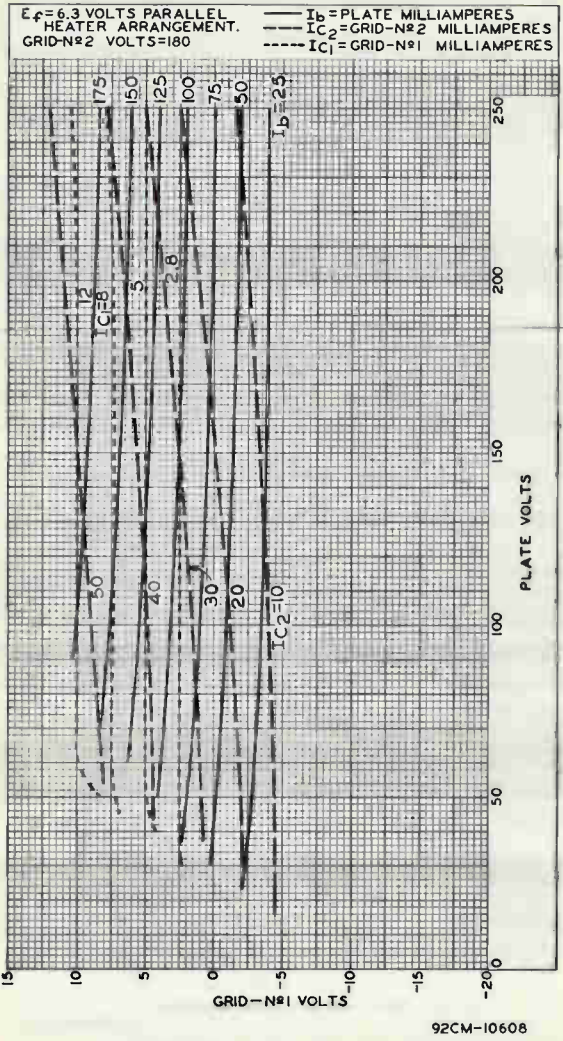


AVERAGE CHARACTERISTICS
Each Unit



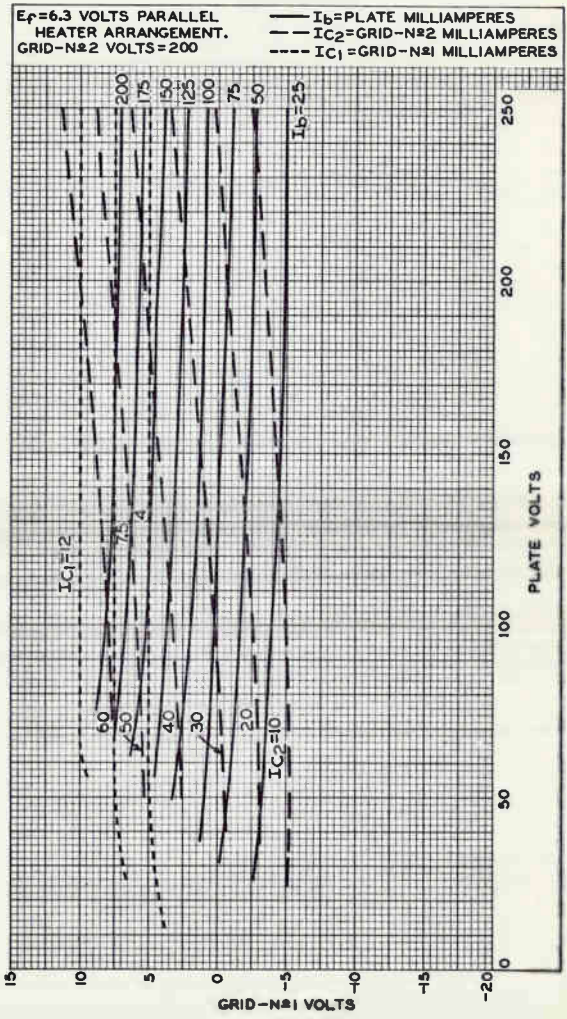
6939

AVERAGE CONSTANT-CURRENT CHARACTERISTICS
Each Unit



92CM-10608

AVERAGE CONSTANT-CURRENT CHARACTERISTICS
Each Unit



92CM-10603

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For Computer and other "On-Off" Control Applications Involving Long Periods of Operation under Cutoff Conditions

GENERAL DATA

Electrical:

	Series	Parallel	
Heater, for Unipotential Cathodes:			
Heater arrangement			
Voltage (AC or DC)	12.6 ± 5%	6.3 ± 5%	volts
Current	0.45	0.9	amp
Direct Interelectrode Capacitances (Approx.):[a]			
Grid to plate (Each unit)	6		μμf
Grid to cathode and heater (Each unit)	4.8		μμf
Plate to cathode and heater (Unit No.1)	0.65		μμf
Plate to cathode and heater (Unit No.2)	0.55		μμf
Grid to grid	0.1		μμf
Plate to plate	1.4		μμf
Heater to cathode (Each unit)	6		μμf

Characteristics (Each Unit):

Plate Voltage	90	120	volts
Grid Voltage	[b]	−2	volts
Amplification Factor	−	21	
Plate Resistance (Approx.)	−	1750	ohms
Transconductance	−	12000	μmhos
Plate Current	47	36	ma
Grid Current	250	−	μa
Grid Voltage (Approx.) for plate volts = 150 and plate μa = 200	−	−11	volts

Mechanical:

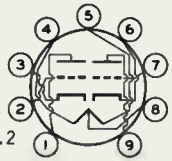
Operating Position	Any, but for the utmost in service, tube should be vertical with base down or up, or horizontal with pins 5 and 9 in vertical plane
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

◄ Indicates a change.

7044

Basing Designation for BOTTOM VIEW. 9H

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pins 4 & 8 – Heater of Unit No.2
Pins 5 & 8 – Heater of Unit No.1



Pin 6 – Cathode of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Heater Mid-Tap
Pin 9 – Plate of Unit No.1

COMPUTER SERVICE and "ON-OFF" CONTROL SERVICE

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, ***Absolute-Maximum Values:***

PLATE VOLTAGE:			
Average.	300	max.	volts
Peak positive-pulse[c]	600	max.	volts
GRID VOLTAGE:			
DC negative.	100	max.	volts
DC positive.	1	max.	volt
Peak negative-pulse[c]	300	max.	volts
Peak positive-pulse[c]	30	max.	volts
GRID CURRENT:			
Average.	5	max.	ma
Peak[c].	200	max.	ma
CATHODE CURRENT:			
Average.	50	max.	ma
Peak[c].	400	max.	ma
PLATE DISSIPATION:			
Either plate	4.5	max.	watts
Both plates (Both units operating) . . .	8	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[d]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	160	max.	°C

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation	0.1	max.	megohm
For cathode-bias operation	0.5	max.	megohm

[a] Without external shield.

[b] Adjusted for indicated grid current.

[c] Under the following conditions: rectangular pulse; pulse duration, 10 microseconds; pulse-repetition rate, 1×10^3 pps; and duty factor, 0.010 ± 0.001. The rise time shall be less than 1 microsecond, fall time less than 2 microseconds, overshoot less than 5 per cent and droop less than 10 per cent.

[d] The dc component must not exceed 100 volts.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Unless Otherwise Specified, Values are for Each Unit

	Note	Min.	Max.	
Heater Current	1	0.41	0.49	amp
Plate Current (1)	1,2	26	45	ma
Plate Current (2)	1,3	34	60	ma ←
Plate Current (3)	1,4	–	200	μa
Reverse Grid Current	1,2	–	-1.5	μa
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,5	–	30	μa
Heater positive with respect to cathode	1,5	–	30	μa
Leakage Resistance:				
Between plate and all other electrodes tied together	1,6	50	–	megohms
Between grid and all other electrodes tied together	1,7	50	–	megohms

Note 1: With heater volts = 12.6 ac or dc (Series arrangement).

Note 2: With plate volts = 120 and grid volts = -2. Each unit tested separately. Unit not under test connected to ground.

Note 3: With plate volts = 90 and grid voltage adjusted for grid μa = 250. Each unit tested separately. Unit not under test connected to ground.

Note 4: With plate volts = 150 and grid volts = -14. Each unit tested separately. Unit not under test connected to ground.

Note 5: With 100 volts dc between heater and cathode.

Note 6: With plate volts = -500.

