

**RCA TUBE
HANDBOOK
HB-3**



**RECEIVING
TUBE
SECTION — Part 1**

This Section contains data for those tubes used primarily in broadcast and home-television receivers.

*For further Technical Information, write to
Commercial Engineering, Tube Division,
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In the Application Guide on the following pages, RCA receiving tubes are classified in two ways: (a) by function, and (b) by structure (diode, triode, etc.). The functional classification covers 42 principal types of application.

Tube types are grouped by structure under each classification; they are also keyed to indicate miniature, octal, nuvistor, duodecar, and novar types.

Triodes are designated as *low*, *medium*-, or *high-mu* types on the following basis: *low*, less than 10; *medium*, 10 or more, but less than 50; *high*, 50 or more. Where applicable, tubes are designated as *sharp*-, *semiremote*-, or *remote-cutoff* on the basis of the ratio, in per cent, of the negative control-grid voltage to the screen-grid voltage (or, for triodes, the plate voltage) for cut-off, as given in the characteristics or typical operation values. These terms are defined as follows: *sharp*, less than 10 per cent; *semiremote*-, 10 or more, but less than 20 per cent; *remote*-, 20 per cent or more.

APPLICATIONS

- | | |
|--|---|
| 1. Audio-Frequency Amplifiers | 22. Horizontal-Deflection Circuits |
| 2. Automatic Gain Control Circuits (AGC and AVC) | 23. Intermediate-Frequency Amplifiers |
| 3. Bandpass Amplifiers (Color TV) | 24. Keyed AGC Amplifiers |
| 4. Blankers | 25. Limiters |
| 5. Burst Amplifiers | 26. Mixers—RF |
| 6. Cathode-Drive RF Amplifiers (Grounded-Grid) | 27. Mixer-Oscillators—RF |
| 7. Chroma Amplifiers | 28. Multivibrators |
| 8. Color Killers | 29. Noise Inverters (Noise Immune Circuits) |
| 9. Color Matrixing Circuits | 30. Oscillators |
| 10. Complex-Wave Generators | 31. Phase Inverters |
| 11. Converters | 32. Phase Splitters |
| 12. Dampers | 33. Radio-Frequency Amplifiers |
| 13. Demodulators (Color TV) | 34. Reactance Circuits |
| 14. Detectors | 35. Rectifiers |
| 15. DC Restorers | 36. Regulators (High Voltage) |
| 16. Discriminators | 37. Sync Amplifiers |
| 17. Frequency Dividers | 38. Sync Clippers |
| 18. FM Detectors | 39. Sync Separators |
| 19. Gated Noise, AGC, and Sync Amplifiers | 40. Tuning Indicators |
| 20. Grounded-Grid RF Amplifiers | 41. Vertical-Deflection Circuits (Oscillator and Amplifier) |
| 21. Harmonic Generators | 42. Video Amplifiers |

I. AUDIO-FREQUENCY AMPLIFIERS

Voltage Amplifiers

Medium-Mu Triode with Twin Diode
• 6BF6

Medium-Mu Triode—Sharp-Cutoff Pentode
• 6LQ8 • 11LQ8 • 7199†

Medium-Mu Twin Triode
• 5J6 • 7AU7 ○ 12SN7GTA
• 6J6A • 9AU7 • 19J6
○ 6SN7GTB • 12AU7A/ECC82

Twin Diode—High-Mu Triode
• 3AV6 • 6BN8 • 12AV6
• 4AV6 • 6CN7 • 14GT8
• 6AT6 • 8BN8 • 18FY6A
• 6AV6 • 12AT6

High-Mu Twin Triode
• 6EU7† • 12AZ7A ○ 12SL7GT
○ 6SL7GT • 12BZ7 • 20EZ7
• 12AX7A/ECC83† • 7025†

Triple Diode—High-Mu Triode
• 5T8 • 6T8A

High-Mu Triode—Sharp-Cutoff Pentode
• 6KT8

Sharp-Cutoff Pentode
• 3DT6A* • 6DT6A* • 5879†
• 4DT6A* • 6GX6* • 7543†
• 5HZ6* • 6HZ6*

Power Amplifiers

Beam Power Tube
• 5AQ5 ○ 6L6 • 17CU5/
• 5CZ5 • 6L6GC† 17C5
○ 5V6GT ○ 6V6 • 25C5
• 6AQ5A ○ 6V6GTA • 25F5A
• 6AS5 ○ 6W6GT • 34GD5A
• 6CM6 ○ 6Y6GA/6Y6G • 35C5
• 6CU5 • 11DS5 ○ 35L6GT
• 6CZ5 • 12AB5 • 50B5
○ 6DG6GT • 12AQ5 • 50C5
• 6DS5 • 12CA5 ○ 50L6GT
§ 6GC5 • 12CU5/12C5 • 6973†
○ 6HG5 ○ 12V6GT • 7408†
○ 12W6GT

Beam Power Tube—Sharp-Cutoff Pentode
‡ 6AD10 ‡ 6AL11 ‡ 12BF11*
‡ 6BF11* ‡ 12AL11 ‡ 17BF11*

Pentode—Beam Power Tube
‡ 6Z10/6J10 ‡ 13Z10/13J10

Power Pentode
• 6BQ5/ ○ 6K6GT • 35EH5
EL84 • 8BQ5 • 50EH5
• 6EH5 • 10BQ5 • 60FX5
○ 6F6 • 12FX5 • 7189†
• 6GK6 • 25EH5 ▲ 7868†

2. AUTOMATIC GAIN CONTROL CIRCUITS (AGC & AVC)

Diode—Remote-Cutoff Pentode
• 6EQ7 • 12EQ7

Twin Diode—High-Mu Triode
• 3AV6 • 6AV6 • 12AV6
• 4AV6 • 12AT6 • 18FY6A
• 6AT6

Medium-Mu Triode—Sharp-Cutoff Pentode
• 5AN8 • 6BA8A • 6GH8A
• 5GH8A • 6BH8 • 8BA8A
• 6AN8A • 6CU8 • 8BH8
• 6AZ8

High-Mu Triode—Sharp-Cutoff Pentode
• 6AW8A • 6JV8 • 8JV8
• 6HF8 • 8AW8A • 10HF8

Sharp-Cutoff Twin Pentode
• 3BU8/ • 4HS8 • 6HS8
3GS8 • 6BU8

• Miniature ‡ Duodecar ○ Octal ▲ Novar * Dual-control grids † For high-fidelity equipment § Neonoval

3. BANDPASS AMPLIFIER (COLOR TV)

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6HL8 • 6MQ8
- 6GH8A

High-Mu Triode—Sharp-Cutoff Pentode

- 6AW8A • 6KV8 • 8AW8A
- 6KT8 • 6LF8 • 11KV8

4. BLANKERS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6GH8A • 6MQ8

Medium-Mu Twin Triode

- 6FQ7/6CG7 • 8FQ7/8CG7 • 12BH7A
- 6GU7 • 8GU7

Medium-Mu Triode—Semiremote-Cutoff Pentode

- 6LM8

High-Mu Triode—Sharp-Cutoff Pentode

- 6KT8

5. BURST AMPLIFIERS

Beam-Deflection Tube

- 6JH8

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5EA8 • 6EA8 • 19EA8
- 5GH8A • 6GH8A

Medium-Mu Triode—Semiremote-Cutoff Pentode

- 6LM8 • 6MU8

Twin Diode—High-Mu Triode

- 6BN8 • 8BN8

Sharp-Cutoff Pentode

- 3JC6A • 4JC6A • 6EW6
- 4EW6 • 5EW6 • 6JC6A

6. CATHODE-DRIVE RF AMPLIFIERS (GROUNDED-GRID)

Medium-Mu Triode

- 6BC4

Medium-Mu Twin Triode

- 4BC8 • 5BK7A • 6BQ7A/
6BZ7/
6BS8 • 6BQ7A 6BS8
- 4BS8 • 6BC8/6BZ8
- 4BZ7 • 6BK7B

High-Mu Triode

- △ 2CW4 • 4HQ5 △ 6DS4
- △ 2DS4 • 6AB4 • 6HQ5
- 2HQ5 △ 6CW4 △ 13CW4
- 3HQ5

High-Mu Twin Triode

- 6DT8 • 12AZ7A • 12DT8
- 12AT7/ECC81

7. CHROMA AMPLIFIERS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6GH8A

Medium-Mu Triple Triode

- △ 6MD8 △ 12MD8

Medium-Mu Twin Triode

- 6FQ7/6CG7 • 8FQ7/8CG7 • 12BH7A
- 6GU7 • 8GU7

8. COLOR KILLERS

Quadruple Diode

- 6JU8A • 8JU8A

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6GH8A • 6MQ8

High-Mu Triode—Sharp-Cutoff Pentode

- 6KT8

9. COLOR MATRIXING CIRCUITS

Medium-Mu Twin Triode

- 6FQ7/6CG7 • 8FQ7/8CG7 • 12BH7A
- 6GU7 • 8GU7

Medium-Mu Triode—Sharp Cutoff Pentode

- 5GH8A • 6GH8A

Medium-Mu Triple Triode

- △ 6MD8 ‡ 6MJ8 △ 12MD8

High-Mu Triple Triode

- ‡ 6MN8

Twin Pentode

- 6LE8 • 10LE8 • 15LE8

Quadruple Diode

- 6JU8A • 8JU8A

10. COMPLEX-WAVE GENERATORS

High-Mu Twin Double-Plate Triode

- 12FQ8

Diode—Sharp-Cutoff, Twin-Plate Tetrode

- 6FA7

Diode—Sharp-Cutoff, Three-Plate Tetrode

- 6KM8

Medium-Mu Triode—Three-Plate Tetrode

- 6FH8

11. CONVERTERS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 4KE8 • 5X8 • 6U8A/
- 5EA8 • 6EA8 6KD8
- 5GH8A • 6GH8A • 9KZ8
- 5KE8 • 6KE8 • 19EA8
- 5U8 • 6KZ8 • 19X8

High-Mu Twin Triode

- 6DT8 • 12AZ7A • 12DT8
- 12AT7/ECC81

Sharp-Cutoff Pentode

- 3AU6 • 6AU6A • 18GD6A
- 4AU6 • 12AU6

Pentagrid

- 6BA7 • 12BE6 • 18FX6A
- 6BE6

12. DAMPERS

Half-Wave (Diode)

- | | | |
|--------------|------------|-----------|
| ○ 6AU4GTA | ○ 6DM4A/ | △ 17BH3A |
| ○ 6AX4GTB | 6DA4 | • 17BR3/ |
| △ 6AY3B | △ 6DW4B | 17RK19 |
| △ 6BA3 | ○ 6W4GT | △ 17BS3A/ |
| ‡ 6BE3/6BZ3 | ○ 12AX4GTB | 17DW4A |
| △ 6BH3A | △ 12AY3A | ‡ 17BW3 |
| △ 6BS3A | ‡ 12BE3 | △ 17CK3 |
| ‡ 6CG3/6CE3/ | △ 12BS3A/ | • 17CT3 |
| 6CD3/6BW3 | 12DW4A | ○ 17D4 |
| △ 6CJ3/6CH3 | △ 12CL3 | ○ 17DE4 |
| △ 6CK3 | ○ 12D4 | ○ 17DM4A |
| △ 6CL3 | ○ 17AX4GTA | △ 22BH3A |
| △ 6CM3 | △ 17AY3A | ‡ 22BW3 |
| ○ 6DE4/ | ‡ 17BE3/ | ○ 22DE4 |
| 6CQ4 | 17BZ3 | ○ 25AX4GT |

13. DEMODULATORS (COLOR TV)

Medium-Mu Twin Triode

- 12BH7A

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6GH8A

High-Mu Twin Triode

- 12AZ7A

• Miniature ○ Octal △ Nuvistor ▲ Novar ‡ Duodecar

Sharp-Cutoff Pentode

- 5HZ6 • 6GY6 ‡ 12BV11
- ‡ 6BV11 • 6HZ6

Pentagrid Amplifier

- 3BY6 • 6BY6

Twin Pentode

- 6LE8 • 10LE8 • 15LE8

Beam Deflection Tube

- 6JH8 • 6ME8

Sharp-Cutoff Twin Pentode

- 6MK8

14. DETECTORS

Diode—Sharp-Cutoff Pentode

- 5AM8 • 6AM8A
- 5AS8 • 6AS8

Diode—Remote-Cutoff Pentode

- 6CR6 • 12CR6 • 12EQ7
- 6EQ7

Twin Diode

- 3AL5 • 6AL5 • 12AL5

Twin Diode—High-Mu Triode

- 3AV6 • 6BN8 • 12AV6
- 4AV6 • 6CN7 • 14GT8
- 6AT6 • 8BN8 • 18FY6A
- 6AV6 • 12AT6

Triple Diode

- 6BJ7

Triple Diode—High-Mu Triode

- 5T8 • 6T8A

Quadruple Diode

- 6JU8A • 8JU8A

Sharp-Cutoff Pentode

- 3DT6A* • 5HZ6* • 6GX6*
- 4DT6A* • 6DT6A* • 6HZ6*
- 5GX6*

15. DC RESTORERS

Diode—Sharp-Cutoff Pentode

- 5AM8 • 6AM8A • 6AS8
- 5AS8

Triple Diode

- 6BJ7

16. DISCRIMINATORS

FM

Twin Diode

- 3AL5 • 6AL5 • 12AL5

Twin Diode—High-Mu Triode

- 6BN8 • 14GT8

Triple Diode—High-Mu Triode

- 5T8 • 6T8A

Beam Tube

- 3BN6 • 4BN6 • 6BN6/6KS6

Beam Power Tube—Sharp-Cutoff Pentode

- ‡ 6AL11 ‡ 12AL11 ‡ 17BF11
- ‡ 6BF11 ‡ 12BF11

Pentode—Beam Power Tube

- ‡ 6Z10/6J10 ‡ 13Z10/13J10 ‡ 17AB10/17X10

FM Quadrature-Grid

Sharp-Cutoff Pentode

- 3DT6A* • 6DT6A* • 6GY6*
- 4DT6A* • 6GX6* • 6HZ6*
- 5HZ6*

Beam Tube

- 3BN6 • 4BN6 • 6BN6/6KS6

Horizontal AFC

Twin Diode—High-Mu Triode

- 6BN8 • 8BN8 • 8CN7
- 6CN7

Twin Diode—Sharp Cutoff Pentode

- 6LT8 • 8LT8 • 11LT8

17. FREQUENCY DIVIDERS

High-Mu Twin Double-Plate Triode

- 12FQ8

18. FM DETECTORS

(See 16. Discriminators)

19. GATED NOISE, AGC, AND SYNC AMPLIFIERS

High-Mu Triode—Sharp-Cutoff Pentode
 • 6KA8 • 8KA8 • 8LC8
 • 6LC8

Sharp-Cutoff Pentode
 • 6GY6*

Sharp-Cutoff Twin Pentode
 • 3BU8/ • 4HS8 • 6HS8
 3GS8 • 6BU8

Pentagrid Amplifier
 • 3BY6 • 4CS6 • 6CS6
 • 3CS6 • 6BY6

20. GROUNDED-GRID RF AMPLIFIERS

(See 6. Cathode-Drive RF Amplifiers)

21. HARMONIC GENERATORS

(See 10. Complex-Wave Generators)

22. HORIZONTAL-DEFLECTION CIRCUITS

Amplifiers

Beam Power Tube

○ 6AUSGT	▲ 6JT6A	▲ 17JG6A
○ 6AV5GA	▲ 6JU6	‡ 17JM6A
○ 6BQ6GTB/	▲ 6KM6	▲ 17JT6A
6CU6	▲ 6LQ6/	▲ 22JF6
○ 6CB5A	6JE6C	▲ 22JG6A
○ 6CD6GA	○ 12AV5GA	▲ 22JR6
○ 6DQ5	○ 12BQ6GTB/	▲ 22KM6
▲ 6GJ5A	12CU6	▲ 24LQ6/
▲ 6GT5A	▲ 12JB6A	24JE6C
○ 6GW6/	▲ 12JT6A	○ 25AV5GA
6DQ6B	○ 17BQ6GTB	○ 25BQ6GTB/
▲ 6JB6A	▲ 17GJ5A	25CU6
▲ 6JF6	▲ 17GT5A	○ 25CD6GB
▲ 6JG6A	○ 17GW6/	○ 25DN6
‡ 6JM6A	17DQ6B	‡ 31JS6C
▲ 6JR6	▲ 17JB6A	▲ 31LQ6
‡ 6JS6C		

Oscillators

Medium-Mu Triode—Sharp-Cutoff Pentode
 • 5GH8A • 6GH8A

Medium-Mu Twin Triode

• 6FQ7/6CG7 • 8FQ7/8CG7 • 12BH7A
 ○ 6SN7GTB • 9AU7 ○ 12SN7GTA
 • 7AU7 • 12AU7A/ECC82

23. INTERMEDIATE-FREQUENCY AMPLIFIERS

Medium-Mu Triode—Sharp-Cutoff Tetrode
 • 5CQ8 • 6CQ8

Medium-Mu Triode—Sharp-Cutoff Pentode
 • 5AN8 • 6AZ8 • 6GH8A
 • 5GH8A • 6BH8 • 11LQ8
 • 6AN8A • 6CU8

High-Mu Triode—Sharp-Cutoff Pentode
 • 6AW8A • 6KV8 • 10GN8
 • 6GN8 • 8AW8A • 10HF8
 • 6HF8 • 8GN8/ • 10JA8/
 • 6JV8 • 8EB8 • 10LZ8
 • 6KT8 • 8JV8 • 11KV8

Sharp-Cutoff Pentode

• 3AU6	• 4JD6•	• 6DK6
• 3BC5/3CES	• 5EW6	• 6EJ7/
• 3CB6/3CF6	• 6AG5	EF184
• 3DK6	• 6AK5/	• 6EW6
• 3JC6A	EF95	• 6HS6
• 4AU6	• 6AU6A	• 6JC6A
• 4CB6	• 6BC5/6CES	• 6JD6•
• 4DE6	• 6CB6A/	• 12AU6
• 4DK6	6CF6	• 12AW6
• 4EW6	• 6DC6	• 12DK6
• 4JC6A	• 6DE6	• 18GD6A

• Miniature ○ Octal * Dual-control grids ‡ Duodecar ▲ Nuvistor ▲ Novar

Diode—Sharp-Cutoff Pentode

- 5AM8 • 6AM8A • 6AS8
- 5AS8

Semiremote-Cutoff Pentode

- 3BZ6 • 4KT6 • 6HR6
- 3KT6 • 5GM6 • 6JH6
- 4BZ6 • 6BZ6 • 6KT6
- 4EH7/LF183 • 6EH7/EF183 • 12BZ6
- 4GM6 • 6GM6 • 19HR6
- 4JH6

Remote-Cutoff Pentode

- 6BA6/EF93 • 12BA6 • 18FW6A

Remote-Cutoff Pentode with Diode

- 6EQ7 • 12EQ7

24. KEYED AGC AMPLIFIERS

(See 19. Gated Noise, AGC, and Sync Amplifiers)

25. LIMITERS

Beam Tube

- 3BN6 • 4BN6 • 6BN6/6KS6

Sharp-Cutoff Pentode

- 3AU6 • 6GX6 • 6HZ6
- 4AU6 • 6HS6 • 12AU6
- 6AU6A

Power Pentode—Beam Power Tube

- ‡ 6Z10/6J10 ‡ 13Z10/13J10 ‡ 17AB10/17X10

26. MIXERS—RF

Medium-Mu Twin Triode

- 5J6 • 6J6A

High-Mu Triode

- △ 2CW4 △ 6CW4 △ 13CW4
- 6AB4

27. MIXER-OSCILLATORS—RF

Medium-Mu Triode—Sharp-Cutoff Tetrode

- 5CL8A • 6CL8A • 19JN8/19CL8A
- 5CQ8 • 6CQ8

Medium-Mu Triode—Sharp-Cutoff Pentode

- 4KE8 • 5U8 • 6KE8
- 5AT8 • 5X8 • 6KZ8
- 5B8 • 6AT8A • 6U8A/6KD8
- 5BR8/5FV8 • 6BR8A/6FV8A • 6X8A
- 5CG8 • 6CQ8A • 9KZ8
- 5EA8 • 6EA8 • 9U8A
- 5FG7 • 6FG7 • 19EA8
- 5KE8 • 6HB7 • 19X8

High-Mu Twin Triode

- 6DT8 • 12AT7/ECC81 • 12DT8

28. MULTIVIBRATORS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6GH8A

Medium-Mu Twin Triode

- 6FQ7/6CG7 • 8FQ7/8CG7 • 12BH7A
- 6GU7 • 8GU7 • 12SN7-GTA
- 6SN7GTB • 9AU7 • 12AU7A/ECC82
- 7AU7

High-Mu Twin Triode

- 12AX7A/ECC83

29. NOISE INVERTERS (NOISE IMMUNE CIRCUITS)

High-Mu Triode—Sharp-Cutoff Pentode

- 6KA8 • 8KA8 • 8LC8
- 6LC8

Sharp-Cutoff Pentode

- 6GY6*

Quadruple Diode

- 6JU8A • 8JU8A

30. OSCILLATORS

Radio Frequency—UHF

Medium-Mu Triode

- 2AF4B/2DZ4 • 3AF4A/3DZ4 • 6DV4/6DZ4
- 2DV4 • 6AF4A

* Miniature ○ Octal * Dual-control grids △ Nuvistor ‡ Duodecap

* Approaches semiremote-cutoff characteristics; used in first-IF amplifier applications

Radio Frequency—VHF

Medium-Mu Twin Triode

- 5J6 • 6J6A

High-Mu Triode

- 6AB4

Power Triode

- 6C4 (Class C)

3.58-MHz (Color TV)

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5GH8A • 6GH8A

High-Mu Triode—Sharp-Cutoff Pentode

- 6KT8

Low Frequency, Sweep Type

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5AN8 • 6BA8A • 8AU8
- 6AN8A • 6BH8 • 8BA8A
- 6AU8A • 6CH8 • 8BH8
- 6AZ8

Twin Diode—High-Mu Triode

- 6BN8 • 8BN8 • 8CN7
- 6CN7

High-Mu Twin Triode

- 12AX7A/ECC83

31. PHASE INVERTERS

Medium-Mu Twin Triode

- 6FQ7/6CG7 • 8GU7 • 12BH7A
- 6GU7 • 8FQ7/8CG7 ◊ 12SN7-
- ◊ 6SN7GTB • 9AU7 GTA
- 7AU7 • 12AU7A/ECC82

High-Mu Triode—Sharp-Cutoff Pentode

- 6AW8A • 8AW8A • 10GN8
- 6EB8 • 8GN8/ • 10HF8
- 6GN8 8EB8 • 10JA8/
- 6HF8 10LZ8

High-Mu Twin Triode

- ◊ 6SL7GT ◊ 12SL7GT • 7025
- 12AX7A/ECC83

Medium-Mu Triple Triode

- ‡ 6AV11

32. PHASE SPLITTERS

Medium-Mu Triode—Sharp-Cutoff Tetrode

- 5CQ8 • 6CQ8

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5AN8 • 6BA8A • 8BA8A
- 6AN8A • 6CU8 • 7199
- 6AZ8

High-Mu Triode—Sharp-Cutoff Pentode

- 6AW8A • 8AW8A

**33. RADIO-FREQUENCY
AMPLIFIERS**

Medium-Mu Triode

- 2BN4A • 6BC4 • 6BN4A
- 3BN4A

Medium-Mu Triode—Sharp-Cutoff Tetrode

- 5CQ8 • 6CQ8

Medium-Mu Twin Triode

- 4BC8 • 5BQ7A • 6BQ7A /
- 4BQ7A • 5J6 • 6B77 /
- 4BS8 • 6BC8/6BZ8 • 6BS8
- 5BK7A • 6BK7B • 6J6A

High-Mu Triode

- △ 2CW4 • 3ER5 △ 6DS4
- △ 2DS4 • 3FH5 • 6ER5
- △ 2EG4 • 3GK5 • 6FH5
- 2ER5 • 3HM5/3HA5 • 6GK5 /
- 2FH5 • 4GK5 • 6Q5A
- 2GK5 / • 6AB4 • 6HM5/6HA5
- 2FQ5A △ 6CW4 △ 13CW4

• Miniature ◊ Octal △ Nuistor

* Dual-control grids † Duodecar

High-Mu Twin Triode

- 6DT8 • 12AZ7A • 12DT8

Power Triode

- 6C4 (Class C)

Sharp-Cutoff Tetrode

- 2CY5 • 6CY5 • 6FV6
- 3CY5

Sharp-Cutoff Pentode

- 3AU6 • 4DE6 • 6CB6A/6CF6
- 3BC5/3CE5 • 6AG5 • 6DC6
- 3CB6/ • 6AK5/EF95 • 6DE6
- 3CF6 • 6AU6A • 12AU6
- 4AU6 • 6BC5/6CE5 • 12AW6
- 4CB6 • 6BH6 • 18GD6A

Remote-Cutoff Pentode

- 6BA6/EF93 • 12BA6 • 18FW6A
- 6BJ6

Remote-Cutoff Pentode with Diode

- 6EQ7 • 12EQ7

34. REACTANCE CIRCUITS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5AN8 • 6AZ8 • 6CU8
- 6AN8A • 6BA8A • 8BA8A

Twin Diodes—High-Mu Triode

- 6CN7 • 8CN7

High-Mu Triode—Sharp-Cutoff Pentode

- 6AW8A • 8AW8A

35. RECTIFIERS

Power-Supply Types—Vacuum

Half-Wave (Diode)

- 35W4 • 36AM3B • 50DC4
- 35Z5GT

Full-Wave (Twin Diode)

- 3DG4 • 5V3A • 6CA4
- 5AS4A • 5AU4 • 6X4
- 5BC3A • 5V4GA • 6X5GT
- 5DJ4 • 5Y3GT • 12X4
- 5U4GB

*High-Voltage Types (For rf-rectifier or pulsed low-current applications)—
Vacuum*

Half-Wave (Diode)

- 1BC2 • 2BJ2 • 3CN3A
- 1G3GT/ • 2CN3A • 3CU3A
- 1B3GT • 3A3B • 3CX3
- 1K3/1J3 † 3BW2/ • 3CZ3
- 1V2 3BS2A/ • 3DB3/
- 1X2B/1X2A 3BT2 3CY3
- 2AV2 • 3CA3

36. REGULATORS (HIGH VOLTAGE)

Beam Triode

- 6BK4C/6EL4A • 6LJ6A/6LH6A

Beam Power Tube

- 17KV6A • 22KV6A

37. SYNC AMPLIFIERS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 6AU8A • 6CX8 • 8CX8
- 6AZ8 • 8AU8

Medium-Mu Twin Triode

- 6FQ7/6CG7 • 8FQ7/8CG7
- 7AU7 • 9AU7
- 12AU7A/ECC82

High-Mu Triode with Twin Diode

- 6CN7 • 8CN7

High-Mu Triode—Sharp-Cutoff Pentode

- 6AW8A • 6JVB • 8JVB
- 6HF8 • 8AW8A • 10HF8

High-Mu Twin Triode

- 12BZ7

- Miniature • Octal • Novar † Duodecar

38. SYNC CLIPPERS

Medium-Mu Triode—Sharp-Cutoff Tetrode
 • 5CQ8 • 6CQ8

Medium-Mu Triode—Sharp-Cutoff Pentode
 • 5AN8 • 6AZ8 • 8AU8
 • 6AN8A • 6CU8 • 8CX8
 • 6AU8A • 6CX8

High-Mu Triode—Sharp-Cutoff Pentode
 • 6AW8A • 6HF8 • 8JV8
 • 6EB8 • 6JV8 • 10GN8
 • 6GN8 • 8AW8A • 10HF8
 • 6GW8/ • 8GN8/ • 10JA8/
 ECL86 8EB8 10LZ8

High-Mu Twin Triode
 • 12BZ7

Sharp-Cutoff Twin Pentode
 • 3BU8/ • 4HS8 • 6HS8
 3GS8 • 6BU8

Pentagrid Amplifier
 • 3BY6 • 4CS6 • 6CS6
 • 3CS6 • 6BY6

39. SYNC SEPARATORS

Medium-Mu Triode—Sharp-Cutoff Tetrode
 • 5CQ8 • 6CQ8

Medium-Mu Triode—Sharp-Cutoff Pentode
 • 5AN8 • 6CU8 • 6MQ8
 • 5GH8A • 6CX8 • 8AU8
 • 6AN8A • 6GH8A • 8CX8
 • 6AU8A • 6HL8 • 11LQ8
 • 6AZ8 • 6LQ8

Medium-Mu Twin Triode
 • 6FQ7/6CG7 • 8FQ7/8CG7 • 12AU7A/
 7AU7 • 9AU7 ECC82

Twin Diode—High-Mu Triode
 • 6CN7 • 8CN7

High-Mu Triode—Sharp-Cutoff Pentode
 • 6AW8A • 6KV8 • 8LC8
 • 6EB8 • 6LC8 • 10GN8
 • 6GN8 • 8AW8A • 10HF8
 • 6HF8 • 8GN8/ • 10JA8/
 • 6JV8 8EB8 10LZ8
 • 6KA8 • 8JV8 • 11KV8
 • 6KT8 • 8KA8

High-Mu Twin Triode
 • 12BZ7

Sharp-Cutoff Twin Pentode

• 3BU8/ • 4HS8 • 6HS8
 3GS8 • 6BU8 • 6MK8

Pentagrid Amplifier

• 3BY6 • 4CS6 • 6CS6
 • 3CS6 • 6BY6

40. TUNING INDICATORS

Indicator with Triode Unit

6E5

Twin Indicator Units

○ 6AF6G

41. VERTICAL-DEFLECTION CIRCUITS

Oscillators and Amplifiers(Combined)

Medium-Mu Triode—Low-Mu Triode

• 6DE7 • 10DE7 • 13DE7
 § 6EW7 § 10EW7

Medium-Mu Dual Triode

• 6CM7 • 8CM7 • 8CS7
 • 6CS7

Medium-Mu Twin Triode

• 6FQ7/6CG7 • 8FQ7/8CG7

• Miniature ○ Octal § Neonoval

High-Mu Triode—Low-Mu Triode

- 6CY7 ○ 6GL7 • 13DR7
- 6DR7 • 10DR7 ○ 13EM7/
- 6EM7/6EA7 ○ 10EM7 15EA7
- ▲ 6FD7 ▲ 10GF7A ▲ 13FD7
- ▲ 6GF7A • 11CY7 ▲ 13GF7A

High-Mu Triode—Beam Power Tube

- ▲ 6KY8A ▲ 15KY8A

Dual Triode

- 6EM7/6EA7 ▲ 6GF7A ○ 13EM7/
- 15EA7

Amplifiers

Low-Mu Triode

- 12B4A

Medium-Mu Triode

- 6S4A

Beam Power Tube

- 5AQ5 • 6EM5 • 12AQ5
- 5CZ5 • 6HR5 • 12JQ6#
- 5V6GT • 6JQ6# ○ 12V6GT
- 6AQ5A ○ 6V6 • 17JQ6#
- 6CM6 ○ 6V6GTA
- 6CZ5 • 8EM5

Power Pentode

- 6K6GT

42. VIDEO AMPLIFIERS

Medium-Mu Triode—Sharp-Cutoff Pentode

- 5AN8 • 6BH8 • 6MQ8
- 5GH8A • 6CUB • 8AU8
- 6AN8A • 6CX8 • 8BA8A
- 6AUR8 • 6GH8A • 8BH8
- 6AZ8 • 6HL8 • 8CX8
- 6BAR8 • 6LQ8 • 11LQ8

High-Mu Triode—Sharp-Cutoff Pentode

- 6AW8A • 6KV8 • 8JV8
- 6EB8 • 6LF8 • 10GN8
- 6GN8 • 8AW8A • 10HF8
- 6HF8 • 8GN8/ • 10JA8
- 6JV8 8EB8 • 11KV8
- 6KT8

Sharp-Cutoff Pentode

- 3JC6A • 7KY6 • 12BY7A /
- 4JC6A • 11HM7 12BV7/
- 6JC6A § 12HG7 12DQ7

Sharp-Cutoff Pentode

- 5AM8 • 6AM8A • 12HL7
- 5AS8 • 6AS8

Power Pentode

- 6AG7 • 6CL6 • 6GK6

• Miniature ○ Octal ▲ Novar § Neonoval # With an integral diode



RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS						
			E _f	I _f		P _b	e _{bm}	I _{bm}	I _b	I _{b(av)}	P _o	μ	g _m		Cutoff		
	V	A	W	V									mA	mA	mA	W	g _{1-p} μmho	g_{3-p} μmho	E_{c1} V	E_{c3} V
• 1AY2 b	K8	2-terminal base	1.25F	0.2	D	—	26000	50	—	0.5	—	—	—	—	—	—	—
■ 1AY2A b	K8	2-terminal base	1.25F 1.45•	0.2	D	—	26000•	50	—	0.5	X-Radiation,	Maximum = 0.5 mR/hr.♠		—	—	—	—
• 1BC2 b	B15	9RG	1.25F	0.2	D	—	18000	45	—	0.5	—	—	—	—	—	—	—
■ 1BC2A b	B15	9RG	1.25F 1.45F•	0.2	D	—	18000•	45	—	0.5	X-Radiation,	Maximum = 0.5 mR/hr.♠		—	—	—	—
• 1BH2 b	B17	9RG**	1.25F	0.2	D	—	18000•	45	—	0.5	—	—	—	—	—	—	—
■ 1BY2A b	L14	12HZ	1.25F 1.45F•	0.2	D	—	26000•	50	—	0.5	X-Radiation,	Maximum = 0.5 mR/hr.♠		—	—	—	—
■ 1DG3 b	F50	8ND	1.25F 1.45F•	0.2	D	—	26000•	50	—	0.5	X-Radiation,	Maximum = 0.5 mR/hr.♠		—	—	—	—
■ 1G3GTA b	F45	3C	1.25F 1.45F•	0.2	D	—	26000•	50	—	0.5	X-Radiation,	Maximum = 0.5 mR/hr.♠		—	—	—	—
■ 1G3GTA/ 1B3GT b	F45	3C	1.25F 1.45F•	0.2	D	—	26000•	50	—	0.5	X-Radiation,	Maximum = 0.5 mR/hr.♠		—	—	—	—

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA RECEIVING TUBE TYPES - Supplementary Listing

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS				
			E_f	I_f		P_b	e_{bm}	i_{om}	I_b	$I_b(av)$	P_o	μ	g_m		Cutoff
	V	A	W	V									mA	mA	mA	W	$g_{1-p}$ $\mu mho$	$g_{3-p}$ $\mu mho$	$E_{c1}$ V	$E_{c3}$ V
1K3A ^b	F45	3C	1.25F 1.45F [•]	0.2	D	-	26000 [•]	50	-	0.5	X-Radiation, Maximum = 0.5 mR/hr. [♠]				
1K3A/ 1J3 ^b	F45	3C	1.25F 1.45 [•]	0.2	D	-	26000 [•]	50	-	0.5	X-Radiation, Maximum = 0.5 mR/hr. [♠]				
1S2A/ DY87 ^b	B16	9DT	1.4 1.5 [•]	0.55	D	-	27000 [•]	40	-	0.8	-	-	-	-	-
1X2C ^b	B8	9Y	1.25F 1.45F [•]	0.2	D	-	22000 [•]	45	-	0.5	X-Radiation, Maximum = 0.5 mR/hr. [♠]				
2AF4B/ 2DZ4 ^d	A1	7DK	2.35 [▲]	0.6	T	25	-	-	-	-24	-	13.5	6500	-	-
2AS2A ^b	L6	12EW	2.5 2.9 [•]	0.33	D	-	30000 [•]	90	-	1.7	X-Radiation, Maximum = 25 mR/hr. [♠]				
2BN4A ^d	A2	7EG	2.35 [▲]	0.6	T	2.2	-	-	-22	-	-	43	7700	-	-6
2BU2/ 2AH2 ^b	L6	12JB	2.5 2.9 [•]	0.33	D	-	30000 [•]	80	-	1.5	X-Radiation, Maximum = 0.5 mR/hr. [♠]				

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 2 10-71

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS					
			E _f	I _f		P _b	e _{bm}	i _{bm}	I _b	I _{b(av)}	P _o	μ	g _m		Cutoff	
	V	A	W	V									mA	mA	mA	W	g_{1-p} μmho	g_{3-p} μmho	E_{c1} V	E_{c3} V
2EG4 e	D1	12AQ	1.7 [▲]	0.6	T	1.5	—	—	—	-15	—	68	12500	—	-6.8	—
2HQ5 e	A2	7GM	2.4 [▲]	0.6	T	2.5	—	—	-22	—	—	78	15000	—	—	—
■ 3A3B b	F49	8EZ	3.15 3.65 [●]	0.22	D	—	30000 [●]	100	—	2.0	X-Radiation, Maximum = 25 mR/hr. [▲]					
■ 3A3C b	F46	8EZ	3.15 3.65 [●]	0.22	D	—	38000 [●]	100	—	2.0	X-Radiation, Maximum = 25 mR/hr. [▲]					
■ 3AT2B b	L20	12FV	3.15 3.65 [●]	0.22	D	—	38000 [●]	88	—	1.7	X-Radiation, Maximum = 25 mR/hr. [▲]					
■ 3AW2A b	L6	12HA	3.15 3.65 [●]	0.35	D	—	38000 [●]	110	—	2.2	X-Radiation, Maximum = 25 mR/hr. [▲]					
3BC5/ 3CE5 k	A2	7BD	3.15 [▲]	0.6	P	2	—	—	—	—	—	—	6100	—	-6	—
■ 3BN2A b	L6	12FV	3.15 3.47 [●]	0.3	D	—	30000 [●]	88	—	1.7	X-Radiation, Maximum = 25 mR/hr. [▲]					

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA RECEIVING TUBE TYPES-
Supplementary Listing

RCA RECEIVING TUBE TYPES - Supplementary Listing

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS				
			E _f	I _f		P _b	e _{bm}	i _{bm}	I _b	I _{b(av)}	P _o	μ	g _m		Cutoff
	DIM.	T.D.	V	A		W	V	mA	mA	mA	W		g _{1-p} μmho	g _{3-p} μmho	E _{c1} V
▪ 3BW2/ 3BS2A/ 3BT2 b	L6	12HY	3.15 3.65 [•]	0.48	D	—	38000 [•]	110	—	2.2	X-Radiation, Maximum = 25 mR/hr. [▲]				
3BY6 u	A2	7CH [◆]	3.15 [▲]	0.6	—	2.3	—	—	—	—	—	1900	500	-12	-15
3BZ6 j	A2	7CM	3.15 [▲]	0.6	P	2.3	—	—	—	—	—	8000	—	-19	—
□ *3CA3 b	F21	8MH	3.6	0.225	D	—	30000	100	—	2.0	—	—	—	—	—
▪ 3CN3B b	F47	8MU	3.15 3.65 [•]	0.48	D	—	38000 [•]	110	—	2.2	X-Radiation, Maximum = 25 mR/hr. [▲]				
3CB6															
3CF6 k	A2	7CM	3.15 [▲]	0.6	P	2.3	—	—	—	—	—	8000	—	-6.5	—
□ *3CX3 b	F16	8MT	3.15 [▲]	0.48	D	—	38000 [•]	110	—	2.2	—	—	—	—	—
▪ 3DB3/ 3CY3 b	F48	8MX	3.15 3.65 [•]	0.245	D	—	38000 [•]	100	—	2.0	X-Radiation, Maximum = 25 mR/hr. [▲]				
▪ 3DC3 b	F49	8MZ	3.15 3.65 [•]	0.28	D	—	38000 [•]	110	—	2.2	X-Radiation, Maximum = 25 mR/hr. [▲]				
3HQ5 e	A2	7GM	3.0 [▲]	0.45	T	2.5	—	—	-22	—	78	15000	—	-2	—

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 2

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 3 10-71

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS					
			E_f	I_f		P_b	e_{bm}	i_{bm}	I_b	$I_{b(av)}$	P_o	μ	g_m		Cutoff	
	DIM.	T.D.	V	A		W	V	mA	mA	mA	W		g_{1-p} μmho	g_{3-p} μmho	E_{c1} V	E_{c3} V
4GJ7/ XCF801 ^t	B14	9QA	4.1	0.6	T	1.8	-	-	-	-	-	20	9000	-	-1.3 max.	-
					P	2.4	-	-	-	-	-	55 approx.	11000	-	-1.3 max.	-
4GK5 e	A2	7FP	4 [▲]	0.3	T	2.5	-	-	-	-22	-	78	15000	-	-4.2	-
4HQ5 e	A2	7GM	4.2 [▲]	0.3	T	2.5	-	-	2.2	-	-	78	15000	-	-4.2	-
4JH6 j	A2	7CM	4.2 [▲]	0.45	P	2.3	-	-	-	-	-	-	8000	-	-19	-
6AD10 r	L3	12EZ	6.3	1.05	P	1.7	-	-	-	-	-	-	3400	600	-4.5	-7
					B	10	-	-	-	-	4.2	-	6500	-	-	-
6AV11 g	L1	12BY	6.3 [▲]	0.6	T ₁	2.75	-	-	-	-20	-	17	2200	-	-24	-
					T ₂	2.75	-	-	-	-20	-	17	2200	-	-24	-
					T ₃	2.75	-	-	-	-20	-	17	2200	-	-24	-

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA RECEIVING TUBE TYPES-
Supplementary Listing

RCA RECEIVING TUBE TYPES- Supplementary Listing

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS					
			E_f	I_f		P_b	e_{bm}	I_{bm}	I_b	$I_{b(av)}$	P_o	μ	g _m		Cutoff	
	DIM.	T.D.	V	A		W	V	mA	mA	mA	W		g_{1-p} μmho	g_{3-p} μmho	E_{c1} V	E_{c3} V
▪ 6BK4C/ 6EL4A ^c	F35	8GC	6.3 6.9 [•]	0.2	T	40 [•]	DC Plate Voltage, 27000 V [•] X-Radiation, Maximum = 0.5 mR/hr. [•]									
6BV11 ^m	L3	12HB	6.3	0.9	P	1.7	-	-	-	-	-	3700	400	3	-	-5.5
6DM4A/ 6DA4 ^a	F16	4CG	6.3	1.2	D	6.5	5000	1100	175	-	-	-	-	-	-	-
▪ 6EH4A ^c	L21	12FA	6.3	0.2	T	40 [•]	DC Plate Voltage, 27000 V [•] X-Radiation, Maximum = 0.5 mR/hr. [•]									
▪ 6EJ4A ^c	L21	12HC	6.3	0.2	T	40 [•]	DC Plate Voltage, 27000 V [•] X-Radiation, Maximum = 0.5 mR/hr. [•]									
▪ 6EL4A ^c	F34	8MW	6.3	0.2	T	40 [•]	DC Plate Voltage, 27000 V [•] X-Radiation, Maximum = 0.5 mR/hr. [•]									
6HQ5 ^e	A2	7GM		0.2	T	2.5	-	-	22	-	-	78	15000	-	-	-
6HR5 ^h	A3	7BZ	6.3 [▲]	0.45	B	8	1300	125	-	-35	-	-	3600	-	-43	-

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 3

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 4 10-71

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS					
			E _f	I _f		P _b	e _{bm}	i _{bm}	I _b	I _{b(av)}	P _o	μ	gm		Cutoff	
	V	A	W	V									mA	mA	mA	W	91 - p μmho	93 - p μmho	E_{c1} V	E_{c3} V
6JM6A s	L9	12FJ	6.3	1.2	B	17.5	6500 -1500	-550	—	-175	—	4.4	7300	—	-42	—
6JS6C s	L10	12FY	6.3	2.25	B	30	7500 -1200	-1200	—	-350	—	3	11500	—	-54	—
•6LH6A c	F35	8ML	6.3 6.9●	0.2	T	40	DC Plate Voltage, 27000 V.●		X-Radiation, Maximum=0.5mR/hr.♠							
•6LJ6A/ 6LH6A c	F35	8MQ	6.3 6.9●	0.2	T	40	DC Plate Voltage, 27000 V.●		X-Radiation, Maximum=0.5mR/hr.♠							
6LT8 n	B2	9RL	6.3▲	0.6	D	—	—	20	5	—	—	—	—	—	—	—
					D	—	—	20	5	—	—	—	—	—	—	—
					P	3.1	—	—	—	—	—	—	13000	—	-3.5	—
6MK8 m	B4	9FG	6.3	0.3	P	1.1	—	—	-12	—	—	—	1100	450	-2.3	-3.5
8LT8 n	B2	9RL	8.1▲	0.45	D	—	—	20	5	—	—	—	—	—	—	—
					D	—	—	20	5	—	—	—	—	—	—	—
					P	3.1	—	—	—	—	—	—	13000	—	-3.5	—

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA RECEIVING TUBE TYPES-
Supplementary Listing

RCA RECEIVING TUBE TYPES- Supplementary Listing

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS						
			E _f	I _f		P _b	e _{bm}	I _{bm}	I _b	I _{b(av)}	P _o	μ	g _m		Cutoff		
	V	A	W	V									mA	mA	mA	W	g _{1-p} μmho	g_{3-p} μmho	E_{c1} V	E_{c3} V
9KZ8	B2	9FZ	9.45 [▲]	0.3	T P	2.5 2.5	-	-	-	-	-	46	8500 7500	-	.8 .8	-	-
10BQ5	B10	9CV	10.6 [▲]	0.45	P	12	-	-	65	-	5.7	-	11300	-	-	-	-
10EW7	H1	9HF	9.7 [▲]	0.6	T ₁ T ₂	1.5 1.0	-	77 175	0 0	22 50	-	17.5 6	2000 7500	-	.20 .40	-	-
11LT8	B2	9RL	11.4	0.315	D D P	3.1	-	20 20	5 5	-	-	-	- 13000	-	-	-	-
12BV11	L3	12HB	12.6 [▲]	0.45	P	1.7	-	-	-	-	-	67	3700	400	3	5.5	-
12DK6	A2	7CM	12.6	0.15	P	2.3	-	-	-	-	-	-	9800	-	6.5	-	-
12HL7	B18	9BF	12.6	0.3	P	1.0	-	-	-	-	-	-	21000	-	7.2	-	-
12MD8	C18	9RQ	12.6 [▲]	0.45	T ₁ T ₂ T ₃	3 3 3	-	-	-	-	-	17 17 17	3100 3100 3100	-	23 23 23	-	-

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 4

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS					
			E _f	I _f		P _b	e _{bm}	I _{bm}	I _b	I _{b(av)}	P _o	μ	g _m		Cutoff	
	V	A	W	V		mA	mA	mA	W		g _{1-p} μmho	g _{3-p} μmho	E _{c1} V	E _{c3} V		
12T10 r	L3	12EZ	12.6 [▲]	0.45	P	1.7	-	-	-	-	-	-	1000	400	-4.5	-4.5
					B	10	-	-	-	-	4.2	-	6500	-	-	-
15LE8 m	B10	9QZ	15 [▲]	0.3	P	2	-	-	-	-	-	-	5800	350	-7.2	-17.4
16LU8A h	L7	12DZ	16 [▲]	0.6	T	2.5	400	-105	-	-30	-	58	3600	-	-6.6	-
					B	14	250	-260	-	-75	-	-	9300	-	-30	-
17AB10/ 17AX10 ^r	L2	12BT	16.8 [▲]	0.45	P	-	-	-	-	-13	-	-	360	700	4	4
					B	6.5	-	-	65	-	2.4	-	8600	-	-	-
17BR3/ 17RK19 ^a	B20	9CB	16.8 [▲]	0.45	D	6.5	5500	1200	200	-	-	-	-	-	-	-
17BW3 ^a	L4	12FX	16.8 [▲]	0.6	D	6.5	5000	1100	175	-	-	-	-	-	-	-
17JM6A ^s	L9	12FJ	16.8 [▲]	0.45	B	17.5	6500	-550	-	-175	-	4.4	7300	-	-42	-
							1500									
18AJ10 r	L3	12EZ	18 [▲]	0.315	P	1.7	-	-	-	-60	-	-	2400	750	4	-3.5
					B	6	-	-	-	-	1.45	-	5600	-	-	-

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA RECEIVING TUBE TYPES- Supplementary Listing

RCA TYPE	DIMENSIONS AND TERMINAL DIAGRAM		HEATER		U N I T	MAXIMUM RATINGS					CHARACTERISTICS					
			E_f	I_f		P_b	e_{bm}	i_{bm}	I_b	$I_b(av)$	P_o	μ	g_m		Cutoff	
	V	A	W	V									mA	mA	mA	W	$g_{1-p}$ $\mu\text{mho}$	$g_{3-p}$ $\mu\text{mho}$	$E_{c1}$ V	$E_{c3}$ V
19JN8/ 19CL8A ^t	B2	9FA	18.9	0.15	T P	2.5 2.5	- -	- -	- -	- -	- -	46 -	8500 7500	- -	-8 -8	- -
20AQ3/ LY88	a B12	9CB	20.2	0.45	D	5.0	7500	550	220	-	-	-	-	-	-	-
22BW3	a L4	12FX	22.4 [▲]	0.45	D	6.5	5000	1100	175	-	-	-	-	-	-	-
24BF11	r L3	12EZ	24.2 [▲]	0.315	P B	1.7 6.5	- -	- -	- -	- -	- 2.4	- -	1000 8600	400	-4.5	-4.5
25JZ8	h L2	12DZ	25.2 [▲]	0.3	T P	1 7	- 2000	-70 -245	- -	-20 -70	- -	20 -	2350 7100	-	-11	-25
26LX6	s L21	12JA	26 [▲]	0.6	B	33 [●]	7000	-1400	400	-	-	4	14000	-	-	-
30KD6	s L21	12GW	30 [▲]	0.6	B	33 [●]	7000	-1400	400	-	-	4	14000	-	-	-
31LR8	h C21	9QT	31.5 [▲]	0.3	T P	2.5 14	- 2500	-105 -260	- -	-30 -75	2.5 -	58 6.5	4100 9200	-	-6.6	-28

NOTE: For key to symbols, footnotes & abbreviations see end of this section.

RCA

Electronic
Components

RCA RECEIVING TUBE
DATA 5

SYMBOL	DEFINITION
e_{bm}	Peak-Pulse Plate Voltage (Beam Tubes) Peak Inverse Plate Voltage (Diodes)
E_{c1}	DC Grid No. 1 Cutoff Voltage
E_{c3}	DC Grid No. 3 Cutoff Voltage
E_f	DC or RMS AC Heater or Filament Voltage (Bogey Value)
g_m	Transconductance (Mutual Conductance)
I_b	DC Plate Current (Positive Values) DC Cathode Current (Negative Values)

SYMBOL	DEFINITION
$I_{b(av)}$	Average Plate (+) or Cathode (-) Current
i_{bm}	Peak Plate (+) or Cathode (-) Current
I_f	DC or RMS AC Heater or Filament Current (Bogey Value)
P_b	Plate Dissipation
P_o	Maximum-Signal Power Output
μ	Amplification Factor (Mu)

ABBREVIATIONS

A Ampere	B Beam Unit	D Diode Unit	F Filament	g_1 Grid No. 1	g_3 Grid No. 3
mA Milliampere	mR/hr Milliroentgens per hour	P Pentode Unit	p Plate	T Triode Unit	V Volt
W Watt	μ mho Micromho				

For Key to Tube Dimensions and Terminal Diagrams, see following pages.

KEY TO TUBE DIMENSIONS

Symbol	Maximum Overall Length x Diameter Inches	
7-Pin Miniature Types		
A1	1-3/4	x 3/4
A2	2-1/8	x 3/4
A3	2-5/8	x 3/4
9-Pin Miniature Types		
B2	2-3/16	x 7/8
B4	2-5/8	x 7/8
B8	2-27/32	x 7/8
B10	3-1/16	x 7/8
B11	3-9/32	x 7/8
B12	3-1/2	x 7/8
B14	2	x 7/8
B15	2.531	x .875
B16	2.913	x .875
B17	2.716	x .875
B18	2-3/8	x 7/8
B20	3.5	x .875

Symbol	Maximum Overall Length x Diameter Inches	
Novar Type		
C18	2.960	x 1.188
C21	3.710	x 1.562
Nuvistor Type		
D1	0.800	0.440
Octal-Glass Types		
F16	3-13/16	x 1-9/32
F21	4-1/16	x 1-9/32
F34	5	x 1-9/16
F35	5	x 1-23/32
F45	3.563	x 1.377
F46	3-13/16	x 1-1/4
F47	3.812	x 1.377
F48	3.812	x 1.188
F49	3.812	x 1.281
F50	3.563	x 1.188

Symbol	Maximum Overall Length x Diameter Inches	
9-Pin T-9 Bulb Type		
H1	2.90	x 1.188
Other Type		
K8	3.08	x 1.188
12-Pin Types		
L1	1.875	x 1.188
L2	2.375	x 1.188
L3	2.625	x 1.188
L4	2.875	x 1.188
L6	3.625	x 1.188
L7	2.875	x 1.563
L9	3.625	x 1.563
L10	4.125	x 1.563
L14	3.125	x 1.188
L18	4.000	x 1.563
L20	3.625	x 1.250
L21	4.625	x 1.563

KEY: TERMINAL DIAGRAMS (Bottom Views)

F = Filament End (Unpolarized)
G = Grid (Triode)
G₁ = Grid No. 1
G₂ = Grid No. 2

G₃ = Grid No. 3
H = Heater End (Unpolarized)
H_M = Heater Tap
IC = Do Not Use

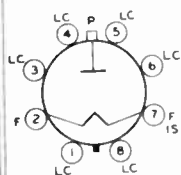
LETTER COMBINATIONS

IS = Internal Shield
K = Cathode
LC = May be used only under Limited Conditions

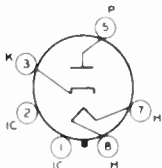
NC = No Internal Connection
P = Plate (Vacuum tubes)
Anode (Gas-Filled tubes)

SUBSCRIPTS FOR MULTIUNIT TYPES

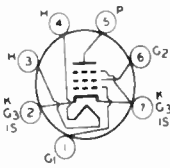
B = Beam Power Unit D = Diode Unit P = Pentode Unit T = Triode Unit 1, 2, 3, = No. 1, No. 2, No. 3.



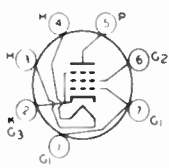
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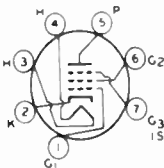
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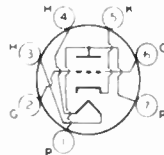
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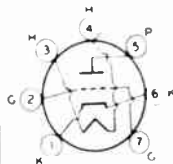
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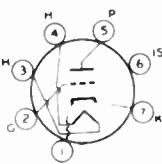
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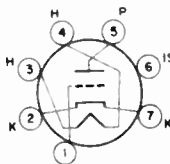
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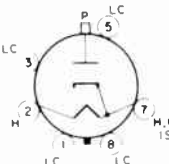
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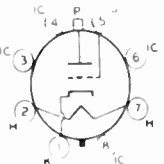
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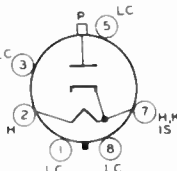
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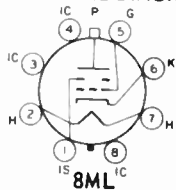
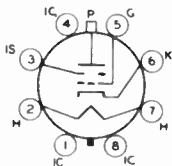
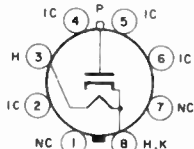
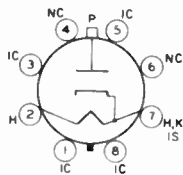
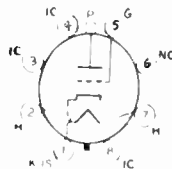
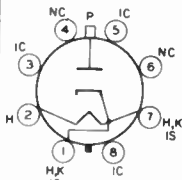
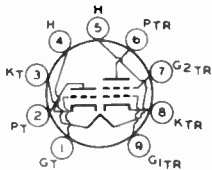
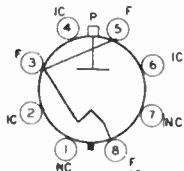
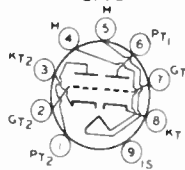
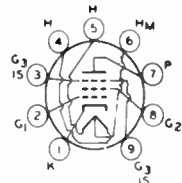
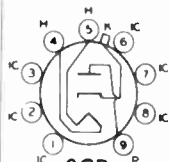
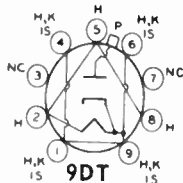
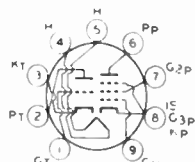
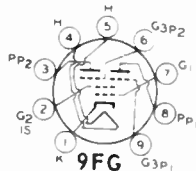
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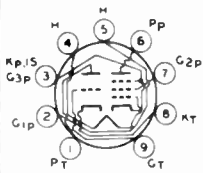
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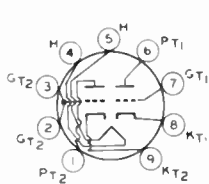
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RCA**Electronic
Components**RCA RECEIVING TUBE
DATA 8 10-71**TERMINAL DIAGRAMS (Cont'd)****8ML****8MQ****8MT****8MU****8MW****8MX****8MZ****8ND****9AJ****9BF****9CB****9CV****9DT****9FA****9FG****RCA RECEIVING TUBE TYPES-
Supplementary Listing**

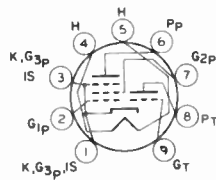
TERMINAL DIAGRAMS (Cont'd)



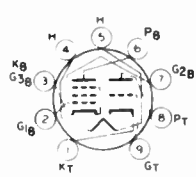
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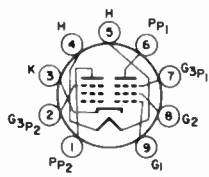
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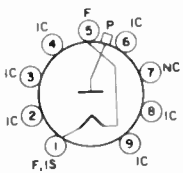
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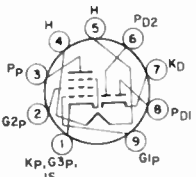
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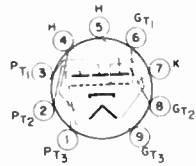
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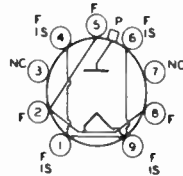
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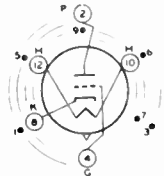
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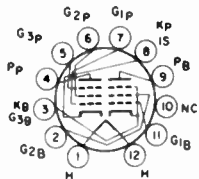
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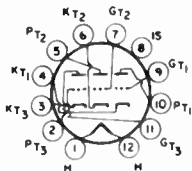
INDEX - LARGE LUG
• - SHORT PIN - IC
12AQ



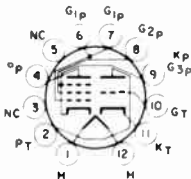
TERMINAL DIAGRAMS (Cont'd)



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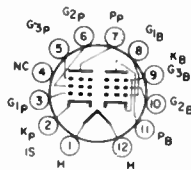
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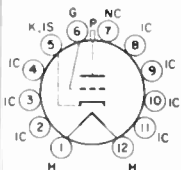
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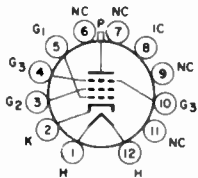
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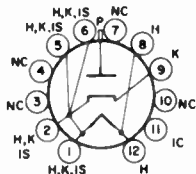
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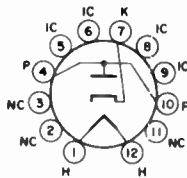
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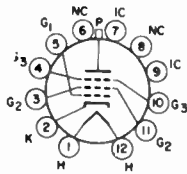
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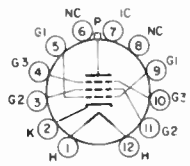


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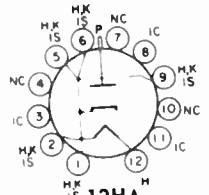


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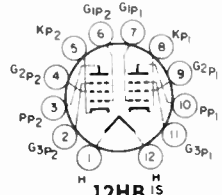
TERMINAL DIAGRAMS (Cont'd)



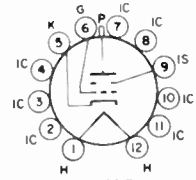
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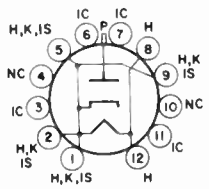
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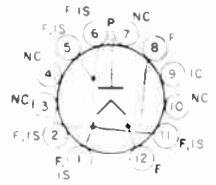
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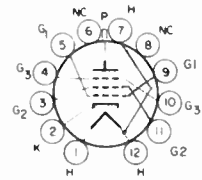
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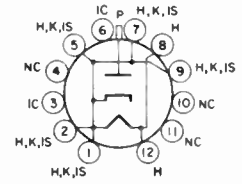
12HY



12HZ



12JA



12JB



Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. \oplus Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dist.	B. D.	Volts	Amps.										
0Z4	Full-Wave Gas Rectifier	E2 F2	4R	—	—	Rectifier	Starting Supply Voltage per Plate, 300 min. peak volts. DC Output Current, 75 max., 30 min. mA. Peak Plate Current, 200 max. mA. DC Output Voltage, 300 max. volts.								
1A3	Diode	A2	6AP	1.4	0.15	Rectifier	Max. Peak Plate Inverse Volts, 330			Max. DC Output mA, 0.5			Max. Peak Heater-Cathode Volts, 140		
1A5-GT	Pwr Pentode	F8	6X	1.4F	0.05	Class A Amp	85 90	- 4.5v - 4.5v	85 90	0.7 1.1	3.5 4.0	300000 300000	800 850	25000 25000	0.100 0.115
1L6	Pentagrid Converter α	A2	7DC	1.4F	0.05	Converter	90	0v	45	0.6	0.5	650000	Anode-Grid ($\# 2$): 90 max. volts, 1.2 mA.		
							Oscillator Grid ($\# 1$) Resistor, 0.2 meg. Conversion Transcond., 300 micromhos.								
1N5-GT	Sharp-Cutoff Pentode	F7	6YK	1.4F	0.05	Class A Amp	90	0v	90	0.3	1.2	1.5 \S	750	—	—
1R5	Pentagrid Converter Δ	A2	7AT	1.4F	0.05	Converter	45 90	0v 0v	45 67.5	2.1 3.5	0.7 1.5	500000 400000	Convers. Transcond., 210 μ mho		
							Convers. Transcond., 280 μ mho								
1S4	Pwr Pentode	A2	7AV	1.4F	0.1	Class A Amp	45 90	- 4.5v - 7v	45 67.5	0.8 1.4	3.8 7.4	100000 100000	1250 1575	8000 8000	0.065 0.27
1S5	Diode— Sharp-Cutoff Pentode	A2	6AU	1.4F	0.05	Pentode Unit as AF Amp	Plate Supply, 90 v applied through 1 meg. resistor. Screen Supply, 90 v applied through 3.1 meg. resistor. Grid Bias, 0 volts. Grid Resistor, 10 megohms. Voltage Gain, 66 approx.								
1T4	Remote-Cutoff Pentode	A2	6AR	1.4F	0.05	Class A Amp	45 90	0v 0v	45 67.5	0.7 1.4	1.7 3.5	350000 500000	700 900	—	—
1U4	Sharp-Cutoff Pentode	A2	6AR	1.4F	0.05	Class A Amp	90	0v	90	0.50	1.1	1.0 \S	900	—	—
1U5	Diode— Sharp-Cutoff Pentode	A2	88W	1.4F	0.05	Pentode Unit as Class A Amp	67.5	0v	67.5	0.4	1.6	600000	625	—	—

Note: For footnotes, see end of this section.

 Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. \oplus Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (!)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts	
		Dim.	B. O.	Volts	Amps.											
2A3	Power Triode	K11	4D	2.5F	2.5	Class A Amp	250	-45v	$\mu_{\text{u}} = 4.2$	—	60.0	800	5250	2500	3.5	
						Push-Pull Class AB ₁ Amp	300	780 Ω \uparrow	—	—	80.0 \uparrow	—	—	5000	10.0 \uparrow	
							300	-62v	—	—	80.0 \uparrow	—	—	3000	15.0 \uparrow	
2EN5	Twin Diode	A2	7FL	2.1 \oplus	0.45	Horizontal Phase Detector	Max. Peak Heater-Cathode Volts, ± 200		Max. DC Plate mA, 5							
3A2	Half-Wave Rectifier	B5	9DT	3.15	0.22	Pulsed Rectifier in TV Receivers	Max. Peak Inverse Plate Volts, 18000		Max. DC Plate mA, 80							
							Max. Average Plate mA, 1.5									
3B2	Half-Wave Rectifier	F38	8GH	3.15	0.22	Pulsed Rectifier in TV Service	Max. Peak Plate mA, 80		Max. DC Inverse Plate Volts, 25000		Max. Total DC & Pk Inv Plate Volts, 35000 (Abs.)					Max. Av Plate mA, 1.1
3Q4	Power Pentode	A2	7BA	1.4F 2.8F	0.1 0.05	Class A Amp	For other characteristics, refer to Type 3V4									
3Q5-GT	Beam Power Tube	F6	7AP	1.4F 2.8F	0.1 0.05	Class A Amp	110	-6.6v	110	1.4	10.0	100000	2200	8000	0.40	
							110	-6.6v	110	1.1	8.5	110000	2000	8000	0.33	
3S4	Power Pentode	A2	7BA	1.4F 2.8F	0.1 0.05	Class A Amp	90	-7v	67.5	1.4	7.4	100000	1575	8000	0.27	
							90	-7v	67.5	1.1	6.1	100000	1425	8000	0.235	
3V4	Power Pentode	A2	6BX	1.4F 2.8F	0.1 0.05	Class A Amp	90	-4.5v	90	2.1	9.5	100000	2150	10000	0.27	
							90	-4.5v	90	1.7	7.7	120000	2000	10000	0.24	
5A4	Full-Wave Rectifier	J3	5T	5.0F	2.0	With Capacitive Input Filter	Max. AC Volts per Plate (RMS), 350		Max. DC Output mA, 125							
							Max. Peak Inverse Volts, 1400		Max. Peak Plate mA, 440							
							Min. Total Effect. Supply Imped. per Plate, 50 ohms									
5BE8	Medium- μ Triode—Sharp-Cutoff Pentode	B2	9EG	4.7 \oplus	0.6	Triode Unit as Class A Amp	150	56 Ω	$\mu_{\text{u}} = 40$	18	5000	8500	—	—		
						Pentode Unit as Class A Amp	250	68 Ω	110	3.5	10	400000	5200	—	—	
5BT8	Twin-Diode—Sharp-Cutoff Pentode	B2	9FE	4.7 \oplus	0.6	Class A Amp	200	180 Ω	150	2.8	9.5	300000	6200	—	—	

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ⊕ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Transconductance Micromhos
		Dim.	B. D.	Volts	Amps.								
5DJ4	Full-Wave Rectifier	F25	8K5	5.0F	3.0	With Capacitive-Input Filter	Max. DC Output mA, 300 for AC Volts per Plate, 500 and Min. Total Effect. Supply Imped. per Plate, 83 ohms Max. Peak Inverse Volts, 1700 Max. Peak Plate mA per Plate, 1000						
						With Inductive-Input Filter	Max. DC Output mA, 300 for AC Volts per Plate, 600 Max. Peak Inverse Volts, 1700 Max. Peak Plate mA per Plate, 1000						
5U4-G	Full-Wave Rectifier	F30	8T1	5.0F	3.0	With Capacitive-Input Filter	Max. AC Volts per Plate (RMS), 450 Max. DC Output mA, 225 Max. Peak Inverse Volts, 1550 Max. Peak Plate mA, 675 Min. Total Effect. Supply Imped. per Plate, 170 ohms						
5Y4-GA 5Y4-GT	Full-Wave Rectifier	F25 FB	5Q	5.0F	2.0		Max. Peak Plate mA, 400 For other ratings, refer to Type 5A24.						
5Z3	Full-Wave Rectifier	K11	4C	5.0F	3.0		For other ratings, refer to Type 5U4-G.						
5Z4	Full-Wave Rectifier	E4	8L	5.0	2.0	With Capacitive-Input Filter	Max. AC Volts per Plate (RMS), 350		Max. DC Output mA, 125		Min. Total Effect.		
						With Inductive-Input Filter	Max. AC Volts per Plate (RMS), 500		Max. DC Output mA, 125		Supply Imped. per Plate, 50 Ω		
6A7	Pentagrid Converter \odot	K5	7C	6.3	0.3	Converter	For other characteristics, refer to Type 6A8.						
6A8	Pentagrid Converter \odot	E3	8A	6.3	0.3	Converter	250	~ 3v	100	2.7	3.5	360000	Anode-Grid (#2): 250 μ max. v, 4.0 mA Oscillator-Grid (#1) Res. ∞ . Conversion Transcond., 550 μ mho
6AC7	Sharp-Cutoff Pentode	E2	8N	6.3	0.45	Class A Amp	300	160 Ω	150	2.5	10.0	1.0 Ω	9000

 Note: For footnotes, see end of this section. Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. \oplus Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. O.	Volts	Amps.										
6AH4-GT	Low-Mu Triode	F8	8EL	6.3	0.75	Vertical Deflection Amp	Max. DC Plate Volts, 500 Max. DC Cathode mA, 60		Max. Peak Positive-Pulse Plate Volts, 2000 Max. Plate Dissipation, 7.5 watts						
6AH6	Sharp-Cutoff Pentode	A2	7BK	6.3	0.45	Class A Amp	300	160 Ω	150	2.5	10.0	500000	9000	—	—
6AL7-GT	Electron-Ray Tube	F8	8CH	6.3	0.15	Visual Indicator	Target Voltage, 315 volts Grid Voltage = 0 volts		Grid Voltage for Pattern Cutoff, -7 volts approx. Cathode Bias Res., 3300 ohms approx. Deflecting-Electrodes—No. 1, No. 2 and No. 3 Voltage = 0						
6AM4	High-Mu Triode	B1	9BX	6.3	0.225	Class A Amp	200	100 Ω	$\mu_{11} = 85$	10	8700	9800	—	—	
6AQ6	Twin-Diode—High-Mu Triode	A2	7BT	6.3	0.15	Triode Unit as Class A Amp	100 250	-1v -3v	$\mu_{11} = 70$	0.8 1.0	61000 58000	1150 1200	—	—	
6AQ7-GT	Twin-Diode—High-Mu Triode	F8	8CK	6.3	0.3	Triode Unit as Class A Amp	250	-2v	$\mu_{11} = 70$	2.3	44000	1600	—	—	
6AR5	Power Pentode	A3	8CC	6.3	0.4	Class A Amp	250	-18v	250	5.5	32.0	90000	2300	7600	3.4
6AS5	Beam Power Tube	A3	7CV	6.3	0.8	Class A Amp	150	-8.5v	110	2.0	35	—	5600	4500	2.2
6AV5-GA	Beam Power Tube	F19	6CK	6.3	1.2	Horizontal Deflection Amp	Max. DC Plate Volts, 550 Max. DC Cathode mA, 110		Max. Peak Positive-Pulse Plate Volts, 5500 (Abs.) Max. Plate Dissipation, 11 watts						
6AX8	Medium-Mu Triode—Semiremote Cutoff Pentode	B2	9AE	6.3	0.45	Triode Unit as Class A Amp	150	560 Ω	$\mu_{11} = 40$	18	5000	8500	—	—	
						Pentode Unit as Class A Amp	250	120 Ω	110	3.5	10	400000	4800	—	—
6B8	Twin-Diode—Semiremote-Cutoff Pentode	E3	8E	6.3	0.3	Pentode Unit as Amp	250	-3v	125	2.3	10	600000	1325	—	—
6BD6	Remote-Cutoff Pentode	A2	7BK	6.3	0.3	Class A Amp	250	-3v	100	3.0	9.0	800000	2000	—	—

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TUBE DATA 3-270

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. \oplus Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. O.	Volts	Amps.										
6BF5	Beam Power Tube	A3	7BZ	6.3	1.2	Class A Amp	110	- 7.5v	110	4.0	36.0	12000	7500	2500	1.9
6BF6	Twin-Diode—Medium-Mu Triode	A2	7BT	6.3	0.3	Triode Unit as Class A Amp	250	- 9v	$\mu = 16$		9.5	8500	1900	Power Output, 300 milliwatts	
6BG6-G 6BG6-GA	Beam Power Tube	F40 F33	5BT	6.3	0.9	Horizontal Deflection Amp	Max. DC Plate Volts, 700 Max. DC Cathode mA, 110		Max. Peak Positive-Pulse Plate Volts, 6600 (Abs.) Max. Plate Dissipation, 20 watts						
6BH8	Medium-Mu Triode—Sharp-Cutoff Pentode	B4	9DX	6.3 \oplus	0.6	Triode Unit as Class A Amp	150	- 5v	$\mu = 17$		9.5	5150	3300	—	—
						Pentode Unit as Class A Amp	200	82 Ω	125	3.4	15	150000	7000	—	—
6BK5	Beam Power Tube	B4	9BQ	6.3	1.2	Class A Amp	250	- 5v	250	3.5	35	100000	8500	6500	3.5
6BS8	Medium-Mu Twin Triode	B2	9AJ	6.3	0.4	Each Unit as Class A Amp	150	220 Ω	$\mu = 36$		10	5000	7200	—	—
6BV8	Twin Diode—Medium-Mu Triode	B2	9FJ	6.3 \oplus	0.6	Triode Unit as Class A Amp	200	330 Ω	$\mu = 33$		11	5900	5600	—	—
6BW4	Full-Wave Rectifier	B4	9DJ	6.3	0.9	With Capacitive Input Filter	Max. AC Volts per Plate (RMS), 325 Max. Peak Inverse Volts, 1275 Max. DC Output mA, 62.5 Total Effect. Supply Imped. per Plate, 82 ohms								
						With Inductive Input Filter	Max. AC Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1275 Max. DC Output mA, 62.5 Mir. Value of Input Choke, 10 henries Max. Peak Plate mA per Plate, 350								

Note: For footnotes, see end of this section.

 Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Types Not Recommended for New Equipment Design

RCA RECEIVING-TUBE DATA

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ⊕ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (1)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Amplification Factor
		Dim.	B. D.	Volts	Amps.									
6BX7-GT	Medium-Mu Twin Triode	F8	88D	6.3	1.5	Vertical Deflection Oscillator	Max. DC Plate Volts, 500		Max. DC Cathode mA, 180					
						Vertical Deflection Amplifier	Max. DC Plate Volts, 500		Max. DC Cath. mA, 180					
6BY5-GA	Full-Wave Rectifier	F17	6CN	6.3	1.6	Television Damper Service	Max. DC Plate Volts, 500		Max. Pk Positive-Pulse Plate Volts, 2000 (Abs.)					
6C5	Medium-Mu Triode	E2	8Q	6.3	0.3	Class A Amp	250	- 8v	—	—	8.0	10000	2000	20
6C6	Sharp-Cutoff Pentode	K9	8F	6.3	0.3	Amplifier Detector	For other characteristics, refer to Type 6J7.							
6C9	Sharp-Cutoff Dual Triode	G1	10F	6.3	0.4	Each Unit as Class A Amp	125	- 1V	80	1.5	10	100000	8000	—
6CH8	Medium-Mu Triode—Sharp-Cutoff Pentode	B2	9FT	6.3	0.45	Triode Unit as Class A Amp	200	- 6v	—	—	13	5750	3300	19
						Pentode Unit as Class A Amp	200	180Ω	150	2.8	9.5	300000	6200	—
6CK4	Low-Mu Triode	F9	8JB	6.3	1.25	Vertical Deflection Amp	Max. DC Plate Volts, 550		Max. Pk Positive-Pulse Plate Volts, 2000 (Abs.)					
6CM8	High-Mu Triode—Sharp-Cutoff Pentode	B2	9FZ	6.3⊕	0.45	Triode Unit as Class A Amp	250	- 2v	—	—	1.8	50000	2000	100
						Pentode Unit as Class A Amp	250	180Ω	150	2.8	9.5	600000	6200	—
6CR6	Diode—Remote-Cutoff Pentode	A2	7EA	6.3	0.3	Pentode Unit as Class A Amplifier	250	- 2v	100	2.6	6	800000	2200	—
										Grid (# 1) Volts for transcond. of 10 micromhos, -32				

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Electronic
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TUBE DATA 4-2-70

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. \oplus Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (\pm)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. D.	Volts	Amps.										
6DN6	Beam Power Tube	F33	5BT	6.3	2.5	Horizontal Deflection Amp	Max. DC Plate Volts, 700		Max. Peak Positive-Pulse Plate Volts, 6600 (Abs.)						
							Max. DC Cathode mA, 200		Max. Plate Dissipation, 15 watts						
6EH5	Power Pentode	A3	7CV	6.3	1.2	Class A Amp	110	62 Ω	115	11.5	42	11000	14600	8000	1.4
6EV7	High-Mu Twin Triode	B4	9LP	6.3	0.6	Relay Control	250 150	0v 0v	2500-ohm relay		18.5 10.0	Grid Volts for Plate μ A, 100 = -9 Grid Volts for Plate μ A, 100 = -5			
6EZ5	Beam Power Tube	F9	7AC	6.3	0.8	Vertical Deflection Amp	250	-20v	250	3.5	43	50000	4100	—	—
6F5	High-Mu Triode	E3	5M	6.3	0.3	Class A Amplifier	100 250	-1v -2v	μ = 100		0.4 0.9	85000 66000	1150 1500	—	—
6F6	Power Pentode	E4	7S	6.3	0.7	Pentode Class A Amp	250 285	-16.5v -20v	250 285	6.5 7.0	34.0 38.0	80000 78000	2500 2550	7000 7000	3.2 4.8
6F6-GT		F9	7S1			Pentode Push-Pull Class A Amp	315	-24v	285	12.0 ϕ	62.0 ϕ	—	—	10000	11.0 ϕ
6F8-G	Medium-Mu Twin Triode	F24	8G	6.3	0.6	Each Unit as Class A Amp	For other characteristics, refer to Type 6J5								
6FE5	Beam Power Tube	F15	8KB	6.3	1.2	Class A Amp	145	-16v	145	18	100	8000	9500	1000	5.6
6GY8	Triple High-Mu Triode	B2	9MB	6.3	0.45	Each Unit as Class A Amp	125	-1v	μ = 63		4.5	14000	4500	—	—
6J5	Medium-Mu Triode	E2	8Q	6.3	0.3	Class A Amp	90	0v	μ = 20		10	6700	3000	—	—
6J5-GT		F7	8Q \times				250	-8v	9	7700	2600	—	—		
6J7	Sharp-Cutoff Pentode	E3	7R	6.3	0.3	Pentode Class A RF Amp	100 250	-3v -3v	100 100	0.5 0.5	2.0 2.0	1.0 ϕ 1.0 ϕ	1185 1225	—	—

Note: For footnotes, see end of this section.

 Δ For key to tube dimensions, description, and basing diagram, see end of this section.Types Not Recommended for New Equipment Design
RCA RECEIVING-TUBE DATA

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ⊕ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. O.	Volts	Amps.										
6K7	Remote-Cutoff Pentode	E3	7R	6.3	0.3	Class A Amp	250	- 3v	125	2.6	10.5	600000	1650	—	—
6K8	Triode-Hexode Converter	E3	8K	6.3	0.3	Triode Unit as Oscillator	100	Grid Res., 50000 ohms			3.8	Triode-Grid & Hexode-Grid Current, 0.15 mA			
						Hexode Unit as Mixer	100 250	- 3v - 3v	100 100	6.2 6.0	2.3 2.5	400000 600000	Conv Transcond., 325 μ mho Conv Transcond., 350 μ mho		
6KL8	Diode—Sharp-Cutoff Pentode	B4	9LQ	6.3	0.3	Pentode Unit as Class A Amp	100	2.2 M Ω Grid Res	100	2.2	5.5	550000	4300	—	—
6L7	Pentagrid Mixer A	E3	7T	6.3	0.3	Mixer Service	250	- 6v	150	9.2	2.3	Osc Grid (No. 3) Bias, -15 volts Grid-No. 3 Peak Swing, 16 volts min Conv Transcond., 350 micromhos.			
6N7 6N7-GT	Medium-Mu Twin Power Triode	E4 F6	8B 8B:	6.3	0.8	Class A Amp (as Driver) ^o	250 300	- 5v - 6v	Mu = 35		6.0 7.0	11300 11000	3100 3200	20000 or more	exceeds 0.4
						Class B Amp	300	0v	Pwr Output for 1 tube at stated plate-to-plate load				8000	10.0	
6Q7	Twin Diode High-Mu Triode	E3	7V	6.3	0.3	Triode Unit as Class A Amp	100 250	- 1v - 3v	Mu = 70		0.8 1.1	58000 58000	1200 1200	—	—
6S8-GT	Triple Diode—Hi-Mu Triode	F6	8CB	6.3	0.3	Triode Unit as Class A Amp	250	- 2v	Mu = 100		0.9	91000	1100	—	—
6SB7-Y	Pentagrid Converter A	E2	8R	6.3	0.3	Mixer	100	- 1v	100	10.2	3.6	500000	Grid-No. 1 Res, 20000- Ω Conversion Transcond., 950 micromhos		
6SC7	High-Mu Twin Triode	E2	8S	6.3	0.3	Each Unit as Amplifier	250	- 2v	Mu = 70		2.0	53000	1325	—	—
6SF5	High-Mu Triode	E2	6AB	6.3	0.3	Class A Amp	250	- 2v	Mu = 100		0.9	66000	1500	—	—

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ⊕ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. D.	Volts	Amps.										
6SF7	Diode— Remote-Cutoff Pentode	E2	7AZ	6.3	0.3	Pentode Unit as Class A Amp	100	- 1v	100	3.4	12.0	200000	1975	—	—
							250	- 1v	100	3.3	12.4	700000	2050		
6SG7	Semiremote- Cutoff Pentode	E2	8BK	6.3	0.3	Class A Amp	100	- 1v	100	3.2	8.2	250000	4100	—	—
							250	- 2.5v	150	3.4	9.2	1.0 \S	4000		
6SH7	Sharp-Cutoff Pentode	E2	8BK	6.3	0.3	Class A Amp	100	- 1v	100	2.1	5.3	350000	4000	—	—
							250	- 1v	150	4.1	10.8	900000	4900		
6SK7 6SK7-GT	Remote-Cutoff Pentode	E2 F7	8N 8N $\frac{1}{2}$	6.3	0.3	Class A Amp	100	- 1v	100	4.0	13.0	120000	2350	—	—
							250	- 3v	100	2.6	9.2	800000	2000		
6SR7	Twin Diode— Medium-Mu Triode	E2	8Q	6.3	0.3	Triode Unit as Class A Amp	250	- 9v	$\mu = 16$	9.5	8500	1900	—	—	
6T4	Medium-Mu Triode	A1	7DK	6.3	0.225	Use in UHF TV Receivers Class A Amp	Max. DC Plate Volts, 200 Max. DC Cathode mA, 30		Max. Plate Dissipation, 3.5 watts			Max. Grid mA, 8			
							80	150 Ω	$\mu = 13$	18	—	7000	—	—	
6U5	Electron-Ray Tube	K3	6R	6.3	0.3	Visual Indicator	Plate & Target Supply = 250 volts. Triode Plate Resistor = 1.0 meg. Grid Bias, - 22 volts; Shadow Angle, 0°. Bias, 0 volts; Angle, 30°. Target Current = 4.0 mA Plate Current, 0.24 mA								
6V6	Beam Power Tube	E4	7AC	6.3	0.45	Single-Tube Class A Amp	250	- 12.5v	250	4.5	45.0	50000	4100	5000	4.5
							315	- 13v	225	2.2	34.0	80000	3750	8500	5.5
						Push-Pull Class AB ₁ Amp	250	- 15v	250	5.0 \spadesuit	70.0 \spadesuit	—	—	10000	10.0 \dagger
							285	- 19v	285	4.0 \spadesuit	70.0 \spadesuit	—	—	8000	14.0 \dagger
7A7	Remote-Cutoff Pentode	J2	8V	6.3	0.3	Class A Amp	For other characteristics, refer to Type 6SK7.								
7C5	Beam Power Tube	J3	6AA	6.3	0.45	Class A Amp	For other characteristics, refer to Type 6V6.								

 Note: For footnotes, see end of this section. Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) <small>Unless specified all types have heaters. ⊕ Heater with controlled warmup time.</small>		Use <small>Values to right give operating conditions and characteristics for indicated typical use</small>	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Amplification Factor
		Dim.	B. O.	Volts	Amps.									
7C7	Sharp-Cutoff Pentode	J2	8V	6.3	0.15	Class A Amplifier	250	- 3v	100	0.5	2.0	2.0 \S	1300	—
7F7	High-Mu Twin Triode	J2	8AC	6.3	0.3	Each Unit as Class A Amplifier	250	- 2v	—	—	2.3	44000	1600	70
7F8	Medium-Mu Twin Triode	J2	8BW	6.3	0.3	Each Unit as Class A Amplifier	250	500 Ω	—	—	6.0	—	3300	48
7N7	Medium-Mu Twin-Triode	J3	8AC	6.3	0.6	Each Unit as Class A Amplifier	90 250	0v - 8v	—	—	10.0 9.0	6700 7700	3000 2600	20 20
9BR7	Twin Diode—High-Mu Triode	B2	9CF	4.7 \oplus 9.4	0.6 0.3	Triode Unit as Class A Amplifier	250	200 Ω	—	—	10	10900	4000	60
9U8-A	Medium-Mu Triode—Sharp-Cutoff Pentode	B2	9AE	9.45 \oplus	0.3	Triode Unit as Class A Amplifier	125	- 1v	—	—	13.5	5000	7500	40
	Pentode Unit					125	- 1v	110	3.5	9.5	200000	5000	—	
10C8	High-Mu Triode—Sharp-Cutoff Pentode	B2	9DA	10.5 \oplus	0.3	Triode Unit as Class A Amplifier	250	390 Ω	—	—	7.3	12000	4400	53
	Pentode Unit as Class A Amplifier					135	100 Ω	135	3.2	11.5	190000	8000	—	
12AC6	Remote-Cutoff Pentode \circ	A2	7BK	10.0 to 15.9	0.15 approx. at 12.6 v	Class A Amplifier	12.6	—	12.6	.2	.55	500000	730	G_1 Supp. V. 0 G_1 Res. 2.2 megohms
12AD6	Pentagrid Converter \circ	A2	7CH	10.0 to 15.9	0.15 approx. at 12.6 v	Converter	12.6	Self-excited	12.6	1.5	0.45	1 \S	G_1 Res. 33000 Ω ! Conv Transcond., 260 micromhos	—
12AE6-A	Twin Diode—Medium-Mu Triode \circ	A2	7BT	10.0 to 15.9	0.15 approx. at 12.6 v	Triode Unit as Class A Amplifier	12.6	0v	—	—	1	13000	1300	16.7

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TUBE DATA 6 2-70

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ○ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Transconductance Micromhos	Amplification Factor	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. D.	Volts	Amps											
12AF6	Remote-Cutoff Pentode ○	A2	7BK	10.0 to 15.9	0.15 approx at 12.6 v	Class A Amp	12.6	—	12.6	0.45	1.1	350000	1500	G ₁ Supply Volts, 0 G ₁ Res., 2.2 megohms		
12AL8	Medium-Mu Triode—Power Triode ○	B4	9GS	10.0 to 15.9	0.55 approx. at 12.6 v	Triode Unit as Class A Amp	12.6	- 0.9v (across 2.2 megohm res.)	—	—	.5	13000	1000	13	—	—
						Tetrode Unit as Class A Amp	Grid-No. 2 (Control Grid) Volts, - .5 (across 2.2 megohm res.)		Ampl. Factor (Grid-No. 2 to Plate), 7.2		Grid-No. 1 m.A., 75		Plate m.A., 40		Transcond. (Grid-No. 2 to Plate), 15000 μ ho		Plate Resistance, 480 ohms
12AV7	Medium-Mu Twin-Triode	B2	9A	6.3 to 12.6	0.45 to 0.225	Each Unit as Class A Amp	150	56 Ω	—	—	18	48000	8500	41	Cutoff Volts, -12	
12AW6	Sharp-Cutoff Pentode	A2	7CM	12.6	0.15	Class A Amp	100 250	180 Ω 180 Ω	100 150	1.4 2.0	4.5 6.5	600000 800000	4500 5000	— —	— —	— —
12BK5	Beam Power Tube	B4	9BQ	12.6	0.6	Class A Amp	250	- 5v	250	3.5	35	100000	8500	—	6500	3.5
12BL6	Remote-Cutoff Pentode ○	A2	7BK	10.0 to 15.9	0.15 approx at 12.6 v	Class A Amp	12.6	Grid No. 1 Supply Volts, 0	12.6	0.5	1.35	500000	1350	C ₁ and G ₃ Volts for transcond. of 10 micromhos, - 5		
12BR7	Twin Diode—Hi-Mu Triode	B2	9CF	6.3 to 12.6	0.45 to 0.225	Triode Unit as Class A Amp	100 250	270 Ω 200 Ω	— —	— —	3.7 10	15000 10900	4000 5500	60 60	— —	— —
12BV7	Sharp-Cutoff Pentode	B4	9BF	6.3 to 12.6	0.6 to 0.3	Class A Amp	250 250	68 Ω - 8v	150 180	6 —	27 0.5 \times	85000 —	13000 —	— —	— —	— —
12BW4	Full-Wave Rectifier	B4	9DJ	12.6	0.45	With Capacitive Input Filter	Max AC Volts per Plate (RMS) 450 Max Peak Inverse Volts, 1275 Total Effect. Supply Imped. per Plate, 82 ohms		Max DC Output m.A. 62.5 Max Peak Plate m.A. 350							
12BZ7	High-Mu Twin Triode	B4	9A	6.3 to 12.6	0.6 to 0.3	Each Unit as Class A Amp	250	- 2v	—	—	2.5	31800	3200	100	—	—

Note: For footnotes, see end of this section.

 Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Types Not Recommended for New Equipment Design

RCA RECEIVING-TUBE DATA

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ⊕ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Amplification Factor	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. D.	Volts	Amps.											
12CN5	Remote-Cutoff Pentode \odot	A3	7CV	16.0 to 15.9	0.45 approx at 12.6 v	Class A Amp	12.6	—	12.6	3.5	4.5	40000	3800	Grid-No. 1 Supply Volts, 0 Grid-No. 1 Res., 2.2 meg		
12CX6	Remote-Cutoff Pentode \odot	A2	7BK	10.0 to 15.9	0.15 approx. at 12.6 v	Class A Amp	12.6	Grid-No. 1 Supply Volts, 0	12.6	1.4	3	40000	3100	G ₁ Volts for Plate Current of 10 μ A, -4.5		
12DQ7	Power Pentode	B4	9BF	6.3 \oplus 12.6	0.6 0.3	Class A Amp	200	68 Ω	125	5.6	26	53000	10500	—	—	—
12DS7	Twin Diode—Power Tetrode \odot	B4	9JU	10.0 to 15.9	0.4 approx. at 12.6 v	Tetrode Unit as Class A Amplifier	12.6	12.6v	-0.5 (across 22 megohm resistor)	75 (Grid No 1)	35	500	19000 (Grid No. 2 to Plate)	9.1 (Grid No. 2 to Plate)	—	—
						Diode Plate mA, with 10 Volts Applied, 3 mA										—
12DW7	Dual Triode	B2	9A	12.6 6.3	0.15 0.3	Unit No. 1 as Class A Amp	250	- 2v	—	—	1.2	62500	—	100	—	—
						Unit No. 2 as Class A Amp	250	-8.5v	—	—	10.5	7700	2200	17	—	—
12DY8	Medium-Mu Triode—Remote-Cutoff Tetrode \odot	B2	9JD	10.0 to 15.9	0.35 approx. at 12.6V	Triode Unit as Class A Amp	12.6	—	—	—	1.2	10000	2000	20	—	—
						Tetrode Unit as Signal Seeker Relay	10	—	10	—	5 min.	Grid No. 1 res, 10 meg. Plate Load, 700 ohms				
							15	- 6v	15	—	3 max.	—	—	Plate Load, 700 ohms		
12ED5	Beam Power Tube	A3	7CV	12.6 \oplus	0.45	Class A Amp	1.25	- 4.5v	125	7	37	14000	8500	—	4500	1.5
12EK6	Remote-Cutoff Pentode \odot	A2	7BK	10.0 to 15.9	0.19 approx. at 12.6 v	Class A Amp	12.6	—	12.6	1.7	4	50000	4200	G ₁ Supply Volts, 0 G ₁ Res (Bypassed), 2.2 megohms		

RCA

Electronic
ComponentsRCA RECEIVING
TUBE DATA 7 2-70

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters \oplus Heater with controlled warmup time		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (!)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Amplification Factor	Load for Stated Power Output Ohms
		Dim.	B. O.	Volts	Amps.										
12EQ7	Diode—Remote-Cutoff Pentode	B4	9LQ	12.6	0.15	Pentode Unit as Class A Amplifier	100	0v	100	3.5	9	250000	3800	Grid-No. 1 Res. 2 2 megohms	
12F8	Twin Diode—Remote-Cutoff Pentode \ominus	B2	9FH	10.0 to 15.9	0.15 approx at 12.6 v	Pentode Unit as Class A Amplifier	12.6	0v	12.6	0.38	1	330000	1000	Grid-No. 1 Volts for transcond. of 10 micromhos. - 5	
12FK6	Twin Diode—Low-Mu Triode \ominus	A2	7BT	10.0 to 15.9	0.15 approx at 12.6 v	Triode Unit as Class A Amplifier	12.6	Grid Supply Volts, 0 Grid Res (Bypassed), 2.2 megohms			1.3	6200	1200	7.4	—
12FM6	Twin Diode—Medium-Mu Triode \ominus	A2	7BT	10.0 to 15.9	0.15 approx at 12.6 v	Triode Unit as Class A Amplifier	12.6	0v	—	—	1	7700	1300	10	—
12FV7	Medium-Mu Twin Triode	B4	9A	6.3 to 12.6	0.9 to 0.45	Each Unit as Class A Amplifier	100	- 2v	—	—	16	2250	9600	21.5	—
12J5-GT	Medium-Mu Triode	F7	6Q1	12.6	0.15	Amplifier	For other characteristics, refer to Type 6J5-GT								
12J8	Twin Diode—Power Tetrode \oplus	B2	9GC	10.0 to 15.9	0.325 approx at 12.6 v	Tetrode Unit as Class A Amplifier	12.6	- 0v	12.6	1.5	12	6000	5500	—	2700
12K5	Power Tetrode \oplus	A3	7EK	10.0 to 15.9	0.4 approx at 12.6 v	Class A Amplifier	EC Plate Volts, 12.6 Grid-No. 2 (Control Grid) Volts, -.5 Grid-No 1 (Space-Charge Grid) Volts, 12.6 Amplification Factor, DC Plate mA, 40 Grid-No. 1 mA, 75 Grid-No. 2 to Plate, 7.2 Plate Resistance, 480 ohms Transcond., Grid-No. 2 to Plate, 15000 μ ho								
12K7-GT	Remote-Cutoff Pentode	F7	7R κ	12.6	0.15	Amplifier	For other characteristics, refer to Type 6K7-GT.								

Note: For footnotes, see end of this section.