Note 7: With grid volts = -300.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 15 (Series heater arrangement) cycled one minute on and four minutes off, heater 180 volts positive with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

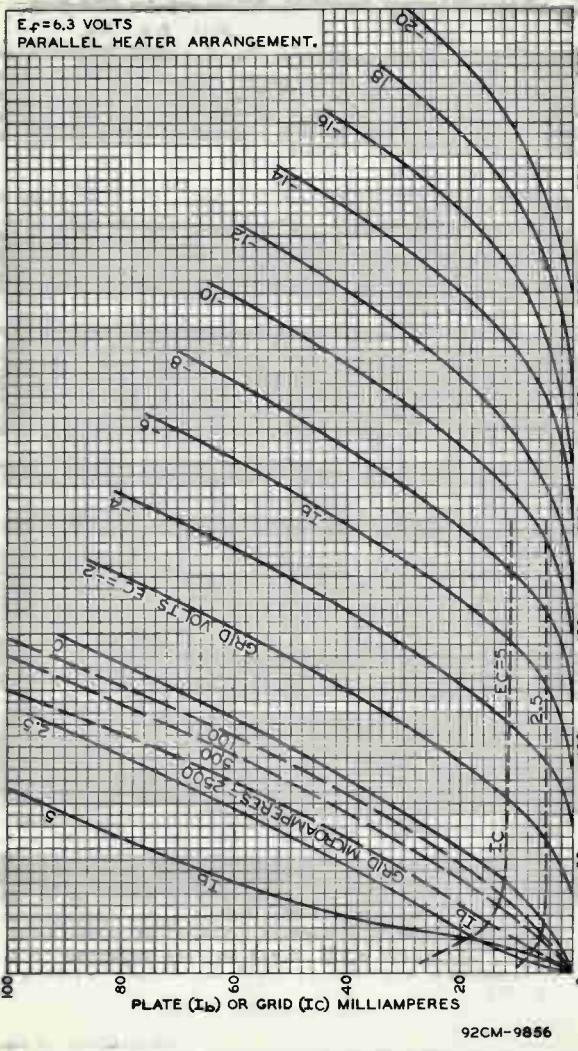
Cathode-Interface-Resistance Life Test: ←

A sample lot of tubes from each production run is life tested at heater volts = 12.6 (Series heater arrangement) and with zero cathode current. At the end of 1000 hours, tubes will not show a cathode-interface resistance in excess of 25 ohms when measured in accordance with Method B, the Complementary Network Method, of ASTM Standard F 300-57T at heater volts = 11.4, plate volts = 75, plate current adjusted to 6.5 milliamperes, and 50-kc, square-wave signal voltage of 0.2 volt.

← Indicates a change.

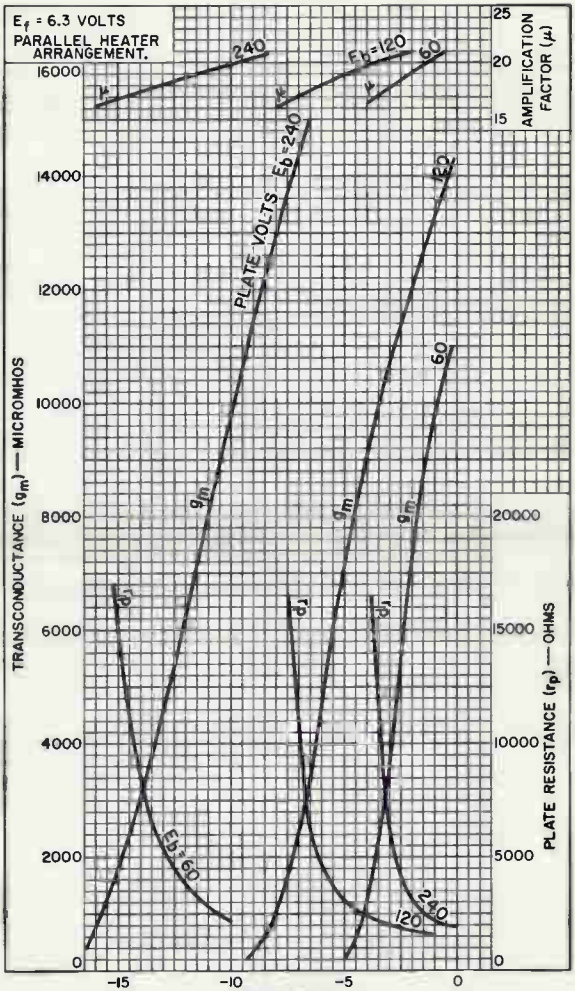
7044

AVERAGE CHARACTERISTICS
Each Unit



92CM-9856

AVERAGE CHARACTERISTICS
Each Unit



92CM-9857RI

Power Pentode

9-PIN MINIATURE TYPE

For Mobile-Communications Equipment Operating from 6-Cell Storage-Battery Systems. Useful as a Class-C RF-Power-Amplifier, Oscillator, and Frequency-Multiplier Tube up to 40 Mc, and as a Modulator and AF-Power-Amplifier Tube.

The 7054 is the same as the 8077/7054 except for the following items:

Mechanical:

Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"

7055

TWIN DIODE

7-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems. Useful as a detector in AM and FM receivers, as a full-wave rectifier in power supplies having low dc requirements, and in speech-clipper applications.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage range	12 to 15	ac or dc volts
Current (Approx.) at 13.5 volts	0.155	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Plate to cathode, internal shield, and heater (Each unit)	3.2	μμf
Cathode to plate, internal shield, and heater (Each unit)	3.6	μμf
Plate of unit No.1 to plate of unit No.2	0.026	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	6BT

Pin 1 – Cathode of Unit No.1
Pin 2 – Plate of Unit No.2
Pin 3 – Heater
Pin 4 – Heater

Pin 5 – Cathode of Unit No.2
Pin 6 – Internal Shield
Pin 7 – Plate of Unit No.1

RECTIFIER

Maximum Ratings, *Absolute Values:*

PEAK INVERSE PLATE VOLTAGE	350 max.	volts
PEAK PLATE CURRENT PER PLATE	60 max.	ma
DC OUTPUT CURRENT PER PLATE	10 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	120 max.	volts
Heater positive with respect to cathode	120 max.	volts

Typical Operation:

The two units may be used separately or in parallel

Heater Voltage	13.5	volts

[o]: See next page.

7055

TWIN DIODE

AC Plate Voltage per Plate (RMS).	117	volts
Minimum Total Effective Plate-Supply Impedance per Plate	300	ohms
DC Output Current per Plate	9	ma

° With external shield JETEC No.316 connected to cathode of unit under test.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current.	1	0.143	0.167	amp
Plate Current per Plate	1,2	15	-	ma
Heater-Cathode Leakage Current (Each unit):				
Heater negative with respect to cathode.	1,3	-	5	μa
Heater positive with respect to cathode.	1,3	-	5	μa
Leakage Resistance:				
Plate to all other electrodes of both units tied together. .	1,4	50	-	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With plate volts = 5 and electrodes of unit not under test connected to ground.

Note 3: With 100 volts dc between heater and cathode.

Note 4: With plate 300 volts negative with respect to all other electrodes of both units tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one-minute on and four minutes off, heater 135 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

500-Hour Intermittent Life Performance:

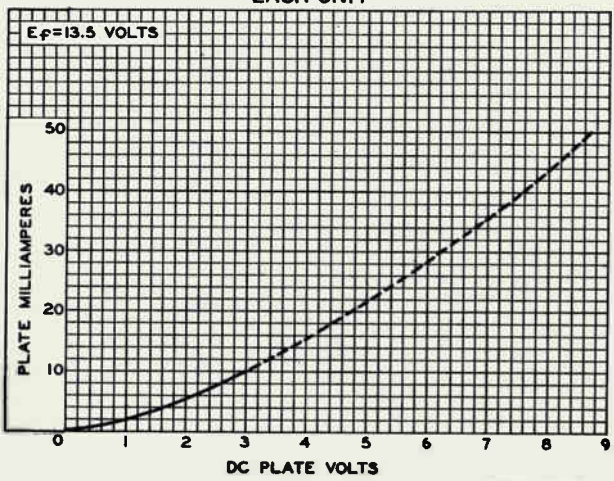
This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate current.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

7055

AVERAGE PLATE CHARACTERISTIC
EACH UNIT



92CS-9774

7056

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems. Useful as if or rf amplifier at frequencies up to 45 Mc.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage range	12 to 15	ac or dc volts
Current (Approx.) at 13.5 volts	0.15	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield©	
Grid No.1 to plate	0.02 max.	0.01 max.	μμf
Grid No.1 to all other electrodes except plate	6.5	6.5	μμf
Plate to all other electrodes except grid No.1	2	3	μμf

Characteristics, Class A_1 Amplifier:

Heater Voltage	13.5	volts
Plate-Supply Voltage	200	volts
Grid No.3 (Suppressor Grid)	*Connected to cathode at socket*	
Grid-No.2 (Screen-Grid) Supply Voltage	150	volts
Cathode Resistor	180	ohms
Plate Resistance (Approx.)	0.6	megohm
Transconductance	6200	μmhos
Plate Current	9.5	ma
Grid-No.2 Current	2.8	ma
Grid-No.1 (Control-Grid) Voltage (Approx.) for plate μa = 100	-7	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CM

Pin 1 - Grid No.1
Pin 2 - Cathode
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Plate

Pin 6 - Grid No.2
Pin 7 - Grid No.3, Internal Shield

© With external shield JETEC No.316 connected to cathode.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 1

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts	0.5 max.	watt
For grid-No.2 voltages between 165 volts and 330 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	120 max.	volts
Heater positive with respect to cathode	120 max.	volts

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Heater Current	1	0.138	0.164	amp
Transconductance	1,2	5000	7400	μmhos
Plate Current	1,3	6.5	12.5	ma
Grid-No.2 Current	1,3	1.6	4	ma
Reverse Grid-No.1 Current	1,4	–	−1	μa
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode	1,5	–	20	μa
Heater positive with respect to cathode	1,5	–	20	μa
Leakage Resistance:				
Between grid-No.1 and all other electrodes tied together	1,6	50	–	megohms
Between plate and all other electrodes tied together	1,7	50	–	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With dc plate-supply volts = 200, grid-No.2 supply volts = 150, grid No.3 connected to cathode at socket, cathode resistor (ohms) = 180, and cathode-bypass capacitor (μf) = 1000.

Note 3: With dc plate-supply volts = 200, grid-No.2 supply volts = 150, grid No.3 connected to cathode at socket, and cathode resistor (ohms) = 180.

Note 4: With dc plate volts = 200, grid-No.2 volts = 150, grid No.3 connected to cathode at socket, and grid-No.1 volts = −1.5.

Note 5: With 100 volts dc between heater and cathode.

Note 6: With grid-No.1 100 volts negative with respect to all other electrodes tied together.

Note 7: With plate 300 volts negative with respect to all other electrodes tied together.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 1

7056

SHARP-CUTOFF PENTODE

SPECIAL TESTS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one minute on and four minutes off, heater 135 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions: heater volts = 13.5, plate-supply volts = 200, grid No.3 connected to cathode, grid-No.2 volts = 150, grid-No.1 volts = -2, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 250 millivolts.

500-Hour Intermittent Life Performance:

This test is made on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate dissipation and grid-No.2 input.

7056

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AVERAGE PLATE CHARACTERISTICS

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92CM-979

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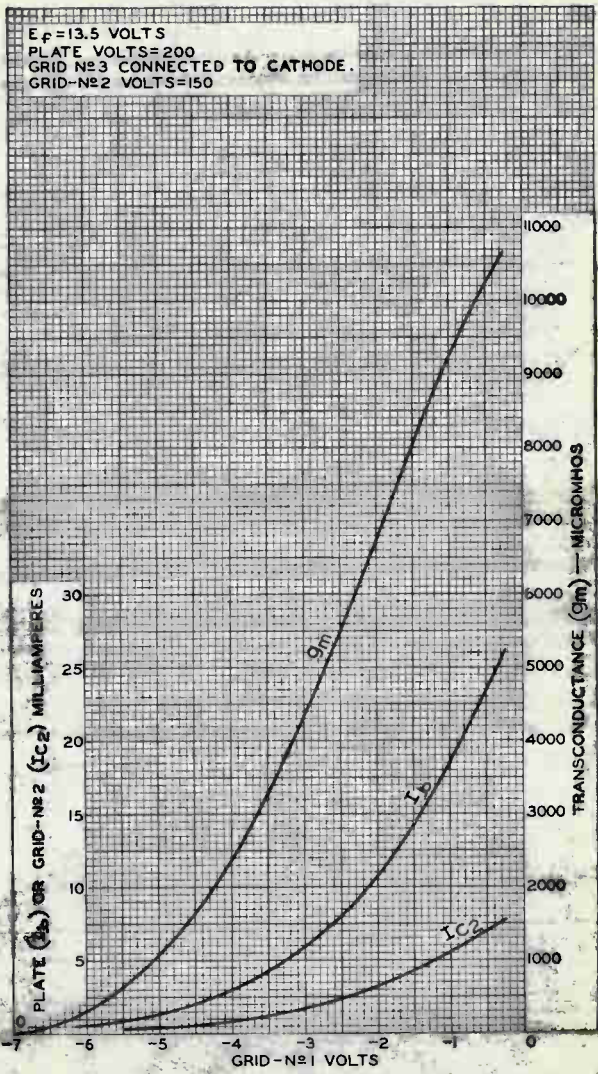
AVERAGE CHARACTERISTICS



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MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems. Useful as an rf amplifier in direct-coupled cathode-drive circuits at frequencies up to 200 Mc.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage range	12 to 15		ac or dc volts
Current (Approx.) at 13.5 volts	0.18		amp
Direct Interelectrode Capacitances:[o]	*Unit No.1*	*Unit No.2*	
Grid to plate	1.2	1.2	μμf
Grid to cathode, internal shield, and heater	2.6	—	μμf
Plate to cathode, internal shield, and heater	1.2	—	μμf
Plate to cathode	0.12	0.12	μμf
Cathode to heater	2.6	2.7	μμf
Cathode to grid, internal shield, and heater	—	5	μμf
Plate to grid, internal shield, and heater	—	2.2	μμf
Plate of unit No.1 to plate of unit No.2	0.01 max.		μμf
Plate of unit No.2 to plate and grid of unit No.1	0.024 max.		μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Heater Voltage	13.5	volts
Plate-Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	36	
Plate Resistance (Approx.)	5300	ohms
Transconductance	6800	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate μa = 10.	-12	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2

[o] With external shield JETEC NO.315 connected to pin 9.

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7057

MEDIUM-MU TWIN TRIODE

Base. . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. 9AJ

Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Internal Shield

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Absolute Values:*

PLATE VOLTAGE	275 max.	volts
PLATE DISSIPATION	2.2 max.	watts
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode .	150 max.	volts
Heater positive with respect to cathode .	150 max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values are for Each Unit Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current.	1	0.165	0.195	amp
Direct Interelectrode Capacitances:				
Grid to cathode, internal shield, and heater (Unit No.1)	2	2.05	3.15	μμf
Cathode to grid, internal shield, and heater (Unit No.2)	2	4.1	5.9	μμf
Plate to grid, internal shield, and heater (Unit No.2)	2	1.9	2.5	μμf
Amplification Factor.	1,3	26	46	
Plate Current	1,4	7	13	ma
Transconductance.	1,3	5800	7800	μmhos
Reverse Grid Current (Total—both units)	1,5	–	-2	μa
Heater–Cathode Leakage Current:				
Heater negative with respect to cathode.	1,6	–	20	μa
Heater positive with respect to cathode.	1,6	–	20	μa

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TENTATIVE DATA 1

7057

MEDIUM-MU TWIN TRIODE

	Note	Min.	Max.	
Leakage Resistance:				
Between grid and all other electrodes of both units tied together.	1,7	50	–	megohms
Between plate and all other electrodes of both units tied together.	1,8	50	–	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With external shield JETEC No.315 connected to pin 9.

Note 3: With dc plate-supply volts = 150, cathode resistor (ohms) = 220, and cathode-bypass capacitor (μf) = 1000. Each unit tested separately. Electrodes of unit not under test are connected to ground.

Note 4: With dc plate-supply volts = 150, and cathode resistor (ohms) = 220. Each unit tested separately. Electrodes of unit not under test are connected to ground.

Note 5: With dc plate-supply volts = 250, cathode resistor (ohms) = 250, and grid resistor (megohms) = 0.5. Units are tested in parallel with cathode and grid resistors common to both units.

Note 6: With 150 volts dc between heater and cathode.

Note 7: With grid 100 volts negative with respect to all other electrodes of both units tied together.

Note 8: With plate 300 volts negative with respect to all other electrodes of both units tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one minute on and four minutes off, heater 180 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions: units connected in parallel, heater volts = 13.5, plate-supply volts = 250, grid volts = -8, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 150 millivolts.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate dissipation.