 Δ For key to tube dimensions, description, and basing diagram, see end of this section.Types Not Recommended for New Equipment Design
RCA RECEIVING-TUBE DATA

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heater. ... Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (?)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power-Output Watts
		Dim.	B. O.	Volts	Amps.										
12KL8	Diode—Sharp-Cutoff Pentode	B4	9LQ	12.6	0.15	Pentode Unit as Class A Amplifier	For other characteristics, refer to Type 6KL8.								
12L6-GT	Beam Power Tube	F6	7AC	12.6- Φ	0.6	Class A Amplifier	110 200	- 7.5v 180 Ω	110 125	4.0 2.2	49 46	13000 28000	8000 8000	2000 4000	2.1 3.8
12R5	Beam Power Tube	A3	7CV	12.6- Φ	0.6	Vertical Deflection Amplifier	Max. DC Plate Volts, 150 Max. Peak Neg.-Pulse Grid-No. 1 Volts, 150 Max. Peak Cathode mA, 155 Max. Grid No. 2 Volts, 150 Max. Plate Dissipation, 4.5 watts Max. Peak Positive Pulse Plate Volts, 1500 (Abs.)								
12SC7	High-Mu Twin Triode	E2	8S	12.6	0.15	Each Unit as Class A Amplifier	For other characteristics, refer to Type 6SC7.								
12SF5	Hi-Mu Triode	E2	6AB	12.6	0.15	Class A Amplifier	For other characteristics, refer to Type 6SF5.								
12SF7	Diode—Remote-Cutoff Pentode	E2	7AZ	12.6	0.15	Pentode Unit as Amplifier	For other characteristics, refer to Type 6SF7.								
12SG7	Semiremote-Cutoff Pentode	E2	8BK	12.6	0.15	Class A Amplifier	For other characteristics, refer to Type 6SG7.								
12SH7	Remote-Cutoff Pentode	E2	8BK	12.6	0.15	Class A Amplifier	For other characteristics, refer to Type 6SH7.								
12SK7 12SK7-GT	Remote-Cutoff Pentode	E2 F7	8N 8N κ	12.6	0.15	Class A Amplifier	For other characteristics, refer to Type 6SK7.								
17BH3	Noxar Half-Wave Rectifier	C1	9HP	17.0- Φ	0.6	Television Damper Service	Max. Peak Inverse Plate Volts, 5500			Max. Peak Plate mA, 1100					
17BQ6-GTB	Beam Power Tube	F16	6AM	16.8- Φ	0.45	Horizontal Deflection Amplifier	Max. DC Plate Volts, 600			Max. Pk. Positive-Pulse Plate Volts, 6000 (Abs.) Max. DC Cathode mA, 112.5 Max. Plate Dissipation, 11 watts					

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. ⊕ Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (!)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Amplification Factor	Load for Stated Power Output Ohms	Power Output Watts		
		Dim.	B. D.	Volts	Amps.													
17C9	Sharp-Cutoff Twin Tetrode	G1	10F	16.8	0.15	Each Unit as Class A Amp	125	- 1v	80	1.5	10	100000	8000	—	—	—		
17GE5	Beam Power Tube	L2	12BJ	16.8	0.45	Horizontal Deflection Amp	Max. DC Plate Volts, 770		Max. Peak Positive-Pulse Plate Volts, 6500 (Abs.) Max. DC Cathode mA, 175								Max. Plate Dissipation, 17.5 watts	
17GV5	Beam Power Tube	L3	12DR	16.8	0.45	Horizontal Deflection Amp	For other characteristics, refer to Type 17GE5											
19AU4-GTA	Half-Wave Rectifier	F15	4CG	18.9 ϕ	0.6	Television Dumper Service	Max. Peak Inverse Plate Volts, 4500		Max. Average Plate mA, 210 Max. Plate Dissipation, 6.5 Watts									
19BG6-GA	Beam Power Tube	F33	5BT	18.9	0.3	Horizontal Deflection Amp	Max. DC Plate Volts, 700		Max. Peak Positive-Pulse Plate Volts, 6600 (Abs.) Max. DC Plate Current, 110 mA								Max. Plate Dissipation, 20 watts	
19J6	Medium-Mu Twin Triode	A2	7BF	18.9	0.15	Each Unit as Class A Amp	100	50 μ (For both units at the specified conditions)		8.5	7100	5300	38	—	—			
19T8	Triple Diode—Hi-Mu Triode	B2	9E	18.9	0.15	Triode Unit as Class A Amp	100	- 1v	—	—	0.8	54000	1300	70	—	—		
19X8	Medium-Mu Triode—Sharp-Cutoff Pentode	B2	9AK	18.9	0.15	Triode Unit as Class A Amp	125	- 1v	—	—	12	6000	6500	40	—	—		
						Pentode Unit as Class A Amp	125	- 1v	125	2.2	9	300000	5500	—	—	—		
25CA5	Beam Power Tube	A3	7CV	25.0	0.3	Class A Amp	110	4v	110	3.5	32	16000	8100	—	3500	1.1		
							125	4.5v	125	4	37	15000	9200	—	4500	1.5		
25EC6	Beam Power Tube	F29	5BT	25.0 ϕ	0.6	Horizontal Deflection Amp	Max. DC Plate Volts, 700		Max. Peak Positive-Pulse Plate Volts, 7000 (Abs.) Max. DC Cathode mA, 200								Max. Plate Dissipation, 10 Watts	
25L6-GT	Beam Power Tube	F6	7AC1	25.0	0.3	Amplifier	100	7.5v	110	4	49	13000	8000	—	2000	2.1		
							200	180 μ	125	2.2	46	28000	8000	—	4000	3.8		

Note: For footnotes, see end of this section. Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F)		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. O.	Volts	Arms.										
25W4-GT	Half-Wave Rectifier	F6	4CG	25.0	0.3	Television Damper Service	Max. Peak Inverse Plate Volts, 3850 (Abs.) Max. Peak Plate mA, 750 | Max. Peak Heater-Cathode Volts: { -500 (Abs.) Max. DC Plate mA, 125 | DC Component must not exceed 100 volts. { +200								
25Z5	Rectifier-Doubler	K4	6E	25.0	0.3	Rectifier-Doubler	For other ratings, refer to Type 25Z6-GT.								
25Z6-GT	Rectifier-Doubler	F6	7Q1	25.0	0.3	Voltage Doubler	Max. AC Volts per Plate (RMS), 117 | Min. Total Effective Plate-Supply Max. DC Output mA, 75 | Imped: Half-Wave, 30 ohms; Full-Wave, 15 ohms								
						Half-Wave Rectifier	Max. AC Volts per Plate (RMS), 235 | Min. Total Effect. Supply Imped. per Max. DC Output mA per Plate, 75 | Plate: at 117 volts, 15 ohms; at 150 volts, 40 ohms; at 235 volts, 100 ohms								
35B5	Beam Power Tube	A3	7BZ	35.0	0.15	Class A Amp	110	- 7.5v	110	3.0	40.0	13000	5800	2500	1.5
35GL6	Beam Power Tube	A3	7FZ	35.0	0.15	Class A Amp	110	- 7.5v	110	3	45	12000	7500	2500	1.8
35Y4	Half-Wave Rectifier Heater Tap for Pilot	J3	5AL	35.0	0.15	With Capacitive-Input Filter	Max. AC Plate Volts (RMS), 117. | Min. Total Effect. | Plate-Supply Max. DC Output mA : With Pilot and No Shunt Res , 60; | Impedance, 15: With Pilot and Shunt Res., 90; | Without Pilot, 100.								
35Z4GT	Half-Wave Rectifier	F6	5AA	35.0	0.15	With Capacitive-Input Filter	Min. Total Effective Plate-Supply Impedance: Up to 117 volts, 15 ohms; Max. DC Output mA , 100 | at 235 volts, 100 ohms.								
						With Capacitive-Input Filter	Min. Total Effect. Plate-Supply Imped.: Up to 117 volts, 15 ohms; at 235 Max. DC Output mA : With Pilot and | volts, 100 ohms. No Shunt Res. , 60; With Pilot and Shunt Res , 90; Without Pilot, 100.								
42	Power Pentode	K8	6B	6.3	0.7	Amplifier	For other characteristics, refer to Type 6F6-G.								
43	Power Pentode	K8	6B	25.0	0.3	Class A Amp	95	- 15v	95	4	20	45000	2000	4500	0.9
50A5	Beam Power Tube	J3	6AA	50.0	0.15	Single-Tube Class A Amp	100	- 7.5v	110	4	49	13000	8000	2000	2.1
							200	180 Ω	125	2.2	46	28000	8000	4000	3.8

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F) Unless specified all types have heaters. \oplus Heater with controlled warmup time.		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts
		Dim.	B. D.	Volts	Amps.										
50FK5	Power Pentode	A3	7CV	50.0	0.1	Class A Amp	110	62 Ω	115	8.5	32	14000	12800	3000	1.2
50X6	Rectifier-Doubler	J3	7DX	50.0	0.15	Rectifier-Doubler	For other ratings, refer to Type 25Z6-GT.								
50Y6-GT	Rectifier-Doubler	F6	7Q1	50.0	0.15	Rectifier-Doubler	For other ratings, refer to Type 25Z6-GT								
80	Full-Wave Rectifier	K8	4C	5.0F	2.0	With Capacitive-Input Filter	AC Volts per Plate (RMS), 350 Max. Peak Inverse Volts, 1400 Min. Total Effect. Supply Imped. per Plate, 50 ohms			DC Output mA, 125 Max. Peak Plate mA, 440					
						With Inductive-Input Filter	AC Volts per Plate (RMS), 500 Max. Peak Inverse Volts, 1400 Min. Value of Input Choke, 10 henries			Max. DC Output mA, 125 Max. Peak Plate mA, 440					
84/6Z4	Full-Wave Rectifier	K4	5D	6.3	0.5	With Capacitive-Input Filter	AC Volts per Plate (RMS), 325 Max. Peak Inverse Volts, 1250 Total Effect. Supply Imped. per Plate, 150 ohms.			DC Output mA, 60 Max. Peak Plate mA, 180					
						With Inductive-Input Filter	AC Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1250 Value of Input Choke, 10 henries			Max. DC Output mA, 60 Max. Peak Plate mA, 180					
117L7-GT/ 117M7-GT	Rectifier-Beam Power Tube	F9	8A0	117	0.09	Amplifier Unit as Class A Amp	105	- 5.2v	105	4	43	17000	5300	4000	0.85
						Half-Wave Rectifier	Max. AC Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350 Min. Total Effect. Plate-Supply Imped., 15 ohms			Max. DC Output mA, 75 Max. Peak Plate mA, 450					

Note: For footnotes, see end of this section. Δ For key to tube dimensions, description, and basing diagram, see end of this section.

Type	Name	Tube Dimensions and Basing Diagram Δ		Heater or Filament (F)		Use Values to right give operating conditions and characteristics for indicated typical use	Plate Supply Volts	Grid Bias Volts (v) or Cathode Resistor Ohms (Ω)	Screen Supply Volts	Screen Current mA	Plate Current mA	AC Plate Resistance Ohms	Trans-conductance Micromhos	Load for Stated Power Output Ohms	Power Output Watts	
		Dim.	B. O.	Volts	Amps.											
117N7-GT	Rectifier-Beam Power Tube	F9	8AV	117	0.09	Amplifier Unit as Class A Amp	100	-6v	100	5	51	16000	7000	3000	1.2	
						Half-Wave Rectifier	Max. AC Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350 Min. Total Effect. Plate-Supply Impedance, 15ohms. Max. DC Output mA, 75 Max. Peak Plate mA, 450									
117Z3	Half-Wave Rectifier	A3	4CB	117	0.04	With Capacitive-Input Filter	Max. Peak Inverse Volts, 330 Min. Total Effect. Plate-Supply Imped., 20 ohms Max. DC Output mA, 90 Max. Peak Plate mA, 540									
5881	Beam Power Tube	F10	7AC	6.3	0.9	Single Tube Class A Amp	250 350	-14v -18v	250 250	4.3 2.5	75 53	30000 48000	6100 5200	2500 4200	6.7 11.3	
						Push-Pull Class A Amp	250 270	-16v -17.5v	250 270	10 \uparrow 11 \uparrow	120 \uparrow 134 \uparrow	— —	— —	5000 5000	14.5 \uparrow 17.5 \uparrow	
						Push-Pull Class AB ₁ Amp	360 360	-22.5v -22.5v	270 270	5 \uparrow 5 \uparrow	88 \uparrow 88 \uparrow	— —	— —	6600 3800	26.5 \uparrow 18 \uparrow	
7247	Dual Triode	B2	9A	12.6 6.3	0.15 0.3	Unit No. 1 as Class A Amp	250	-2v	μ = 100		1.2	62500	1600	—	—	
						Unit No. 2 as Class A Amp	250	-8.5v	μ = 17		10.5	7700	2200	—	—	
7695	Beam Power Tube	H2	9PX	50	0.15	Class A Amp	130	-11v	130	5	100	7000	11000	1100	4.5	
						Push-Pull Class AB Amp	140	50 Ω	140	9 \uparrow	210 \uparrow	—	—	1500	10 \uparrow	
EM84/6FG6	Electron-Ray Tube	B8	9GA	6.3	0.27	Visual Indicator	Triode Plate Supply Volts, 250 Triode-Plate Resistance, 1 meg. Triode Grid-Supply Volts, -22 Max. Length of Dark Part of Target, when triode grid resistor = 0, 1.14 inch Fluorescent-Target Volts, 250 Triode-Grid Resistance, 0.47 meg. Triode Plate mA, 0.06 Fluorescent Target mA, 1.6									

FOOTNOTES

- Note 1:** Subscript 1 on class of amplifier service (as AB₁) indicates that grid current does not flow during any part of input cycle.
- With tube mounted horizontally and pins No. 4 and No. 8 in a vertical plane (pin No. 4 on top), deflecting electrode No. 1 controls left-hand section of pattern, deflecting electrode No. 2 controls top right-hand section of pattern, deflecting electrode No. 3 controls bottom section of pattern.
 - ▴ Supply voltage applied through 20000-ohm voltage-dropping resistor.
 - Both grids connected together; likewise, both plates.
 - ▲ Grids * 2 and * 4 are screen. Grid * 3 is signal-input control grid.
 - Grids * 3 and * 5 are screen. Grid * 4 is signal-input control grid.
 - † Power output is for two tubes at stated plate-to-plate load.
 - ✖ Applied through plate resistor of 250000 ohms
 - ▲ Grids * 2 and * 4 are screen. Grid * 1 is signal-input control grid.
 - ‡ This diagram is like the one having the same designation except that Pin No. 1 has no connection.
 - ✖ This diagram is like the one having the same designation except that base sleeve is connected to Pin No. 1.
 - For use in automobile receivers which operate directly from 12-volt storage batteries.
 - § Megohms. ◆ For two tubes. ● 50000 ohms.

KEY TO TUBE DIMENSIONS

Symbol	Maximum Overall		Description
	Length	x Diameter	
A1	1-3/4"	x 3/4"	7-Pin Miniature Types
A2	2-1/8"	x 3/4"	
A3	2-5/8"	x 3/4"	
B1	1-3/4"	x 7/8"	9-Pin Miniature Types
B2	2-3/16"	x 7/8"	
B4	2-5/8"	x 7/8"	
B5	2-11/16"	x 7/8"	
B8	2-27/32"	x 7/8"	
C1	3.410"	x 1.188"	Navar Type
E2	2-5/8"	x 1-5/16"	Octal-Metal Types
E3	3-1/8"	x 1-5/16"	
E4	3-1/4"	x 1-5/16"	

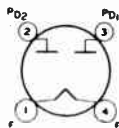
Symbol	Maximum Overall		Description
	Length	x Diameter	
F1	2 5/16"	x 1-5/16"	Octal-Glass Types
F6	3-5/16"	x 1-9/32"	
F7	3 5/16"	x 1-5/16"	
F8	3 3/8"	x 1-9/32"	
F9	3 7/16"	x 1-9/32"	
F10	3-15/32"	x 1 7/16"	
F15	3-13/16"	x 1 9/32"	
F16	3-7/8"	x 1-9/32"	
F17	3-7/8"	x 1 9/16"	
F19	4"	x 1 9/16"	
F24	4-15/32"	x 1 9/16"	
F25	4-5/8"	x 1 9/16"	
F29	4-3/4"	x 1-9/16"	
F33	5"	x 1 9/16"	
F38	5-7/32"	x 1 23/32"	
F39	5-5/16"	x 2 1/16"	
F40	5-11/16"	x 2 1/16"	

Symbol	Maximum Overall		Description
	Length	x Diameter	
G1	2.190"	x 0.875"	10-Pin Miniature Type
H2	3.23"	x 1.188"	9-Pin T9-Bulb Type
J2	2-25/32"	x 1-3/16"	Lock-In Types
J3	3 5/32"	x 1-3/16"	
K3	4 3/16"	x 1-3/16"	Other Types
K4	4 3/16"	x 1-9/16"	
K5	4-17/32"	x 1 9/16"	
K8	4-11/16"	x 1-13/16"	
K9	4 15/16"	x 1-9/16"	
K11	5-3/8"	x 2-1/16"	
L2	2.875"	x 1.563"	12-Pin T9-Bulb Types
L3	3.625"	x 1.563"	

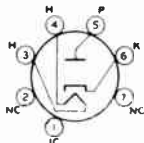
KEY: BASING DIAGRAMS (Bottom Views)

- | | | |
|---------------------------------|--|--|
| ● = Gas-Type Tube | F+ = Filament (positive only) | IS = Internal Shield |
| BC = Base Sleeve | F- = Filament (negative only) | K = Cathode |
| BS = Base Shell | F _M = Filament Tap | LC = Limited Connection—Do Not Use,
Except As Specified in Data |
| C = External Conductive Coating | G = Grid | NC = No Internal Connection |
| CL = Collector | H = Heater | P = Plate (Anode) |
| DJ = Deflecting Electrode | HL = Heater Tap for Panel Lamp | RC = Ray-Control Electrode |
| ES = External Shield | H _M = Heater Tap | S = Shell |
| F = Filament | IC = Internal Connection
Do Not Use | TA = Target |

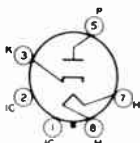
Subscripts for multi-unit types: B, beam unit; D, diode unit; HP, heptode unit; HX, hexode unit; P, pentode unit; T, triode unit; TR, tetrode unit.



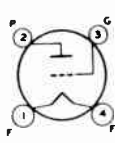
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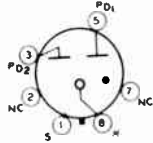
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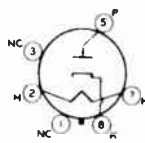
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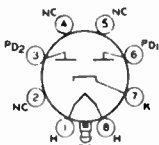
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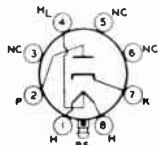
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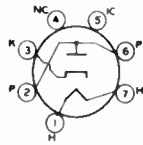
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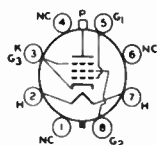
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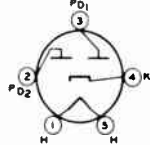
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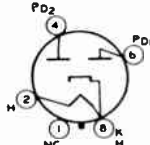
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5BT



5D

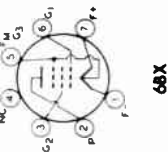
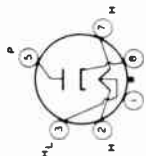
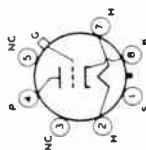
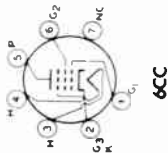
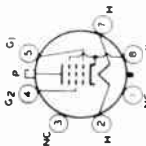
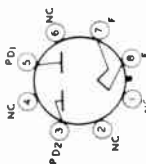
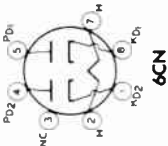
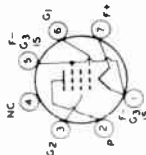
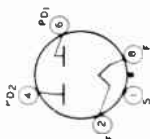
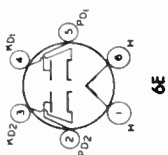
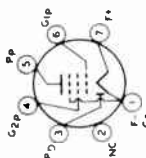
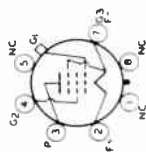
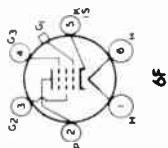
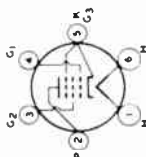
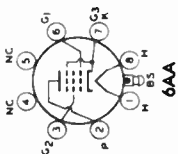
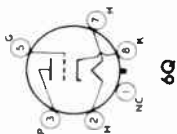
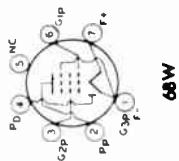
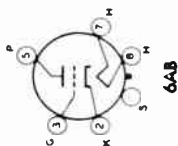


5L



RCA RECEIVING-TUBE DATA

Types Not Recommended for New Equipment Design



Electronic Components

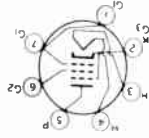
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RCA RECEIVING-TUBE DATA

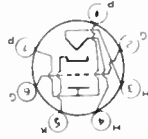
Types Not Recommended for New Equipment Design



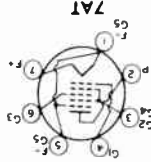
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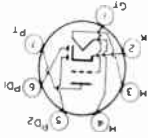
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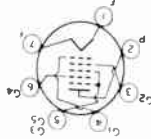
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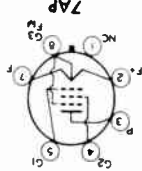
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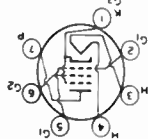
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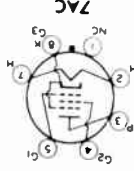
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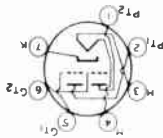
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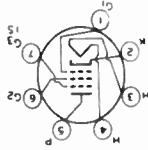
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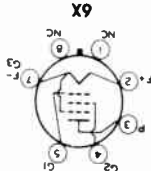
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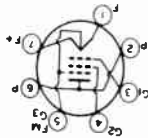
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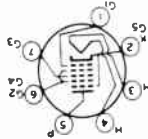
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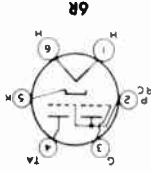
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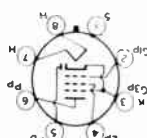
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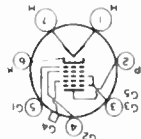
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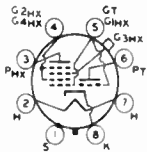


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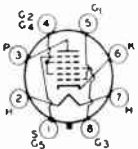


Electronic
Components

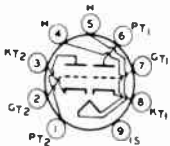
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TUBE DATA 11



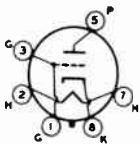
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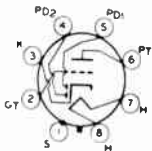
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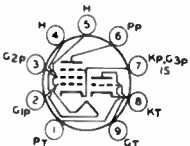
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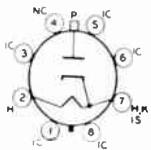
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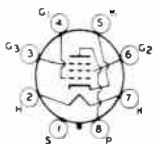
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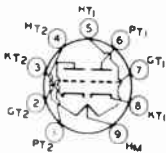
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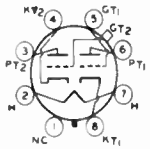
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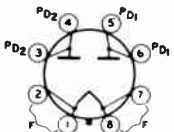
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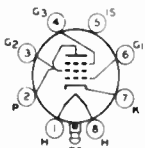
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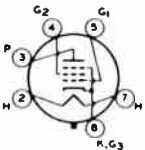
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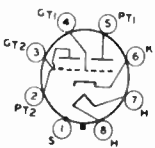
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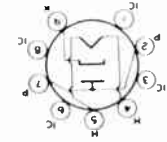
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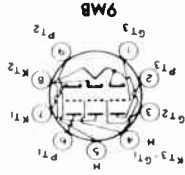
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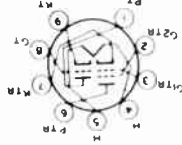
Types Not Recommended for New Equipment Design



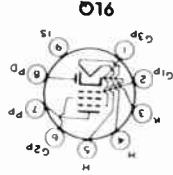
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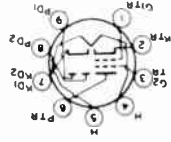
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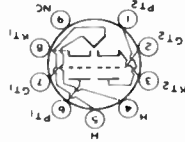
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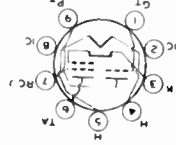
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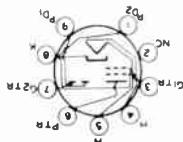
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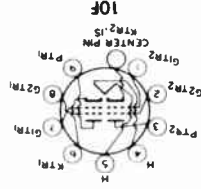
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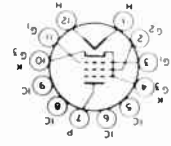
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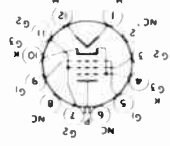
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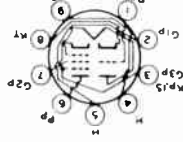
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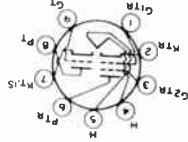
128J



12DR



9FZ



9JD



9PX



Electronic
Components

RCA RECEIVING
TUBE DATA 13

Safety Precautions (I) For Receiving Tubes

High voltage rectifier and shunt regulator receiving tubes operate at potentials which may result in the production of X-Radiation.

Precautions must be exercised during the servicing of equipment employing these devices to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

NOTE: For additional Safety Precautions, refer to sheet *Safety Precautions (II) For Receiving Tubes* which follows.



Safety Precautions (II) For Receiving Tubes

SHOCK HAZARD WARNING

Most electron tubes present a shock hazard in use because of the voltages at which they operate. This hazard applies to all applications and is not restricted to high-voltage circuits. Therefore, precautions should be taken when servicing equipment in which electron tubes are used.

Some electron tubes such as high-voltage rectifiers and shunt regulators operate with very high electrode voltages. Extreme care should be taken during testing or adjustment of circuits in which such tubes are employed. Precautions must be exercised during the replacement or servicing of these tubes in equipment to assure that the high-voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector. The tube and its associated apparatus, especially all parts which may be at high-potential with respect to ground, should be housed in a protective enclosure. The protective housing should be designed with interlocks so that personnel cannot possibly come in contact with any high-potential point in the electrical system.

It should be noted that high voltages may appear at normally low-potentials points in the circuit as a result of capacitor breakdown or incorrect circuit connections. Therefore, before any part of the circuit is touched, the power supply switch should be turned off and both terminals of any capacitor should be grounded.

X-RADIATION WARNING

High-voltage rectifier and shunt regulator receiving tubes operate at potentials which may result in the production of X-Radiation. Types covered in the HB-3 Handbook which fall into these categories and which have EIA published values for X-Radiation are tested for an X-Radiation characteristic as specified in their published data.

X-Radiation is measured in accordance with JEDEC Publication No. 67 A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publications No. 73 A, "Recommended Practice for Quality Control of X-Radiation from High Voltage Rectifier and Shunt Regulator Receiving Tubes". These publications are available from the Electronic Industries Association, 2001 Eye St. N. W., Washington, D. C. 20006.

Safety Precautions (II) For Receiving Tubes

Operation of these devices above the design-maximum values indicated in their Maximum Ratings may result in either temporary or permanent changes in the X-Radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

The high voltages associated with these devices result in production of X-Radiation which may constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing these devices to assure that the high-voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.



DIODE CONSIDERATIONS

DIODE-TRIODE AND DIODE-PENTODE TUBES

Certain multi-unit tubes contain one or more diode plates, each having its own base pin, in addition to a triode or pentode unit. Such types may employ either a unipotential cathode or a filamentary cathode.

In unipotential-cathode tubes the cathode is common to the triode or pentode unit and the diode(s). In filamentary-cathode tubes the filament is likewise common to the triode or pentode unit and the diode(s). However, in filament types, diode operation is affected by the position of the diode plate(s) with respect to the filament, and, therefore, the position of the diode plate(s) is specified on the individual tube data sheets.

The rectifying action of the diode is commonly used for the following purposes:

Detection: Detection may be accomplished by using either a half-wave or full-wave circuit arrangement to supply signal voltage to the triode or pentode unit of the tube or to another amplifier tube. The half-wave circuit will provide approximately twice the rectified voltage obtainable from a full-wave circuit for the same applied signal voltage. Since the amplitude variation of the envelope of the rectified voltage is usually of greater importance than rectifier power, the half-wave circuit is more commonly used in practice.

AVC: Regulation of amplifier gain, generally called Automatic Volume Control, may be accomplished by using the output of a diode rectifier in a number of ways. The diode output may be applied to the control grids of the preceding amplifier tubes, or it may be applied, in the case of rf pentodes, to their suppressors, plates and/or screens.

The above functions can be performed simultaneously by using a single diode, two diodes in parallel, or by two diodes operating independently. A number of typical circuit arrangements are shown on the following pages.

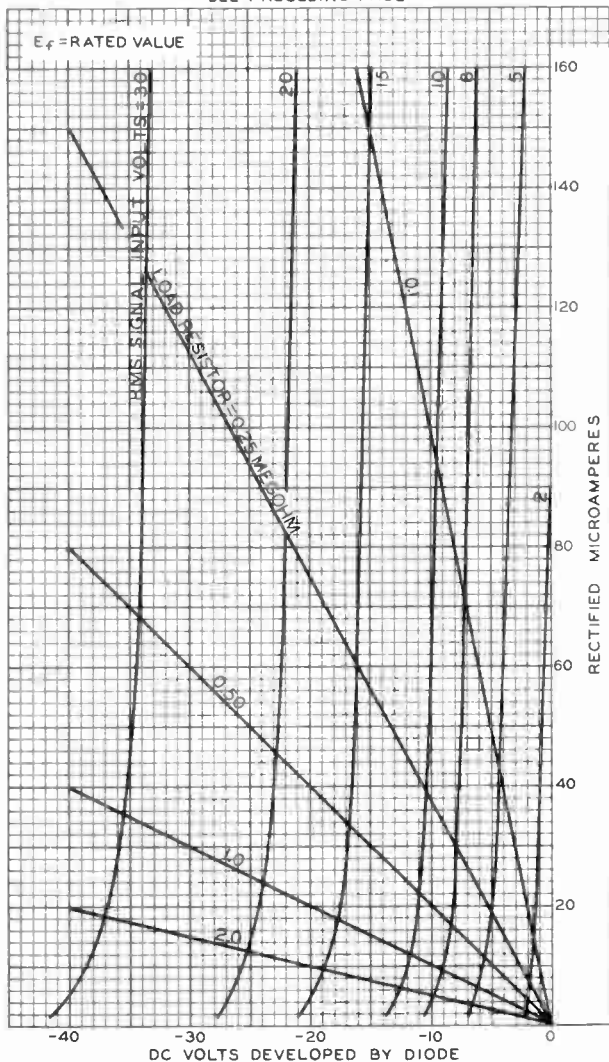
Average Characteristic Curves for diodes in diode-triode and diode-pentode tubes are shown on the next page.



AVERAGE DIODE CHARACTERISTICS

HALF-WAVE RECTIFICATION-SINGLE DIODE UNIT

SEE PRECEDING PAGE



JULY 15, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

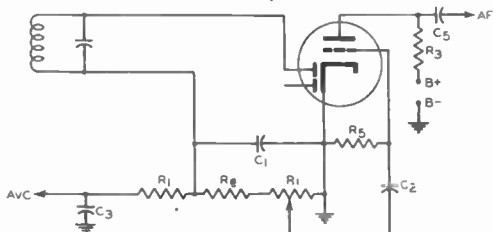
92CM-6875



DIODE CONSIDERATIONS

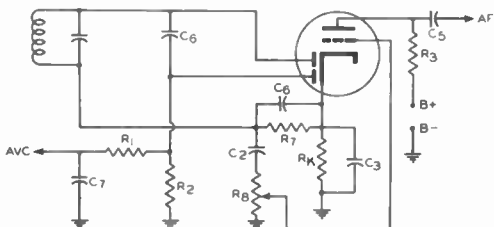
TYPICAL DIODE-TRIODE CIRCUITS

HALF-WAVE DETECTOR, AVC, ZERO-BIAS AMPLIFIER



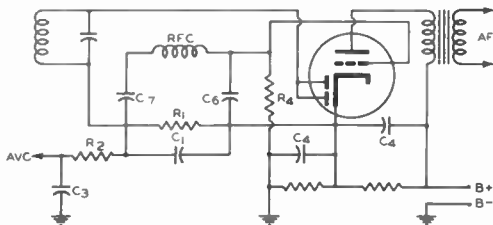
92CS-8677

HALF-WAVE DETECTOR AND DELAYED AVC, CATHODE-BIAS AMPLIFIER



92CS-6679

HALF-WAVE DETECTOR, AVC, FIXED-BIAS AMPLIFIER



92CS-6678A1

TYPICAL VALUES

C1: 150 μf for
450-1600 kc
C2: 0.01 μf
C3: 0.1 μf
C4: 0.5 μf or larger
C5: 0.01 to 0.1 μf
or larger

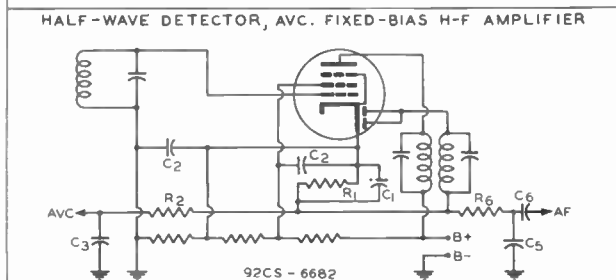
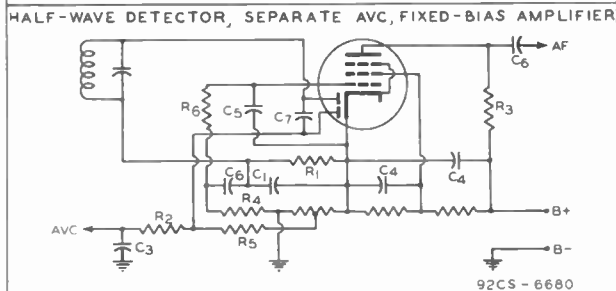
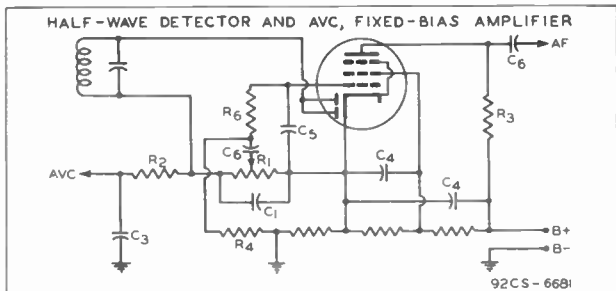
C6: 100 μf
C7: 0.01 to 0.05 μf
R1: 0.5 Megohm
R2: 1.0 Megohm

R3: 0.1 Megohm
R4: 0.05 to 1.0
Megohm
R5: 10 Megohms
R6: 22000 Ohms
R7: 0.25 Megohm
R8: 1 to 2 Megohm



DIODE CONSIDERATIONS

TYPICAL DIODE-PENTODE CIRCUITS



TYPICAL VALUES

C1: 150 μf for 450-1600 kc
 C2, C3: 0.1 μf
 C4: 0.5 μf or larger
 C5: 100 μf or smaller
 C6: 0.01 to 0.1 μf
 C7: 500 to 1000 μf

R1: 0.5 to 1.0 Megohm
 R2: 1.0 to 1.5 Megohms
 R3: 0.1 to 0.2 Megohm
 R4: 0.5 to 1.0 Megohm
 R5: 1.0 Megohm
 R6: 0.1 to 0.2 Megohm

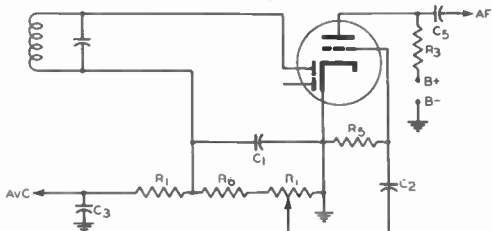
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DIODE CONSIDERATIONS

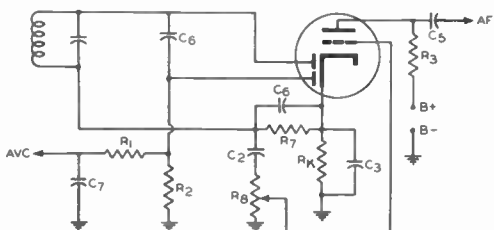
TYPICAL DIODE-TRIODE CIRCUITS

HALF-WAVE DETECTOR, AVC, ZERO-BIAS AMPLIFIER



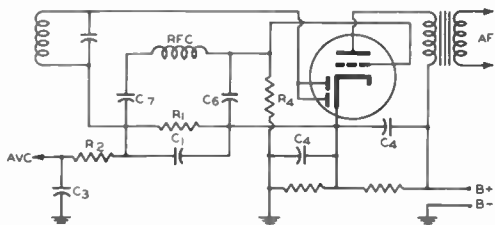
92CS-6677

HALF-WAVE DETECTOR AND DELAYED AVC, CATHODE-BIAS AMPLIFIER



92CS-6679

HALF-WAVE DETECTOR, AVC, FIXED-BIAS AMPLIFIER



92CS-6678A1

TYPICAL VALUES

C1: 150 μf for
450-1600 kc
C2: 0.01 μf
C3: 0.1 μf
C4: 0.5 μf or larger
C5: 0.01 to 0.1 μf
or larger

C6: 100 μf
C7: 0.01 to 0.05 μf
R1: 0.5 Megohm
R2: 1.0 Megohm

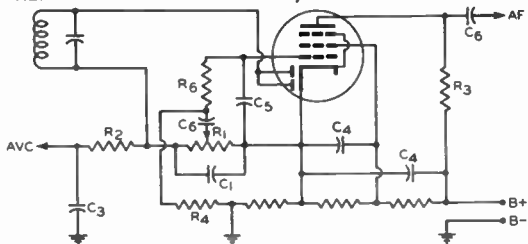
R3: 0.1 Megohm
R4: 0.05 to 1.0
Megohm
R5: 10 Megohms
R6: 22000 Ohms
R7: 0.25 Megohm
R8: 1 to 2 Megohm



DIODE CONSIDERATIONS

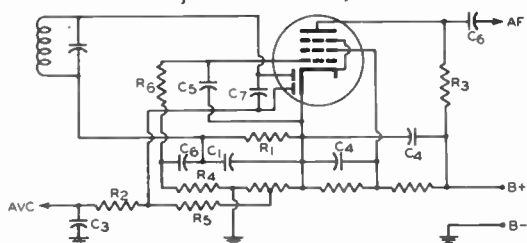
TYPICAL DIODE-PENTODE CIRCUITS

HALF-WAVE DETECTOR AND AVC, FIXED-BIAS AMPLIFIER



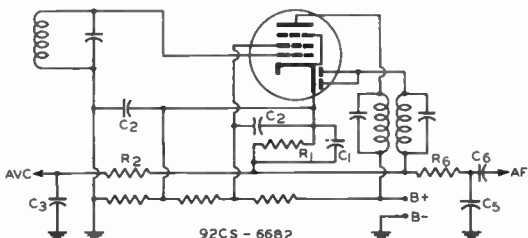
92CS-6681

HALF-WAVE DETECTOR, SEPARATE AVC, FIXED-BIAS AMPLIFIER



92CS-6680

HALF-WAVE DETECTOR, AVC, FIXED-BIAS H-F AMPLIFIER



92CS-6682

TYPICAL VALUES

C1: 150 μmf for 450-1600 kc
 C2, C3: 0.1 μf
 C4: 0.5 μf or larger
 C5: 100 μmf or smaller
 C6: 0.01 to 0.1 μf
 C7: 500 to 1000 μmf

R1: 0.5 to 1.0 Megohm
 R2: 1.0 to 1.5 Megohms
 R3: 0.1 to 0.2 Megohm
 R4: 0.5 to 1.0 Megohm
 R5: 1.0 Megohm
 R6: 0.1 to 0.2 Megohm

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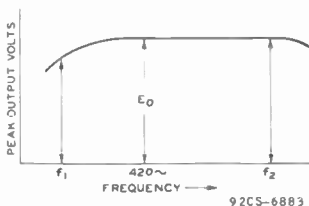
RESISTANCE-COUPLED AMPLIFIERS

Symbols used in the following text and charts are explained at the end of the text.

GENERAL CIRCUIT CONSIDERATIONS

In the discussions which follow, the frequency (f_2) is that value at which the high-frequency response begins to fall off. The frequency (f_1) is that value at which the low-frequency response drops below a satisfactory value, as discussed below. Decoupling filters are not necessary for two stages or less.

A variation of 10 per cent in values of resistors and capacitors has only slight effect on performance. One-half-watt resistors are usually suitable for R_{g2} , R_g , R_p , and R_k resistors. Capacitors C and C_{g2} should have a working voltage equal to or greater than E_{bb} . Capacitor C_k may have a low working voltage in the order of 10 to 25 volts. Peak Input Voltage is equal to the Peak Output Voltage divided by the Voltage Gain.



Triode (Heater-Cathode Type) Amplifier

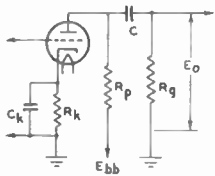


Diagram No. 1

Capacitors C and C_k have been chosen to give an output voltage equal to $0.8 E_0$ for a frequency (f_1) of 100 cycles. For any other values of (f_1), multiply values of C and C_k by $100/f_1$. In the case of capacitor C_k , the values shown in the charts are for an amplifier with dc heater excitation; when ac is used, depending on the character of the associated circuit, the gain, and the value of f_1 , it may be necessary to increase the value of C_k to minimize hum

disturbances. It may be desirable to operate the heater at a positive voltage of from 15 to 40 volts with respect to the cathode. The voltage output at f_1 , of "n" like stage equals $(0.8)^n E_0$ where E_0 is the peak output voltage of the final stage. For an amplifier of typical construction, the value of f_2 is well above the audio-frequency range for any value of R_p .

Pentode (Filament-Type) Amplifier

Capacitors C and C_{g2} have been chosen to give an output voltage equal to $0.8 E_0$ for a frequency (f_1) of 100 cycles. For any other value of f_1 , multiply values of C and C_{g2} by $100/f_1$. The voltage output at f_1 for "n" like stages equals $(0.8)^n E_0$



RESISTANCE-COUPLED AMPLIFIERS

(continued from preceding page)

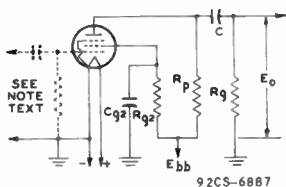


Diagram No. 2

where E_o is the peak output voltage of the final stage. For an amplifier of typical construction, and for R_p values of 0.1, 0.25, and 0.5 megohm, approximate values of f_2 are 20000, 10000, and 5000 cps, respectively.

Note: The values of input coupling capacitor in microfarads and of grid resistor in megohms should be such that their product lies between 0.02 and 0.1. Values commonly used are 0.005 μ f and 10 megohms.

92CS-6887

Pentode (Heater-Cathode Type) Amplifier

Capacitors C , C_k , and C_{g2} have been chosen to give an output voltage equal to 0.7 E_o for a frequency (f_1) of 100 cycles. For any other value of f_1 , multiply values of C , C_k , and C_{g2} by 100/ f_1 . In the case of capacitor C_k , the values shown in the charts are for an amplifier with dc heater excitation; when ac is used, depending on the character of the associated circuits, the voltage gain, and the value of f_1 , it may be necessary to increase the value of C_k to minimize hum disturbances. It may be desirable to operate the heater at a positive voltage of from 15 to 40 volts with respect to the cathode. The voltage output at f_1 for "n" like stages equals $(0.7)^n E_o$ where E_o is the peak output voltage of the final stage. For an amplifier of typical construction, and for R_p values of 0.1, 0.25, and 0.5 megohm, approximate values of f_2 are 20000, 10000, and 5000 cps, respectively.

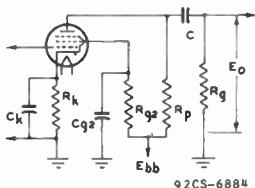


Diagram No. 3

Phase Inverters

Information given for triode amplifiers, in general, applies to this case. Capacitors C have been chosen to give an output voltage equal to 0.9 E_o for a frequency (f_1) of 100 cycles. For any other value of f_1 , multiply values of C by 100/ f_1 . The signal input is applied to the grid of triode unit A. The grid of triode unit B obtains its signal from a tap (P) on the grid resistor (R_g) in the output circuit of unit A. The tap is chosen so as to make the voltage output of unit B equal to that of unit A. Its location is determined by the voltage gain values given in the charts. For



RESISTANCE-COUPLED AMPLIFIERS

(continued from preceding page)

example, if V.G. is 20 (from the charts), P is chosen so as to supply 1/20 of the voltage across R_g to the grid of unit B. For phase-inverter service, the cathode resistor may be left un-bypassed unless a bypass capacitor is necessary to minimize hum; omission of the bypass capacitor assists in balancing the output stages. The value of R_k is specified on the basis that both units are operating simultaneously at the same values of plate load and plate voltage.

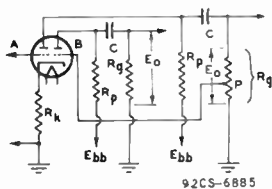


Diagram No. 4

SYMBOLS USED IN RESISTANCE-COUPLED AMPLIFIER CHARTS

- C = Blocking Capacitor (μf).
 C_k = Cathode Bypass Capacitor (μf).
 C_{g2} = Screen Bypass Capacitor (μf).
 E_{bb} = Plate-Supply Voltage (volts).
 Voltage at plate equals plate-supply voltage minus drop in R_p and R_k . See Note 1, below.
 R_k = Cathode Resistor (ohms).
 R_{g2} = Screen Resistor (megohms).
 R_g = Grid Resistor (megohms) for following stage.
 R_p = Plate Resistor (megohms).
 V.G. = Voltage Gain. At 5 volts (RMS) output, unless otherwise specified.
 E_o = Peak Output Voltage (volts).
 This voltage is obtained across R_g (for following stage) at any frequency within the flat region of the output vs frequency curve, and is for the condition where the signal level is adequate to swing the resistance-coupled amplifier tube to the point where its grid starts to draw current.

Note 1: For other supply voltages differing by as much as 50 per cent from those listed, the values of resistors, capacitors, and voltage gain are approximately correct. The value of voltage output, however, for any of these other supply voltages, equals the listed voltage output multiplied by the new plate-supply voltage divided by the plate-supply voltage corresponding to the listed voltage output.

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KEY TO RESISTANCE-COUPLED AMPLIFIER CHARTS

<u>Tube Type</u>	<u>Chart No.</u>	<u>Tube Type</u>	<u>Chart No.</u>	<u>Tube Type</u>	<u>Chart No.</u>
1L4	1	6Q7-G	7	12AY7 ##.	28
1S5	2	6Q7-GT	7	12C8	5
1U4	3	6R7	9	12F5-GT	18
1U5	2	6R7-GT	9	12J5-GT	13
2B7	5	6S7	16	12J7-GT { t.	11
6A6 #	6	6S7-G	16	{ p.	14
6AQ6	7	6S8-GT	4	12Q7-GT	7
6AQ7-GT	7	6SC7 #	17	12S8-GT	4
6AT6	7	6SF5	18	12SC7 #	17
6AU6	8	6SF5-GT	18	12SF5	18
6AV6	25	6SF7	19	12SF7	19
6B7	5	6SH7	8	12SH7	8
6B8	5	6SJ7	20	12SJ7	20
6BF6	9	6SJ7-GT	20	12SJ7-GT.	20
6C4	10	6SL7-GT ##	7	12SL7-GT ##	7
6C5	11	6SN7-GT ##	13	12SN7-GT ##	13
6C5-GT	11	6SN7-GTA ##	29	12SQ7	4
6C6 { t.	11	6SQ7	4	12SQ7-GT	4
{ p.	14	6SQ7-GT	4	12SR7	9
6C8-G ##	12	6SR7	9	19T8	7
6F5	18	6ST7	9	53 #	6
6F5-GT	18	6SZ7	7	55	22
6F8-G ##	13	6T8	7	56	23
6J5	13	6W7-G { t.	11	57 { t.	11
6J5-GT	13	{ p.	14	{ p.	14
6J7		12AT6	7	75	4
6J7-G } { t.	11	12AU6	8	76	23
6J7-GT } { p.	14	12AV6	25	85	22
6N7 #	6	12AU7 ##.	10	5879 { t.	27
6N7-GT #	6	12AX7 ##.	25	{ p.	26
6Q7	7				

The cathodes of the two units have a common terminal.

Chart values are for one triode unit. The cathodes of each unit have separate terminals.

t - Triode Connection

p - Pentode Connection



RESISTANCE-COUPLED AMPLIFIER CHARTS

See Circuit Diagram 2									1
Ebb	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
45	0.22	0.22	0.24	-	0.071	-	0.011	12	16*
		0.47	0.32	-	0.06	-	0.006	14	23
		1.0	0.39	-	0.056	-	0.0035	18	30
	0.47	0.47	0.57	-	0.049	-	0.0052	14	22
		1.0	0.64	-	0.047	-	0.0035	17	30
		2.2	0.74	-	0.044	-	0.0018	19	33
	1.0	1.0	1.1	-	0.036	-	0.0028	14	28
		2.2	1.25	-	0.035	-	0.0018	16	32
		3.3	1.45	-	0.032	-	0.0015	18	38
90	0.22	0.22	0.4	-	0.089	-	0.011	26	28
		0.47	0.46	-	0.081	-	0.0055	36	36
		1.0	0.47	-	0.08	-	0.0035	42	41
	0.47	0.47	0.84	-	0.07	-	0.0055	30	34
		1.0	0.9	-	0.069	-	0.003	38	42
		2.2	1.0	-	0.062	-	0.0018	40	50
	1.0	1.0	2.0	-	0.045	-	0.0028	30	45
		2.2	2.1	-	0.045	-	0.0018	35	55
		3.3	2.2	-	0.044	-	0.0012	40	61
135	0.22	0.22	0.5	-	0.09	-	0.011	42	34
		0.47	0.63	-	0.074	-	0.0055	54	51
		1.0	0.67	-	0.072	-	0.0035	57	60
	0.47	0.47	1.1	-	0.071	-	0.005	47	49
		1.0	1.4	-	0.06	-	0.0028	54	68
		2.2	1.5	-	0.051	-	0.0018	60	87
	1.0	1.0	2.1	-	0.059	-	0.0025	45	53
		2.2	2.4	-	0.054	-	0.0018	57	88
		3.3	2.7	-	0.049	-	0.0012	61	91

* At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> 2 </div>		See Circuit Diagram 2							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
45	0.22	0.22	0.26	-	0.042	-	0.013	14	17
		0.47	0.36	-	0.035	-	0.006	17	24
		1.0	0.4	-	0.034	-	0.004	18	28
	0.47	0.47	0.82	-	0.025	-	0.0055	14	25
		1.0	1.0	-	0.023	-	0.003	17	33
		2.2	1.1	-	0.022	-	0.002	18	38
	1.0	1.0	1.9	-	0.019	-	0.003	14	31
		2.2	2.0	-	0.019	-	0.002	17	38
		3.3	2.2	-	0.018	-	0.0015	18	43
90	0.22	0.22	0.5	-	0.05	-	0.011	31	25
		0.47	0.59	-	0.05	-	0.006	37	34
		1.0	0.67	-	0.042	-	0.003	40	41
	0.47	0.47	1.2	-	0.035	-	0.005	31	37
		1.0	1.4	-	0.034	-	0.003	36	47
		2.2	1.6	-	0.031	-	0.002	40	57
	1.0	1.0	2.5	-	0.026	-	0.003	31	45
		2.2	2.9	-	0.025	-	0.002	36	58
		3.3	3.1	-	0.024	-	0.0012	38	66
135	0.22	0.22	0.66	-	0.052	-	0.011	45	31
		0.47	0.71	-	0.051	-	0.006	56	41
		1.0	0.86	-	0.039	-	0.003	60	54
	0.47	0.47	1.45	-	0.042	-	0.005	46	44
		1.0	1.8	-	0.034	-	0.003	54	62
		2.2	1.9	-	0.033	-	0.002	60	71
	1.0	1.0	3.1	-	0.03	-	0.003	45	56
		2.2	3.7	-	0.029	-	0.0015	53	76
		3.3	4.3	-	0.026	-	0.0014	56	88



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 2									3
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
45	0.22	0.22	0.06	-	0.046	-	0.011	11	23
		0.47	0.07	-	0.045	-	0.006	15	33
		1.0	0.011	-	0.04	-	0.003	17	39
	0.47	0.47	0.34	-	0.025	-	0.005	13	34
		1.0	0.44	-	0.022	-	0.003	16	46
		2.2	0.5	-	0.022	-	0.002	18	55
	1.0	1.0	1.0	-	0.016	-	0.003	14	43
		2.2	1.0	-	0.016	-	0.002	17	51
		3.3	1.1	-	0.015	-	0.001	17	60
90	0.22	0.22	0.3	-	0.046	-	0.01	27	37
		0.47	0.36	-	0.04	-	0.006	36	54
		1.0	0.4	-	0.038	-	0.003	39	63
	0.47	0.47	0.9	-	0.027	-	0.0045	29	61
		1.0	1.0	-	0.023	-	0.003	35	82
		2.2	1.1	-	0.022	-	0.002	38	96
	1.0	1.0	1.9	-	0.02	-	0.0025	30	77
		2.2	2.0	-	0.02	-	0.002	35	98
		3.3	2.2	-	0.018	-	0.001	37	114
135	0.22	0.22	0.4	-	0.052	-	0.011	44	46
		0.47	0.49	-	0.037	-	0.005	55	71
		1.0	0.52	-	0.034	-	0.003	60	83
	0.47	0.47	1.1	-	0.029	-	0.0045	45	77
		1.0	1.3	-	0.023	-	0.003	53	106
		2.2	1.4	-	0.022	-	0.002	59	123
	1.0	1.0	2.3	-	0.021	-	0.0025	45	104
		2.2	2.5	-	0.019	-	0.0015	53	136
		3.3	2.9	-	0.016	-	0.001	56	163



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

4		See Circuit Diagram 1							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	6300	-	2.2	0.02	3	23◐
		0.25	-	6600	-	1.7	0.01	5	29■
		0.5	-	6700	-	1.7	0.006	6	31★
	0.25	0.25	-	10000	-	1.24	0.01	5	34■
		0.5	-	11000	-	1.07	0.006	7	40★
		1.0	-	11500	-	0.9	0.003	10	40
	0.5	0.5	-	16200	-	0.75	0.005	7	39
		1.0	-	16600	-	0.7	0.003	10	44
		2.0	-	17400	-	0.65	0.0015	13	48
180	0.1	0.1	-	2600	-	3.3	0.025	16	29
		0.25	-	2900	-	2.9	0.015	22	36
		0.5	-	3000	-	2.7	0.007	23	37
	0.25	0.25	-	4300	-	2.1	0.015	21	43
		0.5	-	4800	-	1.8	0.007	28	50
		1.0	-	5300	-	1.5	0.004	33	53
	0.5	0.5	-	7000	-	1.3	0.007	25	52
		1.0	-	8000	-	1.1	0.004	33	57
		2.0	-	8800	-	0.9	0.002	38	58
300	0.1	0.1	-	1900	-	4.0	0.03	31	31
		0.25	-	2200	-	3.5	0.015	41	39
		0.5	-	2300	-	3.0	0.007	45	42
	0.25	0.25	-	3300	-	2.7	0.015	42	48
		0.5	-	3900	-	2.0	0.007	51	53
		1.0	-	4200	-	1.8	0.004	60	56
	0.5	0.5	-	5300	-	1.6	0.007	47	58
		1.0	-	6100	-	1.3	0.004	62	60
		2.0	-	7000	-	1.2	0.002	67	63

◐ At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 3									5
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.37	2000	0.07	3.0	0.02	19	24
		0.25	0.5	2200	0.07	3.0	0.01	28	33
		0.5	0.6	2000	0.06	2.8	0.006	29	37
	0.25	0.25	1.18	3500	0.04	1.9	0.008	26	43
		0.5	1.1	3500	0.04	2.1	0.007	33	55
		1.0	1.35	3500	0.04	1.9	0.003	32	65
	0.5	0.5	2.6	5000	0.04	1.5	0.004	22	63
		1.0	2.8	6000	0.04	1.55	0.003	29	85
		2.0	2.9	6200	0.04	1.5	0.003	27	100
180	0.1	0.1	0.44	1000	0.08	4.4	0.02	30	30
		0.25	0.5	1200	0.08	4.4	0.015	52	41
		0.5	0.6	1200	0.07	4.0	0.008	53	46
	0.25	0.25	1.18	1900	0.05	2.7	0.01	39	55
		0.5	1.2	2100	0.06	3.2	0.007	55	69
		1.0	1.5	2200	0.05	3.0	0.003	53	83
	0.5	0.5	2.6	3300	0.04	2.1	0.005	47	81
		1.0	2.8	3500	0.04	2.0	0.003	55	115
		2.0	3.0	3500	0.04	2.2	0.002	53	116
300	0.1	0.1	0.5	950	0.09	4.6	0.025	60	36
		0.25	0.55	1100	0.09	5.0	0.015	89	47
		0.5	0.6	900	0.08	4.8	0.009	86	54
	0.25	0.25	1.2	1500	0.06	3.2	0.015	70	64
		0.5	1.2	1600	0.06	3.5	0.008	100	79
		1.0	1.5	1800	0.08	4.0	0.004	95	100
	0.5	0.5	2.7	2400	0.05	2.5	0.006	80	96
		1.0	2.9	2500	0.05	2.3	0.003	120	150
		2.0	3.4	2800	0.05	2.8	0.0025	90	145



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> 6 </div>		See Circuit Diagram 4							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	1900*	-	-	0.025	13	16
		0.25	-	2250*	-	-	0.01	19	19
		0.5	-	2500*	-	-	0.006	20	20
	0.25	0.25	-	4050*	-	-	0.01	16	20
		0.5	-	4950*	-	-	0.006	20	22
		1.0	-	5400*	-	-	0.003	24	23
	0.5	0.5	-	7000*	-	-	0.006	18	22
		1.0	-	8500*	-	-	0.003	23	23
		2.0	-	9650*	-	-	0.0015	26	23
180	0.1	0.1	-	1300*	-	-	0.03	35	19
		0.25	-	1700*	-	-	0.015	46	21
		0.5	-	1950*	-	-	0.007	50	22
	0.25	0.25	-	2950*	-	-	0.015	40	23
		0.5	-	3800*	-	-	0.007	50	24
		1.0	-	4300*	-	-	0.0035	57	24
	0.5	0.5	-	5250*	-	-	0.007	44	24
		1.0	-	6600*	-	-	0.0035	54	25
		2.0	-	7650*	-	-	0.002	61	25
300	0.1	0.1	-	1150*	-	-	0.03	60	20
		0.25	-	1500*	-	-	0.015	83	22
		0.5	-	1750*	-	-	0.007	86	23
	0.25	0.25	-	2650*	-	-	0.015	75	23
		0.5	-	3400*	-	-	0.0055	87	24
		1.0	-	4000*	-	-	0.003	100	24
	0.5	0.5	-	4850*	-	-	0.0055	76	23
		1.0	-	6100*	-	-	0.003	94	24
		2.0	-	7150*	-	-	0.0015	104	24

*Values shown are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									7
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	4200	-	2.5	0.025	5.4	22 [⊕]
		0.22	-	4600	-	2.2	0.014	7.5	27 [⊕]
		0.47	-	4800	-	2.0	0.0065	9.1	30 [⊕]
	0.22	0.22	-	7000	-	1.3	0.013	7.3	30 [⊕]
		0.47	-	7800	-	1.3	0.007	10	34 [■]
		1.0	-	8100	-	1.1	0.0035	12	37 [★]
	0.47	0.47	-	12000	-	0.83	0.006	10	36 [■]
		1.0	-	14000	-	0.7	0.0035	14	39 [★]
		2.2	-	15000	-	0.6	0.002	16	41 [★]
180	0.1	0.1	-	1900	-	3.6	0.027	19	30 [★]
		0.22	-	2200	-	3.1	0.014	25	35
		0.47	-	2500	-	2.8	0.0065	32	37
	0.22	0.22	-	3400	-	2.2	0.014	24	38
		0.47	-	4100	-	1.7	0.0065	34	42
		1.0	-	4600	-	1.5	0.0035	38	44
	0.47	0.47	-	6600	-	1.1	0.0065	29	44
		1.0	-	8100	-	0.9	0.0035	38	46
		2.2	-	9100	-	0.8	0.002	43	47
300	0.1	0.1	-	1500	-	4.4	0.027	40	34
		0.22	-	1800	-	3.6	0.014	54	38
		0.47	-	2100	-	3.0	0.0065	63	41
	0.22	0.22	-	2600	-	2.5	0.013	51	42
		0.47	-	3200	-	1.9	0.0065	65	46
		1.0	-	3700	-	1.6	0.0035	77	48
	0.47	0.47	-	5200	-	1.2	0.006	61	48
		1.0	-	6300	-	1.0	0.0035	74	50
		2.2	-	7200	-	0.9	0.002	85	51

⊕ At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

8		See Circuit Diagram 3							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.07	1800	0.11	9.0	0.021	25	52
		0.22	0.09	2100	0.1	8.2	0.012	32	72
		0.47	0.096	2100	0.1	8.0	0.0065	37	88
	0.22	0.22	0.25	3100	0.08	6.2	0.009	25	72
		0.47	0.26	3200	0.078	5.8	0.0055	32	99
		1.0	0.35	3700	0.085	5.1	0.003	34	125
0.47	0.47	0.75	6300	0.042	3.4	0.0035	27	102	
	1.0	0.75	6500	0.042	3.3	0.0027	32	126	
	2.2	0.8	6700	0.04	3.2	0.0018	36	152	
180	0.1	0.1	0.12	800	0.15	14.1	0.021	57	74
		0.22	0.15	900	0.126	14.0	0.012	82	116
		0.47	0.19	1000	0.1	12.5	0.006	81	141
	0.22	0.22	0.38	1500	0.09	9.6	0.009	59	130
		0.47	0.43	1700	0.08	8.7	0.005	67	171
		1.0	0.6	1900	0.066	8.1	0.003	71	200
	0.47	0.47	0.9	3100	0.06	5.7	0.0045	54	172
		1.0	1.0	3400	0.05	5.4	0.0028	65	232
		2.2	1.1	3600	0.04	3.6	0.0019	74	272
300	0.1	0.1	0.2	500	0.13	18.0	0.019	76	109
		0.22	0.24	600	0.11	16.4	0.011	103	145
		0.47	0.26	700	0.11	15.3	0.006	129	168
	0.22	0.22	0.42	1000	0.1	12.4	0.009	92	164
		0.47	0.5	1000	0.098	12.0	0.007	108	230
		1.0	0.55	1100	0.09	11.0	0.003	122	262
	0.47	0.47	1.0	1800	0.075	8.0	0.0045	94	248
		1.0	1.1	1900	0.065	7.6	0.0028	105	318
		2.2	1.2	2100	0.06	7.3	0.0018	122	371



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									9
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.047	0.047	-	2200	-	2.5	0.063	14	9
		0.1	-	2800	-	2.0	0.033	18	10
		0.22	-	3200	-	1.7	0.015	20	10
	0.1	0.1	-	4100	-	1.4	0.032	13	10
		0.22	-	5400	-	1.0	0.013	20	11
		0.47	-	6400	-	0.9	0.007	24	11
	0.22	0.22	-	8500	-	0.67	0.015	18	11
		0.47	-	12000	-	0.5	0.0065	23	11
		1.0	-	14000	-	0.43	0.0035	27	11
180	0.047	0.047	-	2000	-	2.9	0.062	32	10
		0.1	-	2500	-	2.2	0.033	42	10
		0.22	-	3000	-	1.9	0.016	47	11
	0.1	0.1	-	3800	-	1.5	0.033	36	11
		0.22	-	5100	-	1.1	0.015	47	11
		0.47	-	6200	-	0.9	0.007	55	12
	0.22	0.22	-	8000	-	0.73	0.015	41	12
		0.47	-	11000	-	0.5	0.007	54	12
		1.0	-	13000	-	0.4	0.0035	69	12
300	0.047	0.047	-	1800	-	3.0	0.063	58	10
		0.1	-	2400	-	2.4	0.033	74	11
		0.22	-	2900	-	2.0	0.016	85	11
	0.1	0.1	-	3600	-	1.6	0.033	65	12
		0.22	-	5000	-	1.2	0.015	85	12
		0.47	-	6200	-	0.95	0.007	96	12
	0.22	0.22	-	7800	-	0.73	0.015	74	12
		0.47	-	11000	-	0.5	0.007	95	12
		1.0	-	13000	-	0.43	0.0035	106	12



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

10 See Circuit Diagram 1									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.047	0.047	-	1600	-	3.2	0.061	9	10 [■]
		0.1	-	1800	-	2.5	0.033	11	11★
		0.22	-	2000	-	2.0	0.015	14	11
	0.1	0.1	-	3000	-	1.6	0.032	10	11★
		0.22	-	3800	-	1.1	0.015	15	11
		0.47	-	4500	-	1.0	0.007	18	11
0.22	0.22	-	6800	-	0.7	0.015	14	11	
	0.47	-	9500	-	0.5	0.0065	20	11	
	1.0	-	11500	-	0.43	0.0035	24	11	
180	0.047	0.047	-	920	-	3.9	0.062	20	11
		0.1	-	1200	-	2.9	0.037	26	12
		0.22	-	1400	-	2.5	0.016	29	12
	0.1	0.1	-	2000	-	1.9	0.032	24	12
		0.22	-	2800	-	1.4	0.016	33	12
		0.47	-	3600	-	1.1	0.007	40	12
0.22	0.22	-	5300	-	0.8	0.015	31	12	
	0.47	-	8300	-	0.56	0.007	44	12	
	1.0	-	10000	-	0.48	0.0035	54	12	
300	0.047	0.047	-	870	-	4.1	0.065	38	12
		0.1	-	1200	-	3.0	0.034	52	12
		0.22	-	1500	-	2.4	0.016	68	12
	0.1	0.1	-	1900	-	1.9	0.032	44	12
		0.22	-	3000	-	1.3	0.016	68	12
		0.47	-	4000	-	1.1	0.007	80	12
0.22	0.22	-	5300	-	0.9	0.015	57	12	
	0.47	-	8800	-	0.52	0.007	82	12	
	1.0	-	11000	-	0.46	0.0035	92	12	

■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									11
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	-	2800	-	2.0	0.05	14	9
		0.1	-	3400	-	1.62	0.025	17	9
		0.25	-	3800	-	1.3	0.01	20	10
	0.1	0.1	-	4800	-	1.12	0.025	16	10
		0.25	-	6400	-	0.84	0.01	22	11
		0.5	-	7500	-	0.66	0.005	23	12
	0.25	0.25	-	11400	-	0.52	0.01	18	12
		0.5	-	14500	-	0.4	0.006	23	12
		1.0	-	17300	-	0.33	0.004	26	13
180	0.05	0.05	-	2200	-	2.2	0.055	34	10
		0.1	-	2700	-	2.1	0.03	45	11
		0.25	-	3100	-	1.85	0.015	54	11
	0.1	0.1	-	3900	-	1.7	0.035	41	12
		0.25	-	5300	-	1.25	0.015	54	12
		0.5	-	6200	-	1.2	0.008	55	13
	0.25	0.25	-	9500	-	0.74	0.015	44	13
		0.5	-	12300	-	0.55	0.008	52	13
		1.0	-	14700	-	0.47	0.004	59	13
300	0.05	0.05	-	2100	-	3.16	0.075	57	11
		0.1	-	2600	-	2.3	0.04	70	11
		0.25	-	3100	-	2.2	0.015	83	12
	0.1	0.1	-	3800	-	1.7	0.035	65	12
		0.25	-	5300	-	1.3	0.015	84	13
		0.5	-	6000	-	1.17	0.008	88	13
	0.25	0.25	-	9600	-	0.9	0.015	73	13
		0.5	-	12300	-	0.59	0.008	85	14
		1.0	-	14000	-	0.37	0.003	97	14



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

12		See Circuit Diagram 1							
Ebb	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	3040	-	2.34	0.028	13	18
		0.25	-	3700	-	1.48	0.0115	17	20
		0.5	-	4520	-	1.29	0.006	19	21
	0.25	0.25	-	6770	-	0.95	0.011	15	21
		0.5	-	7870	-	0.81	0.0065	19	23
		1.0	-	8830	-	0.69	0.0035	21	23
	0.5	0.5	-	12400	-	0.51	0.006	16	22
		1.0	-	15000	-	0.43	0.0035	20	24
		2.0	-	16500	-	0.38	0.0015	25	24
180	0.1	0.1	-	2420	-	2.34	0.028	30	20
		0.25	-	3080	-	1.84	0.012	40	22
		0.5	-	3560	-	1.6	0.0065	45	23
	0.25	0.25	-	5170	-	1.25	0.012	35	24
		0.5	-	6560	-	0.95	0.007	45	25
		1.0	-	7550	-	0.85	0.0035	50	26
	0.5	0.5	-	9840	-	0.66	0.007	38	25
		1.0	-	12500	-	0.5	0.004	44	26
		2.0	-	15600	-	0.44	0.0015	51	26
300	0.1	0.1	-	2120	-	3.93	0.037	55	22
		0.25	-	2840	-	2.01	0.013	73	23
		0.5	-	3250	-	1.79	0.007	80	25
	0.25	0.25	-	4750	-	1.29	0.013	64	25
		0.5	-	6100	-	0.96	0.0065	80	26
		1.0	-	7100	-	0.77	0.004	90	27
	0.5	0.5	-	9000	-	0.67	0.007	67	27
		1.0	-	11500	-	0.48	0.004	83	27
		2.0	-	14500	-	0.37	0.002	96	28



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									13
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	-	1650	-	2.80	0.06	11	11
		0.1	-	2070	-	2.66	0.029	14	12
		0.25	-	2380	-	1.95	0.012	17	13
	0.1	0.1	-	3470	-	1.85	0.035	12	13
		0.25	-	3940	-	1.29	0.012	17	13
		0.5	-	4420	-	1.0	0.007	19	13
	0.25	0.25	-	7860	-	0.73	0.0135	14	13
		0.5	-	9760	-	0.55	0.007	18	13
		1.0	-	10690	-	0.47	0.004	20	13
180	0.05	0.05	-	1190	-	3.27	0.06	24	13
		0.1	-	1490	-	2.86	0.032	30	13
		0.25	-	1740	-	2.06	0.0115	36	13
	0.1	0.1	-	2330	-	2.19	0.038	26	14
		0.25	-	2830	-	1.35	0.012	34	14
		0.5	-	3230	-	1.15	0.006	38	14
	0.25	0.25	-	5560	-	0.81	0.013	28	14
		0.5	-	7000	-	0.62	0.007	36	14
		1.0	-	8110	-	0.5	0.004	40	14
300	0.05	0.05	-	1020	-	3.56	0.06	41	13
		0.1	-	1270	-	2.96	0.034	51	14
		0.25	-	1500	-	2.15	0.012	60	14
	0.1	0.1	-	1900	-	2.31	0.035	43	14
		0.25	-	2440	-	1.42	0.0125	56	14
		0.5	-	2700	-	1.2	0.0065	64	14
	0.25	0.25	-	4590	-	0.87	0.013	46	14
		0.5	-	5770	-	0.64	0.0075	57	14
		1.0	-	6950	-	0.54	0.004	64	14



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

14		See Circuit Diagram 3							
Ebb	R_p	R_g	R_{g2}	R_k	C_{g2}	C_k	C	E_o	V.G.
90	0.1	0.1	0.37	1200	0.05	5.2	0.02	17	41
		0.25	0.44	1100	0.05	5.3	0.01	22	55
		0.5	0.44	1300	0.05	4.8	0.006	33	66
	0.25	0.25	1.1	2400	0.03	3.7	0.008	23	70
		0.5	1.18	2600	0.03	3.2	0.005	32	85
		1.0	1.4	3600	0.025	2.5	0.003	33	92
0.5	0.5	2.18	4700	0.02	2.3	0.005	28	93	
	1.0	2.6	5500	0.05	2.0	0.0025	29	120	
	2.0	2.7	5500	0.02	2.0	0.0015	27	140	
180	0.1	0.1	0.44	1000	0.05	6.5	0.02	42	51
		0.25	0.5	750	0.05	6.7	0.01	52	69
		0.5	0.5	800	0.05	6.7	0.006	59	83
	0.25	0.25	1.1	1200	0.04	5.2	0.008	41	93
		0.5	1.18	1600	0.04	4.3	0.005	60	118
		1.0	1.4	2000	0.04	3.8	0.0035	60	140
	0.5	0.5	2.45	2600	0.03	3.2	0.005	45	135
		1.0	2.9	3100	0.025	2.5	0.0025	56	165
		2.0	2.7	3500	0.02	2.8	0.0015	60	165
300	0.1	0.1	0.44	500	0.07	8.5	0.02	55	61
		0.25	0.5	450	0.07	8.3	0.01	81	82
		0.5	0.53	600	0.06	8.0	0.006	96	94
	0.25	0.25	1.18	1100	0.04	5.5	0.008	81	104
		0.5	1.18	1200	0.04	5.4	0.005	104	140
		1.0	1.45	1300	0.05	5.8	0.005	110	185
	0.5	0.5	2.45	1700	0.04	4.2	0.005	75	161
		1.0	2.9	2200	0.04	4.1	0.003	97	200
		2.0	2.95	2300	0.04	4.0	0.0025	100	230



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									15
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.*
90	0.05	0.05	-	2120	-	2.3	0.05	14	9.3
		0.1	-	2500	-	1.86	0.03	18	10
		0.25	-	2900	-	1.65	0.014	21	11
	0.1	0.1	-	3510	-	1.36	0.03	16	11
		0.25	-	4620	-	1.08	0.015	22	12
		0.5	-	5200	-	1.0	0.0085	23	12
	0.25	0.25	-	8050	-	0.61	0.0125	18	12
		0.5	-	10300	-	0.49	0.0085	22	12
		1.0	-	12100	-	0.42	0.0055	24	12
180	0.05	0.05	-	1810	-	2.9	0.06	32	10
		0.1	-	2240	-	2.2	0.03	41	11
		0.25	-	2660	-	1.8	0.014	46	12
	0.1	0.1	-	3180	-	1.46	0.03	36	12
		0.25	-	4200	-	1.1	0.0145	46	12
		0.5	-	4790	-	1.0	0.009	50	12
	0.25	0.25	-	7100	-	0.7	0.014	38	12
		0.5	-	9290	-	0.54	0.009	46	12
		1.0	-	10950	-	0.46	0.0055	52	13
300	0.05	0.05	-	1740	-	2.91	0.06	56	11
		0.1	-	2160	-	2.18	0.032	68	12
		0.25	-	2600	-	1.82	0.015	79	12
	0.1	0.1	-	3070	-	1.64	0.032	60	12
		0.25	-	4140	-	1.1	0.014	79	13
		0.5	-	4700	-	0.81	0.0075	89	13
	0.25	0.25	-	6900	-	0.57	0.013	64	13
		0.5	-	9100	-	0.46	0.0075	80	13
		1.0	-	10750	-	0.4	0.005	88	13

★ At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

16		See Circuit Diagram 3							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.59	870	0.065	5.1	0.018	16	33
		0.25	0.65	900	0.061	5.0	0.01	21	47
		0.5	0.7	910	0.057	4.58	0.007	23	54
	0.25	0.25	1.5	1440	0.044	3.38	0.007	14	56
		0.5	1.6	1520	0.044	3.23	0.0055	18	66
		1.0	1.7	1560	0.043	3.22	0.004	19	77
	0.5	0.5	3.2	2620	0.029	2.04	0.004	12	70
		1.0	3.5	2800	0.03	1.95	0.0026	15	84
		2.0	3.7	3000	0.031	1.92	0.0024	16	94
180	0.1	0.1	0.58	530	0.073	7.2	0.017	33	47
		0.25	0.68	540	0.07	6.9	0.01	43	66
		0.5	0.71	540	0.065	6.6	0.0063	48	75
	0.25	0.25	1.6	850	0.05	4.6	0.0071	33	79
		0.5	1.8	890	0.044	4.7	0.005	40	104
		1.0	1.9	950	0.046	4.4	0.0037	44	118
	0.5	0.5	3.3	1410	0.041	3.5	0.0041	30	109
		1.0	3.6	1520	0.037	3.0	0.003	38	134
		2.0	3.8	1600	0.031	2.9	0.0024	42	147
300	0.1	0.1	0.59	430	0.007	8.5	0.0167	57	57
		0.25	0.67	440	0.071	8.0	0.01	75	78
		0.5	0.71	440	0.071	8.0	0.0066	82	89
	0.25	0.25	1.7	620	0.058	6.0	0.0071	54	98
		0.5	1.95	650	0.057	5.8	0.005	66	122
		1.0	2.1	700	0.055	5.2	0.0036	76	136
	0.5	0.5	3.6	1000	0.04	4.1	0.0037	52	136
		1.0	3.9	1080	0.041	3.9	0.0029	66	162
		2.0	4.1	1120	0.043	3.8	0.0023	73	174



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 4									17
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	1850*	-	-	0.028	4.1	13 [⊙]
		0.25	-	1960*	-	-	0.012	5.9	23 [⊙]
		0.5	-	2050*	-	-	0.0065	6.9	25 [★]
	0.25	0.25	-	3400*	-	-	0.011	6.1	26 [★]
		0.5	-	3750*	-	-	0.006	8.6	30
		1.0	-	3900*	-	-	0.003	10	33
	0.5	0.5	-	5500*	-	-	0.005	7.4	31
		1.0	-	6300*	-	-	0.003	10	33
		2.0	-	7450*	-	-	0.0015	12	36
180	0.1	0.1	-	960*	-	-	0.031	17	25
		0.25	-	1070*	-	-	0.012	24	29
		0.5	-	1220*	-	-	0.0065	27	33
	0.25	0.25	-	1850*	-	-	0.011	21	35
		0.5	-	2150*	-	-	0.006	28	39
		1.0	-	2400*	-	-	0.003	32	41
	0.5	0.5	-	3050*	-	-	0.006	24	40
		1.0	-	3420*	-	-	0.003	32	43
		2.0	-	3890*	-	-	0.002	36	45
300	0.1	0.1	-	750*	-	-	0.033	35	29
		0.25	-	930*	-	-	0.014	50	34
		0.25	-	1040*	-	-	0.007	54	36
	0.25	0.25	-	1400*	-	-	0.012	45	39
		0.5	-	1680*	-	-	0.006	55	42
		1.0	-	1840*	-	-	0.003	64	45
	0.5	0.5	-	2330*	-	-	0.006	50	45
		1.0	-	2980*	-	-	0.003	62	48
		2.0	-	3280*	-	-	0.002	72	49

⊙ At 2 volts (RMS) output. ⊙ At 3 volts (RMS) output. ★ At 4 volts (RMS) output.
*Values are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

18		See Circuit Diagram 1							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	4400	-	2.5	0.02	4	28 [⊕]
		0.25	-	4800	-	2.1	0.01	5	34 [■]
		0.5	-	5000	-	1.8	0.005	6	35 [★]
	0.25	0.25	-	8000	-	1.33	0.01	6	39 [■]
		0.5	-	8800	-	1.18	0.005	7	43 [★]
		1.0	-	9000	-	0.9	0.003	10	44
	0.5	0.5	-	12200	-	0.76	0.005	8	43
		1.0	-	13500	-	0.67	0.003	10	46
		2.0	-	14700	-	0.58	0.0015	12	48
180	0.1	0.1	-	1800	-	4.4	0.025	16	37
		0.25	-	2000	-	3.3	0.015	23	44
		0.5	-	2200	-	2.9	0.006	25	46
	0.25	0.25	-	3500	-	2.3	0.01	21	48
		0.5	-	4100	-	1.8	0.006	26	53
		1.0	-	4500	-	1.7	0.004	32	57
	0.5	0.5	-	6100	-	1.3	0.006	24	53
		1.0	-	6900	-	0.9	0.003	33	63
		2.0	-	7700	-	0.83	0.0015	37	66
300	0.1	0.1	-	1300	-	5.0	0.025	33	42
		0.25	-	1600	-	3.7	0.01	43	49
		0.5	-	1700	-	3.2	0.006	48	52
	0.25	0.25	-	2600	-	2.5	0.01	41	56
		0.5	-	3200	-	2.1	0.007	54	63
		1.0	-	3500	-	2.0	0.004	63	67
	0.5	0.5	-	4500	-	1.5	0.006	50	65
		1.0	-	5400	-	1.2	0.004	62	70
		2.0	-	6100	-	0.93	0.002	70	70

⊕ At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 3								19	
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.26	1500	0.11	4.8	0.02	21	21
		0.22	0.3	1600	0.1	4.4	0.012	26	29
		0.47	0.35	1900	0.09	4.2	0.006	28	37
	0.22	0.22	0.64	2400	0.09	3.4	0.009	21	33
		0.47	0.7	2500	0.09	3.2	0.0055	26	40
		1.0	0.84	2600	0.084	3.0	0.0035	29	52
0.47	0.47	1.5	4200	0.06	2.1	0.0045	21	50	
	1.0	1.6	4400	0.05	1.9	0.003	26	59	
	2.2	1.7	4800	0.058	1.6	0.002	29	64	
180	0.1	0.1	0.33	1000	0.13	6.7	0.02	32	33
		0.22	0.5	1200	0.12	5.8	0.011	37	45
		0.47	0.6	1300	0.11	5.5	0.006	43	52
	0.22	0.22	0.76	1700	0.11	4.5	0.0095	37	47
		0.47	0.9	1700	0.1	4.5	0.0055	44	68
		1.0	1.0	1800	0.1	4.2	0.003	47	82
0.47	0.47	1.8	3300	0.09	2.9	0.0045	38	70	
	1.0	2.0	3800	0.08	2.4	0.003	50	85	
	2.2	2.1	4000	0.07	2.3	0.002	57	98	
300	0.1	0.1	0.32	750	0.19	8.0	0.021	62	39
		0.22	0.36	850	0.18	7.7	0.012	80	46
		0.47	0.37	900	0.18	7.7	0.006	93	57
	0.22	0.22	0.8	1150	0.13	6	0.01	63	62
		0.47	0.94	1300	0.12	5.7	0.0055	78	88
		1.0	0.98	1500	0.11	5.0	0.0035	99	97
0.47	0.47	1.7	2300	0.1	3.5	0.0045	71	82	
	1.0	1.9	2500	0.1	3.5	0.003	89	109	
	2.2	2.0	2800	0.09	3.1	0.002	105	125	



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

20		See Circuit Diagram 3							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.29	820	0.09	8.8	0.02	18	41
		0.25	0.29	880	0.085	7.4	0.016	23	68
		0.5	0.31	1000	0.075	6.6	0.007	28	70
	0.25	0.25	0.69	1680	0.06	5.0	0.012	16	75
		0.5	0.92	1700	0.045	4.5	0.005	18	93
		1.0	0.82	1800	0.04	4.0	0.003	22	104
	0.5	0.5	1.5	3600	0.045	2.4	0.003	18	91
		1.0	1.7	3800	0.03	2.4	0.002	22	119
		2.0	1.9	4050	0.028	2.35	0.0015	24	139
180	0.1	0.1	0.29	760	0.10	9.1	0.019	49	55
		0.25	0.31	800	0.09	8.0	0.015	60	82
		0.5	0.37	860	0.09	7.8	0.007	62	91
	0.25	0.25	0.83	1050	0.06	6.8	0.001	38	109
		0.5	0.94	1060	0.06	6.6	0.004	47	131
		1.0	0.94	1100	0.07	6.1	0.003	54	161
	0.5	0.5	1.85	2000	0.05	4.0	0.003	37	151
		1.0	2.2	2180	0.04	3.8	0.002	44	192
		2.0	2.4	2410	0.035	3.6	0.0015	54	208
300	0.1	0.1	0.35	500	0.10	11.6	0.019	72	67
		0.25	0.37	530	0.09	10.9	0.016	96	98
		0.5	0.47	590	0.09	9.9	0.007	101	104
	0.25	0.25	0.89	850	0.07	8.5	0.011	79	139
		0.5	1.10	860	0.06	7.4	0.004	88	167
		1.0	1.18	910	0.06	6.9	0.003	98	185
	0.5	0.5	2.0	1300	0.06	6.0	0.004	64	200
		1.0	2.2	1410	0.05	5.8	0.002	79	238
		2.0	2.5	1530	0.04	5.2	0.0015	89	263



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 4									21
Ebb	R_p	R_g	R_{g2}	R_k	C_{g2}	C_k	C	E_o	V.G.
90	0.1	0.1	-	1480*	-	2.65	0.025	8	21★
		0.25	-	1760*	-	2.02	0.0115	11	25
		0.5	-	1930*	-	1.7	0.0065	14	26
	0.25	0.25	-	3000*	-	1.36	0.01	12	28
		0.5	-	3390*	-	1.1	0.006	15	30
		1.0	-	3670*	-	0.8	0.0035	18	33
	0.5	0.5	-	5300*	-	0.65	0.0055	14	31
		1.0	-	6050*	-	0.61	0.003	18	33
		2.0	-	6700*	-	0.45	0.0015	20	35
180	0.1	0.1	-	930*	-	3.4	0.028	18	26
		0.25	-	1100*	-	2.6	0.0115	28	31
		0.5	-	1210*	-	2.32	0.007	33	32
	0.25	0.25	-	1820*	-	1.71	0.012	28	35
		0.5	-	2110*	-	1.38	0.007	34	38
		1.0	-	2400*	-	1.1	0.0035	41	39
	0.5	0.5	-	3240*	-	0.9	0.006	32	39
		1.0	-	3890*	-	0.703	0.0035	38	40
		2.0	-	4360*	-	0.553	0.002	44	41
300	0.1	0.1	-	670*	-	3.81	0.028	38	31
		0.25	-	950*	-	2.63	0.012	52	34
		0.5	-	1050*	-	2.34	0.007	60	36
	0.25	0.25	-	1430*	-	1.87	0.012	50	38
		0.5	-	1680*	-	1.46	0.006	59	40
		1.0	-	1930*	-	1.19	0.0035	66	43
	0.5	0.5	-	2540*	-	0.97	0.006	55	42
		1.0	-	3110*	-	0.72	0.0035	70	44
		2.0	-	3560*	-	0.56	0.002	75	45

★ At 4 volts (RMS) output. *Values are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

22		See Circuit Diagram 1							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	-	3800	-	1.4	0.06	16	4.5
		0.1	-	4600	-	1.1	0.03	19	4.9
		0.25	-	5400	-	0.86	0.015	23	5.1
	0.1	0.1	-	6620	-	0.7	0.04	17	5.1
		0.25	-	9000	-	0.55	0.015	22	5.4
		0.5	-	10300	-	0.5	0.007	25	5.5
	0.25	0.25	-	15100	-	0.31	0.015	18	5.3
		0.5	-	20500	-	0.25	0.007	23	5.5
		1.0	-	24400	-	0.2	0.004	26	5.6
180	0.05	0.05	-	3200	-	1.8	0.06	33	4.9
		0.1	-	4100	-	1.6	0.045	44	5.2
		0.25	-	5000	-	1.2	0.02	49	5.3
	0.1	0.1	-	6200	-	0.9	0.04	37	5.3
		0.25	-	8700	-	0.7	0.015	47	5.5
		0.5	-	10000	-	0.57	0.008	50	5.5
	0.25	0.25	-	14500	-	0.43	0.015	40	5.6
		0.5	-	20000	-	0.29	0.008	48	5.7
		1.0	-	24000	-	0.24	0.004	53	5.7
300	0.05	0.05	-	3200	-	1.9	0.08	50	5.2
		0.1	-	4100	-	1.5	0.045	74	5.5
		0.25	-	5100	-	1.2	0.015	85	5.6
	0.1	0.1	-	5900	-	0.8	0.03	64	5.5
		0.25	-	8300	-	0.54	0.015	82	5.7
		0.5	-	9600	-	0.43	0.006	88	5.8
	0.25	0.25	-	14300	-	0.3	0.01	71	5.7
		0.5	-	19400	-	0.22	0.006	84	5.7
		1.0	-	23600	-	0.2	0.003	94	5.8



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									23
Ebb	R_p	R_g	R_{g2}	R_k	C_{g2}	C_k	C	E_o	V.G.
90	0.05	0.05	-	2500	-	2.0	0.06	16	7.0
		0.1	-	3200	-	1.6	0.03	21	7.7
		0.25	-	3800	-	1.25	0.015	23	8.1
	0.1	0.1	-	4500	-	1.05	0.03	19	8.1
		0.25	-	6500	-	0.82	0.015	23	8.9
		0.5	-	7500	-	0.68	0.007	25	9.3
	0.25	0.25	-	11100	-	0.48	0.015	21	9.4
		0.5	-	15100	-	0.36	0.007	24	9.7
		1.0	-	18300	-	0.32	0.0035	28	9.8
180	0.05	0.05	-	2400	-	2.5	0.06	36	7.7
		0.1	-	3000	-	1.9	0.035	48	8.2
		0.25	-	3700	-	1.65	0.015	55	9.0
	0.1	0.1	-	4500	-	1.45	0.035	45	9.3
		0.25	-	6500	-	0.97	0.015	55	9.5
		0.5	-	7600	-	0.8	0.008	57	9.8
	0.25	0.25	-	10700	-	0.6	0.015	49	9.7
		0.5	-	14700	-	0.45	0.007	59	10
		1.0	-	17700	-	0.4	0.0045	64	10
300	0.05	0.05	-	2400	-	2.8	0.08	65	8.3
		0.1	-	3100	-	2.2	0.045	80	8.9
		0.25	-	3800	-	1.8	0.02	95	9.4
	0.1	0.1	-	4500	-	1.6	0.04	74	9.5
		0.25	-	6400	-	1.2	0.02	95	10
		0.5	-	7500	-	0.98	0.009	104	10
	0.25	0.25	-	11100	-	0.69	0.02	82	10
		0.5	-	15200	-	0.5	0.009	96	10
		1.0	-	18300	-	0.4	0.005	108	10



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

24		See Circuit Diagram 4							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	2050*	-	-	0.04	5.8	23 [■]
		0.25	-	2200*	-	-	0.015	8.4	29*
		0.5	-	2350*	-	-	0.009	9.5	29
	0.25	0.25	-	4000*	-	-	0.015	7.1	31*
		0.5	-	4250*	-	-	0.005	9.7	33
		1.0	-	4650*	-	-	0.004	12	35
	0.5	0.5	-	6150*	-	-	0.006	8.8	34
		1.0	-	6850*	-	-	0.004	12	38
		2.0	-	7500*	-	-	0.002	15	40
180	0.1	0.1	-	1050*	-	-	0.04	21	27
		0.25	-	1250*	-	-	0.02	27	31
		0.5	-	1350*	-	-	0.009	31	34
	0.25	0.25	-	2050*	-	-	0.02	26	37
		0.5	-	2450*	-	-	0.01	34	41
		1.0	-	2750*	-	-	0.005	40	42
	0.5	0.5	-	3450*	-	-	0.009	30	42
		1.0	-	4100*	-	-	0.0035	39	44
		2.0	-	4650*	-	-	0.002	44	45
300	0.1	0.1	-	800*	-	-	0.025	40	29
		0.25	-	1000*	-	-	0.01	57	34
		0.5	-	1100*	-	-	0.006	60	36
	0.25	0.25	-	1650*	-	-	0.01	56	39
		0.5	-	2050*	-	-	0.0055	66	42
		1.0	-	2350*	-	-	0.003	77	43
	0.5	0.5	-	2850*	-	-	0.0055	61	44
		1.0	-	3600*	-	-	0.003	75	46
		2.0	-	4450*	-	-	0.0015	82	46

■ At 3 volts (RMS) output.

★ At 4 volts (RMS) output.

*Values are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									25
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	4400	-	2.7	0.023	5	29◐
		0.22	-	4700	-	2.4	0.013	6	35◐
		0.47	-	4900	-	2.3	0.007	8	41◐
	0.22	0.22	-	7000	-	1.6	0.001	6	39◐
		0.47	-	7400	-	1.4	0.006	9	45■
		1.0	-	7600	-	1.3	0.003	11	48★
	0.47	0.47	-	12000	-	0.9	0.006	9	48■
		1.0	-	13000	-	0.8	0.003	11	52★
		2.2	-	14000	-	0.7	0.002	13	55★
180	0.1	0.1	-	1800	-	4.0	0.025	18	40
		0.22	-	2000	-	3.5	0.013	25	47
		0.47	-	2200	-	3.1	0.006	32	52
	0.22	0.22	-	3000	-	2.4	0.012	24	53
		0.47	-	3500	-	2.1	0.006	34	59
		1.0	-	3900	-	1.8	0.003	39	63
	0.47	0.47	-	5800	-	1.3	0.006	30	62
		1.0	-	6700	-	1.1	0.003	39	66
		2.2	-	7400	-	1.0	0.002	45	68
300	0.1	0.1	-	1300	-	4.6	0.027	43	45
		0.22	-	1500	-	4.0	0.013	57	52
		0.47	-	1700	-	3.6	0.006	66	57
	0.22	0.22	-	2200	-	3.0	0.013	54	59
		0.47	-	2800	-	2.3	0.006	69	65
		1.0	-	3100	-	2.1	0.003	79	68
	0.47	0.47	-	4300	-	1.6	0.006	62	69
		1.0	-	5200	-	1.3	0.003	77	73
		2.2	-	5900	-	1.1	0.002	92	75

◐ At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

26		See Circuit Diagram 3								
E_{bb}	R_p	R_g	R_{g1}	R_k	C_{g1}	C_k	C	E_o	V.G.*	
90	0.1	0.1	0.35	1700	0.044	4.6	0.020	13	29	
		0.22			0.046		4.5	0.012	17	39
		0.47			0.047		4.4	0.006	20	47
90	0.22	0.22	0.80	3000	0.034	3.2	0.010	15	43	
		0.47			0.035		3.1	0.005	21	59
		1.0			0.036		3.0	0.003	24	67
90	0.47	0.47	1.9	7000	0.021	1.8	0.005	21	59	
		1.0			0.022		1.7	0.003	25	75
		2.2			0.023		1.7	0.002	28	87
180	0.1	0.1	0.35	700	0.060	7.4	0.020	24	39	
		0.22			0.062		7.3	0.012	28	56
		0.47			0.064		7.2	0.006	33	65
180	0.22	0.22	0.80	1200	0.045	5.5	0.010	24	65	
		0.47			0.046		5.3	0.005	31	87
		1.0			0.048		5.2	0.003	34	101
180	0.47	0.47	1.9	2500	0.033	3.5	0.005	27	98	
		1.0			0.034		3.4	0.003	32	122
		2.2			0.035		3.3	0.002	37	140
300	0.1	0.1	0.35	300	0.075	10.8	0.020	25	51	
		0.22			0.077		10.6	0.012	32	68
		0.47			0.080		10.5	0.006	35	83
300	0.22	0.22	0.80	600	0.056	7.9	0.010	28	81	
		0.47			0.057		7.5	0.005	37	109
		1.0			0.058		7.4	0.003	41	123
300	0.47	0.47	1.3	1200	0.044	5.3	0.005	35	125	
		1.0			0.046		5.2	0.003	42	152
		2.2			0.047		5.1	0.002	48	174

* At an output voltage of 1 volt RMS and Grid No. 1 bias of 1 volt.

CHART FOR MAXIMUM VOLTAGE OUTPUT

E_{bb}	R_p	R_g	R_{g1}	R_k	C_{g1}	C_k	C	E_o	V.G.		
90	0.1	0.1	0.12	2000	0.09	4.8	0.027	22	23		
		0.22	0.15	2200	0.08		4.4	0.013	28	32	
		0.47	0.17	2400	0.07		4.0	0.007	31	39	
	0.22	0.22	0.22	0.35	3500	0.06	3.3	0.011	24	33	
			0.47	0.40	3800	0.065		3.2	0.006	30	44
			1.0	0.44	4100	0.06		3.0	0.003	32	50
	0.47	0.47	0.47	0.90	6800	0.04	2.0	0.005	25	47	
			1.0	1.0	7400	0.04		2.0	0.003	30	57
			2.2	1.1	8000	0.04		2.0	0.002	32	64

(Continued on next page)



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit
Diagram 3

Cont'd

26

E _{bb}	R _p	R _g	R _{g1}	R _k	C _{g1}	C _k	C	E _o	V.G.
180	0.1	0.1	0.19	1300	0.08	6.0	0.021	48	33
		0.22	0.20	1400	0.08	5.85	0.013	59	46
		0.47	0.22	1500	0.07	5.45	0.007	68	57
	0.22	0.22	0.44	2000	0.09	4.85	0.011	48	41
		0.47	0.53	2300	0.07	4.45	0.006	62	62
		1.0	0.55	2400	0.065	4.25	0.004	68	72
	0.47	0.47	1.0	3500	0.07	3.5	0.005	51	54
		1.0	1.1	3700	0.07	3.5	0.003	59	66
		2.2	1.2	4000	0.07	3.3	0.002	66	81
300	0.1	0.1	0.18	1000	0.1	7.0	0.022	85	38
		0.22	0.2	1100	0.1	6.8	0.013	110	53
		0.47	0.23	1200	0.075	6.4	0.007	124	66
	0.22	0.22	0.47	1400	0.1	5.75	0.012	88	44
		0.47	0.52	1600	0.1	5.45	0.006	113	64
		1.0	0.58	1700	0.075	5.0	0.004	124	86
	0.47	0.47	1.1	2300	0.1	4.6	0.006	90	58
		1.0	1.2	2500	0.1	4.3	0.004	110	76
		2.2	1.3	2800	0.1	4.2	0.002	121	99



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

27		See Circuit Diagram 1					
E_{bb}	R_p	R_z	R_k	C_k	C	E_o	V.G.
90	0.047	0.047	1800	2.9	0.060	9	10 [#]
		0.1	2100	2.4	0.033	12	11 [‡]
		0.22	2200	2.3	0.016	14	21 [*]
	0.1	0.1	3200	1.8	0.027	10	12 [‡]
		0.22	3900	1.3	0.015	13	13 [*]
		0.47	4300	1.0	0.007	16	13
0.22	0.22	6200	0.87	0.015	12	13 [‡]	
	0.47	8100	0.53	0.006	16	13	
	1.0	9000	0.49	0.003	19	14	
180	0.047	0.047	1200	3.5	0.063	21	12
		0.1	1600	2.6	0.033	29	13
		0.22	1800	2.4	0.016	35	13
	0.1	0.1	2200	1.9	0.031	26	13
		0.22	2900	1.35	0.015	33	14
		0.47	3400	1.1	0.007	40	14
0.22	0.22	4500	0.92	0.015	28	14	
	0.47	6400	0.61	0.006	39	14	
	1.0	8200	0.52	0.003	47	14	
300	0.047	0.047	1100	3.9	0.063	42	13
		0.1	1500	2.8	0.033	65	13
		0.22	1700	2.5	0.016	71	14
	0.1	0.1	2000	2.1	0.032	45	15
		0.22	3400	1.4	0.015	74	15
		0.47	3700	1.1	0.007	83	15
0.22	0.22	4300	0.97	0.015	50	15	
	0.47	7200	0.63	0.007	88	15	
	1.0	7400	0.63	0.003	94	15	

At 2 volts (RMS) output. ‡ At 3 volts (RMS) output.

* At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1							28
E_{bb}	R_p	R_g	R_k	C_k°	C°	E_o	V.G.*
90	0.1	0.24	1800	—	—	13	24
	0.24	0.51	3700	—	—	14	26
	0.51	1.0	7800	—	—	16	27
180	0.1	0.24	1300	—	—	31	27
	0.24	0.51	2800	—	—	33	29
	0.51	1.0	5700	—	—	33	30
300	0.1	0.24	1200	—	—	58	28
	0.24	0.51	2300	—	—	30	30
	0.51	1.0	4800	—	—	56	31

* At 2 volts (RMS) output.

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



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

29		See Circuit Diagram 1							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.047	0.047	-	1870	-	3.1	0.063	14	13
		0.1	-	2230	-	2.5	0.031	18	14
		0.22	-	2500	-	2.1	0.016	20	14
	0.1	0.1	-	3370	-	1.8	0.034	15	14
		0.22	-	4100	-	1.3	0.015	20	14
		0.47	-	4800	-	1.1	0.006	23	15
	0.22	0.22	-	7000	-	0.80	0.013	16	14
		0.47	-	9100	-	0.65	0.007	22	14
		1.00	-	10500	-	0.60	0.004	25	15
180	0.047	0.047	-	1500	-	3.6	0.066	33	14
		0.1	-	1860	-	2.9	0.055	41	14
		0.22	-	2160	-	2.2	0.015	47	15
	0.1	0.1	-	2750	-	1.8	0.028	35	15
		0.22	-	3550	-	1.4	0.015	45	15
		0.47	-	4140	-	1.3	0.007	51	16
	0.22	0.22	-	5150	-	1.0	0.016	36	16
		0.47	-	7000	-	0.71	0.007	45	16
		1.00	-	7800	-	0.61	0.004	51	16
300	0.047	0.047	-	1300	-	3.6	0.061	59	14
		0.1	-	1580	-	3.0	0.032	73	15
		0.22	-	1800	-	2.5	0.015	83	16
	0.1	0.1	-	2500	-	1.9	0.031	68	16
		0.22	-	3130	-	1.4	0.014	82	16
		0.47	-	3900	-	1.2	0.0065	96	16
	0.22	0.22	-	4800	-	0.95	0.015	68	16
		0.47	-	6500	-	0.69	0.0065	85	16
		1.00	-	7800	-	0.58	0.0035	96	16



GRID-NO. 2 INPUT RATING CHART

The Grid-No.2 Input Rating Chart shown on the back of this page presents graphically the relationship between the grid-No.2 voltage and the maximum grid-No.2 input for certain multi-electrode tube types.

The chart shows that full rated grid-No.2 input is permissible at grid-No.2 voltages up to 50 per cent of the maximum rated grid-No.2 supply voltage. From the 50 per cent point to the full rated value of supply voltage, the grid-No.2 input must be decreased. The decrease in allowable grid-No.2 input follows a curve of the parabolic form.

This chart is useful for applications utilizing either a fixed grid-No.2 voltage, or a series grid-No.2 voltage-dropping resistor.

Where a fixed grid-No.2 voltage is used, it is necessary only to determine that the grid-No.2 input is within the boundary of the operating area on the chart at the selected value of grid-No.2 voltage to be used.

Where a grid-No.2 voltage-dropping resistor is used, the minimum value of resistor that will assure tube operation within the boundary of the curve can be determined from the following relation:

$$R_{g2} \geq \frac{E_{c2} (E_{cc2} - E_{c2})}{P_{c2}}$$

where:

- R_{g2} = minimum value for grid-No.2 voltage-dropping resistor in ohms.
- E_{c2} = selected value of grid-No.2 voltage in volts.
- E_{cc2} = grid-No.2 supply voltage in volts.
- P_{c2} = grid-No.2 input in watts corresponding to E_{c2} .

EXAMPLES

Example 1 - Use of a Fixed Grid-No.2 Supply Voltage:

The tube data for a certain tube stipulates a maximum grid-No.2 supply voltage rating of 300 volts, and a maximum grid-No.2 input rating of 1 watt. It is desired to operate the tube with a fixed voltage of 200 volts between grid No.2 and cathode. This value is 66-2/3% of the maximum grid-No.2 supply voltage rating. From the chart, the maximum grid-No.2 input, therefore, must be limited to 88% of the maximum grid-No.2 input rating or 0.88 watt.

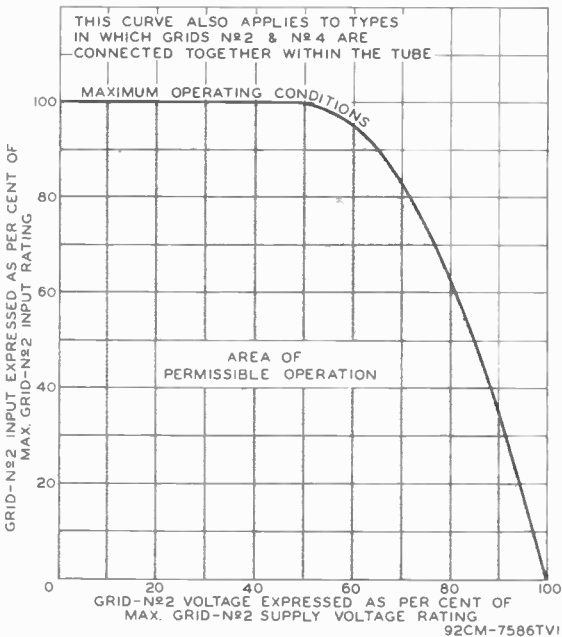


GRID-No. 2 INPUT RATING CHART

Example 2 - Use of a Grid-No. 2 Voltage-Dropping Resistor:

The tube data for a certain tube stipulates a maximum grid-No. 2 supply voltage rating of 300 volts, and a maximum grid-No. 2 input rating of 1 watt. It is desired to operate the tube with a grid-No. 2-to-cathode voltage of 250 volts, obtained through a dropping resistor from a 300-volt power supply. Because 250 volts is 83% of 300 volts, the maximum grid-No. 2 input must be limited, as shown on the chart, to 56% of the maximum grid-No. 2 input rating, or 0.56 watt. Then, the minimum value required for the grid-No. 2 voltage-dropping resistor will be:

$$R_{g2} = \frac{250 (300 - 250)}{0.56} = 22,320 \text{ ohms}$$

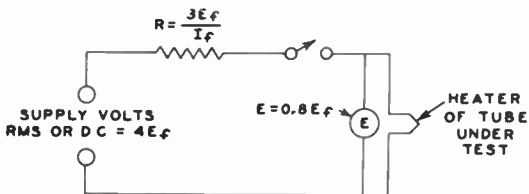




HEATER WARM-UP TIME MEASUREMENT FOR TUBE TYPES INTENDED FOR USE IN SERIES HEATER-STRING ARRANGEMENT

Heater warm-up time is measured in the circuit shown below as follows: The heater is placed in series with a resistance having a value 3 times the heater operating resistance. A voltage having a value 4 times the rated heater voltage is then applied. Heater warm-up time is then defined as the time required for the voltage across the heater to reach 80 per cent of its rated value.

TEST CIRCUIT FOR DETERMINING HEATER WARM-UP TIME

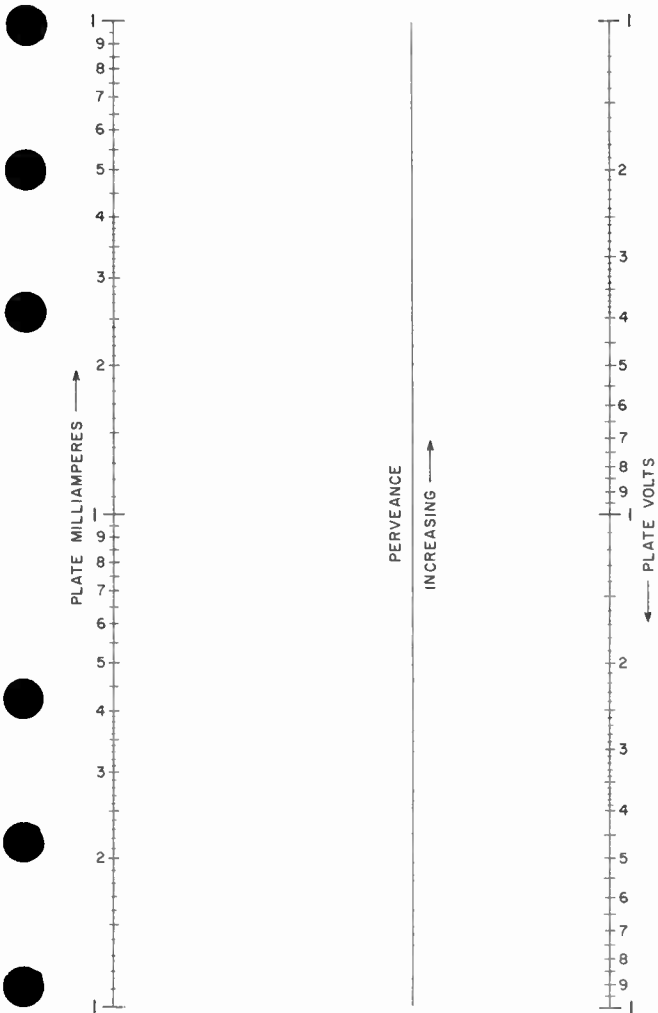


E_f = RATED HEATER VOLTAGE OF TUBE UNDER TEST.
 I_f = RATED HEATER CURRENT OF TUBE UNDER TEST.
92CS-8503



Diode Nomograph

AVERAGE PLATE-CHARACTERISTIC NOMOGRAPH For Diodes and Rectifiers



92CM-11244



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

World Radio History

DIODE
NOMOGRAPH
7-61

Diode Nomograph

The Diode Nomograph on the preceding page may be used to determine for a diode unit (1) tube voltage drop for any plate current, or (2) plate current for any plate voltage when values for a single plate-voltage, plate-current condition are available from the published data. The nomograph may also be used to compare the perveance ($G = I_b/E_b^{3/2}$) of several diodes.

For convenience, PLATE VOLTS and PLATE MILLIAMPERES are plotted on two-decade logarithmic scales with the PERVEANCE line located between them.

To determine for a specific diode unit the desired tube voltage drop or plate current:

1. Obtain the plate-voltage, plate-current condition from the published data for the type.
2. Select convenient values for the decade scales for PLATE VOLTS and PLATE MILLIAMPERES.
3. Locate and connect with a straightedge the points for PLATE VOLTS and PLATE MILLIAMPERES obtained from the data.
4. Mark the intersection of the straightedge and the PERVEANCE line.
5. With this intersection as a pivot point, line up the straightedge with the desired value of PLATE VOLTS or PLATE MILLIAMPERES, and read the corresponding value of tube voltage drop or plate current on the appropriate scale.

Because the pivot point for a specific diode unit represents its perveance, the pivot points for several units (plotted to the same scales) indicate their relative perveance.

EXAMPLE

The published data for type 5U4GB gives a tube voltage drop (Per plate) of 44 volts at plate ma. = 225.

1. To determine the tube voltage drop at plate ma. = 100:
 - a. On the nomograph, establish the decade scale for PLATE VOLTS as 1, 10, 100 (reading down) and the scale for PLATE MILLIAMPERES as 10, 100, 1000 (reading up).
 - b. Locate and connect the points "PLATE VOLTS = 44" and "PLATE MILLIAMPERES = 225" with a straightedge.
 - c. Mark the intersection of the straightedge and the PERVEANCE line.
 - d. Pivot the straightedge about this intersection, line it up with the point "PLATE MILLIAMPERES = 100", and read "PLATE VOLTS = 25"—the tube voltage drop (Per plate).
2. To determine the plate current at plate volts = 33:
 - a. Use the same pivot point on the PERVEANCE line as in "1d" above, line up the straightedge with the point "PLATE VOLTS = 33", and read "PLATE MILLIAMPERES = 150".

LIMITATIONS

For readings in the order of 1 volt and/or 1 milliamperere or less, the nomograph is not accurate because of the effects of contact potential and initial electron velocity.



OY4

OY4

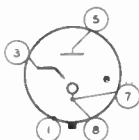
HALF-WAVE GAS RECTIFIER

IONICALLY HEATED, STARTER - ELECTRODE TYPE

DATA**General:**

Cathode.	Ionically Heated
Tube Voltage Drop (Approx.).	12 volts
Maximum Overall Length	2-5/8"
Maximum Seated Length.	1-31/32 ± 3/32"
Maximum Diameter	1-5/16"
Bulb	MT8G
Base	Small-Wafer Octal 5-Pin
Basing Designation for BOTTOM VIEW	

Pin 1 - Shell
 Pin 3 - Starter
 Electrode



Pin 5 - Anode
 Pin 7[□] - Cathode
 Pin 8[□] - Cathode

□ Pins 7 and 8 must be tied together at socket.

HALF-WAVE RECTIFIER**Maximum Ratings, Design-Center Values:**

PEAK INVERSE ANODE VOLTAGE.	300 max.	volts
PEAK ANODE CURRENT.	500 max.	ma
DC OUTPUT CURRENT	{ 75 max.	ma
	{ 40 min.	ma

Typical Operation With Capacitor-Input Filter:

Minimum RMS Starting Voltage*	100	volts
DC Output Current	75	ma
Minimum Series Anode Resistance [▲]	50	ohms

RF filter circuits placed close to socket terminals are required to reduce rectifier noise.

* when starter electrode is connected to anode through a 10-megohm resistor bypassed with a 0.002- μ f capacitor.

[▲] For 117-volt line operation.



Full-Wave Gas Rectifier

METAL TYPE HAVING IONICALLY HEATED CATHODE

GENERAL DATA

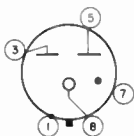
Electrical:

Cathode Ionically Heated Type

Mechanical:

Operating Position Any
 Maximum Overall Length 2-5/8"
 Maximum Seated Length 2-1/16"
 Maximum Diameter 1-5/16"
 Dimensional Outline See General Section
 Envelope Metal Shell M18G
 Base Small-Wafer Octal 5-Pin (JEDEC Group 1, No. B5-215)
 Basing Designation for BOTTOM VIEW 4R

Pin 1 - Shell
 Pin 3 - Plate No. 2
 Pin 5 - Plate No. 1



Pin 7 - No Connection
 Pin 8 - Cathode

FULL-WAVE RECTIFIER

Maximum and Minimum Ratings, Design-Center Values Except as Noted:

PEAK INVERSE PLATE VOLTAGE PER PLATE	880	max.	volts
PEAK STARTING-SUPPLY VOLTAGE PER PLATE	300 [▲]	min.	volts
PEAK PLATE CURRENT PER PLATE	330	max.	ma
DC OUTPUT CURRENT	{ 110	max.	ma
	{ 30 [▲]	min.	ma

Typical Operation:

With vibrator-type power supply and capacitor input to filter

Peak Plate Supply Voltage Per Plate	440	volts
Filter-Input Capacitor	8	μf
Total Effective Plate Supply Impedance Per Plate	600	ohms
DC Output Voltage at input to filter	310	volts
DC Output Current	100	ma

Characteristics:

Tube Voltage Drop for plate ma. = 110 (Per plate) 24 volts

Minimum Circuit Value:

Total Effective Plate Supply Impedance Per Plate	300 min.	ohms
---	----------	------

- ▲ Absolute value. Under no circumstances should the tube be operated with less than this value.
- Open-circuit voltage—flat portion of transformer voltage wave.





Half-Wave Vacuum Rectifier

ELECTRICAL

Bogey Values

Filament (Coated) Voltage, AC or DC	1.25 V
Filament Current	0.2 A
Direct Interelectrode Capacitance (Approx.) Without external shield:	
Plate to filament	1.6 pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Filament
Maximum Overall Length	3.125 in
Seated Length	2.500 to 2.750 in
Diameter	1.062 to 1.188 in
Dimensional Outline (JEDEC No.9-98)	See <i>General Section</i>
Envelope	JEDEC T9

Caps (Alternates)

Small (JEDEC No.Ci-1)

Small with Tubular Support (JEDEC No.Ci-34)

Base Small-Button Duodecar 12-Pin (JEDEC No.E12-70)

TERMINAL DIAGRAM (Bottom View)

Pin 1 - Filament, Internal Shield

Pin 2 - Do Not Use^a

Pin 3 - Do Not Use^a

Pin 4 - See **Note**

Pin 5 - Do Not Use^a

Pin 6 - Same as Pin 1

Pin 7 - Do Not Use^a

Pin 8 - Do Not Use^a

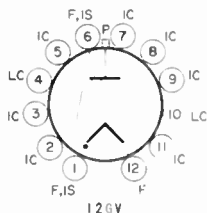
Pin 9 - Do Not Use^a

Pin 10 - See **Note**

Pin 11 - Do Not Use^a

Pin 12 - Filament

Cap - Plate



Note: May be used only under condition specified in Operating Considerations.

PULSED-RECTIFIER SERVICE

Design-Maximum Ratings

For operation in a 525-line, 30-frame system

Inverse Plate Voltage

Total dc and peak ^b	26000 V
DC	22000 V
Peak Plate Current	50 mA
Average Plate Current	0.5 mA
Filament Voltage, AC or DC	1.05 to 1.45 V

Characteristics, Instantaneous Value

Tube Voltage Drop for plate mA = 7	225 V
--	-------

^a Socket terminals 2, 3, 5, 7, 8, 9, and 11 should not be used as tie points.

^b This rating is applicable when the duration of the voltage pulse does 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.

← Indicates a change.



RADIO CORPORATION OF AMERICA
Electronic Components and Devices

Harrison, N J

DATA
6-66

OPERATING CONSIDERATIONS

Socket Connections. Socket terminals 4 and 10 may be used as tie points for components at or near the cathode potential; otherwise, do not use.

The high voltages at which the 1AD2 is operated are very dangerous. Great care should be taken in the design of equipment to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X-Radiation. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X-radiation* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.





IE 8

IE 8

PENTAGRID CONVERTER

SUBMINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:

Voltage	1.25	. . . . .	dc volts
Current	0.04	. . . . .	amp

Direct Interelectrode Capacitances:⁰

Grid No.3 to All Other Electrodes (RF Input)	6	. . . . .	μ f
Plate to All Other Electrodes (Mixer Input)	5	. . . . .	μ f
Grid No.1 to All Other Electrodes (Osc. Input)	2.4	. . . . .	μ f
Grid No.3 to Plate	0.4	max.	μ f
Grid No.3 to Grid No.1	0.2	max.	μ f

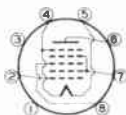
⁰ with no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (excluding tip)	1.200" \pm 0.060"
Maximum Diameter	0.4"
Bulb	T-3
Base	Small-Button Sub-miniatur 8-Pin

BOTTOM VIEW

- Pin 1 - Internal Connection- Do Not Use
- Pin 2 - Grid No.1
- Pin 3 - No Connection



- Pin 4 - Filament (-), Grid No.5
- Pin 5 - Filament (+)
- Pin 6 - Plate
- Pin 7 - Grid No.2, Grid No.4
- Pin 8 - Grid No.3

CONVERTER

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	67.5	max.	volts
GRIDS-No.2 & No.4 (SCREEN) VOLTAGE	45	max.	volts
GRIDS-No.2 & No.4 SUPPLY VOLTAGE	67.5	max.	volts
TOTAL CATHODE CURRENT	4.0	max.	ma

Characteristics - Separate Excitation:*

Plate Voltage	30	45	67.5	volts
Grids-No.2 & No.4 Supply Voltage	30	45	67.5	volts
Grids-No.2 & No.4 Resistor	10000	15000	20000	ohms

* The characteristics shown under separate excitation approximate those obtained in a self-excited oscillator operating with zero bias.

IE8



IE8

PENTAGRID CONVERTER

Grid-No.3 (Control-Grid)			
Voltage	0	0	0 volts
Grid-No.1 (Oscillator-Grid)			
Resistor	0.1	0.1	0.1 megohm
Plate Resistance (Approx.)	0.3	0.4	0.4 megohm
Conversion Transconductance	115	140	150 μ mhos
Grid-No.3 Voltage (Approx.) for conversion transconductance of 5 μ mhos	-7	-8	-9 volts
Plate Current	0.3	0.6	1.0 ma
Grids-No.2 & No.4 Current	0.8	1.1	1.5 ma
Grid-No.1 Current	30	50	70 μ amp
Total Cathode Current	1.1	1.7	2.5 ma

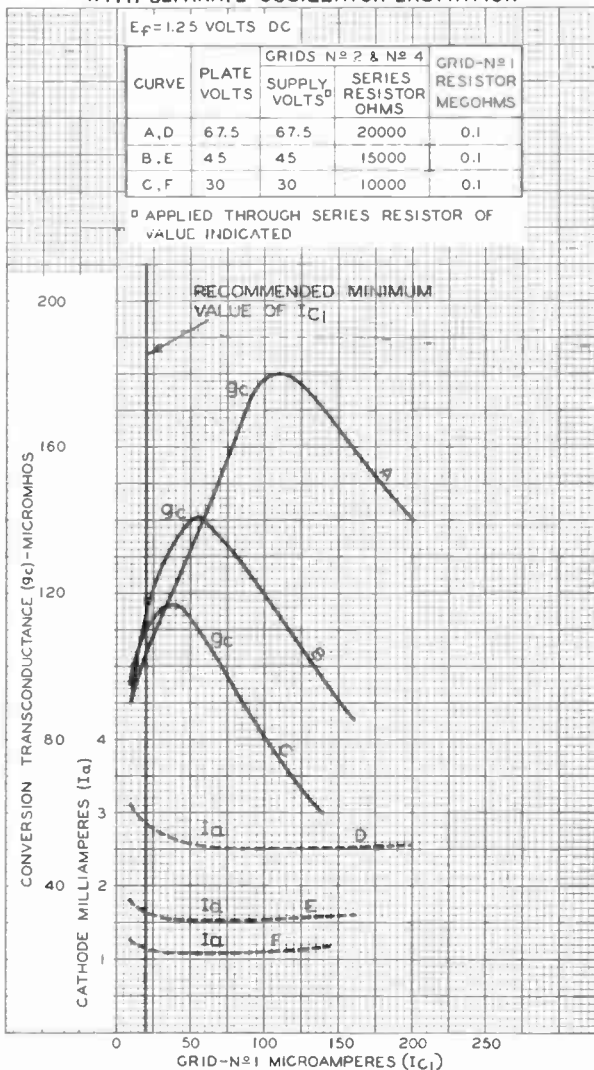
NOTE: The transconductance between grid No.1 and grids No.2 & No.4 connected to plate (not oscillating) is approximately 730 micromhos under the following conditions: signal applied to grid No.1 at zero bias; grids No.2 & No.4 and plate at 30 volts; and grid No.3 grounded. Under the same conditions, the total cathode current is 3 milliamperes and the amplification factor is 3.9.



IE8

IE8

OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION



JAN. 24, 1949

TUBE DEPARTMENT

92CM-7165

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History

IE8



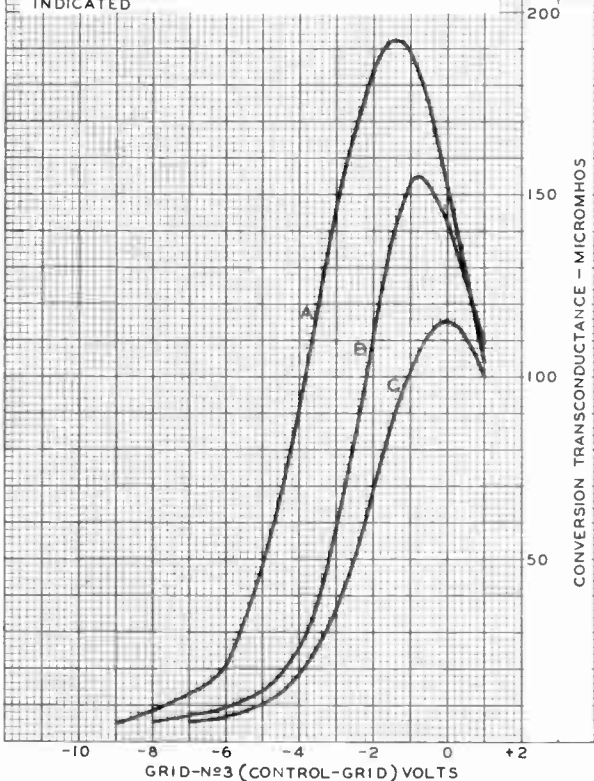
IE8

OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION

$E_p = 1.25$ VOLTS D C					
CURVE	PLATE VOLTS	GRIDS No 2 & No 4		GRID-No 1 RESISTOR MEGOHMS	GRID-No 1 CURRENT μ AMP*
		SUPPLY VOLTS ^D	SERIES RESISTOR OHMS		
A	30	30	10000	0.1	30
B	45	45	15000	0.1	50
C	67.5	67.5	20000	0.1	70

* OBTAINED BY ADJUSTMENT OF OSCILLATOR GRID VOLTAGE TO GIVE INDICATED VALUES

^D APPLIED THROUGH SERIES RESISTOR OF VALUE INDICATED



JAN. 25, 1949

TUBE DEPARTMENT

92CM-7166

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

1G3GT/1B3GT

Half-Wave Vacuum Rectifier

ELECTRICAL

Filament, Coated

	V_{in}	I_1	I_{Max}	
Volt at 100%	1.05	1.25	1.45	V
Current at 1.0 volt	-	0.2	-	A
Direct Interelectrode Capacitance (Approx.) ^a				
Plate to filament & internal shields	1.3			pF

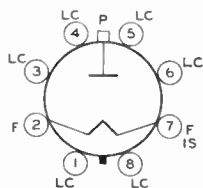
MECHANICAL

Operating Position	Any
Maximum Overall Length	3-9/16 in
Seated Length	2-13/16 ± 3/16 in
Maximum Diameter	1-9/32 in
Bulb	T9
Cap	Small with Tubular Support (JEDEC No. C1-34)
Bases (Alternates)	

- Intermediate—Shell Octal:
 - 4-Pin (JEDEC Group 1, No. B8-f)
 - 7-Pin, Arrangement 1 (JEDEC Group 1, No. B7-10G)
 - 7-Pin, Arrangement 2 (JEDEC Group 1, No. B8--)
 - 7-Pin, Arrangement 3 (JEDEC Group 1, No. B7-8r)
- Short Intermediate—Shell Octal:
 - 7-Pin (JEDEC Group 1, No. B7-47)
- Short Intermediate—Shell Octal with External Bases:
 - 6-Pin, Arrangement 1 (JEDEC Group 1, No. B6-6C)
 - 5-Pin, Arrangement 2 (JEDEC Group 1, No. B5-b)

Basing Designation for BOTTOM VIEW 3C

- Pin 1^b — Limited Connection
- Pin 2 — Filament
- Pin 3 — Same as Pin 1
- Pin 4^d — Same as Pin 1
- Pin 5 — Same as Pin 1
- Pin 6^e — Same as Pin 1
- Pin 7 — Filament, Internal Shield
- Pin 8 — Same as Pin 1
- Cap — Plate



PULSED-RECTIFIER SERVICE

Maximum Ratings, Design-Maximum Values

~~for operation in a 525-line, 30 frame system~~

Inverse Plate Voltage		
Instantaneous	26000	V
Average	22000	V
Peak Plate Current	50	mA
Average Plate Current	0.5	mA

Characteristics, Instantaneous Value

Tube Voltage Drop for plate mA 7	100	V
--	-----	---



1G3GT/1B3GT

RADIO-FREQUENCY RECTIFIER SERVICE

Maximum Ratings, Design-Maximum Values

For operation in a 525-line, 30-frame system

Peak Inverse Plate Voltage	33000	V
Peak Plate Current	35	mA
Average Plate Current	1.1	mA
Frequency Range of Supply Voltage	1.5 to 100	kc/s

Characteristics, Instantaneous Value

Tube Voltage Drop for plate mA - 7	100	V
--	-----	---

- a Without external shield.
- b On the 5-pin bases, pin 1 is omitted.
- c See *Operating Considerations*.
- d On the 5-pin bases, the 6-pin bases, and the 7-pin base JEDEC No. B7-166, pin 4 is omitted.
- e On the 5-pin bases, the 6-pin bases, and the 7-pin base JEDEC No. B7-47, pin 6 is omitted.
- f This rating is applicable where the duration of the voltage pulse does 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

Socket Connections. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to socket terminal 7 or to a corona shield which is connected to socket terminal 7. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential. Otherwise, do not use.

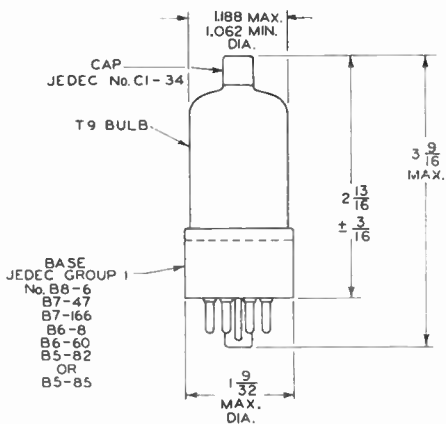
Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse- or rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1G3GT/1B3GT is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1G3GT/1B3GT is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X-Radiation. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce X-radiation which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

1G3GT/1B3GT

DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES





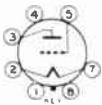


IG4-GT/G

IG4-GT/G

DETECTOR AMPLIFIER TRIODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances (Approx.):		
Grid to Plate	2.8	μf
Grid to Filament	2.2	μf
Plate to Filament	3.4	μf
Maximum Overall Length		3-5/16" \rightarrow
Maximum Seated Height		2-3/4" \uparrow
Maximum Diameter		1-5/16" \uparrow
Bulb		T-9
Base		Intermed. Sh. Octal 7-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Filament +		Pin 7 - Filament -
Pin 3 - Plate		Pin 8 - No Connection
Pin 4 - No Connection		
Mounting Position		Any



BOTTOM VIEW (G-5S7)

Maximum Ratings Are Design-Center Values

AMPLIFIER

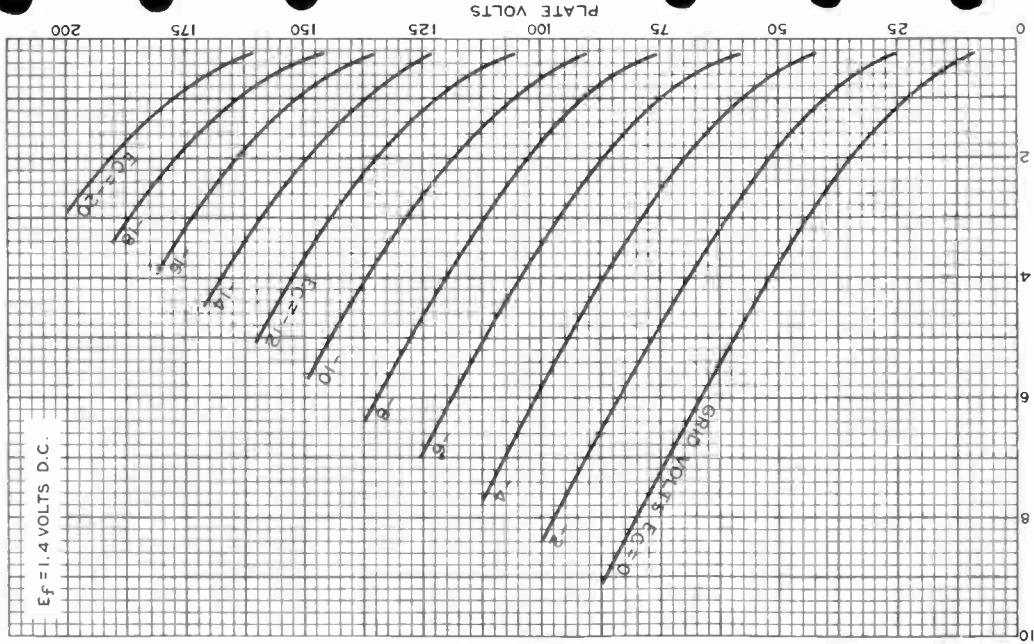
Plate Voltage		110 max. volts
Total Zero-Sig. Cathode Current		4 max. ma.
<i>Typical Operation and Characteristics-Class A₁ Amplifier:</i>		
Plate	90	volts
Grid	-6	volts
Amp. Fact.	8.8	
Plate Res.	10700	ohms
Transcond.	825	μmhos
Plate Cur.	2.3	ma.

-- Indicates a change.



IG4-GT/G

AVERAGE PLATE CHARACTERISTICS



IG4-GT/G

SEPT. 17, 1941

RCA RADIODRON DIVISION
RCA MANUFACTURING COMPANY INC

92C-6128RI



IV2

HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

IV2

GENERAL DATA

Electrical:

Filament, Coated:

Voltage 0.625 ac volt

Current 0.3 amp

Direct Interelectrode Capacitance (Approx.):^o

Plate to filament 0.8 μ mf

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" \pm 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 9U

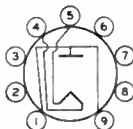
Pin 1 - Plate

Pin 2 - Internal

Connection -
Do Not Use

Pin 3 - Same as Pin 2

Pin 4 - Filament



Pin 5 - Filament

Pin 6 - No Connection

Pin 7 - Same as Pin 2

Pin 8 - Same as Pin 2

Pin 9 - Plate

PULSED-RECTIFIER SERVICE

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system^o

INVERSE PLATE VOLTAGE:

Total dc and peak

(Absolute maximum)[⊕] 8250[■] max. volts

DC 6600 max. volts

PEAK PLATE CURRENT 10 max. ma

AVERAGE PLATE CURRENT 0.5 max. ma

[■] Under no circumstances should the filament voltage be less than 0.525 volt or more than 0.725 volt.

^o without external shield.

[◆] May be used for a tie point for components at or near filament potential; otherwise do not use.

[⊕] 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.

[■] Under no circumstances should this absolute value be exceeded.

← Indicates a change.

IV2



IV2

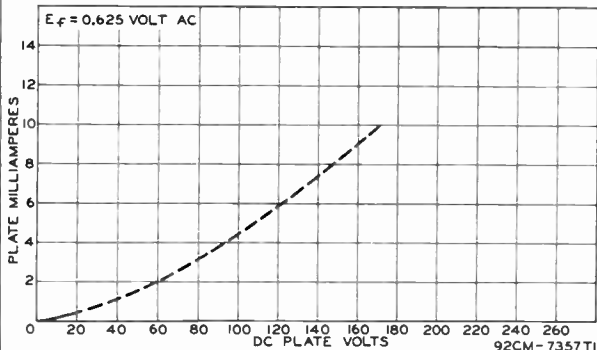
HALF-WAVE VACUUM RECTIFIER

OPERATING CONSIDERATIONS

When the *filament voltage* is measured, it is recommended that a thermal rms voltmeter be used. The meter and its leads must be insulated to withstand 15,000 volts and the stray capacitances to ground should be minimized.

To provide the required insulation in Noval sockets designed with a cylindrical center shield, it is necessary to remove the center shield.

AVERAGE PLATE CHARACTERISTIC



→ indicates a change.

Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

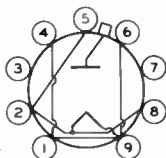
Filament, Coated:

	Min.	Av.	Max.	
Voltage (AC)	1.05	1.25	1.45	volts
Current at 1.25 volts	-	0.2	-	amp
Direct Interelectrode Capacitance (Approx.): ^a				
Plate to filament & internal shield	1			μf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-27/32"
Seated Length	2-7/16" ± 1/8"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Cap	Skirted Miniature (JEDEC No. C1-2 or C1-33)
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9Y

Pin 1 - Filament,
Internal
Shield
Pin 2 - Filament
Pin 3 - Limited
Connection^b
Pin 4 - Same as Pin 1



Pin 5 - Same as Pin 2
Pin 6 - Same as Pin 1
Pin 7 - Same as Pin 3
Pin 8 - Same as Pin 2
Pin 9 - Same as Pin 1
Cap - Plate

PULSED-RECTIFIER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

INVERSF PLATE VOLTAGE:

Total dc and peak ^d	22000 max.	volts
DC	18000 max.	volts
PEAK PLATE CURRENT	45 max.	ma
AVERAGE PLATE CURRENT	0.5 max.	ma

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 7 100 volts

^a without external shield.

^b See *Operating Considerations*.

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

^d 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.

← Indicates a change.



1X2B

OPERATING CONSIDERATIONS

Socket Connections. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential; otherwise, do not use.

Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse-or-rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1X2B is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1X2B is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce X rays which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



Half-Wave Vacuum Rectifier

Electrical:

Heater Characteristic and Ratings:

Voltage (AC or DC)	2.5 ± 0.1	volts
Current at heater volts = 2.5	0.330	amp
Direct Interelectrode Capacitance (Approx.): ^a		
P to (K + IS + H)	1.4	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.675"
Seated Length	3.000" to 3.250"
Diameter	1.002" to 1.188"
Bulb	T4
Case	Small (JEDEC No. C1-1) or Small With Tubular Support (JEDEC No. C1-34)
Base	Small-Button Duodecap 12-Pin (JEDEC No. E12-10)
Basing Designation for BOTTOM VIEW	12F4

Pin 1 - Heater, Cathode,
Internal Shield

Pin 2 - Same as Pin 1

Pin 3 - Do Not Use^b

Pin 4 - See Note

Pin 5 - Do Not Use^b

Pin 6 - Same as Pin 1

Pin 7 - See Note

Pin 8 - Do Not Use^b

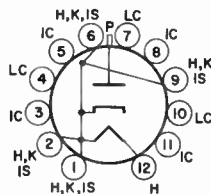
Pin 9 - Same as Pin 1

Pin 10 - See Note

Pin 11 - Do Not Use^b

Pin 12 - Heater

Cap - Plate



NOTE: May be used only under conditions specified in Operating Considerations.

PULSED-RECTIFIER SERVICE**Maximum Ratings, Design-Maximum Values:**For operation in a 525-line, 30-frame system^c**Inverse Plate Voltage:**

Total dc and peak ^a	30000 max.	volts
DC	24000 max.	volts
Peak Plate Current	80 max.	volts
Average Plate Current	1.5 max.	volts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 7	100	volts
---	-----	-------

^a without external shield.^b Socket terminals 3, 5, 8, and 11 should not be used as tie points.

2AS2

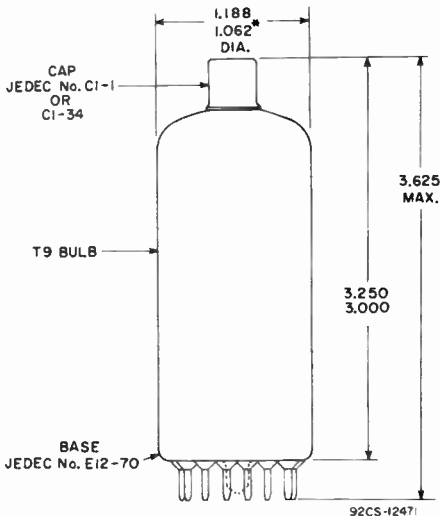
- c As described in "Standards of Good Engineering Practice Concerning Television Receivers' Statics," Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15 percent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 percent of one horizontal scanning cycle is 10 microseconds.

OPERATING CONSIDERATIONS

Socket Connections. Socket terminals 4, 7, and 10 may be used as tie points for components at or near the cathode potential; otherwise, do not use.

The high voltages at which the 2AS2 is operated are very dangerous. Great care should be taken in the design of equipment to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of heater voltage. Under all circumstances, circuit parts which may be high potentials should be enclosed or adequately insulated.

X-radiation. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce X-radiation which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



DIMENSIONS IN INCHES

* Applies to minimum diameter except in area of seal.

Half-Wave Vacuum Rectifier

Useful in High-Voltage, Low-Current Applications such as Pulse-Operated, Focus-Rectifier Circuits in Color TV Receivers

ELECTRICAL

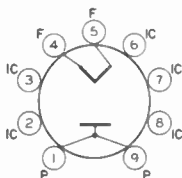
Filament Characteristics and Ratings

Voltage (AC)	1.80 ± 0.27	V
Current at 1.80 V	0.225	A ←
Direct Interelectrode Capacitance (Approx.)^a		
Plate to filament	0.8	pF ←

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Filament
Maximum Overall Length	2-3/16 in
Maximum Seated Length	1-15/16 in
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16 + 3/32 in
Diameter	0.750 to 0.875 in
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Socket	See <i>Operating Considerations</i>
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9U

- Pin 1 - Plate
- Pin 2 - Do Not Use^b
- Pin 3 - Do Not Use^b
- Pin 4 - Filament
- Pin 5 - Filament



- Pin 6 - Do Not Use^b
- Pin 7 - Do Not Use^b
- Pin 8 - Do Not Use^b
- Pin 9 - Plate

HALF-WAVE PULSED RECTIFIER

Design-Maximum Ratings

(except as noted)

For Operation in a 525-line, 30-frame system^c

Inverse Plate Voltage		
Peak (Absolute-Maximum Value) ^d	8250 ^e	V
DC	7000	V
Plate Current		
Peak	50	mA ←
Average	0.6	mA

Characteristics, Instantaneous Value

Tube Voltage Drop for plate mA = 1	20	V ←
--	----	-----

← Indicates a change.



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA
0-0

- a Without external shield.
- b See *Operating Considerations*.
- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations". Federal Communications Commission.
- d 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.
- e Under no circumstances should this absolute-maximum value be exceeded.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 2AV2 fit the Noval 9-contact socket. Socket terminals 2, 3, 6, 7, and 8 should not be used as tie points for external-circuit components. The socket should be made of material having low leakage and should have adequate insulation between its filament and plate terminals to withstand the maximum peak-inverse plate voltage. To provide the required insulation in Noval 9-contact sockets having a cylindrical center shield, it is necessary to remove the center shield. In addition, it is recommended that socket clips for pins 2, 3, 6, 7, and 8 be removed to minimize leakage and the possibility of arc-over.

Measurement of Filament Voltage. It is recommended that a thermal rms voltmeter be used to measure filament voltage. The meter and its leads must be insulated to withstand 15,000 volts. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

High Voltages. The high voltage at which the 2AV2 is operated are very dangerous. Great care should be taken in the design of equipment to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in measuring the filament voltage particularly in those circuits where the filament is not grounded. In all cases, all circuit parts which may be at high potentials should be enclosed and interlock switches should be used to open the primary circuit of the high-voltage power supply when access to the equipment is required.



Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

For High-Voltage Rectifier Service in Transistorized TV Receivers

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC)	2.30 ± 0.30	V
Current at 2.30 V.	0.300	A

Direct Interelectrode Capacitance (Approx.)

Without external shield		
P to (K + IS + H)	1.0	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-27/32 in
Seated Length	2-7/16 ± 1/8 in
Diameter	0.750 to 0.875 in
Dimensional Outline (JEDEC No.6-7)	See <i>General Section</i>
Bulb	T6-1/2
Cap.	Skirted Miniature (JEDEC No.C1-2 or C1-33)
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9RT

Pin 1—Heater, Cathode, Internal Shield

Pin 2—Heater

Pin 3—Do Not Use

Pin 4—Same as Pin 1

Pin 5—Heater

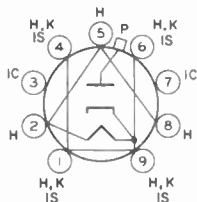
Pin 6—Same as Pin 1

Pin 7—Do Not Use

Pin 8—Heater

Pin 9—Same as Pin 1

Cl—Plate



PULSED-RECTIFIER SERVICE

For operation in a 525-line, 30-frame system

Maximum Ratings. Design-Maximum Values

Peak Inverse Plate Voltage ^a	20000	V
Peak Plate Current	80	mA
Average Plate Current	1.0	mA

Characteristic. Instantaneous Value

Tube Voltage Drop for plate mA = 7	80	V
--	----	---

^a This rating is applicable where the duration of the voltage pulse does 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 micro-seconds.



OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 2BJ2 fit the Noval 9-contact socket. Socket terminals 3 and 7 should not be used as tie points for external-circuit components.

The high voltages at which the 2BJ2 is operated are very dangerous. Great care should be taken in the design of equipment to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of heater voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X-radiation. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce X-radiation which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



2BJ2A

Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

Designed to minimize X-Radiation

$-e_{bm} = 22,000$ max. V $i_{bm} = 80$ mA

ELECTRICAL CHARACTERISTICS – Bogy Values

Heater Voltage, ac or dc	E_h	2.30	V
Heater Current at $E_h = 2.3$ V	I_h	0.300	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	c_{p-all}	1.0	pf
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current ($i_b = 7$ mA)	e_b	80	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	.2844in. (72.24 mm)
Maximum Seated Length	.2562in. (65.07 mm)
Maximum Bulb Diameter	.0875in. (22.22 mm)
Envelope	JEDEC T 6½
Top Cap	Skirted minaiture (JEDEC NO. CI-2, CI-33 or CI-45)
Base	Small-Button noval 9-pin (JEDEC E9-I)
Terminal Diagram	JEDEC 9RT
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b – High Voltage Rectifier

For operation as a pulsed rectifier tube in a 525-line, 30-frame system^c

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	22,000	V
Average (absolute max.)	$E_{b(av)}$	20,000	V
Plate Current:			
Peak (design max.)	i_{bm}	80	mA
Average (design max.)	$I_{b(av)}$	1.0	mA
Heater Voltage (absolute max.)	E_h	2.6	V
Heater Voltage (absolute min.)	E_h	2.0	V

2BJ2A

- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.
- ^b As defined in the current issue of EIA Standard RS-239A.
- ^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 2BJ2A fit the standard noval socket. Socket terminals 1, 3, 4, 6, and 7 may be connected to terminal 9 or to a corona shield which connects to terminal 9. Terminals 3 and 7 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 22,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-RADIATION CHARACTERISTIC

X-Radiation, Maximum

Statistical Value Controlled On A Lot

Sampling Basis 0.5 mR/hr

X-Radiation is measured in accordance with JEDEC Publication No. 67 A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73 A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Operation of the 2BJ2A outside of the absolute values indicated above may result in either temporary or permanent

changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

WARNING
X-Radiation

The high voltages associated with the 2BJ2A result in production of X-Radiation which may constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 2BJ2A to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

SHOCK HAZARD

The high voltages at which the 2BJ2A is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 2BJ2A in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

2BJ2A

TERMINAL DIAGRAM – JEDEC 9RT – Bottom View

Pin 1 – Heater, Cathode,
Internal Shield

Pin 9 – Same as Pin 1
Cap – Plate

Pin 2 – Heater

Pin 3 – Do Not Use

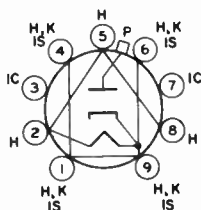
Pin 4 – Same as Pin 1

Pin 5 – Heater

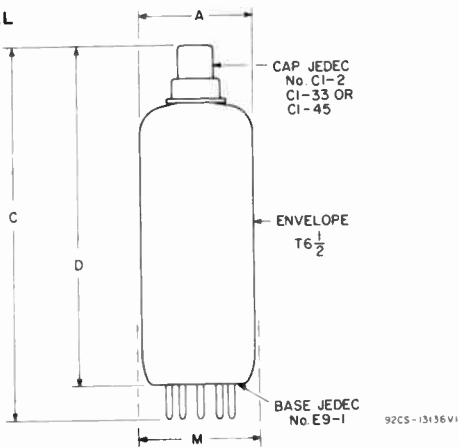
Pin 6 – Same as Pin 1

Pin 7 – Do Not Use

Pin 8 – Heater



DIMENSIONAL OUTLINE



DIMENSION	INCHES			MILLIMETERS		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A*	0.800	—	0.845	20.32	—	21.46
C	—	—	2.844	—	—	72.24
D	2.312	2.347	2.562	58.72	61.90	65.07
M*	—	—	0.875	—	—	22.22
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION						
*As defined in the current issue of EIA standards RS-209-A1.						

Half-Wave Vacuum Rectifier

T-9 Duodecar Type

Designed to minimize X-Radiation

$-e_{bm} = 30,000$ max. V

$i_{bm} = 80$ mA

ELECTRICAL CHARACTERISTICS – Bogy Values

Heater Voltage, ac or dc	E_h	2.5 ± 0.4	V
Heater Current at $E_h = 2.5$ V	I_h	0.33	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	c_{p-all}	1.4	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	60	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.625 in (92.07 mm)
Maximum Seated Length	3.250 in (82.55 mm)
Maximum Bulb Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Small-Button Duodecar 12-pin (JEDEC E12-70)
Terminal Diagram	JEDEC 12-JB
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b – High Voltage Rectifier

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system^c*

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	30,000	V
DC (absolute max.)	$E_{b(av)}$	24,000	V
Plate Current:			
Peak (design max.)	i_{bm}	80	mA
Average (design max.)	$I_{b(av)}$	1.5	mA
Heater Voltage (absolute max.)	E_h	2.9	V
Heater Voltage (absolute min.)	E_h	2.1	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239A.

2BU2

- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 2BU2 fit the standard duodecar socket. Socket terminals 2, 3, 4, 5, 6, 7, 9, 10 and 11 may be connected to terminal 1 or to a corona shield which connects to terminal 1. Terminals 4, 10 and 11 may be used as pie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 30,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-Radiation Characteristic

X-Radiation, Maximum

0.5 mR/hr

Operation of the 2BU2 outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

X-Radiation is measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Warning

X-Radiation

The high voltages associated with the 2BU2 result in production of X-Radiation which may constitute a health

hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 2BU2 to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

Shock Hazard

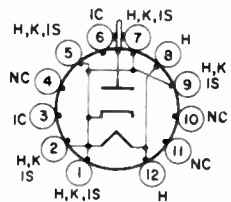
The high voltages at which the 2BU2 is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 2BU2 in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

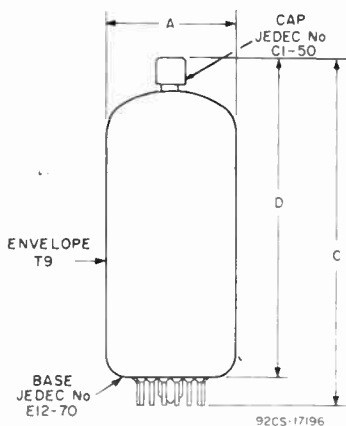
TERMINAL DIAGRAM – JEDEC 12JB – Bottom View

- Pin 1 - Heater, Cathode, Internal Shield
 - Pin 2 - Heater, Cathode, Internal Shield
 - Pin 3 - Do Not Use
 - Pin 4 - No Connection
 - Pin 5 - Heater, Cathode, Internal Shield
 - Pin 6 - Do Not Use
 - Pin 7 - Heater, Cathode, Internal Shield
 - Pin 8 - Heater
 - Pin 9 - Heater, Cathode, Internal Shield
 - Pin 10 - No Connection
 - Pin 11 - No Connection
 - Pin 12 - Heater
- Cap - Plate



2BU2

DIMENSIONAL OUTLINE



DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.062*	1.188	27.0*	30.17
C	—	3.625	—	92.07
D	3.000	3.250	76.2	82.55
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

2CN3A

Half-Wave Vacuum Rectifier

4-Second Heater Warm-up Time

The 2CN3A is the same as the 3CN3A except for:

Heater Characteristics and Ratings:

Current	0.900 ± 0.050	A
Voltage (ac or dc) at 0.900 A	1.80	V

2CW4

High-Mu Triode

Nuvistor Type

The 2CW4 is the same as the 6CW4 except for:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	A
Voltage (ac or dc) at 0.450 A	2.1	V
Warm-up Time (Average)	8	s

2CY5

Sharp-Cutoff Tetrode

The 2CY5 is the same as the 6CY5 except for:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	2.4	V
Warm-up Time (Average)	11	s

2DS4

High-Mu Triode

Nuvistor Type
Having Extended Cutoff Characteristic

The 2DS4 is the same as the 6DS4 except for:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	A
Voltage (ac or dc) at 0.450 A	2.1	V
Warm-up Time (Average)	8	s

2DV4

Medium-Mu Triode

Nuvistor Type

The 2DV4 is the same as the 6DV4 except for:

Heater a Heater Characteristics and Ratings:

Current	0.450 + 0.030	A
Voltage (ac or dc) at 0.450 A	2.1	V
Warm-up Time (Average)	8	s



2E5

2E5



ELECTRON-RAY TUBE

INDICATOR TYPE WITH TRIODE UNIT

Heater	Coated Unipotential Cathode	
Voltage	2.5	a-c or d-c volts
Current	0.9	amp.
Maximum Overall Length		4-3/16"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 6-Pin
Pin 1 - Heater		Pin 4 - Target
Pin 2 - Plate		Pin 5 - Cathode
Pin 3 - Grid		Pin 6 - Heater
Mounting Position	BOTTOM VIF V (6R)	Any

■ 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.

Maximum Ratings, Typical Operating Conditions and Curves for the 2E5 are the same as for type 6K5.



2ER5

High-Mu Triode

The 2ER5 is the same as the 6ER5 except for the following items:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
voltage (A.C. or D.C. at 0.600 A.)	2.3	V

2FH5

High-Mu Triode

The 2FH5 is the same as the 6FH5 except for the following items:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
voltage (A.C. or D.C. at 0.600 A.)	2.35	V
Warm-up time (Average)	11	s

2FS5

Beam Hexode

The 2FS5 is the same as the 6FS5 except for the following items:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
voltage (A.C. or D.C. at 0.600 A.)	2.4	V
Warm-up time (Average)	11	s

2GK5

High-Mu Triode

The 2GK5 is the same as the 6GK5 except for the following items:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
voltage (A.C. or D.C. at 0.600 A.)	2.3	V
Warm-up time (Average)	11	s



2GU5

Beam Hexode

The 2GU5 is the same as the 6GU5 except for the following items:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
voltage (AC or DC) at 0.600 A.	2.4	V
Warm-up time (Average)	11	s



3A2A

Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

Designed to minimize X-Radiation

$$-e_{bm} = 20,000 \text{ max. V} \quad i_{bm} = 80 \text{ mA}$$

ELECTRICAL CHARACTERISTICS — Bogey Values

Heater Voltage, ac or dc	E_h	3.15	V
Heater Current at $E_h = 3.15 \text{ V}$	I_h	0.22	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H).	$c_{p\text{-all}}$	1.0	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	70	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	2.844in. (72.24 mm)
Maximum Seated Length	2.562in. (65.07 mm)
Maximum Diameter	0.875in. (22.22 mm)
Envelope	JEDEC T6½
Top Cap	Skirted Miniature (JEDEC NO. CI-2, CI-33 or CI-45)
Base	Small-Button Noval 9-pin (JEDEC E9-I)
Terminal Diagram	JEDEC 9DT
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b — High Voltage Rectifier

For operation as a pulsed rectifier tube in a 525-line, 30-frame system^c

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	20,000	V
Average (absolute max.)	$E_{b(av)}$	18,000	V
Plate Current:			
Peak (design max.)	i_{bm}	80	mA
Average (design max.)	$I_{b(av)}$	1.5	mA
Heater Voltage (absolute max.)	E_h	3.65	V
Heater Voltage (absolute min.)	E_h	2.65	V

3A2A

- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.
- ^b As defined in the current issue of EIA Standard RS-239A.
- ^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is $10\mu\text{s}$.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3A2A fit the standard noval socket. Socket terminals 1, 3, 4, 6, and 7 may be connected to terminal 9 or to a corona shield which connects to terminal 9. Terminals 3 and 7 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 20,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-RADIATION CHARACTERISTIC

X-Radiation, Maximum

Statistical Value Controlled On A Lot

Sampling Basis 0.5mR/hr

X-Radiation is measured in accordance with JEDEC Publication No. 67 A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73 A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Operation of the 3A2A outside of the absolute values indicated above may result in either temporary or permanent

changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

WARNING

X-Radiation

The high voltages associated with the 3A2A result in production of X-Radiation which may constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3A2A to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

SHOCK HAZARD

The high voltages at which the 3A2A is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 3A2A in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

3A2A

TERMINAL DIAGRAM – JEDEC 9RT – Bottom View

Pin 1 – Heater, Cathode, Internal Shield

Pin 2 – Heater

Pin 3 – Do Not Use

Pin 4 – Same as Pin 1

Pin 5 – Heater

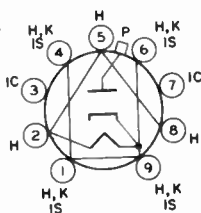
Pin 6 – Same as Pin 1

Pin 7 – Do Not Use

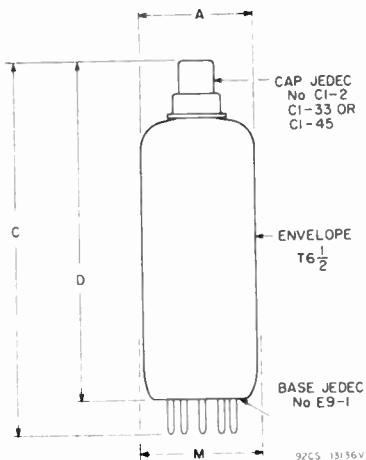
Pin 8 – Heater

Pin 9 – Same as Pin 1

Cap – Plate



DIMENSIONAL OUTLINE



DIMENSION	INCHES			MILLIMETERS		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A*	0.800	—	0.845	20.32	—	21.46
C	—	—	2.844	—	—	72.24
D	2.312	2.347	2.562	58.72	61.90	65.07
M*	—	—	0.875	—	—	22.22

MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION

*As defined in the current issue of EIA standards RS-209-A1.

Half-Wave Vacuum Rectifier

For High-Voltage Rectifier Circuits in
Color and Black-and-White TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Characteristics and Ratings

Voltage, AC	E_h	3.15	V
Current at 3.15 V	I_h	0.220	A

Direct Interelectrode Capacitance (Approx.)

Without external shields

Plate (H) to H ₁	C_{p-all}	1.5	pF
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Instantaneous Tube Voltage Drop

For $I_b = 2$ mA	e_b	100	V
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MECHANICAL CHARACTERISTICS

Operating Position		Any
Type of Cathode	Coated Unipotential	
Maximum Overall Length		3.812 in
Maximum Seated Length		3.250 in
Maximum Diameter		1.281 in
Envelope		JEDEC T9

Caps (Alternates)

Small JEDEC No. 1-11

Small with Tubular Support (JEF No. 1-54)

Base (Alternates)

Intermediate-Shell Octal:

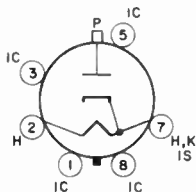
6-Pin Arrangement 1 (JEDEC Drawing No. 9-8)

Short Intermediate-Shell Octal with External Shields:

6-Pin Arrangement 1 (JEDEC Drawing No. 9-60)

TERMINAL DIAGRAM (Bottom View)

Pin 1—Do Not Use
Pin 2—Heater
Pin 3—Do Not Use
Pin 4—Do Not Use
Pin 5—Heater, Ground,
Internal Shield
Pin 6—Do Not Use
Cap—Plate



Note: May be used only under conditions specified in Operating Considerations.

PULSED-RECTIFIER SERVICE

Design-Maximum Ratings

For operation in a 525-line, 30-frame system

Peak Inverse Plate Voltage ^a	-	30000	V
Peak Plate Current	i_b	100	mA
Average Plate Current	$I_b(av)$	2	mA
Heater Voltage, AC	E_h	2.65 min—3.65 max	V



^a This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

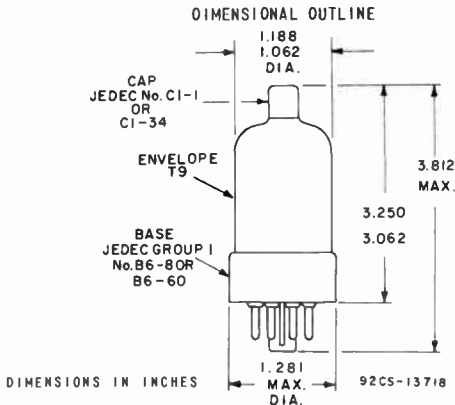
OPERATING CONSIDERATIONS

Socket terminals 1, 3, 4, 5, 6 and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Socket terminals 4 and 6 may be used as tie points at or near cathode potential. Otherwise, do not use.

The high voltages at which the 3A3A is operated may be extremely dangerous to the user. Great care should be taken during the adjustment of circuits. The tube and its associated apparatus, especially all parts which may be at high potential above ground, should be housed in a protective enclosure. The protective housing should be designed with interlocks so that personnel cannot possibly come in contact with any high potential points in the electrical system. The interlock devices should function to break the primary circuits of the high-voltage supply when any gate or door on the protective housing is opened, and should prevent the closing of this primary circuit until the door is locked again.

It should be noted that high voltages may appear at normally low-potential points in the circuit as a result of capacitor breakdown or incorrect circuit connections. Therefore, before any part of the circuit is touched, the power-supply switch should be turned off and both terminals of any capacitor should be grounded.

Operation of the 3A3A with a plate voltage above approximately 16000 volts (absolute value) results in the production of A-radiations which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simply shielding should prove adequate, but the need for this precaution should be considered in equipment design.





3A8-GT

3A8-GT



DIODE-TRIODE-R-F AMPLIFIER PENTODE

Filament ^o	Coated Series*	Parallel**	
Filament Arrangement			
Voltage	2.8	1.4	c-c volts
Current	0.05	0.1	amp.
Direct Interelectrode Capacitances:*			
Pentode Unit - Grid to Plate			0.012 max. uuf
Input			3.0 uuf
Output			10 uuf
Triode Unit - Grid to Plate (approx.)			2.0 uuf
Grid to Filament (approx.)			2.6 uuf
Plate to Filament (approx.)			4.2 uuf
Maximum Overall Length			3-7/16"
Maximum Sealed Height			2-7/8"
Maximum Diameter			1-5/16"
Bulb			T-9
Cap			Skirted Miniature
Base			Intermed. Sh. Octal 8-Pin
Pin 1 - Fil. Midtap, Supp'r.			Pin 5 - Triode Grid
Pin 2 - Internal Shield			Pin 6 - Triode Plate
Pin 3 - Filament			Pin 7 - Filament
Pin 4 - Pentode Plate			Pin 8 - Diode Plate
Pin 8 - Pentode Screen			Cap - Pentode Grid
Mounting Position	BOTTOM VIEW (BAS)		Any

TRIODE UNIT

Plate Voltage	110 max.	volts
Typical Operation and Characteristics - Class A ₁ Amplifier:		
Plate Voltage	90	volts
Grid Voltage ^{oo}	0	volts
Amplification Factor	65	
Plate Resistance	0.2 approx.	megohm
Transconductance	325	μmhos
Plate Current	0.2	ma.

PENTODE UNIT

Plate Voltage	110 max.	volts
Screen Voltage	110 max.	volts
Typical Operation and Characteristics - Class A ₁ Amplifier:		
Plate Voltage	90	volts
Screen Voltage	90	volts
Grid Voltage ^{oo}	0	volts
Plate Resistance	0.8 approx.	megohm
Transconductance	750	μmhos
Plate Current	1.5	ma.
Screen Current	0.5	ma.

DIODE UNIT

The diode plate is located at the negative end of the filament, and is independent of the triode unit and of the pentode unit except for the common filament.

* filament voltage applied across the two sections in series between pins #2 and #7.

** filament voltage applied across the two sections in parallel between pin #1 and pins #2 and #7 connected together.

^o The filament is designed so that the two sections may be operated satisfactorily with parallel arrangement when connected directly across a 1.5-volt dry battery, or with series arrangement when connected directly across two 1.5-volt dry batteries in series.

[■] with close-fitting shield connected to negative filament terminal.

^{oo} Grid voltage for parallel filament arrangement is referred for both triode unit and pentode unit to pins #2 and #7 connected together. For series filament arrangement, grid voltage for triode unit is referred to pin #7 and for pentode unit to pin #1.

← Indicates a change.

May 1, 1941

RCA RADIODRON DIVISION
RCA MANUFACTURING COMPANY INC

World Radio History

DATA



3AF4A

Medium-Mu Triode

7-PIN MINIATURE TYPE

The 3AF4A is the same as the 6AF4A except for the following items:
Heater Characteristics and Ratings:

Current.	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450.	3.15	volts
Warm-up time (Average)	11	sec

3AL5

Twin Diode

7-PIN MINIATURE TYPE

The 3AL5 is the same as the 6AL5 except for the following items:
Heater Characteristics and Ratings:

Current.	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600.	3.15	volts
Warm-up time (Average)	11	sec





Half-Wave Vacuum Rectifier

DUODECAR TYPE

Electrical:

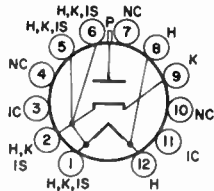
Heater Characteristics and Ratings:

Voltage (AC or DC)	3.15 ± 0.32	volts
Current at heater volts = 3.15	0.220	amp
Direct Interelectrode Capacitance (Approx.): ^a		
P to (K+IS+H)	1.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.625"
Seated Length	3.000" to 3.250"
Diameter	1.062" to 1.188"
Dimensional Outline	See <i>General Section</i>
Bulb	T9
Cap	Small (JEDEC No. C1-1) or Small With Tubular Support (JEDEC No. C1-34)
Base	Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
Basing Designation for BOTTOM VIEW	12FV

- Pin 1 - Heater, Cathode,
Internal Shield
- Pin 2 - Same as Pin 1
- Pin 3 - *Do Not Use*
- Pin 4 - No Internal Connection
- Pin 5 - Same as Pin 1
- Pin 6 - Same as Pin 1
- Pin 7 - Same as Pin 4
- Pin 8 - Heater
- Pin 9 - Same as Pin 1
- Pin 10 - Same as Pin 4
- Pin 11 - *Do Not Use*
- Pin 12 - Heater
- Cap - Plate



PULSED-RECTIFIER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

Peak Inverse Plate Voltage ^c	30000 max.	volts
Peak Plate Current	88 max.	ma
Average Plate Current	1.7 max.	ma

^a without external shield.

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

^c This rating is applicable when the duration of the voltage pulse does 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.



3AT2

OPERATING CONSIDERATIONS

The high voltages at which the 3AT2 is operated are very dangerous. Great care should be taken in the design of equipment to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of heater voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X-radiation. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X-radiation* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



3AU6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

The 3AU6 is the same as the 6AU6A except for:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	A
Voltage (AC or DC) at heater amperes = 0.600	3.15	V
Warm-up time (Average)	11	s

3AV6

Twin Diode—High-Mu Triode

7-PIN MINIATURE TYPE

The 3AV6 is the same as the 6AV6 except for:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	A
Voltage (AC or DC) at heater amperes = 0.600	3.15	V
Warm-up time (Average)	11	s

3BA6

Remote-Cutoff Pentode

The 3BA6 is the same as the 6BA6 except for:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	3.15	V
Warm-up Time (Average).	11	s

3BN4A

Medium-Mu Triode

The 3BN4A is the same as the 6BN4A except for:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	A
Voltage (ac or dc) at 0.450 A	3	V
Warm-up Time (Average).	11	s

3BN6

Beam Tube

The 3BN6 is the same as the 6BN6 except for:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	3.15	V
Warm-up Time (Average).	11	s

3BU8/3GS8

Sharp-Cutoff Twin Pentode

With Common Cathode

Grid No. 1, and Grid No. 2

The 3BU8/3GS8 is the same as the 6BU8 except for:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	3.15	V
Warm-up Time (Average).	11	s

Half-Wave Vacuum Rectifier

T-9 Duodecar Type

Designed to minimize X-Radiation

$-e_{bm} = 38,000$ max. V

$i_{bm} = 110$ mA

ELECTRICAL CHARACTERISTICS – Bogyey Values

Heater Voltage, ac or dc	E_h	3.15 ± 0.5	V
Heater Current at $E_h = 3.15$ V	I_h	0.48	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	c_{p-all}	1.6	pf
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	70	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.625 in (92.07 mm)
Maximum Seated Length	3.250 in (82.55 mm)
Maximum Bulb Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Small-Button Duodecar 12-pin (JEDEC E12-70)
Terminal Diagram	JEDEC 12-HY
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b – High Voltage Rectifier

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system^c*

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	38,000	V
DC (absolute max.)	$E_{b(av)}$	30,000	V
Plate Current:			
Peak (design max.)	i_{bm}	110	mA
Average (design max.)	$I_{b(av)}$	2.2	mA
Heater Voltage (absolute max.)	E_h	3.65	V
Heater Voltage (absolute min.)	E_h	2.65	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239A.

3BW2

- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3BW2 fit the standard duodecar socket. Socket terminals 2, 3, 4, 5, 6, 7, 9, 10 and 11 may be connected to terminal 1 or to a corona shield which connects to terminal 1. Terminals 4 and 10 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 38,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-Radiation Characteristic

X-Radiation, Maximum

25 mR/hr

Operation of the 3BW2 outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

X-Radiation is measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Warning

X-Radiation

The high voltages associated with the 3BW2 result in production of X-Radiation which may constitute a health

hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3BW2 to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

Shock Hazard

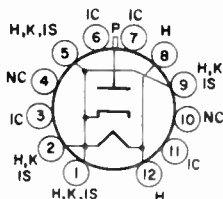
The high voltages at which the 3BW2 is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 3BW2 in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

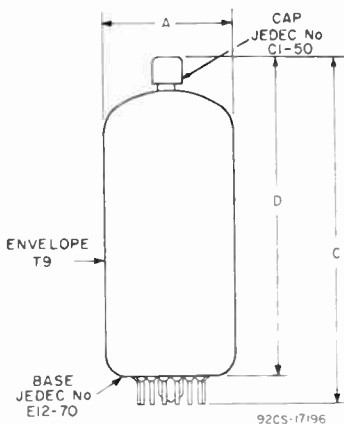
TERMINAL DIAGRAM — JEDEC 12 HY — Bottom View

- Pin 1 - Heater, Cathode, Internal Shield
 - Pin 2 - Heater, Cathode, Internal Shield
 - Pin 3 - Do Not Use
 - Pin 4 - No Connection
 - Pin 5 - Heater, Cathode, Internal Shield
 - Pin 6 - Do Not Use
 - Pin 7 - Do Not Use
 - Pin 8 - Heater
 - Pin 9 - Heater, Cathode, Internal Shield
 - Pin 10 - No Connection
 - Pin 11 - Do Not Use
 - Pin 12 - Heater
- Cap - Plate



3BW2

DIMENSIONAL OUTLINE



DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.062*	1.188	27.0*	30.17
C	—	3.625	—	92.07
D	3.000	3.250	76.2	82.55

MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION

* Applies to the minimum diameter except in the area of the seal.

Half-Wave Vacuum Rectifier

Designed to minimize X-Radiation

$-e_{bm} = 38,000$ max. V $i_{bm} = 100$ mA

ELECTRICAL CHARACTERISTICS — Bogey Values

Heater Voltage, ac or dc	E_h	3.60	V
Heater Current at $E_h = 3.60$ V	I_h	0.225	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H).	C_{p-all}	1.6	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	60	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.812in. (96.82 mm)
Maximum Seated Length	3.250in. (82.55 mm)
Maximum Diameter	1.188in. (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Ultra-Short Small-Wafer with External Barriers: 6-pin (JEDEC No. B6-253)
Terminal Diagram	JEDEC 8EZ
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b — High Voltage Rectifier

For operation as a pulsed rectifier tube in a 525-line, 30-frame system^c

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	38,000	V
Average (absolute max.)	$E_{b(av)}$	30,000	V
Plate Current:			
Peak (design max.)	i_{bm}	100	mA
Average (design max.)	$I_{b(av)}$	2.0	mA
Heater Voltage (absolute max.)	E_h	4.14	V
Heater Voltage (absolute min.)	E_h	3.06	V

3CA3A

- a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- b As defined in the current issue of EIA Standard RS-239A.
- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is $10\mu\text{s}$.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3CA3A fit the standard octal socket. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Terminals 4 and 6 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 38,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-RADIATION CHARACTERISTIC

X-Radiation, Maximum

Statistical Value Controlled On A Lot

Sampling Basis 25mR/hr

X-Radiation is measured in accordance with JEDEC Publication No. 67 A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73 A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Operation of the 3CA3A outside of the absolute values indicated above may result in either temporary or permanent

changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

WARNING

X-Radiation

The high voltages associated with the 3CA3A result in production of X-Radiation which may constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3CA3A to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

SHOCK HAZARD

The high voltages at which the 3CA3A is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

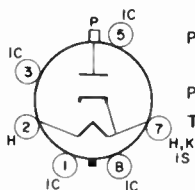
Precautions must be exercised during the replacement or servicing of the 3CA3A in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

3CA3A

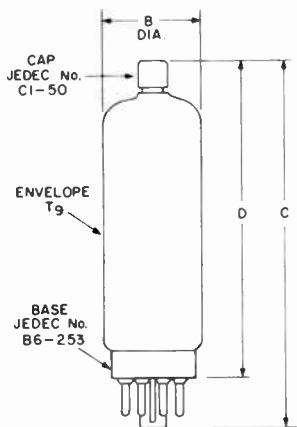
TERMINAL DIAGRAM – JEDEC 8EZ – Bottom View

- Pin 1 – Do Not Use
- Pin 2 – Heater
- Pin 3 – Do Not Use
- Pin 5 – Do Not Use



- Pin 7 – Heater, Cathode,
Internal Shield
- Pin 8 – Do Not Use
- Top Cap – Plate

DIMENSIONAL OUTLINE



92CS-15232VI

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
B	1.062*	1.188	26.98*	30.17
C	—	3.812	—	96.82
D	3.062	3.250	77.78	82.55
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

Pentagrid Amplifier

The 3CS6 is the same as the 6CS6 except for the following items:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	3.15	V
Warm-up time (Average)	11	s



Half-Wave Vacuum Rectifier

Controlled for X-Radiation

$-e_{bm} = 33,000$ max. V

$i_{bm} = 100$ mA

ELECTRICAL CHARACTERISTICS — Bogy Values

Filament Voltage, ac or dc	E_h	3.15 ± 0.5	V
Filament Current at $E_f = 3.15$ V	I_h	0.280	A
Direct Interelectrode Capacitance, ^a P to (F + IS)	C_{p-all}	1.5	pF
Instantaneous Tube Voltage Drop for Instantaneous Plate Current (i_b) = 7 mA	e_b	50	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.812 in (96.82 mm)
Maximum Seated Length	3.250 in (82.55 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Ultra-Short Small-Wafer Octal with External Barriers: 6-Pin. (JEDEC Group 1, No. B6-253)
Terminal Diagram	JEDEC 8 MK
Type of Cathode	Coated Filament
Operating Position	Any

MAXIMUM RATINGS^b — High Voltage Rectifier

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system^c*

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	33,000	V
DC (absolute max.)	$E_{b(av)}$	27,500	V
Plate Current:			
Peak (design max.)	i_{bm}	100	mA
Average (design max.)	$I_{b(av)}$	2	mA
Filament Voltage (absolute max.)	E_f	3.65	V
Filament Voltage (absolute min.)	E_f	2.65	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239A.

3CU3A

- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3CU3A fit the standard octal socket. Socket terminals 1, 3, 4, 5, 6 and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Terminals 4 and 6 may be used as tie points at or near filament potential. Otherwise, do not use.

Measurement of Filament Voltage. It is recommended that a thermocouple rms voltmeter be used to measure filament voltage. The meter and its leads must be insulated to withstand 33,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-Radiation Characteristic

X-Radiation, Maximum

25 mR/hr

Operation of the 3CU3A outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

X-Radiation is measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Warning

X-Radiation

The high voltages associated with the 3CU3A result in production of X-Radiation which may constitute a health

hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3CU3A to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

Shock Hazard

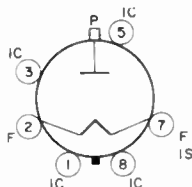
The high voltages at which the 3CU3A is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 3CU3A in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

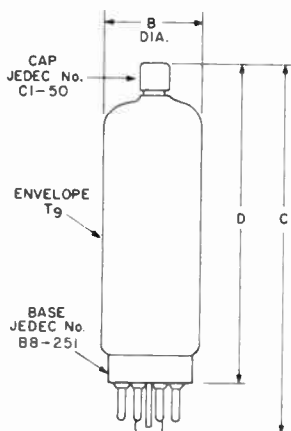
TERMINAL DIAGRAM – JEDEC 8MK – Bottom View

Pin 1 - Do Not Use
 Pin 2 - Filament
 Pin 3 - Do Not Use
 Pin 5 - Do Not Use
 Pin 7 - Filament
 Internal Shield
 Pin 8 - Do Not Use
 Top Cap - Plate



3CU3A

DIMENSIONAL OUTLINE



92CS-15232R1

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
B	1.062*	1.188	26.98*	30.17
C	—	3.812	—	96.82
D	3.062	3.250	77.78	82.55

MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION

* Applies to the minimum diameter except in the area of the seal.

Sharp-Cutoff Tetrode

The 3CY5 is the same as the 6CY5 except for the following items:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	A
Voltage (ac or dc) at 0.450 A	2.9	V
Warm-up time (Average)	11	s



Half-Wave Vacuum Rectifier

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac	E_h	3.15	V
Heater Current at $E_h=3.15$ V.	I_h	0.48	A
Warm-up Time	T_{dh}	4	s
Direct Interelectrode Capacitance:			

P to (K + IS + H)	c_{p-all}	1.6	pF
Instantaneous Tube Voltage Drop for Instantaneous Plate Current ($i_b = 7$ mA)	e_b	60	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	4.312 in (109.52 mm)
Maximum Seated Length	3.750 in (95.25 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-48)

Base:

Ultra-Short Small-Wafer with External Barriers:
6-pin (JEDEC No. B6-253)

Terminal-Connections Designation	JEDEC 8EZ
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS – Design-Maximum Values^b

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system*

Inverse Plate Voltage:^c

Total DC and Peak	$-e_{bm}$	38,000	V
DC	$E_{b(av)}$	30,000	V

Plate Current:

Peak	i_b	110	mA
Average	$I_{b(av)}$	2.2	mA
Heater Voltage	E_h	2.65 to 3.65	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

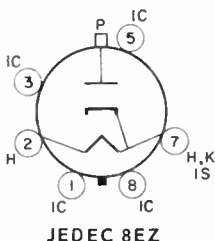
^b As defined in the current issue of EIA Standard RS-239.

^c This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

3CZ3

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Do Not Use
- Pin 2 - Heater
- Pin 3 - Do Not Use
- Pin 5 - Do Not Use
- Pin 7 - Heater, Cathode, Internal Shield
- Pin 8 - Do Not Use
- Top Cap - Plate



OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3CZ3 fit the standard octal socket. Socket terminals 1, 3, 4, 5, 6 and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Terminals 4 and 6 may be used as tie points at or near cathode potential. Otherwise, do not use.

High Voltages. The high voltages at which the 3CZ3 is operated may be extremely dangerous to the user. Great care should be taken during the adjustment of circuits. The tube and its associated apparatus, especially all parts which may be at high potential with respect to ground, should be housed in a protective enclosure. The protective housing should be designed with interlocks so that personnel cannot possibly come in contact with any high potential point in the electrical system.

X-Radiation. Operation of the 3CZ3 with a plate voltage above approximately 16,000 V results in the production of X-radiation which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

3CZ3A

Half-Wave Vacuum Rectifier

Designed to minimize X-Radiation

- e_{bm} = 38,000 max. V

Warm-up Time = 4 sec.

ELECTRICAL CHARACTERISTICS — Bogey Values

Heater Voltage, ac or dc.	E_h	3.15	V
Heater Current at $E_h = 3.15$ V	I_h	0.48	A
Warm-up Time	T_h	4	s
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	C_{p-all}	1.6	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	60	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	4.312in. (109.52 mm)
Maximum Seated Length	3.750in. (95.25 mm)
Maximum Diameter	1.188in. (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Ultra-Short Small-Wafer with External Barriers: 6-pin (JEDEC No. B6-253)
Terminal Diagram	JEDEC 8EZ
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b — High Voltage Rectifier

For operation as a pulsed rectifier tube in a 525-line, 30-frame system^c

Inverse Plate Voltage^d

Total DC and Peak (absolute max.)	- e_{bm}	38,000	V
DC (absolute max.)	$E_{b(av)}$	30,000	V
Plate Current:			
Peak (design max.)	i_{bm}	110	mA
Average (design max.)	$I_{b(av)}$	2.2	mA
Heater Voltage (absolute max.)	E_h	3.65	V
Heater Voltage (absolute min.)	E_h	2.65	V

3CZ3A

- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.
- ^b As defined in the current issue of EIA Standard RS-239A.
- ^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is $10\mu\text{s}$.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3CZ3A fit the standard octal socket. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Terminals 4 and 6 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 38,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-RADIATION CHARACTERISTIC

X-Radiation, Maximum

Statistical Value Controlled On A Lot

Sampling Basis 25mR/hr

X-Radiation is measured in accordance with JEDEC Publication No. 67 A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73 A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Operation of the 3CZ3A outside of the absolute values indicated above may result in either temporary or permanent

changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

WARNING

X-Radiation

The high voltages associated with the 3CZ3A result in production of X-Radiation which may constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3CZ3A to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

SHOCK HAZARD

The high voltages at which the 3CZ3A is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

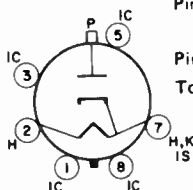
Precautions must be exercised during the replacement or servicing of the 3CZ3A in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

3CZ3A

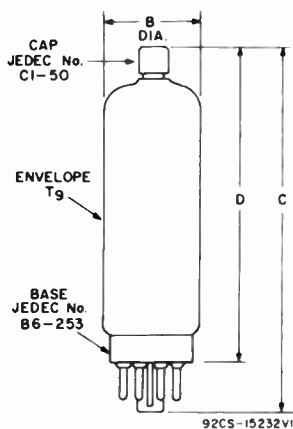
TERMINAL DIAGRAM – JEDEC 8EZ – Bottom View

- Pin 1 – Do Not Use
- Pin 2 – Heater
- Pin 3 – Do Not Use
- Pin 5 – Do Not Use



- Pin 7 – Heater, Cathode,
Internal Shield
- Pin 8 – Do Not Use
- Top Cap – Plate

DIMENSIONAL OUTLINE



DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
B	1.062*	1.188	26.98*	30.17
C	—	4.312	—	109.52
D	3.500	3.750	88.90	95.25
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
*Applies to the minimum diameter except in the area of the seal.				

Half-Wave Vacuum Rectifier

Designed to minimize X-Radiation

$$-e_{bm} = 38,000 \text{ max. V}$$

$$i_{bm} = 100 \text{ mA}$$

ELECTRICAL CHARACTERISTICS – Bogy Values

Heater Voltage, ac or dc	E_h	3.15 ± 0.5	V
Heater Current at $E_h = 3.15 \text{ V}$	I_h	0.245	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	$c_{p\text{-all}}$	1.5	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	c_b	60	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.812 in (96.82 mm)
Maximum Seated Length	3.250 in (82.55 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Ultra-Short Small-Wafer with External Barriers: 8-pin (JEDEC No. B8-251)
Terminal Diagram	JEDEC 8 MX
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b – High Voltage Rectifier

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system^c*

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	38,000	V
Average (absolute max.)	$E_{b(av)}$	30,000	V
Plate Current:			
Peak (design max.)	i_{bm}	100	mA
Average (design max.)	$I_{b(av)}$	2.0	mA
Heater Voltage (absolute max.)	E_h	3.65	V
Heater Voltage (absolute min.)	E_h	2.65	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239A.

3DB3

- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3DB3 fit the standard octal socket. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Terminals 4 and 6 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 38,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-Radiation Characteristic

X-Radiation, Maximum

25 mR/hr

Operation of the 3DB3 outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

X-Radiation is measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Warning

X-Radiation

The high voltages associated with the 3DB3 result in production of X-Radiation which may constitute a health

hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3DB3 to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

Shock Hazard

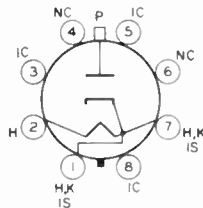
The high voltages at which the 3DB3 is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 3DB3 in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

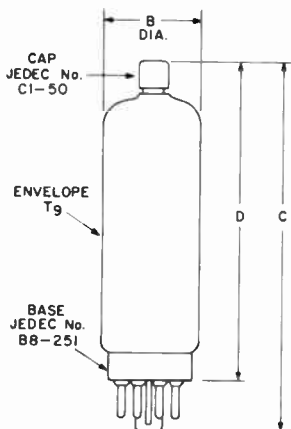
TERMINAL DIAGRAM – JEDEC 8MX – Bottom View

- Pin 1 - Heater, Cathode,
Internal Shield
- Pin 2 - Heater
- Pin 3 - Do Not Use
- Pin 4 - No Connection
- Pin 5 - Do Not Use
- Pin 6 - No Connection
- Pin 7 - Heater, Cathode,
Internal Shield
- Pin 8 - Do Not Use
- Top Cap - Plate



3DB3

DIMENSIONAL OUTLINE



92CS-15232R1

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
B	1.062*	1.188	26.98*	30.17
C	—	3.812	—	96.82
D	3.062	3.250	77.78	82.55

MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION

* Applies to the minimum diameter except in the area of the seal.

Half-Wave Vacuum Rectifier

Designed to minimize X-Radiation

$$-e_{bm} = 38,000 \text{ max. V}$$

$$i_{bm} = 110 \text{ mA}$$

ELECTRICAL CHARACTERISTICS – Bogy Values

Heater Voltage, ac or dc	E_h	3.15 ± 0.5	V
Heater Current at $E_h = 3.15 \text{ V}$	I_h	0.48	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	$c_{p\text{-all}}$	1.6	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	60	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.812 in (96.82 mm)
Maximum Seated Length	3.250 in (82.55 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Ultra-Short Small-Wafer with External Barriers: 8-pin (JEDEC No. B8-251)
Terminal Diagram	JEDEC 8 MT
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b – High Voltage Rectifier

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system^c*

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	38,000	V
DC (absolute max.)	$E_{b(av)}$	30,000	V
Plate Current:			
Peak (design max.)	i_{bm}	110	mA
Average (design max.)	$I_{b(av)}$	2.2	mA
Heater Voltage (absolute max.)	E_h	3.65	V
Heater Voltage (absolute min.)	E_h	2.65	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239A.

3DF3

- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is $10\mu\text{s}$.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3DF3 fit the standard octal socket. Socket terminals 1, 2, 4, 5, 6, and 7 may be connected to terminal 8 or to a corona shield which connects to terminal 8. Terminals 1 and 7 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 38,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-Radiation Characteristic

X-Radiation, Maximum

25 mR/hr

Operation of the 3DF3 outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

X-Radiation is measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Warning

X-Radiation

The high voltages associated with the 3DF3 result in production of X-Radiation which may constitute a health

hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3DF3 to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

Shock Hazard

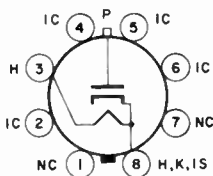
The high voltages at which the 3DF3 is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 3DF3 in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

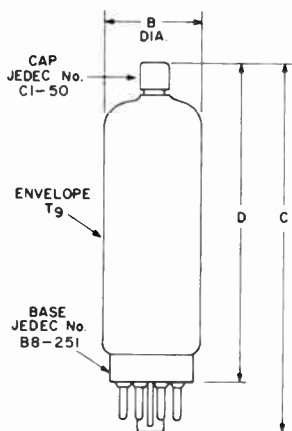
TERMINAL DIAGRAM – JEDEC 8MT – Bottom View

- Pin 1 - No Connection
- Pin 2 - Do Not Use
- Pin 3 - Heater
- Pin 4 - Do Not Use
- Pin 5 - Do Not Use
- Pin 6 - Do Not Use
- Pin 7 - No Connection
- Pin 8 - Heater, Cathode,
Internal Shield
Top Cap - Plate



3DF3

DIMENSIONAL OUTLINE



92CS-15232R1

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
B	1.062*	1.188	26.98*	30.17
C	—	3.812	—	96.82
D	3.062	3.250	77.78	82.55
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

Full-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

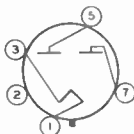
Filament, Coated:

Voltage (AC or DC)	3.3 ± 10%	volts
Current at 3.3 volts.	3.8	amp

Mechanical:

Operating Position.	Any
Maximum Overall Length.	4-5/8"
Maximum Seated Length	4-1/16"
Diameter.	1.438" to 1.562"
Bulb.	T12
Base.	Short Medium-Shell Octal 5-Pin with External Barriers, Style A (JEDEC Group 1, No. B5-234) or Short Medium-Shell Octal 5-Pin with External Barriers, Style B (JEDEC Group 1, No. B5-239)
Basing Designation for BOTTOM VIEW.	5DE

Pin 1 - Filament
Pin 2 - Internal Connection—Do Not Use



Pin 3 - Filament
Pin 5 - Plate No. 2
Pin 7 - Plate No. 1

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Maximum Values:

PEAK INVERSE PLATE VOLTAGE.	1050 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS)	See Rating Chart I	
PEAK PLATE CURRENT PER PLATE.	1.2 max.	amp
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE ^a	6.5 max.	amp
DC OUTPUT CURRENT	See Rating Chart I	
BULB TEMPERATURE (At hottest point on bulb surface)	200 max.	°C

Typical Operation:

With capacitor input to filter

AC Plate-to-Plate Supply Voltage (RMS).	550	volts
Filter-Input Capacitor ^b	40	μf
Total Effective Plate Supply Impedance Per Plate	32	ohms
DC Output Voltage (Approx.) at input to filter at full-load current of 350 ma.	300	volts



3DG4

Characteristics:

Tube-Voltage Drop for plate ma.
= 350 (Per plate). 25 volts

- a Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of rectifier tubes. If capacitor-input circuits are to be used, protect the circuits against the adverse effects of possible hot-switching, and do not exceed a hot-switching transient plate current per plate of 6.5 amperes during the initial cycles of the hot-switching transient. If hot-switching is required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current.
- b values of capacitance higher than those indicated may be used, provided the effective plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHARTS and OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor input and choke input to filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor input to filter.

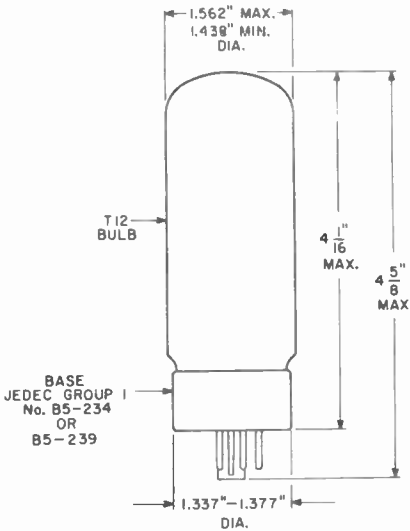
A choice of operating values of dc output current per plate and rectification efficiency should be made such that they fall within the area of permissible operation to insure that the maximum peak-plate-current rating will not be exceeded. If the operating values chosen fall outside the permissible operating area, a different choice of parameters should be made. For a given value of ac voltage input and dc output current, it is possible to reduce the rectification efficiency either by increasing the plate supply resistance per plate or by using a smaller value of input filter capacitor.

Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum ac plate supply voltage per plate under no-load conditions of capacitor input to filter when occasional hot-switching is employed.

If occasional hot-switching is required with capacitor-input circuits, it is important to protect the tube and the circuits against the flow of plate currents having magnitudes in excess of the maximum hot-switching-current rating of 6.5 amperes. To limit the hot-switching current, adequate series plate supply resistance per plate is necessary. This resistance value may be determined with the formula shown in legend of *Rating Chart III*. To insure that the maximum hot-switching current is not exceeded, a value of series plate supply resistance per plate should be chosen such that it is equal to or greater than the minimum value indicated by the curve.



If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the hot-switching current to the indicated maximum rated value.