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TENTATIVE DATA

7057

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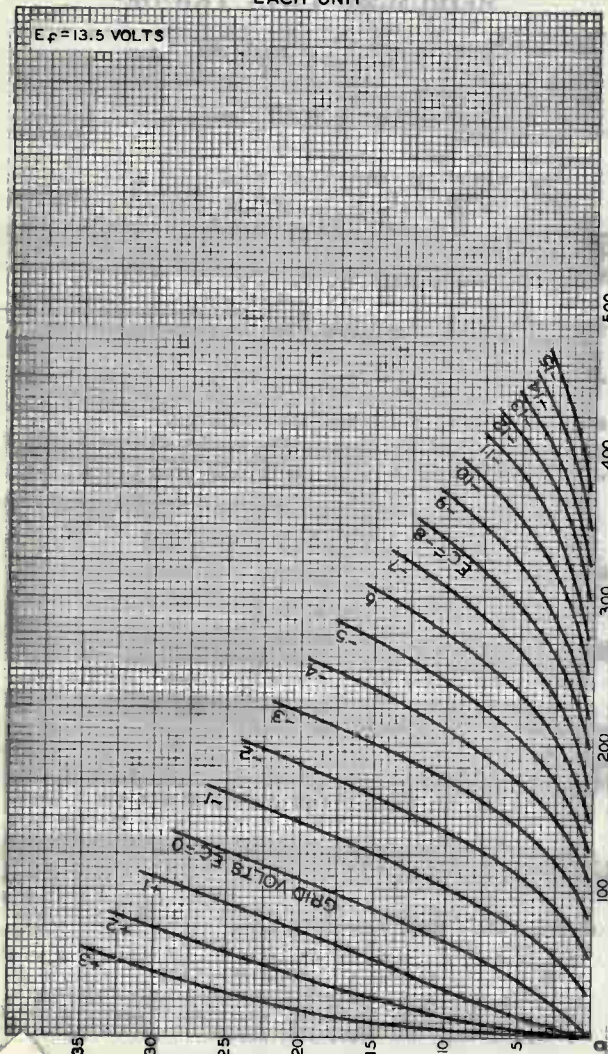
7057

AVERAGE PLATE CHARACTERISTICS

EACH UNIT



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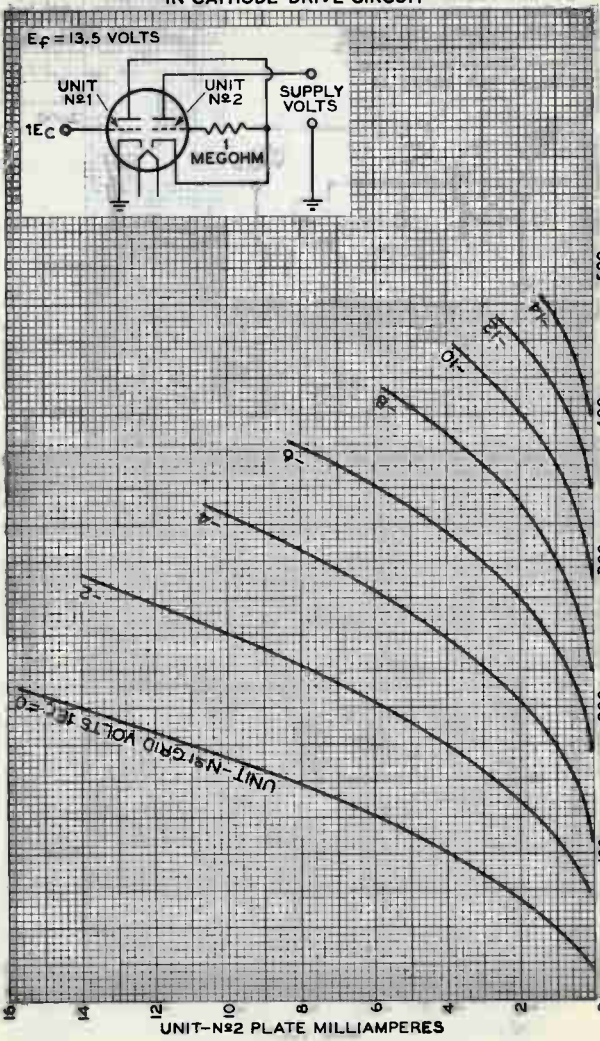
AVERAGE PLATE CHARACTERISTICS

DIRECT-COUPLED DRIVEN RF AMPLIFIER IN CATHODE-DRIVE CIRCUIT



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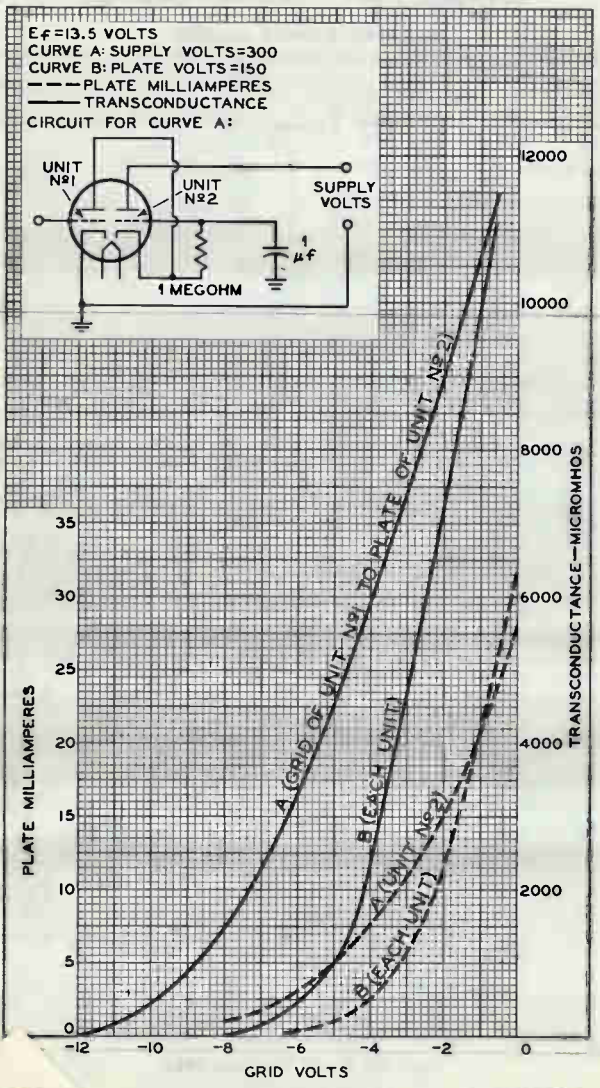
AVERAGE CHARACTERISTICS



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92CM-9790

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HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems. Useful in phase-inverter, resistance-coupled-amplifier, and low-frequency-oscillator applications.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
Voltage range. . . . . 12 to 15 . . . . . ac or dc volts
Current (Approx.) at
13.5 volts . . . . . 0.155 . . . . . amp

Direct Interelectrode Capacitances:[o]

	Unit No.1	Unit No.2	
Grid to plate.	1.7	1.7	μμf
Grid to cathode and heater . . .	1.6	1.6	μμf
Plate to cathode and heater. . .	0.46	0.34	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Heater Voltage	13.5	volts
Plate Voltage.	250	volts
Grid Voltage	-2	volts
Amplification Factor	100	
Plate Resistance (Approx.)	61000	ohms
Transconductance	1650	μmhos
Plate Current.	1.25	ma
Grid Voltage (Approx.) for plate μa = 10	-5	volts

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 2-3/16"
Maximum Seated Length. . . . . 1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . . 1-9/16" ± 3/32"
Diameter . . . . . 0.750" to 0.875"
Dimensional Outline. . . . . *See General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW 9EP

Pin 1 - Plate of Unit No.2
Pin 2 - Grid of Unit No.2
Pin 3 - Cathode of Unit No.2
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Plate of Unit No.1
Pin 7 - Grid of Unit No.1
Pin 8 - Cathode of Unit No.1
Pin 9 - Internal Connection—Do Not Use

[o]: See next page.

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HIGH-MU TWIN TRIODE

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, ***Absolute Values:***

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts
Negative-bias value	55 max.	volts
PLATE DISSIPATION	1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	120 max.	volts
Heater positive with respect to cathode.	120 max.	volts

Typical Operation as Resistance-Coupled Amplifier (Each Unit):

See RESISTANCE-COUPLED AMPLIFIER CHART No. 25 at front of Receiving Tube Section

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation.	0.5 max.	megohm
For cathode-bias operation.	1 max.	megohm

○ Without external shield.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values are for Each Unit Unless Otherwise Specified

	Note	Min.	Max.	
Heater Current	1	0.143	0.167	amp
Amplification Factor	1,2	85	115	
Plate Current	1,2	0.9	1.75	ma
Transconductance	1,2	1360	2100	μmhos
Reverse Grid Current (Total—both units)	1,3	–	-1	μa
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode.	1,4	–	20	μa
Heater positive with respect to cathode.	1,4	–	20	μa
Leakage Resistance:				
Between grid and all other electrodes of both units tied together	1,5	50	–	megohms
Between plate and all other electrodes of both units tied together	1,6	50	–	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With dc plate volts = 250, and dc grid volts = −2. Each unit tested separately. Electrodes of unit not under test are connected to ground.