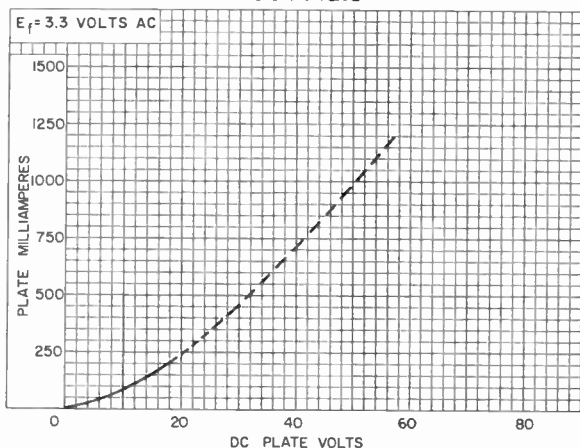


92CS-10983RI



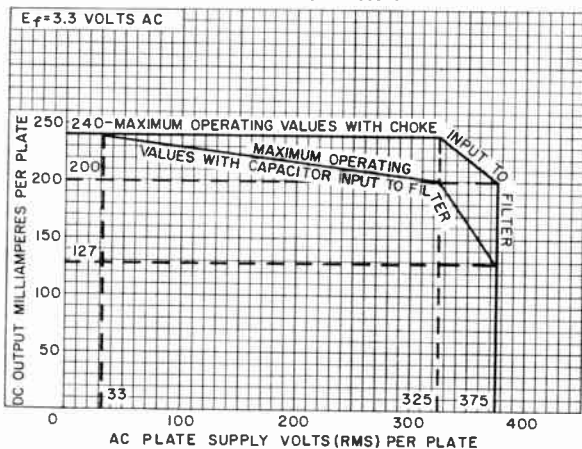
3DG4

AVERAGE PLATE CHARACTERISTIC Each Plate



92CS-10980

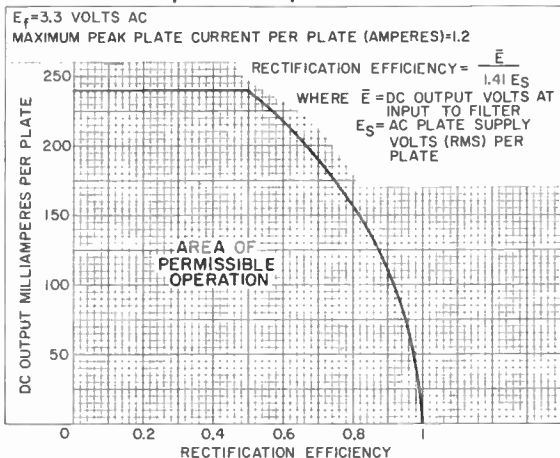
RATING CHART I



92CS-10982R1

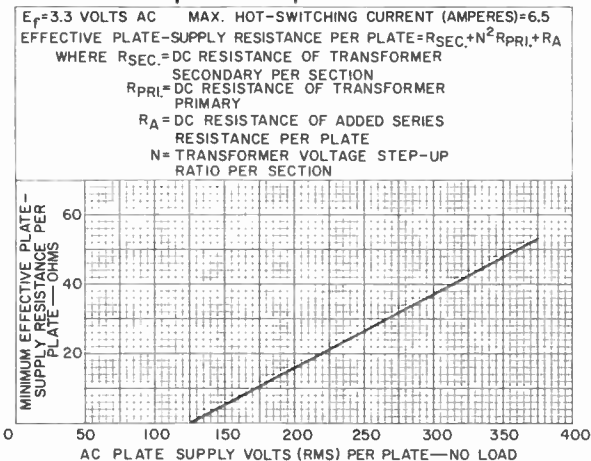


RATING CHART II Capacitor Input to Filter



92CS-10978

RATING CHART III Capacitor Input to Filter



92CS-10977





Half-Wave Vacuum Rectifier

Designed to minimize X-Radiation

$-e_{bm} = 38,000$ max. V

$i_{bm} = 100$ mA

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc	E_h	3.15 ± 0.5	V
Heater Current at $E_h = 3.15$ V	I_h	0.30	A
Direct Interelectrode Capacitance: ^a			
P to (K + IS + H)	c_{p-all}	1.6	pF
Instantaneous Tube Voltage			
Drop for Instantaneous			
Plate Current (i_b) = 7 mA	e_b	70	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.812 in (96.82 mm)
Maximum Seated Length	3.250 in (82.55 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-50)
Base	Ultra-Short Small-Wafer with External Barriers: 8-pin (JEDEC No. B8-251)
Terminal Diagram	JEDEC 8 MX
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^b – High Voltage Rectifier

*For operation as a pulsed rectifier tube in a
525-line, 30-frame system^c*

Inverse Plate Voltage ^d			
Total DC and Peak (absolute max.)	$-e_{bm}$	38,000	V
Average (absolute max.)	$E_{b(av)}$	30,000	V
Plate Current:			
Peak (design max.)	i_{bm}	100	mA
Average (design max.)	$I_{b(av)}$	2.0	mA
Heater Voltage (absolute max.)	E_h	3.65	V
Heater Voltage (absolute min.)	E_h	2.65	V

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239A.

3DJ3

- c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket Connections. The base pins of the 3DJ3 fit the standard octal socket. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to terminal 7 or to a corona shield which connects to terminal 7. Terminals 4 and 6 may be used as tie points at or near cathode potential. Otherwise, do not use.

Measurement of Heater Voltage. It is recommended that a thermocouple rms voltmeter be used to measure heater voltage. The meter and its leads must be insulated to withstand 38,000 V. To minimize loading of the rectifier circuit during this measurement, stray capacitances to ground should be kept as low as possible.

X-Radiation Characteristic

X-Radiation, Maximum

25 mR/hr

Operation of the 3DJ3 outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

X-Radiation is measured in accordance with JEDEC Publication No. 67A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Warning

X-Radiation

The high voltages associated with the 3DJ3 result in production of X-Radiation which may constitute a health

hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 3DJ3 to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

Shock Hazard

The high voltages at which the 3DJ3 is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 3DJ3 in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

TERMINAL DIAGRAM – JEDEC 8 MX – Bottom View

Pin 1 - Heater, Cathode,
Internal Shield

Pin 2 - Heater

Pin 3 - Do Not Use

Pin 4 - No Connection

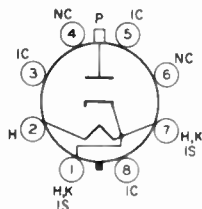
Pin 5 - Do Not Use

Pin 6 - No Connection

Pin 7 - Heater, Cathode,
Internal Shield

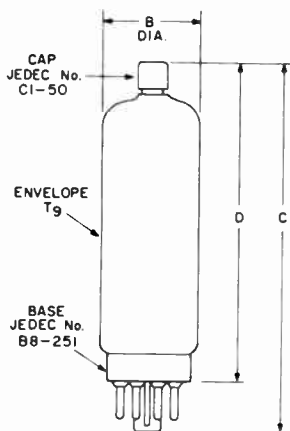
Pin 8 - Do Not Use

Top Cap - Plate



3DJ3

DIMENSIONAL OUTLINE



92CS-15232R1

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
B	1.062*	1.188	26.98*	30.17
C	—	3.812	—	96.82
D	3.062	3.250	77.78	82.55

MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION

* Applies to the minimum diameter except in the area of the seal.

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

The 3DK6 is the same as the 6DK6 except for the following items:

Heater Characteristics and Ratings:

Current	0.600 ± 0.10	amp
Voltage (AC or DC) at heater amperes = 0.600	3.1 ^a	volts
Warm-up time (Average)	11	sec
Peak heater-cathode voltage:		
Heater negative with respect to cathode	300 ^a max.	volts
Heater positive with respect to cathode	200 ^b max.	volts

3DT6A

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

The 3DT6A is the same as the 6DT6A except for the following items:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	3.1 ^b	volts
Warm-up time (Average)	11	sec

^a The dc component must not exceed 200 volts.

^b The dc component must not exceed 100 volts.



3DZ4

Medium-Mu Triode

7-PIN MINIATURE TYPE

The 3DZ4 is the same as the 6DZ4 except for the following items:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450	3.2	volts
Warm-up time (Average)	11	sec
Peak heater-cathode voltage: Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 ^b max.	sec

3EA5

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

The 3EA5 is the same as the 6EA5 except for the following items:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450	2.9	volts
Warm-up time (Average)	11	sec

3EH7

Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

The 3EH7 is the same as the 6EH7 except for the following items:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	3.4	volts

^b The dc component must not exceed 100 volts.



3EJ7

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

The 3EJ7 is the same as the 6EJ7 except for the following items:

Heater Characteristics and Ratings:

Current.	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600.	3.4	volts

3ER5

High-Mu Triode

7-PIN MINIATURE TYPE

The 3ER5 is the same as the 6ER5 except for the following items:

Heater Characteristics and Ratings:

Current.	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450.	2.8	volts

3FH5

High-Mu Triode

7-PIN MINIATURE TYPE

The 3FH5 is the same as the 6FH5 except for the following items:

Heater Characteristics and Ratings:

Current.	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450.	3.0	volts
Warm-up time (Average)	11	sec



3FS5

Beam Hexode

7-PIN MINIATURE TYPE

The 3FS5 is the same as the 6FS5 except for the following items:
Heater Characteristics and Ratings:

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater temperature = 0.210	1.9	volts
Warm-up time (Average)	11	sec

3GK5

High-Mu Triode

7-PIN MINIATURE TYPE

The 3GK5 is the same as the 6GK5 except for the following items:
Heater Characteristics and Ratings:

Current	0.410 ± 0.030	amp
Voltage (AC or DC) at heater temperature = 0.210	1.9	volts
Warm-up time (Average)	11	sec



Sharp-Cutoff Twin Pentode

With Common Cathode, Grid No.1, and Grid No.2

The 3GS8 is the same as the 6GS8 4BU8 except for the following items:

Heater Characteristics and Ratings

Current (at 0.150 V)	I_h	0.600 - 0.040	A
Voltage (at 0.600 A)	E_h	3.15	V

3HM5/3HA5

High-Mu Triode

The 3HM5 3HA5 is the same as the 6HM5/6HA5 except for the following items:

Heater Characteristics and Ratings

Current (at 0.150 V)	I_h	0.450 + 0.030	A
Voltage (at 0.450 A)	E_h	2.7	V
Warm-up time (minutes)		11	s

3HS8

Sharp-Cutoff Twin Pentode

The 3HS8 is the same as the 6HS8 except for the following items:

Heater Characteristics and Ratings

Current (at 0.150 V)	I_h	0.600 + 0.040	A
Voltage (at 0.600 A)	E_h	3.15	V
Warm-up time (minutes)		11	s



3JC6, 3JC6A

Sharp-Cutoff Pentodes

The 3JC6 and 3JC6A are the same as the 6JC6 and 6JC6A, respectively, except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	3.5	V
Warranty Time (Average)		11	s

3JD6

Sharp-Cutoff Pentode

The 3JD6 is the same as the 6JD6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	3.5	V
Warranty Time (Average)		11	s

3KT6

Semiremote-Cutoff Pentode

The 3KT6 is the same as the 6KT6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	3.5	V
Warranty Time (Average)		11	s



4AU6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4AU6 is the same as the 6AU6 except for the following items:

Heater Characteristics and Ratings (Design-Maximum Values):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes		
= 0.450	4.2	volts
warm-up time (Average)	11	sec

4AV6

Twin Diode—High-Mu Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4AV6 is the same as the 6AV6 except for the following items:

Heater Characteristics and Ratings (Design-Maximum Values):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes		
= 0.450	4.2	volts
warm-up time (Average)	11	sec

4BC5

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BC5 is the same as the 6BC5 except for the following items:

Heater Characteristics and Ratings (Design-Center Values):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes		
= 0.450	4.2	volts
warm-up time (Average)	11	sec
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

^a The dc component must not exceed 100 volts.



4BC8

Medium-Mu Twin Triode

With Semiremote-Cutoff Characteristic

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BC8 is the same as the 6BC8 except for the following items:

Heater Characteristics and Ratings (Design-Center Values):

Current 0.600 ± 0.040 amp

Voltage (AC or DC) at heater amperes
= 0.600 4.2 volts

Warm-up time (Average) 11 sec

4BL8

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BL8 is the same as the 6BL8 except for the following items:

Heater Characteristics and Ratings (Design-Center Values):

Current 0.600 ± 0.040 amp

Voltage (AC or DC) at heater amperes
= 0.600 4.6 volts

4BN6

Beam Tube

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BN6 is the same as the 6BN6 except for the following items:

Heater Characteristics and Ratings (Design-Maximum Values):

Current 0.450 ± 0.030 amp

Voltage (AC or DC) at heater amperes
= 0.450 4.2 volts

Warm-up time (Average) 11 sec



Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BQ7A is the same as the 6BQ7A except for the following items:

Heater Characteristics and Ratings (*Design-Center Values*):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater current = 0.600	4.2	volts
Warm-up time (Average).	11	sec

4BS8

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BS8 is the same as the 6BS8 except for the following items:

Heater Characteristics and Ratings (*Design-Center Values*):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater current = 0.600	4.5	volts
Warm-up time (Average).	11	sec

4BU8

Sharp-Cutoff Twin Pentode

With Common Cathode, Grid No.1, & Grid No.2

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BU8 is the same as the 6BU8 except for the following items:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater current = 0.450	4.2	volts
Warm-up time (Average).	11	sec



4BZ6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BZ6 is the same as the 6BZ6 except for the following items:

Heater Characteristics and Ratings (Design-Maximum Values):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater current = 0.450	4.2	volts
Warm-up time (Average).	11	sec

4BZ7

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4BZ7 is the same as the 6BZ7 except for the following items:

Heater Characteristics and Ratings (Design-Center Values):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater current = 0.600	4.2	volts
Warm-up time (Average).	11	sec

4CB6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 4CB6 is the same as the 6CB6 except for the following items:

Heater Characteristics and Ratings (Design-Center Values):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater current = 0.450	4.2	volts
Warm-up time (Average).	11	sec
Peak heater-cathode voltage:		
Heater negative with respect to cathode.	300 ^a max.	volts
Heater positive with respect to cathode.	200 ^b max.	volts

^a The dc component must not exceed 200 volts.

^b The dc component must not exceed 100 volts.



4CS6

Pentagrid Amplifier

7-PIN MINIATURE TYPE

The 4CS6 is the same as the 6CS6 except for the following items:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030 amp
Voltage (AC or DC) at heater amperes = 0.450	4.2 volt
Warm-up time (Average)	11 sec

4CY5

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

The 4CY5 is the same as the 6CY5 except for the following items:

Heater Characteristics and Ratings:

Current	0.300 ± 0.02 amp
Voltage (AC or DC) at heater amperes = 0.300	4.5 volt
Warm-up time (Average)	11 sec

4DE6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

The 4DE6 is the same as the 6DE6 except for the following items:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030 amp
Voltage (AC or DC) at heater amperes = 0.450	4.2 volts
Warm-up time (Average)	11 sec



4DK6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

The 4DK6 is the same as the 6DK6 except for the following items:

Heater Characteristics and Ratings:

Current	0.150 ± 0.010 amp
Voltage (AC or DC) at heater amperes = 0.251	1.2 volts
Warm-up time (Average)	11 sec

4DT6A

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

The 4DT6A is the same as the 6DT6A except for the following items:

Heater Characteristics and Ratings:

Current	0.150 ± 0.010 amp
Voltage (AC or DC) at heater amperes = 0.250	1.2 volts
Warm-up time (Average)	11 sec



4EH7

Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

The 4EH7 is the same as the 6EH7 except for the following items:

Heater Characteristics and Ratings:

Current.	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450.	4.4	volts

4EJ7

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

The 4EJ7 is the same as the 6EJ7 except for the following items:

Heater Characteristics and Ratings:

Current.	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450.	4.4	volts

4ES8

Variable-Mu Twin Triode

9-PIN MINIATURE TYPE

The 4ES8 is the same as the 6ES8 except for the following items:

Heater Characteristics and Ratings:

Current.	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600.	4	volts
Warm-up time (Average)	11	sec



4EW6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

The 4EW6 is the same as the 6EW6 except for the following items:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.2	volts
Warm-up time (Average)	11	sec

4GM6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

The 4GM6 is the same as the 6GM6 except for the following items:

Heater Characteristics and Ratings:

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.2	volts
Warm-up time (Average)	11	sec



Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Rating:

Current	2.0 ± 0.3	amps
Voltage (A.C. or D.C.) at heater terminals - res. = 0.150	4.2	volts
Warm-up time (Average)	11	sec
Maximum heater-cathode voltage: heater negative with respect to cathode	2.0	volts
heater positive with respect to cathode	200 max.	volt

Direct Inter-electrode Capacitances:

	Without External Shield	With External Shield ^a	
Grid No. 1 to plate	0.031	0.75	pf
Grid No. 1 to cathode, grid No. 2 and internal shield, grid No. 2, and heater	8.7	4.7	pf
Plate to cathode, grid No. 1 & internal shield, grid No. 2, and heater	2.15	3.0	pf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	175	volts
Grid No. 3 (Suppressor Grid)	Connected to cathode at socket	
Grid No. 2 Supply Voltage	2.7	volts
Cathode Resistor	45	hms
Plate Resistance (Approx.)	0.2-4	megohm
Transconductance	14000	μmhos
Plate Current	13	ma
Grid No. 2 Current	3.2	ma
Grid No. 1 Voltage (Approx.) for transconductance (μmhos) = 100	-3	volts

Mechanical:

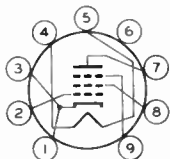
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-3 1/8"
Maximum Sealed Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb	T6-1/2
Base	Small-Button Novel 9-pin (JEDEC No. E9-1)



4HM6

Basing Designation for BOTTOM VIEW. 9P4

- Pin 1 -Cathode
- Pin 2 -Grid No.1
- Pin 3 -Cathode
- Pin 4 -Heater
- Pin 5 -Heater
- Pin 6 -No Internal Connection



- Pin 7 -Plate
- Pin 8 -Grid No.2
- Pin 9 -Grid No.3,
Internal
Shield

AMPLIFIER — CLASS A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. 250 max. volts
GRID No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . 250 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
CATHODE CURRENT. 25 max. ma

GRID No.2 INPUT:
For grid-No.2 voltages up to 125 volts . . 0.6 max. watt
For grid-No.2 voltages between 125 and
250 volts. See Grid-No.2 Input
Rating Chart at front of Receiving Tube Section

PLATE DISSIPATION. 2.5 max. watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
For fixed-bias operation 0.25 max. megohm
For cathode-bias operation 1 max. megohm

^a With JEDEC shield No.315 connected to ground.



Sharp-Cutoff Twin Pentode

9-PIN MINIATURE TYPE

The 4HS8 is the same as the 6HS8 except for the following items:

Heater Characteristics and Ratings:

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450	1.2	volts
Warm-up time (Average)	11	sec





4JC6, 4JC6A

Sharp-Cutoff Pentodes

The 4JC6 and 4JC6A are the same as the 6JC6 and 6JC6A, respectively, except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.450 ± 0.030	A
Voltage (AC or DC) at 0.450 A	E_h	4.5	V
Warm-up time (Average).		11	s

4JD6

Sharp-Cutoff Pentode

The 4JD6 is the same as the 6JD6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.450 ± 0.030	A
Voltage (AC or DC) at 0.450 A	E_h	4.5	V
Warm-up time (Average).		11	s

4KE8

Medium-Mu Triode— Sharp-Cutoff Pentode

The 4KE8 is the same as the 6KE8 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	4.5	V
Warm-up time (Average).		11	s

4KT6

Semiremote-Cutoff Pentode

The 4KT6 is the same as the 6KT6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.450 ± 0.030	A
Voltage (AC or DC) at 0.450 A	E_h	4.5	V
Warm-up time (Average).		11	s



5AM8

Diode—Sharp-Cutoff Pentode

CONTROLLED HEATER WARM-UP TIME

The 5AM8 is the same as the 6AM8A except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	4.7	V

5AN8

Medium-Mu Triode— Sharp-Cutoff Pentode

CONTROLLED HEATER WARM-UP TIME

The 5AN8 is the same as the 6AN8A except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	4.7	V

5AQ5

Beam Power Tube

CONTROLLED HEATER WARM-UP TIME

The 5AQ5 is the same as the 6AQ5A except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A	E_h	4.7	V





5AS4-A

5AS4-A

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

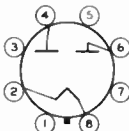
Filament, Coated:

- Voltage 5 ac volts
- Current 3 amp

Mechanical:

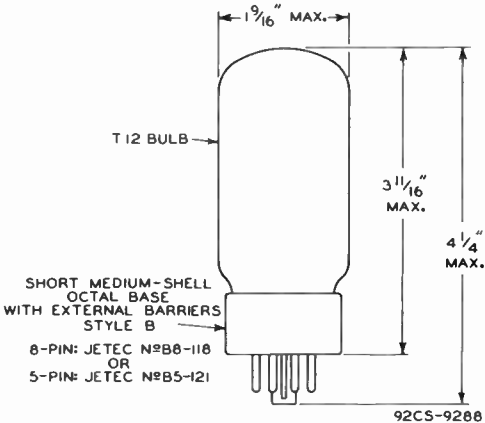
- Mounting Position Vertical, base up or down, or Horizontal with pins 1 and 4 in vertical plane
- Maximum Overall Length 4-1/4"
- Maximum Seated Length 3-11/16"
- Maximum Diameter 1-9/16"
- Bulb T12
- Base Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JETEC No. B8-118) or Short Medium-Shell Octal 5-Pin with External Barriers, Style B (JETEC No. B5-121)
- Basins Designation for BOTTOM VIFW 5T

- Pin 1 - No Connection
- Pin 2 - Filament
- Pin 3 - Same as Pin 1
- Pin 4 - Plate No. 2



- Pin 5 - Same as Pin 1
- Pin 6 - Plate No. 1
- Pin 7 - Same as Pin 1
- Pin 8 - Filament

MAXIMUM RATINGS, TYPICAL OPERATION, and CURVES for Type 5AS4-A are the same as those shown for Type 5U4-GB



On the 5-pin base, pins 3, 5, and 7 are omitted.



Diode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5AS8 is the same as the 6AS8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5AT8 is the same as the 6AT8A except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec





Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances.*

Triode Unit:

Grid to plate	1.5	μf
Grid to cathode and heater	2	μf
Plate to cathode and heater	0.34	μf

Pentode Unit:

Grid No.1 to plate	0.04 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	3	μf
Triode grid to pentode plate	0.005	μf
Pentode grid No.1 to triode plate	0.006	μf
Pentode plate to triode plate	0.045	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate Supply Voltage	200	200	volts
Grid-No.2 Supply Voltage	—	150	volts
Grid-No.1 Voltage	-6	—	volts
Cathode Resistor	—	180	ohms
Amplification Factor	19	—	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6200	μmhos
Plate Current	13	9.5	ma
Grid-No.2 Current	—	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μ a = 10	-19	-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 <i>General Section</i>
Bulb	T6-1/2



5AV8

Base Small-Button Noval 9-Pin (JEDEC No. E9-1)
 Basing Designation for BOTTOM VIEW. 9D7

Pin 1 - Triode
 Cathode

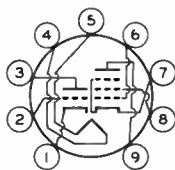
Pin 2 - Triode
 Grid

Pin 3 - Triode Plate

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Pentode
 Grid No.1



Pin 7 - Pentode
 Cathode.

Pentode
 Grid No.3,
 Internal
 Shield

Pin 8 - Pentode
 Grid No.2

Pin 9 - Pentode Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center 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 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with

respect to cathode. 200 max. 200 max. volts

Heater positive with

respect to cathode. 200^b max. 200^b max. volts

Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance: ^c			
For fixed-bias operation. . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. .	1 max.	1 max.	megohm

^a Without external shield.

^b The dc component must not exceed 100 volts.

^c If either unit is operated at maximum-rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.





5B8

5B8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having
series heater-string arrangement*

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	4.7	. . . . .	ac or dc volts
Current	0.6	. . . . .	amp
Warm-up time (Average)	11	. . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:^o

Triode Unit:

Grid to plate	1.7		$\mu\mu\text{f}$
Grid to cathode & pentode grid No.3 & internal shield, and heater.	1.9		$\mu\mu\text{f}$
Plate to cathode & pentode grid No.3 & internal shield, and heater.	1.4		$\mu\mu\text{f}$

Pentode Unit:

Grid No.1 to plate	0.05 max.		$\mu\mu\text{f}$
Grid No.1 to cathode, grid No.2, and heater	6		$\mu\mu\text{f}$
Plate to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	2.6		$\mu\mu\text{f}$
Plate to cathode, grid No.2, and heater	0.15		$\mu\mu\text{f}$
Triode grid to pentode plate	0.0078		$\mu\mu\text{f}$
Pentode grid No.1 to triode plate.	0.0033		$\mu\mu\text{f}$
Pentode plate to triode plate.	0.06		$\mu\mu\text{f}$

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage	200	200	volts
Grid-No.2 Supply Voltage	—	150	volts
Grid Voltage	-6	—	volts
Cathode Resistor	—	180	ohms
Amplification Factor	19	—	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6200	μmhos
Plate Current.	13	9.5	ma
Grid-No.2 Current.	—	2.8	ma
Grid-No.1 Voltage (Approx.) for plate $\mu\text{a} = 10$	-19	-8	volts

^o: See next page.



5B8

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

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	9EC

Pin 1 - Pentode
Grid No. 3,
Triode
Cathode,
Internal
Shield

Pin 2 - Triode Grid
Pin 3 - Triode Plate
Pin 4 - Heater



Pin 5 - Heater
Pin 6 - Pentode
Grid No. 1
Pin 7 - Pentode
Cathode
Pin 8 - Pentode
Grid No. 2
Pin 9 - Pentode
Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center 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 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

○, ▲: See next page.



5B8

5B8

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
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

o without external shield.

* The dc component must not exceed 100 volts.

* If either unit is operated at maximum rated conditions, grid-no.1-circuit resistances for both units should not exceed the stated values.



Full-Wave Vacuum Rectifier

NOVAR TYPE

For Power Supplies of Equipment Having
High DC Power Output Requirements

Electrical:

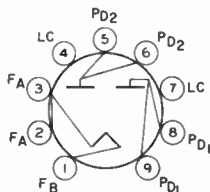
Filament Characteristics and Rating :

Voltage (AC)	5.0 ± 0.5 volts
Current at filament volts = 5.0	3.000 amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length	3.880"
Seated Length	3.250" to 3.500"
Diameter	1.438" to 1.512"
Dimensional Outline (JEDEC No.12-99)	See <i>General Section</i>
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-88)
Basing Designation for BOTTOM VIEW	9QJ

- Pin 1 - Filament End B
- Pin 2 - Filament End A
- Pin 3 - Filament End A
- Pin 4 - See Note
- Pin 5 - Plate No. 2
- Pin 6 - Plate No. 2
- Pin 7 - See Note
- Pin 8 - Plate No. 1
- Pin 9 - Plate No. 1



Note: May be used as tie point for ac line providing the peak value of the ac voltage does not exceed 200 volts.

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Maximum Values:

Peak Inverse Plate Voltage	1700 volts
AC Plate Supply Voltage Per Plate (RMS, without load)	See accompanying <i>Rating Chart I</i>
Peak Plate Current Per Plate	1 amp
Hot-Switching Transient Plate Current per plate ^a	1 amp
DC Output Current	See accompanying <i>Rating Chart I</i>

Typical Operation:

With capacitor-input filter

AC Plate-to-Plate Supply Voltage (RMS, without load)	600	900	1100	volts
Filter-Input Capacitor ^b	40	40	40	μf
Total Effective Plate Supply Impedance Per Plate	21	67	97	ohms



5BC3A

DC Output Voltage (Approx.) at input to filter at load ma =				
300	290	-	-	volts
275	-	460	-	volts
162	-	-	630	volts
150	335	-	-	volts
137.5	-	520	-	volts
81	-	-	680	volts

With choke-input filter

AC Plate-to-Plate Supply Voltage (RMS, without load)	900	1100	volts
Filter-Input Choke	10	10	henrys

DC Output Voltage at input to filter (Approx.) at load ma =			
348	340	-	volts
275	-	440	volts
174	355	-	volts
137.5	-	455	volts

a Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of rectifier tubes. If capacitor-input circuits are to be used, protect the circuits against the adverse effects of possible hot-switching, and do not exceed a hot-switching transient plate current per plate of 5 amperes during the initial cycles of the hot-switching transient. If hot-switching is required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current.

b values of capacitance higher than those indicated may be used, provided the effective plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHARTS and OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor-input filter.

A choice of operating values of dc output current per plate and rectification efficiency should be made such that they fall within the area of permissible operation to insure that the maximum peak-plate-current rating will not be exceeded. If the operating values chosen fall outside the permissible operating area, a different choice of parameters should be made. For a given value of ac voltage input and dc output current, it is possible to reduce the rectification efficiency either by increasing the plate supply resistance per plate or by using a smaller value of input filter capacitor.

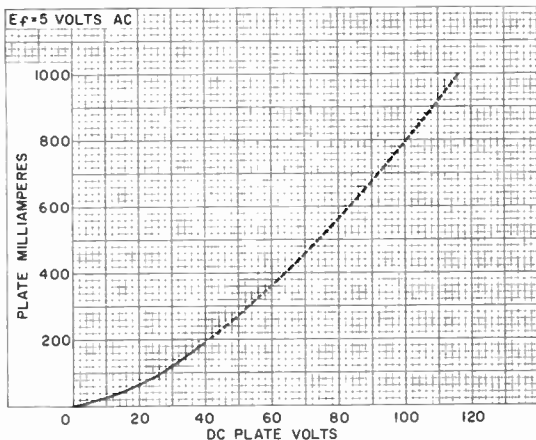


Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum average plate supply voltage per plate under no-load conditions of capacitor-input filter when occasional hot-switching is employed.

If occasional hot-switching is required with capacitor-input circuits, it is important to protect the tube and the circuits against the flow of plate currents having magnitudes in excess of the maximum hot-switching-current rating of 5 amperes. To limit the hot-switching current, adequate series plate supply resistance per plate is necessary. This resistance value may be determined with the formula shown in legend of *Rating Chart III*. To insure that the maximum hot-switching current is not exceeded, the value of series plate supply resistance per plate should be equal to or greater than the minimum value indicated by the curve.

If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the hot-switching current to the indicated maximum-rated value.

AVERAGE PLATE CHARACTERISTIC Each Plate



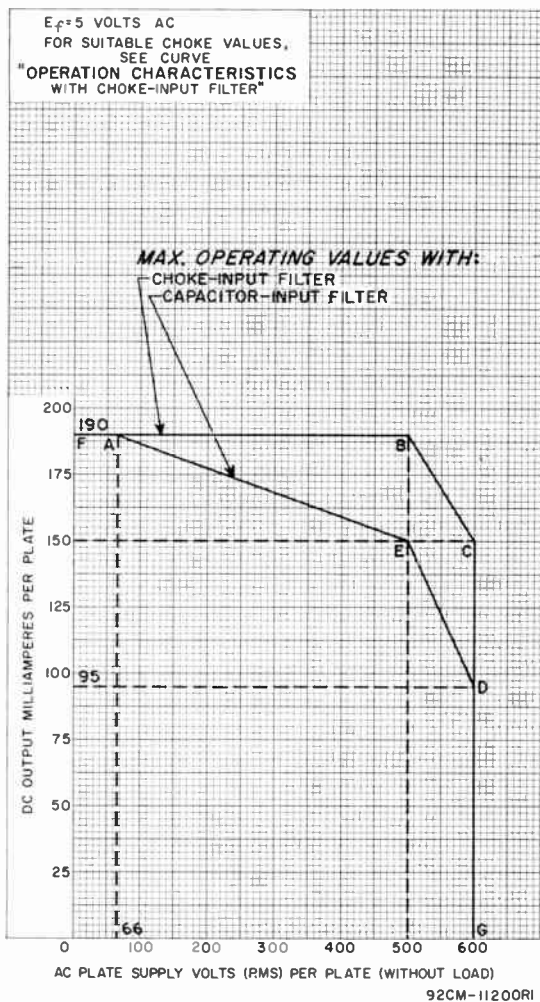
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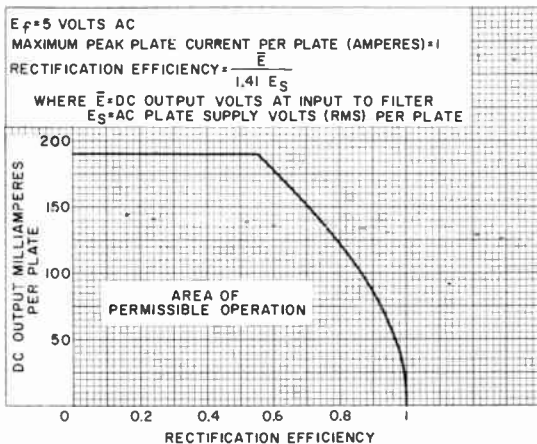
RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 2
4-65

RATING CHART I

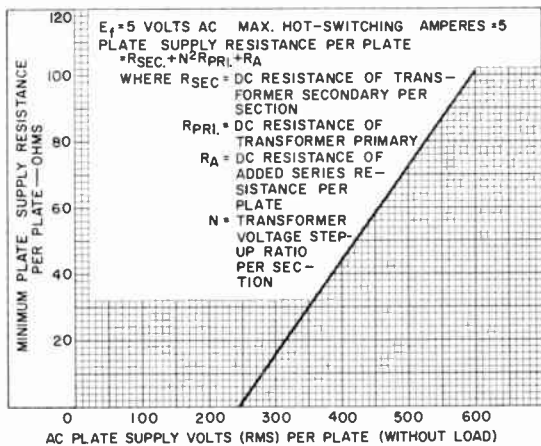


RATING CHART II Capacitor-Input Filter



92CS-1120I

RATING CHART III Capacitor-Input Filter

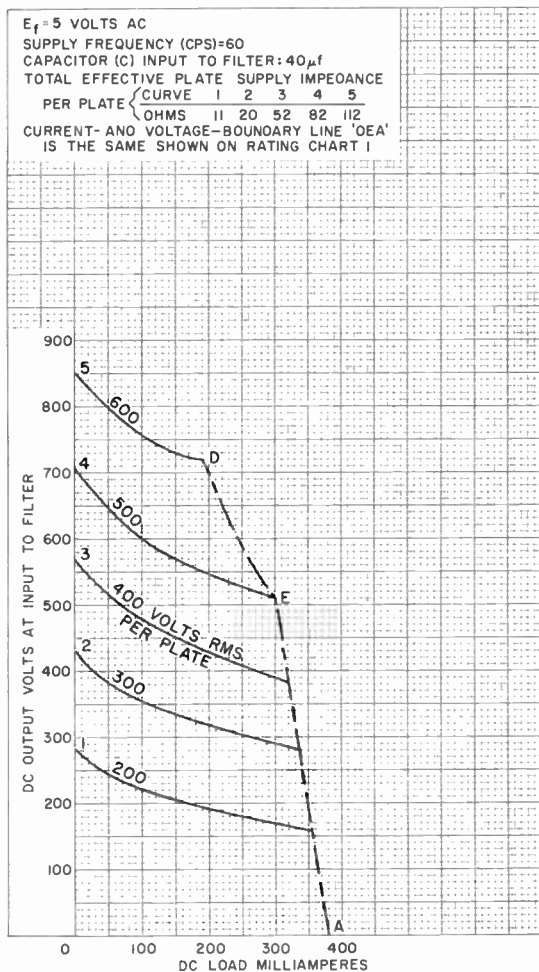


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OPERATION CHARACTERISTICS

Full-Wave Circuit, Capacitor-Input Filter



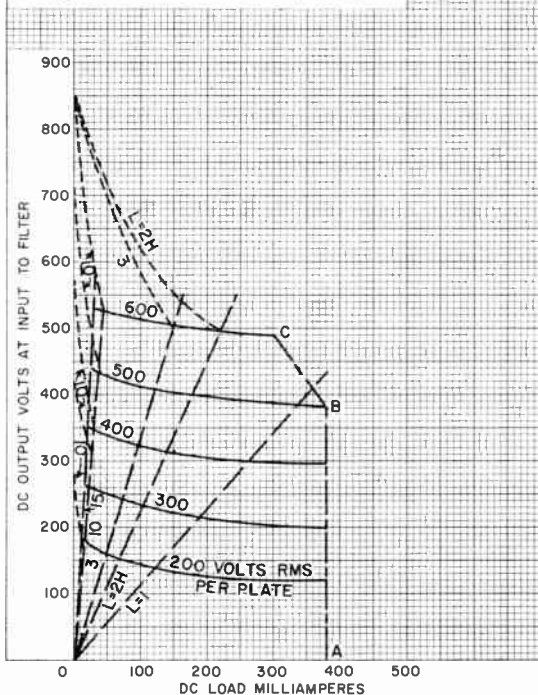
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OPERATION CHARACTERISTICS

Full-Wave Circuit, Choke-Input Filter

$E_f = 5$ VOLTS AC SUPPLY FREQUENCY (CPS) = 60
 SOLID-LINE CURVES = CHOKES OF INFINITE
 INDUCTANCE
 LONG-DASH LINES = BOUNDARY LINES FOR
 CHOKE SIZES AS SHOWN
 SHORT-DASH CURVES = REGULATION CURVES
 FOR REPRESENTATIVE
 CHOKE SIZES
 CURRENT- AND VOLTAGE-BOUNDARY LINE 'CBA'
 IS THE SAME AS SHOWN ON RATING CHART I



92CM-11199



RADIO CORPORATION OF AMERICA
 Electronic Components and Devices

Harrison, N. J.

DATA 4
 4-EE





5BK7-A

5BK7-A
TO
5BR8

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in direct-coupled cathode-drive circuits of TV tuners in equipment having series heater-string arrangement

The 5BK7-A is the same as the 6BK7-B except for the following items:

Heater, for Unipotential Cathodes:

Voltage.	4.7	. . . . .	ac or dc volts
Current.	0.6	. . . . .	amp

5BQ7-A

MEDIUM-MU TWIN TRIODE

LOW-NOISE 9-PIN MINIATURE TYPE

For use in direct-coupled cathode-drive circuits of TV tuners in equipment having series heater-string arrangement

The 5BQ7-A is the same as the 6BQ7-A except for the following items:

Heater, for Unipotential Cathodes:

Voltage.	5.6	. . . . .	ac or dc volts
Current.	0.45	. . . . .	amp
Warm-up time (Average)*.	11	. . . . .	sec

5BR8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5BR8 is the same as the 6BR8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage.	4.7	. . . . .	ac or dc volts
Current.	0.6	. . . . .	amp
Warm-up time (Average)*.	11	. . . . .	sec

* For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.



Twin Diode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5BW8 is the same as the 6BW8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec





5CG8

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CG8 is the same as the 6CG8A except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CL8A

Medium-Mu Triode— Sharp-Cutoff Tetrode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CL8A is the same as the 6CL8A except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CM8

High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CM8 is the same as the 6CM8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp



5CQ8

Medium-Mu Triode— Sharp-Cutoff Tetrode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CQ8 is the same as the 6CQ8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CZ5

Beam Power Tube

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CZ5 is the same as the 6CZ5 except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp



5EA8

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5EA8 is the same as the 6EA8 except for the following items:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts

5EU8

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5EU8 is the same as the 6EU8 except for the following items:

Heater Characteristics and Ratings (*Design-Center Values*):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts
Cathode Warm-Up Time ^a	35	sec

5EW6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5EW6 is the same as the 6EW6 except for the following items:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450	5.6	volts
Warm-up time (Average).	11	sec

^a The time required for the transconductance to reach 6500 μ hos when the tube is operated from a cold start with dc plate volts = 100, grid volts = 0, and heater amperes = 0.560.



5FG7

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5FG7 is the same as the 6FG7 except for the following items:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts

5FV8

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5FV8 is the same as the 6FV8 except for the following items:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts



5GH8A

Medium-Mu Triode— Sharp-Cutoff Pentode

Controlled Heater Warm-up Time

The 5GH8A is the same as the 6GH8A except for:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	4.7	V

5GM6

Semiremote-Cutoff Pentode

The 5GM6 is the same as the 6GM6 except for:

Heater Characteristics and Ratings

Current	0.450 ± 0.030	A
Voltage (ac or dc) at 0.450 A	5.6	V
Warm-up Time (Average)	11	s

5GX6

Sharp-Cutoff Pentode With Two Independent Control Grids

Controlled Heater Warm-up Time

The 5GX6 is the same as the 6GX6 except for:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	4.7	V

5HZ6

Sharp-Cutoff Pentode With Two Independent Control Grids

Controlled Heater Warm-up Time

The 5HZ6 is the same as the 6HZ6 except for:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	4.75	V

5J6

Medium-Mu Twin Triode

Controlled Heater Warm-up Time

The 5J6 is the same as the 6J6A except for:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	4.7	V

5KE8

Medium-Mu Triode— Sharp-Cutoff Pentode

The 5KE8 is the same as the 6KE8 except for:

Heater Characteristics and Ratings

Current	0.450 ± 0.030	A
Voltage (ac or dc) at 0.450 A	5.6	V
Warm-up Time (Average)	11	s

5MQ8

Medium-Mu Triode— Sharp-Cutoff Pentode

The 5MQ8 is the same as the 6MQ8 except for:

Heater Characteristics and Ratings

Current	0.600 ± 0.040	A
Voltage (ac or dc) at 0.600 A	5.6	V
Warm-up Time (Average)	11	s



5T8

5T8

TRIPLE DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5T8 is the same as the 6T8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage	4.7	ac or dc volts
Current	0.6	amp
Warm-up time (Average)	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max. volts
Heater positive with respect to cathode	200 [▲] max. volts

[▲] The dc component must not exceed 100 volts.



Full-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

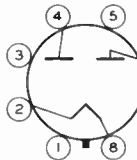
Filament, Coated:

Voltage (AC or DC) 5 volts
 Current 3 amp

Mechanical:

Operating Position Vertical, base down or up, or
 Horizontal with pins 1 and 4 in vertical plane
 Maximum Overall Length 4-5/8"
 Maximum Seated Length 4-1/16"
 Diameter 1.438" to 1.562"
 Bulb T12
 Base Short Medium-Shell Octal 5-Pin
 with External Barriers, Style B, Arrangement 1
 (JEDEC Group 1, No. B5-121), or
 Short Medium-Shell Octal 8-Pin
 with External Barriers, Style B (JEDEC Group 1, No. B8-118)
 Basing Designation for BOTTOM VIEW 5T

Pin 1 - No Connection
 Pin 2 - Filament
 Pin 3^a - No Connection



Pin 4 - Plate No. 2
 Pin 5 - Same as Pin 3
 Pin 6 - Plate No. 1
 Pin 7 - Same as Pin 3
 Pin 8 - Filament

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Center Values:

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE 1550 max. volts
 AC PLATE SUPPLY VOLTAGE PER PLATE
 (RMS, without load) See Rating Chart I
 STEADY-STATE PEAK PLATE CURRENT
 PER PLATE (See Rating Chart II) 1 max. amp
 TRANSIENT PEAK PLATE CURRENT
 PER PLATE (See Rating Chart III) 4.6 max. amp
 DC OUTPUT CURRENT See Rating Chart I

Typical Operation:

With capacitor- With choke-
 input filter input filter

AC Plate-to-Plate Supply Voltage (RMS, without load)	600	900	1100	volts
Filter-Input Capacitor ^b	40	40	-	μf
Filter-Input Choke	-	-	10	henrys

← Indicates a change.



5U4GB

Total Effective Plate Supply Impedance Per Plate	21	67	-	ohms
DC Output Voltage at input to filter	290	460	420	volts
DC Output Current	300	275	275	ma

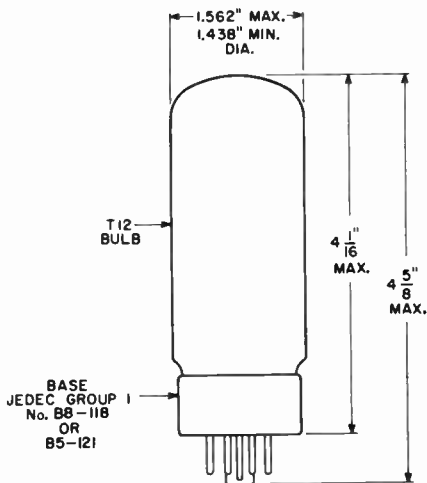
Characteristics:

Tube Voltage Drop for plate ma. (Per plate) =				
225			44	volts
275			50	volts
300			54	volts

^a On the 5-pin base, pins 3, 5, and 7 are omitted.

^b values of capacitance greater than 40 μ f may be used, provided the plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

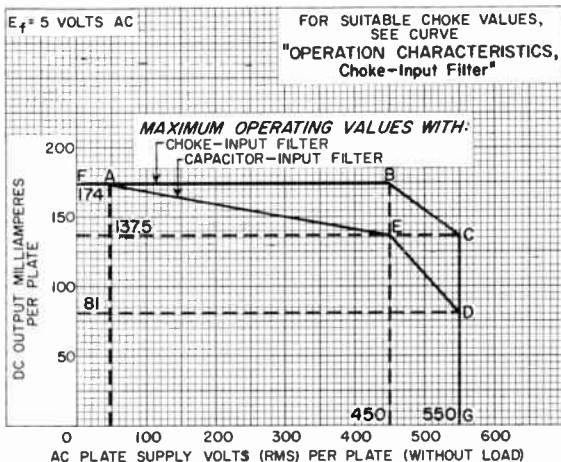
→ Indicates a change.



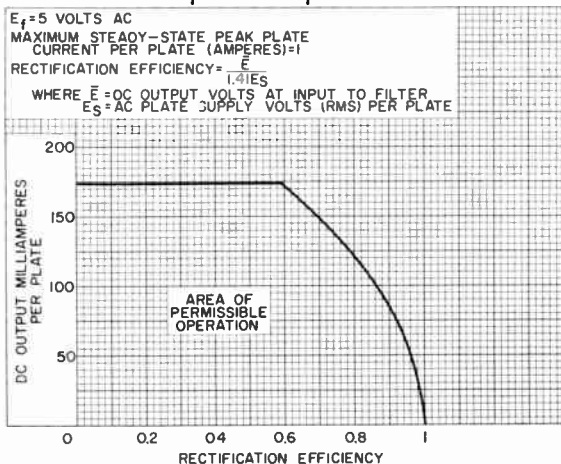
92CS-8444R2



RATING CHART I

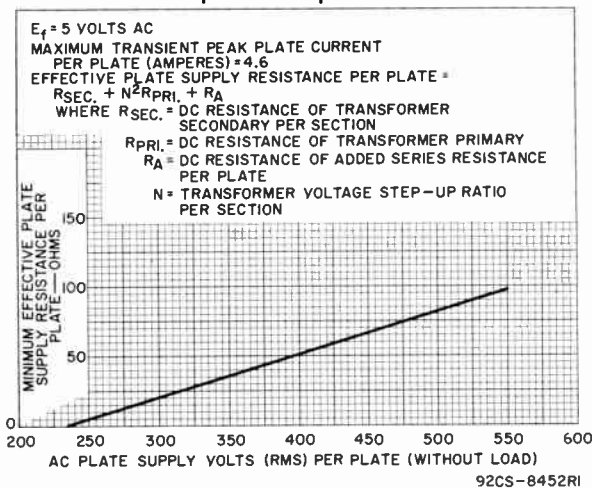


RATING CHART II Capacitor-Input Filter



5U4GB

RATING CHART III Capacitor-Input Filter



OPERATION CHARACTERISTICS Full-Wave Circuit, Capacitor-Input Filter

$E_f = 5$ VOLTS AC

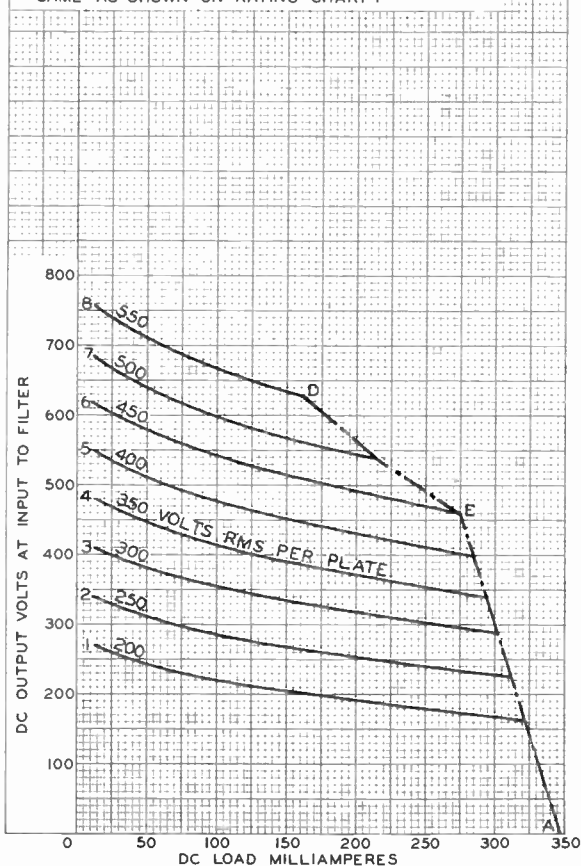
SUPPLY FREQUENCY (CPS) = 60

CAPACITOR (C) INPUT TO FILTER: (μf) = 40

TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE

PER PLATE	CURVE	1	2	3	4	5	6	7	8
	OHMS	11	11	20	36	52	67	82	97

CURRENT- AND VOLTAGE-BOUNDARY LINE 'DEA' IS THE SAME AS SHOWN ON RATING CHART I



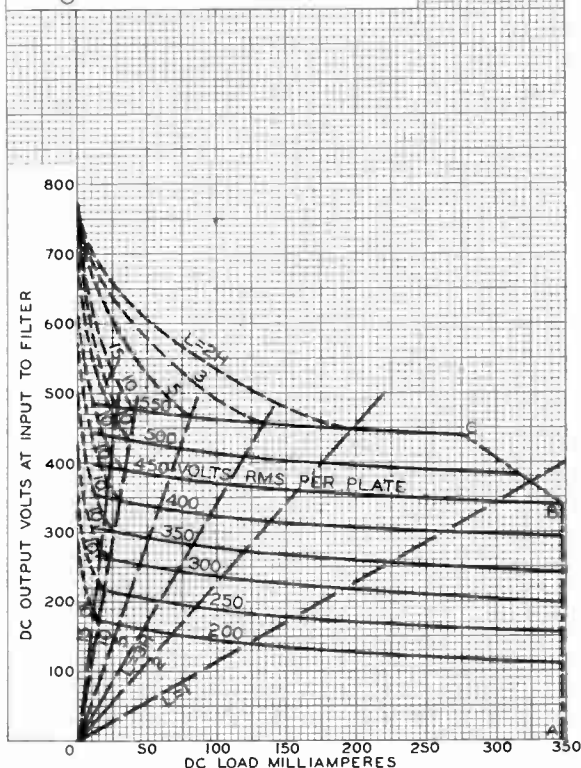
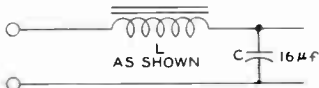
92CM-8446RI



5U4GB

OPERATION CHARACTERISTICS Full-Wave Circuit, Choke-Input Filter

$E_f = 5$ VOLTS AC
 SUPPLY FREQUENCY (CPS) = 60
 SOLID LINE CURVES = CHOKES OF INFINITE INDUCTANCE
 LONG-DASH LINES = BOUNDARY LINES FOR CHOKE SIZES AS SHOWN
 SHORT-DASH CURVES = REGULATION CURVES FOR REPRESENTATIVE CHOKE SIZES
 CURRENT- AND VOLTAGE-BOUNDARY LINE 'CBA' IS THE SAME AS SHOWN ON RATING CHART I



92CM-84 47RI





5U8

5U8

MEDIUM-MU TRIODE- SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having
series heater-string arrangement*

The 5U8 is the same as the 6U8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage 4.7 ac or dc volts

Current 0.6 amp

Warm-up time (Average) 11 sec

*For definition of heater warm-up time and method of determining
it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of
this Section.*

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200[▲] max. volts

▲ The dc component must not exceed 100 volts.



Full-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

Filament, Coated:

Voltage (AC or DC) $5 \pm 10\%$ volts
 Current at 5 volts. 3 amp

Mechanical:

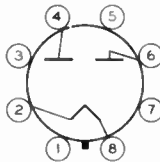
Operating Position. Vertical, base down or up, or
 Horizontal with pins 2 and 4 in vertical plane
 Maximum Overall Length. 4-5/8"
 Maximum Seated Length 4-1/16"
 Diameter. 1.438" to 1.562"
 Bulb. T12
 Base. . . Short Medium-Shell Octal 8-Pin with External Barriers
 Style B (JEDEC Group 1, No. B8-118) or
 Style A (JEDEC Group 1, No. B8-110), or
 Short Medium-Shell Octal 5-Pin 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 3^a - Same as Pin 1

Pin 4 - Plate No. 2



Pin 5 - Same as Pin 1

Pin 6 - Plate No. 1

Pin 7 - Same as Pin 1

Pin 8 - Filament

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Maximum Values:

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE. 1550 max. volts
 AC PLATE SUPPLY VOLTAGE PER PLATE
 (RMS, without load) 550 max. volts
 STEADY-STATE PEAK PLATE CURRENT PER PLATE . . . 1.4 max. amp
 TRANSIENT PEAK PLATE CURRENT PER PLATE . . . 6.6 max. amp
 DC OUTPUT CURRENT with capacitor-input
 filter for ac plate supply volts (RMS,
 per plate, without load) = 470. 415 max. ma

Typical Operation:

	With capacitor- input filter		With choke- input filter	
AC Plate-to-Plate Supply Voltage (RMS, without load)	600	850	1000	volts
Filter-Input Capacitor ^b	40	40	-	μ f
Filter-Input Choke.	-	-	10	henrys



5V3A

Total Effective Plate Supply Impedance				
Per Plate	20	50	-	ohms
DC Output Voltage at input to filter . . .	300	440	390	volts
DC Output Current . . .	380	350	350	ma

Characteristics:

Tube-Voltage Drop for plate ma. = 350
(Per plate) 42 volts

- ^a on the 5-pin base, pin 3 as well as pins 5 and 7 is omitted.
^b when capacitance values higher than 40 μ f are used, the effective plate supply impedance should be increased so that the maximum peak-plate-current rating is not exceeded.





5V4-G

5V4-G



FULL-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-7/8"
Maximum Grid Weight		1-1/16"
Maximum Diameter		1-13/16"
Solo		ST-11
Base		Medium Shell Octal 8-Pin
Pin 1 - No Connection		Pin 6 - Plate #1
Pin 2 - Heater		Pin 8 - Heater #2
Pin 3 - Plate #2		Cathode
Mounting Position		Any



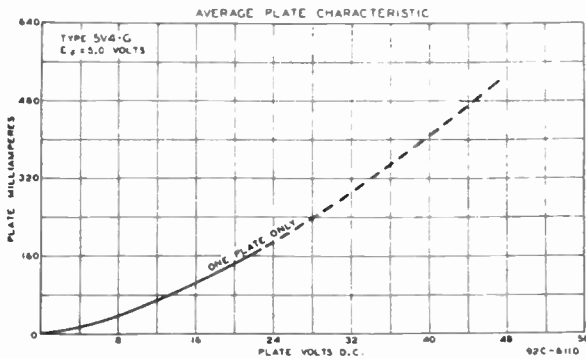
BOTTOM VIEW (3-5L)

FULL-WAVE RECTIFIER

Peak Inverse Voltage	1400 max. volts
Peak Plate Current per Plate	525 max. ma.
With Condenser-Input Filter:	
A-C Plate Voltage per Plate (PVS)	375 max. volts
Total Effective Plate-Supply Impedance per Plate Δ	100 min. ohms
D-C Output Current	175 max. ma.
With Choke-Input Filter:	
A-C Plate Voltage per Plate (PVS)	500 max. volts
Input-Choke Inductance	4 min. henries
D-C Output Current	175 max. ma.

Δ When a filter-input condenser larger than 40 μ f 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.

\leftarrow Indicates a range.



Sept. 2, 1941

RCA RADOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

DATA

5V4-G



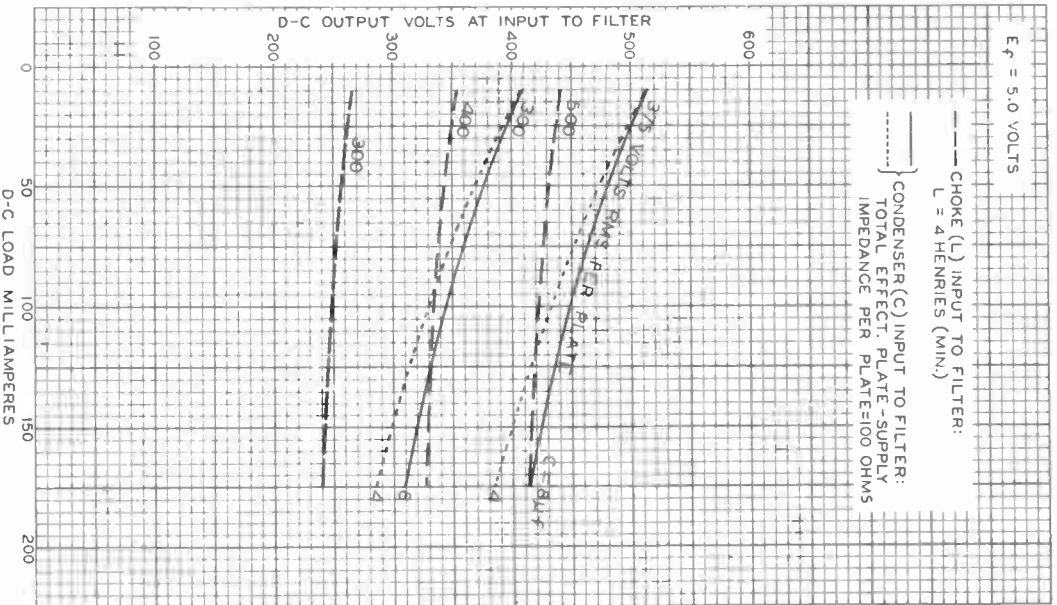
5V4-G

OPERATION CHARACTERISTICS

 $E_f = 5.0$ VOLTS

--- CHOKE (L) INPUT TO FILTER:
L = 4 HENRIES (MIN.)

----- } CONDENSER (C) INPUT TO FILTER:
TOTAL EFFECT. PLATE-SUPPLY
IMPEDANCE PER PLATE=100 OHMS



JAN. 8, 1940

RCA RADIODIODE DIVISION
RCA ELECTRONIC PRODUCTS DIVISION
HARRISBURG, PENNSYLVANIA

92C-6090R1



5V4-GA

5V4-GA

FULL-WAVE VACUUM RECTIFIER

For use in full-wave power supplies having high dc requirements

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

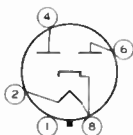
Voltage	5	ac or dc volts
Current	2	amp

Mechanical:

Operating Position	Any
Maximum Overall Length	3-7/8"
Maximum Seated Length	3-5/16"
Maximum Diameter	1-9/16"
Bulb	T12
Base	Medium-Shell Octal 5-Pin (JETEC No. B5-15), or Short Medium-Shell Octal 5-Pin with External Barriers, Style B, Arrangement 1 (JETEC No. B5-121)

Basing Designation for BOTTOM VIEW 5L

Pin 1 - No Connection
 Pin 2 - Heater
 Pin 4 - Plate of Unit No. 2



Pin 6 - Plate of Unit No. 1
 Pin 8 - Heater, Cathode

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE	1400 max.	volts
AC PLATE-SUPPLY VOLTAGE PER PLATE (RMS):		
With capacitor-input filter	375 max.	volts
With choke-input filter	500 max.	volts
PEAK PLATE CURRENT PER PLATE	525 max.	ma
DC OUTPUT CURRENT	175 max.	ma

HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE:

Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of tubes. If capacitor-input circuits are to be used, protect the circuits against the possibility of hot-switching and do not exceed a maximum peak current value per plate of 3.5 amperes during the initial cycles of the hot-switching transient. If hot-switching is required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current.

5V4-GA



5V4-GA

FULL-WAVE VACUUM RECTIFIER

Typical Operation:

With capacitor input to filter

AC Plate-to-Plate Supply Voltage (RMS)	750	volts
Filter-Input Capacitor*	10	μ f
Total Effective Plate-Supply Impedance Per Plate	100	ohms
DC Output Voltage at Input to Filter (Approx.) for dc output current of 175 ma.	410	volts

With choke input to filter

AC Plate-to-Plate Supply Voltage (RMS)	1000	volts
Filter-Input Choke	4	henries
DC Output Voltage at Input to Filter (Approx.) for dc output current of 175 ma.	410	volts

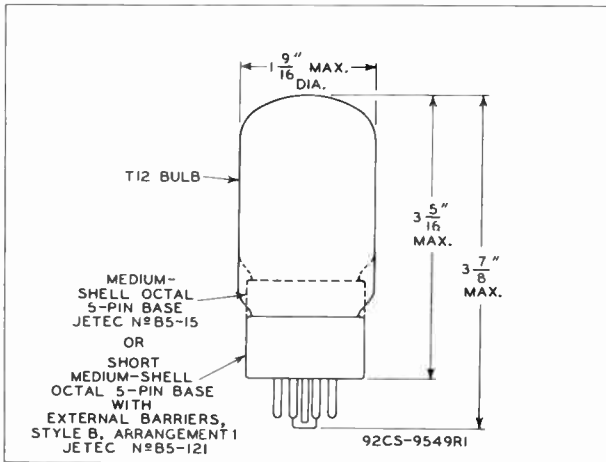
* Higher values of capacitance than indicated may be used, but the effective plate-supply impedance should be increased to prevent exceeding the maximum rating for peak plate current.



5V4-GA

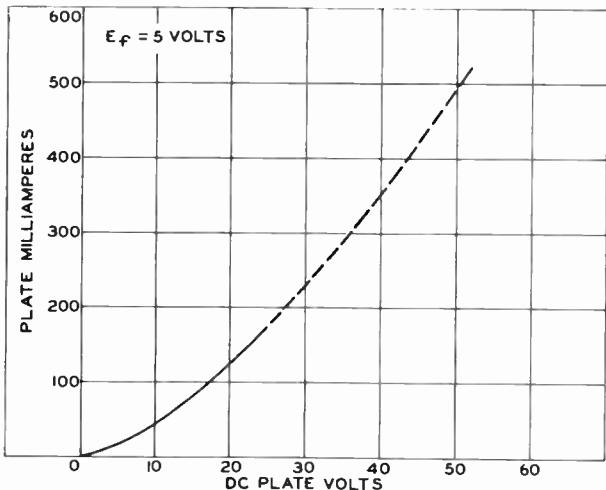
FULL-WAVE VACUUM RECTIFIER

5V4-GA



CE-9549R1

AVERAGE PLATE CHARACTERISTIC
EACH UNIT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

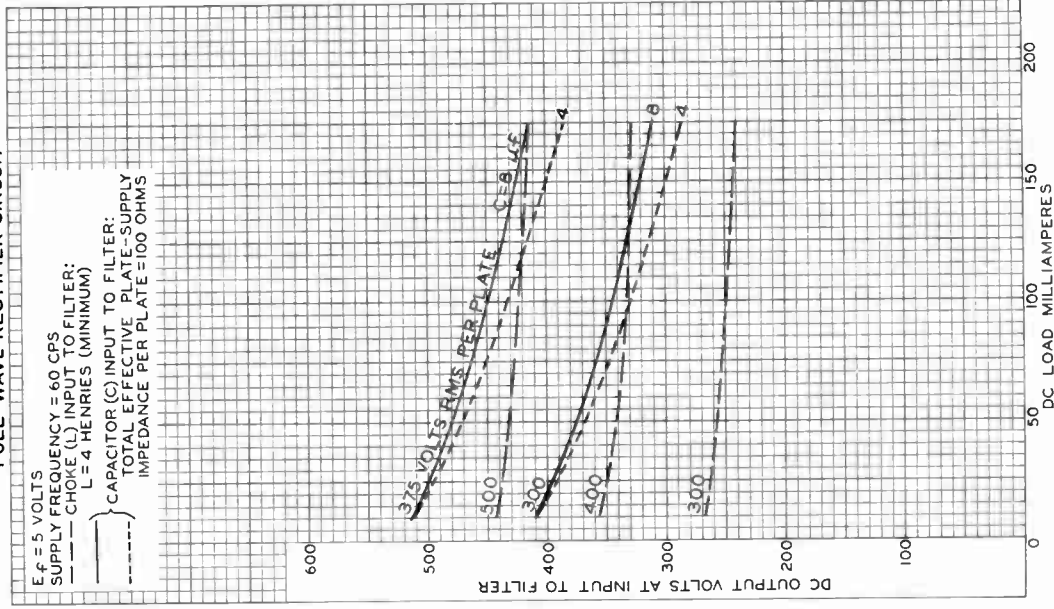
92CS-6110R1

5V4-GA



5V4-GA

OPERATION CHARACTERISTICS FULL-WAVE RECTIFIER CIRCUIT





5V6-GT

5V6-GT BEAM POWER TUBE

*Intended for use in equipment having
series heater-string arrangement*

The 5V6-GT is the same as the 6V6-GT except for the following items:

Heater, for Unipotential Cathode:

Voltage.	4.7	. . . . .	ac or dc volts
Current.	0.6	. . . . .	amp
Warm-up time (Average)	11	. . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	200	max. volts
Heater positive with respect to cathode.	200 [▲]	max. volts

[▲] The dc component must not exceed 100 volts.





5X8

5X8

TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5X8 is the same as the 6X8 except for the following items:

Heater, for Unipotential Cathode:

Voltage	4.7	. . . . .	ac or dc volts
Current	0.6	. . . . .	amp
Warm-up time (Average).	11	. . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this section.

PEAK HEATER-CATHODE VOLTAGE:

- Heater negative with respect to cathode . 200 max. volts
- Heater positive with respect to cathode . 200[▲] max. volts

[▲] The dc component must not exceed 100 volts.



Full-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

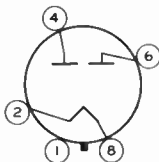
Filament, Coated:

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. 3-3/8"
 Maximum Seated Length. 2-13/16"
 Maximum Diameter. 1-9/32" ←
 Dimensional Outline See *General Section*
 Bulb. T9
 Base. Intermediate-Shell Octal 5-Pin, ←
 Arrangement 1 (JEDEC Group 1, No.B5-10), or
 Short Intermediate-Shell Octal 5-Pin
 with External Barriers, Arrangement 1
 (JEDEC Group 1, No.B5-62)
 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, Design-Center Values:

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE. 1400 max. volts
 AC PLATE SUPPLY VOLTAGE PER PLATE
 (RMS, without load) See *Rating Chart I*
 STEADY-STATE PEAK PLATE CURRENT
 PER PLATE (See *Rating Chart II*) 440 max. ma
 TRANSIENT PEAK PLATE CURRENT
 PER PLATE (See *Rating Chart III*). 2.5 max. amp
 DC OUTPUT CURRENT See *Rating Chart I*

Typical Operation:

	<i>With capacitor- input filter</i>	<i>With choke- input filter</i>	
AC Plate-to-Plate Supply Voltage (RMS, without load)	700	1000	volts
Filter-Input Capacitor ^a	20	-	μf

← Indicates a change.



5Y3GT

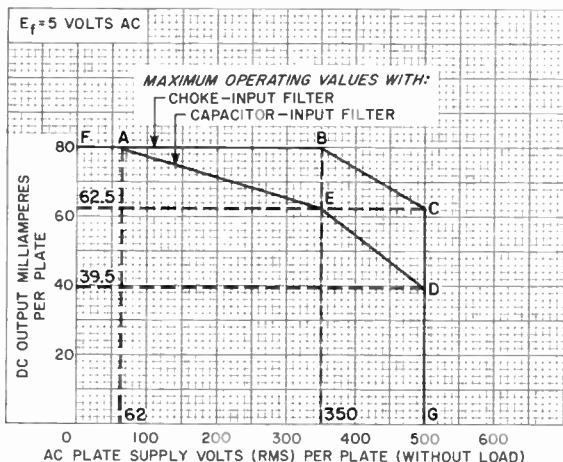
Filter-Input Choke	-	10	henrys
Total Effective Plate Supply Impedance Per Plate	50	-	ohms
DC Output Voltage at input to filter	360	360	volts
DC Output Current	125	125	ma

→ **Characteristics, Instantaneous Test Condition:**

Tube-Voltage Drop for plate ma. = 125
 (Per plate) 50 volts

^a values of capacitance greater than 20 μ f may be used, provided the plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHART I



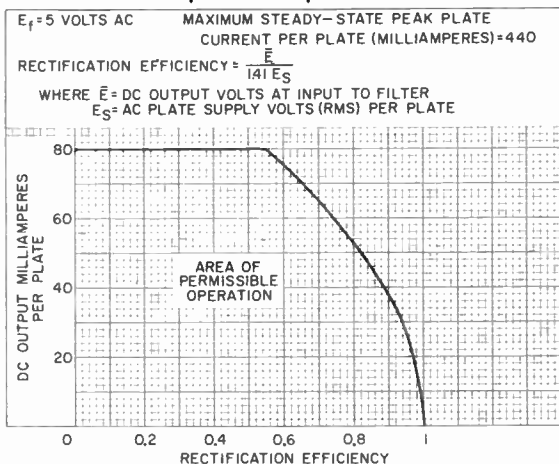
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→ Indicates a change.

RADIO CORPORATION OF AMERICA
 Electron Tube Division
 Harrison, N. J.

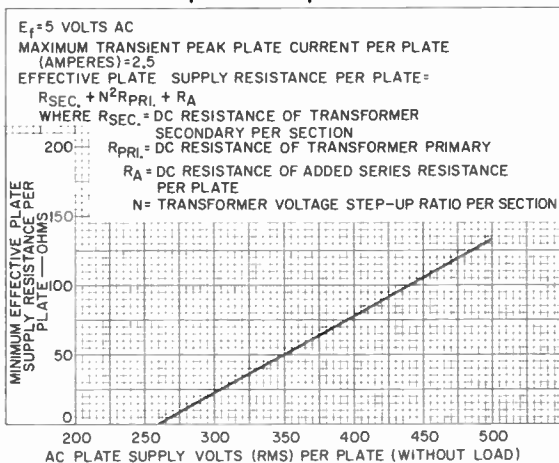


RATING CHART II Capacitor-Input Filter



92CS-11212

RATING CHART III Capacitor-Input Filter



92CS-11213







6A3

6A3

POWER AMPLIFIER TRIODE

Filament	Coated	
Voltage	0.3	a-c or d-c volts
Current	1.0	amp.
Maximum Overall Length		5-3/8"
Maximum Seated Height		4-3/4"
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium 4-Pin
Pin 1 - Filament		Pin 3 - Grid
Pin 2 - Plate		Pin 4 - Filament
Mounting Position		Any



BOTTOM VIEW (4D)

SINGLE-TUBE AMPLIFIER*Typical Operation and Characteristics - Class A₁ Amplifier:*

Plate	250 max.	volts
Grid*	-45	volts
Plate Cur.	60	ma.
Amp. Factor	4.2	
Plate Res.	800	ohms
Transcond.	5250	μhos
Load Res.	2500	ohms
Second Har. Dist.	5	%
Power Output	3.2	watts

PUSH-PULL AMPLIFIER

Unless otherwise specified, values are for two tubes

Typical Operation.

	<u>Fixed Bias</u>	<u>Cathode-Bias</u>	
Plate	225 max.	max.	volts
Grid*	-60	-	volts
Cathode-Bias Resistor	-	850	ohms
Zero-Sig. Plate Cur.	80	80	ma.
Load Res. (per tube)	750	1250	ohms
Effective Load Res. (plate to plate)	3000	5000	ohms
Total Har. Dist.	2.5	5.0	%
Power Output	15	10	watts

If a single 6A3 is operated cathode-biased, the cathode-biasing resistor should be 750 ohms approx.

The type of 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 not to exceed 0.5 megohm.

* Grid voltage referred to mid-point of a-c operated filament.

Curves for the 6A3 are essentially the same as those shown for type 2A3.





6AB4

6AB4

HIGH-MU TRIODE

MINIATURE TYPE PARTICULARLY SUITABLE FOR CATHODE-DRIVE CIRCUITS

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 0.15 amp

Direct Interelectrode

Capacitances:

	Without External Shield	With External Shield No. 316 Tied to Cathode	
Grid to Plate	1.5	1.5	μμf
Grid to Heater and Cathode	2.2	2.2	μμf
Plate to Heater and Cathode	0.5	1.4	μμf
Heater to Cathode	2.9	2.9	μμf
Plate to Cathode	0.24	0.2	μμf
Cathode to Heater and Grid	5.0	5.2	μμf
Plate to Heater and Grid	1.7	2.6	μμf

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)

Basing Designation for BOTTOM VIEW 5CE

Pin 1 - Plate

Pin 2 - Internal Shield

Pin 3 - Heater

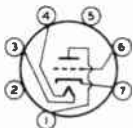
Pin 4 - Heater

Pin 5 - No

Connection

Pin 6 - Grid

Pin 7 - Cathode



AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE 300 max. volts

GRID VOLTAGE:

Negative bias value 50 max. volts

Positive bias value 0 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 100 250 volts

Cathode-bias Resistor 270 200 ohms

Internal Shield Connected to ground

Amplification Factor 60 60

← Indicates a change

MAY 1, 1952

DATA

6AB4



6AB4

HIGH-MU TRIODE

Plate Resistance (Approx.)	15000	10900	ohms
Transconductance	4000	5500	μ hos
Grid Bias (Approx.) for plate current of 10 μ amp.	-5	-12	volts
Plate Current	3.7	10	ma

CURVES
for the 6AB4 are the same
as those for each unit of Type 12AT7



6AF3

6AF3

HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

For television damper service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.2	amp

Direct Interelectrode Capacitances (Approx.):^o

Plate to cathode and heater	6	μf
Cathode to plate and heater	9	μf
Heater to cathode	2.8	μf

Mechanical:

Operating Position	Any
Maximum Overall Length	3-9/32"
Maximum Seated Length	2-7/8" ± 1/8"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb	T6-1/2
Cap	Skirted Miniature (JEDEC No. C1-2)
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9CB

Pin 1 - Internal
 Connection—
 Do Not Use[♦]

Pin 2 - Same as Pin 1
 Pin 3 - Same as Pin 1
 Pin 4 - Heater



Pin 5 - Heater
 Pin 6 - Same as Pin 1
 Pin 7 - Same as Pin 1
 Pin 8 - Same as Pin 1
 Pin 9 - Plate
 Cap - Cathode

DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

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

PEAK INVERSE PLATE VOLTAGE	4500 [■] max.	volts
PEAK PLATE CURRENT	750 max.	ma
DC PLATE CURRENT	185 max.	ma
PLATE DISSIPATION	6 max.	watts
PEAK HEATER CATHODE VOLTAGE:		
Heater negative with respect to cathode	4500 [•] max.	volts
Heater positive with respect to cathode	300 [▲] max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)		
	210 max.	°C

Characteristics:

Tube-Voltage Drop for plate ma. = 340 30 volts

^o Without external shield.

[♦] Socket terminals 1,2,3,6,7, and 8 should not be used as tie points.

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

6AF3



6AF3

HALF-WAVE VACUUM RECTIFIER

■ This rating is applicable where the duty cycle of the voltage pulse does 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.

▲ The dc component must not exceed 1000 volts.

▲ The dc component must not exceed 100 volts.

Medium-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	$6.3 \pm 10\%$	volts
Current at 6.3 volts	0.225	amp

Direct Inter-electrode Capacitance (Approx.):^a

Grid to plate	1.9	$\mu\mu\text{f}$
Grid to cathode and heater	2.2	$\mu\mu\text{f}$
Plate to cathode and heater	1.4	$\mu\mu\text{f}$
Heater to cathode	2.2 ^b	$\mu\mu\text{f}$

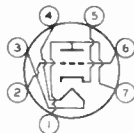
Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	80	volts
Cathode Resistor	150	ohms
Amplification Factor	13.5	
Plate Resistance (Approx.)	2100	ohms
Transconductance	1500	μmhos
Plate Current	17.5	ma

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" \pm 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See General Section
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (EBC No. E7-1)
Basing Designation for BOTTOM VIEW	7D ^c

Pin 1 - Plate
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Cathode
Pin 6 - Grid
Pin 7 - Plate

UHF OSCILLATOR

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	150	max.	volts
GRID VOLTAGE:			
Negative-bias value	50	max.	volts
GRID CURRENT	2	max.	ma
CATHODE CURRENT	24	max.	ma
PLATE DISSIPATION	2.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	50	max.	volts
Heater positive with respect to cathode	50 ^c	max.	volts

← Indicates a change.



6AF4A

Typical Operation:

At frequency of 1000 Mc

Plate Supply Voltage.	100	volts
Plate Resistor.	220	ohms
Grid Resistor	10000	ohms
Plate Current	17	ma
Grid Current (Approx.).	750	μ a

Maximum Circuit Values:

Grid-Circuit Resistance:

- For fixed-bias operation. Not recommended
- For cathode-bias operation. 0.5 max. megohm

^a With external shield JEDEC No.316 connected to cathode except as noted.

^b With external shield JEDEC No.316 connected to plate.

^c The dc component must not exceed 25 volts.

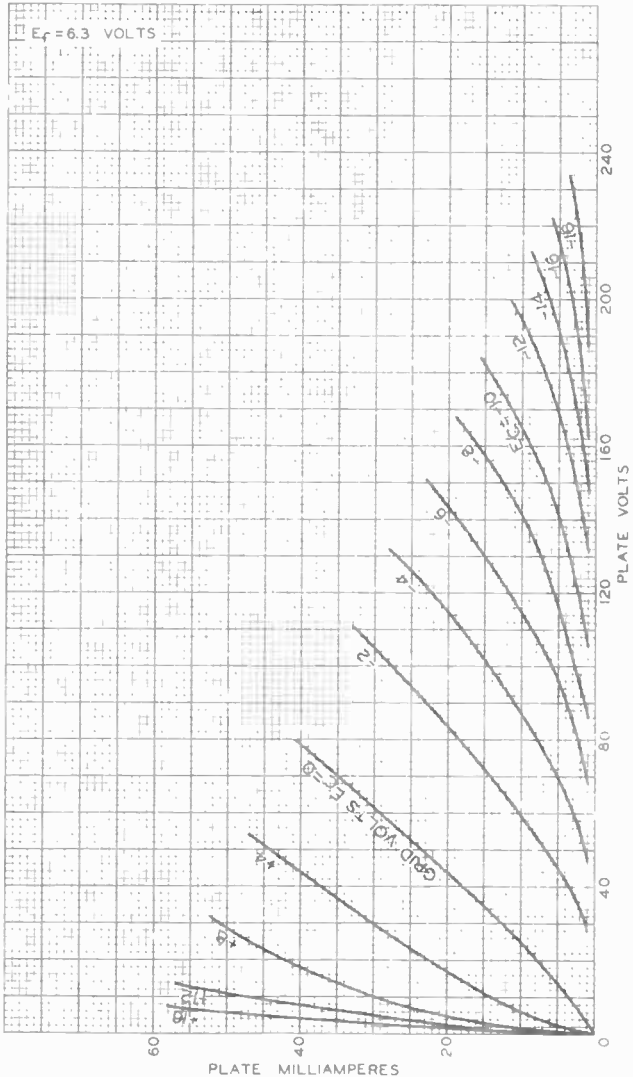




6AF4-A

6AF4-A

AVERAGE PLATE CHARACTERISTICS



FEB 20, 1952

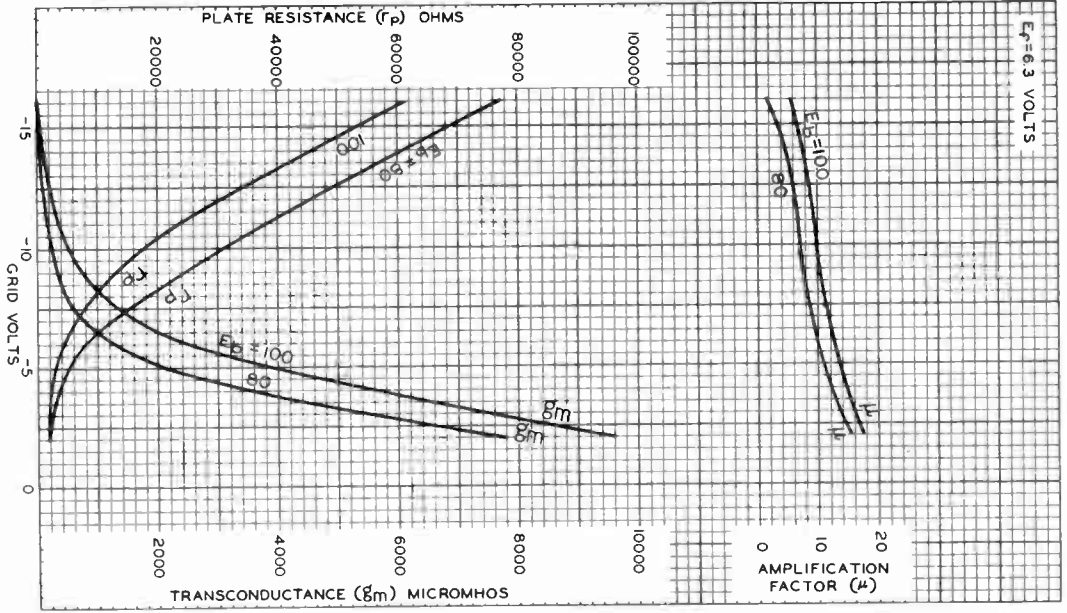
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RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

92CM-7756



AVERAGE CHARACTERISTICS

$E_g = 6.3$ VOLTS



FEB. 26, 1952

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

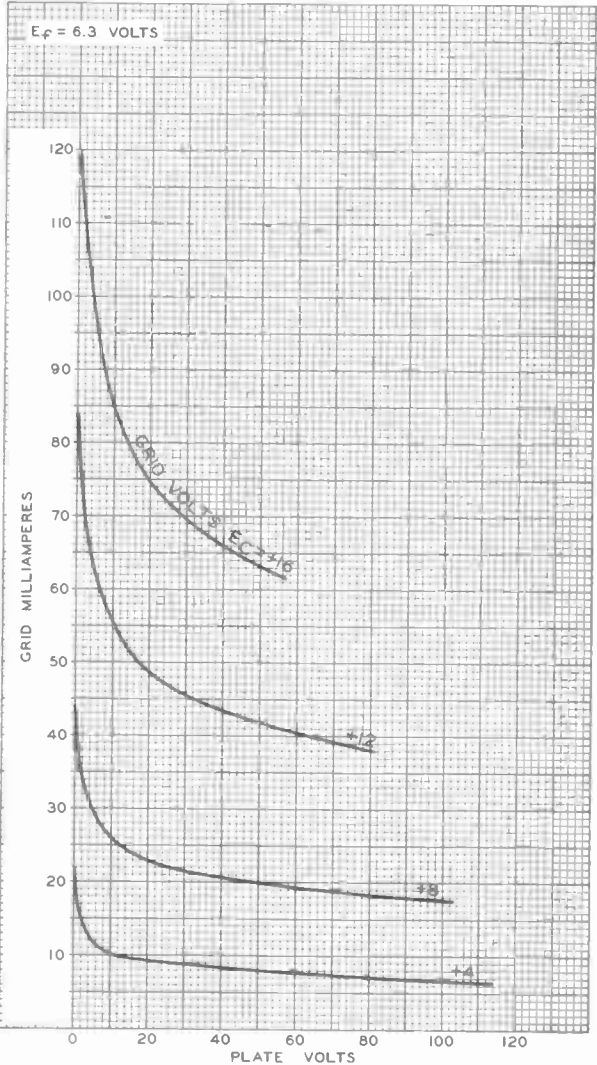
92CM-7758



6AF4-A

6AF4-A

AVERAGE CHARACTERISTICS



MAR. 19, 1952

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

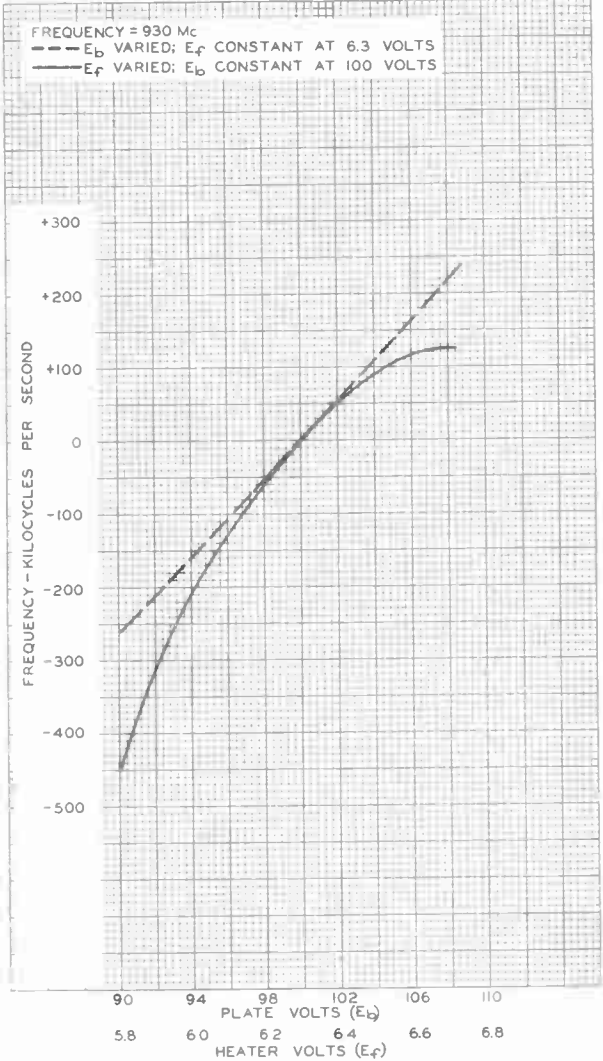
92CM-7759R1

6AF4-A



6AF4-A

FREQUENCY SHIFT CHARACTERISTICS





6AF6-G

6AF6-G

ELECTRON-RAY TUBE

TWIN-INDICATOR TYPE

Heater	Coated Minipotential Cathode	
Voltage	0.3	a-c or d-c volts
Current	0.15	amp.
Overall Length		2-1/4" { +1/16" -1/4" ←
Seated Height		1-11/16" { +1/16" -1/4" ←
Maximum Diameter		1-5/16"
Bulb		T-9
Base		Interned. Sh. Octal 7-Pin
Pin 1 - No Connection		Pin 4 - Ray Control
Pin 2 - Heater		Electrode, Unit No. 1
Pin 3 - Ray-Control Electrode, Unit No. 2		Pin 5 - Target
		Pin 7 - Heater
		Pin 6 - Cathode



Mounting Position: BOTTOM VIEW (TYPICAL) A-2**

Maximum and Minimum Ratings Are Design-Center Values

INDICATOR SERVICE

Target Voltage	1250 max.	volts
	125 min.	volts
Ray-Control Electrode Supply Voltage	250 max.	volts
D-C Heater-Cathode Potential	90 max.	volts

Typical Operation:

Target Voltage	125	250	volts
Series Resistor \square	0.5	1.0	megohm
Target Current*	0.65	2.2	ma.
Ray-Control Electrode Voltage †	80	160 approx.	volt
Ray-Control Electrode Voltage ††	0	0 approx.	volts

** The plane of the ray-control electrode passes through pins No. 3 and No. 7.

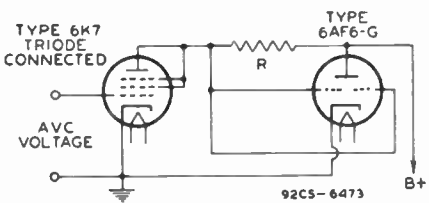
† Designated R in circuit diagram below.

† with 0 volts on ray-control electrodes. Subject to wide variation.

† For shadow angle of 0° produced by either ray-control electrode.

†† For shadow angle of 95° produced by either ray-control electrode.

TYPICAL CIRCUIT USING TYPE 6AF6-G WITH RAY-CONTROL ELECTRODES IN PARALLEL



The license extended to the purchaser of tubes appears in the license notice accompanying them. Information contained herein is furnished without assuming any obligations. ← Indicates a change.

6AF6-G

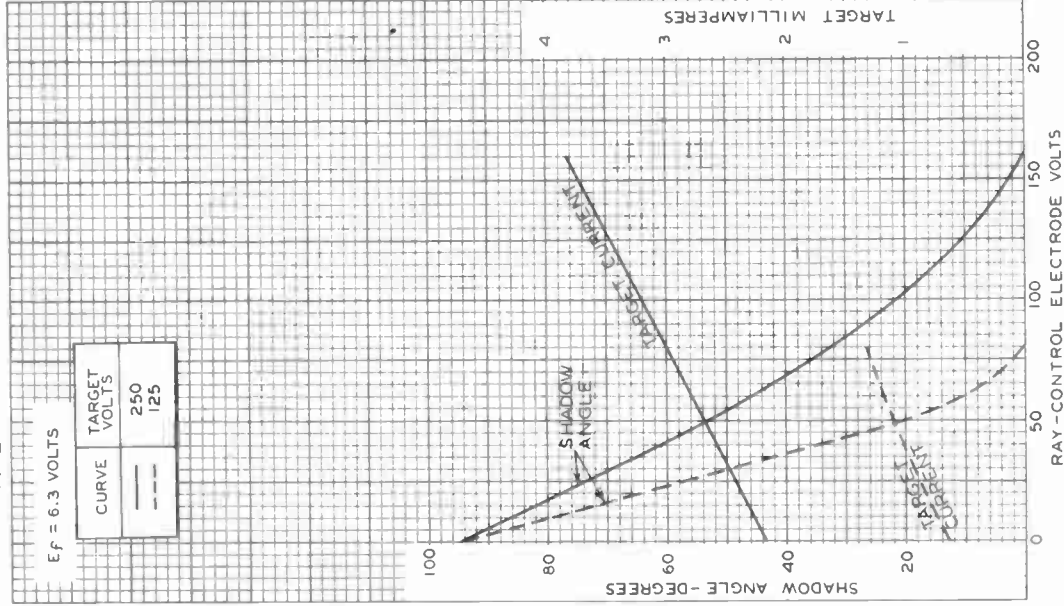


6AF6-G

AVERAGE CHARACTERISTICS

 $E_f = 6.3$ VOLTS

CURVE	TARGET VOLTS
—	250
- - -	125





6AG5

6AG5

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Useful at Frequencies up to 400 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	. . . . .	ac or dc volts
Current	0.3	. . . . .	amp

Direct Interelectrode

Capacitances:

Without Shield

With Shield^o

Pentode Connection:

Grid No.1 to plate	0.030 max.	0.020 max.	μ f
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater. .	6.5	6.6	μ f
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . .	1.8	3.1	μ f

Triode Connection, Grid No.2 tied to Plate:

Grid No.1 to plate and grid No.2.	2.5	2.5	μ f
Grid No.1 to cathode & grid No.3 & internal shield, and heater . . .	3.6	3.6	μ f
Plate and grid No.2 to cathode & grid No.3 & internal shield, and heater	3	4.3	μ f

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" \pm 3/32"

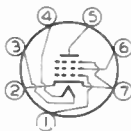
Maximum Diameter 3/4"

Bulb T-5-1/2

Base Small-Button Miniature 7-Pin (JETEC No.E7-1)

Basing Designation for BOTTOM VIEW 78D

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



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

^o With external shield JETEC No.316 connected to pin No.7.

←Indicates a change.

6AG5



6AG5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A₁

Pentode Connection

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

PLATE VOLTAGE.	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE.	300 max.	volts
GRID-No.2 VOLTAGE.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value.	0 max.	volts
PLATE DISSIPATION.	2 max.	watts
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.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
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.	100	125	250	volts
Grid-No.2 Voltage.	100	125	150	volts
Cathode-Bias Resistor.	180	100	180	ohms
Plate Resistance (Approx.)	0.6	0.5	0.8	megohm
Transconductance	4500	5100	5000	μmhos
Plate Current.	4.5	7.2	6.5	ma
Grid-No.2 Current.	1.4	2.1	2.0	ma
Grid-No.1 Voltage (Approx.) for plate current = 10 μamp	-5	-6	-8	volts

AMPLIFIER - Class A₁

Triode Connection - Grid No.2 Connected to Plate

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

PLATE VOLTAGE.	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value.	0 max.	volts
PLATE AND GRID-No.2 DISSIPATION (TOTAL).	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

Typical Operation and Characteristics:

Plate Voltage.	180	250	volts
→ Cathode-Bias Resistor.	330	820	ohms
→ Plate Resistance (Approx.)	0.008	0.01	megohm
Amplification Factor	45	42	
Transconductance	5700	3800	μmhos
Plate & Grid-No.2 Current (Total).	7	5.5	ma

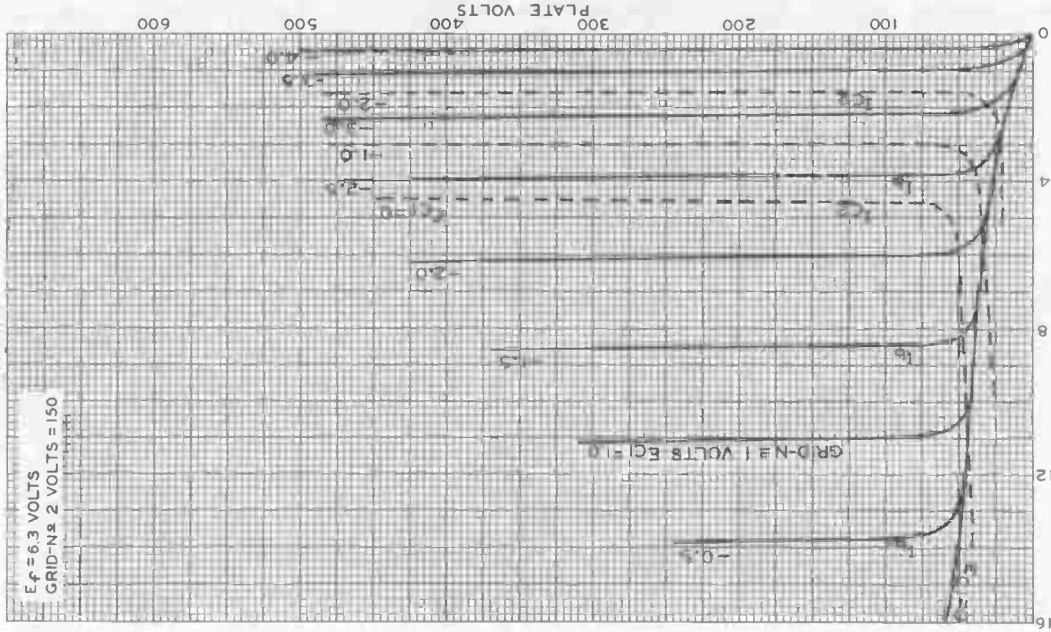
→ indicates a change.