Note 3: With dc plate volts = 250, grid resistor (megohms) = 1 common to both units, and dc grid volts = −2. Units are tested in parallel.

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7058

HIGH-MU TWIN TRIODE

Note 4: With 100 volts dc between heater and cathode.

Note 5: With grid 100 volts negative with respect to all other electrodes of both units tied together.

Note 6: With plate 300 volts negative with respect to all other electrodes of both units tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one minute on and four minutes off, heater 135 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

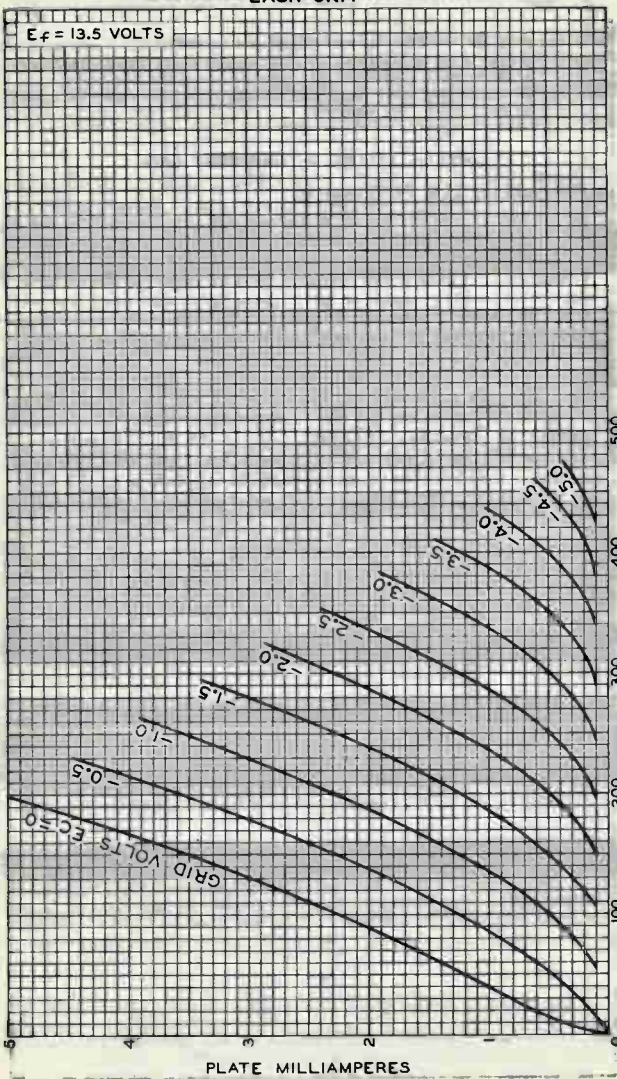
Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions: units connected in parallel, heater volts = 13.5, plate-supply volts = 250, grid volts = -2, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 150 millivolts.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate dissipation.

AVERAGE PLATE CHARACTERISTICS
EACH UNIT



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92CM-9765

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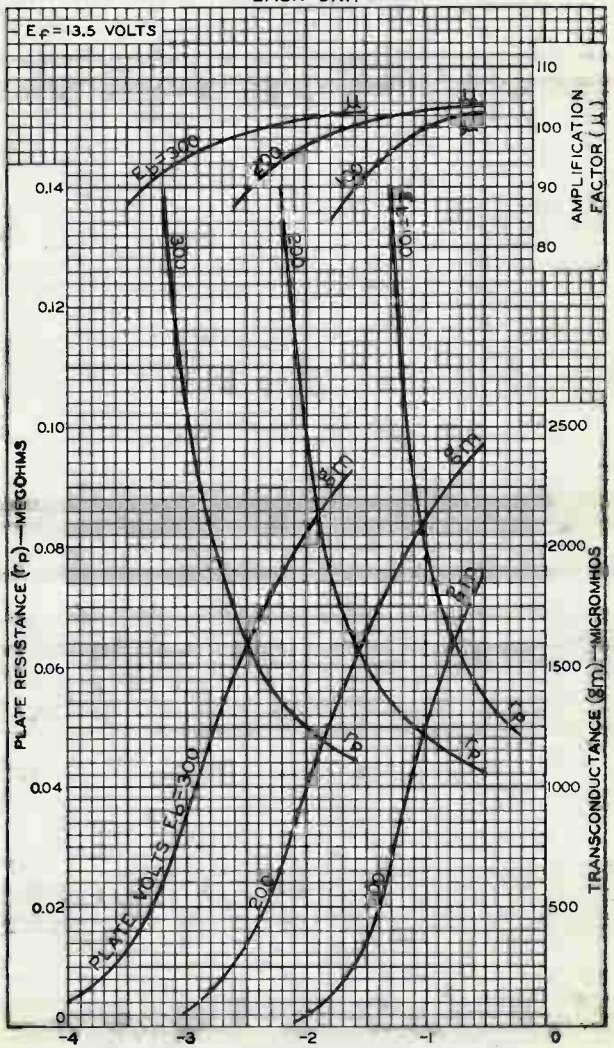
AVERAGE CHARACTERISTICS

EACH UNIT



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92CM-9805

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MEDIUM-MU TRIODE—
SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage range	12 to 15	ac or dc volts
Current (Approx.) at 13.5 volts	0.195	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Triode Unit:			
Grid to plate	1.7	1.7	μμf
Grid to cathode and heater	2.7	2.7	μμf
Plate to cathode and heater	0.4	1	μμf
Pentode Unit:			
Grid No.1 to plate	0.01 max.	0.006 max.	μμf
Grid No.1 to all other electrodes except plate	5	5	μμf
Plate to all other electrodes except grid No.1	2.5	3.4	μμf
Heater to cathode (Each unit)	3	3•	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Heater Voltage	13.5	13.5	volts
Plate-Supply Voltage	150	250	volts
Grid-No.2 (Screen-Grid) Supply Voltage	–	110	volts
Cathode Resistor	56	68	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	4700	400000	ohms
Transconductance	8500	5200	μmhos
Plate Current	18	10	ma
Grid-No.2 Current	–	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	−12	−10	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	.1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*

°, •: See next page.

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MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Bulb. T6-1/2
Base. . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. 9AE

Pin 1 – Triode Plate
Pin 2 – Pentode Grid No.1
Pin 3 – Pentode Grid No.2
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Plate

Pin 7 – Pentode Cathode, Pentode Grid No.3, Internal Shield
Pin 8 – Triode Cathode
Pin 9 – Triode Grid

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	300 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 150 volts	–	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts .	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	2.5 max.	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode.	120 max.	120 max.	volts
Heater positive with respect to cathode.	120 max.	120 max.	volts

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance: For fixed-bias operation. . .	0.5 max.	0.5 max.	megohm
For cathode-bias operation. .	1 max.	1 max.	megohm

[o] With external shield JETEC No.315 connected to cathode of unit under test except as noted.
[•] With external shield JETEC No.315 connected to ground.

7059

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.179	0.211	amp
Transconductance (Triode unit)	1,2	6800	10200	μmhos
Plate Current (Triode unit)	1,3	12.7	23.3	ma
Transconductance (Pentode unit)	1,4	3900	6500	μmhos
Plate Current (Pentode unit)	1,5	7.5	12.5	ma
Grid-No.2 Current (Pentode unit)	1,5	2.2	4.8	ma
Reverse Grid-No.1 Current (Total—both units)	1,6	-	-1.3	μa
Heater-Cathode Leakage Current (Each unit):				
Heater negative with respect to cathode	1,7	-	5	μa
Heater positive with respect to cathode	1,7	-	5	μa
Leakage Resistance (Each unit):				
Between grid No.1 and all other electrodes of both units tied together	1,8	50	-	megohms
Between plate and all other electrodes of both units tied together	1,9	50	-	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With dc plate-supply volts = 150, cathode resistor (ohms) = 56, and cathode-bypass capacitor (μf) = 1000.

Note 3: With dc plate-supply volts = 150, and cathode resistor (ohms) = 56.