6AG5

6AG5

AVERAGE PLATE CHARACTERISTICS



DEC. 27, 1954

PLATE (I_b) OR GRID-NO. 2 (I_{c2}) MILLIAMPERES

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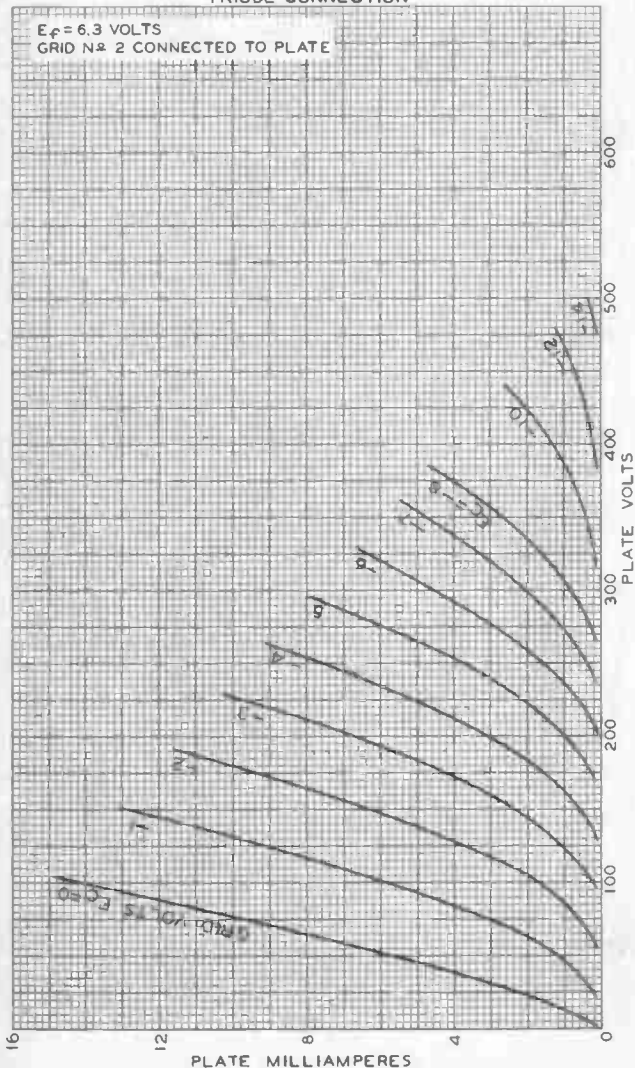
92CM-6399 R2

6AG5



6AG5 AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$ VOLTS
GRID N^o 2 CONNECTED TO PLATE





6AG7

6AG7

POWER PENTODE

SINGLE-ENDED METAL TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.65	amp

Direct Interelectrode Capacitances:

With Pin No.1 and Pin No.3 connected to Pin No.5

Grid No.1 to Plate	0.06 max.	$\mu\mu\text{f}$
Input	13	$\mu\mu\text{f}$
Output	7.5	$\mu\mu\text{f}$

Characteristics, Amplifier Class A₁

Plate Voltage	300	volts
Grid-No.2 Voltage	150	volts
Grid-No.1 Voltage	-3	volts
Peak AF Grid-No.1 Signal Voltage	3	volts
Zero-Signal DC Plate Current	30	ma
Max.-Signal DC Plate Current	30.5	ma
Zero-Signal DC Grid-No.2 Current	7	ma
Max.-Signal DC Grid-No.2 Current	9	ma
Plate Resistance (Approx.)	0.13	megohm
Transconductance	11000	μhos
Load Resistance	10000	ohms
Total Harmonic Distortion	7	per cent
Max.-Signal Power Output	3	watts

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-1/4" ←
Seated Length	2-19/32" ± 3/32" ←
Maximum Diameter	1-5/16" ←
Bulb	Metal Shell, MT-8
Base	Small-Wafer Octal 8-Pin (JETEC No.88-21) ←
Basing Designation for BOTTOM VIEW	8Y ←

Pin 1 - Shell, Grid No.3

Pin 2 - Heater

Pin 3 - No Connection

Pin 4 - Grid No.1



Pin 5 - Cathode

Pin 6 - Grid No.2

Pin 7 - Heater

Pin 8 - Plate

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	300 max.	volts

← Indicates a change

6AG7



6AG7

POWER PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Positive bias value 0 max. volts

PLATE DISSIPATION 9 max. watts

GRID-No.2 INPUT 1.5 max. watts

→ PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode 90 max. volts

Heater positive with respect to cathode 90 max. volts

**Typical Operation in 4-Mc Bandwidth Video Amplifier
Circuit of Fig. 1:**
*With Grid-Resistor Bias**Used where dc restoration is accomplished in grid-no.1 circuit of the 6AG7*

Plate Supply Voltage 300 volts

Grid-No.2 Voltage† 115 volts

Zero-Signal Grid-No.1 Voltage 0 volts

Grid-No.1 Resistor 0.25 to 0.5 megohm

Grid-No.1 Signal Voltage (Peak to Peak) 4 volts

Zero-Signal Plate Current 45 ma

Zero-Signal Grid-No.2 Current 13 ma

Load Resistor 3500 ohms

Voltage Output (Peak to Peak) 135 volts

With Cathode-Resistor Bias

Plate Supply Voltage 300 volts

Grid-No.2 Voltage^o 125 volts*from series resistor of 25000 ohms*

Grid-No.1 Voltage -2 volts

Cathode Resistor (Bypassed with
capacitor of 250 μ f, approx.) 57 ohms

Grid-No.1 Signal Voltage (Peak to Peak) 4 volts

Zero-Signal Plate Current 28 ma

Zero-Signal Grid-No.2 Current 7 ma

Load Resistor 3500 ohms

Voltage Output (Peak to Peak) 140 volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation 0.25 max. megohm

For cathode-bias operation 1.0 max. megohm

† obtained from supply having good regulation.

^o obtained preferably from 300-volt plate supply through resistor of value shown.

→ indicates a change

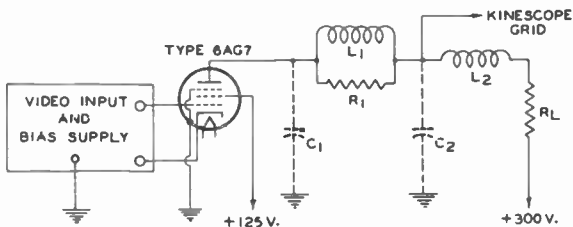


6AG7

6AG7

POWER PENTODE

Fig. 1 - Typical Video Voltage Amplifier Circuit Having Bandwidth of 4 Mc.



$C_1 = 9.5 \mu\text{f} =$ Tube Output Capacitance + Socket Capacitance + Wiring Capacitance + Coil Capacitance

$C_2 = 19 \mu\text{f} =$ Kinescope Capacitance + Socket Capacitance + Wiring Capacitance + Coil Capacitance

$L_1 = 250 \mu\text{h}$ Filter Inductor

$L_2 = 125 \mu\text{h}$ Filter Inductor

$R_1 = 20000\text{-Ohm}$, Non-Reactve Resistor

$R_L = 3500\text{-Ohm}$, 10-Watt, Non-Reactve Resistor

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.

6AG7



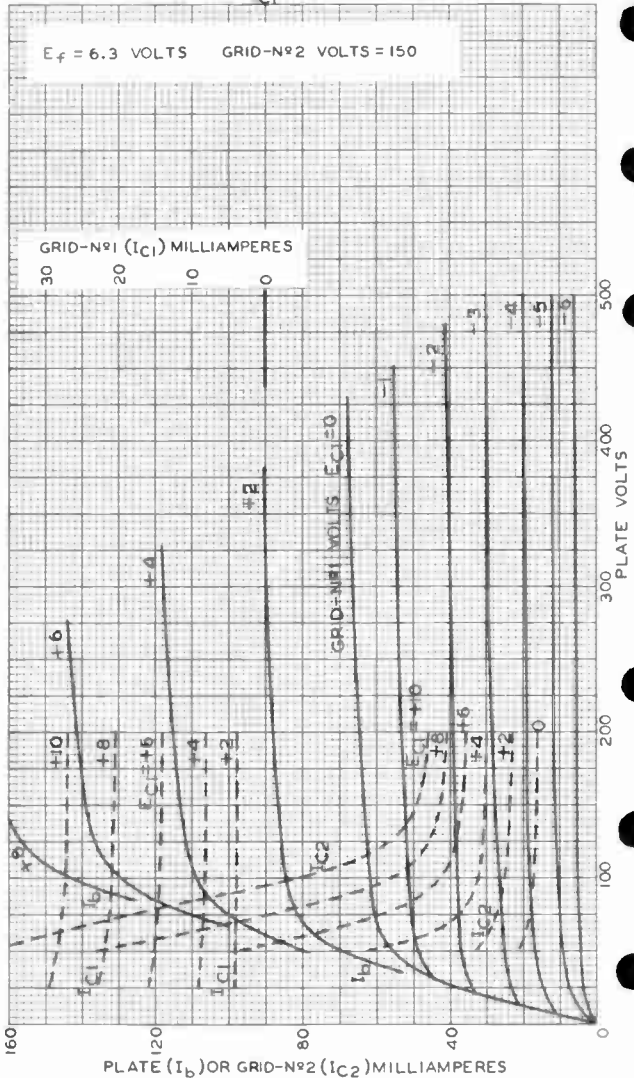
6AG7

AVERAGE PLATE CHARACTERISTICS WITH E_{C1} AS VARIABLE

$E_f = 6.3$ VOLTS GRID-N^o2 VOLTS = 150

GRID-N^o1 (I_{C1}) MILLIAMPERES

30 20 10 0



OCT. 2, 1952

TUBE DEPARTMENT

92CM-6034R2

RADIO CORPORATION OF AMERICA

World Radio History

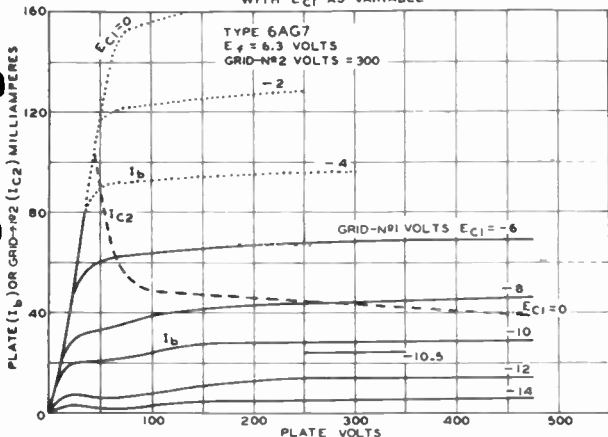


6AG7

POWER PENTODE

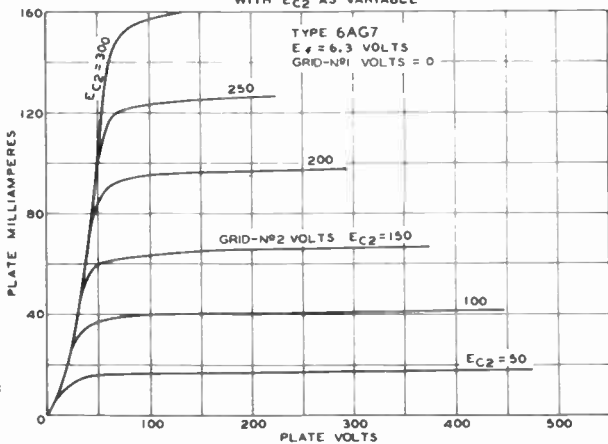
6AG7

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



92CM-6035T1

AVERAGE PLATE CHARACTERISTICS
WITH E_{C2} AS VARIABLE



92CM-6036T1

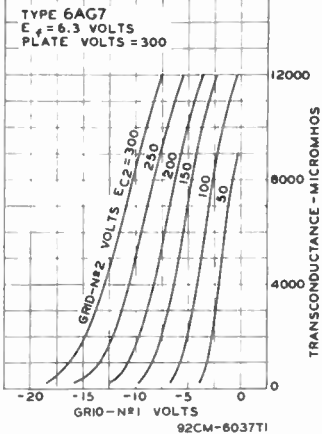
6AG7



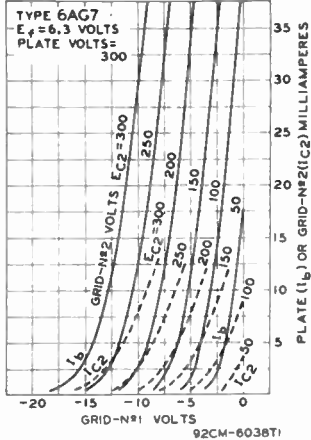
6AG7

POWER PENTODE

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



NOV. 1, 1952

TUBE DEPARTMENT
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

CE-6037T1
 CE-6038T1



6AK5

6AK5

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Useful at frequencies up to 400 Mc

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 ⁰	
Grid No.1 to plate	0.03 max.	0.02 max.	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4	4	$\mu\mu\text{f}$
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.1	2.8	$\mu\mu\text{f}$

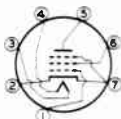
Characteristics, Class A₁ Amplifier:

Plate Voltage	120	180	volts
Grid-No.2 (Screen) Voltage	120	120	volts
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

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" \pm 3/32"
Maximum Diameter	3/4"
Dimensional Outline	See General Section
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No. E7-1)
Basing Designation for BOTTOM VIEW	7BD

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



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

⁰ with external shield JETEC No.316 connected to cathode.

← Indicates a change.

6AK5



6AK5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A₁

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

PLATE VOLTAGE.	180 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE.	180 max.	volts
GRID-No.2 VOLTAGE.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value.	0 max.	volts
PLATE DISSIPATION.	1.7 max.	watts
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.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
CATHODE CURRENT.	18 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	120 max.	volts
Heater positive with respect to cathode.	120 max.	volts

→ Indicates a change.

SEPT. 1, 1955

DATA

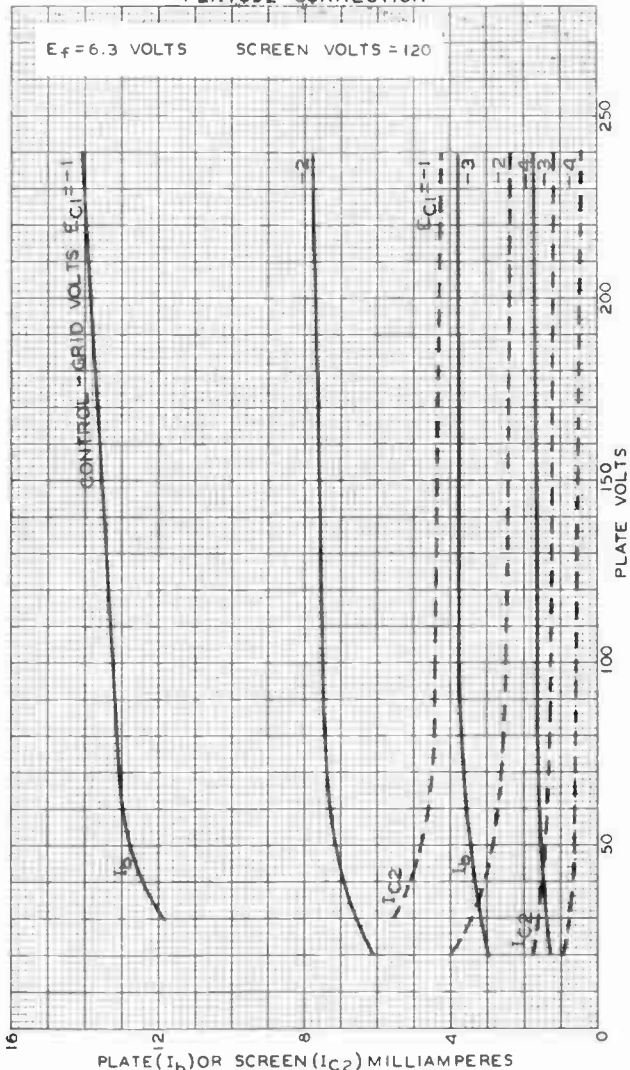
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6AK5

6AK5

AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION



FEB. 15, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6504

6AK5

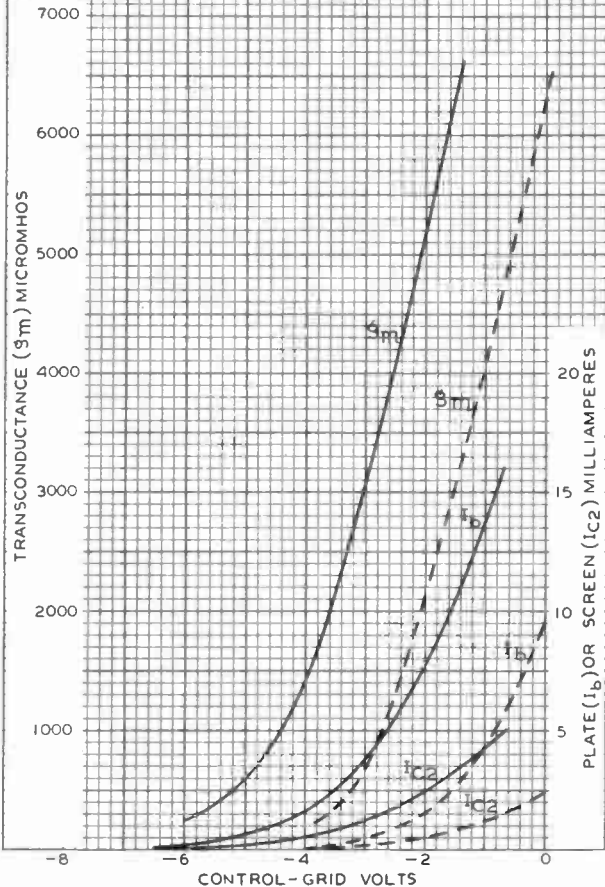


6AK5

AVERAGE CHARACTERISTICS PENTODE CONNECTION

 $E_f = 6.3$ VOLTS

CURVES	SCREEN VOLTS	PLATE VOLTS
—	120	180
- - -	75	180



FEB. 19, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY
World Radio History

92CM-6505



6AK6

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	μuf
Input	3.6	μuf
Output	4.2	μuf
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 A₁ 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.

OCT. 1, 1943

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6AK6

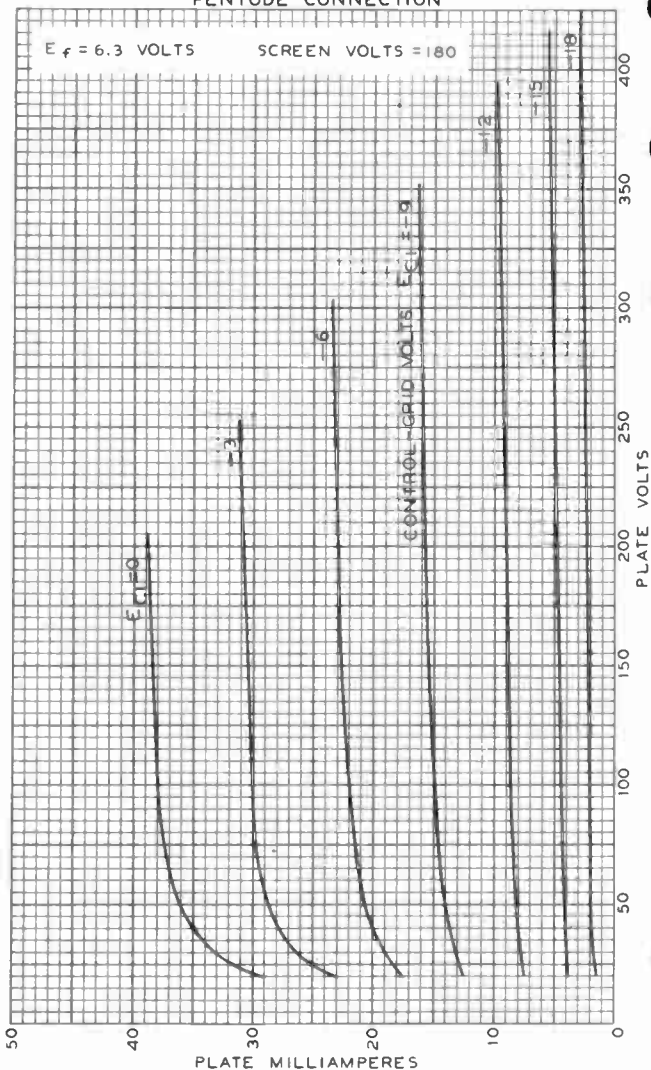


6AK6

AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS

SCREEN VOLTS = 180



AUG. 11, 1943

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

92C-6450

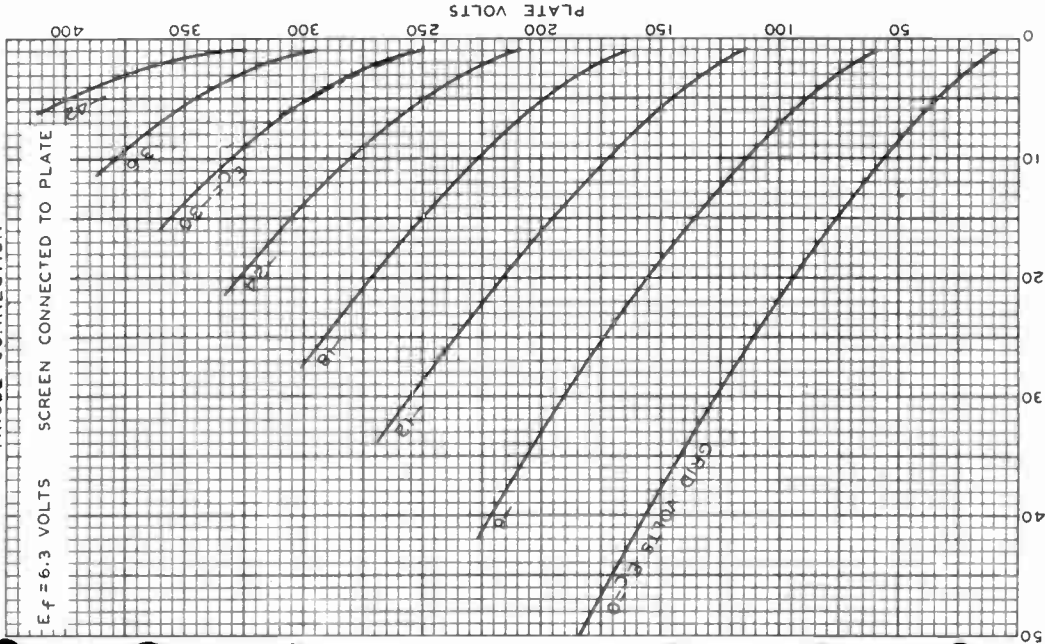
World Radio History



6AK6

6AK6

AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



AUG. 11, 1943

PLATE MILLIAMPERES

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92C-6449

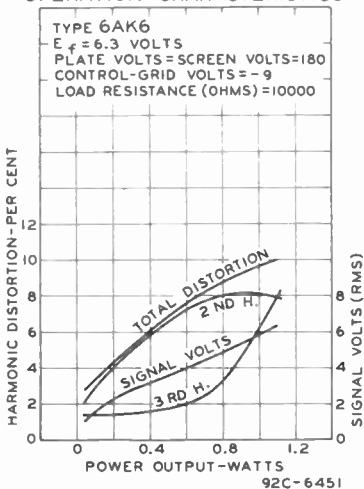
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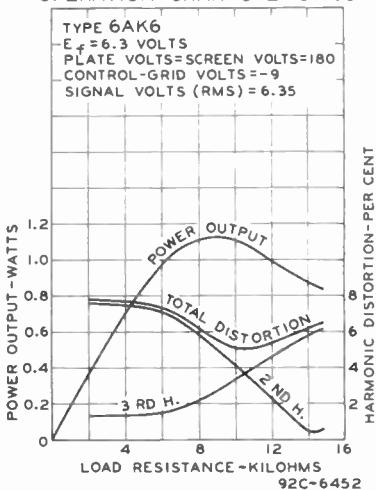
6AK6

POWER AMPLIFIER PENTODE

OPERATION CHARACTERISTICS



OPERATION CHARACTERISTICS



OCT. 1, 1943

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

World Radio History

CE-6451

CE-6452

Half-Wave Vacuum Rectifier

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	1.550	amp
Peak heater-cathode voltage	6600 max.	volts

Direct Interelectrode Capacitances (Approx.):^a

Plate to cathode and heater	8.6	μμf
Heater to cathode	2	μμf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-1/2"
Maximum Seated Length	3-1/4"
Diameter	0.750" to 0.875"
Bulb . . . . .	.T6-1/2
Cap	Skirted Miniature (JEDEC No.C1-2)
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9CB

- Pin 1 - Do Not Use^b
- Pin 2 - Same as Pin 1
- Pin 3 - Same as Pin 1
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Same as Pin 1
- Pin 7 - Same as Pin 1
- Pin 8 - Same as Pin 1
- Pin 9 - Plate
- Cap - Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Center Values Except as Noted:*

For operation in a 525-line, 30-frame system^c

PEAK INVERSE PLATE VOLTAGE (Absolute-maximum value) ^d	7500 ^e max.	volts
PEAK PLATE CURRENT	550 max.	ma
DC PLATE CURRENT	220 max.	ma
PLATE DISSIPATION	5 max.	watts

^a without external shield.

^b Socket terminals 1,2,3,6,7, and 8 should not be used as tie points.

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

^d This rating is applicable where the duty cycle of the voltage pulse does 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.

^e Under no circumstances should this absolute-maximum value be exceeded.







6AL5

TWIN DIODE

MINIATURE TYPE

6AL5

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage 6.3 ac or dc volts

Current 0.3 amp

Direct Interelectrode Capacitances (Approx.):^o

Plate No. 1 to Cathode No. 1, Heater, and Internal Shield* 2.5 μ f

Plate No. 2 to Cathode No. 2, Heater, and Internal Shield[•] 2.5 μ f

Cathode No. 1 to Plate No. 1, Heater, and Internal Shield* 3.4 μ f

Cathode No. 2 to Plate No. 2, Heater, and Internal Shield[•] 3.4 μ f

Plate No. 1 to Plate No. 2[□] 0.068 max. μ f

Cold Resonant Frequency (Each Unit, Approx.) 700 Mc

^o with no external shield.

* with plate and cathode of unit No.2 grounded.

[•] with plate and cathode of unit No.1 grounded.

[□] with all other electrodes and internal shield grounded.

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" \pm 3/32"

Maximum Diameter 3/4"

Bulb T-5-1/2

Base Small-Button Miniature 7-Pin (JEDEC No. E-1)

Basing Designation for BOTTOM VIEW 6BT

Pin 1 - Cathode of Diode No.1

Pin 2 - Plate of Diode No.2

Pin 3 - Heater

Pin 4 - Heater



Pin 5 - Cathode of Diode No.2

Pin 6 - Internal Shield

Pin 7 - Plate of Diode No.1

RECTIFIER

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE 330 max. volts

PEAK PLATE CURRENT PER PLATE 54 max. ma

DC OUTPUT CURRENT PER PLATE 9 max. ma

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 330 max. volts

Heater positive with respect to cathode. 330 max. volts

~ Indicates a change.

6AL5



6AL5

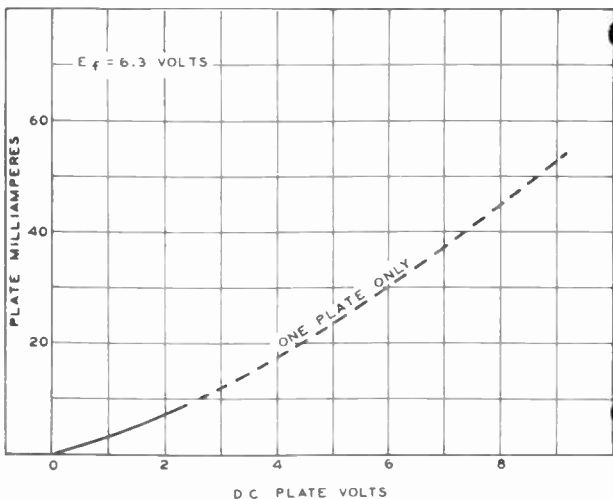
TWIN DIODE

Typical Operation as Half-Wave Rectifier:

The Two Units May Be Used Separately or in Parallel

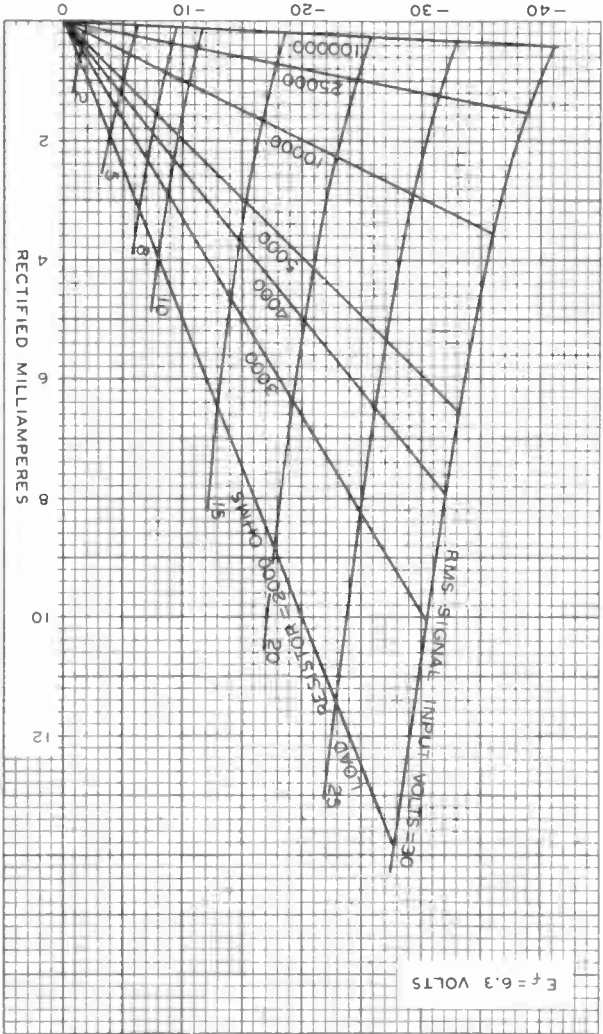
AC Plate Voltage per Plate (RMS)	117	volts
Min. Total Effect. Plate-Supply		
Impedance per Plate	300	ohms
DC Output Current per Plate	9	ma

AVERAGE PLATE CHARACTERISTIC



92CM-6560T

D-C VOLTS DEVELOPED BY DIODE



AVERAGE CHARACTERISTICS
HALF-WAVE RECTIFICATION-SINGLE DIODE

6ALS



6ALS



Beam Power Tube— Sharp-Cutoff Pentode

For Combined FM Detector and Audio-Frequency
Output Amplifier Applications in TV Receivers

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.9	amp
Peak heater-cathode voltage (Each unit)		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

Direct Interelectrode Capacitances (Approx.):^b

Beam Power Unit:

Grid No.1 to plate	0.26	pf
Input: $G1_B$ to ($K_B+G3_B, G2_B, IS, H$)	11	pf
Output: P_B to ($K_B+G3_B, G2_B, IS, H$)	12	pf

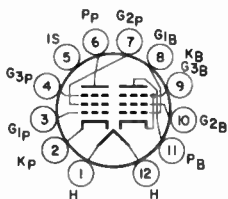
Pentode Unit:

$G1_P$ to P_P	0.034	pf
$G3_P$ to P_P	3.2	pf
$G1_P$ to ($K_P, G2_P, G3_P, IS, H$)	6.5	pf
$G3_P$ to ($K_P, G1_P, G2_P, P_P, IS, H$)	7.5	pf
$G1_P$ to $G3_P$	0.24	pf
P_B to P_P	0.12	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.625" ←
Seated Length	1.000" to 2.250" ←
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-'9)	See <i>General Section</i>
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No. F12-70)
Basing Designation for BOTTOM VIEW	12P11

- Pin 1—Heater
Pin 2—Pentode Cathode
Pin 3—Pentode Grid No.1
Pin 4—Pentode Grid No.3
Pin 5—Internal Shield
Pin 6—Pentode Plate
Pin 7—Pentode Grid No.2
Pin 8—Beam Power Grid No.1
Pin 9—Beam Power Cathode,
Beam Power Grid No.3
Pin 10—Beam Power Grid No.2
Pin 11—Beam Power Plate
Pin 12—Heater



- ^a The dc component must not exceed 100 volts.
^b without external shield.

← Indicates a change.



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 1
10-66

6AL11

Characteristics, Class A₁ Amplifier (Pentode Unit):

Plate Supply Voltage	150	volts
Grid-No.3	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage	100	volts
Grid-No.1	<i>Connected to negative end of cathode resistor</i>	
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1000	μ hos
Transconductance, Grid No.3 to Plate	400	μ hos
Plate Current	1.3	ma
Grid-No.2 Current	2.1	ma
Grid-No.1 Voltage (Approx.) for plate μ = 30	-4.5	volts
Grid-No.3 Voltage (Approx.) for plate μ = 50	-4.5	volts

PENTODE UNIT — FM SOUND DETECTOR

Maximum Ratings, Design-Maximum Values:

Plate Voltage	330 max.	volts
Grid-No.3 (Suppressor-Grid) Voltage	28 max.	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330 max.	volts
Grid-No.2 Voltage	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
Grid-No.1 (Control-Grid) Voltage:		
Positive-bias value	0 max.	volts
Plate Dissipation	1.7 max.	watts
Grid-No.2 Input:		
For grid-no.2 voltages up to 165 volts	1.1 max.	watts
For grid-no.2 voltages between 165 and 330 volts	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	

BEAM POWER UNIT — AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

Plate Voltage	275 max.	volts
Grid-No.2 (Screen-Grid) Voltage	275 max.	volts
Plate Dissipation	10 max.	watts
Grid-No.2 Input	2 max.	watts

Typical Operation and Characteristics:

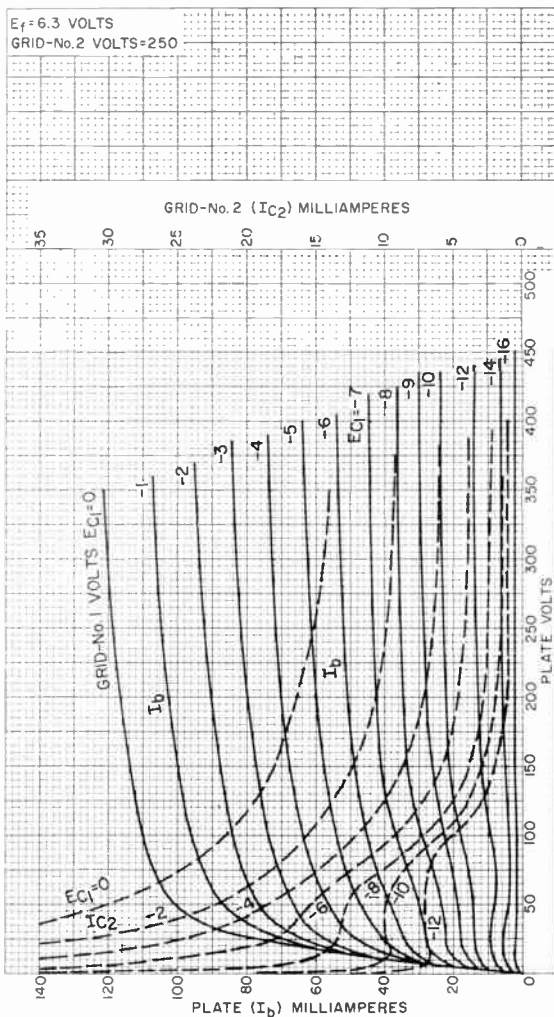
Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts
Zero-Signal Plate Current	35	ma
Max.-Signal Plate Current	39	ma
Zero-Signal Grid-No.2 Current	2.5	ma
Max.-Signal Grid-No.2 Current	7	ma
Plate Resistance (Approx.)	0.1	megohm
Transconductance	6500	μ hos
Load Resistance	5000	ohms
Total Harmonic Distortion	10	percent
Max.-Signal Power Output	4.2	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	0.5 max.	megohm



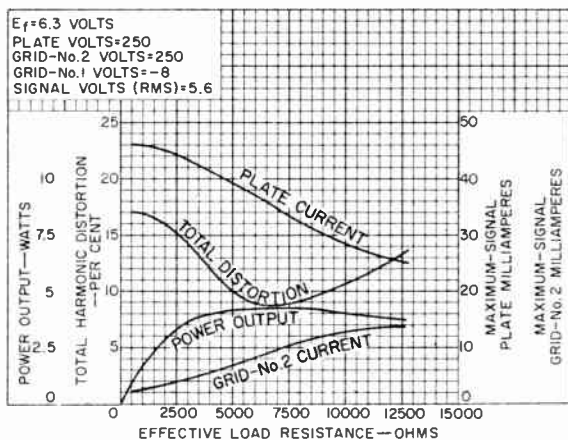
AVERAGE CHARACTERISTICS Beam Power Unit



92CM-12669

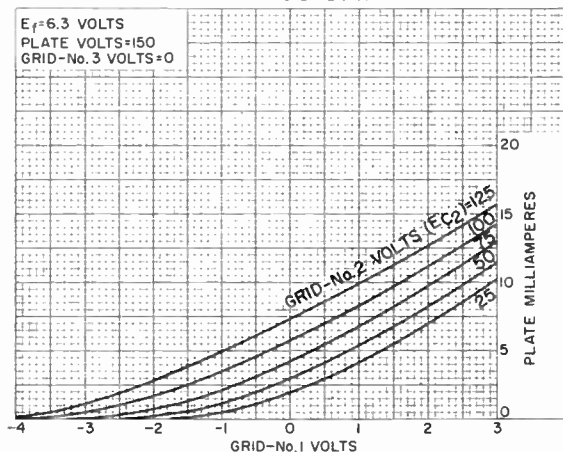


OPERATION CHARACTERISTICS Beam Power Unit



92CS-12663

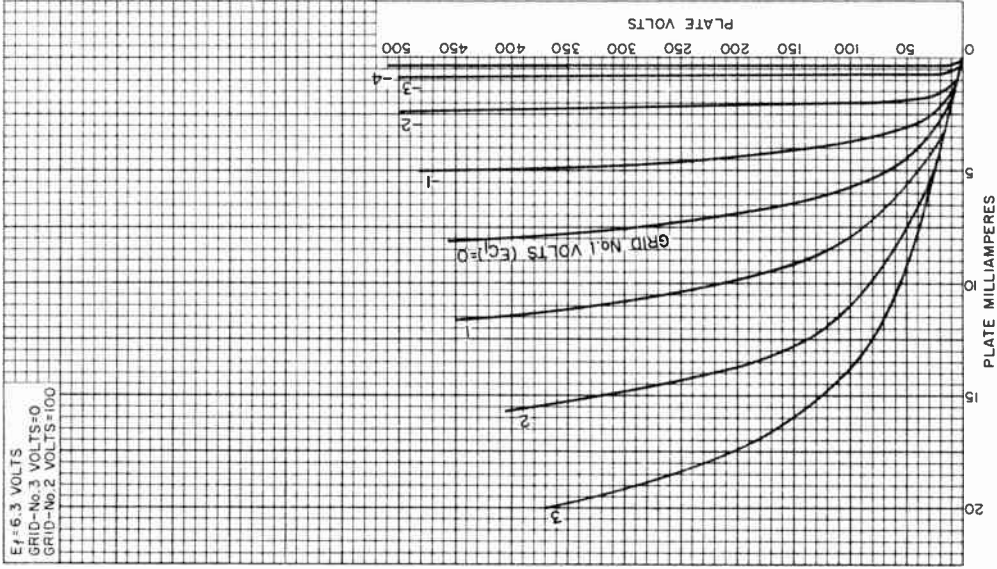
AVERAGE CHARACTERISTICS Pentode Unit



92CS-12670

6AL11

AVERAGE PLATE CHARACTERISTICS Pentode Unit



92CM-12671

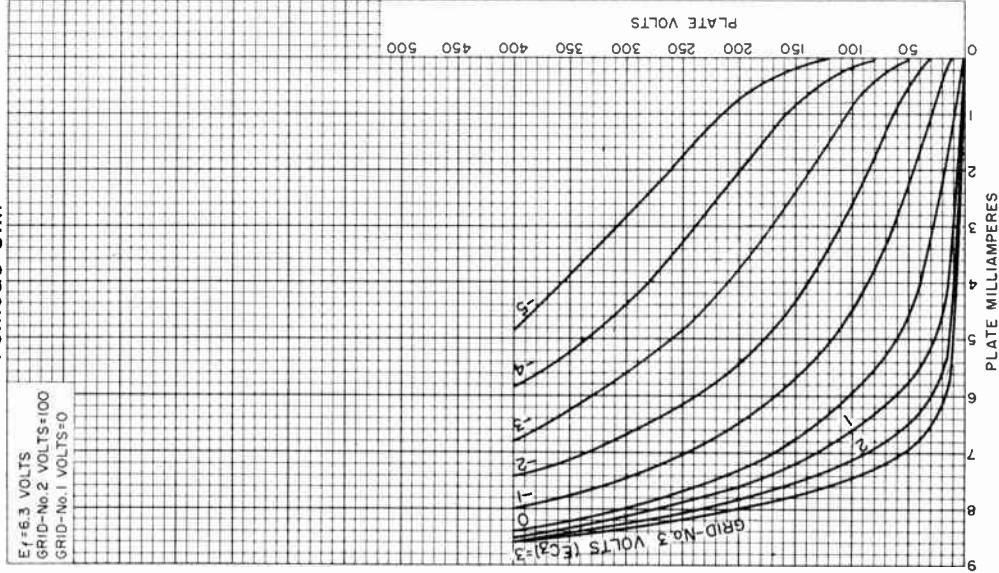


RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 3
6-64

6AL11

AVERAGE PLATE CHARACTERISTICS Pentode Unit



92CM-12672

RADIO CORPORATION OF AMERICA
Electronic Components and Devices

Harrison, N. J.





6AM8-A

6AM8-A DIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:⁰

Diode Unit:

Plate to cathode and heater	1.8	μf
Cathode to plate and heater	3	μf

Pentode Unit:

Grid No.1 to plate	0.015 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.6	μf
Pentode grid No.1 to diode plate	0.006 max.	μf
Pentode plate to diode cathode	0.15 max.	μf
Pentode plate to diode plate	1 max.	μf

Characteristics, Class A₁ Amplifier (Pentode Unit):

Plate Supply Voltage	125	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.3	megohm
Transconductance	7800	μmhos
Plate Current	12.5	ma
Grid-No.2 Current	3.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-6	volts
Grid-No.1 Voltage (Approx.) for plate ma = 2, and cathode resistor (ohms) = 0	-3	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"

← Indicates a change.

6AM8-A



6AM8-A

DIODE-SHARP-CUTOFF PENTODE

Maximum Seated Length. 1-15/16"
 Length, Base Seat to Bulb Top (Excluding tip) 1-9/16" \pm 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 9CY

Pin 1 - Pentode Cathode		Pin 6 - Pentode Plate
Pin 2 - Pentode Grid No.1		Pin 7 - Diode Cathode
Pin 3 - Pentode Grid No.2		Pin 8 - Diode Plate
Pin 4 - Heater		Pin 9 - Pentode Grid No.3, Internal Shield
Pin 5 - Heater		

PENTODE UNIT — Class A₁ Amplifier

→ 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:			
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.	3.2	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-No.1-Circuit Resistance:			
For fixed-bias operation	0.25	max.	megohm
For cathode-bias operation	1	max.	megohm

DIODE UNIT

Maximum Ratings, Design-Maximum Values:

DC PLATE CURRENT	5	max.	ma
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→ indicates a change.



6AM8-A

6AM8-A

DIODE-SHARP-CUTOFF PENTODE

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts
Heater positive with respect to cathode. 200[▲] max. volts

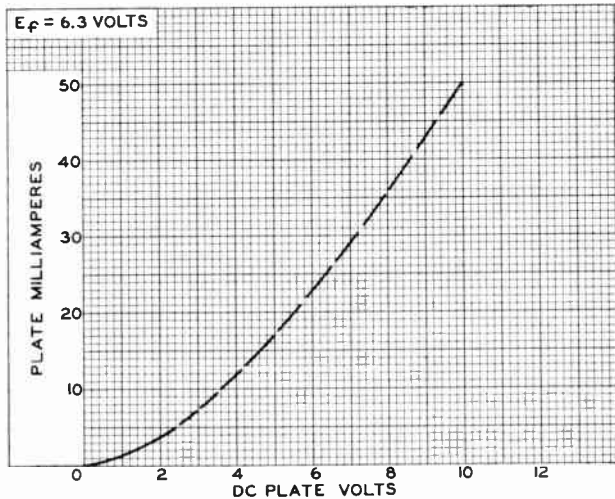
[○] without external shield.

[▲] The dc component must not exceed 100 volts.

10-59

DATA 2

AVERAGE PLATE CHARACTERISTIC DIODE UNIT



6AM8-A



6AM8-A AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
GRID No3 CONNECTED TO
CATHODE AT SOCKET.
GRID-No2 VOLTS = 150

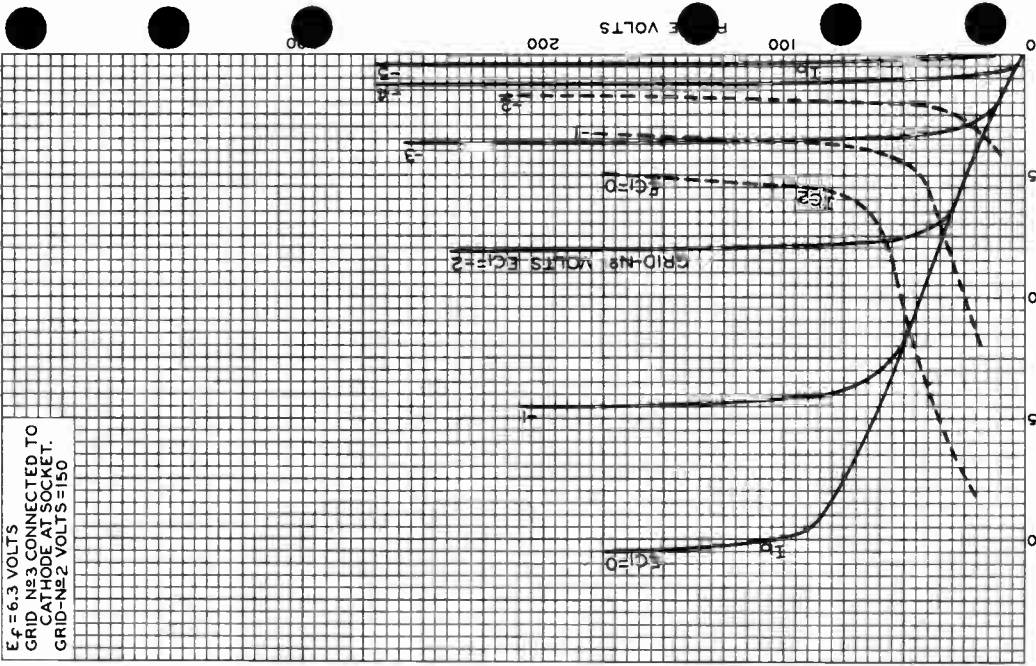


PLATE (I_b) OR GRID-No2 (I_{c2}) MILLIAMPERES
ELECTRON TUBE DIVISION
92CM-8505R1

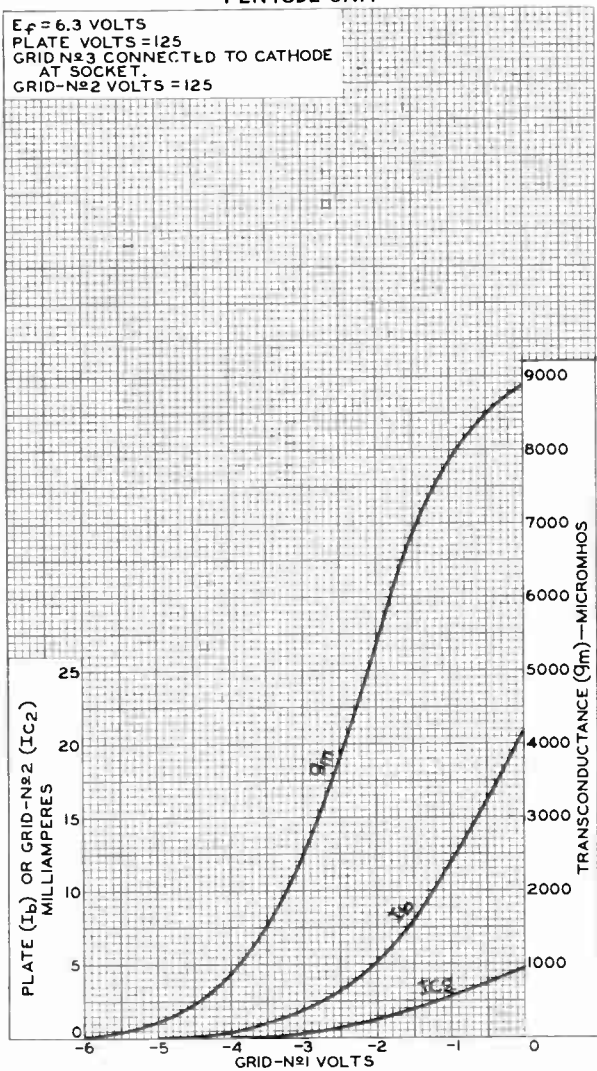
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6AM8-A

6AM8-A AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
PLATE VOLTS = 125
GRID-N^o3 CONNECTED TO CATHODE
AT SOCKET.
GRID-N^o2 VOLTS = 125







6AN4

6AN4

HIGH-MU TRIODE

7-PIN MINIATURE TYPE

For UHF TV service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	. . . . .	ac or ac volts
Current	0.225	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield ^o	
Grid to plate	1.7	1.7	μmf
Grid to cathode and heater.	2.9	3.3	μmf
Plate to cathode and heater	0.25	1.8	μmf
Heater to cathode	3	2.9	μmf
Grid to cathode	2.6	2.6	μmf
Plate to cathode.	0.2	0.18	μmf
Cathode to grid and heater.	5.5	5.1	μmf
Plate to grid and heater.	1.8	3.4	μmf

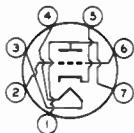
Characteristics, Class A₁ Amplifier:

Plate-Supply Voltage.	200	volts
Cathode Resistor.	100	ohms
Amplification Factor.	70	
Transconductance.	10000	μmhos
Plate Current	13	ma
Grid Voltage (Approx.) for plate current of 20 μa	-7	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length.	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bolt Top (Excluding tip)	1-1/8" \pm 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.	7DK

- Pin 1 - Plate
- Pin 2 - Grid
- Pin 3 - Heater
- Pin 4 - Heater



- Pin 5 - Cathode
- Pin 6 - Grid
- Pin 7 - Plate

^o with external shield JETEC No. 316 connected to cathode except as noted.
 • with external shield JETEC No. 316 connected to ground.
 ♦ with external shield JETEC No. 316 connected to grid.

6AN4



6AN4

HIGH-MU TRIODE

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300	max.	volts
CATHODE CURRENT	30	max.	ma
PLATE DISSIPATION	4	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.	0.1	max.	megohm
For cathode-bias operation.	0.5	max.	megohm

[▲] The dc component must not exceed 100 volts.

6AN8-A

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm up time (Average)	11	sec

Direct Interelectrode Capacitances:▲

Triode Unit:

Grid to plate	1.5	μμf
Grid to cathode and heater	2	μμf
Plate to cathode and heater	0.26	μμf

Pentode Unit:

Grid No.1 to plate	0.04 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.4	μμf
Triode grid to pentode plate	0.02 max.	μμf
Pentode grid No.1 to triode plate	0.02 max.	μμf
Pentode plate to triode plate	0.15 max.	μμf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate Supply Voltage	150	125	volts
Grid-No.2 Supply Voltage	-	125	volts
Grid-No.1 Supply Voltage	-3	0	volts
Cathode Resistor	0	56	ohms
Amplification Factor	21	-	
Plate Resistance (Approx.)	4700	17000	ohms
Transconductance	4500	7800	μmhos
Plate Current	15	12	ma
Grid-No.2 Current	-	3.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-17	-6	volts
Grid-No.1 Voltage (Approx.) for plate ma. = 1.6, and cathode resistor (ohms) = 0	-	-3	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"



6AN8-A

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. 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 A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	-	330 max.	volts
GRID-No.2 VOLTAGE	-	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
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	-	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION	2.8 max.	2.3 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

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

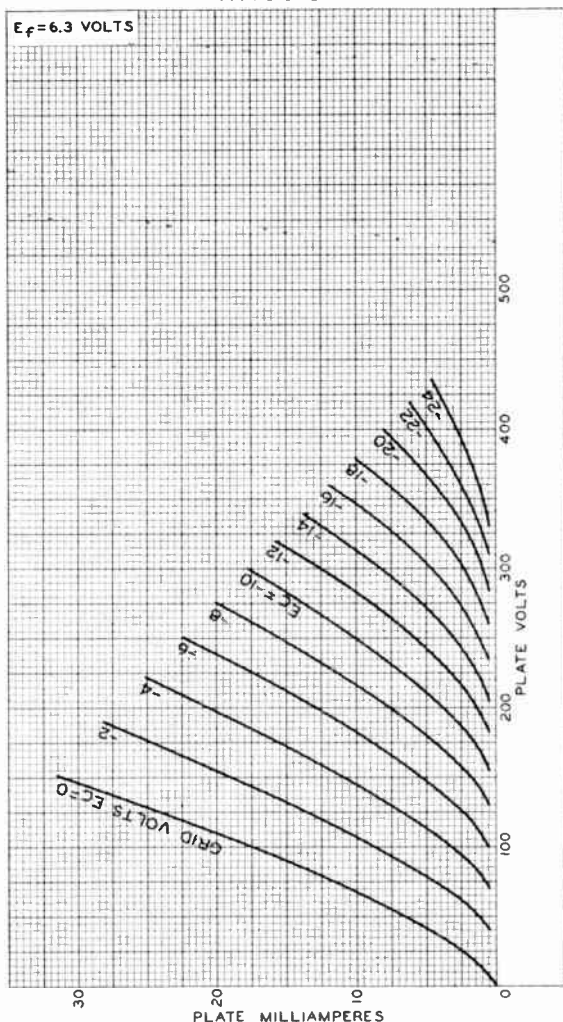
* Without external shield.

• The dc component must not exceed 100 volts.

* If either unit is operated at maximum-rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.



AVERAGE PLATE CHARACTERISTICS Triode Unit

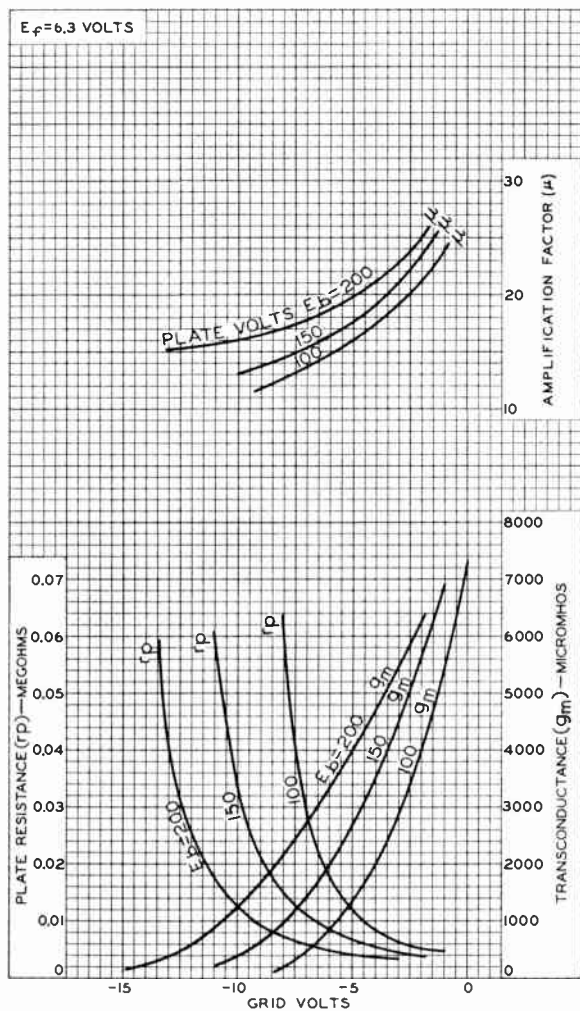


92CM-8209



6AN8-A

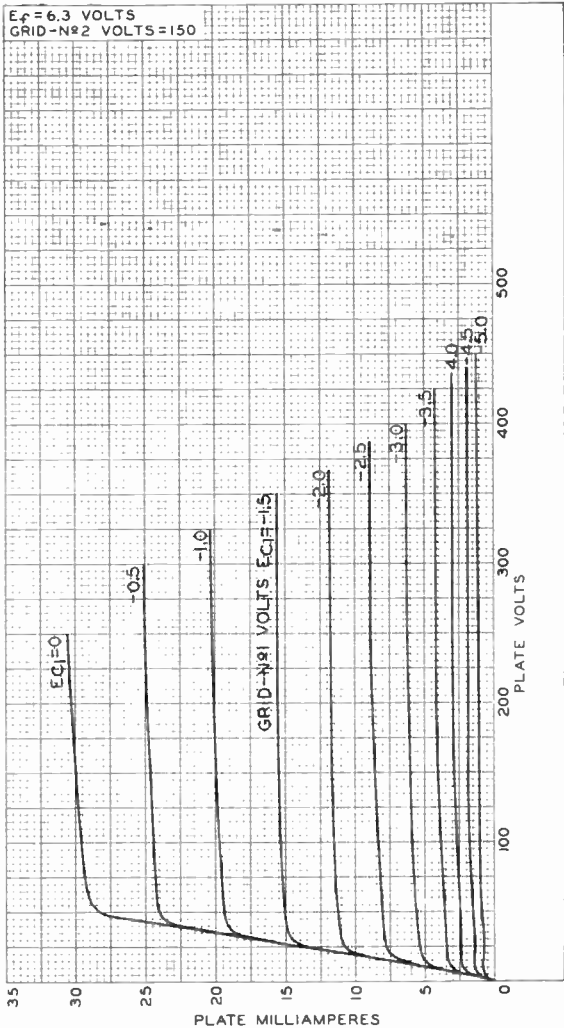
AVERAGE CHARACTERISTICS Triode Unit



92CM-8207RI



AVERAGE PLATE CHARACTERISTICS Pentode Unit

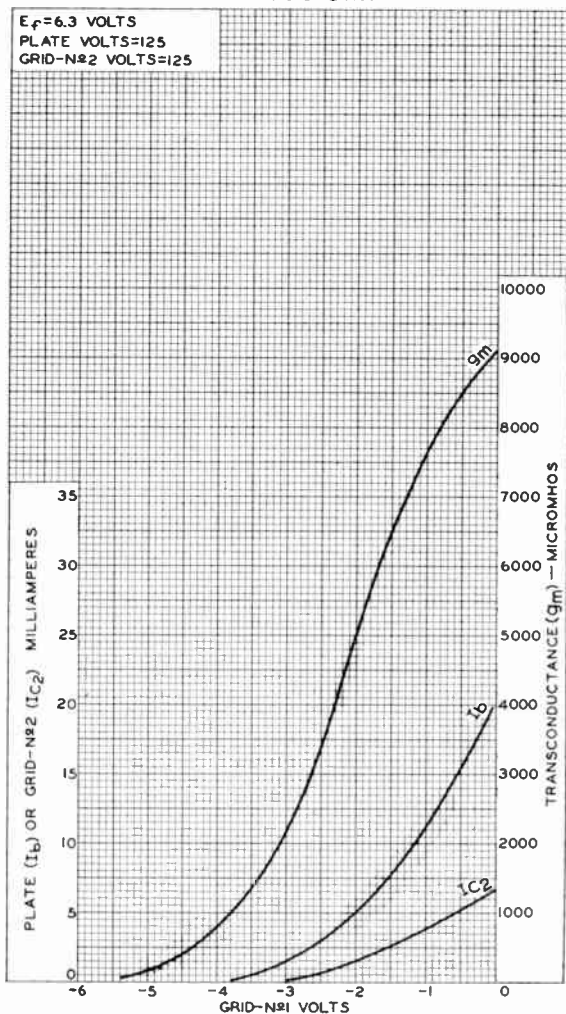


92CM - 8206



6AN8-A

AVERAGE CHARACTERISTICS Pentode Unit



92CM-8208R1



6AQ5-A

6AQ5-A

BEAM POWER TUBE

7-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	. . . . .	ac or dc volts
Current	0.45	. . . . .	amp
Warm-up time (Average).	11	. . . . .	sec

For definition of heater warm-up time and method of determining it see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

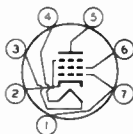
Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate.	0.4	μ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater.	8	μ f
Plate to cathode & grid No.3, grid No.2, and heater.	8.5	μ f

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" \pm 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)
Base 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 A₁

Maximum Ratings, Design-Center 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.	200	max.	volts
Heater positive with respect to cathode.	200 [▲]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).	250	max.	°C

^o, [▲]: See next page.

← Indicates a change.



6AQ5-A

BEAM POWER TUBE

Typical Operation and Characteristics:

Plate Voltage	180	250	volts
Grid-No.2 Voltage	180	250	volts
Grid-No.1 (Control-Grid) Voltage. . .	-8.5	-12.5	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	volts
Zero-Signal Plate Current	29	45	ma
Max.-Signal Plate Current	30	47	ma
Zero-Signal Grid-No.2 Current	3	4.5	ma
Max.-Signal Grid-No.2 Current	4	7	ma
Plate Resistance (Approx.).	58000	52000	ohms
Transconductance.	3700	4100	μmhos
Load Resistance	5500	5000	ohms
Total Harmonic Distortion	8	8	%
Max.-Signal Power Output.	2	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 AB₁

Maximum Ratings, Design-Center 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.	200 max.	volts
Heater positive with respect to cathode.	200 [▲] max.	volts
BULB TEMPERATURE (At hottest point		
on bulb surface).	250 max.	°C

Typical Push-Pull Operation:

Unless otherwise specified, values are for 2 tubes

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

○, ▲, ●: See next page.



6AQ5-A

6AQ5-A

BEAM POWER TUBE

Maximum Circuit Values:

Grid-No.1-Circuit Resistance: [*]		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

VERTICAL-DEFLECTION AMPLIFIER

Triode Connection[†]

Maximum Ratings, Design-Center Values Except as Noted:

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

DC PLATE VOLTAGE	250 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#]		
(Absolute maximum)	1100 [■] max.	volts
PEAK NEGATIVE-PULSE GRID-No.1		
(CONTROL-GRID) VOLTAGE	250 max.	volts
PEAK CATHODE CURRENT	105 max.	ma
DC CATHODE CURRENT	35 max.	ma
PLATE DISSIPATION	9 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:

Plate Voltage	250	volts
Grid-No.1 Voltage	-12.5	volts
Amplification Factor	9.5	
Plate Resistance (Approx.)	1970	ohms
Transconductance	4800	μmhos
Plate Current	49.5	ma
Grid-No.1 Voltage (Approx.) for		
plate ma. = 0.5.	-37	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:	
For cathode-bias operation	2.2 max. megohms

[○] Without external shield.

[▲] The dc component must not exceed 100 volts.

[●] The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

[†] Grid-No.2 (Screen-grid) connected to plate.

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

[#] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

[■] Under no circumstances should this absolute value be exceeded.

← Indicates a change.

6AQ5-A



6AQ5-A

BEAM POWER TUBE

CURVES

For the 6AQ5-A, within its ratings, are the same
as those shown for Type 6V6

Semiremote-Cutoff Twin Pentode

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC) 6.3 ± 0.6 volts

Current at heater volts = 6.3 0.800 amp

Peak heater-cathode voltage

(Each unit):

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200^a max. voltsDirect Interelectrode Capacitances:^b

Unit No. 1:

Grid No.1 to plate 0.026 pf

Grid No.1 to cathode, grid No.2, grid No.3 & internal shield, and heater 10 pf

Plate to cathode, grid No.2, grid No.3 & internal shield, and heater 2.8 pf

Unit No. 2:

Grid No.1 to plate 0.026 pf

Grid No.1 to cathode, grid No.2, grid No.3, grid No.3 of unit No.1 & internal shield, and heater 10 pf

Plate to cathode, grid No.2, grid No.3, grid No.3 of unit No.1 & internal shield, and heater 3.0 pf

Plate of unit No.1 to plate of unit No.2 0.02 max. pf

Grid No.1 of unit No.1 to plate of unit No.2 0.002 max. pf

Grid No.1 of unit No.2 to plate of unit No.1 0.002 max. pf

Characteristics, Class A₁ Amplifier (Each Unit):

Plate Supply Voltage 125 volts

Grid No.3 Connected to cathode at socket

Grid-No.2 Supply Voltage 125 volts

Cathode Resistor 56 ohms

Plate Resistance (Approx.) 0.2 megohm

Transconductance 10500 μ mhos

Plate Current 11 ma

Grid-No.2 Current 3.5 ma

Grid-No.1 Voltage (Approx.) for transconductance (μ mhos) = 50 -15 volts

Mechanical:

Operating Position Any

Type of Cathodes Coated Unipotential

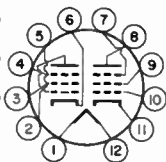
Maximum Overall Length 1.875"



6AR11

Seated Length 1.250" to 1.500"
 Diameter. 1.062" to 1.188"
 Bulb. T9
 Base. Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
 Basing Designation for BOTTOM VIEW. 12DM

- | | |
|---|---------------------------------|
| Pin 1 - Heater | Pin 8 - Plate of Unit No.1 |
| Pin 2 - Plate of Unit No.2 | Pin 9 - Grid No.2 of Unit No.1 |
| Pin 3 - Grid No.2 of Unit No.2 | Pin 10 - Grid No.1 of Unit No.1 |
| Pin 4 - Grid No.3 of Unit No.2 | Pin 11 - Cathode of Unit No.1 |
| Pin 5 - Grid No.1 of Unit No.2 | Pin 12 - Heater |
| Pin 6 - Cathode of Unit No.2 | |
| Pin 7 - Grid No.3 of Unit No.1, Internal Shield | |



AMPLIFIER — Class A₁

Values are for Each Unit

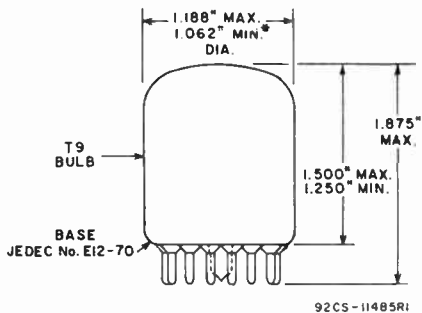
Maximum Ratings, Design-Maximum Values:

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 0.65 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 3.1 max. watts

^a The dc component must not exceed 100 volts.

^b with external shield JEDEC No.309 connected to cathode of unit under test.





* APPLIES TO MINIMUM DIAMETER EXCEPT IN AREA OF SEAL.







6AS7-G

6AS7-G

LOW-MU TWIN POWER TRIODE

GENERAL DATA

Electrical:

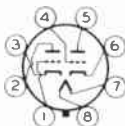
Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	2.5	amp.

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
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

Characteristics:

Plate-Supply Voltage	135	volts
Cathode-Bias Resistor [□]	250	ohms
Amplification Factor	2.0	
Plate Resistance	280	ohms
Transconductance	7000	μmhos
Plate Current	125	ma.

Maximum Circuit Values (for maximum rated conditions):

Grid-Circuit Resistance:

For cathode-bias operation [□]	1.0	megohm
---	-----	--------

□ Operation with fixed bias is not recommended.

← Indicates a change.

6AS7-G



6AS7-G

LOW-MU TWIN POWER TRIODE

BOOSTER SCANNING SERVICE

Values are for each unit

Maximum Ratings, Design-Center Values:

For operation in a 525-line, 30-frame system^o

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 . . megohm

^o 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% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 microseconds.

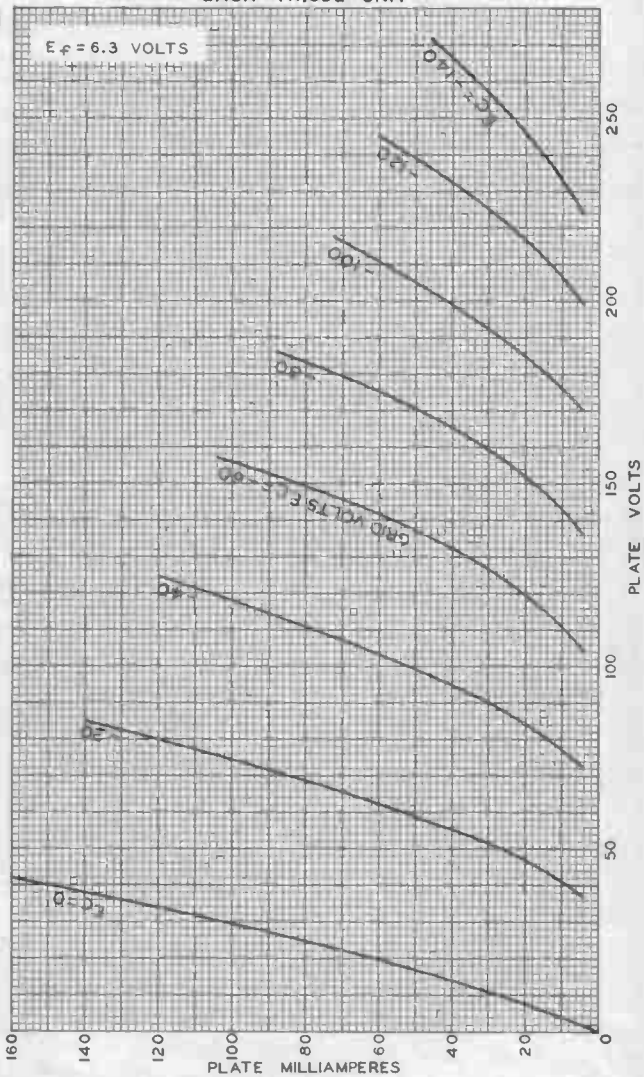
[□] Fixed bias operation not recommended.



6AS7-G

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT

6AS7-G



NOV. 6, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6618





6AS8

6AS8

DIODE-SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage 6.3 ac or dc volts

Current 0.45 amp

Direct Interelectrode Capacitances (Approx.):*

Diode Unit:

Plate to heater and cathode and internal shield 3.0 μf

Pentode Unit:

Grid No.1 to plate 0.04 max. μf

Input 7 μf

Output 2.2 μf

Pentode grid to diode plate 0.005 max. μf

Pentode plate to diode cathode 0.15 max. μf

Pentode plate to diode plate 0.10 max. μf

Characteristics, Class A₁:

Plate-Supply Voltage 200 volts

Grid No.3 Connected to cathode at socket

Grid-No.2 Supply Voltage 150 volts

Cathode-Bias Resistor 180 ohms

Plate Resistance (Approx.) 300000 ohms

Transconductance 6200 μhos

Grid-No.1 Bias (Approx.) for Plate

Current of 10 μamp -8 volts

Plate Current 9.5 ma

Grid-No.2 Current 3 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" \pm 3/32"

Maximum Diameter 7/8"

Bulb T-6-1/2

Base Small-Button Noval 9-Pin (JETEC No.E9-1)

Basing Designation for BOTTOM VIEW 9DS

Pin 1 - Pentode

Grid No.2

Pin 2 - Pentode

Grid No.1

Pin 3 - Pentode

Cathode

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Diode

Plate

Pin 7 - Pentode

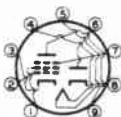
Grid No.3,
Int.Shield

Pin 8 - Diode

Cathode

Pin 9 - Pentode

Plate



* with no external shield.

6AS8



6AS8

DIODE-SHARP-CUTOFF PENTODE

PENTODE UNIT - Class A₁ Amplifier

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max. volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0 max. volts
GRID-No.2 SUPPLY VOLTAGE	300 max. volts
GRID-No.2 (SCREEN) VOLTAGE	See Rating Curve at front of this Section

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Positive bias value	0 max. volts
PLATE DISSIPATION	2.5 max. watts
GRID-No.2 INPUT	0.5 max. watt

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 (For maximum rated conditions):

Grid-No.1-Circuit Resistance:

For cathode-bias operation	1.0 max. megohm
For fixed-bias operation	0.25 max. megohm

DIODE UNIT

Maximum Ratings, Design-Center Values:

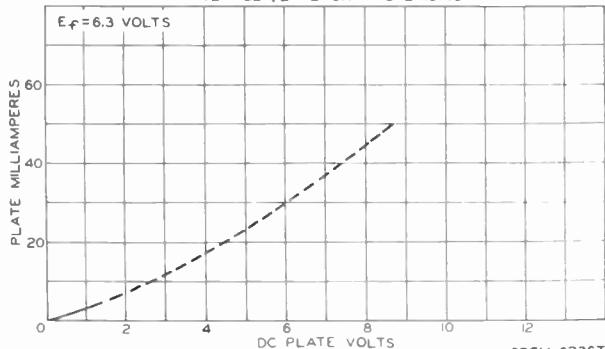
PEAK INVERSE PLATE VOLTAGE	330 max. volts
PEAK PLATE CURRENT	50 max. ma
DC PLATE CURRENT	5 max. ma

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max. volts
Heater positive with respect to cathode	200 [•] max. volts

[•] The dc component must not exceed 100 volts.

AVERAGE PLATE CHARACTERISTIC



92CM-8236T

MAY 3, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

WorldRadioHistory

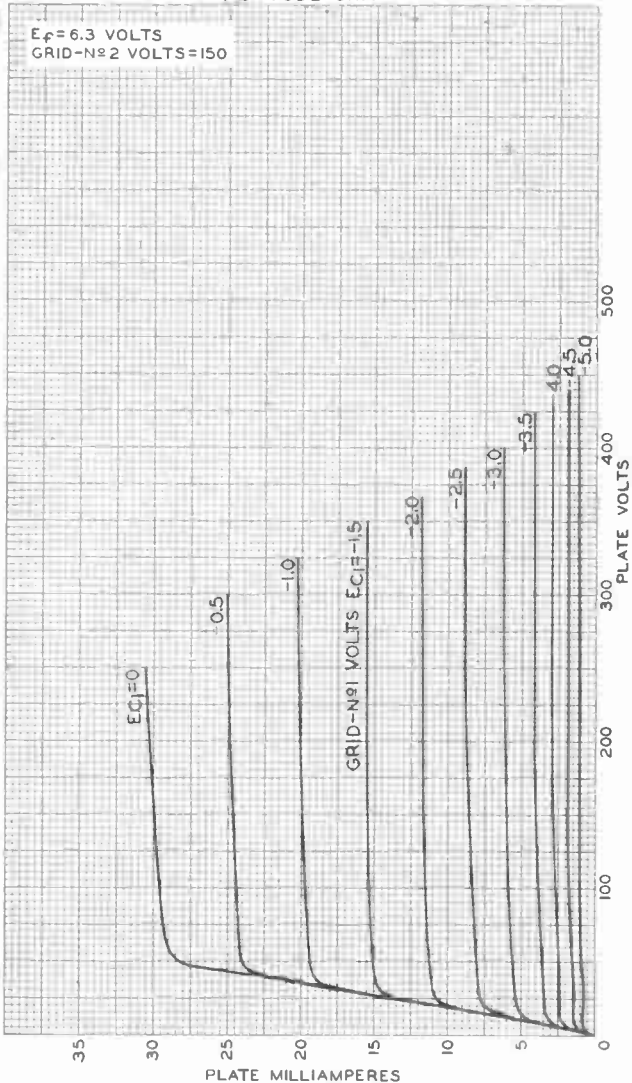


6AS8

6AS8

AVERAGE PLATE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
GRID-N \circ 2 VOLTS = 150



DEC. 23, 1953

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8206

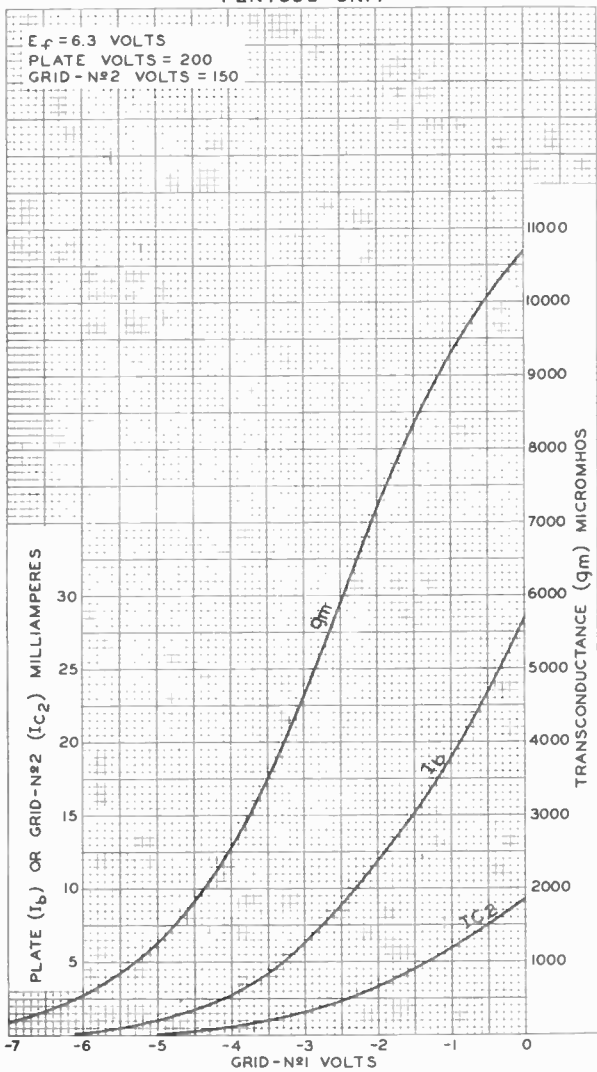
World Radio History

6AS8



6AS8

AVERAGE CHARACTERISTICS PENTODE UNIT



DEC. 23, 1953

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8208

World Radio History

Dual Triode—Sharp-Cutoff Pentode

Dual Triode Has High-Mu Unit & Medium-Mu Unit

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.050	amp

Peak heater-cathode voltage

(Each unit):

Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 ^a max.	volts

Direct Interelectrode Capacitances:^b*Triode Unit No. 1:*

Grid to plate	1.9	pf
Grid to cathode, cathode of triode unit No.2 & internal shield, pentode cathode & pentode grid No.3 & internal shield, and heater.	3.0	pf
Plate to cathode, cathode of triode unit No.2 & internal shield, pentode cathode & pentode grid No.3 & internal shield, and heater.	2.2	pf

Triode Unit No. 2:

Grid to plate	3.6	pf
Grid to cathode & internal shield, pentode cathode & pentode grid No.3 & internal shield, and heater.	2.4	pf
Plate to cathode & internal shield, pentode cathode & pentode grid No.3 & internal shield, and heater.	3.8	pf

Pentode Unit:

Grid No.1 to plate.	0.11	pf
Grid No.1 to cathode of triode unit No.2 & internal shield, cathode & grid No.3 & internal shield, grid No.2, and heater	9.5	pf
Plate to cathode of triode unit No.2 & internal shield, cathode & grid No.3 & internal shield, grid No.2, and heater	4.4	pf
Pentode plate to plate of triode unit No.2	0.044 max.	pf
Plate of triode unit No.1 to plate of triode unit No.2	0.06 max.	pf



6AS11

Characteristics, Class A₁ Amplifier:

Triode Units

	Unit No.1	Unit No.2	
Plate Supply Voltage.	200	200	volts
Grid Voltage.	-2	-	volts
Cathode Resistor.	-	220	ohms
Amplification Factor.	68	41	
Plate Resistance (Approx.).	12400	9400	ohms
Transconductance.	5500	4400	μ mhos
Plate Current	7	9.2	ma
Grid Voltage (Approx.) for plate μ a = 10	-5.5	-	volts
Grid Voltage (Approx.) for plate μ a = 100.	-	-6.5	volts

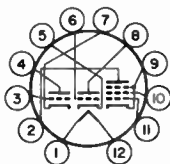
Pentode Unit

Plate Supply Voltage.	200	volts
Grid-No.2 Supply Voltage.	125	volts
Cathode Resistor.	68	ohms
Plate Resistance (Approx.)	70000	ohms
Transconductance.	10500	μ mhos
Plate Current	24	ma
Grid-No.2 Current	5.2	ma
Grid-No.1 Voltage (Approx.) for plate μ a = 100.	-8	volts

Mechanical:

Operating Position.	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length.	2.375"
Seated Length	1.750" to 2.000"
Diameter.	1.062" to 1.188"
Bulb.	T9
Base.	Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
Basing Designation for BOTTOM VIEW.	12DP

- Pin 1 - Heater
- Pin 2 - Pentode Plate
- Pin 3 - Grid of
Triode
Unit No.2
- Pin 4 - Plate of
Triode
Unit No.2
- Pin 5 - Cathode
of Triode
Unit No.1
- Pin 6 - Grid of
Triode
Unit No.1
- Pin 7 - Cathode
of Triode
Unit No.2,
Internal
Shield



- Pin 8 - Plate of
Triode
Unit No.1
- Pin 9 - Pentode
Cathode,
Pentode
Grid No.3,
Internal
Shield
- Pin 10 - Pentode
Grid No.2
- Pin 11 - Pentode
Grid No.1
- Pin 12 - Heater



AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

Triode Units

	Unit No. 1	Unit No. 2	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1.5 max.	2 max.	watts

Pentode Unit

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:			
Positive-bias value	0 max.		volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 165 volts	1.1 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		
PLATE DISSIPATION	5 max.		watts

Maximum Circuit Values:

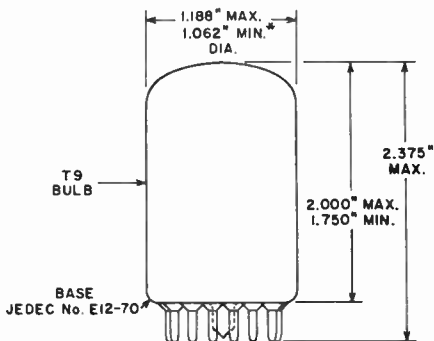
Values are for Each Unit

	Triode Units	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

- ^a The dc component must not exceed 100 volts.
^b without external shield.



6AS11



92CS-11838

* APPLIES TO MINIMUM DIAMETER EXCEPT IN AREA OF SEAL.



6AT6

6AT6 TWIN DIODE—HIGH-MU TRIODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts
Current 0.3 amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
Grid to triode plate.	2.0	2.0	μf
Grid to cathode and heater. . .	2.2	2.2	μf
Plate to cathode and heater . .	0.8	1.2	μf
Plate of diode unit No.2 to triode grid.	0.04 max.		μf

Characteristics, Class A₁ Amplifier (Triode Unit):

Plate Voltage	100	250	volts
Grid Voltage.	-1	-3	volts
Amplification Factor.	70	70	
Plate Resistance (Approx.). . . .	54000	58000	ohms
Transconductance.	1300	1200	μhos
Plate Current	0.8	1	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" \pm 3/32"
Maximum Diameter.	3/4"
Dimensional Outline	See General Section
Bulb.	T-5-1/2
Base.	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
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—AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	300 max.	volts
GRID VOLTAGE:		
Positive bias value.	0 max.	volts
PLATE DISSIPATION.	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

^o with external shield JEDEC No. 316 connected to cathode.

← Indicates a change.

SEPT. 1, 1955

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AT6



6AT6

TWIN DIODE—HIGH-MU TRIODE

→ Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED AMPLIFIER CHART No. 7*
at front of this Section

→ **DIODE UNITS**

Maximum Ratings, Design-Center Values:

PLATE CURRENT (For each diode). 1.0 max. ma

Diode Considerations:

Consideration of these units, including typical circuits and diode curves, is given at the front of this Section. Diode biasing of the triode unit of the 6AT6 is not suitable.

→ Indicates a change.

SEPT. 1, 1955

DATA

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

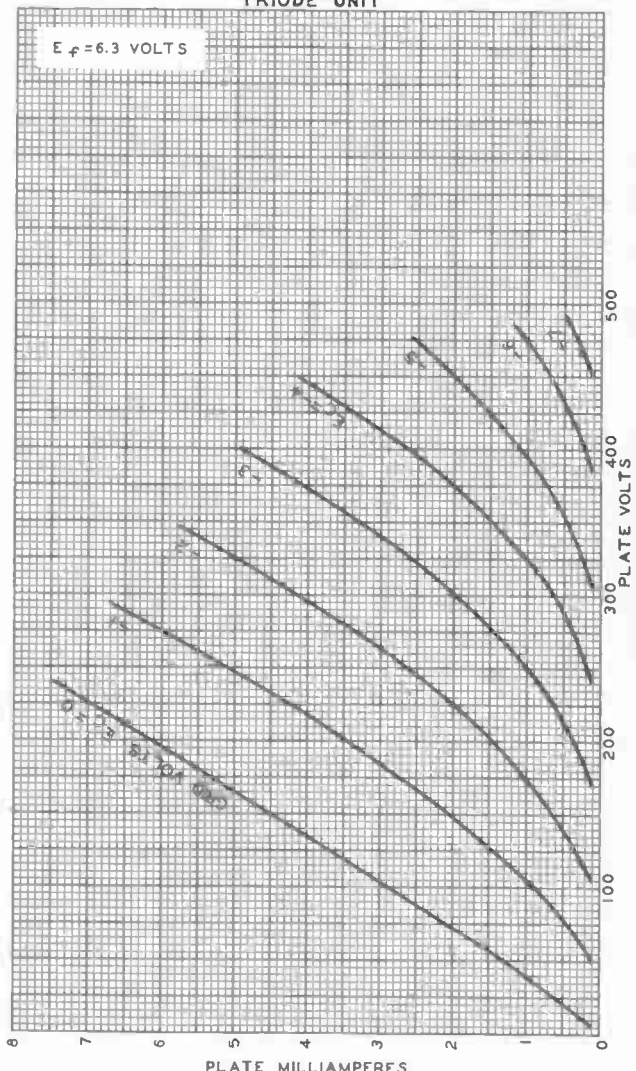


6AT6

AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

6AT6

$E_f = 6.3$ VOLTS



OCT. 19, 1945

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

92CM-6610

World Radio History



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 6AT8-A is the same as the 6X8 except for the following items:

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts	←
Current	0.45 ± 6%	amp	
Warm-up time (Average)	11	sec	

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield [▲]	
<i>Triode Unit:</i>			
Grid to plate	1.5	1.5	μf
Grid to cathode and heater.	2	2.4	μf
Plate to cathode and heater.	0.5	1	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate.	0.06 max.	0.03 max.	μf
Grid No.1 to cathode, grid No.3, grid No.2, and heater.	4.6	4.8	μf
Plate to cathode, grid No.3, grid No.2, and heater.	0.9	1.6	μf
Pentode grid No.1 to triode plate.	0.05 max.	0.04 max.	μf
Pentode plate to triode plate	0.05 max.	0.008 max.	μf
Heater to cathode	6	6 [•]	μf

Mechanical:

Basing Designation for BOTTOM VIEW. 9DW

- Pin 1—Triode Grid
- Pin 2—Triode Plate
- Pin 3—Cathode
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Pentode Plate



- Pin 7—Pentode
Grid No.2
- Pin 8—Pentode
Grid No.3
- Pin 9—Pentode
Grid No.1

▲ with external shield JEDEC No.315 connected to cathode except as noted.
• with external shield JEDEC No.315 connected to pentode plate.

← Indicates a change.







6AU4-GT

6AU4-GT

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 1.8 amp

Direct Interelectrode Capacitances (Approx.):^o

Plate to Heater and Cathode 8.5 $\mu\mu\text{f}$

Cathode to Heater and Plate 11.5 $\mu\mu\text{f}$

Heater to Cathode 4.0 $\mu\mu\text{f}$

Mechanical:

Mounting Position Any

Maximum Overall Length 3-13/16"

Maximum Seated Length 3-1/4"

Maximum Diameter 1-9/32"

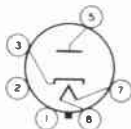
Bulb T-9

Base Short Intermediate-Shell Octal 5-
or 6-Pin with External Barriers
(JETEC Nos. 85-85 or 86-60)

Basing Designation for BOTTOM VIEW 4CG

Pin 1: No Connection-
Do Not Use;
or Omitted

Pin 2: No Connection-
Do Not Use



Pin 3: Cathode

Pin 5: Plate

Pin 7: Heater

Pin 8: Heater

DAMPER SERVICE

Maximum Ratings, Design-Center Values Except as Noted:

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

PEAK INVERSE PLATE VOLTAGE
(Absolute Maximum)[#] 4500[●] max. volts

PEAK PLATE CURRENT 1050 max. ma

DC PLATE CURRENT 175 max. ma

PLATE DISSIPATION 6.0 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to
cathode (Absolute Maximum) 4500[●] max. volts

Heater positive with respect to
cathode 300[†] max. volts

^o with no external shield.

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

[#] This rating is applicable where the duty cycle of the voltage pulse does 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.

[●] Under no circumstances should this absolute value be exceeded.

^{*} The dc component must not exceed 900 volts.

[†] The dc component must not exceed 100 volts.

MARCH 11, 1954

TUBE DEPARTMENT

TENTATIVE DATA

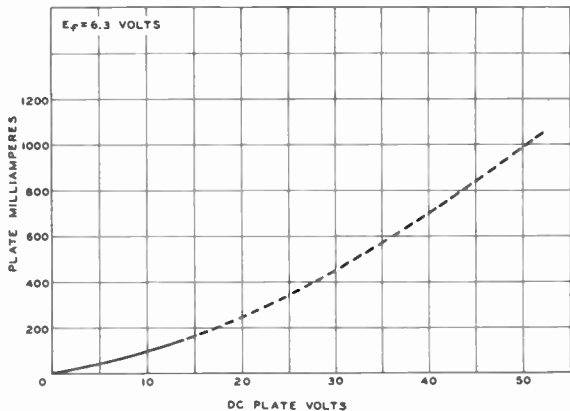
WORD RADIO HISTORY
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU4-GT



6AU4-GT HALF-WAVE VACUUM RECTIFIER

AVERAGE PLATE CHARACTERISTIC



92CM-8066T



6AU4-GTA

6AU4-GTA

HALF-WAVE VACUUM RECTIFIER

For television damper service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.8	amp

Direct Interelectrode Capacitances (Approx.):^o

Plate to cathode and heater	8.5	μf
Cathode to heater and plate	11.5	μf
Heater to cathode	4	μf

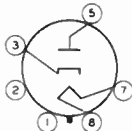
Mechanical:

Operating Position	Any
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
Bulb	T9
Base	Short Intermediate-Shell Octal 5-Pin with External Barriers, Arrangement 2 (JEDEC Group 1, No. B5-85), or Short Intermediate-Shell Octal 6-Pin with External Barriers, Arrangement 1 (JEDEC Group 1, No. B6-60)

Basing Designation for BOTTOM VIEW 4CG

Pin 1 ♦ - Same as Pin 2

Pin 2 - Internal Connection - Do Not Use



Pin 3 - Cathode
Pin 5 - Plate
Pin 7 - Heater
Pin 8 - Heater

DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^o

PEAK INVERSE PLATE VOLTAGE	4500 max.	volts
PEAK PLATE CURRENT	1300 max.	ma
DC PLATE CURRENT	210 max.	ma
PLATE DISSIPATION	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	4500 [▲] max.	volts
Heater positive with respect to cathode	300 [#] max.	volts

^o Without external shield.

♦ On the 5-pin base, pin 1 as well as pins 4 and 6 is omitted.

• Socket terminals 1, 2, 4, and 6 should not be used as tie points.

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

[▲] The dc component must not exceed 900 volts.

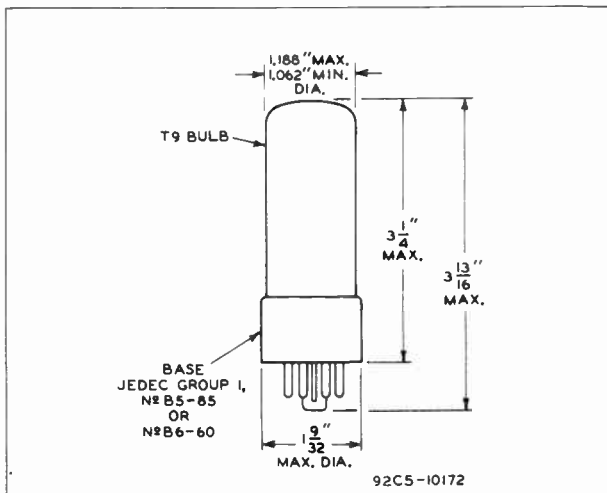
[#] The dc component must not exceed 100 volts.

← Indicates a change.

6AU4-GTA



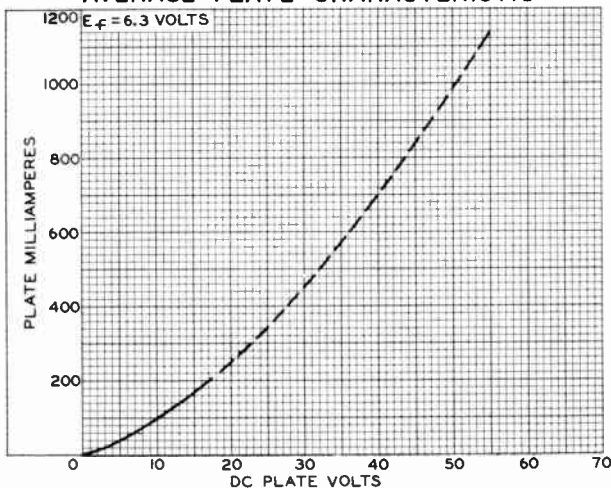
6AU4-GTA HALF-WAVE VACUUM RECTIFIER



8-59

CE-10172

AVERAGE PLATE CHARACTERISTIC



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CS-8651R1



6AU5-GT

6AU5-GT

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 1.25 amp

Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate 0.5 μmf

Grid No.1 to cathode & grid No.3,
grid No.2, and heater 11.3 μmf

Plate to cathode & grid No.3,
grid No.2, and heater / μmf

Transconductance[#] 5600 μmhos ←

Mu-Factor, Grid No.2 to Grid No.1[■] 5.9

Mechanical:

Mounting Position Any

Maximum Overall Length 3-5/16"

Maximum Seated Length 2-3/4"

Maximum Diameter 1-9/32"

Bulb T-9 ←

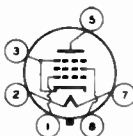
Base Intermediate-Shell Octal 6-Pin (JETEC No. B6-8) ←
or Short Intermediate-Shell Octal 6-Pin (JETEC No. B6-60)

Basing Designation for BOTTOM VIEW 6CK

Pin 1-Grid No.1

Pin 2-Heater

Pin 3-Cathode,
Grid No.3



Pin 5-Plate

Pin 7-Heater

Pin 8-Grid No.2

HORIZONTAL DEFLECTION AMPLIFIER

For operation in a 525-line, 30-frame system^o

Maximum Ratings, Design-Center Values:

DC PLATE VOLTAGE 550 max. volts

PEAK POSITIVE-PULSE

PLATE VOLTAGE* (Absolute maximum) 5500[•] max. volts

PEAK NEGATIVE-PULSE PLATE VOLTAGE* -1250 max. volts

DC GRID-NO.2 (SCREEN) VOLTAGE†. 200 max. volts

^o with no external shield.

[#] For plate volts = 115, grid-no.2 volts = 175, grid-no.1 volts = -20.

[■] For plate volts = 100, grid-no.2 volts = 100, grid-no.1 volts = -4.5.

^o 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.

[•] under no circumstances should this absolute value be exceeded.

† preferably obtained through a series dropping resistor of sufficient magnitude to limit the grid-no.2 input to the rated maximum value.

← indicates a change.

6AU5-GT



6AU5-GT

BEAM POWER TUBE

PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	-300 max.	volts
CATHODE CURRENT:		
Peak	400 max.	ma
Average	110 max.	ma
GRID-No.2 INPUT	2.5 max.	watts
PLATE DISSIPATION [◇]	10 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) [▲] . . .	210 max.	°C

Maximum Circuit Values:

→ Grid-No.1-Circuit Resistance	0.47 max.	megohm
--	-----------	--------

VOLTAGE REGULATOR SERVICE

Triode Connection--Grid No.2 Connected to Plate

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	125 max.	volts
Positive bias value	0 max.	volts
CATHODE CURRENT	110 max.	ma
PLATE & GRID-No.2		
DISSIPATION (Total)	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 max.	volts

- ◇ An adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.
- ◆ The dc component must not exceed 100 volts.
- ▲ For tube in vertical position with base down in free space and with natural ventilation, the hottest point on the bulb is in the center of the dome just above open end of cathode sleeve.

→ Indicates a change.