Note 4: With dc plate-supply volts = 250, grid-No.2 supply volts = 110, cathode resistor (ohms) = 68, and cathode-bypass capacitor (μf) = 1000.

Note 5: With dc plate-supply volts = 250, grid-No.2 supply volts = 110, and cathode resistor (ohms) = 68.

Note 6: With triode dc plate volts = 150, pentode dc plate volts = 250, grid-No.2 volts = 110, grid-No.1 volts = -1.5 on both units, and grid-No.1 resistor (megohms) = 0.5 for each unit.

Note 7: With 50 volts dc between heater and cathode.

Note 8: With grid No.1 100 volts negative with respect to all other electrodes of both units tied together.

Note 9: With plate 300 volts negative with respect to all other electrodes of both units tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one minute on and four minutes off, heater 135 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

7059

MEDIUM-MU TRIODE—
SHARP-CUTOFF PENTODE

Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions:

Triode Unit:

Heater volts = 13.5, plate-supply volts = 150, grid volts = −1.5, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 150 millivolts.

Pentode Unit:

Heater volts = 13.5, plate-supply volts = 250, grid-No.2 volts = 110, grid-No.1 volts = −1.5, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 250 millivolts.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate dissipation and grid-No.2 input.

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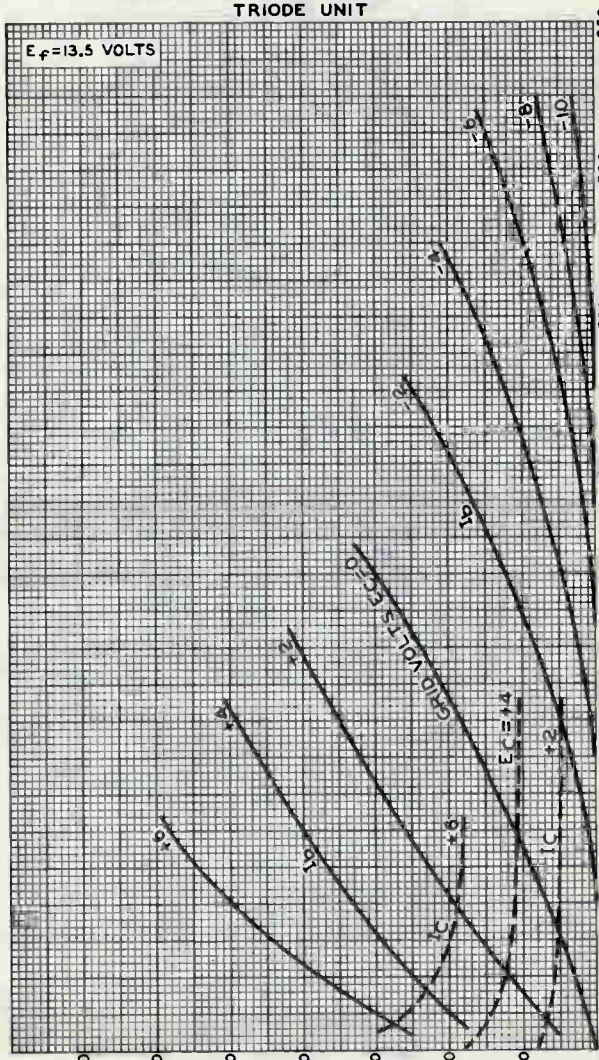
AVERAGE CHARACTERISTICS
TRIODE UNIT



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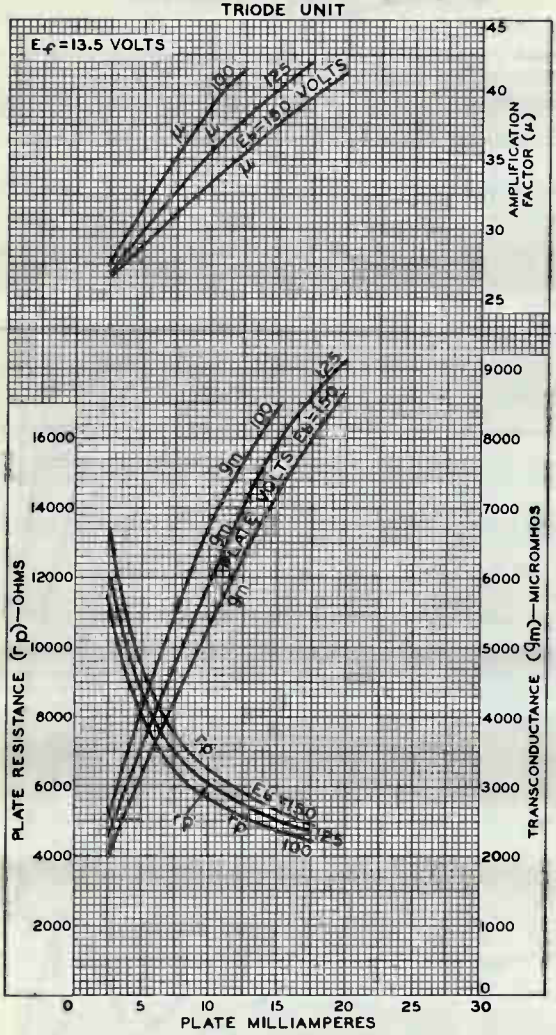
AVERAGE CHARACTERISTICS
TRIODE UNIT



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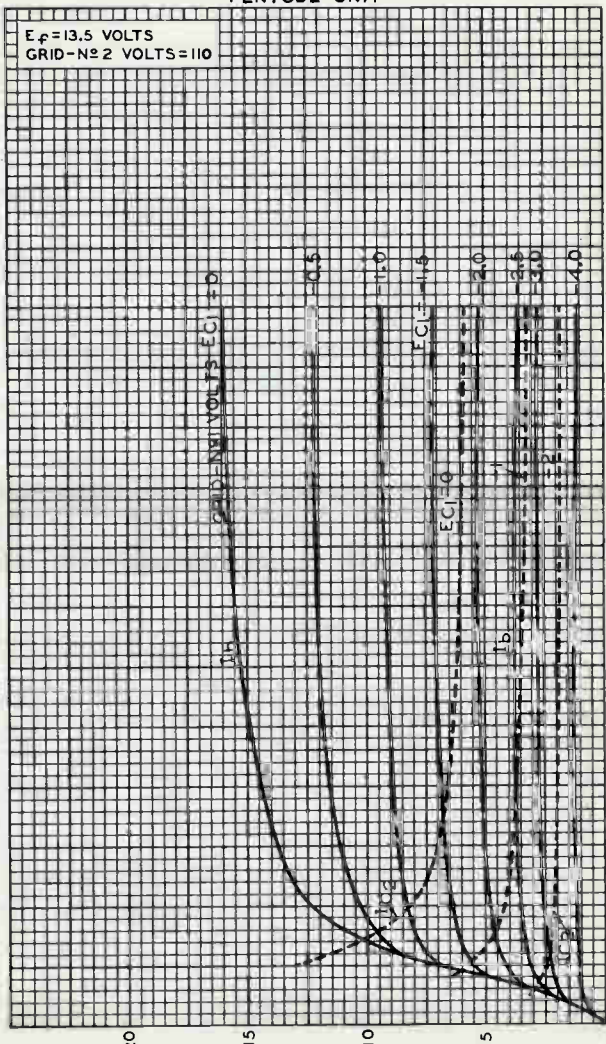
AVERAGE CHARACTERISTICS
PENTODE UNIT



ELECTRON TUBE DIVISION

92CM-9809

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

7060

MEDIUM-MU TRIODE—POWER PENTODE

9-PIN MINIATURE TYPE

For use in mobile communications equipment operating from 6-cell storage-battery systems. The pentode unit is useful in class-C-amplifier and frequency-multiplier applications at frequencies up to 40 Mc. The triode unit is useful as a reactance modulator.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage range.	12 to 15	. . . . ac or dc volts
Current (Approx.) at 13.5 volts	0.28	. . . . . amp
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate.	2.2	μμf
Grid to cathode and heater . . .	2.4	μμf
Plate to cathode and heater. . .	0.22	μμf
Pentode Unit:		
Grid No.1 to plate	0.044	μμf
Grid No.1 to all other electrodes except plate. . . .	7.1	μμf
Plate to all other electrodes except grid No.1	2.5	μμf
Triode grid to pentode plate . . .	0.022 max.	μμf
Pentode grid No.1 to triode plate.	0.015 max.	μμf
Pentode plate to triode plate. . .	0.16 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Heater Voltage	13.5	13.5	volts
Plate-Supply Voltage	150	200	volts
Grid-No.2 (Screen-Grid) Supply Voltage	—	125	volts
Cathode Resistor	150	82	ohms
Amplification Factor	40	—	
Plate Resistance (Approx.) . . .	8200	150000	ohms
Transconductance	4900	7000	μmhos
Plate Current.	9	15	ma
Grid-No.2 Current.	—	3.4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-6.5	-8	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length.	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip).	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2

[o]: See next page.

Base. . . . . .Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. 9DA

Pin 1 - Triode Plate
Pin 2 - Triode Grid
Pin 3 - Triode Cathode
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Pentode Plate
Pin 7 - Pentode Grid No.2

Pin 8 - Pentode Grid No.1
Pin 9 - Pentode Grid No.3, Pentode Cathode, Internal Shield

AMPLIFIER — Class A_1

Maximum Ratings, *Absolute Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	-	300 max.	volts
GRID-No.2 VOLTAGE	-	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	-	1 max.	watt
For grid-No.2 voltages between 150 and 300 volts .	-	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	2.5 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	120 max.	120 max.	volts
Heater positive with respect to cathode.	120 max.	120 max.	volts

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. .	1 max.	1 max.	megohm

°: See next page.

7060

MEDIUM-MU TRIODE—POWER PENTODE

RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy■
and
RF POWER AMPLIFIER — Class C FM Telephony

Pentode Unit

Maximum CCS● Ratings, ***Absolute Values:***

DC PLATE VOLTAGE	300 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	150 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
DC PLATE CURRENT	20 max.	ma
DC GRID-No.2 CURRENT	7 max.	ma
DC GRID-No.1 CURRENT	3 max.	ma
GRID-No.2 INPUT	0.8 max.	watt
PLATE DISSIPATION	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	120 max.	volts
Heater positive wmth respect to cathode	120 max.	volts

Typical Operation:

	At frequencies up to 40 Mc			
Heater Voltage	13.5	13.5	13.5	volts
DC Plate Voltage	200	250	300	volts
DC Grid-No.2 Voltage	85	105	125	volts
DC Grid-No.1 Voltage	-7	-9	-11	volts
DC Plate Current	11	15	20	ma
DC Grid-No.2 Current	3.2	4.5	6	ma
DC Grid-No.1 Current (Approx.)	0.9	1.2	1.6	ma
Driving Power (Approx.)	9	15	25	mw
Power Output	1.3	2.1	3.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.1 max.	megohm

° Without external shield.

■ Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

● Continuous Commercial Service.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Heater Current	1	0.26	0.3	amp
Amplification Factor (Triode unit)	1,2	32	48	
Transconductance (Triode unit)	1,2	3800	6000	μmhos
Plate Current (Triode unit)	1,3	6.5	11.5	ma
Transconductance (Pentode unit)	1,4	5200	8800	μmhos

7060

MEDIUM-MU TRIODE—POWER PENTODE

	Note	Min.	Max.	
Plate Current (Pentode unit) . .	1,5	11.2	22.8	ma
Grid-No.2 Current (Pentode unit).	1,5	2.2	4.6	ma
Direct Interelectrode Capacitance:				
Grid No.1 to plate (Pentode unit).	6	0.035	0.053	μμf
Reverse Grid-No.1 Current (Total—both units)	1,7	–	-2	μa
Heater-Cathode Leakage Current (Each unit):				
Heater negative with respect to cathode.	1,8	–	30	μa
Heater positive with respect to cathode.	1,8	–	30	μa
Leakage Resistance (Each unit):				
Between grid No.1 and all other electrodes of both units tied together	1,9	50	–	megohms
Between plate and all other electrodes of both units tied together	1,10	50	–	megohms

Note 1: With ac or dc heater volts = 13.5.

Note 2: With dc plate-supply volts = 150, cathode resistor (ohms) = 150, and cathode-bypass capacitor (μf) = 1000.

Note 3: With dc plate-supply volts = 150, and cathode resistor (ohms) = 150.

Note 4: With dc plate-supply volts = 200, grid-No.2 supply volts = 125, cathode resistor (ohms) = 82, and cathode-bypass capacitor (μf) = 1000.

Note 5: With dc plate-supply volts = 200, grid-No.2 supply volts = 125, and cathode resistor (ohms) = 82.

Note 6: Without external shield.

Note 7: With pentode dc plate-supply volts = 150, grid-No.2 supply volts = 180, pentode cathode resistor (ohms) = 120, pentode grid-No.1 resistor (megohms) = 1, triode dc plate-supply volts = 180, triode cathode resistor (ohms) = 75, and triode grid resistor (megohms) = 0.5.

Note 8: With 100 volts dc between heater and cathode.

Note 9: With grid No.1 100 volts negative with respect to all other electrodes of both units tied together.

Note 10: With plate 300 volts negative with respect to all other electrodes of both units tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Heater-Cycling Life Performance:

This test is performed on a sample lot of tubes from each production run. A minimum of 2000 cycles of intermittent operation is applied under the following conditions: heater volts = 17 cycled one minute on and four minutes off, heater 135 volts negative with respect to cathode, and all other elements connected to ground. At the end of this test, tubes are checked for heater-cathode shorts and open circuits.

7060

MEDIUM-MU TRIODE—POWER PENTODE

Low-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions:

Triode Unit:

Heater volts = 13.5, plate-supply volts = 150, grid volts = −1.5, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 150 millivolts.

Pentode Unit:

Heater volts = 13.5, plate-supply volts = 200, grid-No.2 volts = 125, grid-No.1 volts = −2, plate load resistor (ohms) = 2000, and vibrational acceleration of 2.5 g at 25 cps. In this test, the rms output voltage must not exceed 250 millivolts.

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against eqidemic failures. Life testing is conducted under the following conditions: heater volts = 15 and maximum-rated plate dissipation and grid-No.2 input.

7060

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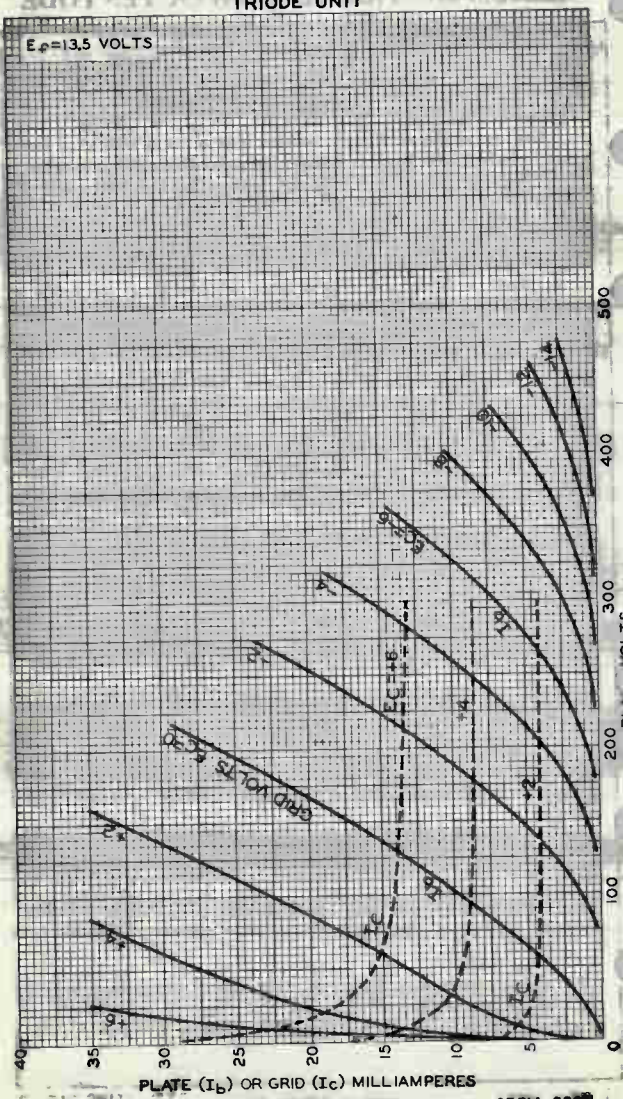
7060