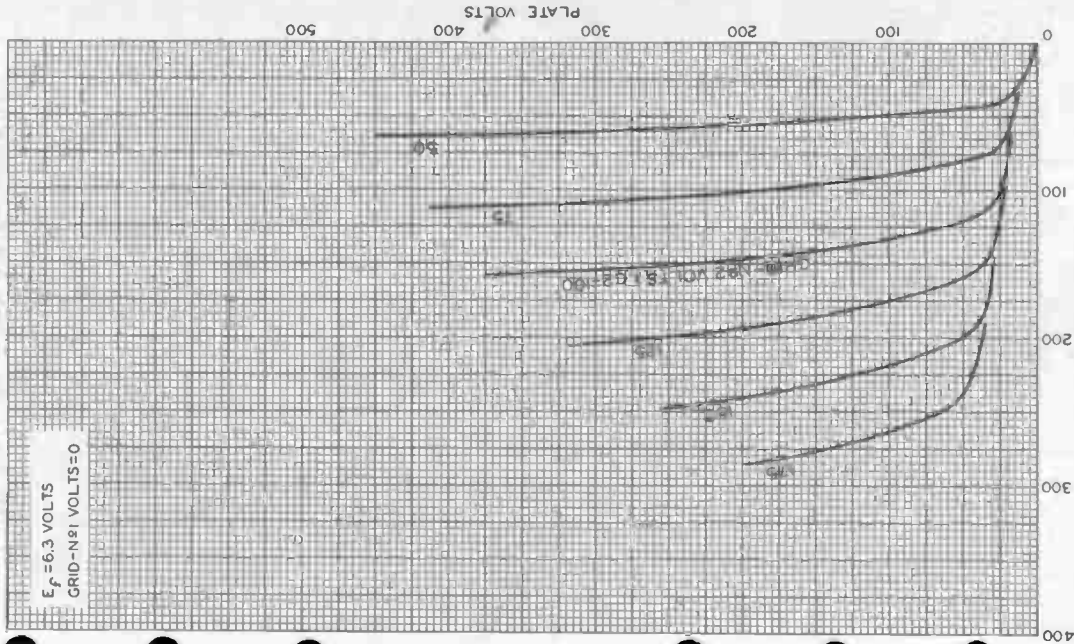


6AU5-GT

6AU5-GT

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-N & I VOLTS = 0



SEPT. 8, 1949

PLATE MILLIAMPERES
TUBE DEPARTMENT

RADCO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

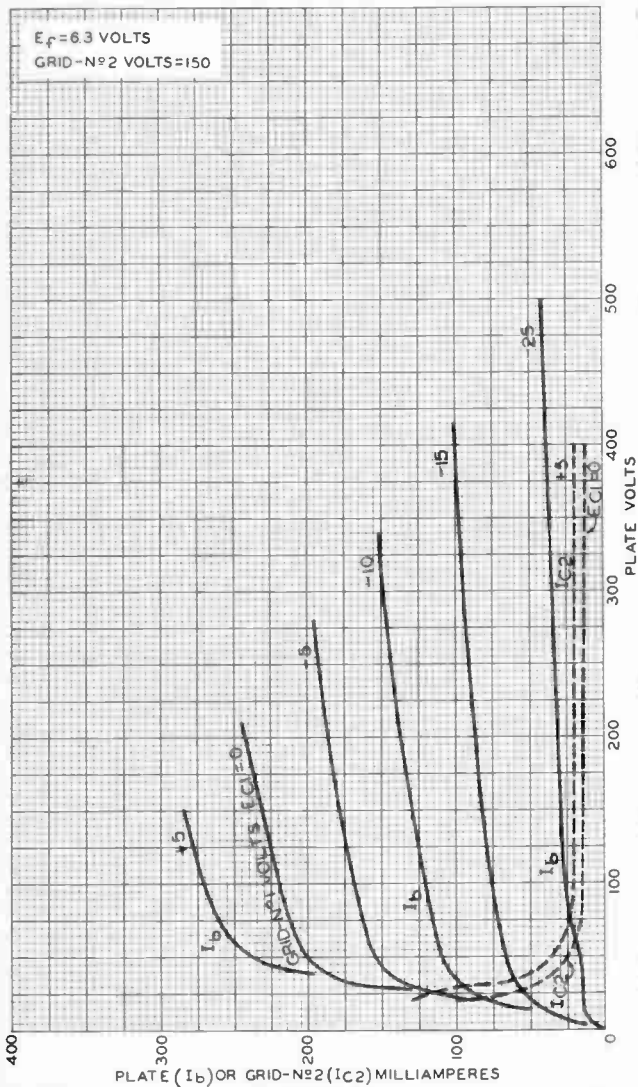
92CM-7355

6AU5-GT



6AU5-GT

AVERAGE PLATE CHARACTERISTICS



AUG. 29, 1949

TUBE DEPARTMENT

92CM-7349

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current at 6.3 volts.	0.3 ± 6%	amp
Warm-up time (Average).	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^Δ	
--	-------------------------------	---	--

Pentode Connection:

Grid No.1 to plate. . .	0.0035 max.	0.0035 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater.	5.5	5.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater.	5	5	μf

Triode Connection:

Grid No.1 to plate, grid No.3 & internal shield, and grid No.2.	2.6	2.6	μf
Grid No.1 to cathode and heater.	3.2	3.2	μf
Plate, grid No.3 & internal shield, and grid No.2 to cathode and heater.	1.2	8.5	μf

Characteristics, Class A₁ Amplifier:

Pentode Connection

Plate Supply Voltage.	100	250	250	volts
Grid No.3	<i>Connected to cathode at socket</i>			
Grid-No.2 Supply Voltage.	100	125	150	volts
Cathode Resistor.	150	100	68	ohms
Plate Resistance (Approx.).	0.5	1.5	1	megohms
Transconductance.	3900	4500	5200	μmhos
Plate Current	5	7.6	10.6	ma
Grid-No.2 Current	2.1	3	4.3	ma
Grid-No.1 Voltage (Approx.) for plate μ _a = 10	-4.2	-5.5	-6.5	volts

Triode Connection

Plate Supply Voltage.	250	volts
Cathode Resistor.	330	ohms
Amplification Factor.	36	



6AU6-A

Plate Resistance (Approx.)	7500	ohms
Transconductance	4800	μ mhos
Plate Current.	12.2	ma

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" \pm 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline.	See <i>General Section</i>
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

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Connection	Pentode Connection
PLATE VOLTAGE.	275 max.	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
<i>Rating Chart at front of Receiving Tube Section</i>		
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	-	0.75 max. watt
For grid-No.2 voltages between 165 and 330 volts.	-	See Grid-No.2 Input
<i>Rating Chart at front of Receiving Tube Section</i>		
PLATE DISSIPATION.	3.5 max.	3.5 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

Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED-AMPLIFIER CHART No.8*
 at front of this Section



6AU6-A

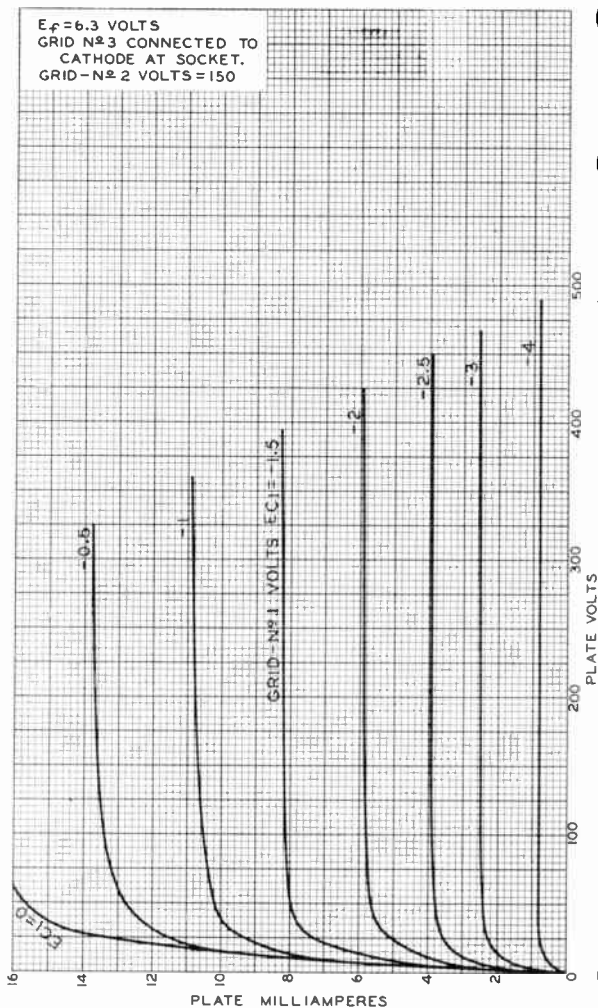
- ▲ With external shield JEDEC No.316 connected to cathode.
- Grid No.3 and grid No.2 connected to plate.
- ★ The dc component must not exceed 100 volts.



6AU6-A

AVERAGE PLATE CHARACTERISTICS Pentode Connection

$E_f = 6.3$ VOLTS
GRID N^o 3 CONNECTED TO
CATHODE AT SOCKET.
GRID-N^o 2 VOLTS = 150

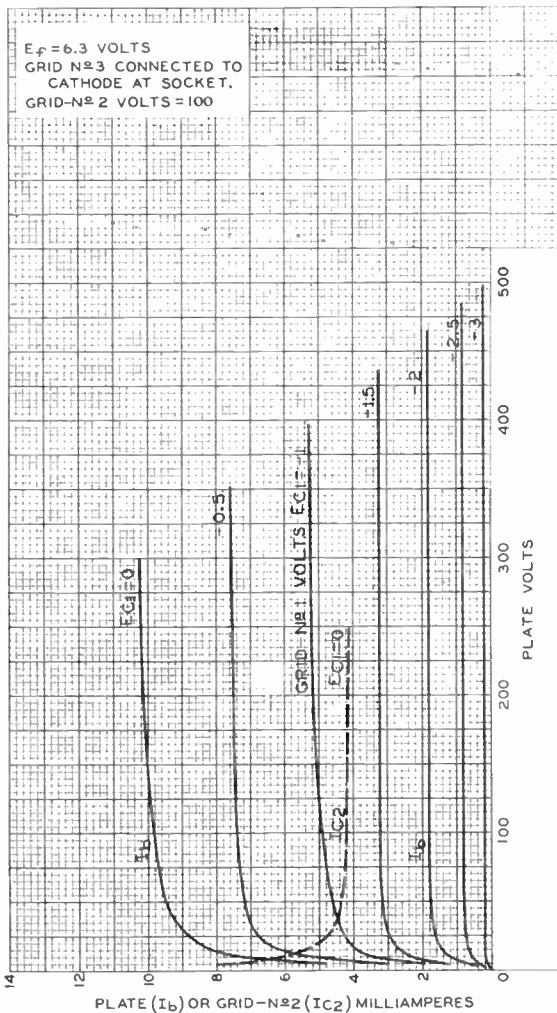


92CM-6613R3



6AU6-A

AVERAGE CHARACTERISTICS Pentode Connection



92CM-6611R3



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

World Radio History

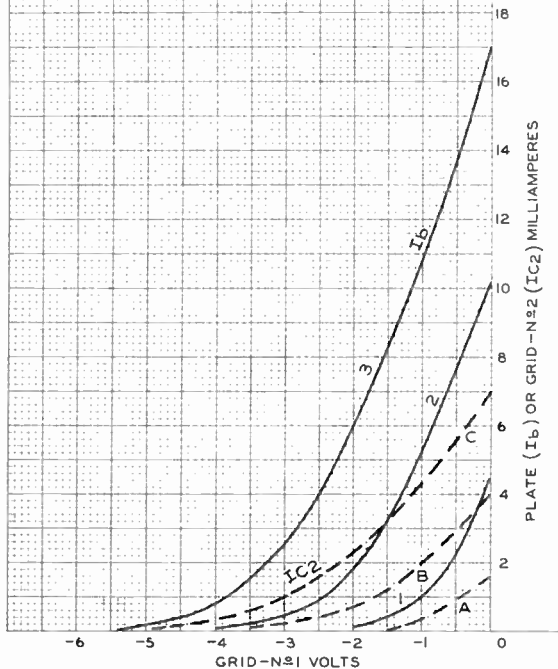
DATA 3
10-60

6AU6-A

AVERAGE CHARACTERISTICS Pentode Connection

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 250
 GRID N^o3 CONNECTED TO
 CATHODE AT SOCKET.

CURVES		GRID-N ^o 2 VOLTS
I_b —	I_{C2} --	
1	A	50
2	B	100
3	C	150

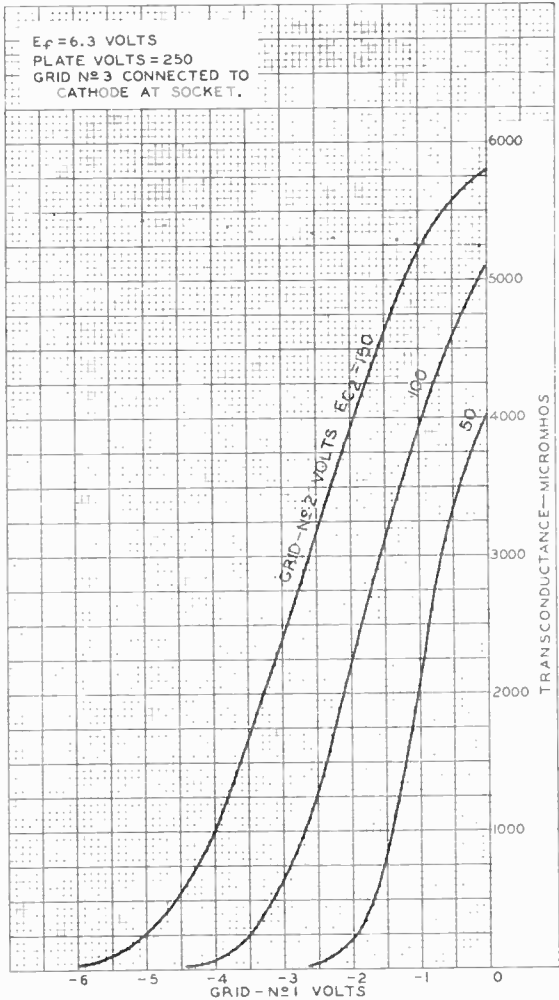


92CM-6623R3



6AU6-A

AVERAGE CHARACTERISTICS Pentode Connection



92CM-6614R3



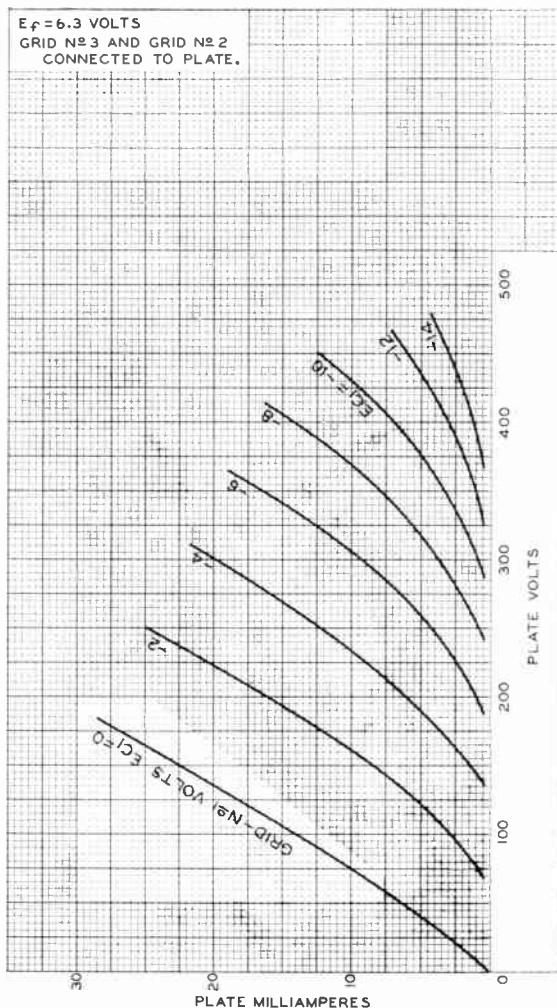
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.

DATA 4
10-60

6AU6-A

AVERAGE PLATE CHARACTERISTICS Triode Connection



92CM-6854RI



6AU8A

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:^a

Triode Unit:

Grid to plate	2.2	μf
Grid to cathode and heater	2.6	μf
Plate to cathode and heater	0.34	μf

Pentode Unit:

Grid No.1 to plate	0.06	μf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	7.5	μf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	3.4	μf
Triode grid to pentode plate	0.022 max.	μf
Pentode grid No.1 to triode plate	0.006 max.	μf
Pentode plate to triode plate	0.12 max.	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate Supply Voltage	150	40	200 volts
Grid-No.2 Supply Voltage	—	125	125 volts
Cathode Resistor	150	—	82 ohms
Amplification Factor	43	—	—
Plate Resistance (Approx.)	8100	—	100000 ohms
Transconductance	5300	—	8000 μmhos
Plate Current	9.5	28 ^b	17 ma
Grid-No.2 Current	—	10 ^b	3.4 ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-6.5	—	-7.5 volts

Mechanical:

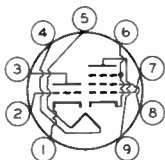
Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)



6AU8A

Basing Designation for BOTTOM VIEW. 9DX

- Pin 1 - Triode Cathode
- Pin 2 - Triode Grid
- Pin 3 - Triode Plate
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Pentode Cathode, Grid No.3, Internal Shield
- Pin 7 - Pentode Grid No.1
- Pin 8 - Pentode Grid No.2
- Pin 9 - Pentode Plate

AMPLIFIER - Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
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	
	<i>Rating Chart at front of Receiving Tube Section</i>		
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	-	1 max.	watt
For grid-No.2 voltages be-			
tween 165 and 330 volts	-	See Grid-No.2 Input	
	<i>Rating Chart at front of Receiving Tube Section</i>		
PLATE DISSIPATION	2.8 max.	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with			
respect to cathode.	200 max.	200 max.	volts
Heater positive with			
respect to cathode.	200 ^c max.	200 ^c 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

OPERATING CONSIDERATIONS

Because the *internal shield* is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.

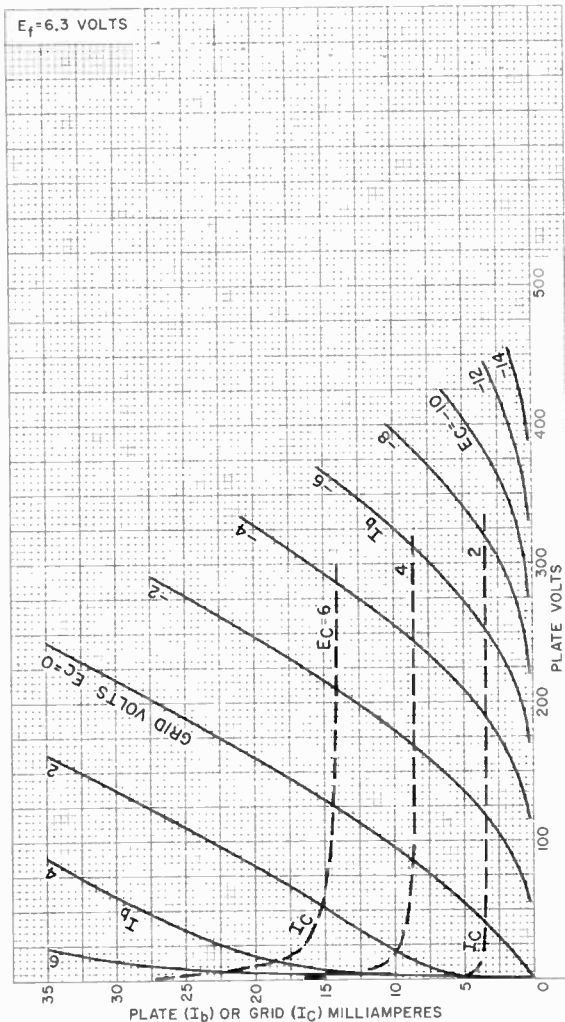
^a Without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

^c The dc component must not exceed 100 volts.



AVERAGE CHARACTERISTICS Triode Unit

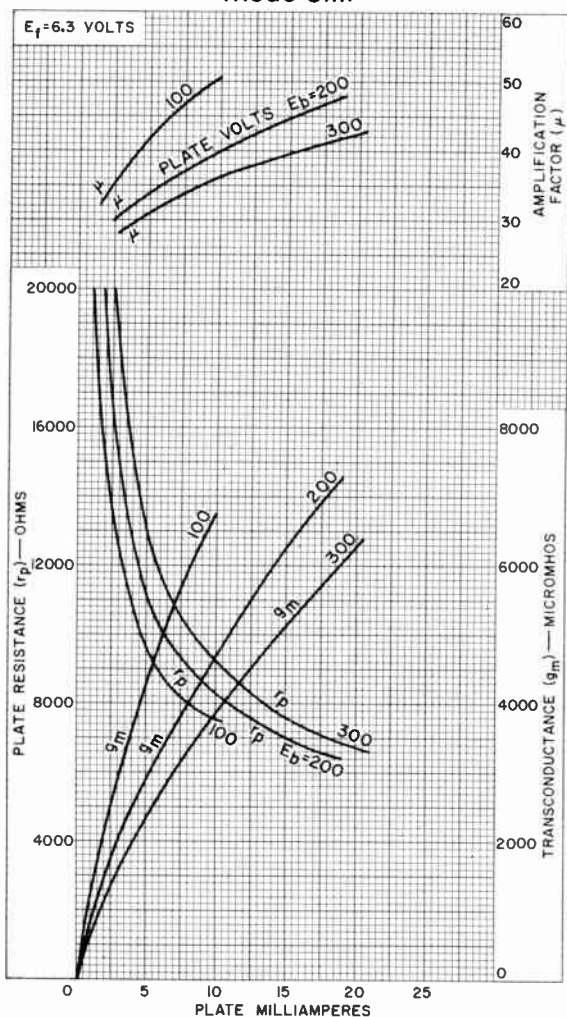


92CM-11140



6AU8A

AVERAGE CHARACTERISTICS Triode Unit



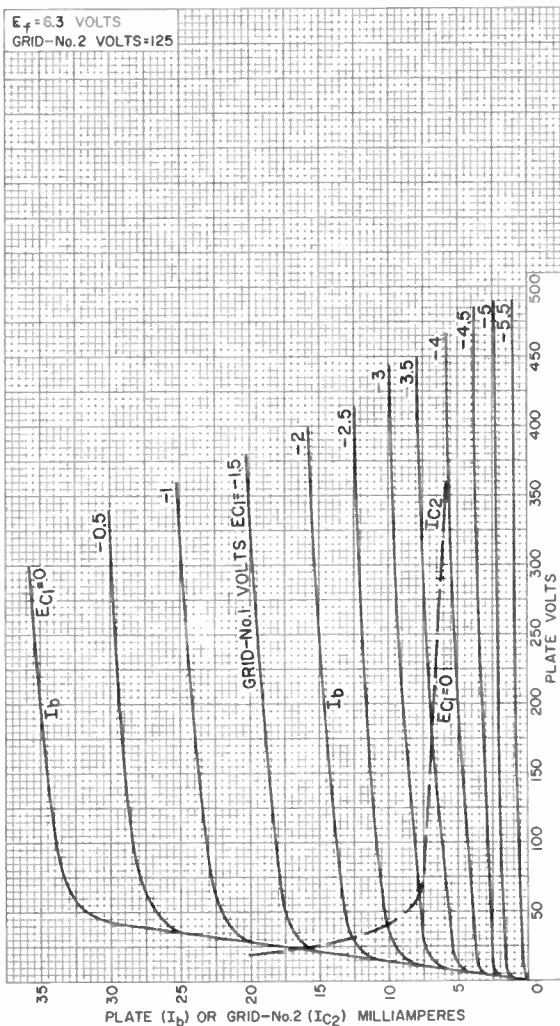
92CM-11144RI

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AVERAGE CHARACTERISTICS Pentode Unit

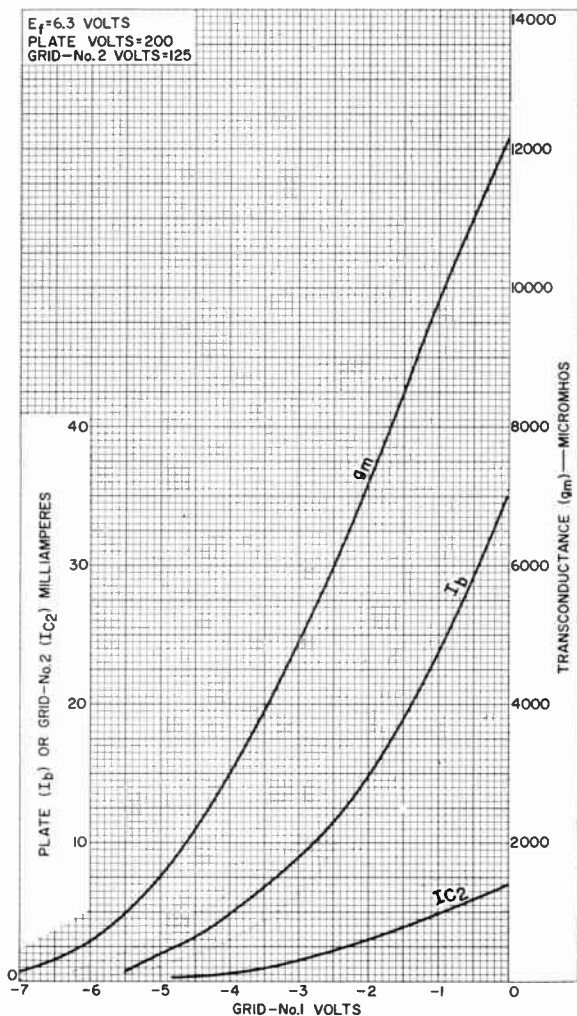


92CM-III41



6AU8A

AVERAGE CHARACTERISTICS Pentode Unit



92CM-11142

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.





6AV5-GT

BEAM POWER AMPLIFIER

6AV5-GT

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts
Current 1.2 amp

Direct Interelectrode Capacitances:^o

Grid No.1 to Plate 0.7 $\mu\mu\text{f}$
Input 14 $\mu\mu\text{f}$
Output 7 $\mu\mu\text{f}$

^o With no external shield.

Characteristics, Amplifier Class A₁:

Plate Voltage	60 ^A	150	250	volts
Grid-No.2 (Screen) Voltage	150 ^A	150	150	volts
Grid-No.1 (Control-Grid) Voltage	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.3	-	
Plate Resistance	-	-	20000	ohms
Transconductance	-	-	5500	μmhos
Plate Current	225	-	55	ma
Grid-No.2 Current	25	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma	-	-	-46	volts

Mechanical:

Mounting Position Any
Maximum Overall Length 3-5/16"
Maximum Seated Length 2-3/4"
Maximum Diameter 1-9/32"
Bulb T-9

Base { Intermediate-Shell Octal 6-Pin (JETEC No. B6-8)
or Short Intermediate-Shell Octal 6-Pin (JETEC No. B6-60)

Basing Designation for BOTTOM VIEW 6CK

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



Pin 5 - Plate
Pin 7 - Heater
Pin 8 - Grid No.2

HORIZONTAL DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system*

DC PLATE SUPPLY VOLTAGE

(Including Boost Voltage) 550 max. volts

* Applied for very short interval so as not to damage tube.

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



6AV5-GT

BEAM POWER AMPLIFIER

PEAK POSITIVE-PULSE PLATE VOLTAGE*	5500	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE*	1250	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	175	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE*	300	max.	volts
CATHODE CURRENT:			
Peak	400	max.	ma
DC	110	max.	m
GRID-No.2 INPUT	2.5	max.	watts
PLATE DISSIPATION#	11	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)	210	max.	op

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.47	max.	megohm
------------------------------	------	------	--------

- * under no circumstances should this absolute value be exceeded.
- * 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.
- # It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.
- * The dc component must not exceed 100 volts.

APRIL 1, 1953

TUBE DEPARTMENT
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

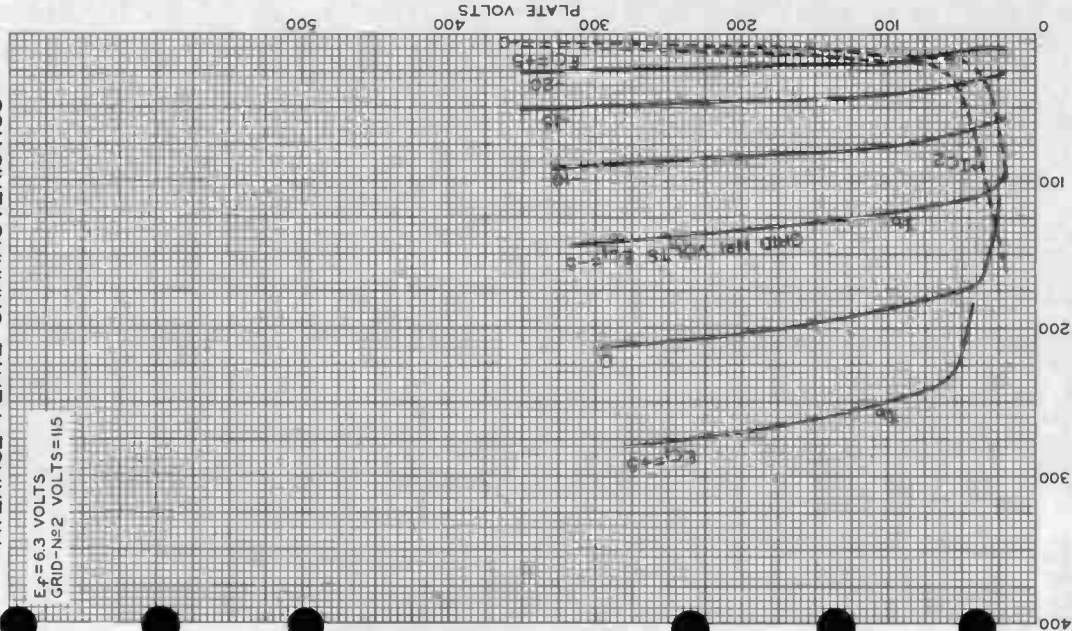
TENTATIVE DATA



6AV5-GT

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-№2 VOLTS = 115



6AV5-GT

MAR. 10, 1953

PLATE (I_b) OR GRID-№2 (I_{c2}) MILLIAMPERES
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7941





6AV6

6AV6

TWIN DIODE—HIGH-MU TRIODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.3	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
<i>Triode Unit:</i>			
Grid to plate.	2	2	μf
Grid to cathode and heater. . .	2.2	2.2	μf
Plate to cathode and heater . .	0.8	1.2	μf
Diode-No.2 plate to triode grid .	0.04 max.	0.04 max.	μf

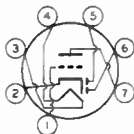
Characteristics, Class A₁ Amplifier (Triode Unit):

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 2-1/8"
- 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 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 — AMPLIFIER, — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	330 max.	volts
GRID VOLTAGE:		
Positive-bias value.	0 max.	volts
PLATE DISSIPATION.	0.55 max.	watt

← Indicates a change.

6AV6



6AV6

TWIN DIODE—HIGH-MU TRIODE

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts
 Heater positive with respect to cathode. 200[▲] max. volts

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No. 25
 at front of this Section

DIODE UNITS — Two

→ Maximum Ratings, Design-Maximum Values:

PLATE CURRENT (For each diode) 1 max. ma

→ Characteristics:

Values are for Each Unit

Plate Current for plate volts = 10 2 ma

Diode Considerations:

Consideration of these units, including typical circuits and diode curves, is given at the front of this Section. Diode biasing of the triode unit of the 6AV6 is not suitable.

^o with external shield JEDEC NO. 316 connected to cathode.

[▲] The dc component must not exceed 100 volts.

Curves for the triode unit of the 6AV6 are the same as those shown for Type 12AX7

→ Indicates a change.

High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at 6.3 volts,	0.6 ^a	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^b</i>	
<i>Triode Unit:</i>			
Grid to plate	2.2	2.2	μf
Grid to cathode, pentode cathode & grid No.3 & internal shield, and heater.	3.2	3.4	μf
Plate to cathode, pentode cathode & grid No.3 & internal shield, and heater.	1.8	3	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate.	0.05 max.	0.04 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater.	10	10	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . .	3.6	4.5	μf
Pentode grid No.1 to triode plate.	0.008 max.	0.005 max.	μf
Pentode plate to triode plate.	0.150 max.	0.025 max.	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>		
Plate Supply Voltage.	200	65	150	volts
Grid-No.2 Supply Voltage. . .	-	150	150	volts
Grid-No.1 Voltage	-2	0	-	volts
Cathode Resistor.	-	-	150	ohms
Amplification Factor.	70	-	-	
Plate Resistance (Approx.)	0.0175	-	0.2	megohm

← Indicates a change.



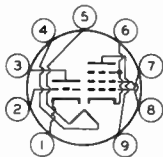
6AW8A

	Triode Unit	Pentode Unit	
Transconductance	4000	-	9500 μ hos
Plate Current	4	46 ^c	15 ma
Grid-No.2 Current	-	15 ^c	3.5 ma
Grid-No.1 Voltage (Approx.) for plate μ a = 20	-5	-	-8 volts

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" \pm 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW	9DX

- Pin 1 - Triode Cathode
- Pin 2 - Triode Grid
- Pin 3 - Triode Plate
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Pentode Cathode, Grid No. 3, Internal Shield
- Pin 7 - Pentode Grid No. 1
- Pin 8 - Pentode Grid No. 2
- Pin 9 - Pentode Plate

AMPLIFIER — Class A₁

→ Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	330 max.	volts
GRID-No.2 VOLTAGE	-	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1.1 max.	3.75 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts	-	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts	-	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	

→ Indicates a change.

**PEAK HEATER-CATHODE
VOLTAGE:**

Heater negative with respect to cathode. . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . .	200 ^d max.	200 ^d 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

- ^a In series-heater-string operation, the heater current rating is 0.600 ± 0.040 ampere at 6.3 volts.
- ^b with external shield JEDEC No.315 connected to pins 4 and 5.
- ^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ^d The dc component must not exceed 100 volts.

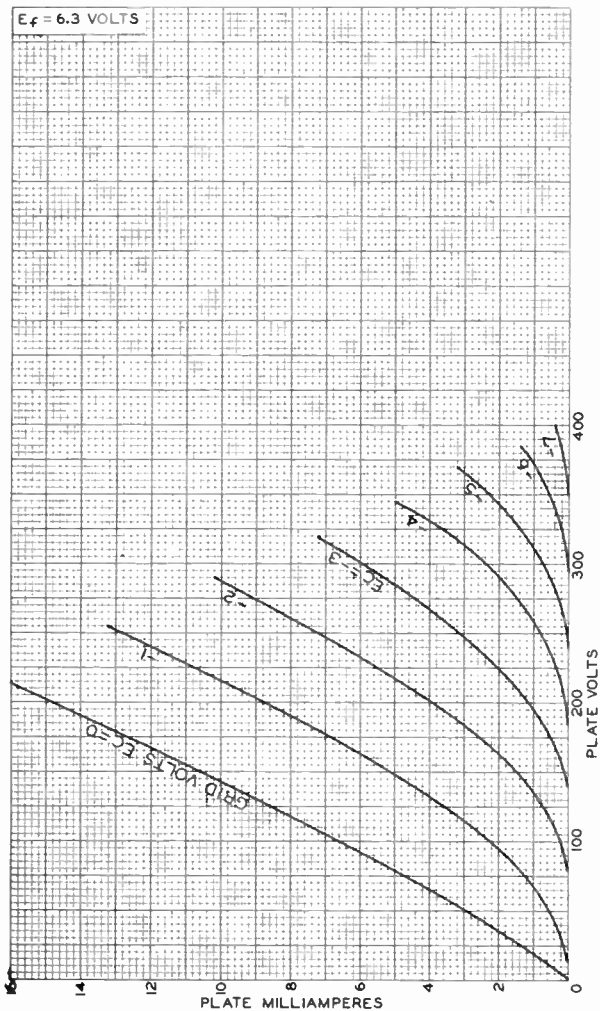
OPERATING CONSIDERATIONS

Because the internal shield is connected to the pentode cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.



6AW8A

AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-8644

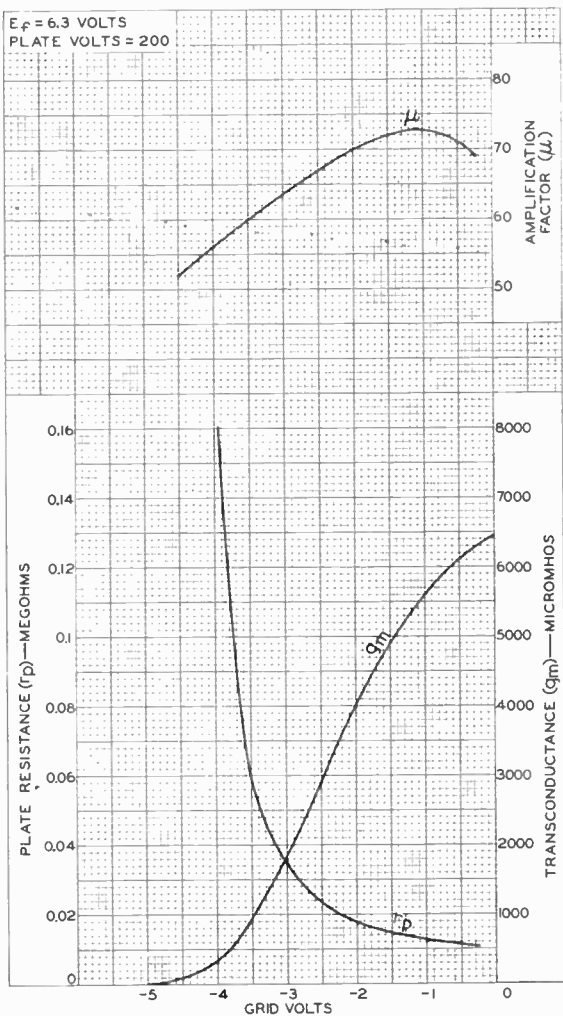
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



World Radio History

AVERAGE CHARACTERISTICS Triode Unit

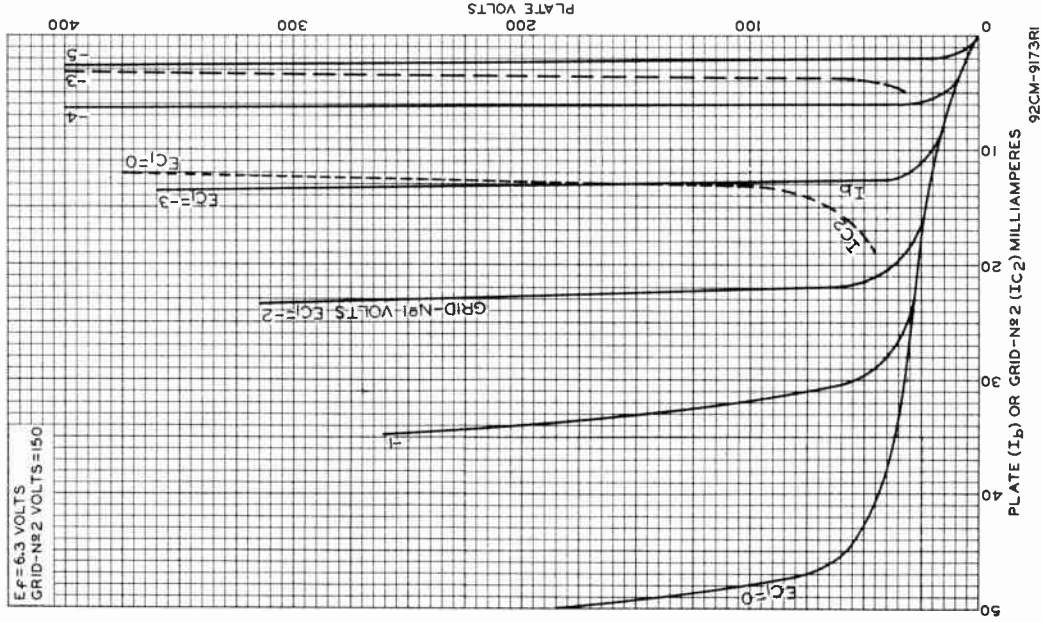


92CM-8647

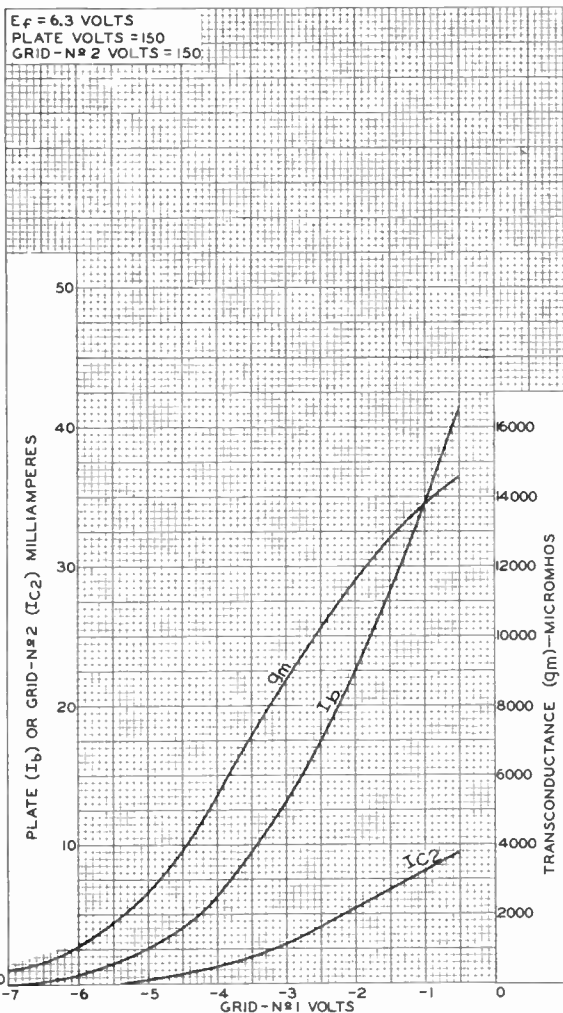


6AW8A

AVERAGE CHARACTERISTICS Pentode Unit



AVERAGE CHARACTERISTICS Pentode Unit



92CS-8646RI





Half-Wave Vacuum Rectifier

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC) 6.3 ± 0.6 volts
 Current at heater volts = 6.3 1.200 amp

Peak heater-cathode voltage:

Heater negative with respect to cathode^a 5000^b max. volts

Heater positive with respect to cathode 500^c max. volts

Direct Interelectrode Capacitances (Approx.):^d

Plate to cathode and heater 5.5 μf
 Cathode to plate and heater 7.5 μf
 Heater to cathode 2.8 μf

Mechanical:

Operating Position Any

Type of Cathode Coated Unipotential

Maximum Overall Length 2.625"

Seated Length 2.000" to 2.250"

Diameter 1.062" to 1.188"

Bulb T9

Base Small-Button Duodecar 12-Pin (JEDEC No. E12-70)

Basing Designation for BOTTOM VIEW 12BL

Pin 1 - Heater

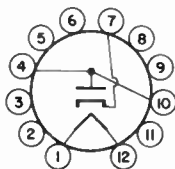
Pin 2 - No Internal Connection

Pin 3 - Same as Pin 2

Pin 4 - Plate

Pin 5 - Do Not Use^e

Pin 6 - Do Not Use^e



Pin 7 - Cathode

Pin 8 - Do Not Use^e

Pin 9 - Do Not Use^e

Pin 10 - Plate

Pin 11 - Same as Pin 2

Pin 12 - Heater

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values*:

For operation in a 525-line, 30-frame system^f

PEAK INVERSE PLATE VOLTAGE^a 5000 max. volts

PEAK PLATE CURRENT 1000 max. ma

DC PLATE CURRENT 165 max. ma

PLATE DISSIPATION 5.3 max. watts

Characteristics, *Instantaneous Value*:

Tube Voltage Drop for plate
 ma. = 250 32 volts



6AX3

- a This rating is applicable when the duration of the voltage pulse does 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.
- b The dc component must not exceed 900 volts.
- c The dc component must not exceed 100 volts.
- d Without external shield.
- e Socket terminals 5,6,8, and 9 should not be used as tie points.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.



Half-Wave Vacuum Rectifier

For Television Damper Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	1.2	amp

Direct Interelectrode Capacitances

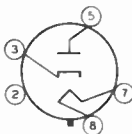
(Approx.):^a

Plate to cathode and heater	5	μμf
Cathode to plate and heater	8.5	μμf
Heater to cathode	4	μμf

Mechanical:

Operating Position.	Any
Maximum Overall Length.	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter.	1-9/32"
Dimensional Outline	See <i>General Section</i>
Bulb.	T9
Base.	Intermediate-Shell Octal 5-Pin, Arrangement 2 (JEDEC Group 1, No. B5-82)
Basing Designation for BOTTOM VIEW.	4CG

Pin 2 - Internal Connection—
Do Not Use^b
Pin 3 - Cathode



Pin 5 - Plate
Pin 7 - Heater
Pin 8 - Heater

DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

PEAK INVERSE PLATE VOLTAGE ^d	5000	max.	volts
PEAK PLATE CURRENT.	1000	max.	ma
DC PLATE CURRENT.	165	max.	ma
PLATE DISSIPATION	5.3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	5000 ^e	max.	volts
Heater positive with respect to cathode.	300 ^f	max.	volts

Characteristics, Instantaneous Test Condition:

Tube Voltage Drop for plate ma. = 250	32	volts
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^a without external shield.

^b Socket terminals 1, 2, 4 and 6 should not be used as tie points.

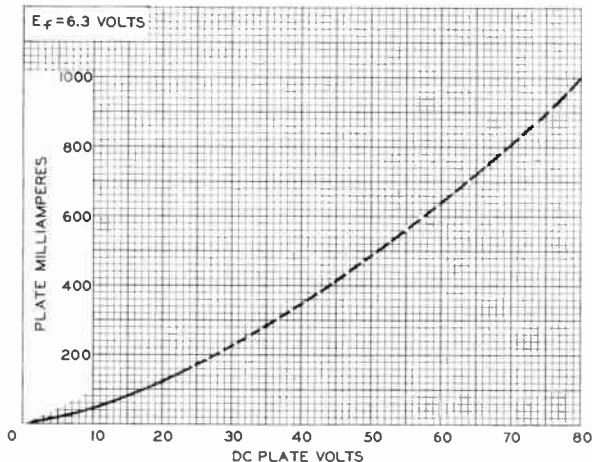
^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.



6AX4-GTB

- d This rating is applicable when the duty cycle of the voltage pulse does 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.
- e The dc component must not exceed 900 volts.
- f The dc component must not exceed 100 volts.

AVERAGE PLATE CHARACTERISTIC



92CS-10850





6AX5-GT

FULL-WAVE VACUUM RECTIFIER

6AX5-GT

GENERAL DATA

Electrical:

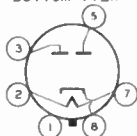
Heater, for Unipotential Cathode:

Voltage.	6.3	ac volts
Current.	1.2	amp

Mechanical:

Mounting Position.	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length.	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short-Intermediate-Shell Octal 6-Pin
Basing Designation for	BOTTOM VIEW G-6S

- Pin 1 - No Connection
- Pin 2 - Heater
- Pin 3 - Plate of Diode No. 2



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

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE	1250 max.	volts
PEAK PLATE CURRENT PER PLATE	375 max.	ma
HOT-SWITCHING TRANSIENT PLATE CURRENT		
For duration of 0.2 second maximum	2.6 max.	amp
AC PLATE SUPPLY VOLTAGE (RMS) PER PLATE.	See Rating Chart	
DC OUTPUT CURRENT PER PLATE.	See Rating Chart	
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	450 max.	volts
Heater positive with respect to cathode.	450 max.	volts

Typical Operation with Capacitor-Input Filter:

AC Plate-to-Plate Supply			
Voltage (RMS)	700	900	volts
Filter-Input Capacitor [▲]	10	10	μf
Effective Plate-Supply Impedance			
Per Plate	50	105	ohms
DC Output Voltage at Input to Filter (Approx.):			
At half-load cur. of	{ 62.5 ma.	395	- volts
	{ 40 ma.	-	540 volts
At full-load cur. of	{ 125 ma.	350	- volts
	{ 80 ma.	-	490 volts
Voltage Regulation (Approx.):			
Half-load to full-load current	45	50	volts

▲ Higher values of capacitance than indicated may be used but the effective plate supply impedance may have to be increased to prevent exceeding the maximum rating for hot-switching transient plate current.

6AX5-GT



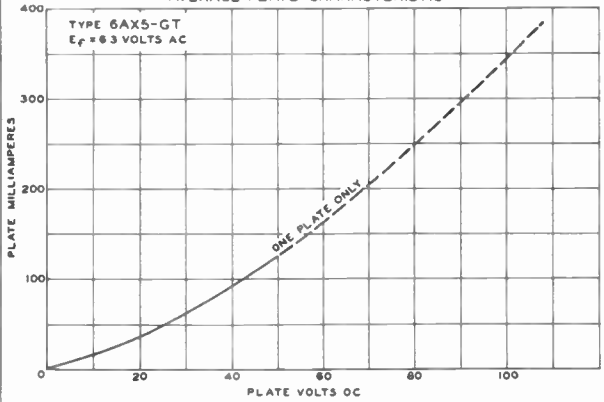
6AX5 - GT

FULL-WAVE VACUUM RECTIFIER

Typical Operation with Choke-Input Filter:

AC Plate-to-Plate Supply			
Voltage (RMS)	700	900	volts
Filter-Input Choke	10	10	henries
DC Output Voltage at Input to Filter (Approx.):			
At half-load cur. of	{ 75 ma.	270	- volts
	{ 62.5 ma.	-	365 volts
At full-load cur. of	{ 150 ma.	250	- volts
	{ 125 ma.	-	350 volts
Voltage Regulation (Approx.):			
Half-load to full-load Current . .	20	15	volts

AVERAGE PLATE CHARACTERISTIC



92CM-7346T

RATING CHART and OPERATION CHARACTERISTICS

The *Rating Chart* presents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

The *Operation Characteristics for Full-Wave Circuit with Capacitor-Input Filter* show not only the typical operating curves for such a circuit, but also show by means of boundary lines "ADK" the limiting current and voltage relationships presented on the Rating Chart.



6AX5-GT

6AX5-GT

FULL-WAVE VACUUM RECTIFIER

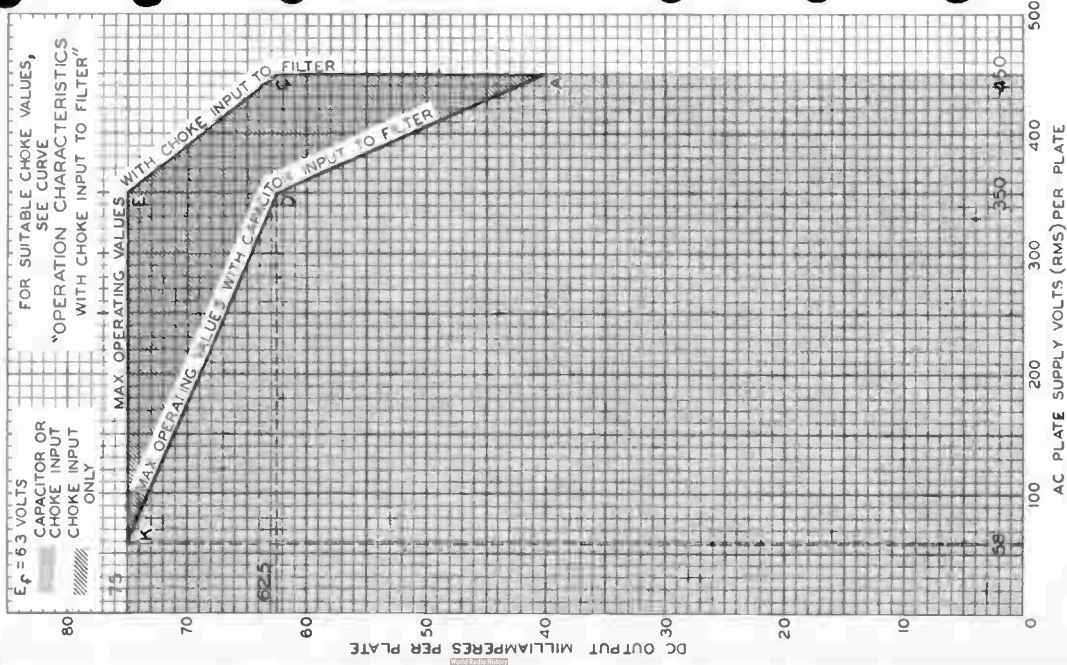
The *Operation Characteristics for Full-Wave Circuit with Choke-Input Filter* show the typical operating curves for such a circuit. They not only show by means of boundary line "CEK" the limiting current and voltage relationships presented on the *Rating Chart*, but also give information as to the effect on regulation of various sizes of chokes. The solid-line curves show the dc voltage outputs which would be obtained if the filter chokes had infinite inductance. The long-dash lines radiating from the zero position are boundary lines for various sizes of chokes as indicated. The intersection of one of these lines with a solid-line curve indicates the point on the curve at which the choke no longer behaves as though it has infinite inductance. To the left of the choke boundary line, the regulation curves depart from the solid-line curves as shown by the representative short-dash regulation curves.

6AX5-GT



6AX5-GT

RATING CHART



OCT. 7, 1949

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARTFORD, NEW JERSEY

92CM-7363



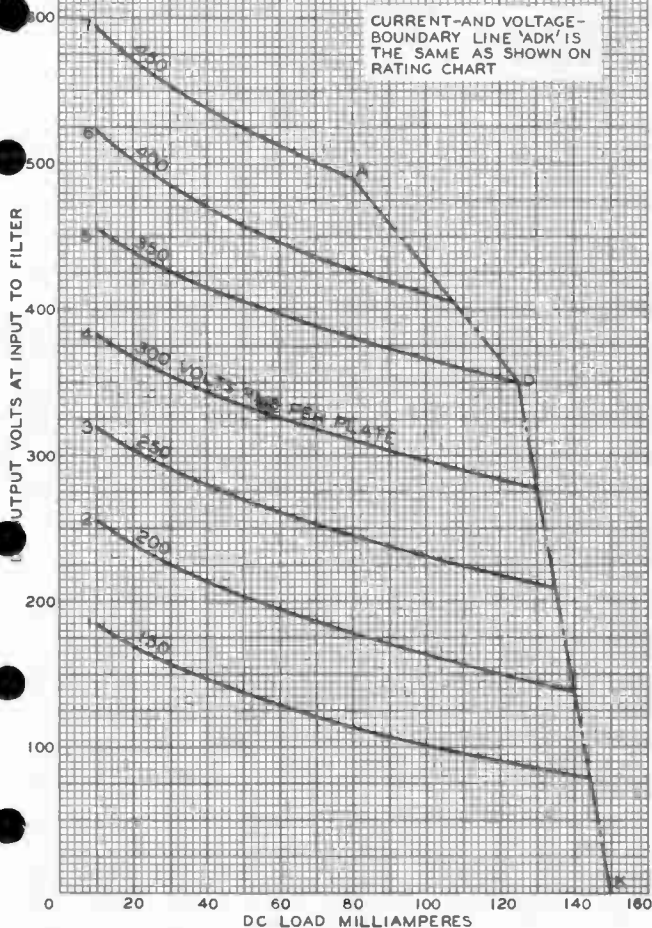
6AX5-GT

6AX5-GT

OPERATION CHARACTERISTICS FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER

$E_f = 6.3$ VOLTS
 CAPACITOR (C) INPUT TO FILTER: $C = 10 \mu F$;
 TOTAL EFFECTIVE PLATE-SUPPLY IMPEDANCE
 PER PLATE $\begin{cases} 50 \text{ OHMS FOR CURVES 1-5} \\ 105 \text{ OHMS FOR CURVES 6 \& 7} \end{cases}$
 SUPPLY FREQUENCY = 60 CPS

CURRENT-AND VOLTAGE-
 BOUNDARY LINE 'ADK' IS
 THE SAME AS SHOWN ON
 RATING CHART



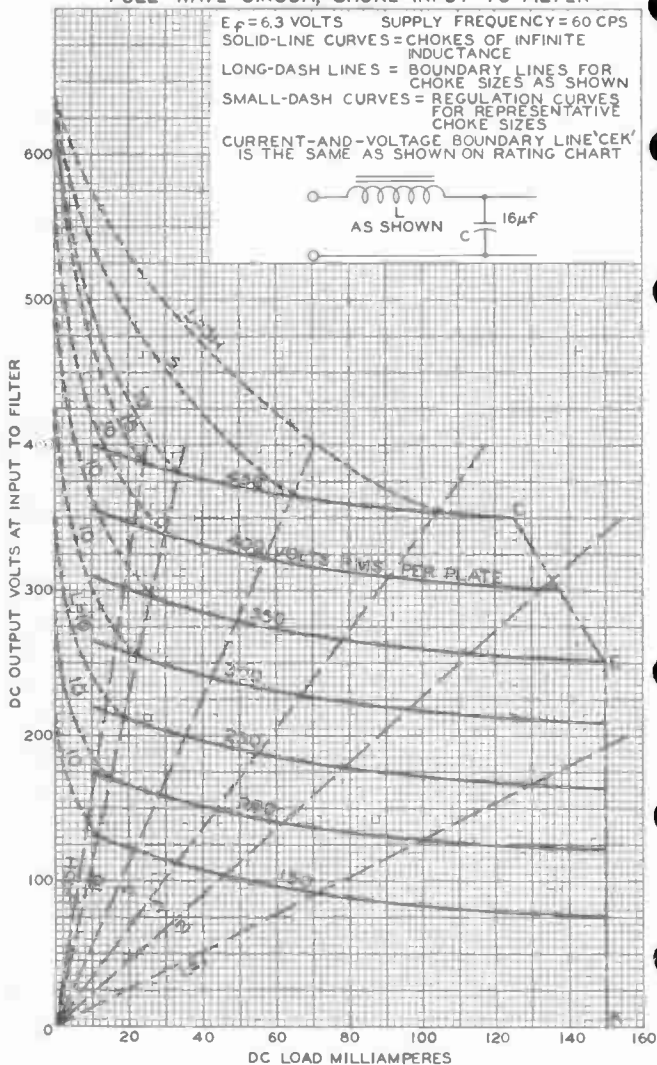
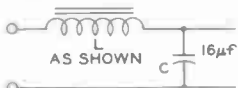
6AX5-GT



6AX5-GT

OPERATION CHARACTERISTICS FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER

$E_f = 6.3$ VOLTS SUPPLY FREQUENCY = 60 CPS
 SOLID-LINE CURVES = CHOKES OF INFINITE INDUCTANCE
 LONG-DASH LINES = BOUNDARY LINES FOR CHOKE SIZES AS SHOWN
 SMALL-DASH CURVES = REGULATION CURVES FOR REPRESENTATIVE CHOKE SIZES
 CURRENT-AND-VOLTAGE BOUNDARY LINE 'CEK' IS THE SAME AS SHOWN ON RATING CHART



OCT. 11, 1949

TUBE DEPARTMENT

92CM-7379

RADIO CORPORATION OF AMERICA, NEW JERSEY

Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

Electrical:

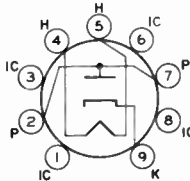
Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode ^a	5000 ^b max.	volts
Heater positive with respect to cathode	300 ^c max.	volts
Direct Interelectrode Capacitances (Approx.): ^d		
P to (K,H)	6.5	pf
K to (P,H)	9.0	pf
Heater to cathode.	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005"
Seated Length.	2.375" to 2.625"
Dimensional Outline.	See <i>General Section</i>
Diameter	1.062" to 1.188"
Bulb	T9
Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW	9HP

- Pin 1 - Do Not Use^e
- Pin 2 - Plate
- Pin 3 - Do Not Use^e
- Pin 4 - Heater



- Pin 5 - Heater
- Pin 6 - Do Not Use^e
- Pin 7 - Plate
- Pin 8 - Do Not Use^e
- Pin 9 - Cathode

DAMPER SERVICE

For operation in a 525-line, 30-frame system^f

Maximum Ratings, Design-Maximum Values:

Peak Inverse Plate Voltage ^a	5000	max.	volts
Peak Plate Current	1100	max.	ma
Average Plate Current.	175	max.	ma
Plate Dissipation.	6.5	max.	watts

Characteristic, Instantaneous Value:

Tube Voltage Drop for plate ma = 350	32	volts
--	----	-------



6AY3B

- a This rating is applicable when the duration of the voltage pulse does 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.
- b The dc component must not exceed 900 volts.
- c The dc component must not exceed 100 volts.
- d Without external shield.
- e Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.





6AZ8

6AZ8

MEDIUM-MU TRIODE—

SEMIREMOTE-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage 6.3 ac or dc volts
Current 0.45 amp

Direct Interelectrode Capacitances:^o

Triode Unit:

Grid to plate 1.7 μf
Grid to cathode, internal shield & heater 2 μf
Plate to cathode, internal shield & heater 1.7 μf

Pentode Unit:^{*}

Grid No.1 to plate 0.02 μf
Grid No.1 to cathode, grid No.2, grid No.3 & internal shield & heater 0.5 μf
Plate to cathode, grid No.2, grid No.3 & internal shield & heater 2.2 μf
Triode grid to pentode plate 0.027 max. μf
Pentode grid No.1 to triode plate 0.020 max. μf
Pentode plate to triode plate 0.045 max. μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage	200	200	volts
Grid-No.2 Supply Voltage	-	150	volts
Grid-No.1 Voltage	-6	-	volts
Cathode-Bias Resistor	-	180	ohms
Amplification Factor	19	-	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6000	μmhos
Plate Current	13	9.5	ma
Grid-No.2 Current	-	3	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-19	-	volt
Grid-No.1 Voltage (Approx.) for transconductance of 10 μmhos	-	-12.5	volt

Mechanical:

Mounting Position any
Maximum Overall Length 2-5/16"
Maximum Seated Length 1-15/16"
Length, Base Seat to Bolt Top (Excluding Pin) 1-9/16" ± 3/32"

^o Without external shield.

*: See next page.

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AZ8



6AZ8

MEDIUM-MU TRIODE— SEMIREMOTE-CUTOFF PENTODE

Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW	9ED
Pin 1 - Pentode Plate	Pin 6 - Pentode
Pin 2 - Pentode	Grid No. 1
Pin 3 - Pentode	Pin 7 - Triode
Grid No. 2	Cathode
Pin 4 - Heater	Pin 8 - Triode
Pin 5 - Pentode Grid	Plate
No. 3, Internal	Pin 9 - Triode
Shield, Heater	Grid



AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

	Triode Unit	Pentode Unit*	
PLATE VOLTAGE.	300 max.	300 max.	volts
GRID-No. 3 (SUPPRESSOR) VOLTAGE.	-	See Operating Considerations	
GRID-No. 2 (SCREEN) 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
PLATE DISSIPATION.	2.5 max.	2 max.	watts
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	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200 max.	▲	volts
Heater positive with respect to cathode	200#max.	▲	volts

* The pentode unit is provided with a separate base pin for the cathode and for grid No. 3 and internal shield which are connected internally to one of the heater leads. This arrangement facilitates the use of an unbypassed cathode resistor to minimize changes in input resistance and input capacitance with bias without causing oscillation which otherwise might occur if grid No. 3 were internally connected to the cathode.

The dc component must not exceed 100 volts.

▲: See next page.

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6AZ8

6AZ8 MEDIUM-MU TRIODE— SEMIREMOTE-CUTOFF PENTODE

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Grid-No.1-Circuit Resistance:*			
For fixed-bias operation. . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. .	1.0 max.	1.0 max.	megohm

OPERATING CONSIDERATIONS

Because *grid No. 3* is connected within the tube to one side of the heater (pin No. 5), it is important that pin No. 5 be connected to ground to maintain grid No. 3 at ground potential. If this precaution is not observed and pin No. 5 is connected to the ungrounded side of the heater supply, grid No. 3 will operate at the heater-supply voltage. As a result, tube characteristics will be changed. Furthermore, if an ac heater supply is used, ac voltage will be applied to grid No. 3 with resulting amplitude modulation of the grid-No. 3 voltage.

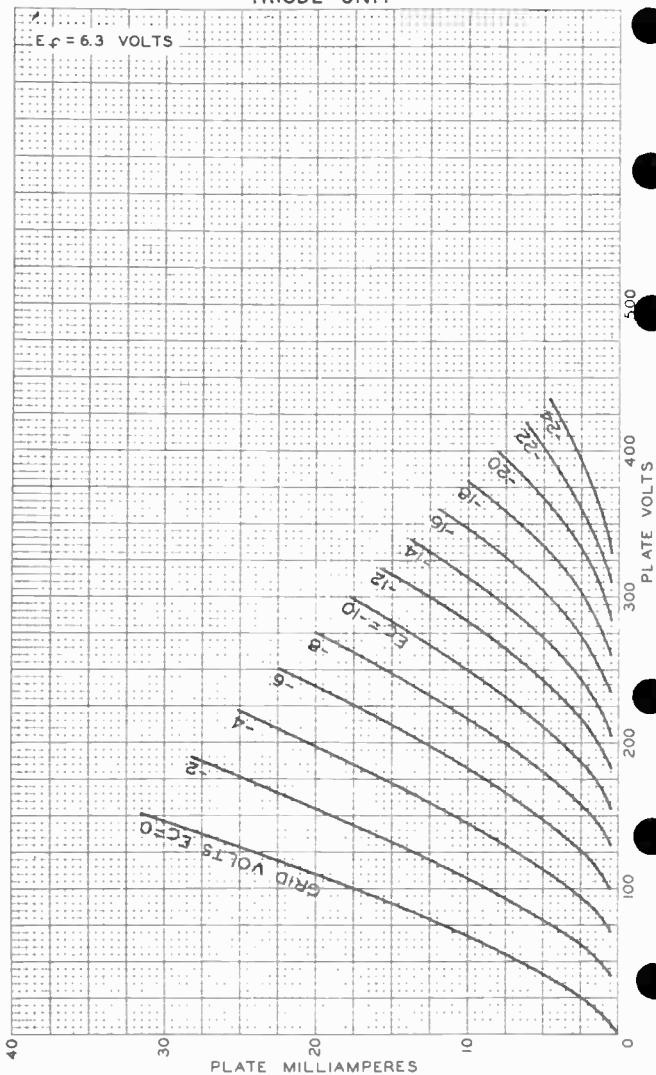
- ▲ The heater-cathode voltage should not exceed the value of the operating cathode bias. If the heater-cathode voltage exceeds the operating cathode bias value, grid No. 3 will be made negative with respect to cathode, and thus possibly cause a change in tube characteristics.
- * If either unit is operated at maximum rated conditions, grid-No. 1-circuit resistances for both units should not exceed the stated values.

6AZ8



6AZ8

AVERAGE PLATE CHARACTERISTICS TRIODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO DEPARTMENT OF AMERICA HARRISON NEW JERSEY

92CM-8520

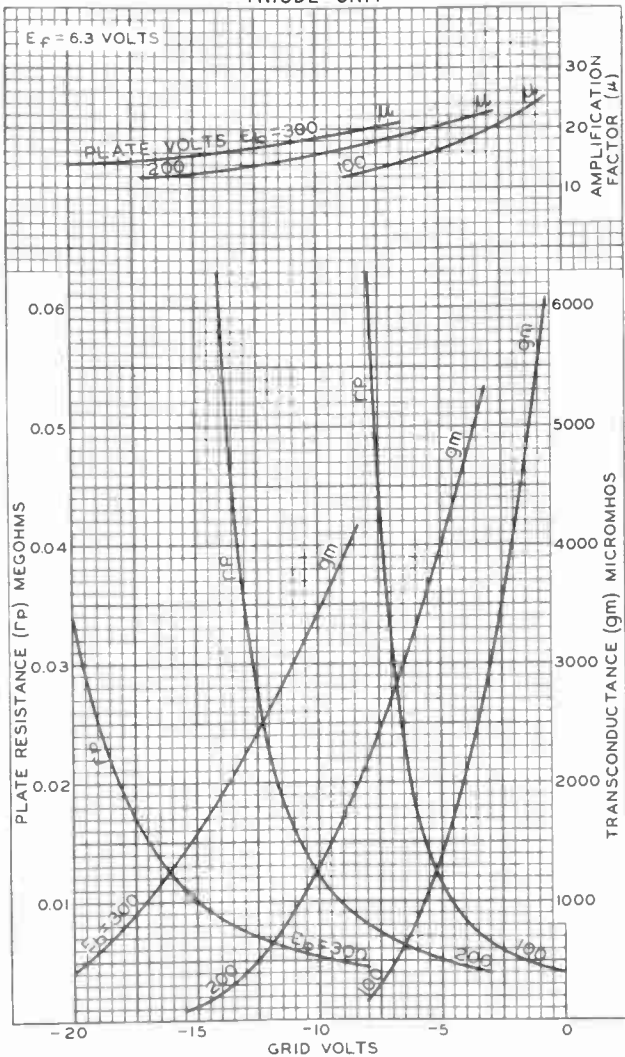
World Radio History



6AZ8

AVERAGE CHARACTERISTICS TRIODE UNIT

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FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA MARRISON, NEW JERSEY

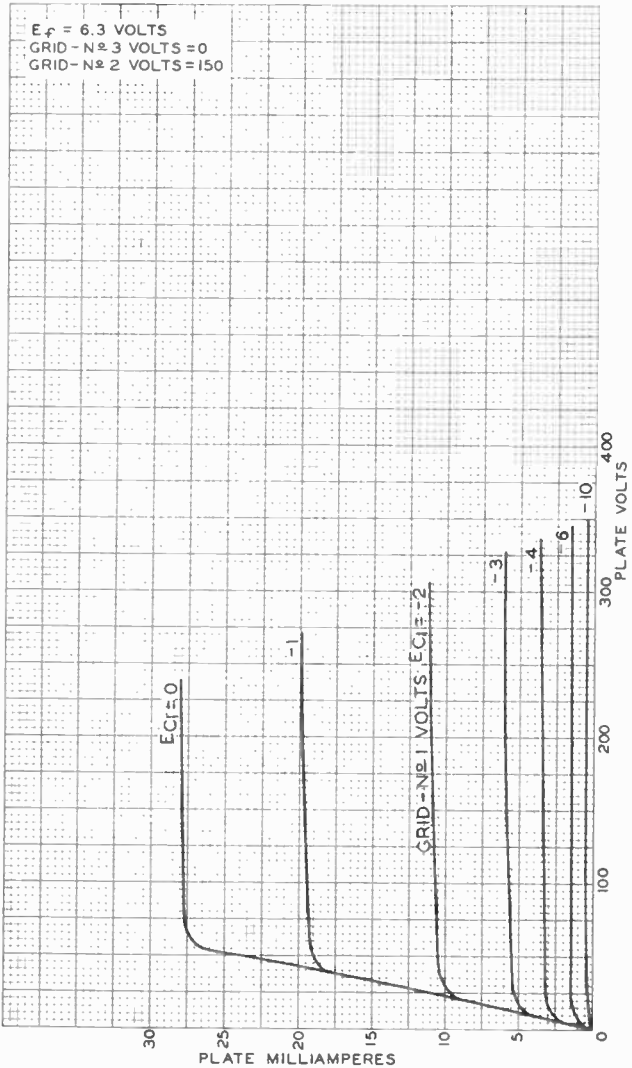
92CM-8519

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AVERAGE PLATE CHARACTERISTICS PENTODE UNIT



FEB. 3, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 8525

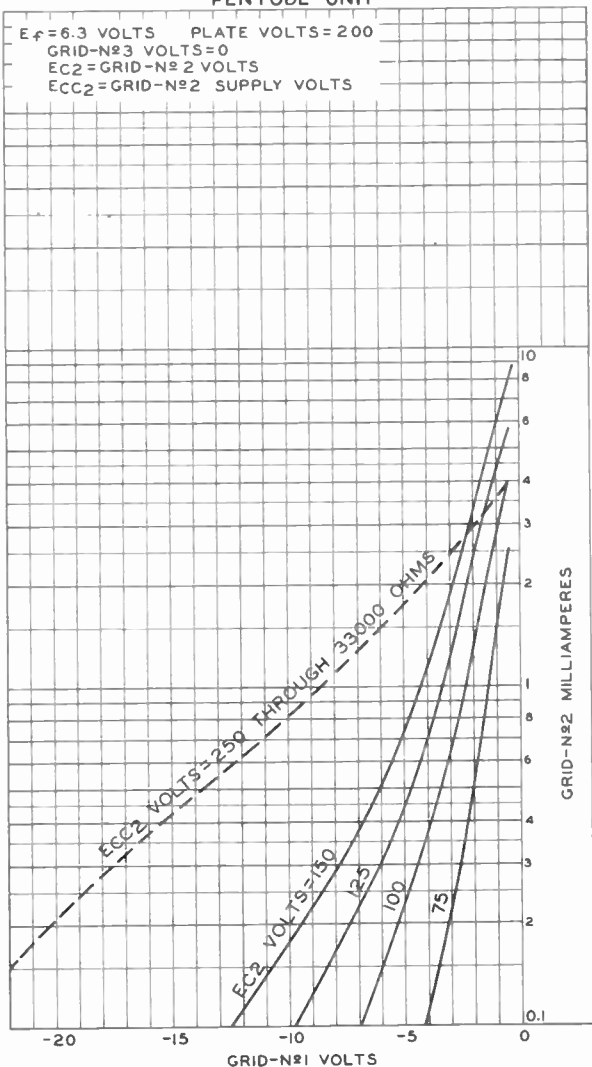


6AZ8

6AZ8

AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS PLATE VOLTS = 200
 GRID-N^o3 VOLTS = 0
 $E_{C2} =$ GRID-N^o2 VOLTS
 $E_{CC2} =$ GRID-N^o2 SUPPLY VOLTS



FEB. 2, 1955

TUBE DIVISION

92CM-8521

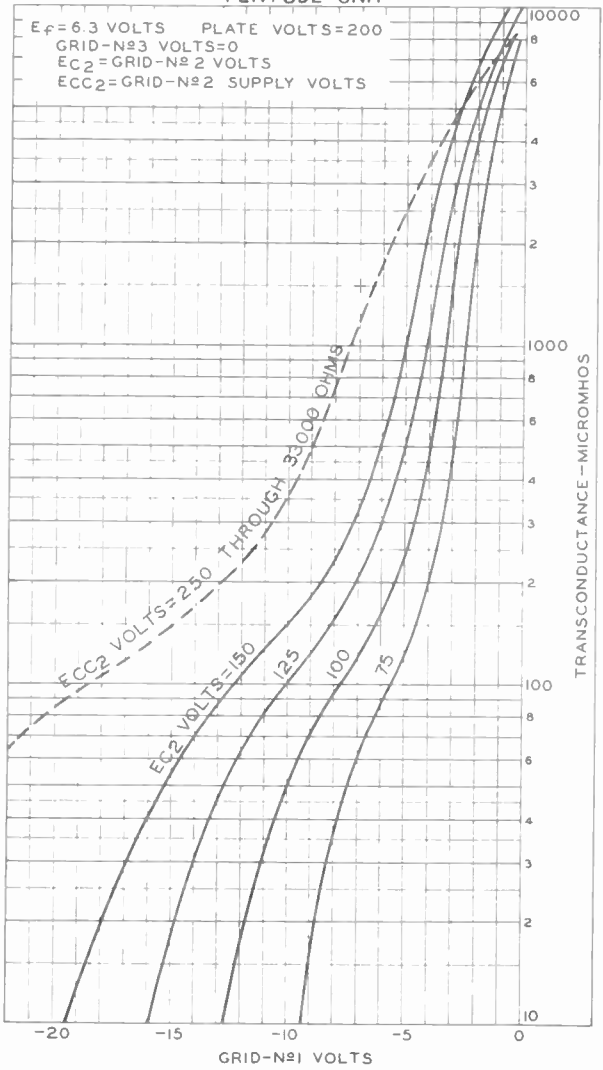
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AZ8



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AVERAGE CHARACTERISTICS PENTODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

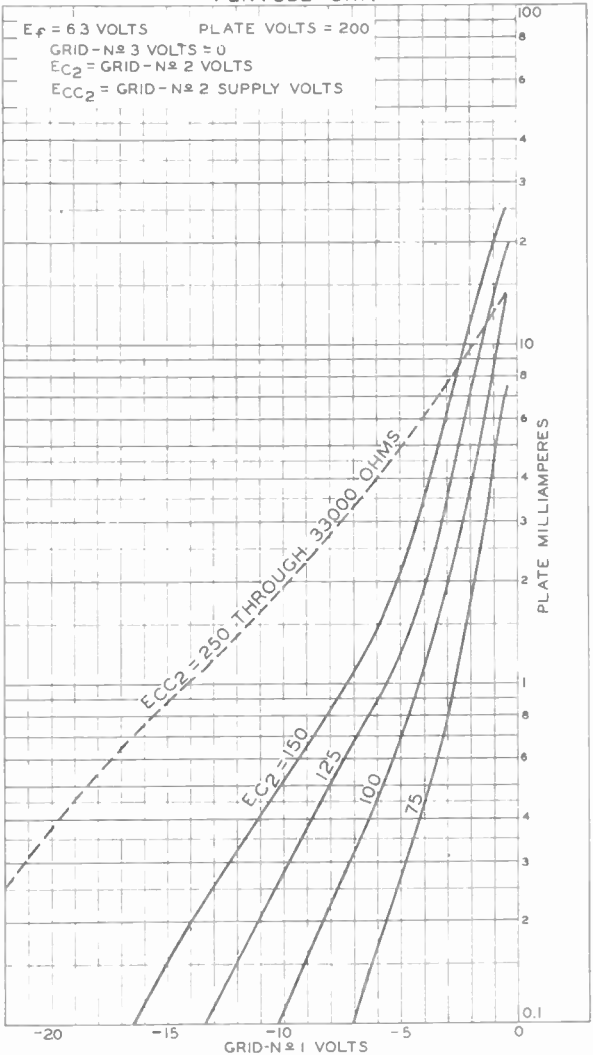
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AVERAGE CHARACTERISTICS PENTODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM - 8523





6B4-G

6B4-G
6B5

POWER AMPLIFIER TRIODE

Filament	Coated	
Voltage	6.3	a-c or d-c volts
Current	1.0	amp.
Maximum Overall Length		5-5/16"
Maximum Seated Height		4-3/4"
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium Shell Octal 8-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Filament		Pin 6 - No Connection
Pin 3 - Plate		Pin 7 - Filament
Pin 4 - No Connection		Pin 8 - No Connection
Mounting Position		Any



BOTTOM VIEW (G-5S₈)

Maximum Ratings, and Typical Operating Conditions for the 6B4-G are the same as for the Type 6A3.

Curves for the 6B4-G are essentially the same as those shown for Type 2A3.

6B5



DIRECT-COUPLED POWER AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.8	amp.
Maximum Overall Length		4-11/16"
Maximum Seated Height		4-1/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 6-Pin
Pin 1 - Heater		Pin 4 - Input-Triode
Pin 2 - Output-Triode		Grid
Plate		Pin 5 - Cathode
Pin 3 - Input-Triode		Pin 6 - Heater
Plate		
Mounting Position		Any



BOTTOM VIEW (EAS)

For additional data, refer to Type 6N6-G.

← Indicates a change.

May 1, 1941

RCA RADIODRON DIVISION
RCA MANUFACTURING COMPANY, INC.

TENTATIVE DATA





6B6-G

6B6-G



DUPLEX-DIODE HIGH-MU TRIODE

Heater [■] Coated Unipotential Cathode
 Voltage 6.3 a-c or d-c volts
 Current 0.3 amp.

Direct Interelectrode Capacitances (Approx.):

Triode Unit:

Grid to Plate	1.7	μf
Grid to Cathode	1.7	μf
Plate to Cathode	3.8	μf

Overall Length 4-7/32" to 4-15/32"

Seated Height 3-21/32" to 3-29/32"

Maximum Diameter 1-9/16"

Bulb ST-12

Cap Miniature

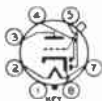
Base Small Shell Octal 7-Pin

Pin 1 - No Connection Pin 5 - Diode Plate #1

Pin 2 - Heater Pin 7 - Heater

Pin 3 - Triode Plate Pin 8 - Cathode

Pin 4 - Diode Plate #2 Cap - Grid



Mounting Position BOTTOM VIEW (G-7V) Any

TRIODE UNIT

Plate Voltage 250 max. volts

Characteristics:

Plate 250 volts

Grid -2 volts

Amp. Fact. 100

Plate Res. 91000 ohms

Transcond. 1100 μmhos

Plate Cur. 0.9 ma.

Typical Operation - Class A₁ Amplifier:

Same as Type 75 in RESISTANCE-COUPLED AMPLIFIER CHART

DIODE UNITS - Two

Consideration of these units is given under Type B5. Circuits will be similar to those shown for the 55 with fixed bias. Diode Biasing of the triode unit of the 6B6-G is not suitable.

■ 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.

Diode Curves under Type 6B7 apply to the 6B6-G. The Curves under Type 75 and 6SQ7 also apply to the 6B6-G.

← Indicates a change.

July 1, 1941

RCA RADIOTRON DIVISION
 RCA MANUFACTURING COMPANY INC.

World Radio History

DATA





6B7

6B7

TWIN DIODE—REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances (Pentode Unit):

Grid No.1 to Plate ⁰	0.007 max.	μ f
Input	3.5	μ f
Output	9.5	μ f

⁰ With external shield connected to cathode.

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-17/32"
Seated Length	3-25/32" \pm 1/8"
Maximum Diameter	1-9/16"
Bulb	ST-12
Cap.	Small
Base	Small-Shell Small 7-Pin
Basing Designation for BOTTOM VIEW	7D

Pin 1 - Heater
 Pin 2 - Pentode Plate
 Pin 3 - Pentode Grid No.2
 Pin 4 - Diode No.2 Plate



Pin 5 - Diode No.1 Plate
 Pin 6 - Cathode, Pentode Grid No.3
 Pin 7 - Heater Cap - Pentode Grid No.1

PENTODE UNIT AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	125 max.	volts
GRID-No.2 SUPPLY VOLTAGE	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	2.25 max.	watts
GRID-No.2 DISSIPATION	0.3 max.	watt
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	100	180	250	250	volts
Grid-No.2 Voltage	100	75	100	125	volts
Grid-No.1 Voltage	-3	-3	-3	-3	volts
Plate Resistance (Approx.)	0.3	1.0	0.8	0.6	megohm
Transconductance	950	840	1000	1125	μ mhos

(continued on next page)

←Indicates a change.

6B7



6B7

TWIN DIODE—REMOTE-CUTOFF PENTODE

Grid-No.1 Bias (Approx.) for

Cathode-Current Cutoff	-17	-13	-17	-21	volts
Plate Current	5.8	3.4	6	9	ma
Grid-No.2 Current	1.7	0.9	1.5	2.3	ma

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

→ PLATE CURRENT (For Each Diode) 1.0 max. ma

Diode Considerations:

See front of this Section.

*For additional data, refer to RESISTANCE-COUPLED
AMPLIFIER CHARTS at the front of this Section.*

*The curve shown under type 2B7 also applies to
the pentode unit of the 6B7.*

→ Indicates a change.

DEC. 30, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

DATA

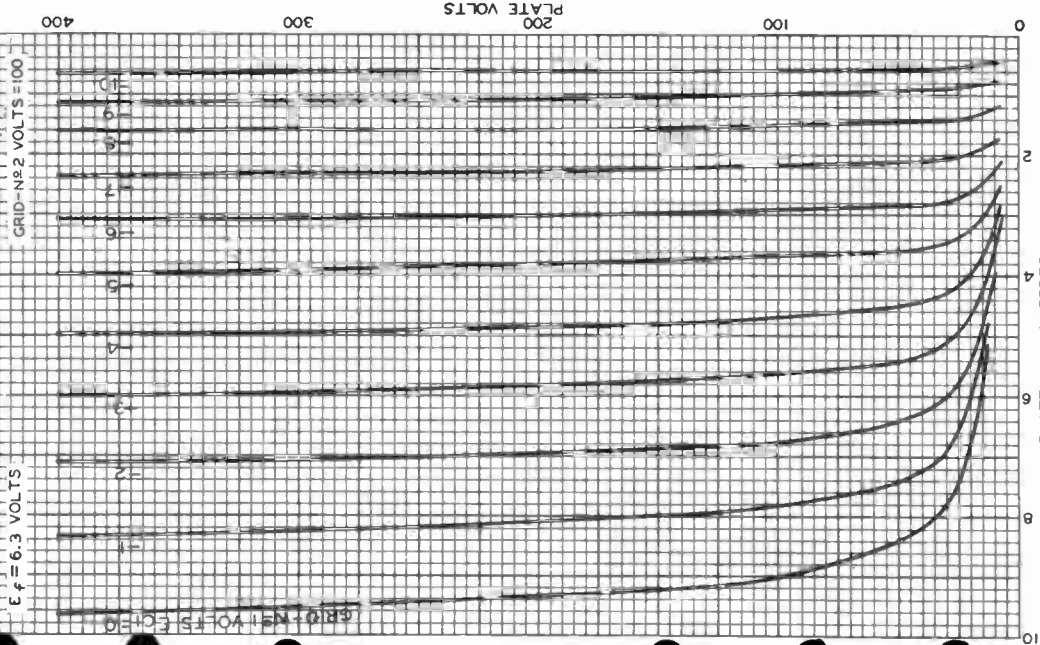


6B7

6B7

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



$E_f = 6.3$ VOLTS

GRID - N₂ 2 VOLTS = 100

GRID - N₁ 1 VOLTS ECHD

FEB. 17, 1936

PLATE MILLIAMPERES
TUBE DEPARTMENT

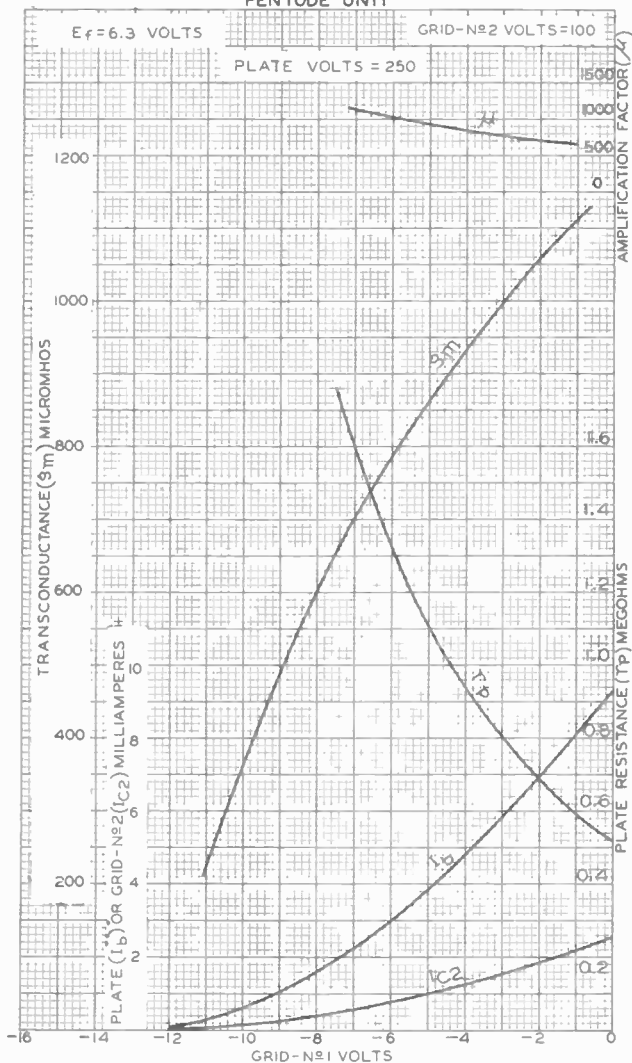
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4880

6B7



AVERAGE CHARACTERISTICS PENTODE UNIT



FEB. 25, 1937

TUBE DEPARTMENT

92CM-4745

RADIO CORPORATION OF AMERICA, NEW JERSEY



6B8-G

6B8-G

TWIN DIODE—REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts
Current 0.3 amp

Direct Interelectrode Capacitances (Pentode Unit):^o

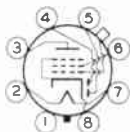
Grid No.1 to Plate 0.01 max. $\mu\mu\text{f}$
Input 3.6 $\mu\mu\text{f}$
Output 9.5 $\mu\mu\text{f}$

^o with external shield connected to cathode.

Mechanical:

Mounting Position Any
Maximum Overall Length 4-15/32"
Seated Length 3-3/4" \pm 5/32" ←
Maximum Diameter 1-9/16"
Bulb ST-12
Cap. Skirted Miniature
Base Small-Shell Octal 8-Pin
Basing Designation for BOTTOM VIEW G-8E

Pin 1 - No Connection
Pin 2 - Heater
Pin 3 - Pentode Plate
Pin 4 - Diode No.2 Plate
Pin 5 - Diode No.1 Plate



Pin 6 - Pentode Grid No.2
Pin 7 - Heater
Pin 8 - Cathode, Pentode Grid No.3
Cap - Pentode Grid No.1

Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as for Type 6B7.

Curves for the pentode unit of the 6B8-G are the same as those for Type 6B7.

For Diode Considerations, see front of this Section.

← Indicates a change.

DEC. 30, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

DATA



Twin Diode—Medium-Mu-Twin Triode

DUODECAR TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	volts
Current	0.600 ± 0.040	0.600 ^b	amp
Warm-up time (Average)	11	-	sec

Peak heater-cathode

voltage (Each unit).

Heater negative with

respect to cathode 200 max.

volts

Heater positive with

respect to cathode 200^c max.

volts

Direct Interelectrode
Capacitances (Approx.):^d

Diode Units:

Plate of unit No.1 to cathode,

internal shield, and heater 1.9 pf

Plate of unit No.2 to cathode,

internal shield, and heater 1.8 pf

Triode Units:

	Unit No. 1	Unit No. 2	
Grid to plate	1.5	1.5	pf
Grid to cathode,			
internal shield,			
and heater	1.7	1.8	pf
Plate to cathode,			
internal shield,			
and heater	1.6	0.6	pf
Plate of diode unit No.1			
to plate of diode			
unit No.2		0.7	pf
Triode grid to plate of			
diode unit No.1	0.015	0.005	pf
Triode grid to plate of			
diode unit No.2	0.02	0.005	pf
Plate of triode unit No.1			
to plate of triode			
unit No.2		0.9	pf

Characteristics, Class A₁ Amplifier (Each Triode Unit):

Plate Voltage	250	volts
Grid Voltage	-8	volts
Amplification Factor	18	
Plate Resistance (Approx.)	7200	ohms
Transconductance	2500	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate $\mu_a = 50$	-20	volts

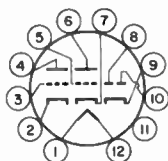


6B10

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	1.875"
Seated Length	1.250" to 1.500"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Small-Button Duodecarr 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12BF

Pin 1 - Heater	Pin 7 - Cathode of Triode Unit No.1
Pin 2 - Cathode of Triode Unit No.2	Pin 8 - Plate of Diode Unit No.2
Pin 3 - Grid of Triode Unit No.2	Pin 9 - Cathode of Diode Units No.1 & No.2
Pin 4 - Plate of Triode Unit No.2	Pin 10 - Plate of Diode Unit No.1
Pin 5 - Grid of Triode Unit No.1	Pin 11 - Internal Shield
Pin 6 - Plate of Triode Unit No.1	Pin 12 - Heater



TRIODE UNITS — AMPLIFIER — Class A₁

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	330 max.	volts
DC CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	3 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1 max.	megohm

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

PLATE CURRENT	5 max.	ma
-------------------------	--------	----

Characteristics, Instantaneous Value:

Plate Current for plate volts = 5 . . .	20	ma
---	----	----

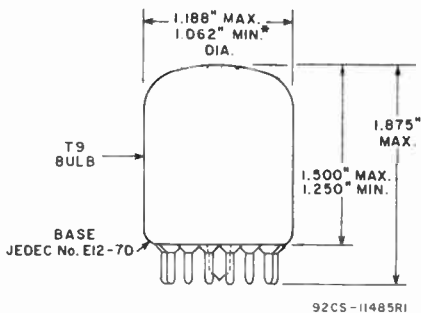
^a At heater amperes = 0.600.

^b At heater volts = 6.3.

^c The dc component must not exceed 100 volts.

^d without external shield.





* APPLIES TO MINIMUM DIAMETER EXCEPT IN AREA OF SEAL.





Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Maximum Heater-Cathode Voltage:		
Heater negative with respect to cathode: ^a		
Peak	5500	volts
DC component	900	volts
Heater positive with respect to cathode:		
Peak	300	volts
DC component	100	volts

Direct Interelectrode Capacitances (Approx.):^b

Plate to cathode and heater.	4.4	pf
Cathode to plate and heater.	6.0	pf
Heater to cathode.	1.8	of

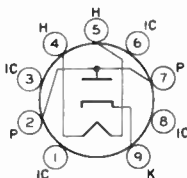
Mechanical:

Operating Position	Any
Type of Cathode.	Coated Unipotential
Maximum Overall Length	3.080"
Maximum Seated Length.	2.700"
Diameter	1.062" to 1.188"
Dimensional Outline.	See <i>General Section</i>
Bulb	T9

Bases (Alternates):

Small-Button Novar 9-Pin (JEDEC No. E9-75)	
Small-Button Novar 9-Pin with Exhaust Tio (JEDEC No. E9-89)	
Basing Designation for BOTTOM VIEW	9HP

- Pin 1 - Do Not Use^c
- Pin 2 - Plate
- Pin 3 - Do Not Use^c
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Do Not Use^c
- Pin 7 - Plate
- Pin 8 - Do Not Use^c
- Pin 9 - Cathode



DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

Peak Inverse Plate Voltage ^a	5000	volts
Peak Plate Current	1000	ma
DC Plate Current	165	ma
Plate Dissipation	5.3	watts

Characteristics, Instantaneous Value:

Tube voltage Drop for plate $m_3 = 250$ 32 volts

^a This rating is applicable where the duration of the voltage pulse does 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.

^b without external shield.

^c Socket terminals 1, 3, 6, and 8 should not be used for tie points. It is also recommended that socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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



Remote-Cutoff Pentode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts	←
Current at 6.3 volts	0.3	amp	

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield[▲]</i>	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	5.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5	5.5	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	100	250	volts
Grid No.3	<i>Connected to cathode at socket</i>		
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 (μmhos) = 40	-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 <i>General Section</i>
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

← Indicates a change.



6BA6

AMPLIFIER — Class A₁

Maximum Ratings, Design-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:	
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.	0.7 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.	3.4 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode.	200 max. volts
Heater positive with respect to cathode.	200 [•] max. volts

- ▲ With external shield JEDEC No.316 connected to cathode.
- The dc component must not exceed 100 volts.

→ Indicates a change.





6BA6

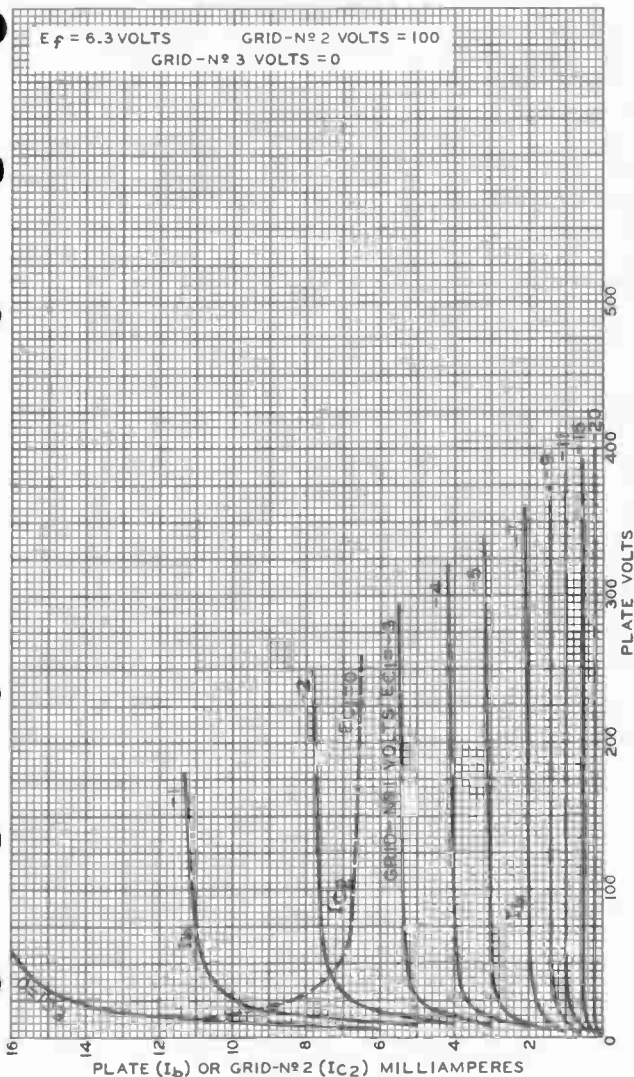
6BA6

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS

GRID-Nº 2 VOLTS = 100

GRID-Nº 3 VOLTS = 0



OCT. 22, 1945

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

92CM-6609

World Radio History

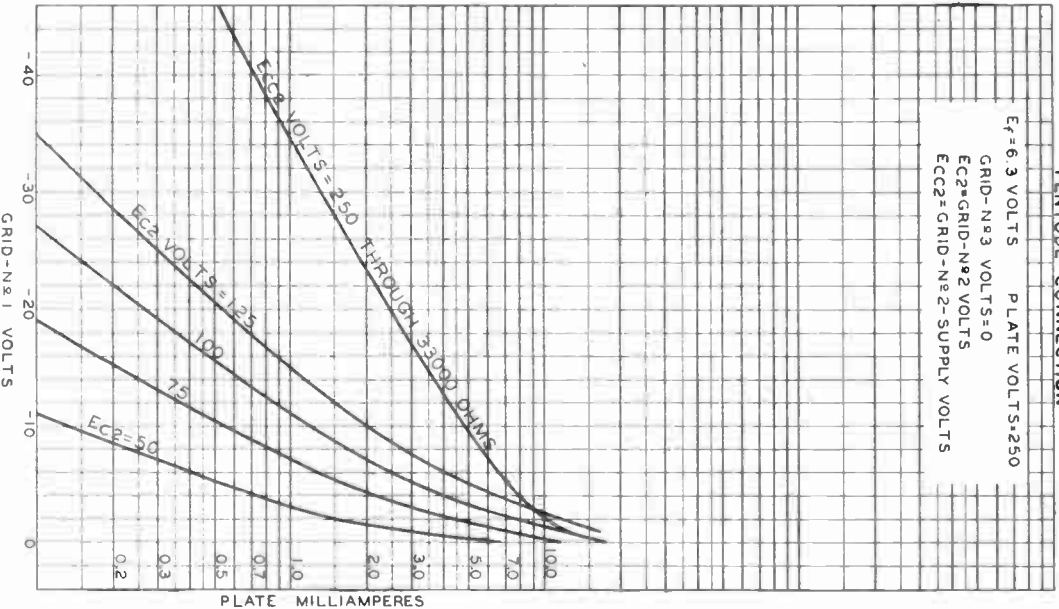
6BA6



6BA6

AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS PLATE VOLTS = 250
GRID-N^o3 VOLTS = 0
 $E_{C2} =$ GRID-N^o2 VOLTS
 $E_{CC2} =$ GRID-N^o2-SUPPLY VOLTS



NOV. 12, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARTSON NEW JERSEY

92CM-6622

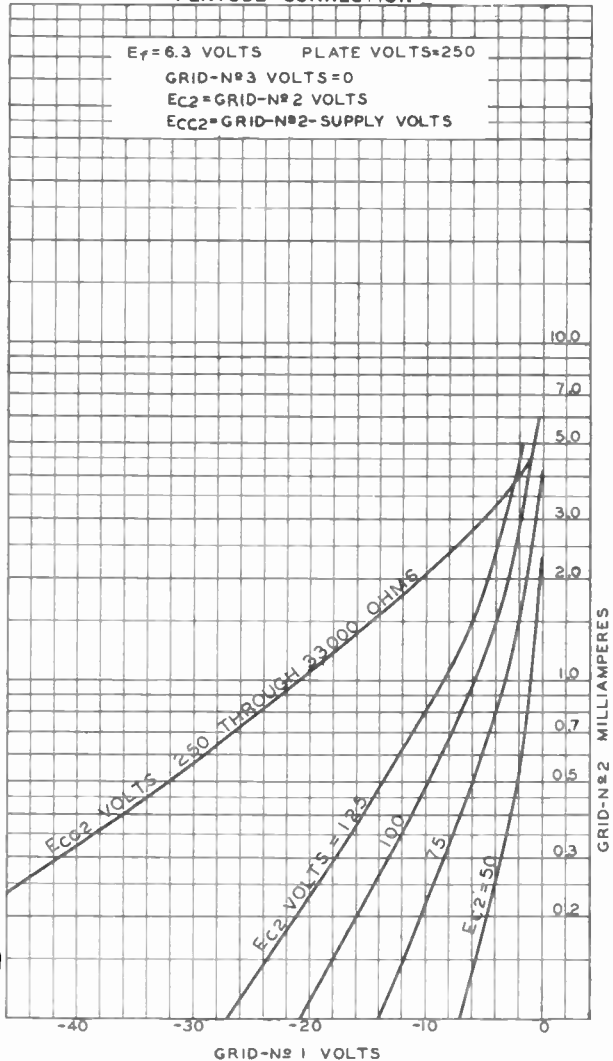


6BA6

6BA6

AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS PLATE VOLTS = 250
GRID-N°3 VOLTS = 0
 $E_{c2} =$ GRID-N°2 VOLTS
 $E_{c2} =$ GRID-N°2-SUPPLY VOLTS



NOV. 12, 1945

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6820

World Radio History

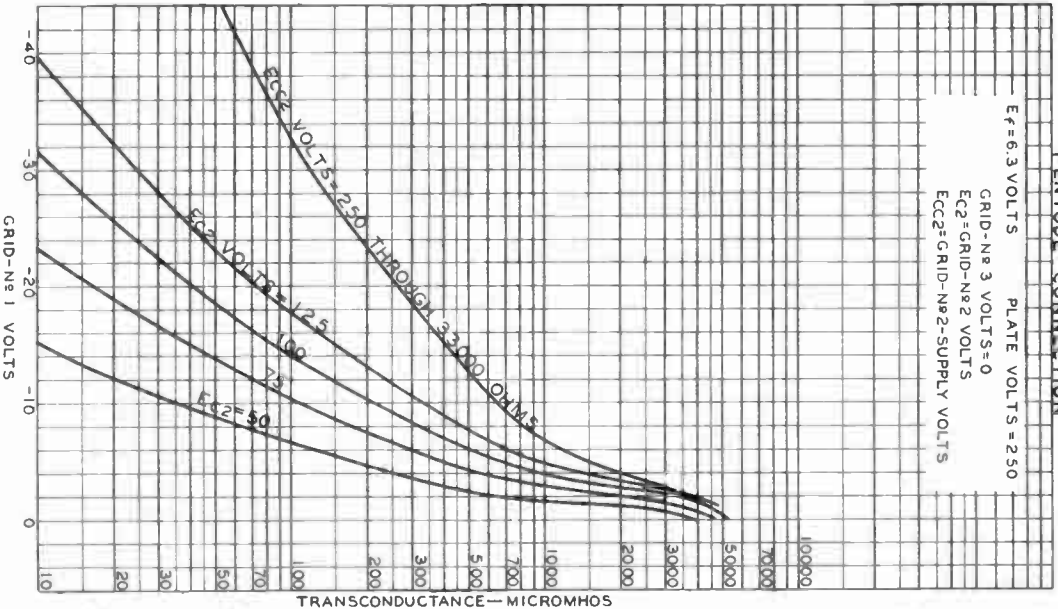
6BA6



6BA6

AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS PLATE VOLTS = 250
 GRID-№ 3 VOLTS = 0
 EC2 = GRID-№ 2 VOLTS
 EC2 = GRID-№ 2-SUPPLY VOLTS



DEC. 10, 1951

 TUBE DEPARTMENT
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6621R1



6BA7

6BA7

PENTAGRID CONVERTER

9-PIN MINIATURE TYPE

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)	9.5	μf
Plate to All Other Electrodes (Mixer Output)	8.3	μf
Grid No.1 to All Other Electrodes (Osc. Input)	6.7	μf
Grid No.3 to Plate	0.19 max.	μf
Grid No.3 to Grid No.1	0.1 max.	μf
Grid No.1 to Plate	0.05 max.	μf
Grid No.1 to All Other Electrodes Except Cathode	3.4	μf
Grid No.1 to Cathode	3.3	μf
Cathode to All Other Electrodes Except Grid No.1	4.0	μf

^o With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Sealed Length	2-3/8"
Length, Base Seat to Bulb Top (excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin
Basing Designation for BOTTOM VIEW	8CT

Pin 1-Grids No.2
& No.4
Pin 2-Grid No.1
Pin 3-Cathode
Pin 4-Heater
Pin 5-Heater



Pin 6-Grid No.5,
Internal
Shield
Pin 7-Grid No.3
Pin 8-Internal
Shield
Pin 9-Plate

CONVERTER SERVICE

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	300 max.	volts
GRID-No.5 & INTERNAL-SHIELD VOLTAGE ▲	0 max.	volts
GRIDS-No.2 & No.4 VOLTAGE.	100 max.	volts
GRIDS-No.2 & No.4 SUPPLY VOLTAGE	300 max.	volts
PLATE DISSIPATION.	2.0 max.	watts
GRIDS-No.2 & No.4 DISSIPATION.	1.5 max.	watts
TOTAL CATHODE CURRENT.	22 max.	ma

▲ See next page.

6BA7



6BA7 PENTAGRID CONVERTER

GRID-NO.3 VOLTAGE:

Negative bias value.	100 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

Characteristics - Separate Excitation:*

Plate Voltage.	100	250	volts
Grid-No.5 & Internal Shield. . .	Connected directly to ground		
Grids-No.2 & No.4 (Screen) Voltage . . .	100	100	volts
Grid-No.3 (Control Grid) Voltage	-1	-1	volt
Grid-No.1 (Oscillator Grid) Resistor . .	20000	20000	ohms
Plate Resistance (Approx.)	0.5	1	megohm
Conversion Transconductance	900	950	μ mhos
Conversion Transconductance (Approx.)# .	3.5	3.5	μ mhos
Plate Current.	3.6	3.8	ma
Grids-No.2 & No.4 Current.	10.2	10	ma
Grid-No.1 Current.	0.35	0.35	ma
Total Cathode Current.	14.2	14.2	ma

NOTE: The transconductance between grid No.1 and grids No.2 & No.4 connected to plate (not oscillating) is approximately 8000 micromhos under the following conditions: signal applied to grid No.1 at zero bias; grids No.2 and No.4 and plate at 100 volts; grid No.3 grounded; under the same conditions, the plate current is 32 milliamperes and the amplification factor is 16.5.

* Internal shield (Pins No.6 and No.8) connected directly to ground.

* 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 -20 volts.

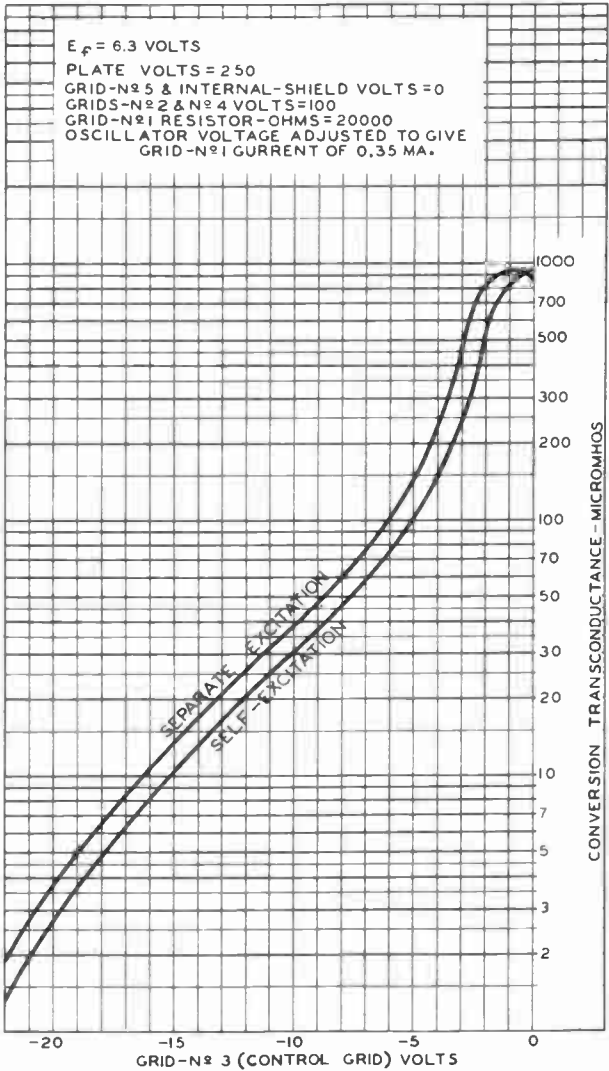


6BA7

6BA7

OPERATION CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 250
GRID-N^o 5 & INTERNAL-SHIELD VOLTS = 0
GRIDS-N^o 2 & N^o 4 VOLTS = 100
GRID-N^o 1 RESISTOR-OHMS = 20000
OSCILLATOR VOLTAGE ADJUSTED TO GIVE
GRID-N^o 1 CURRENT OF 0.35 MA.



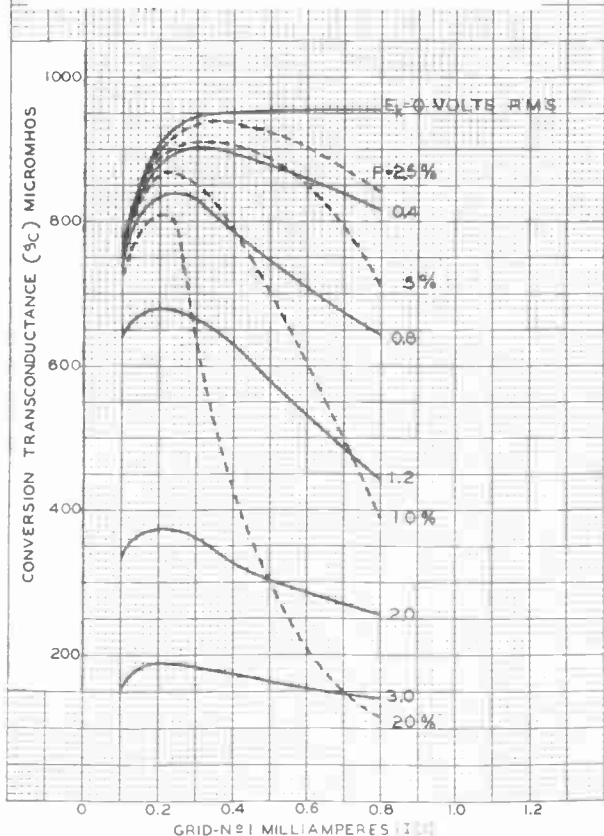
6BA7



6BA7

OPERATION CHARACTERISTICS WITH SELF-EXCITATION

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 250
 GRID-N^o5 & INTERNAL-SHIELD VOLTS = 0
 GRIDS-N^o2 & N^o4 VOLTS = 100
 GRID-N^o3 (CONTROL GRID) VOLTS = -1
 GRID-N^o1 RESISTOR-OHMS = 20000
 P-PERCENTAGE RATIO OF E_k TO $E_k + E_g$, WHERE
 E_k = VOLTAGE ACROSS OSCILLATOR-COIL SECTION
 BETWEEN GROUND AND CATHODE AND
 E_g = OSCILLATOR VOLTAGE BETWEEN CATHODE
 AND GRID





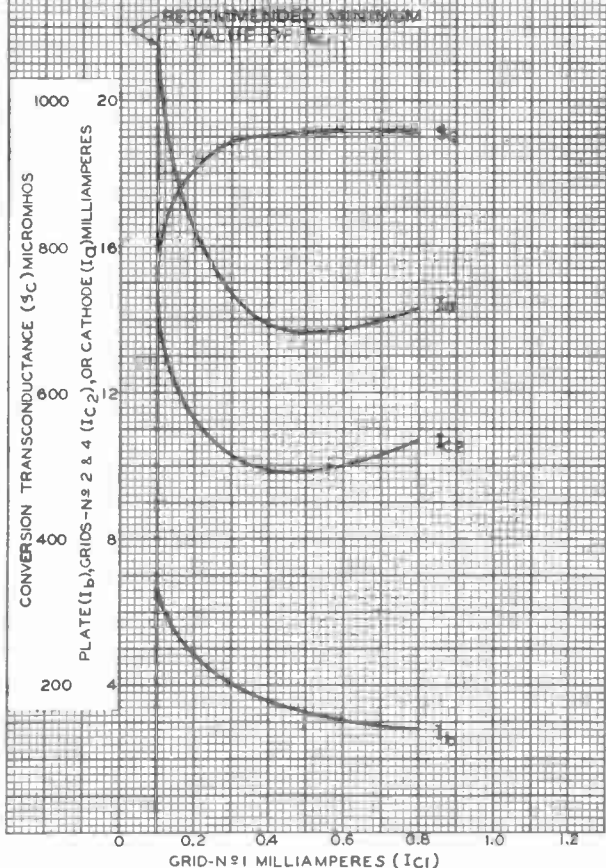
6BA7

6BA7

OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION

 $E_f = 6.3$ VOLTS

PLATE VOLTS = 250

GRID-N^o 5 & INTERNAL - SHIELD VOLTS = 0GRIDS-N^o 2 & N^o 4 VOLTS = 100GRID-N^o 3 (CONTROL GRID) VOLTS = -1GRID-N^o 1 RESISTOR - OHMS = 20000GRID-N^o 1 CURRENT VARIED BY ADJUSTMENT
OF OSCILLATOR VOLTAGE

SEPT. 30, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6980R2

World Radio History





6BA8-A

6BA8-A

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having
series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	. . . . . ac or dc volts
Current	0.6	. . . . . amp
Warm-up time (Average).	11	. . . . . sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield ^o	
<i>Triode Unit:</i>			
Grid to plate	2.2	2.2	μf
Grid to cathode and heater.	2.5	2.7	μf
Plate to cathode and heater.	0.4	1.9	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate.	0.04	0.03	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater.	10	10	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater.	3.6	4.5	μf
Triode grid to pentode plate	0.016	0.006	μf
Pentode grid No.1 to triode plate.	0.006	0.003	μf
Pentode plate to triode plate.	0.15	0.023	μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage.	200	65	200 volts
Grid-No.2 Supply Voltage.	-	150	150 volts
Grid-No.1 Voltage	-8	0	0 volts
Cathode Resistor.	-	-	180 ohms
Amplification Factor.	18	-	-
Plate Resistance (Approx.)	6700	-	400000 ohms

^o with external shield JETEC No.315 connected to cathode of unit under test.



6BA8-A

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	Triode Unit	Pentode Unit	
Transconductance	2700	-	9000 μ hos
Plate Current	8	42*	13 ma
Grid-No.2 Current	-	12.5*	3.5 ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μ a	-16	-	-10 volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb-Top (Excluding tip)	2" \pm 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)
Base Designation for BOTTOM VIEW . . . . .	.9DX

Pin 1 - Triode
Cathode

Pin 2 - Triode
Grid

Pin 3 - Triode
Plate

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Pentode
Cathode,
Grid No.3,
Internal
Shield

Pin 7 - Pentode
Grid No.1

Pin 8 - Pentode
Grid No.2

Pin 9 - Pentode
Plate

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center 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	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias value	-	50 max.	volts
Positive bias value	-	0 max.	volts
PLATE DISSIPATION	2 max.	3.25 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	-	1 max.	watt

* These values can be measured by a method involving a recurrent wave form such that the grid-No.2 input will be kept within ratings in order to prevent damage to the tube.



6BA8-A

6BA8-A

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Triode Unit Pentode Unit

For grid-No.2 voltages

between 150 and 300

voltages - See Grid-No.2 Input Rating

Chart at front of Receiving Tube Section

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

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 1.0 max. 1.0 max. megohm

[▲] The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

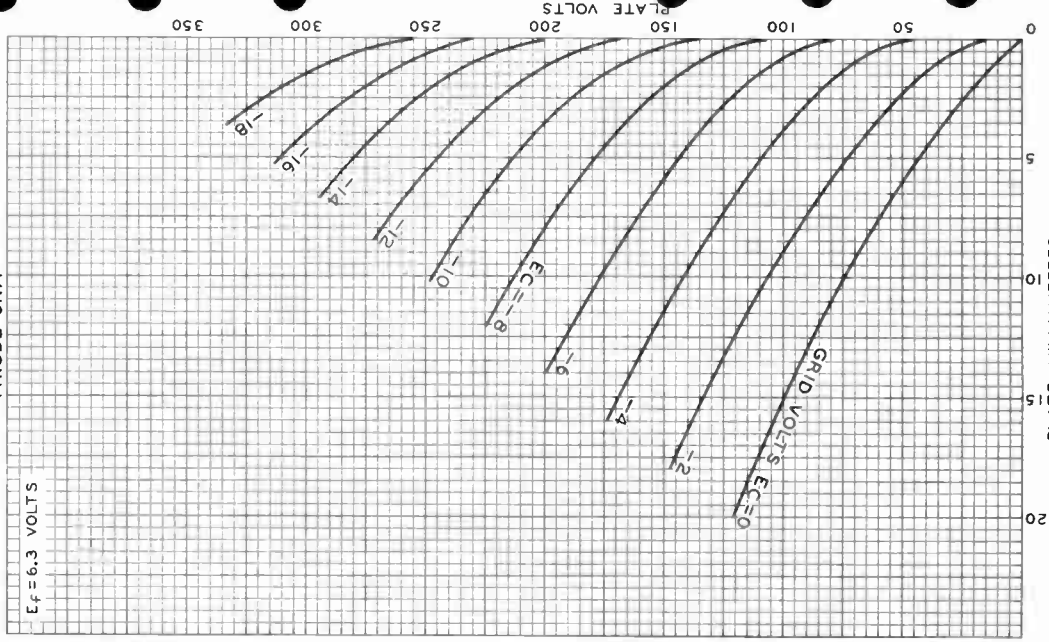
Because the internal shield is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.



6BA8-A

AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$ VOLTS



6BA8-A

World Precision

PLATE MILLIAMPERES

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

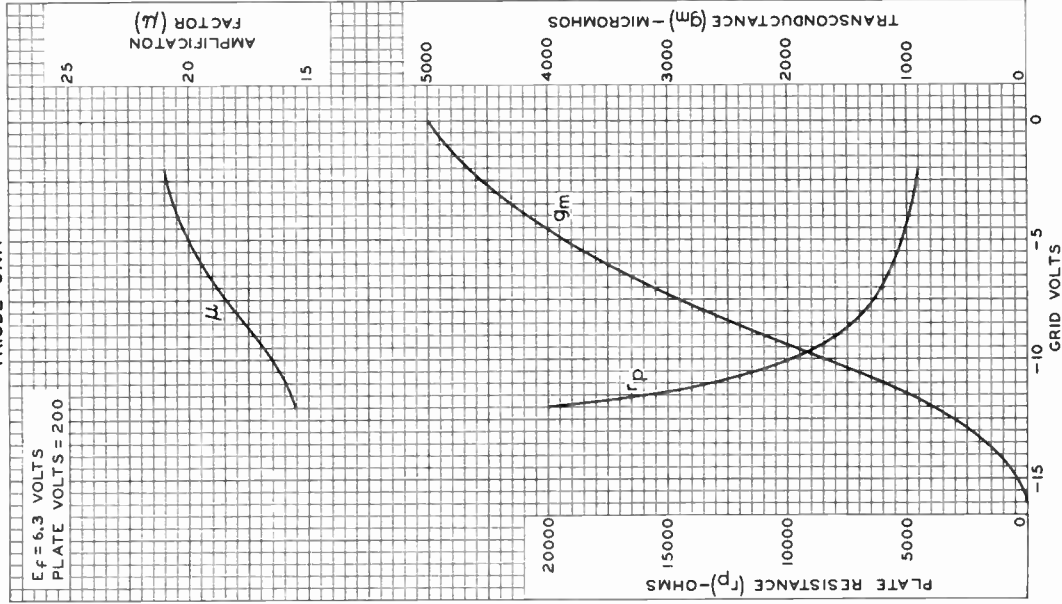
92CM-9338



6BA8-A

AVERAGE CHARACTERISTICS
TRIODE UNIT

$E_f = 6.3$ VOLTS
PLATE VOLTS = 200



6BA8-A

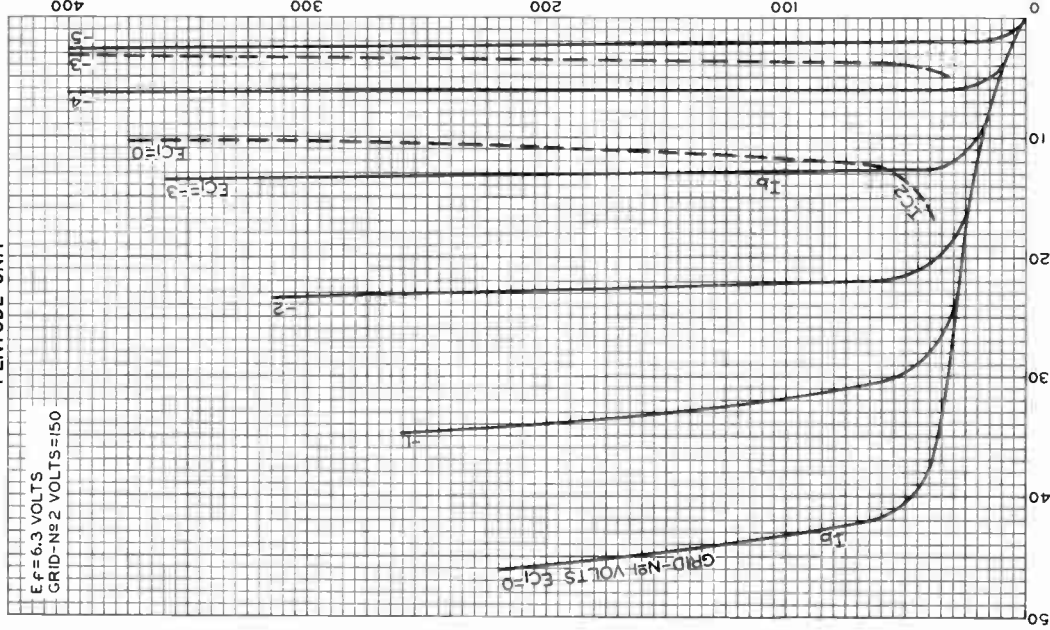
6BA8-A



6BA8-A

AVERAGE CHARACTERISTICS PENTODE UNIT

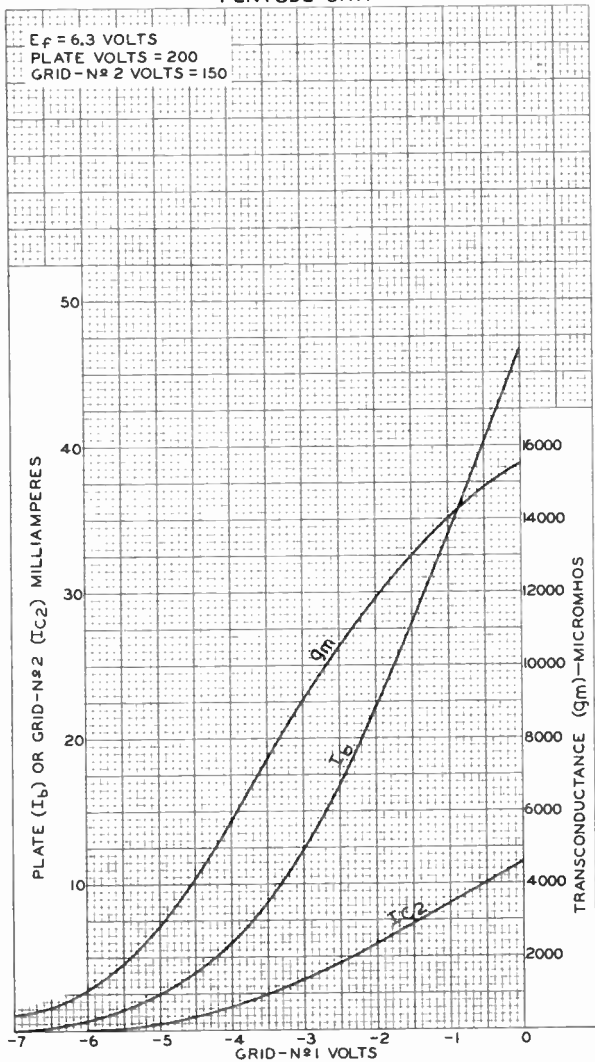
$E_f = 6.3$ VOLTS
GRID-Nº2 VOLTS = 150





6BA8-A

6BA8-A AVERAGE CHARACTERISTICS PENTODE UNIT





Medium-Mu Triode— Sharp-Cutoff Twin Pentode

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6 ^a volts
Current at heater volts = 6.3	0.600 ^b amp
Warm-up time (Average)	11 sec
Peak heater-cathode voltage:	
Heater negative with respect to cathode	200 max. volts
Heater positive with respect to cathode	200 ^c max. volts

Direct Interelectrode Capacitances:^d

Triode Unit:

Grid to plate	2.0	pf
Input: G_T to (K_T, H)	2.0	pf
Output: P_T to (K_T, IS, H)	1.0	pf

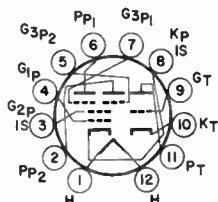
Each Pentode Unit:

G_{3P} to P_P	2.0	pf
G_{3P} to all other electrodes	3.6	pf
G_{1P} to all other electrodes	6.0	pf
P_P to all other electrodes	3.0	pf
G_{3P1} to G_{3P2}	0.026 max.	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See <i>General Section</i>
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)
Basing Designation for BOTTOM VIEW	12ER

- Pin 1—Heater
- Pin 2—Plate of Pentode Unit No.2
- Pin 3—Pentodes Grid No.2, Internal Shield
- Pin 4—Pentodes Grid No.1
- Pin 5—Grid No.3 of Pentode Unit No.2
- Pin 6—Plate of Pentode Unit No.1
- Pin 7—Grid No.3 of Pentode Unit No.1
- Pin 8—Pentodes Cathode, Internal Shield
- Pin 9—Triode Grid
- Pin 10—Triode Cathode
- Pin 11—Triode Plate
- Pin 12—Heater



6BA11

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Units				
		Each Separately ^e		Both Operating ^f		
Plate Voltage.	250	100	100	100	100	volts
Grid-No.3 Voltage.	-	0	0	-10	0	volts
Grid-No.2 Voltage.	-	67.5	67.5	67.5	67.5	volts
Grid-No.1 voltage.	-11	0	g	g	g	volts
Amplification Factor	18	-	-	-	-	
Grid No.3 Transconductance.	-	-	450	-	-	μmhos
Grid No.1 Transconductance.	1800	1700	-	-	-	μmhos
Plate Current.	5	-	2.5	0	2.5	ma
Grid No.2 Current.	-	-	-	7	4.4	ma
Grid-No.3 Voltage (Approx.) for plate μa = 100	-	-	-3.2	-	-	volts
Grid-No.1 Voltage (Approx.) for plate μa = 100	-18	2.3	-	-	-	volts

AMPLIFIER — Class A₁

	Triode Unit	Pentode Unit	
Maximum Ratings, Design-Maximum Values:			
Plate Voltage.	300 max.	300 max.	volts
Grid-No.3 (Suppressor-Grid) Voltage:			
Peak positive value.	-	50 max.	volts
DC negative value.	-	50 max.	volts
DC positive value.	-	3 max.	volts
Grid-No.2 (Screen-Grid) Voltage.	-	150 max.	volts
Grid-No.1 (Control-Grid) Voltage:			
Negative-bias value.	-	50 max.	volts
Cathode Current.	20	12 max.	ma
Grid-No.2 Input.	-	0.75 max.	watts
Plate Dissipation (Each Plate).	1.5	1.1 max.	watts

Maximum Circuit Values:

Grid-No.3-Circuit Resistance (Each Grid).	-	0.5 max.	megohm
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.25 max.	0.5 max.	megohm
For cathode-bias operation	1 max.	0.5 max.	megohm

- a For parallel heater operation.
- b For series heater operation current must be limited to 0.600 ± 0.040 amperes.
- c The dc component must not exceed 100 volts.
- d without external shield.
- e Plate and grid 3 of opposite unit grounded.
- f voltages and plate current apply to each section.
- g Adjusted to give a dc grid-no.1 current of 100 microamperes.





6BC4

6BC4

MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

For use as rf amplifier in cathode-drive circuits
of TV tuners covering range of 470-890 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.225	amp

Direct Interelectrode Capacitances (Approx.):*

Grid to plate	1.6	$\mu\mu\text{f}$
Grid to heater and cathode	2.9	$\mu\mu\text{f}$
Plate to heater and cathode	0.26	$\mu\mu\text{f}$
Heater to cathode	2.7	$\mu\mu\text{f}$

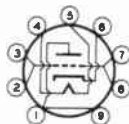
Characteristics - Class A₁ Amplifier:

Plate Supply Voltage	150	volts
Cathode-Bias Resistor	100	ohms
Amplification Factor	48	
Plate Resistance	4800	ohms
Transconductance	10000	μmhos
Grid Voltage (Approx.) for plate current of 10 μamp	-10	volts
Plate Current	14.5	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" \pm 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW	9DR

- Pin 1 - Plate
- Pin 2 - Grid
- Pin 3 - Grid
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Cathode
- Pin 7 - Grid
- Pin 8 - Grid
- Pin 9 - Plate

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	250 max.	volts
PLATE DISSIPATION	2.5 max.	watts
CATHODE CURRENT	25 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	75 max.	volts
Heater positive with respect to cathode	75 max.	volts

* With no external shield.

6BC4



6BC4

MEDIUM-MU TRIODE

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:

For cathode-bias operation 0.5 max. megohm
For fixed-bias operation not recommended

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

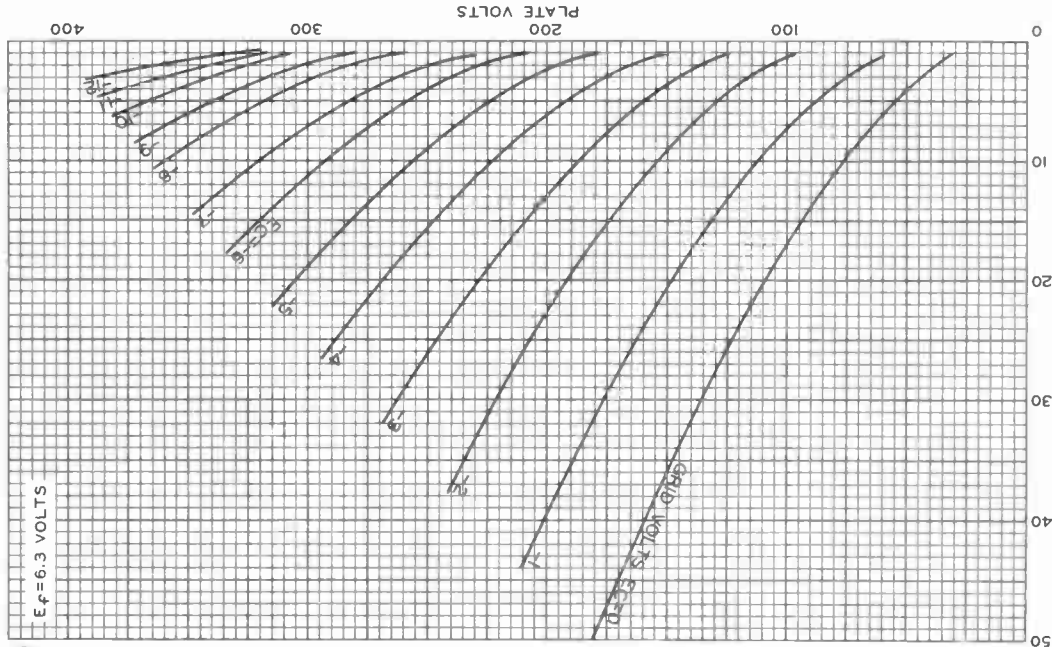
World Radio History



6BC4

6BC4

AVERAGE PLATE CHARACTERISTICS



FEB. 12, 1954

PLATE MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARTFORD, NEW JERSEY

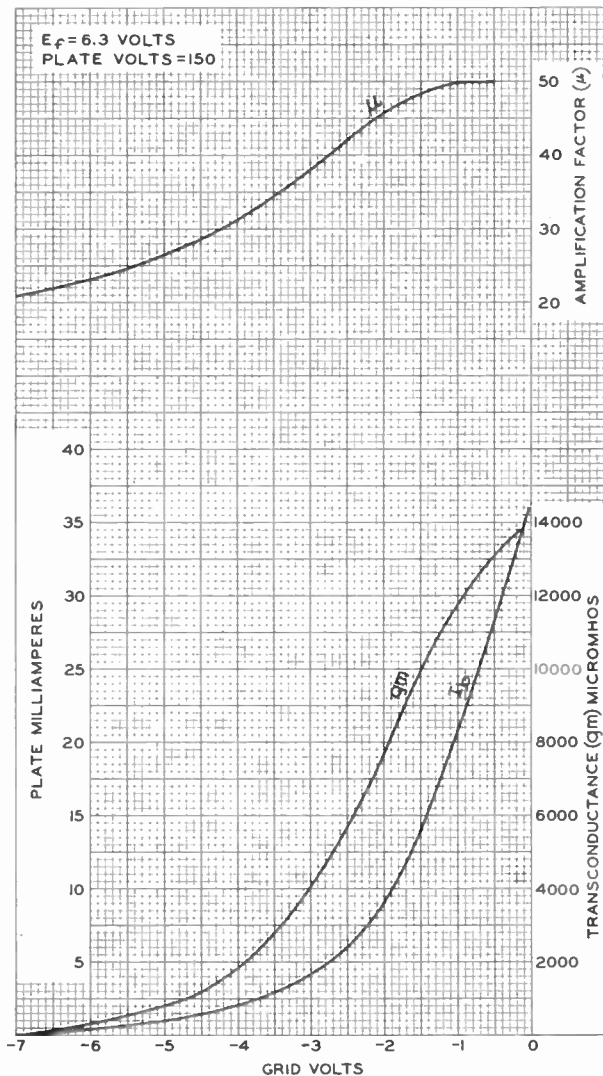
92CM-8241

6BC4



6BC4

AVERAGE CHARACTERISTICS



FEB. 12, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8240



6BC5

6BC5

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Useful at Frequencies up to 400 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

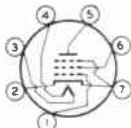
Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
<i>Pentode Connection:</i>			
Grid No.1 to plate . . .	0.030 max.	0.020 max.	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	6.5	6.6	$\mu\mu\text{f}$
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	1.8	2.6	$\mu\mu\text{f}$
<i>Triode Connection, Grid No.2 connected to plate:</i>			
Grid No.1 to plate and grid No.2	2.5	2.5	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3 & internal shield, and heater . . .	3.9	4.0	$\mu\mu\text{f}$
Plate and grid No.2 to cathode & grid No.3 & internal shield, and heater . . .	3.0	4.3	$\mu\mu\text{f}$

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" \pm 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2"
Base	Small-Button Miniature 7-Pin (JETEC No. E7-1)
Basing Designation for BOTTOM VIEW . . . . .	.78D

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



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

^o with external shield JETEC NO.316 connected to cathode.

← indicates a change.

6BC5



6BC5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE.	300 max.	volts
GRID-No.2 VOLTAGE.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section.</i>	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value.	0 max.	volts
PLATE DISSIPATION.	2 max.	watts
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.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section.</i>	
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.	100	125	250	volts
Grid-No.2 Voltage.	100	125	150	volts
Cathode-Bias Resistor.	180	100	180	ohms
Plate Resistance (Approx.)	0.6	0.5	0.8	megohm
Transconductance	4900	6100	5700	μmhos
Grid-No.1 Voltage (Approx.)				
for plate current of 10 μamp	-5	-6	-8	volts
Plate Current.	4.7	8	7.5	ma
Grid-No.2 Current.	1.4	2.4	2.1	ma

AMPLIFIER - Class A₁

Triode Connection - Grid No.2 Connected to Plate

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value.	0 max.	volts
PLATE & GRID-No.2 DISSIPATION (TOTAL).	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

Typical Operation and Characteristics:

Plate Voltage.	180	250	volts
Cathode-Bias Resistor.	330	820	ohms
Amplification Factor	42	40	
Plate Resistance (Approx.)	6000	9000	ohms
Transconductance	6000	4400	μmhos
Plate & Grid-No.2 Current (Total).	8	6	ma

→ Indicates a change.

MAR. 1, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



6BC7

6BC7

TRIPLE DIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.450	amp

Direct Interelectrode Capacitances (Approx.):^o

Plate No.1 to Cathode No.1, Heater, and Internal Shield	3.5	μ f
Plate No.2 to Cathode No.2, Heater, and Internal Shield	5.5	μ f
Plate No.3 to Cathode No.3, Heater, and Internal Shield	3.5	μ f

^o with no external shield.

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" \pm 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small Button Noval 9-Pin (JETEC No.E9-1)

Basing Designation for BOTTOM VIEW 9R

Pin 1 - Cathode of Diode No.3		Pin 6 - Plate of Diode No.2
Pin 2 - Plate of Diode No.3		Pin 7 - Cathode of Diode No.2
Pin 3 - Internal Shield		Pin 8 - Plate of Diode No.1
Pin 4 - Heater		Pin 9 - Cathode of Diode No.1
Pin 5 - Heater		

EACH DIODE

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE	330 max.	volts
PEAK PLATE CURRENT ^o	54 max.	ma
DC OUTPUT CURRENT	12 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Avg.	Max.	
Heater Current	1	0.410	0.450	0.490	amp
Plate Current (1) (Each Unit)	1,2	-	15	21	μ amp

^o In rectifier service, the minimum total effective plate-supply impedance per plate is 560 ohms.

MARCH 1, 1954

TUBE DEPARTMENT

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BC7



6BC7

TRIPLE DIODE

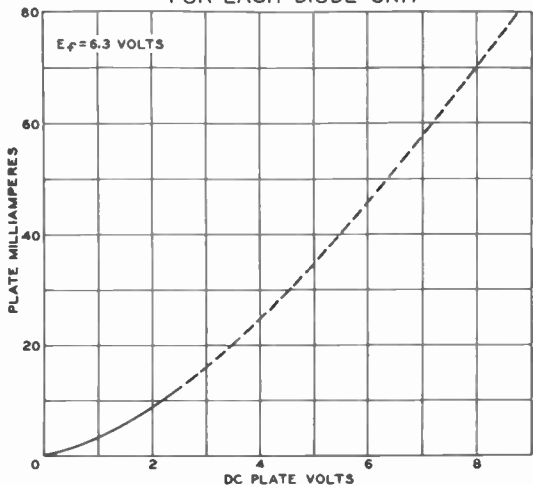
	Note	Min.	Average	Max.	
Plate Current (2) (Each Unit)	1.3	18	35	65	ma
Ratio of Plate Current of Unit No.3 to Plate Current of Unit No.1 .	1.3	0.77	1	1.3	

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

Note 2: With plate voltage of 0 volts, and plate load resistance of 40000 ohms. Each unit tested separately.

Note 3: With plate voltage of 5 volts and no plate load resistance. Each unit tested separately.

AVERAGE PLATE CHARACTERISTIC
FOR EACH DIODE UNIT



92CS-8219

MARCH 1, 1954

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

Medium-Mu Twin Triode With Semiremote-Cutoff Characteristic

9-PIN MINIATURE TYPE

For Use in Cascade-Type Circuits of VHF TV Tuners

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	0.40C	A
Heater-cathode Voltages:		
Peak positive	200	V
Peak negative ^a	200	V
Average	100	V

Direct Interelectrode Capacitances (Approx.)^b

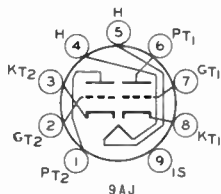
	Unit No. 1	Unit No. 2	
Grid to plate	1.2	1.2	pF
Input: G to (G, IS, H)	2.6	-	pF
Input: C to (G, I, H)	-	5.5	pF
Output: P to (G, I, H)	1.3	-	pF
Output: C to (G, I, H)	-	2.4	pF
Plate to cathode	-	0.12	pF
Heater to cathode	2.8	2.8	pF
Plate of unit No. 1 to plate of unit No. 2	0.02	-	pF
Plate of unit No. 2 to plate and grid of unit No. 1	0.04	-	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.187 in
Maximum Seated Length	1.937 in
Maximum Diameter	0.875 in
Length, Base Seat to Bulb Top including tip	1.469 to 1.656 in
Dimensional Outline (JEDEC 6-2)	See <i>General Section</i>
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)

TERMINAL DIAGRAM (Bottom View)

- Pin 1—Plate of Unit No. 1
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



— Indicates a change.



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 1
10-66

CHARACTERISTICS, CLASS A₁ AMPLIFIER*Values are for Each Unit*

Plate Voltage	150	V
Cathode Resistor	220	Ω
Amplification Factor	35	
→ Plate Resistance (Approx.)	5300	Ω
Transconductance	6200	μmho
Plate Current	10	mA
Grid Voltage for $g_m = 50 \mu\text{mho}$	-13	V

AMPLIFIER—CLASS A₁*Values are for Each Unit*

Design-Maximum Ratings

Plate Voltage ^a	150	V
Cathode Current	22	mA
Plate Dissipation	2.2	W

MAXIMUM CIRCUIT VALUES

Grid-No.1 Circuit Resistance	0.5	M Ω
<i>for cathode-bias operation</i>		

^a This rating may be as high as 300 volts under cutoff conditions when the tube is used as a cascode amplifier and the two units are connected in series.

^b With external shield JEDEC No.315 connected to internal shield.

^c Read as grounded grid amplifier.

→ Indicates a change.



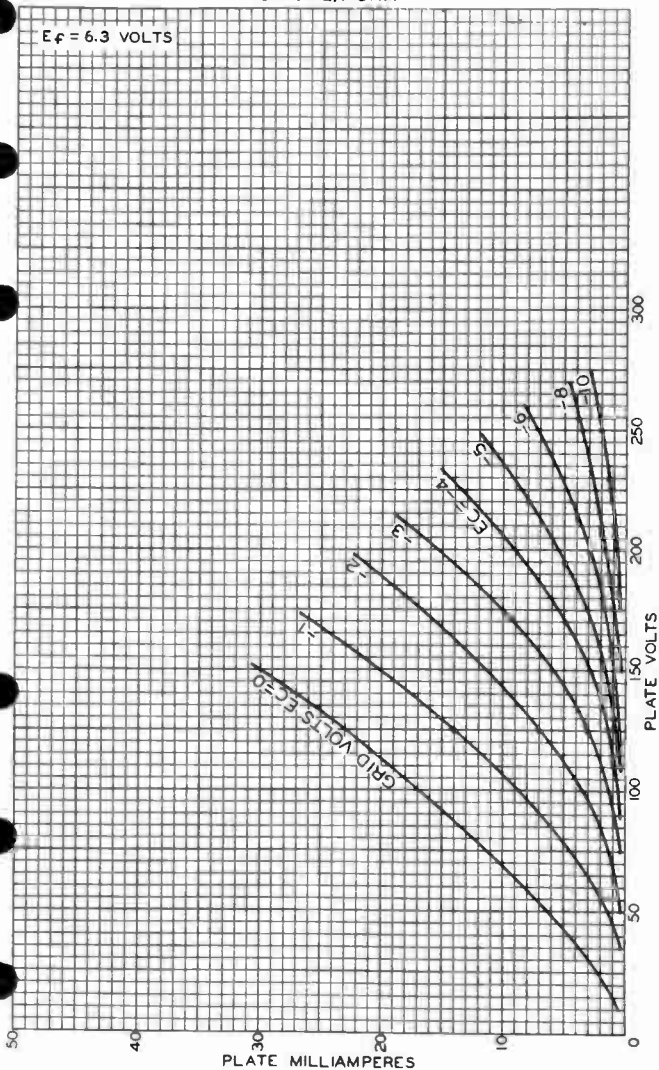


6BC8

6BC8

AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$ VOLTS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

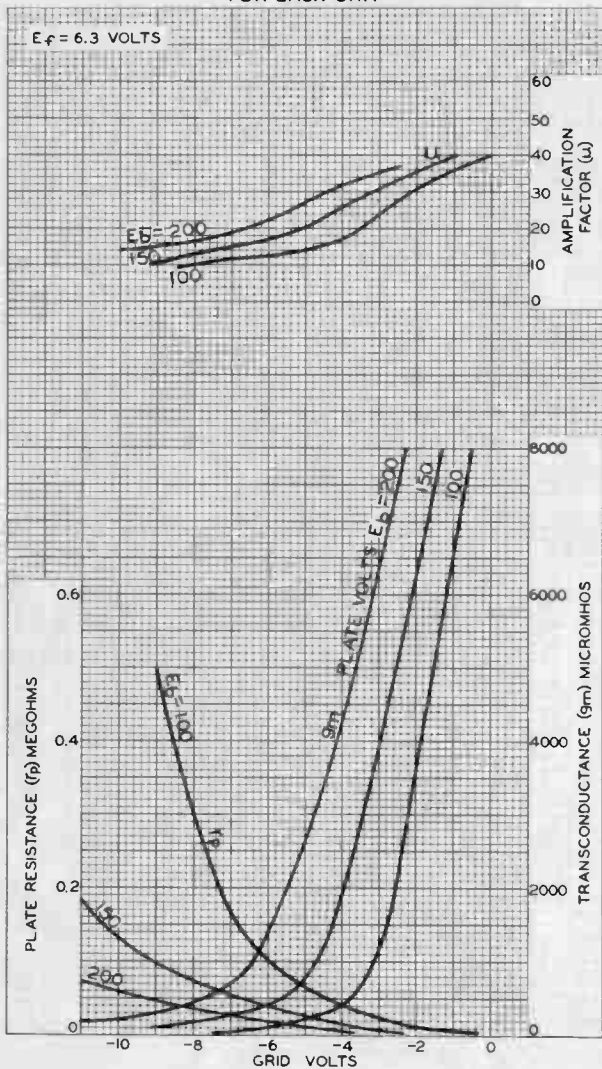
92CM-8789

6BC8



6BC8

AVERAGE CHARACTERISTICS FOR EACH UNIT



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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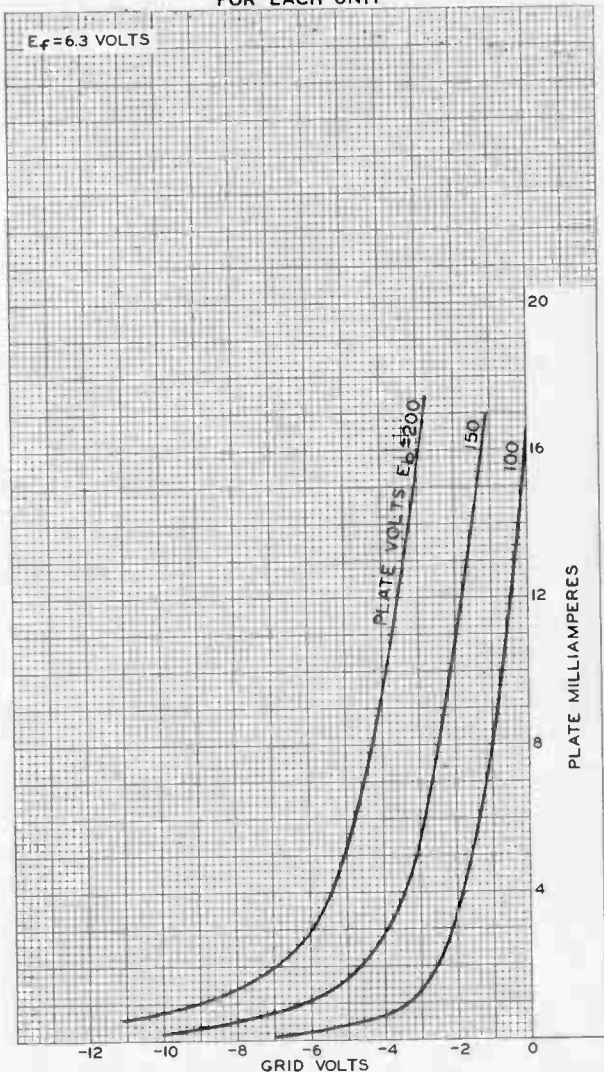
92CM-8790R1



6BC8

6BC8

AVERAGE CHARACTERISTICS FOR EACH UNIT



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8788R1

World Radio History





6BD4-A

6BD4-A

SHARP-CUTOFF BEAM TRIODE

HIGH-VOLTAGE, LOW-CURRENT, REGULATOR TYPE

Supersedes Type 6BD4

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.6	amp

Direct Interelectrode Capacitances:

Grid to Plate	1.0	μf
Input	3.8	μf
Output	0.04 max.	μf

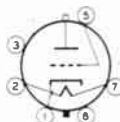
Amplification Factor . . . 1650

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-1/8"
Seated Length	4-1/2" \pm 1/8"
Maximum Diameter	1-23/32"
Weight (Approx.)	2.7 oz
Bulb	T-12
Cap	Small (JETEC No.C1-1)
Base	Short Jumbo-Shell Octal 6-Pin (JETEC No.B6-73)

BOTTOM VIEW

Pin 1 - Cathode
 Pin 2 - Heater
 Pin 3 - No
 Connection
 Pin 5 - Grid



Pin 7 - Heater
 Pin 8 - No
 Connection
 Cap - Plate

VOLTAGE-CONTROL SERVICE

Maximum Ratings, Design-Center Values:

DC PLATE VOLTAGE	27000 max.	volts
UNREGULATED DC SUPPLY VOLTAGE	55000 max.	volts
GRID VOLTAGE:		
DC value	-125 max.	volts
Peak value	-550 max.	volts
DC PLATE CURRENT	1.5 max.	ma
PLATE DISSIPATION	25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

Typical Operation As Shunt Voltage-Regulator Tube In Accompanying Circuits:

Unregulated Supply:			
DC voltage	29800	36300	volts
Equivalent resistance	8	8	megohms

6BD4-A



6BD4-A

SHARP-CUTOFF BEAM TRIODE

Voltage Divider Values:

R ₁ (5 watts)	120	220	megohms
R ₂ (2 watts)	1	1	megohm
R ₃ (1/2 watt)	2	3	megohms

Reference Voltage Supply:

DC value	500	500	volts
Equivalent resistance	1000	1000	ohms
Effective Grid-Plate Transconductance	138	116	μmhos

DC Plate Current:

For load current of 0 ma	1055	1035	μamp
For load current of 1 ma	100	100	μamp

Regulated DC Output Voltage:

For load current of 0 ma	20000	27000	volts
For load current of 1 ma	19700	26500	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

With unregulated supply having an equivalent resistance of at least 8 megohms	4 max.	megohms
With unregulated supply having an equivalent resistance less than 8 megohms	<i>See accompanying curve</i>	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current	1	0.54	0.66	amp
Grid Voltage (1)	1,2	-7	-	volts
Grid Voltage (2)	1,3	-	-40	volts
Grid-Voltage Change	1,4	-	9	volts

Note 1: With heater voltage of 6.3 volts ac or dc.

Note 2: With dc plate voltage of 30000 volts and dc plate current of 1 ma.

Note 3: With dc plate voltage of 30000 volts and dc plate current of 0.1 ma.

Note 4: Difference between grid voltage (1) and grid voltage (2).

OPERATING NOTES

Operation of the 6BD4-A with a plate voltage above approximately 16000 volts (absolute value) results in the production of x-rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

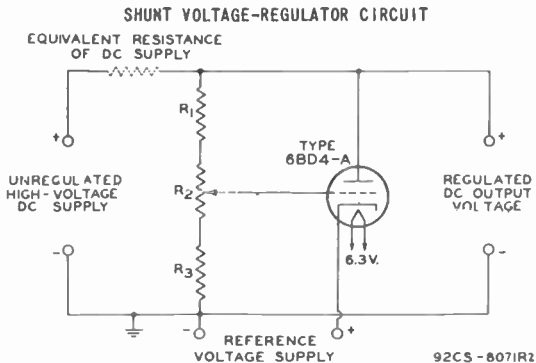
World Radio History



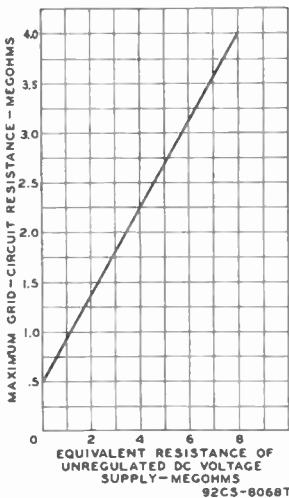
6BD4-A

6BD4-A

SHARP-CUTOFF BEAM TRIODE



Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the above tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6BD4-A.



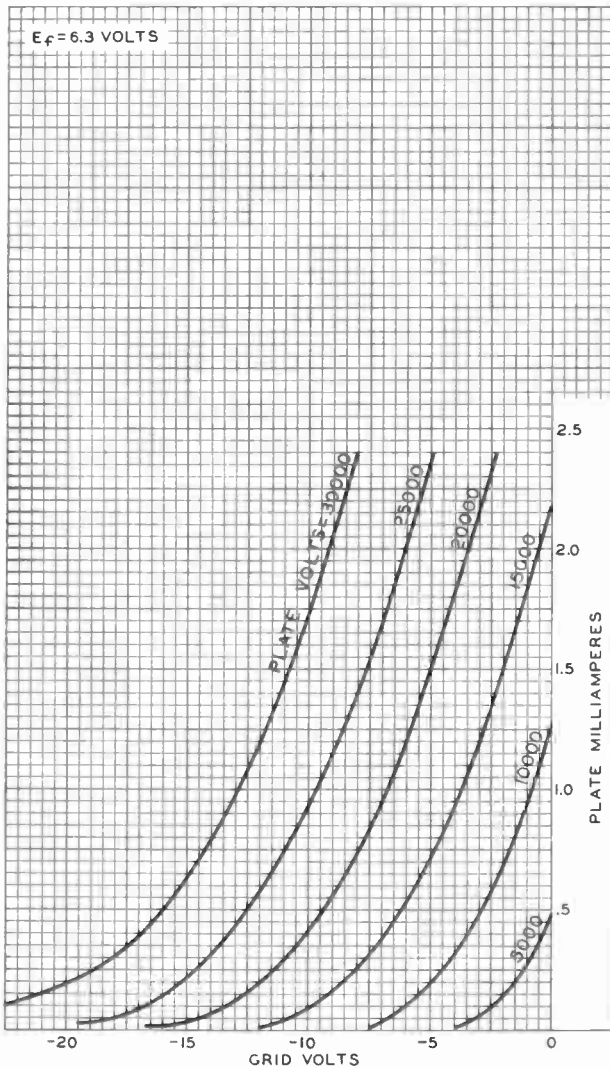
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6BD4-A



6BD4-A

AVERAGE TRANSFER CHARACTERISTICS



MAR. 11, 1954

TUBE DIVISION

92CM-8070R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Half-Wave Vacuum Rectifier

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6 volts
Current at heater volts = 6.3	1.200 amp
Peak heater-cathode voltage:	
Heater negative with respect to cathode ^a	5000 ^b max. volts
Heater positive with respect to cathode	300 ^c max. volts

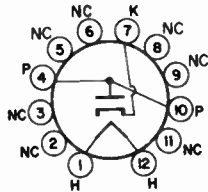
Direct Interelectrode Capacitance (Approx.)^d

P to (K,H)	10	pf
K to (P,H)	8.0	pf
H to K	3.4	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.875"
Seated Length	2.250" to 2.500"
Diameter	1.062" to 1.188"
Dimensional Outline	See <i>General Section</i>
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JFDEC No. E12-70)
Basing Designation for BOTTOM VIEW	12BL

- Pin 1-Heater
- Pin 2-No Internal Connection
- Pin 3-Same as Pin 2
- Pin 4-Plate
- Pin 5-Same as Pin 2
- Pin 6-Same as Pin 2
- Pin 7-Cathode
- Pin 8-Same as Pin 2
- Pin 9-Same as Pin 2
- Pin 10-Plate
- Pin 11-Same as Pin 2
- Pin 12-Heater



DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

Peak Inverse Plate Voltage ^a	5000 max.	volts
Peak Plate Current	1200 max.	ma
DC Plate Current	200 max.	ma
Plate Dissipation	6.5 max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 350	25	volts
--	----	-------



6BE3

- a This rating is applicable when the duration of the voltage pulse does not exceed 15 percent of the horizontal scanning cycle. For the 525-line, 40-frame system, 15 percent of the horizontal scanning cycle is 10 microsecond.
- b The dc component must not exceed 400 μ amp.
- c The dc component must not exceed 100 volt.
- d without external shield.
- e As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.



Pentagrid Converter

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	0.3	amp

Direct Interelectrode Capacitances:

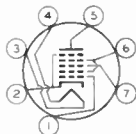
	Without External Shield	With External Shield ^a	
Grid No.3 to all other elec- trodes (kF input)	7	7	μf
Plate to all other electrodes (Mixer input)	8	13	μf
Grid No.1 to all other elec- trodes (Oscillator input) . .	5.5	5.5	μf
Grid No.3 to plate	0.3 max.	0.25 max.	μf
Grid No.3 to grid No.1	0.15 max.	0.1 max.	μf
Grid No.1 to plate	0.1 max.	0.05 max.	μf
Grid No.1 to cathode & grid No.5 .	3	4	μf
Cathode & grid No.5 to all other electrodes except grid No.1 . .	15	20	μf

Mechanical:

Operating Position Any
 Maximum Overall Length 2-1/8"
 Maximum Sealed Length 1-7/8"
 Length, Base Bent to Bulb Top (Excluding Tip) . . 1-1/2" ± 3/32"
 Diameter 0.650" to 0.750"
 Dimensional Outline See General Section
 Bulb F5-1/2
 Base Small-Button Miniature 7-Pin (JEDEC No. E7-1)

Base 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-Maximum 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
GRIDS-NO.2 & NO.4 VOLTAGE	110 max.	volts

← Indicates a change.



6BE6

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	200	max.	volts
Heater positive with respect to cathode	200 ^b	max.	volts

Characteristics:

With separate excitation^c

Plate Voltage	100	250	volts
Grid-No.3 Voltage	-1.5	-1.5	volts
Grids-No.2 & No.4 Voltage	100	100	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	μ mhos
Grid-No.3 Voltage (Approx.) for conversion transconductance (μ mhos) =			
10	-30	-30	volts
100	-6	-6	volts
Plate Current	2.6	2.9	ma
Grids No.2 & No.4 Current	7	6.8	ma
Grid-No.1 Current	0.5	0.5	ma
Cathode Current	10.1	10.2	ma

Oscillator Characteristics (Not Oscillating):

With grids No.2 & No.4 connected to plate

Plate and Grids-No.2 & No.4 Voltage	100	volts
Grid-No.3 Voltage	0	volts
Grid-No.1 Voltage	0	volts
Amplification Factor between grid No.1 and grids No.2 & No.4 connected to plate	20	
Transconductance between grid No.1 and grids No.2 & No.4 connected to plate	7250	μ mhos
Cathode Current	25	ma
Grid-No.1 Voltage (Approx.) for plate μ a = 10	-11	volts

^a with external shield JEDEC No.316 connected to cathode.

^b The dc component must not exceed 100 volts.

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



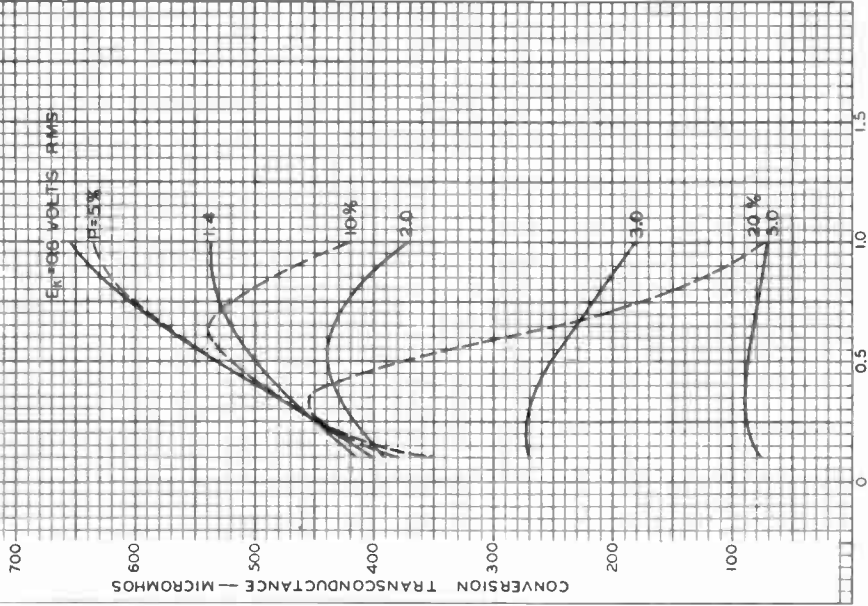


6BE6

6BE6

OPERATION CHARACTERISTICS WITH SELF-EXCITATION

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 250
 GRIDS - N^o 2 & N^o 4 VOLTS = 100
 GRID - N^o 3 CONTROL-GRID VOLTS = -1
 GRID - N^o 1 RESISTOR-OHMS = 20000
 P - PERCENTAGE RATIO OF E_k TO $E_k + E_g$, WHERE
 E_k = VOLTAGE ACROSS OSCILLATOR-COIL SECTION
 BETWEEN GROUND & CATHODE
 E_g = OSCILLATOR VOLTAGE BETWEEN CATHODE & GRID



NOV. 12, 1945

GRID - N^o 1 MILLIAMPERES

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

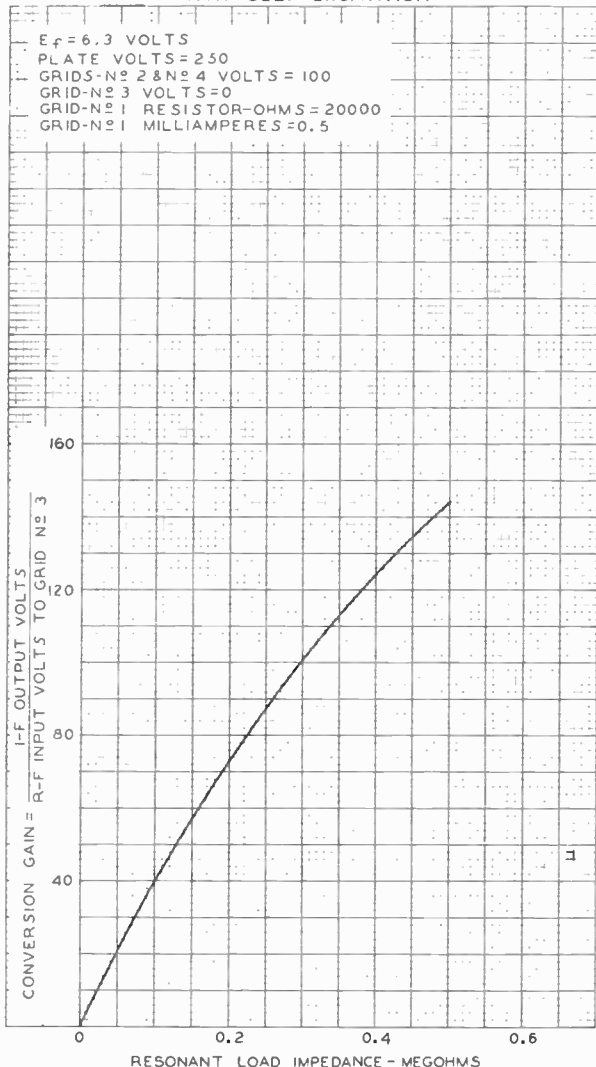
92CM-6625

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OPERATION CHARACTERISTIC WITH SELF-EXCITATION



OCT. 16, 1945

RCA VICTOR DIVISION

92CM - 6805

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

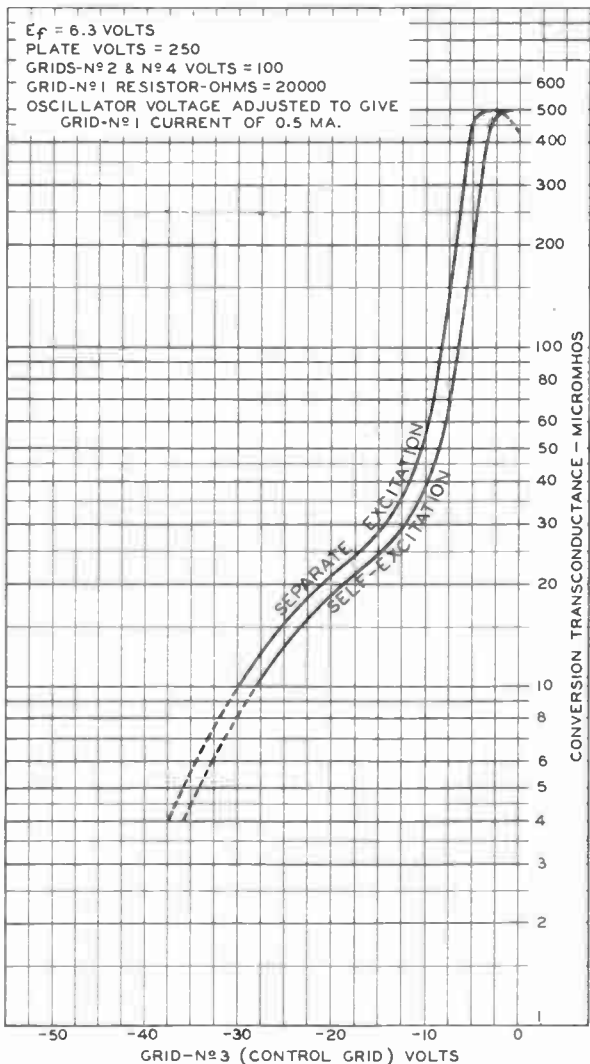
World Radio History



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OPERATION CHARACTERISTICS



SEPT. 26, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
World Radio History

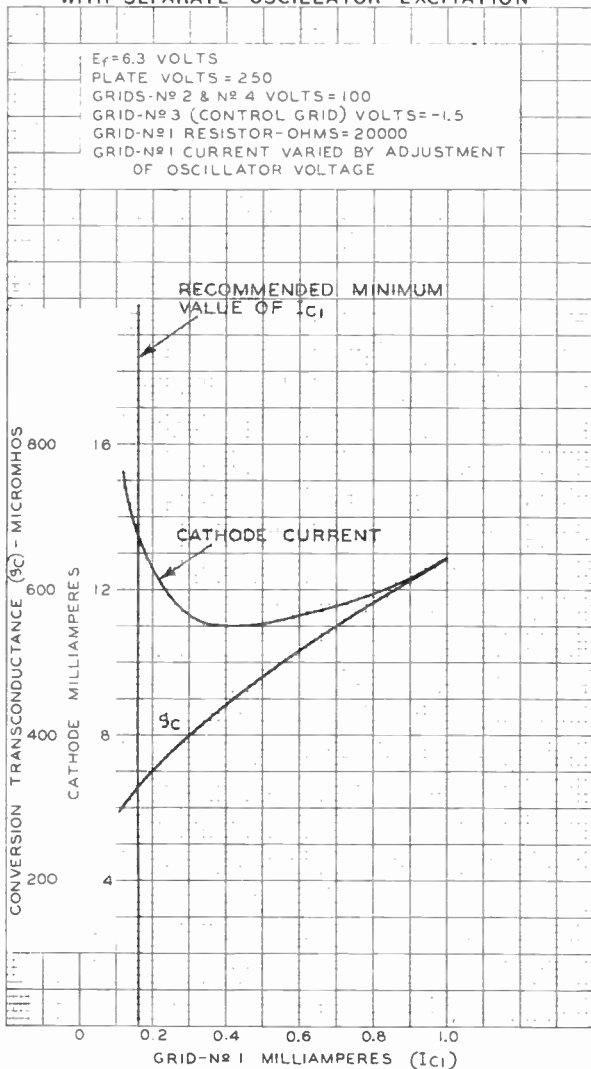
92CM-6601

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OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION



NOV. 12, 1945

RCA VICTOR DIVISION

92CM-6624

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World Radio History

Dual-Control Sharp-Cutoff Pentode— Beam Power Tube

DUODECAR TYPE

For Combined FM-Sound-Detector & AF-Power-Amplifier
Applications in Low-B* TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	1.200	A ←

Direct Interelectrode Capacitances

Without external fields

Pentode Unit

Grid No. 1 to plate	C_{g1-p}	0.036	pF
Grid No. 2 to plate	C_{g3-p}	3.2	pF
Input: G1 to (K, IS, P, μ)	C_i	6.5	pF
Grid No. 3 to all: G2 to (K, IS, P, μ , Si, H)	C_{g3-all}	8.0	pF
Grid No. 1 to Grid No. 3	C_{g1-g3}	0.11	pF

Beam Power Unit

Grid No. 1 to plate	C_{g1-p}	0.24	pF
Input: G1 to (K, IS, P, μ , H)	C_i	13	pF
Output: P to (K, IS, P, μ , H)	C_o	10	pF

Coupling

Pentode plate to beam-power plate	C_{p-p}	0.13	pF
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For the following characteristics, see Conditions

		Pentode Unit	Beam Power Unit	
Plate Resistance (Approx.)	r_p	150	30	k Ω
Transconductance				
Grid No. 1 to plate	$g_m(g1-p)$	1000	8600	μ mho
Grid No. 3 to plate	$g_m(g3-p)$	400	-	μ mho
Zero-Signal Plate				
Current	I_{b0}	1.3	36	mA
Max-Signal Plate Current	I_b	-	40	mA
Zero-Signal Grid-No. 2				
Current	I_{c2}	2	3	mA
Max-Signal Grid-No. 2				
Current	I_{c2}	-	9	mA
Total Harmonic				
Distortion		-	10	%
Max-Signal Power Output	P_o	-	2.4	W
Cutoff DC Grid-No. 1				
Voltage for $I_b = 10 \mu A$	$E_{c1(co)}$	-4.5	-	V
Cutoff DC Grid-No. 3				
Voltage for $I_b = 10 \mu A$	$E_{c3(co)}$	-4.5	-	V

Conditions

Heater Voltage	E_h	—Bogey value—	V	
DC Plate Supply Voltage	E_{bb}	150	145	V

← Indicates a change.



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Electronic Components and Devices Harrison N J

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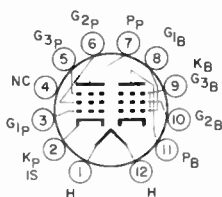
Grid No.3	-	Connected to negative end of R_k	-	V
DC Grid-No.2 Supply Voltage . . .	E_{cc2}	100	110	V
Grid No.1	-	Connected to negative end of R_k	-	
DC Grid-No.1 Voltage	E_{c1}	-	-6	V
Peak AF Grid-No.1 Voltage	e_{g1m}	-	6	V
Cathode Resistor	R_k	560	-	Ω
Load Resistor	R_L	-	3000	Ω

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.625 in
Maximum Seated Length	2.250 in
Maximum Diameter	1.188 in
Dimensional Outline (JEDEC 9-59)	See <i>General Section</i>
Envelope	JEDEC T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Heater
- Pin 2 - Pentode Cathode
- Pin 3 - No. 3 Internal Connection
- Pin 4 - Pentode Grid No. 1
- Pin 5 - No. 4 Internal Connection
- Pin 6 - Pentode Grid No. 2
- Pin 7 - Pentode Plate
- Pin 8 - Beam-Power Grid No. 1
- Pin 9 - Beam-Power Cathode
- Pin 10 - Beam-Power Grid No. 2
- Pin 11 - Beam-Power Plate
- Pin 12 - Heater



12EZ

DESIGN-MAXIMUM RATINGS

For operation with Pentode Unit as FM Sound Detector and Beam Power Unit as AF Power Amplifier

		Pentode Unit	Beam Power Unit	
DC Plate Voltage	E_b	330	165	V
DC Grid-No.3 (Control-Grid) Voltage	E_{c3}	28	-	V
DC Grid-No.2 (Screen-Grid) Supply Voltage	E_{cc2}	330	-	V
DC Grid-No.2 Voltage	E_{c2}	See <i>Grid-No. 2-Input Rating Chart at front of Receiving Tube Section</i>		V



		Pentode Unit	Beam Power Unit	
Positive DC Grid-No. 1 (Control-Grid) Voltage	E_{c1}	0	-	V
Heater-Cathode Voltage				
Peak	e_{hkm}	-200	± 200	V
Average ^a	$E_{hk(av)}$	100	100	V
Heater Voltage (AC or DC).	E_h	5.7 to 6.9		V
Average Cathode Current ^a	$I_{k(av)}$	-	65	mA
Grid-No. 2 Input	P_{g2}	-	1.8	W
For $V_{g2} \leq 16$ V		1.1	-	W
For $V_{g2} > 16$ V		See Grid-No. 2- Input Rating Chart at front of Receiving Tube Section		
≤ 2 V		-	-	W
Plate Dissipation	P_b	1.7	6.5	W

MAXIMUM CIRCUIT VALUES

		Pentode Unit	Beam Power Unit	
Grid-No. 1-Circuit Resistance:	$R_{g1}(ckt)$			
For fixed-tuning operation	-	250	250	k Ω
For automatic tuning operation	-	500	500	k Ω

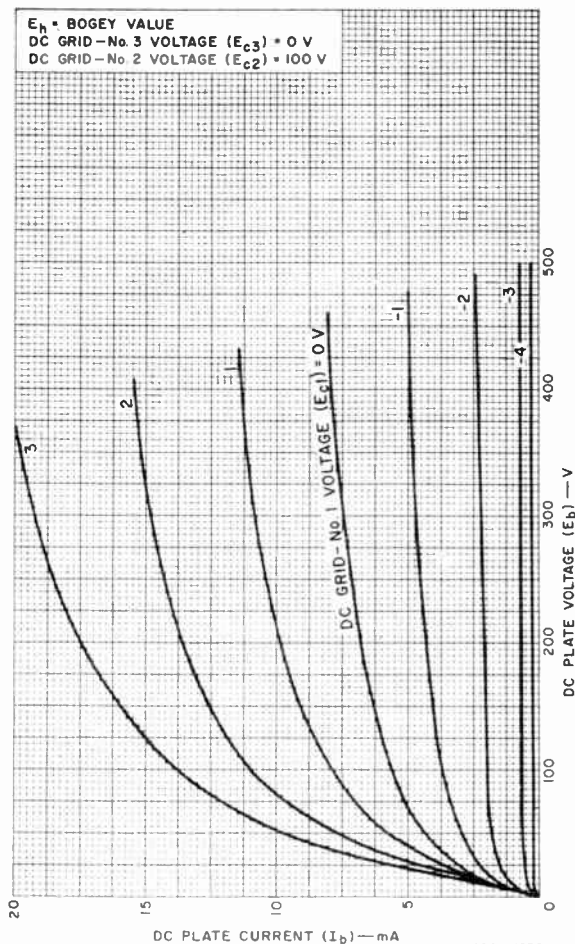
^a Measured with a dc meter.



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Typical Plate Characteristics

Pentode Unit



92CM-13739

DATA

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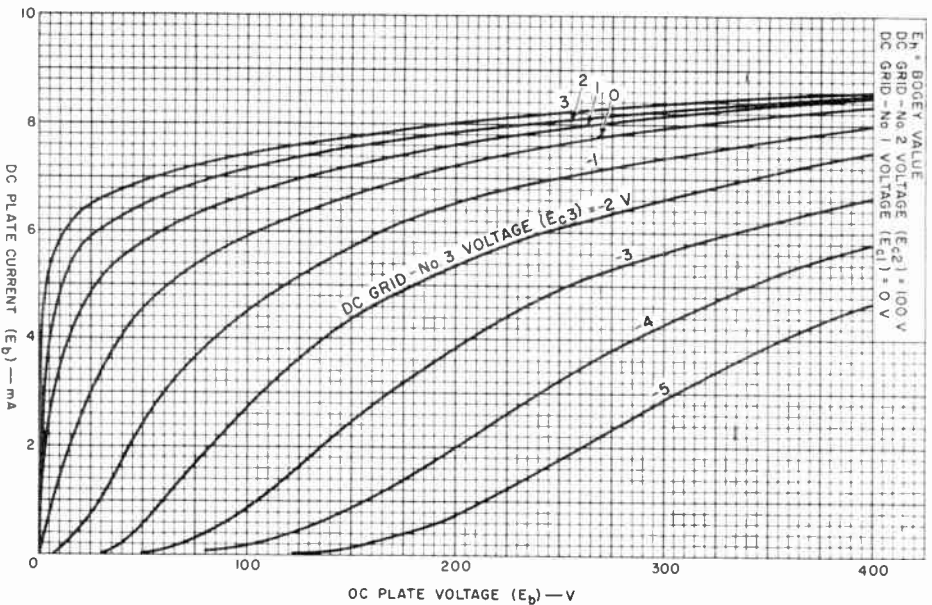
Harrison, N. J.



World Radio History

Typical Plate Characteristics

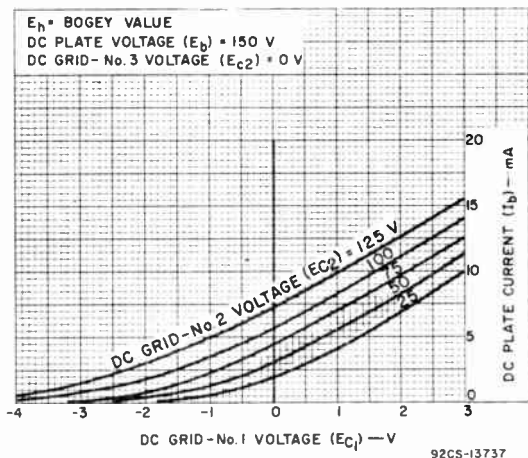
Pentode Unit



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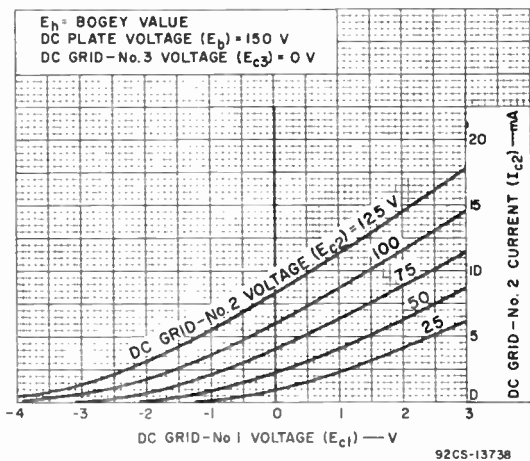
Typical Transfer Characteristics

Pentode Unit



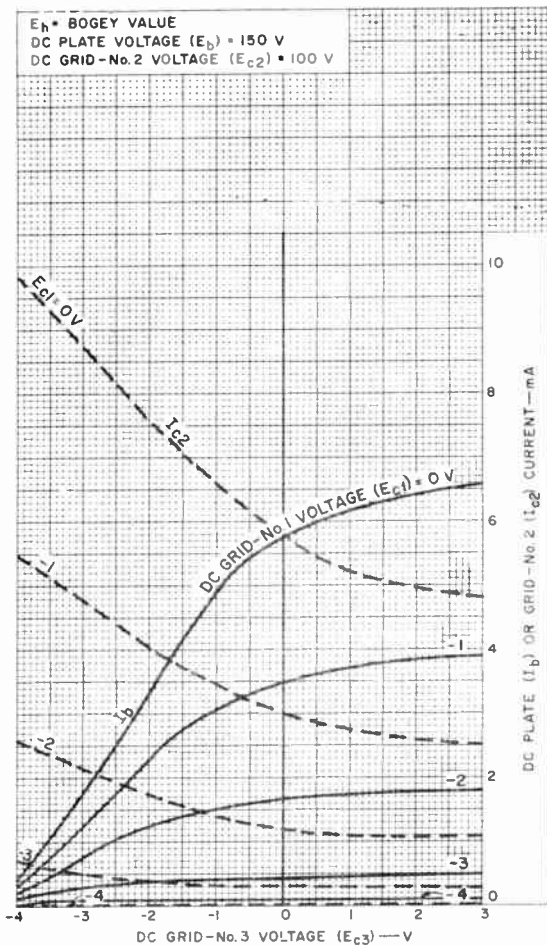
Typical Transfer Characteristics

Pentode Unit



Typical Transfer Characteristics

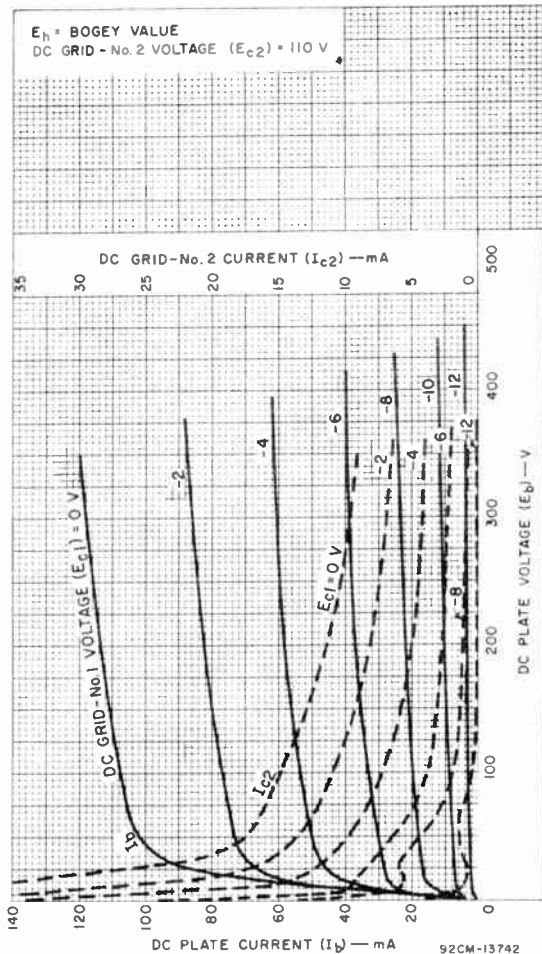
Pentode Unit



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Typical Characteristics

Beam Power Unit



Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

Electrical:

Heater Characteristics and Ratings:

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 ^a	5500 ^b max.	volts
Heater positive with respect to cathode	300 ^c max.	volts

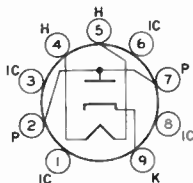
Direct Interelectrode Capacitances

(Approx): ^d		
P to (H,K)	6.5	pf
K to (P,H)	9.0	pf
Heater to cathode.	2.8	pf

Mechanical:

Mounting Position.	any
Type of Cathode.	Coated Unipotential
Maximum Overall Length	3.005"
Seated Length.	2.375" to 2.625"
Diameter	1.062" to 1.188"
Dimensional Outline.	See <i>General Section</i>
Bulb	T9
Socket	Novar 9-Contact
Base	Small-Button Novar 9-Pin with Exhaust (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 - Do Not Use^e
Pin 2 - Plate
Pin 3 - Do Not Use^e
Pin 4 - Heater



Pin 5 - Heater
Pin 6 - Do Not Use^e
Pin 7 - Plate
Pin 8 - Do Not Use^e
Pin 9 - Cathode

DAMPER SERVICE

For operation in a 525-line, 30-frame system^f

Maximum Ratings, Design-Maximum Values:

Peak Inverse Plate Voltage ^a	5500	max.	volts
Peak Plate Current	1100	max.	ma
Average Plate Current.	180	max.	ma
Plate Dissipation.	6.8	max.	watts

Characteristic, Instantaneous Value:

Tube Voltage Drop for plate ma = 350	32	volts
--	----	-------



6BH3A

- a This rating is applicable when the duty cycle of the voltage pulse does 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.
- b The dc component must not exceed 900 volts.
- c The dc component must not exceed 100 volts.
- d Without external shield.
- e Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.





6BH6

6BH6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage.	6.3	ac or dc volts
Current.	0.15	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^o</i>	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μ f
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	5.4	5.4	μ f
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	4.4	4.4	μ f

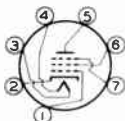
Characteristics, Class A₁ Amplifier:

Plate Voltage.	100	250	volts
Grid No.3 (Suppressor)	<i>Connected to cathode at socket</i>		
Grid-No.2 Voltage.	100	150	volts
Grid-No.1 Voltage.	-1	-1	volt
Plate Resistance (Approx.) . . .	0.7	1.4	megohm
Transconductance	3400	4600	μ hos
Plate Current.	3.6	7.4	ma
Grid-No.2 Current.	1.4	2.9	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μ amp . . .	-5	-7.7	volts

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" \pm 3-3/32"
Maximum Diameter	3/4"
Dimensional Outline.	<i>See General Section</i>
Bulb	T-5-1/2
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

^o With external shield JETEC No. 316 connected to cathode.

← Indicates a change.

6BH6



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SHARP-CUTOFF PENTODE

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. 300 max. volts

GRID-No.2 (SCREEN) 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:

Negative bias value. 50 max. volts

Positive bias value. 0 max. volts

PLATE DISSIPATION. 3 max. watts

→ 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

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . 90 max. volts

Heater positive with respect to cathode. . 90 max. volts

→ Indicates a change.

SEPT. 1, 1955

DATA

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

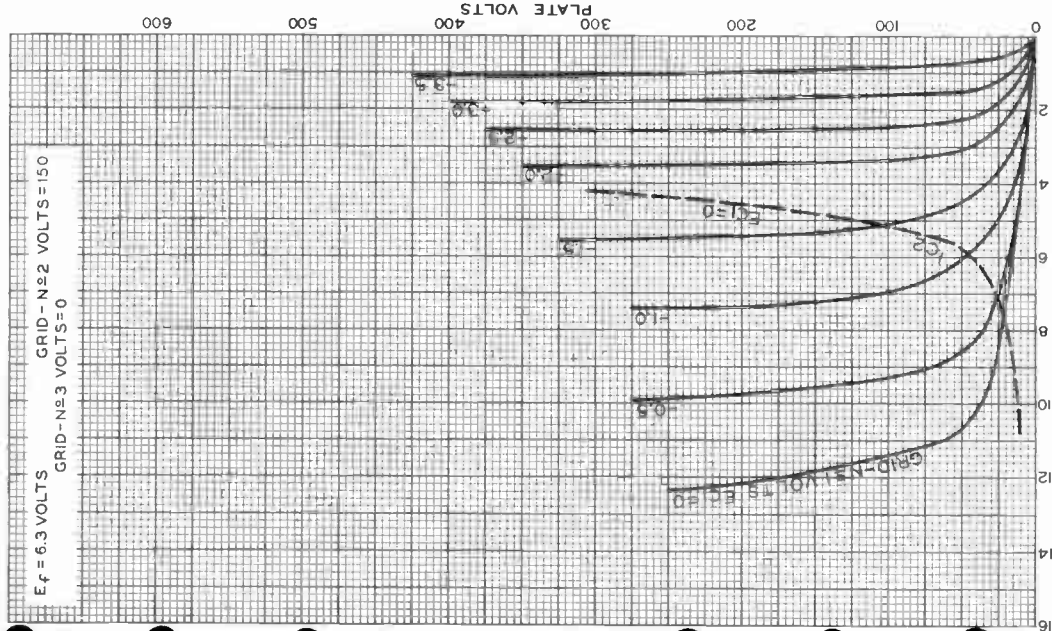
World Radio History



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AVERAGE PLATE CHARACTERISTICS



AUG. 23, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, MORTON, NEW JERSEY

PLATE (I_b) OR GRID-N₂ (I_{c2}) MILLIAMPERES

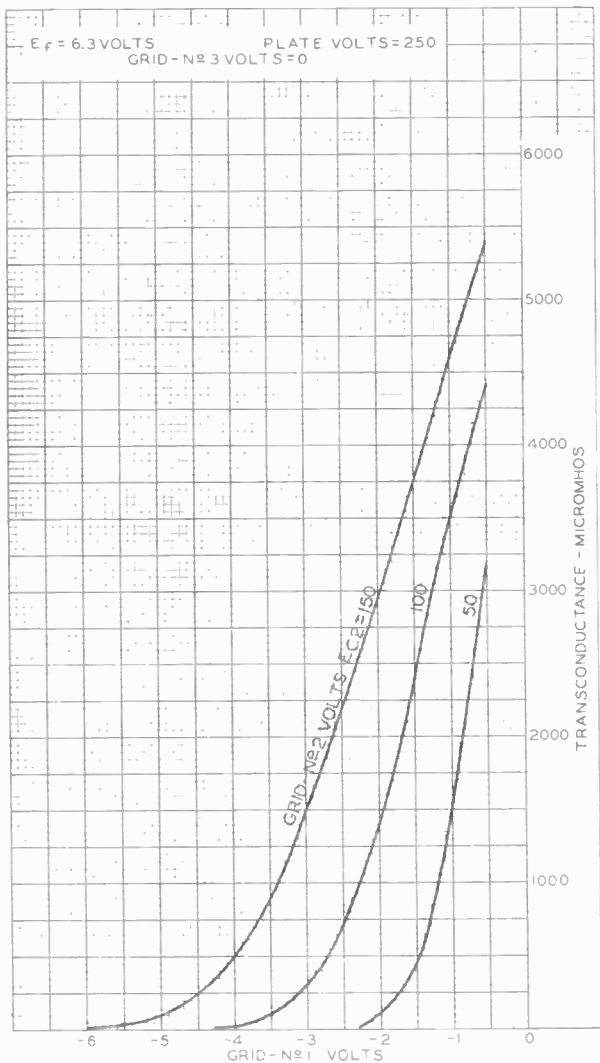
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AVERAGE CHARACTERISTICS



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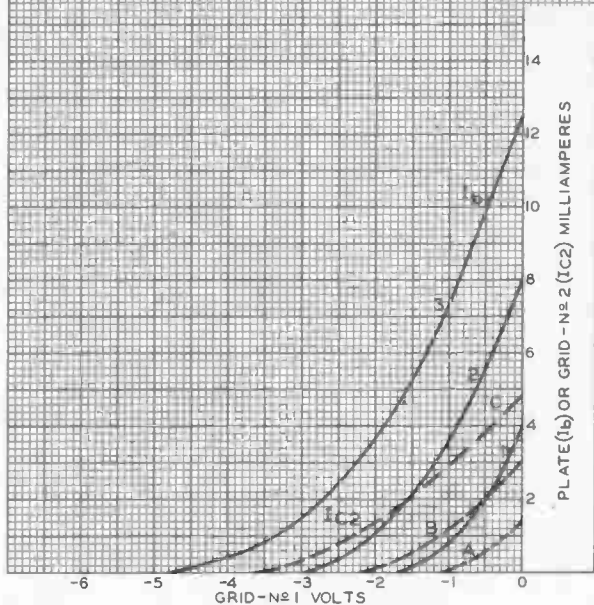
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AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS PLATE VOLTS = 250 GRID - N^o 3 VOLTS = 0

CURVES		GRID - N ^o 2 VOLTS
I_b ———	I_{c2} ———	
1	A	50
2	B	100
3	C	150

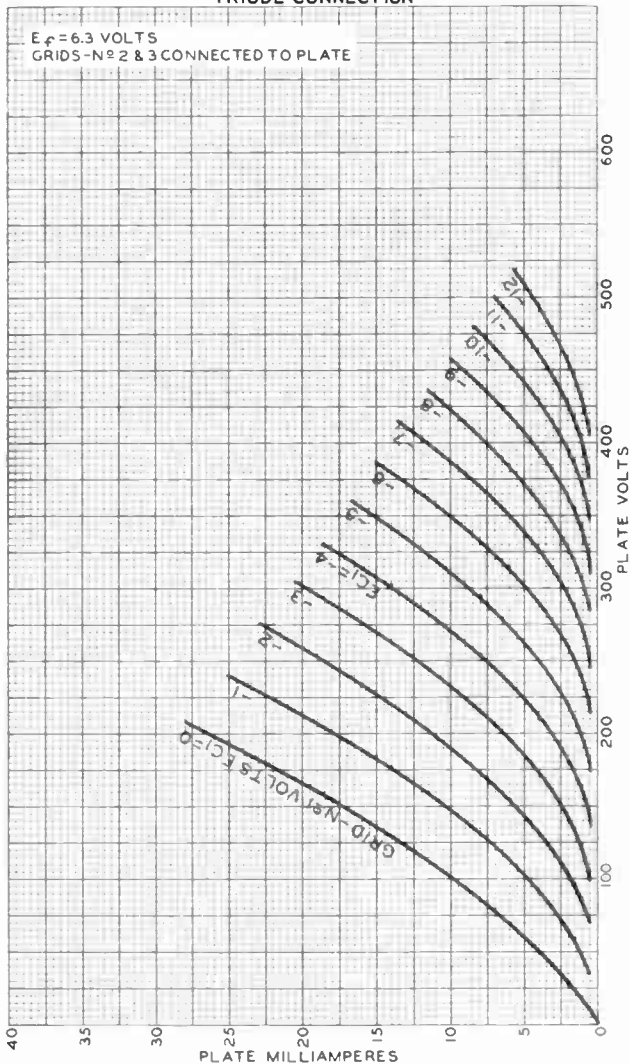


6BH6



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AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



Half-Wave Vacuum Rectifier

DUODECAR TYPE

Electrical:

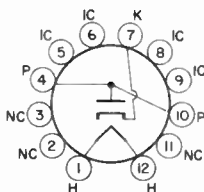
Heater Characteristics and Rating (Design-Maximum Values):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater voltage = 6.3	1.200	amp
Heater-cathode voltage:		
Heater negative with respect to cathode ^a	5300 ^b max.	volts
Heater positive with respect to cathode	500 ^c max.	volts
Direct Inter-electrode Capacitances (Approx.): ^d		
K to (P,H)	8.0	pf
F to (K,H)	5.5	pf
H to K	2.7	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.625"
Seated Length	2.000" to 2.250"
Diameter	1.062" to 1.188"
Rulb.	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
Basing Designation for BOTTING VIEW	12BL

- Pin 1 - Heater
- Pin 2 - No Internal Connection
- Pin 3 - Same as Pin 2
- Pin 4 - Plate
- Pin 5 - Do Not Use^e
- Pin 6 - Do Not Use^e
- Pin 7 - Cathode
- Pin 8 - Do Not Use^e
- Pin 9 - Do Not Use^e
- Pin 10 - Plate
- Pin 11 - Same as Pin 2
- Pin 12 - Heater



DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^f

Peak Inverse Plate Voltage ^a	3300 max.	volts
Peak Plate Current	840 max.	ma
DC Plate Current	140 max.	ma
Plate Dissipation	4 max.	watts

Characteristics, Instantaneous Value.