AVERAGE CHARACTERISTICS

TRIODE UNIT



ELECTRON TUBE DIVISION

92CM-9807

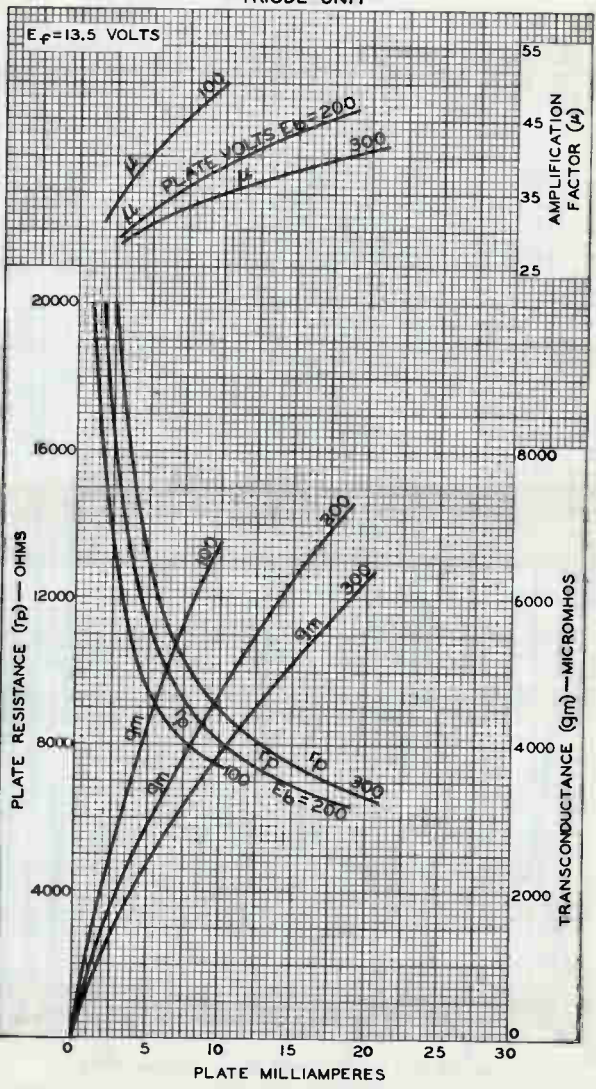
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

7060

AVERAGE CHARACTERISTICS

TRIODE UNIT



7060

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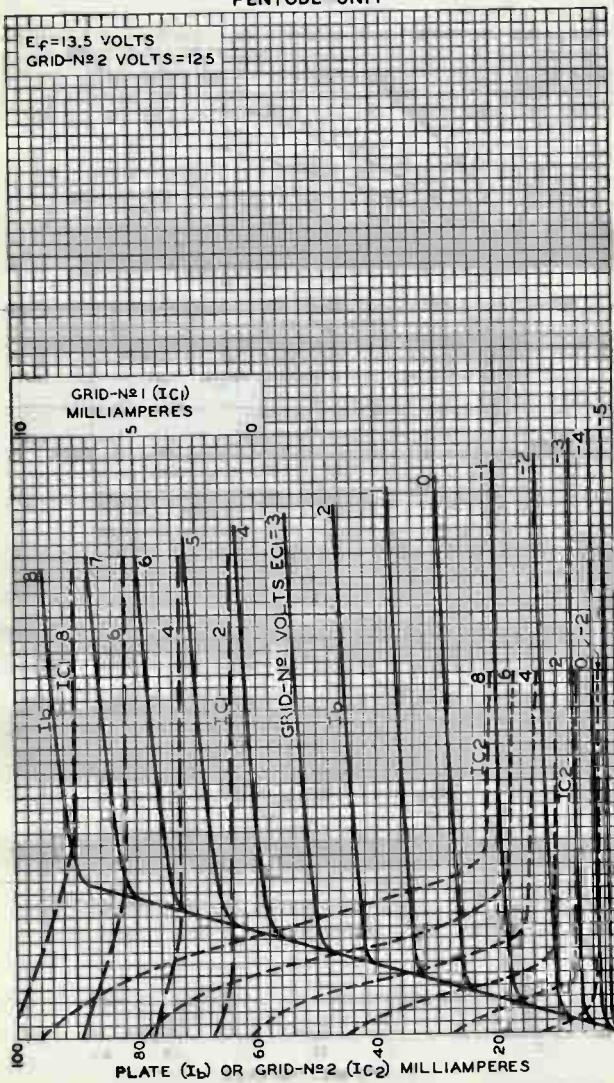
AVERAGE CHARACTERISTICS
PENTODE UNIT



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92CM-9815

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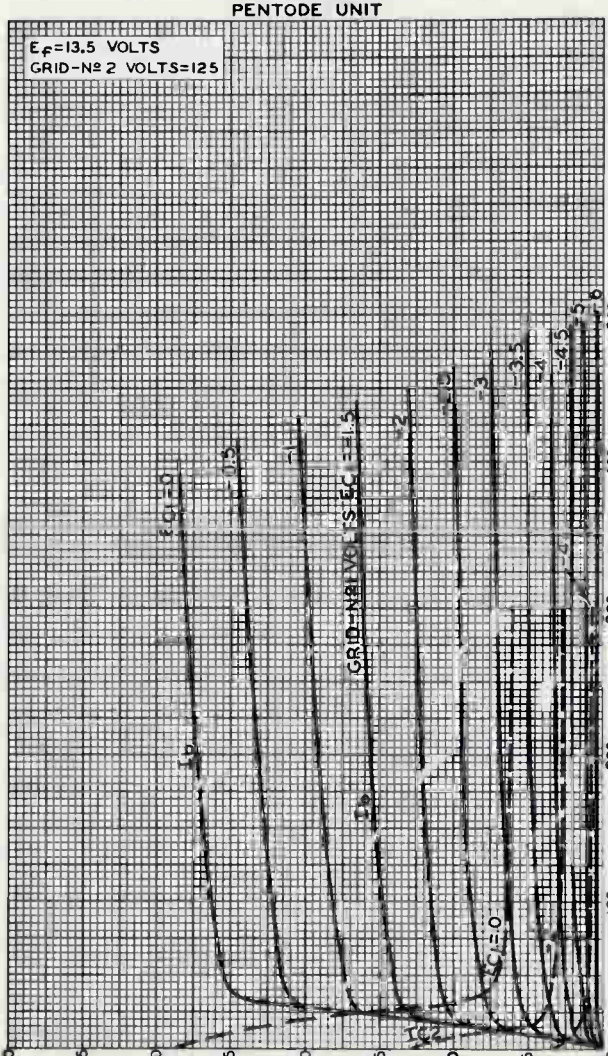
AVERAGE CHARACTERISTICS
PENTODE UNIT



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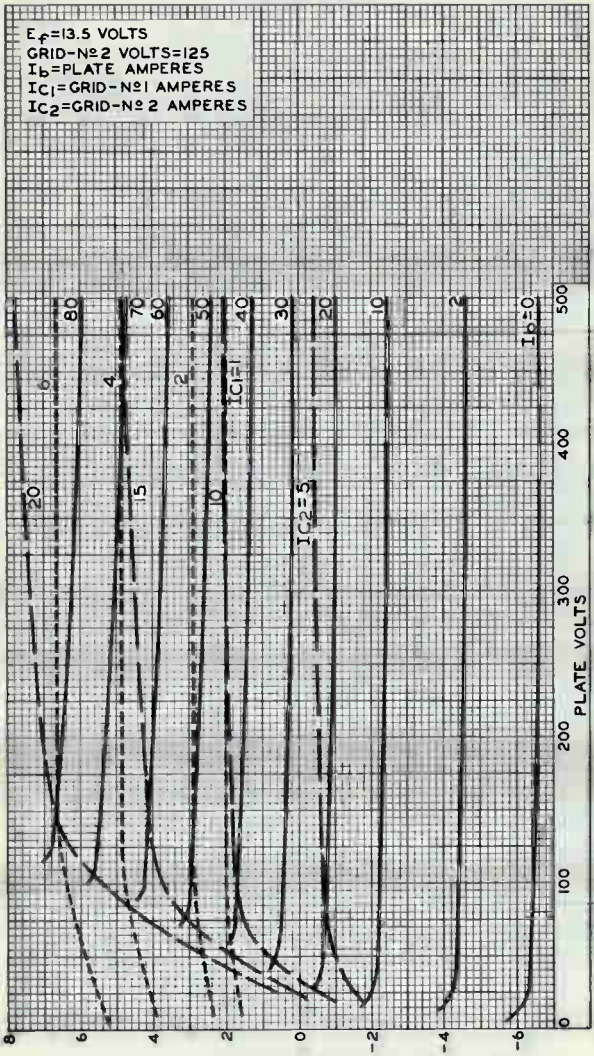
AVERAGE CONSTANT-CURRENT CHARACTERISTICS

PENTODE UNIT



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92CM-9803

7060

AVERAGE CHARACTERISTICS
PENTODE UNIT