Tube Voltage Drop for plate ma. = 250	21	volts
--	----	-------



6BJ3

- a This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 4-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
- b The dc component must not exceed 100 volts.
- c The dc component must not exceed 100 volts.
- d Without external shield.
- e Socket terminals 5, 6, 8 and 9 should not be used at tie points.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.





6BJ6

6BJ6

REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.15	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^o</i>	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μ f
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	4.5	4.5	μ f
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	5.5	μ f

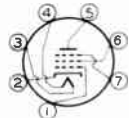
Characteristics, Class A₁ Amplifier:

Plate Voltage	100	250	volts
Grid No.3 (Suppressor)	<i>Connected to cathode at socket</i>		
Grid-No.2 Voltage	100	100	volts
Grid-No.1 Voltage	-1	-1	volt
Plate Resistance (Approx.)	0.25	1.3	megohm
Transconductance	3650	3600	μ hos
Plate Current	9	9.2	ma
Grid-No.2 Current	3.5	3.3	ma
Grid-No.1 Voltage (Approx.) for transconductance of 10 μ hos	-20	-20	volts

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" \pm 3/32"
Maximum Diameter	3/4"
Dimensional Outline	<i>See General Section</i>
Bulb	T-5-1/2
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

^o with external shield JETEC No. 316 connected to cathode.

← Indicates a change.

6BJ6



6BJ6

REMOTE-CUTOFF PENTODE

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	300 max. volts
GRID-No.2 (SCREEN) 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:	
Negative bias value.	50 max. volts
Positive bias value.	0 max. volts
PLATE DISSIPATION.	3 max. watts
→ GRID-No.2 INPUT:	
For grid-No.2 voltages up to 150 volts . . .	0.6 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
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode. .	90 max. volts
Heater positive with respect to cathode. .	90 max. volts

→ Indicates a change.

SEPT. 1, 1955

DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

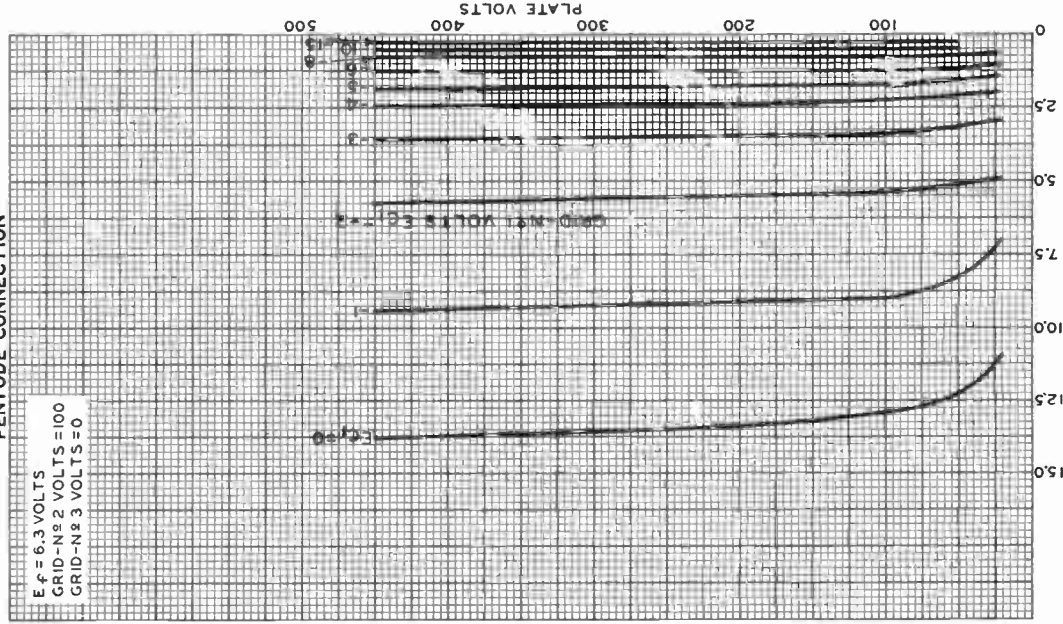


6BJ6

6BJ6

AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS
GRID-N₂ 2 VOLTS = 100
GRID-N₃ 3 VOLTS = 0



MAY 29, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

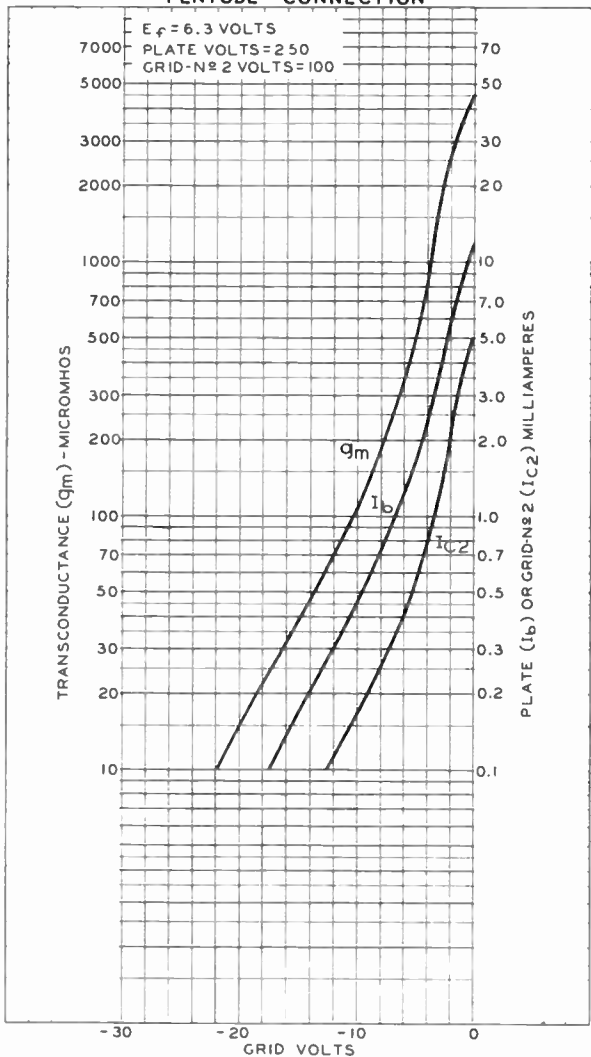
92CM-6867

6BJ6



6BJ6

AVERAGE CHARACTERISTICS PENTODE CONNECTION



JUNE 2, 1947

 TUBE DEPARTMENT
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6868

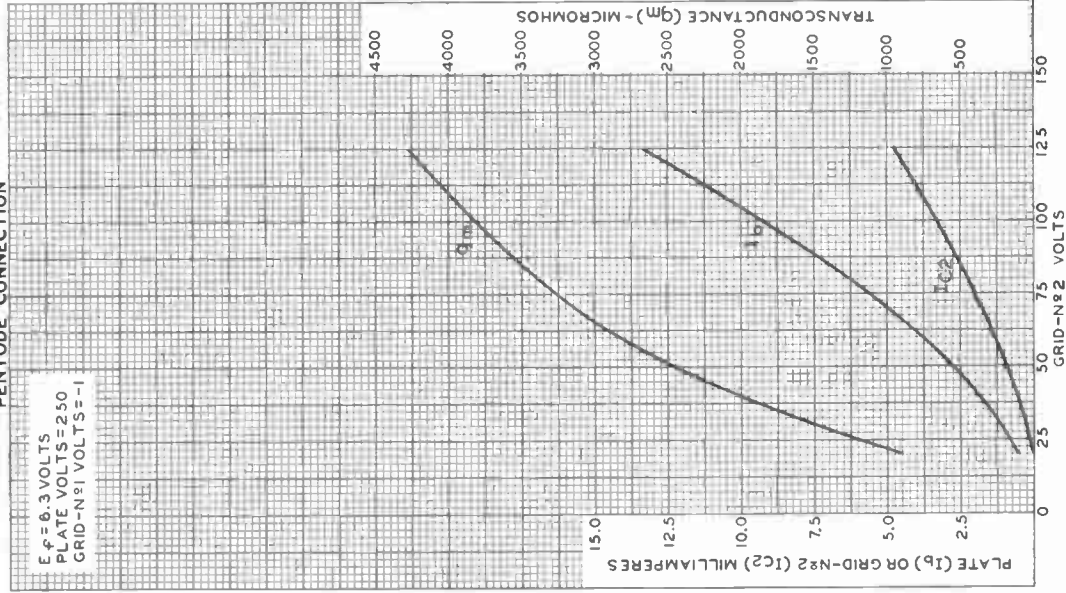
World Radio History



6BJ6

AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS
PLATE VOLTS = 250
GRID-N₂ VOLTS = -1



6BJ6

JUNE 5, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6870





6BJ7

6BJ7 TRIPLE DIODE

9-PIN MINIATURE TYPE
For dc restorer service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.45	amp

Direct Interelectrode Capacitances (Approx.):^o

Plate of unit No.1 to cathode of unit No.1, internal shield, and heater. . .	3	μ f
Plate of unit No.2 to cathode of unit No.2, internal shield, and heater. . .	2.6	μ f
Plate of unit No.3 to cathode of unit No.3, internal shield, and heater. . .	2.6	μ f
Cathode of unit No.1 to plate of unit No.1, internal shield, and heater. . .	4	μ f
Cathode of unit No.2 to plate of unit No.2, internal shield, and heater. . .	3.8	μ f
Cathode of unit No.3 to plate of unit No.3, internal shield, and heater. . .	4	μ f
Plate of unit No.1 to plate of unit No.2. . .	0.055	μ f
Plate of unit No.2 to plate of unit No.3. . .	0.036	μ f
Plate of unit No.3 to plate of unit No.1. . .	0.036	μ f

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" \pm 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.	9AX

- Pin 1 - Cathode of Unit No.3
- Pin 2 - Plate of Unit No.3
- Pin 3 - Internal Shield
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No.2
- Pin 7 - Cathode of Unit No.2
- Pin 8 - Plate of Unit No.1
- Pin 9 - Cathode of Unit No.1

DC RESTORER SERVICE

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE.	330 max.	volts
PEAK PLATE CURRENT.	10 max.	ma

^o without external shield.

6BJ7



6BJ7

TRIPLE DIODE

DC OUTPUT CURRENT. 1 max. ma
PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode . . 330 max. volts
Heater positive with respect to cathode . . 100 max. volts

Characteristics:

Plate Current for plate volts = 2.7. 10 ma



6BJ8

6BJ8

TWIN DIODE—MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-strin  arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.6	amp
Warm-up time (Average)	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:^o

Triode Unit:

Grid to plate	2.6	$\mu\mu\text{f}$
Grid to heater and cathode	2.8	$\mu\mu\text{f}$
Plate to heater and cathode	0.31	$\mu\mu\text{f}$

Diode Units:

Diode-No.1 plate to triode grid	0.07 max.	$\mu\mu\text{f}$
Diode-No.2 plate to triode grid	0.11 max.	$\mu\mu\text{f}$
Diode-No.1 cathode to all other electrodes	4.8	$\mu\mu\text{f}$
Diode-No.2 cathode to all other electrodes	4.8	$\mu\mu\text{f}$
Diode-No.1 plate to diode-No.2 plate	0.06 max.	$\mu\mu\text{f}$
Diode-No.1 plate to diode-No.1 cathode and heater	1.9	$\mu\mu\text{f}$
Diode-No.2 plate to diode-No.2 cathode and heater	1.9	$\mu\mu\text{f}$
Diode-No.1 cathode to diode-No.1 plate and heater	4.6	$\mu\mu\text{f}$
Diode-No.2 cathode to diode-No.2 plate and heater	4.6	$\mu\mu\text{f}$
Diode-No.1 plate to all other electrodes	3	$\mu\mu\text{f}$
Diode-No.2 plate to all other electrodes	3	$\mu\mu\text{f}$

Characteristics, Class A₁ Amplifier (Triode Unit):

Plate Voltage	90	250	volts
Grid Voltage	0	-9	volts
Amplification Factor	22	20	
Plate Resistance (Approx.)	4700	7150	ohms
Transconductance	4700	2800	μmhos
Plate Current	13.5	8	ma
Plate Current for grid volts = -12.5	-	1.7	ma
Grid Voltage (Approx.) for plate $\mu\text{a.} = 10$	-7	-18	volts

^o: See next page.



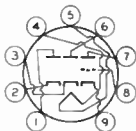
6BJ8

TWIN DIODE—MEDIUM-MU TRIODE

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"
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	9ER

Pin 1—Diode—No. 2
Plate
Pin 2—Diode—No. 2
Cathode
Pin 3—Diode—No. 1
Cathode
Pin 4—Heater



Pin 5—Heater
Pin 6—Diode—No. 1
Plate
Pin 7—Triode Plate
Pin 8—Triode Grid
Pin 9—Triode
Cathode

TRIODE UNIT — AMPLIFIER — Class A₁**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
AVERAGE CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	3.5 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	1 max.	megohm
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TRIODE UNIT — VERTICAL DEFLECTION AMPLIFIER**Maximum Ratings, Design-Center Values Except as Noted:**

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

DC PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) [#]	1200 [■] max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	70 max.	ma
Average	20 max.	ma
PLATE DISSIPATION	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 [▲] max.	volts

○, ▲, □, #, ■: See next page.



6BJ8

6BJ8

TWIN DIODE—MEDIUM-MU TRIODE

Maximum Circuit Values:

Grid-Circuit Resistance:

For cathode-bias operation. 2.2 max. megohms

DIODE UNITS — Two

Maximum Ratings, Design-Center Values:

Values are for Each Unit

PEAK PLATE CURRENT.	54 max.	ma
DC PLATE CURRENT.	9 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 [▲] max.	volts

○ without external shield.

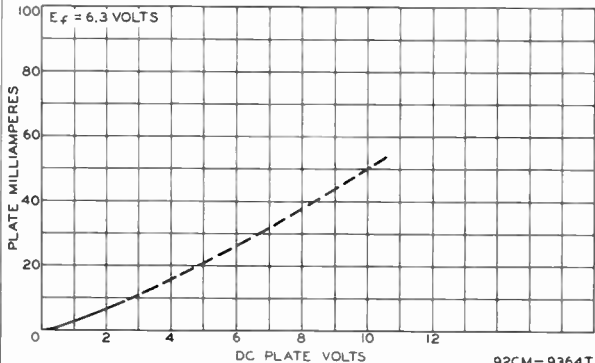
▲ The dc component must not exceed 100 volts.

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

* This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ under no circumstances should this absolute value be exceeded.

AVERAGE PLATE CHARACTERISTIC EACH DIODE UNIT

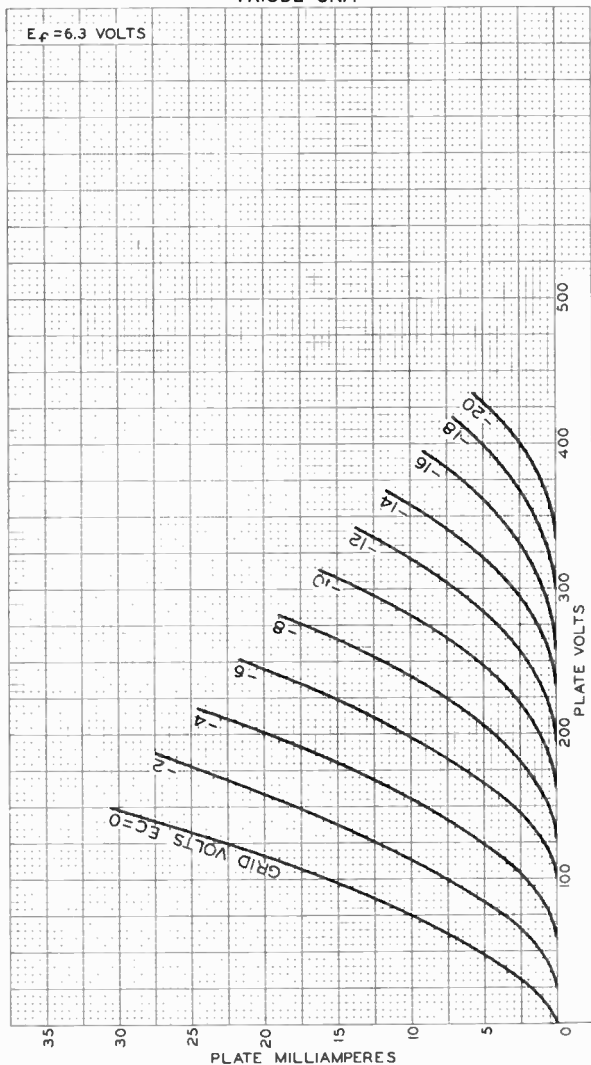


6BJ8



6BJ8

AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

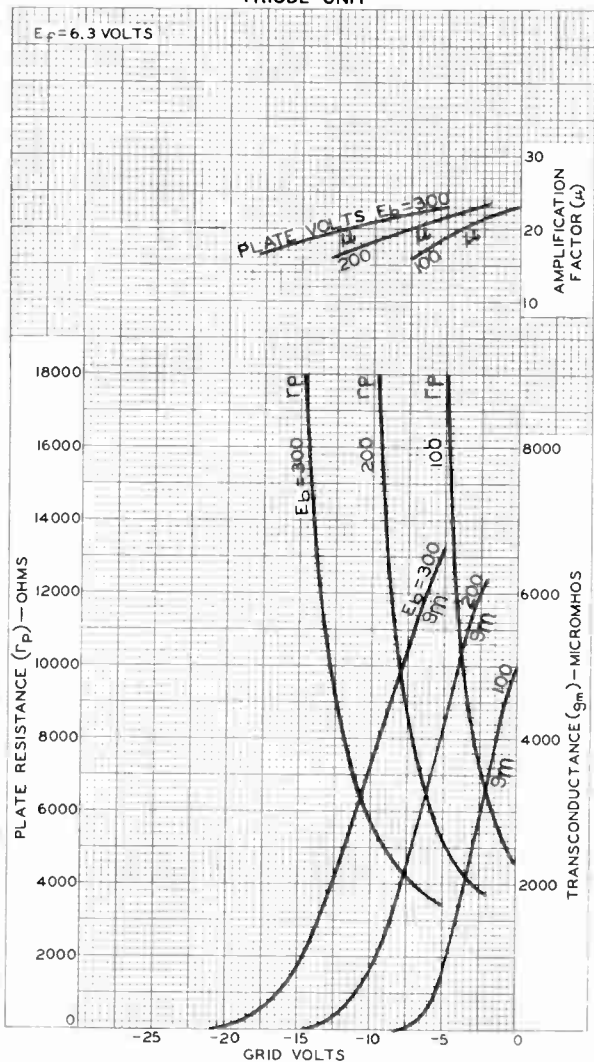




6BJ8

6BJ8

AVERAGE CHARACTERISTICS TRIODE UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

92CM-9535



Beam Triode

*High-Voltage, Low-Current Type
For DC Power Supplies in Color-TV Receivers*

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ± 0.6	V
Current (at 2.0 V)	0.200	A
Plate heater-cathode voltage:		
Maximum (without respect to stress)	450 ^a max	V
Heater positive with respect to cathode	Not Recommended	

Direct Interelectrode Capacitances (Approx.)

Without external grids:		
Grid to plate	0.03	pF
Grid to cathode and heater	2.6	pF
Plate to cathode and heater	1.0	pF

MECHANICAL

Operating Position	Any
Maximum Overall Length	5 in
Seated Length	4-1/4 ± 3/16 in
Maximum Diameter	1-23/32 in
Bulb	T12
Cap.	Small (JEDEC No. C1-1 or C1-34)

Base (Alternates)

Short Jumbo-shell Octal with External Barriers:

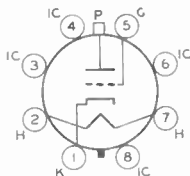
8-Pin, JEDEC Group 2, No. 68-11)

Short Jumbo-shell Octal with External Barriers:

8-Pin, style B (JEDEC Group 2, No. 68-18)

Basing Designation for BOTTOM VIEW BGC

- Pin 1—Cathode
- Pin 2—Heater
- Pin 3—Do Not Use
- Pin 4—Do Not Use
- Pin 5—Grid
- Pin 6—Do Not Use
- Pin 7—Heater
- Pin 8—Plate
- Cap—Plate



SHUNT VOLTAGE-REGULATOR SERVICE

Maximum Ratings, Design-Maximum Values

DC Plate Voltage	27000	V
Unregulated DC Supply Voltage	60000	V
Grid Voltage		
Peak ^b	-440	V
DC	-135	V
DC Plate Current	1.6	mA
Plate Dissipation	40	W



6BK4B

Typical Operation

As Shunt Voltage-Regulator Tube in Accompanying Circuit

Unregulated Supply

DC Voltage	36000	V
Equivalent resistance	11	MΩ

Voltage Divider Values

R ₁ (5 W)	220	MΩ
R ₂ (2 W)	1	MΩ
R ₃ (1/2 W)	0.82	MΩ

Reference Voltage Supply

DC Value	200	V
Equivalent resistance	1000	Ω

Effective Grid-Plate Transconductance

200 μmhos

DC Plate Current

For load current of 0 mA	1000	μA
For load current of 1 mA	45	μA

Regulated DC Output Voltage

For load current of 0 mA	25000	V
For load current of 1 mA	24500	V

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance	3	MΩ
-----------------------------------	---	----

^a Sufficient impedance should be used in series with the cathode to limit the cathode current under prolonged short-circuit conditions to 450 mA. This protective impedance will minimize the danger of heater burnout in case of a momentary internal arc within the tube.

^b For 20 seconds maximum duration during equipment warm-up period.

CHARACTERISTICS RANGE VALUES

	Note	Min	Max	
Grid Voltage (1)	1	-7	-	V
Grid Voltage (2)	2	-	-40	V
Grid-Voltage Change	3	-	9	V

Note 1: With dc plate voltage of 30000 volts and dc plate current of 1 mA.

Note 2: With dc plate voltage of 30000 volts and dc plate current of 0.1 mA.

Note 3: Difference between grid voltage (1) and grid voltage (2).

OPERATING CONSIDERATIONS

The 6BK4B base pins fit the standard octal socket. Socket terminals for pins 3, 4, 6, and 8 should not be used for tie points. Otherwise, tube performance may be adversely affected.

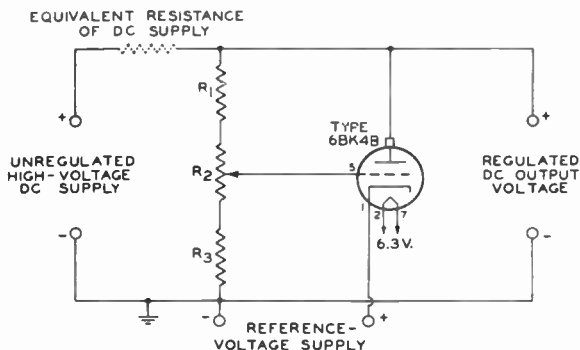
The high voltages at which the 6BK4B is operated may be extremely dangerous to the user. Great care should be taken during the adjustment of circuits. The tube and its associated apparatus, especially all parts which may be at high potential with respect to ground, should be housed in a protective enclosure.

At maximum plate dissipation the plate of the 6BK4B shows a dull red color. Connection to the plate cap should be made by a connector with flexible lead to prevent any strain on the seal of the cap.



Operation of the 6BK4B with a plate voltage above approximately 16000 volts (absolute value) results in the production of X-Rays which can constitute a hazard to the operator. In the event of a tube failure, the tube is adequately shielded. Relatively simple shielding should provide adequate protection for this product. Shielding and safety must be designed.

SHUNT VOLTAGE-REGULATOR CIRCUIT

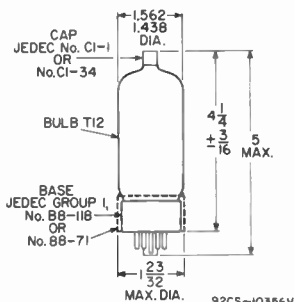


92CS-8435R3

Typical performance data for the regulated circuit with certain parameters of the unregulated ac supply and relative voltage-diverter values are given in the regulator data. Other combinations are possible within the maximum ratings and the maximum circuit values for the 6BK4B.

DIMENSIONAL OUTLINE

JEDEC No. 12-36



DIMENSIONS IN INCHES

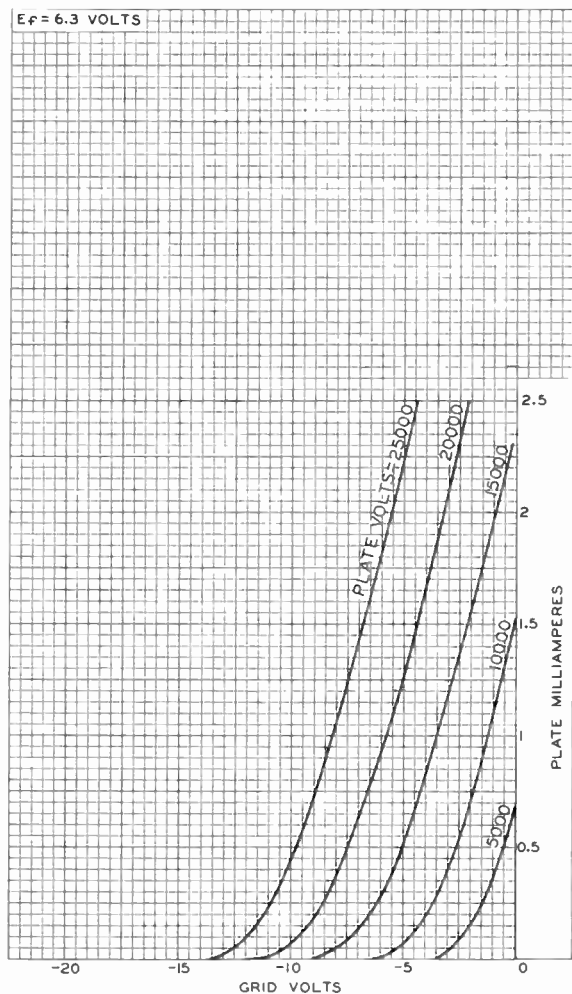


RADIO CORPORATION OF AMERICA
Electronic Components and Devices

Harrison, N. J.

DATA .
967

Average Transfer Characteristics



92CM-8432R1





6BK7-B

6BK7-B

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time. For TV tuners using direct-coupled cathode-drive circuits.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	. . . . . ac or dc volts
Current	0.45	. . . . . amp
Warm-up time (Average)	11	. . . . . sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrnde Capacitances:⁰

	Unit No.1	Unit No.2	
Grid to plate	1.8	1.8	μf
Grid to cathode, internal shield, and heater.	3	3	μf
Plate to cathode, internal shield, and heater.	1	0.9	μf
Heater to cathode	2.8	3	μf
Plate to cathode.	0.22	0.22	μf
Cathode to grid, internal shield, and heater.	6	6	μf
Plate to grid, internal shield, and heater.	2.4	2.4	μf
Grid of unit No.1 to grid of unit No.2.	0.004 max.		μf
Plate of unit No.1 to plate of unit No.2.	0.075 max.		μf

Characteristics, Class A₁ Amplifier (Each Unit):

Plate-Supply Voltage.	150	volts
Cathode Resistor.	56	ohms
Amplification Factor.	43	
Plate Resistance (Approx.).	4600	ohms
Transconductance.	9300	μmhos
Plate Current	18	ma
Grid Volts (Approx.) for plate μa = 10.	-11	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

⁰ without external shield.

6BK7-B

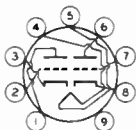


6BK7-B

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 A₁

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max. volts
GRID VOLTAGE:	
Negative-bias value	50 max. volts
PLATE DISSIPATION	2.7 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode.	200 [■] max. volts
Heater positive with respect to cathode.	200 [▲] max. volts

■ Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

▲ The dc component must not exceed 100 volts.



6BK7-B

6BK7-B

AVERAGE PLATE CHARACTERISTICS

EACH UNIT

$E_f = 6.3$ VOLTS

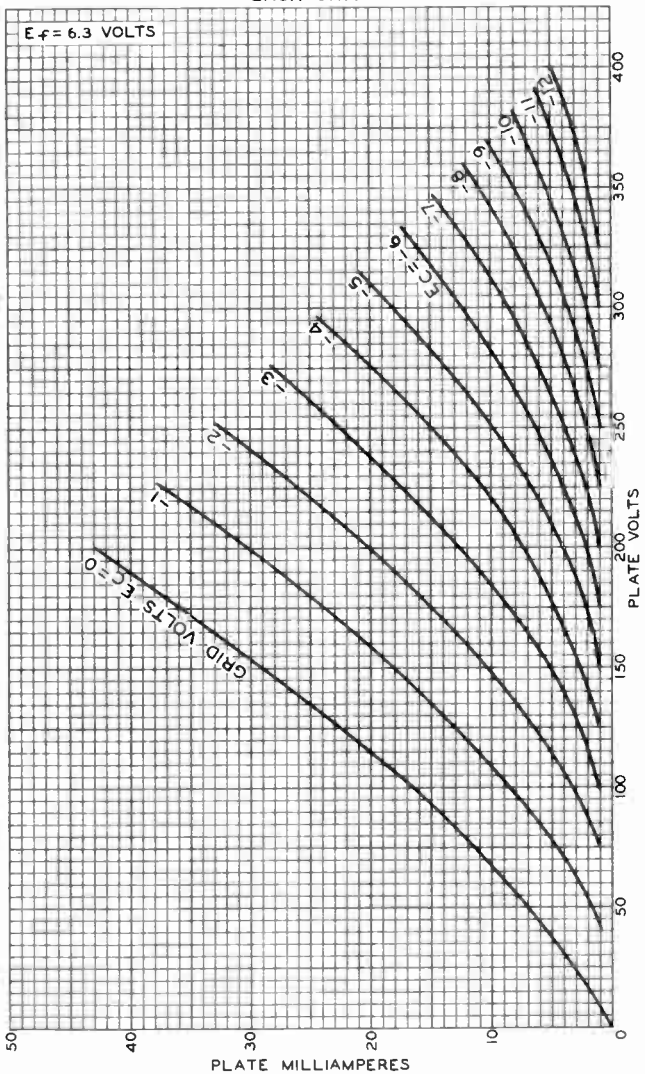


PLATE MILLIAMPERES

PLATE VOLTS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

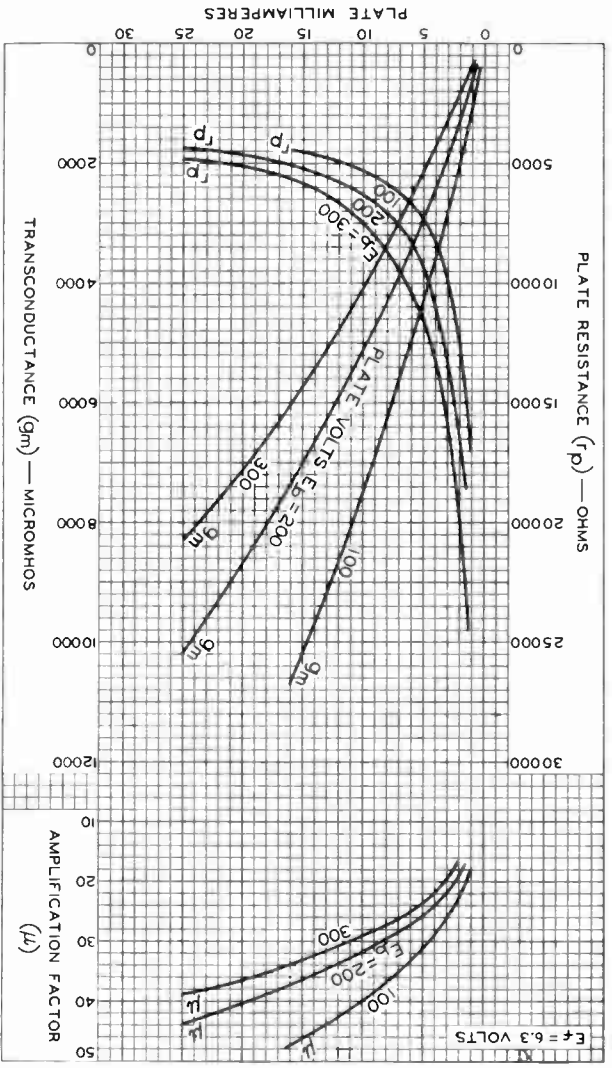
92CM-9764

6BK7-B



World Radio History

6BK7-B AVERAGE CHARACTERISTICS EACH UNIT



92CM-9768

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



6BL4

6BL4 HALF-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage.	6.3	ac or dc volts
Current.	3.0	amp

Direct Interelectrode Capacitances (Approx.):^o

Plate to heater and cathode.	11.5	μmf
Cathode to heater and plate.	16	μmf
Heater to cathode.	5	μmf

Mechanical:

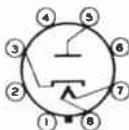
Mounting Position.	Any
Maximum Overall Length	4-5/8"
Maximum Seated Length.	4-1/16"
Maximum Diameter	1-23/32"
Bulb	T-12
Base	Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No. 88-71)

Basing Designation for BOTTOM VIEW 8GB

Pin 1 - Internal Connection-
Do Not Use

Pin 2 - Same As Pin 1

Pin 3 - Cathode



Pin 4 - Same as Pin 1

Pin 5 - Plate

Pin 6 - Same as Pin 1

Pin 7 - Heater

Pin 8 - Heater

DAMPER SERVICE

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system^o

PEAK INVERSE PLATE VOLTAGE (Absolute value) [#]	4500 ^o	max.	volts
PEAK PLATE CURRENT	1200	max.	ma
DC PLATE CURRENT	200	max.	ma
PLATE DISSIPATION.	8	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode (Absolute value).	4500 ^o [▲]	max.	volts
Heater positive with respect to cathode.	300 ^o	max.	volts

^o Without external shield.

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

[#] This rating is applicable where the duty cycle of the voltage pulse does 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.

[•] Under no circumstances should this absolute value be exceeded.

[▲] The dc component must not exceed 900 volts.

[●] The dc component must not exceed 100 volts.

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA

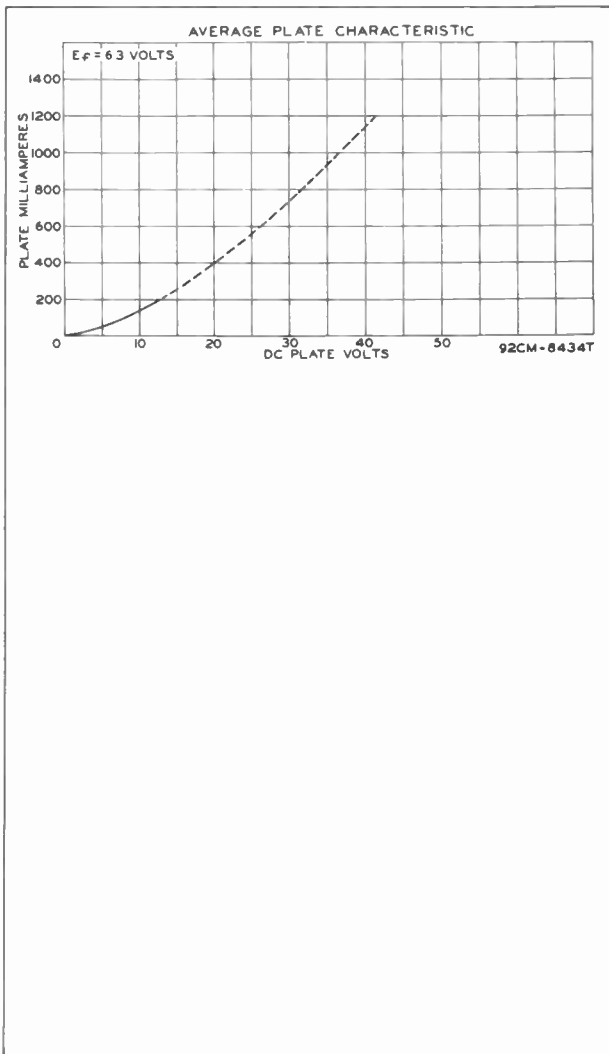
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL4



6BL4

HALF-WAVE VACUUM RECTIFIER



MAR. 1, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

CE-8434T



6BL7-GTA

6BL7-GTA

MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage 6.3 ac or dc volts

Current 1.5 amp

Direct Interelectrode Capacitances (Approx.):^C

	Unit No. 1	Unit No. 2	
Grid to plate	6	6	μf
Grid to cathode and heater . . .	4.7	4.6	μf
Plate to cathode and heater . . .	0.9	0.9	μf

Characteristics, Class A₁ Amplifier (Each Unit):

Plate voltage	150	250	250	volts
Grid Voltage	0	-17	-9	volts
Amplification Factor	-	-	15	
Plate Resistance (Approx.)	-	-	2150	ohms
Transconductance	-	-	7000	μmhos
Plate Current	65*	4	40	ma
Grid Voltage (Approx.) for plate current of 50 μa	-	-	-23	volts

Mechanical:

Operating Position Any

Maximum Overall Length 3-5/16"

Maximum Seated Length 2-3/4"

Maximum Diameter 1-9/32"

Dimensional Outline See General Section

Bulb T9

Base Short Intermediate-Shell Octal 8-Pin
with External Barriers (JETEC No. 88-58)

Basing Designation for BOTTOM VIEW 8BD

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

VERTICAL DEFLECTION OSCILLATOR[†]

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, Design-Center Values:

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

DC PLATE VOLTAGE	500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400 max.	volts

^O, [†], [‡]: See next page.

6BL7-GTA



6BL7-GTA

MEDIUM-MU TWIN TRIODE

CATHODE CURRENT:			
Peak	210	max.	ma
DC	60	max.	ma
PLATE DISSIPATION:			
Either plate	10	max.	watts
Both plates (Both units operating) . . .	12	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.	4.7	max.	megohms
----------------------------------	-----	------	---------

VERTICAL DEFLECTION AMPLIFIER[◆]

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, Design-Center Values Except as Noted:

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

DC PLATE VOLTAGE	500	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#]			
(Absolute maximum)	2000 [■]	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	210	max.	ma
DC	60	max.	ma
PLATE DISSIPATION:			
Either plate [†]	10	max.	watts
Both plates (Both units operating) . . .	12	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 Cathode-bias operation [†]	4.7	max.	megohms

- [□] Without external shield.
- [■] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- [◆] When this tube type is operated as a combined vertical deflection oscillator and amplifier, it is recommended that unit No.1 (pins 4, 5, and 6) be used as the oscillator.
- [□] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- [▲] The dc component must not exceed 100 volts.
- [#] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.
- [■] Under no circumstances should this absolute value be exceeded.
- [†] In stages operating with grid-resistor bias, an adequate cathode resistor or other suitable means is required to protect the tube in the absence of excitation.



6BL7-G1A
AVERAGE PLATE CHARACTERISTICS
EACH UNIT

6BL7-G1A

$E_f = 6.3$ VOLTS

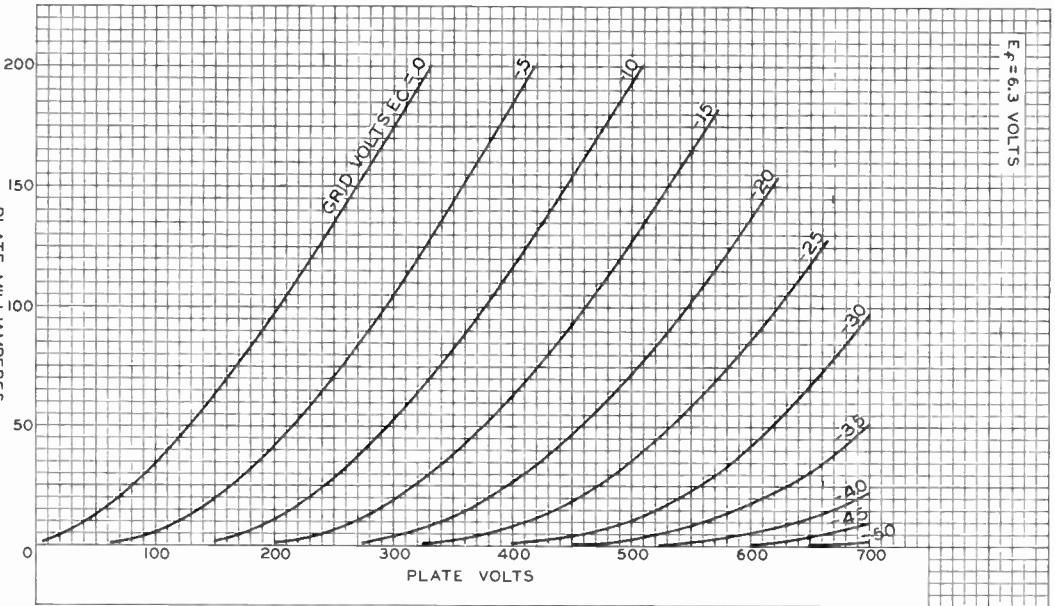


PLATE MILLIAMPERES
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9526



Medium-Mu Triode— Sharp-Cutoff Pentode

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	0.450	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

Triode Unit:

Grid to plate	1.5	μf
Grid to cathode and heater	2.5	μf
Plate to cathode and heater	1.8	μf

Pentode Unit:

Grid No.1 to plate	0.025 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5.5	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	3.8	μf
Pentode plate to triode grid	0.02 max.	μf
Pentode grid No.1 to triode plate	0.16 max.	μf
Pentode plate to triode plate	0.07 max.	μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Voltage	100	170	volts
Grid-No.2 Voltage	-	170	volts
Grid-No.1 Voltage	-2	-2	volts
Amplification Factor	20	-	
Amplification Factor, Grid No.2 to Grid No.1	-	47	
Plate Resistance (Approx.)	-	0.4	megohm
Transconductance	5000	6200	μmhos
Plate Current	14	10	ma
Grid-No.2 Current	-	2.8	ma
Input Resistance at frequency (Mc) = 50	-	0.01	megohm
Equivalent Noise Resistance	-	1500	ohms

Mechanical:

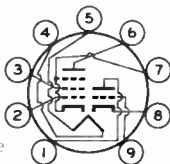
Operating Position	Any
Type of Cathodes	Coated Unipotential



6BL8

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 9DC

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
 Grid No.3,
 Pentode
 Cathode,
 Internal
 Shield
 Pin 8 - Triode
 Cathode
 Pin 9 - Triode Grid

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
PLATE SUPPLY VOLTAGE	550 max.	550 max.	volts
PLATE VOLTAGE	250 max.	250 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	550 max.	volts
GRID-No.2 VOLTAGE:			
With cathode ma. = 14	-	175 max.	volts
with cathode ma. < 10	-	200 max.	volts
CATHODE CURRENT	14 max.	14 max.	ma
GRID-No.2 INPUT:			
With plate dissipation (watts) > 1.2	-	0.5 max.	watt
With plate dissipation (watts) < 1.2	-	0.75 max.	watt
PLATE DISSIPATION	1.5 max.	1.7 max.	watts

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.5 max.	0.5 max.	megohm
For cathode-bias operation	0.5 max.	1 max.	megohm

^a without external shield.



Medium-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	0.2	amp

Direct Interelectrode Capacitances (Approx.):^a

Grid to plate	1.2	μf
Grid to cathode and heater	3.2	μf
Plate to cathode and heater	1.4	μf

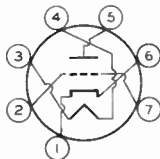
Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	43	
Plate Resistance (Approx.)	5400	ohms
Transconductance	7700	μmhos ←
Plate Current	9	ma
Grid Volts (Approx.) for plate $\mu\text{v} = 100$	-6	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 <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7EG

Pin 1 - Cathode
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Plate
Pin 6 - Cathode
Pin 7 - Grid

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	275 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts
CATHODE CURRENT	22 max.	ma
PLATE DISSIPATION	2.2 max.	watts

← indicates a change.



6BN4A

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 100 max. volts
Heater positive with respect to cathode. 100 max. volts

Maximum Circuit Values:

Grid-Circuit Resistance 0.5 max. megohm

^a with external shield JEDEC No. 316 connected to cathode.

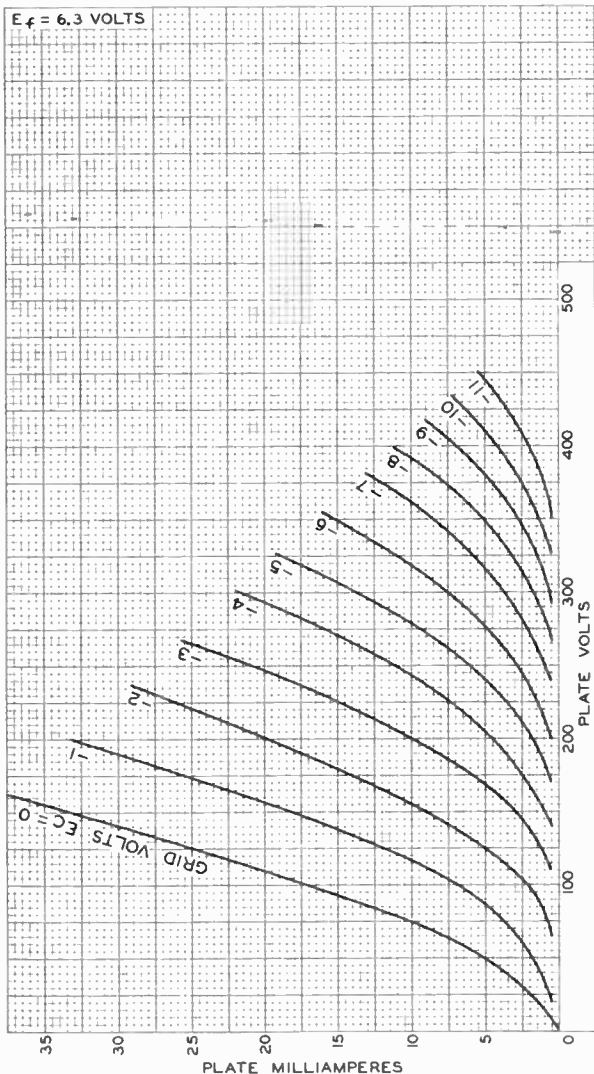




6BN4-A

6BN4-A

AVERAGE PLATE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9941

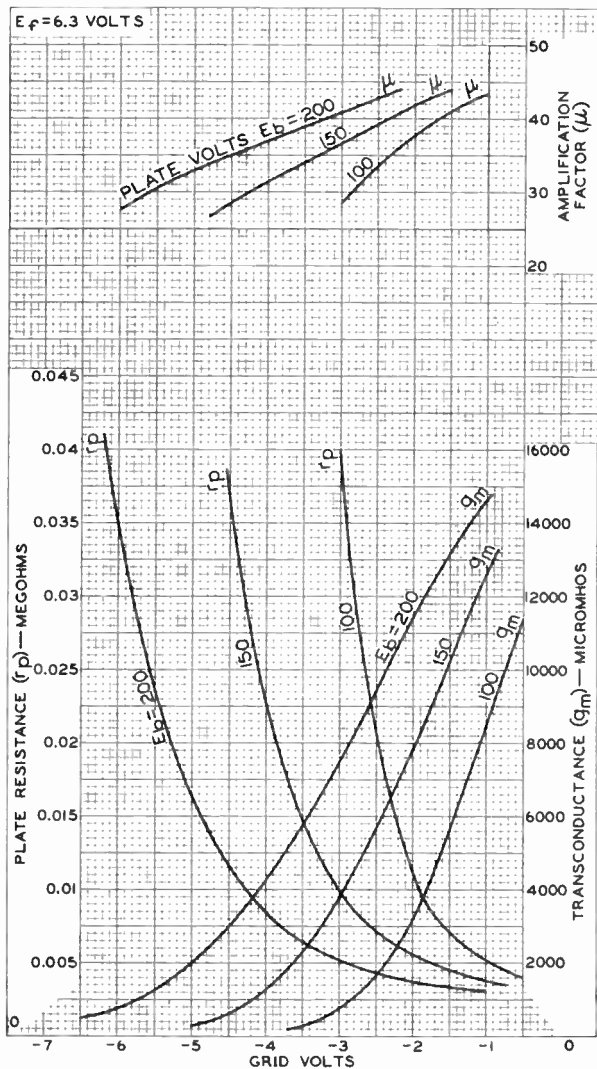
World Radio History

6BN4-A



6BN4-A

AVERAGE CHARACTERISTICS



Beam Tube

7-PIN MINIATURE TYPE

For Use in FM and TV Receivers As Combined Limiter, Discriminator, and Audio-Voltage-Amplifier Tube

GENERAL DATA

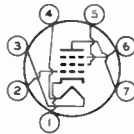
Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3 ± 10%	volts	←
Current at 6.3 volts	0.3	amp	
Direct Interelectrode Capacitances:▲			
Grid No.1 to cathode & internal shields, plate, grid No.3, grid No.2, and heater	4.2	μmf	
Grid No.3 to cathode & internal shields, plate, grid No.2, grid No.1, and heater	3.3	μmf	
Grid No.1 to grid No.3.	0.004 max.	μmf	

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"
Maximum Diameter	0.650" to 0.750" ←
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7DF

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



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

LIMITER & DISCRIMINATOR SERVICE

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE	330 max.	volts
GRID-No.3 (QUADRATURE-GRID) VOLTAGE	•	
GRID-No.2 (ACCELERATOR-GRID) VOLTAGE	110 max.	volts
GRID-No.1 (LIMITER-GRID) VOLTAGE:		
Positive-peak value	60 max.	volts
CATHODE CURRENT	13 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts

← Indicates a change.



6BN6

Typical Operation:

In accompanying typical quadrature-grid-fm-detector circuit

Input-Signal Center Frequency	4.5	10.7	10.7	Mc
Plate Supply Voltage.	270	85	285	volts
Plate Voltage	121	63	122	volts
Grid-No.3 Voltage . .	•	•	•	
Grid-No.2 Voltage . .	100	55	100	volts
Cathode-Circuit Resistance*	200 to 400	200 to 400	200 to 400	ohms
Peak AF Output Voltage	16.8	6	16.6	volts
Minimum Grid-No.1 Signal Voltage (RMS) for AM rejection* .	2	1.25	2	volts
Minimum Grid-No.1 Signal Voltage (RMS) for limiting action♦	1.25	1.25	1.25	volts
Plate Current	0.44	0.25	0.49	ma
Grid-No.2 Current . .	10	4.1	9.8	ma
Plate Load Resistor .	0.33	0.085	0.33	megohm
Linearity Resistor . .	1000	470	1500	ohms
Integrating Capacitor	0.001	0.002	0.001	μf
Coupling Capacitor . .	0.25	0.25	0.01	μf
Frequency Deviation .	±25	±75	±75	kc
AM Rejection:				
For grid-No.1 signal volts (RMS) = 2 .	25	31	20	db
For grid-No.1 signal volts (RMS) = 3 .	30	30	29	db
Total Harmonic Distortion.	1.8	2	1.6	%

▲ without external shield.

• For proper operation of this electron tube in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the quadrature-grid tuned circuit (L₁, C₆) should be sufficiently high to assure that a 4-volt rms signal is developed at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

It is recommended that L₁ be shunted by a capacitance of at least 10 μmf. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L₁, and a fixed capacitor.

■ The dc component must not exceed 100 volts.

* The cathode-circuit resistance should be adjusted for maximum AM rejection at the AF output of the circuit at the specified grid-No.1 signal voltage. AM rejection is measured with an applied signal containing 30 per cent amplitude modulation and 30 per cent frequency modulation.

♦ At signal levels above specified value, limiting is within ±2 decibels.

OPERATING CONSIDERATIONS

To insure proper phasing of the signal voltage developed at the quadrature grid, the components of the quadrature-grid circuit should be shielded from those of the control-grid circuit.

To obtain a symmetrical discriminator-response curve, the plate currents for no input signal and for unmodulated

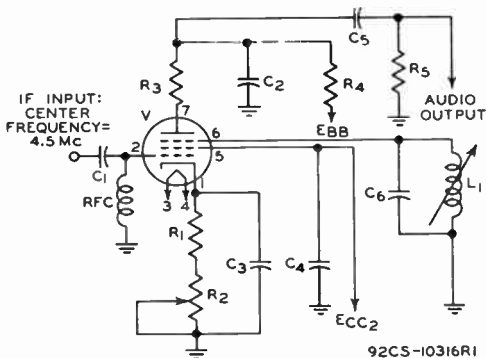
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input signal should be equal. To assure this equality, it is necessary that the plate voltage and grid-No.2 voltage have the proper values.

The proper plate voltage for any grid-No.2 voltage may be determined from the accompanying *Operation Characteristics* curve. This curve may also be used to determine the average dynamic plate current for any combination of grid-No.2 voltage and plate voltage.

TYPICAL QUADRATURE-GRID-FM-DETECTOR CIRCUIT



- C_1 : 100 μf
 C_2 : Integrating capacitor, 0.001 μf
 C_3 C_4 : 0.01 μf
 C_5 : 0.25 μf
 C_6 : 10 μf
 L_1 :
 R_1 : 200 ohms
 R_2 : Cathode-bias potentiometer, 200 ohms
 R_3 : Linearity resistor, 1000 ohms
 R_4 : Plate-load resistor, 0.33 megohm
 R_5 : 0.47 megohm
 V : Electron-tube-type 6BN6

For proper operation of this electron tube in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the quadrature-grid tuned circuit (L_1 , C_6) should be sufficiently high to assure that a 4-volt rms signal is developed at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

It is recommended that L_1 be shunted by a capacitance of at least 10 μf . This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L_1 , and a fixed capacitor.

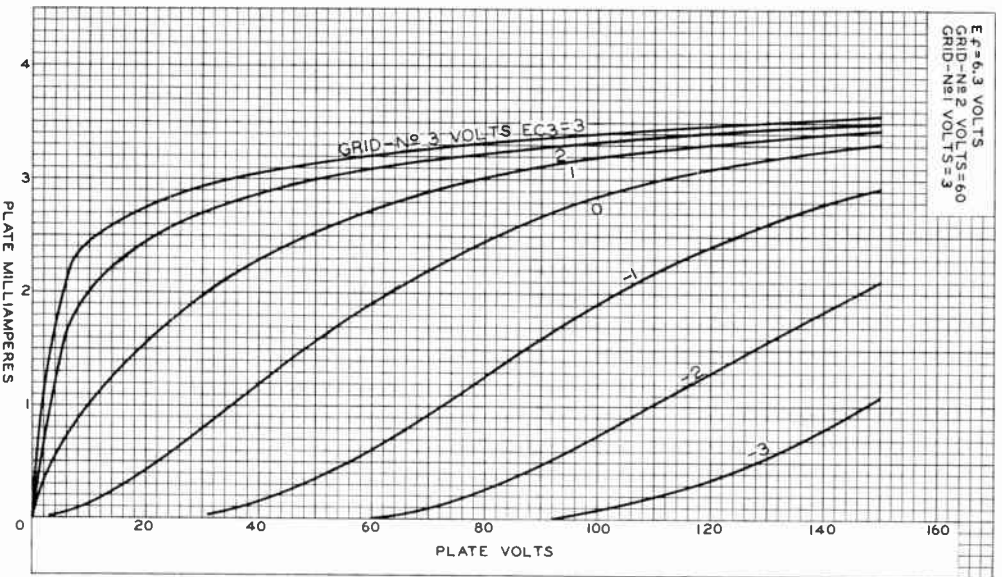
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AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-№ 2 VOLTS = 60
GRID-№ 1 VOLTS = 3



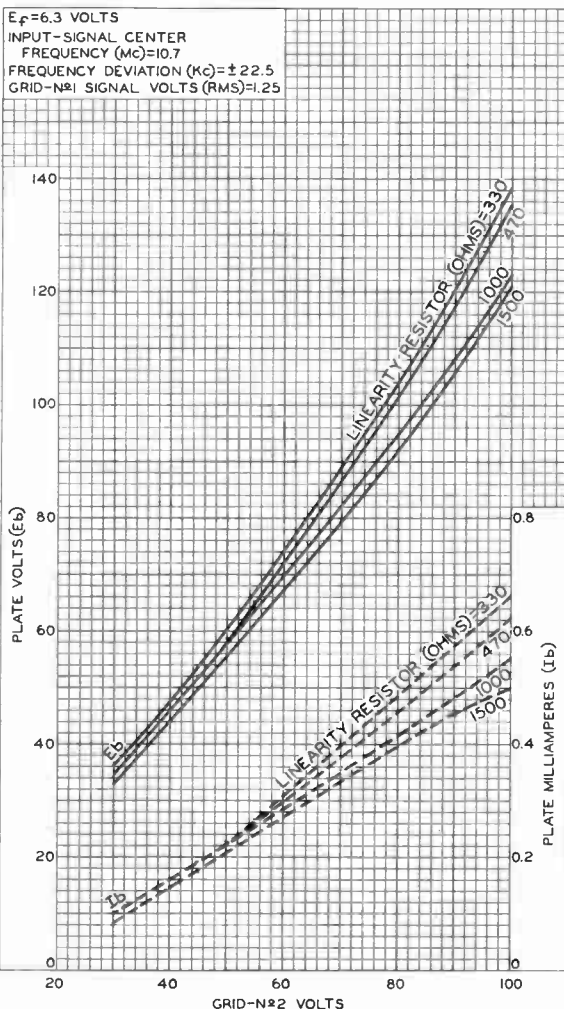
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Electron Tube Division
Harrison, N. J.



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OPERATION CHARACTERISTICS



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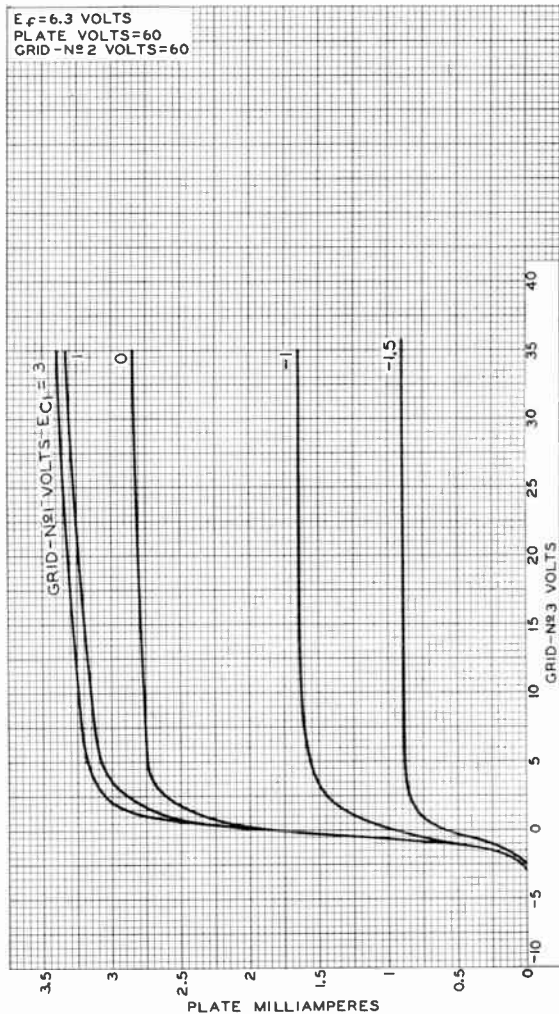


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 Harrison, N. J.

DATA 3
 8-60

6BN6

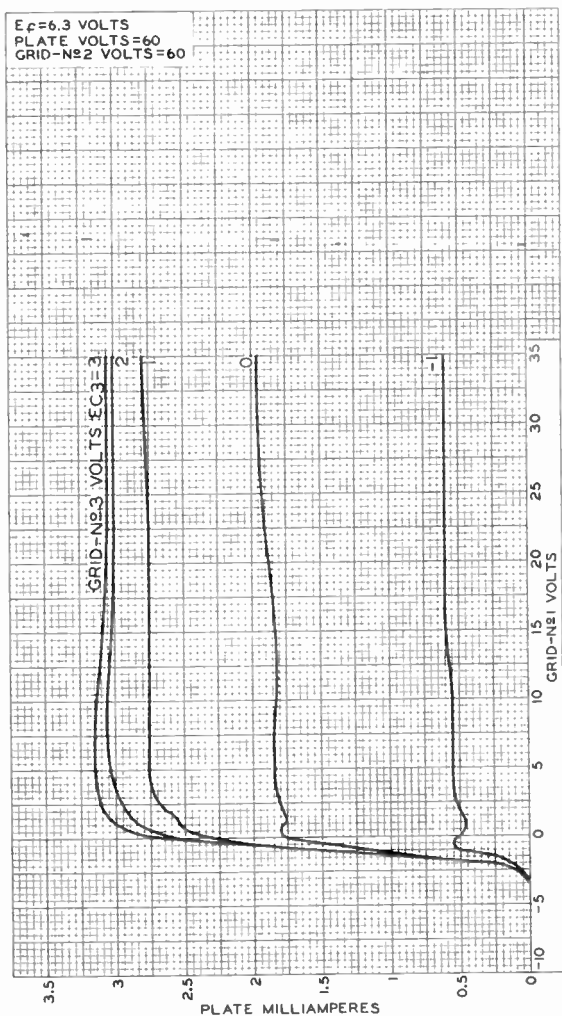
AVERAGE CHARACTERISTICS



92CM-10320



AVERAGE CHARACTERISTICS



92CM-10322







6BN8

6BN8

TWIN DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:⁰

Triode Unit:

Grid to plate	2.5	μuf
Grid to heater and cathode	3.6	μuf
Plate to heater and cathode	0.25	μuf

Diode Units:

Diode-No.1 plate to triode grid	0.06 max.	μuf
Diode-No.2 plate to triode grid	0.1 max.	μuf
Diode-No.1 cathode to all other electrodes	5	μuf
Diode-No.2 cathode to all other electrodes	5	μuf
Diode-No.1 plate to diode-No.2 plate	0.07 max.	μuf
Diode-No.1 plate to diode-No.1 cathode and heater	1.9	μuf
Diode-No.2 plate to diode-No.2 cathode and heater	1.9	μuf
Diode-No.1 cathode to diode-No.1 plate and heater	4.8	μuf
Diode-No.2 cathode to diode-No.2 plate and heater	4.8	μuf
Diode-No.1 plate to all other electrodes	3	μuf
Diode-No.2 plate to all other electrodes	3	μuf

Characteristics, Class A₁ Amplifier (Triode Unit):

Plate Voltage	100	250	volts
Grid Voltage	-1	-3	volts
Amplification Factor	75	70	
Plate Resistance (Approx.)	21000	28000	ohms
Transconductance	3500	2500	μmhos
Plate Current	1.5	1.6	ma
Grid Voltage (Approx.) for plate μa = 10	-2.5	-5.5	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tie)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section

← Indicates a change.

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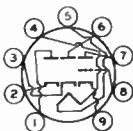


6BN8

TWIN DIODE—HIGH-MU TRIODE

Bulb. T6-1/2
 Base. Small-Button Noval 9-Pin (JEDEC No. E9-1)
 Basing Designation for BOTTOM VIEW. 9ER

Pin 1—Diode—No. 2
 Plate
 Pin 2—Diode—No. 2
 Cathode
 Pin 3—Diode—No. 1
 Cathode
 Pin 4—Heater



Pin 5—Heater
 Pin 6—Diode—No. 1
 Plate
 Pin 7—Triode Plate
 Pin 8—Triode Grid
 Pin 9—Triode
 Cathode

TRIODE UNIT — AMPLIFIER — Class A₁

→ Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE 330 max. volts
 GRID VOLTAGE:
 Positive-bias value 0 max. volts
 PLATE DISSIPATION 1.7 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 1 max. megohm

DIODE UNITS — Two

Maximum Ratings, Design-Maximum Values:

Values are for Each Unit

PEAK PLATE CURRENT. 54 max. ma
 DC PLATE CURRENT. 9 max. ma
 PEAK HEATER-CATHODE VOLTAGE:
 Heater negative with respect to cathode 200 max. volts
 Heater positive with respect to cathode 200[▲] max. volts

○ without external shield.

▲ The dc component must not exceed 100 volts.

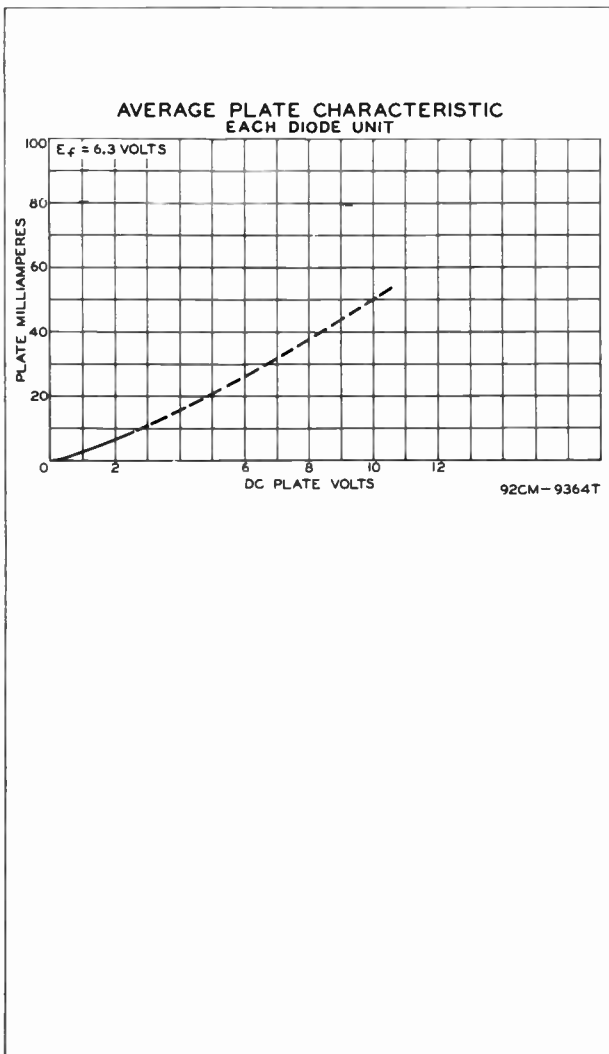
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6BN8

TWIN DIODE-HIGH-MU TRIODE

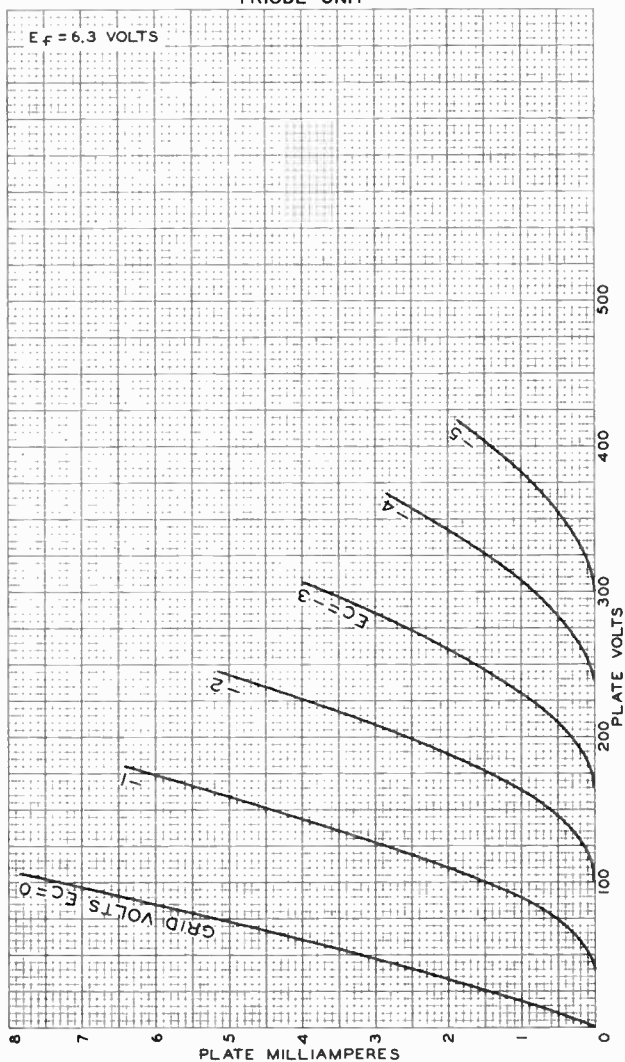


6BN8



6BN8

AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

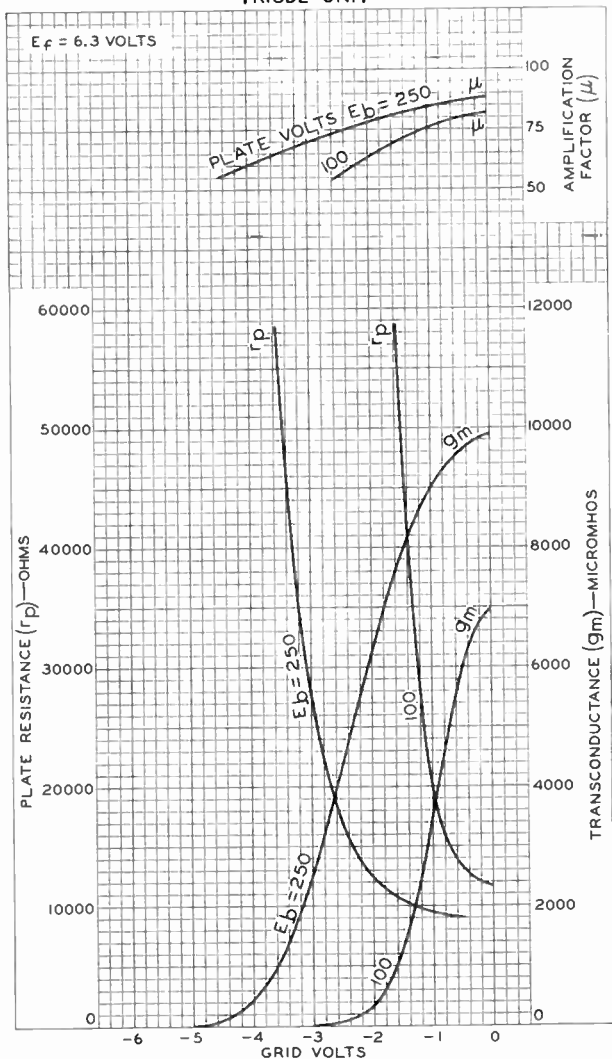




6BN8

6BN8

AVERAGE CHARACTERISTICS TRIODE UNIT





**6BQ5****POWER PENTODE**

9-PIN MINIATURE TYPE

6BQ5**GENERAL DATA****Electrical:**

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 0.76 amp

Direct Interelectrode Capacitances:⁰Grid No.1 to plate 0.5 max. μ fGrid No.1 to cathode & grid No.3,
grid No.2, and heater 10.8 μ fPlate to cathode & grid No.3,
grid No.2, and heater 6.5 μ f**Characteristics, Class A₁ Amplifier:**

Plate Voltage 250 volts

Grid-No.2 (Screen-grid) Voltage 250 volts

Grid-No.1 (Control-grid) Voltage -7.3 volts

Plate Resistance (Approx.) 38000 ohms

Transconductance 11300 μ hos

Plate Current 48 ma

Grid-No.2 Current 5.5 ma

Mechanical:

Operating Position Any

Maximum Overall Length 3-1/16"

Maximum Seated Length 2-13/16"

Length, Base Seat to Bulb Top (Excluding tip). 2-7/16" \pm 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 9CV

Pin 1 - Internal Con-
nection—
Do Not Use

Pin 2 - Grid No.1

Pin 3 - Cathode,
Grid No.3

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Same as Pin 1

Pin 7 - Plate

Pin 8 - Same as Pin 1

Pin 9 - Grid No.2

AMPLIFIER — Class A₁**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE 300 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE 300 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:
Positive-bias value 0 max. volts

CATHODE CURRENT 65 max. ma

PLATE DISSIPATION 12 max. watts

GRID-No.2 INPUT 2 max. watts

6BQ5



6BQ5

POWER PENTODE

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 [▲] max.	volts

Typical Operation:

Plate Voltage.	250	volts
Grid-No.2 Voltage.	250	volts
Grid-No.1 Voltage.	-7.3	volts
Peak AF Grid-No.1 Voltage.	6.2	volts
Zero-Signal Plate Current.	48	ma
Max.-Signal Plate Current.	50.6	ma
Zero-Signal Grid-No.2 Current.	5.5	ma
Max.-Signal Grid-No.2 Current.	10	ma
Effective Load Resistance.	4500	ohms
Total Harmonic Distortion.	10	%
Max.-Signal Power Output	5.7	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.3 max.	megohm
For cathode-bias operation	1 max.	megohm

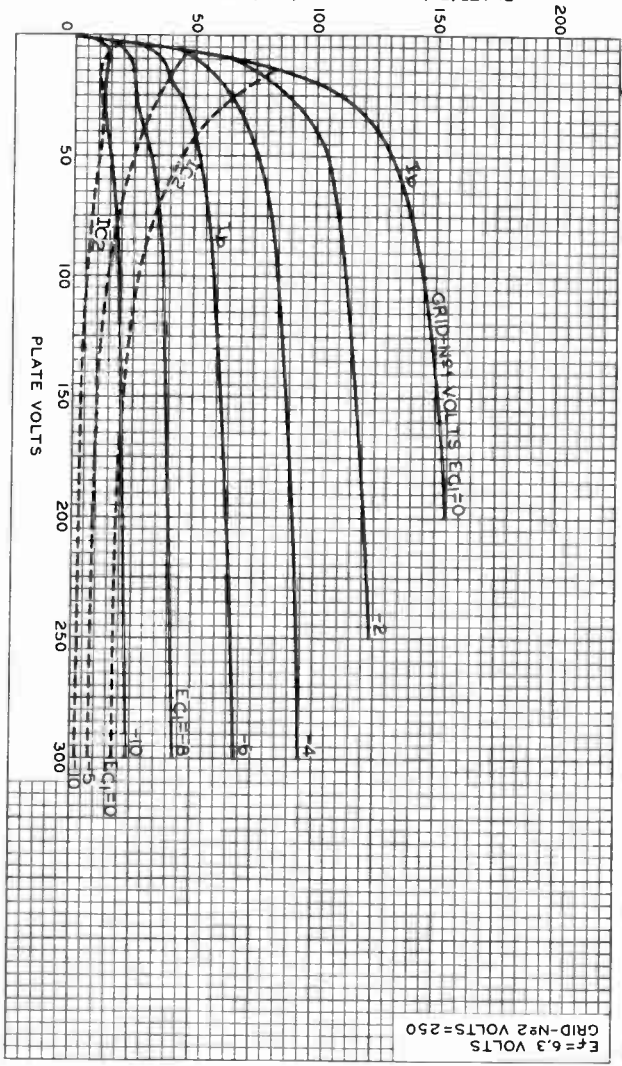
○ without external shield.

● Grid-No.2 input must not exceed 4 watts under maximum-signal conditions.

▲ The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided.



AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 GRID-#2 VOLTS = 250

6BQ5



6BQ5

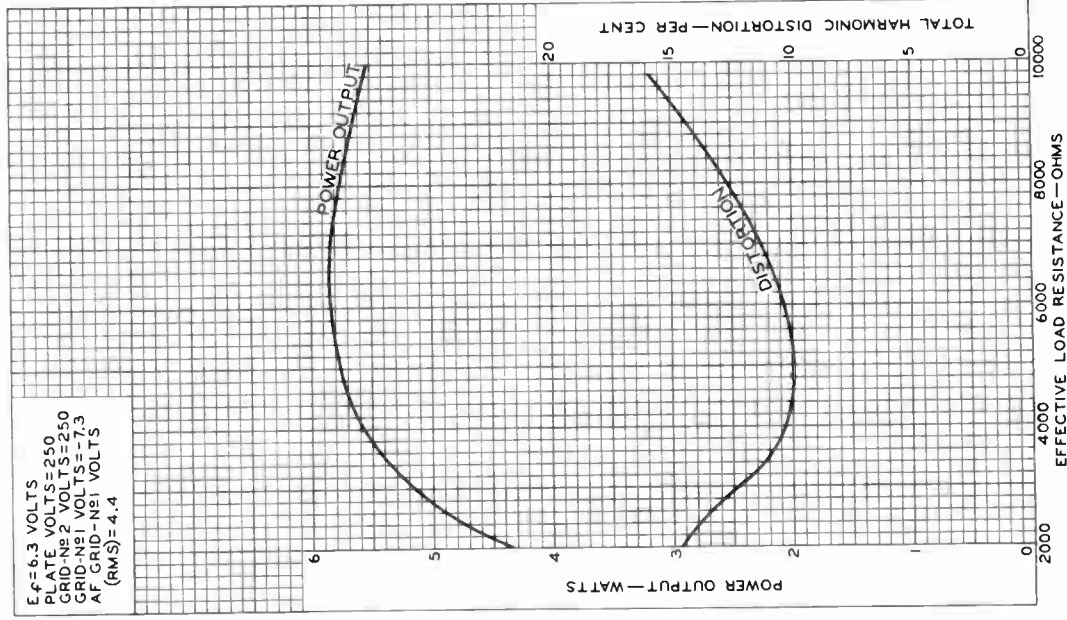
6BQ5



6BQ5

OPERATION CHARACTERISTICS

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 250
 GRID-N₂ VOLTS = 250
 GRID-N₁ VOLTS = -7.3
 AF GRID-N₁ VOLTS
 (RMS) = 4.4



World Precision

6BQ6GTB/6CU6

Beam Power Tube

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	1.2	amp

Direct Interelectrode Capacitances (Approx.):^a

Grid No.1 to plate	0.6	μmf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μmf
Plate to cathode & grid No.3, grid No.2, and heater	7	μmf ←

Characteristics, Class A₁ Amplifier:

Plate Voltage	60	150	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.3	-	
Plate Resistance (Approx.)	-	-	14500	ohms
Transconductance	-	-	5900	μmhos
Plate Current	260 ^b	-	57	ma
Grid-No.2 Current	26 ^b	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-	-43	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3-7/8"
Seated Length	2-7/8" to 3-5/16"
Maximum Diameter	1-9/32"
Bulb	T9
Cap	Skirted Miniature (JEDEC No. C1-2, C1-3, or C1-33)

Bases (Alternates):

Intermediate-Shell Octal:

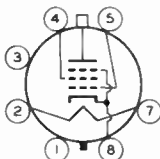
- 7-Pin, Arrangement 1 (JEDEC Group 1, No. B7-7)
- 6-Pin, Arrangement 2 (JEDEC Group 1, No. B6-81)

Short Intermediate-Shell Octal with External Barriers:

- 7-Pin (JEDEC Group 1, No. B7-59)
- 6-Pin, Arrangement 2 (JEDEC Group 1, No. B6-84)
- 5-Pin, Arrangement 3 (JEDEC Group 1, No. B5-187)

Basing Designation for BOTTOM VIEW 6AM

- Pin 1^c - No Connection
- Pin 2 - Heater
- Pin 3^c - No Connection
- Pin 4 - Grid No.2



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

← Indicates a change.



6BQ6GTB/6CU6

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system^d

DC PLATE-SUPPLY VOLTAGE	600	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) ^e	6000 ^f	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1250	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	200	max.	volts
PEAK NEGATIVE PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE	300	max.	volts
CATHODE CURRENT:			
Peak	400	max.	ma
Average	110	max.	ma
→ GRID-No.2 INPUT	2.5	max.	watts
PLATE DISSIPATION ^g	11	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^h	max.	volt
BULB TEMPERATURE (At hottest point on bulb surface)	220	max.	°C

→ Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.47	max.	megohm
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^a without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

^c On the 6-pin bases, pin 1 as well as pin 6 is omitted. On the 5-pin base, pins 1 and 3 as well as pin 6 are omitted.

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

^e This rating is applicable where the duration of the voltage pulse does 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.

^f Under no circumstances should this absolute value be exceeded.

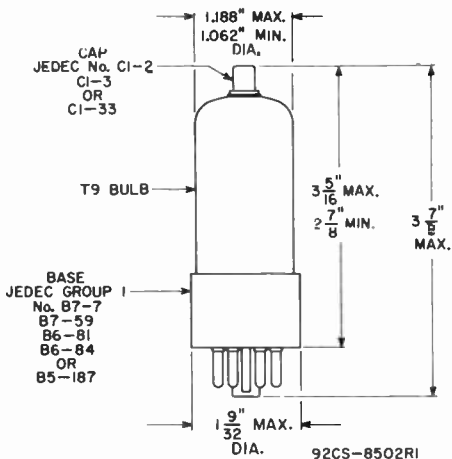
^g An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

^h The dc component must not exceed 100 volts.

→ Indicates a change.



6BQ6GTB/6CU6

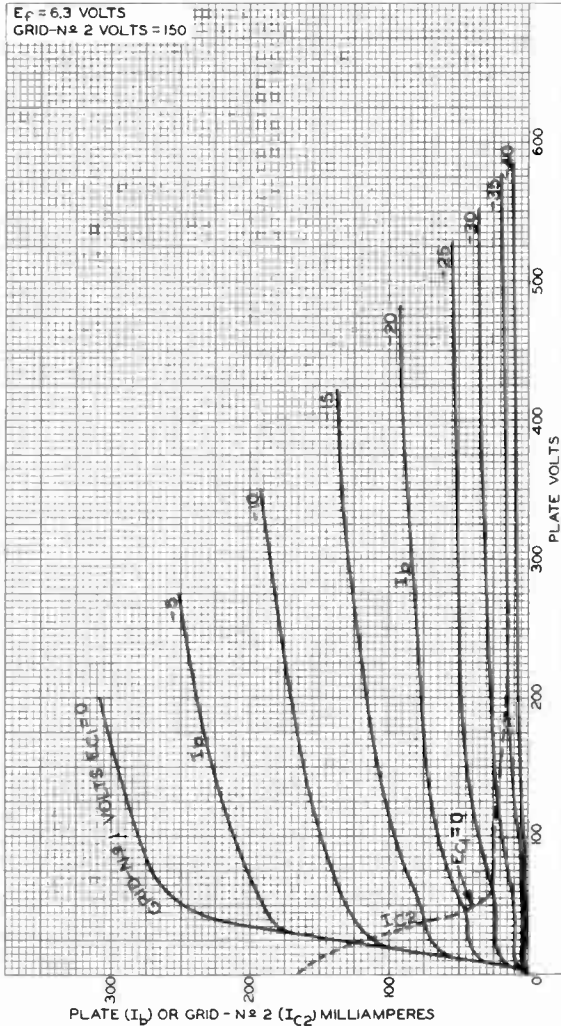


RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 2
1-62

6BQ6GTB/6CU6

AVERAGE CHARACTERISTICS



Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For TV Tuners Using Direct-Coupled Cathode-Drive Circuits

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.4	amp

Direct Interelectrode Capacitances:^a

	Unit No.1	Unit No.2	
Grid to plate	1.2	1.2	μf
Grid to cathode, internal shield, and heater.	2.6	-	μf
Cathode to grid, internal shield, and heater.	-	5	μf
Plate to cathode, internal shield, and heater.	1.2	-	μf
Plate to grid, internal shield, and heater.	-	2.2	μf
Plate to cathode.	0.12	0.12	μf
Heater to cathode	2.6	2.6	μf
Plate of unit No.1 to plate of unit No.2.	0.010 max.		μf
Plate of unit No.2 to plate and grid of unit No.1	0.024 max.		μf

Characteristics, Class A₁ Amplifier (Each Unit):

Plate Supply Voltage.	150	volts
Cathode Resistor.	220	ohms
Amplification Factor.	38	
Plate Resistance (Approx.).	5900	ohms
Transconductance.	6400	μhos
Plate Current	9	ma
Grid Voltage (Approx.) for plate $\mu\text{a} = 100$	-6.5	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" \pm 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb.	T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC No.E9-1)

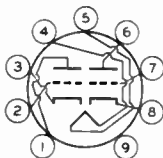
← Indicates a change.



6BQ7A

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 3 - Cathode of Unit No.1
- Pin 5 - Internal Shield

AMPLIFIER — Class A₁

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	250 ^b max.	volts
PLATE DISSIPATION	2 max.	watts
CATHODE CURRENT	20 max.	ma

→ PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	200 ^b max.	volts
Heater positive with respect to cathode.	200 ^c max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm
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^a with external shield JEDEC No.315 connected to internal shield.

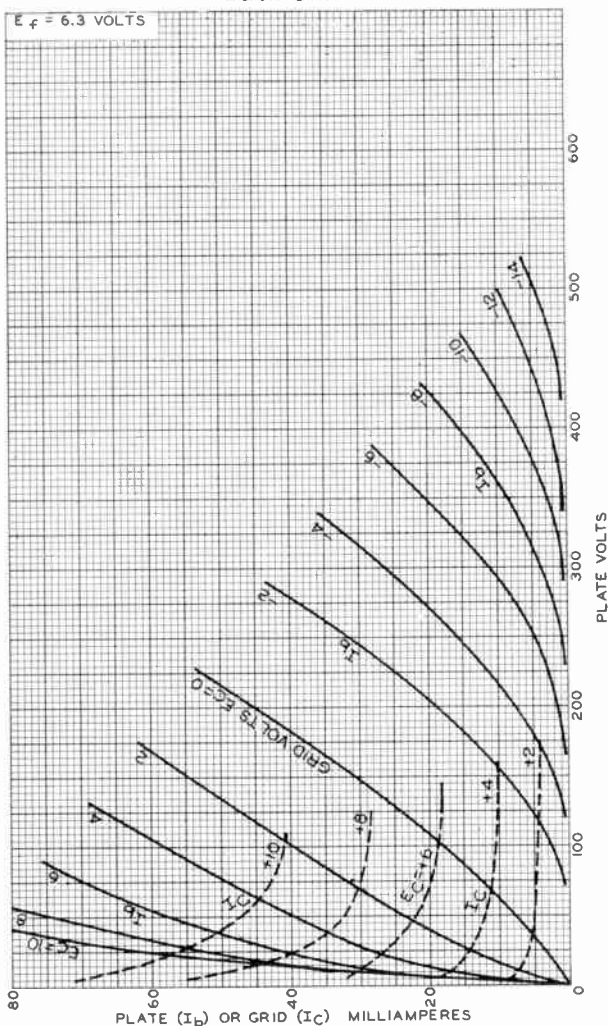
^b Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

^c The dc component must not exceed 100 volts.

→ Indicates a change.

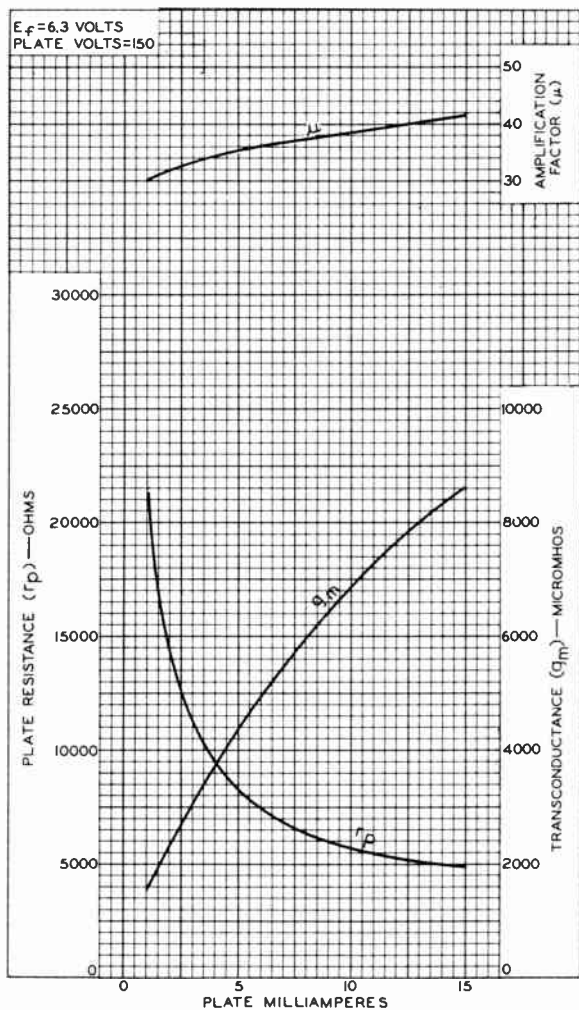


AVERAGE CHARACTERISTICS Each Unit



6BQ7A

AVERAGE CHARACTERISTICS Each Unit



92CM-7538R2

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

Especially Useful as Combined Triode Oscillator and Pentode Mixer in VHF TV Tuners

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	V
Current	0.450 ± 0.030	0.450 ^b	A
Warm-up time (average)	11	-	s
Peak heater-cathode voltage (Each unit)			
Heater negative with respect to cathode		200 max	V
Heater positive with respect to cathode		200 ^c max	V

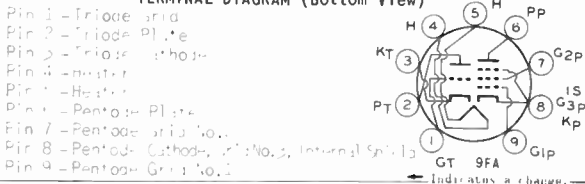
Direct Interelectrode Capacitances (Approx.)

	Without External Shield	With External Shield ^d	
<i>Triode Unit</i>			
Grid to plate	1.8	1.8	pF
Input: G ₁ to (K _T , K _P + G _{3P} + IS, H)	2.8	2.8	pF
Output: P _T to (K _T , K _P + G _{3P} + IS, H)	1.5	2.0	pF
<i>Pentode Unit</i>			
Grid No. 1 to plate	0.02	0.01	pF
Input: G _{1P} to (K _P + G _{3P} + IS, G _{2P} , H)	4.6	4.6	pF
Output: P _P to (K _P + G _{3P} + IS, G _{2P} , H)	2.4	3.2	pF
Triode-Cathode to Heater	2.4	2.4 ^e	pF
Pentode-Cathode to Heater	2.4	2.4 ^e	pF
Pentode Grid No. 1 to Triode Plate	0.2 max	0.2 max	pF
Pentode Plate to Triode Plate	0.1 max	0.02 max	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.187 in
Maximum Seated Length	1.937 in
Maximum Diameter	0.875 in
Length, Base Seat to Bulb Top	1.469 to 1.656 in
<i>(Including tip)</i>	
Dimensional Outline (JEDEC 6-2)	See <i>General Section</i>
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)

TERMINAL DIAGRAM (Bottom View)



← Indicates a change.



RADIO CORPORATION OF AMERICA
 Electronic Components and Devices
 Harrison, N. J.

DATA
 4-7

6BR8A

CHARACTERISTICS, CLASS A₁ AMPLIFIER

	Triode Unit	Pentode Unit	
Plate Voltage.	125	125	V
Grid No.2 Voltage.	-	110	V
Grid No.1 Voltage.	-1	-1	V
Amplification Factor	40	-	
Plate Resistance (Approx.)	-	0.2	MΩ
Transconductance	7500	5000	μmho
Plate Current.	13.5	9.5	mA
Grid-No.2 Current.	-	3.5	mA
Grid-No.1 Voltage (Approx.)	-9	-9	V

for plate $\mu A = 0$

CLASS A₁ AMPLIFIER

Design Maximum Ratings

	Triode Unit	Pentode Unit	
Plate Voltage.	330	330	V
Grid-No.2 (Screen-Grid) Supply Voltage	-	330	V
Grid-No.2 Voltage.	-	See Grid-No.2	
<i>Input Rating Chart at front of Receiving Tube Section</i>			
Grid-No.1 (Control-Grid) Voltage	0	0	V
Positive-bias value			
Grid-No.2 Input			
for grid-No.2 voltages up to 165 volts	-	0.55	W
for grid-No.2 voltages between 165 and 330 volts	-	See Grid-No.2	
<i>Input Rating Chart at front of Receiving Tube Section</i>			
Plate Dissipation.	2.5	3	W

a At heater amperes = 0.450.

b At heater volts = 6.3.

c The dc component must not exceed 100 volts.

d With external shield JEDEC No. 315 connected to Pin 4, except as noted.

e With external shield JEDEC No. 315 connected to Pin 6.

Curves shown under Type 6U8A also apply to the 6BR8A.

→ Indicates a change.



Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp

Peak heater-cathode voltage:

Heater negative with respect to cathode ^a	5000 ^b max.	volts
Heater positive with respect to cathode	300 ^c max.	volts

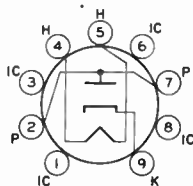
Direct Interelectrode Capacitances (Approx):^d

P to (K,H)	6.5	pf
K to (P,H)	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005"
Seated Length	2.375" to 2.625"
Diameter	1.062" to 1.188"
Dimensional Outline	See <i>General Section</i>
Bulb	T9
Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW	9HP

- Pin 1 - Do Not Use^e
- Pin 2 - Plate
- Pin 3 - Do Not Use^e
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Do Not Use^e
- Pin 7 - Plate
- Pin 8 - Do Not Use^e
- Pin 9 - Cathode



DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^f

Peak Inverse Plate Voltage ^a	5000 max.	volts
Peak Plate Current	1100 max.	ma
Average Plate Current	200 max.	ma
Plate Dissipation	6 max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 140	12	volts
--	----	-------



6BS3A

- a This rating is applicable where the duration of the voltage pulse does 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.
- b The dc component must not exceed 900 volts.
- c The dc component must not exceed 100 volts.
- d Without external shield.
- e Socket terminals 1, 3, 6, and 8 should not be used for tie points. It is also recommended that socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.



Sharp-Cutoff Twin Pentode

With Common Cathode, Grid No.1, and Grid No.2

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp

Direct Interelectrode Capacitances:^a

Grid No.3 to plate (Each unit)	1.9	μf
Grid No.1 to all other electrodes	6	μf
Grid No.3 to all other electrodes (Each unit)	3.6	μf
Plate to all other electrodes (Each unit)	3	μf
Grid No.3 (Unit No.1) to grid No.3 (Unit No.2)	0.015 max.	μf

Characteristics, Class A₁ Amplifier:

With both units operating

Plate Voltage (Each Unit)	100	100	volts
Grid-No.3 Voltage (Each Unit)	-10	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	b	b	volts
Plate Current (Each Unit)	-	2.2	ma
Grid-No.2 Current	6.5	3.3	ma
Cathode Current	6.6	7.8	ma

With one unit operating^c

Plate Voltage	100	100	volts
Grid-No.3 Voltage	0	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	0	b	volts
Grid-No.3-to-Plate Transconductance	-	180	μhos
Grid-No.1-to-Plate Transconductance	1500	-	μhos
Plate Current	-	2.2	ma
Grid-No.3 Voltage (Approx.) for plate μa = 100	-	-4.5	volts
Grid-No.1 Voltage (Approx.) for plate μa = 100	-	-2.3	volts

Mechanical:

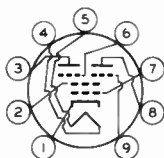
Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb	T6-1/2



6BU8

Base Small-Button Noval 9-Pin (JEDEC No. T9-1)
 Base Designation for 60104 VIE 9FG

Pin 1 - Cathode
 Pin 2 - Grid No. 2,
 Internal
 Shield
 Pin 3 - Plate of
 Unit No. 2
 Pin 4 - Heater
 Pin 5 - Heater



Pin 6 - Grid No. 3 of
 Unit No. 2
 Pin 7 - Grid No. 1
 Pin 8 - Plate of
 Unit No. 1
 Pin 9 - Grid No. 3 of
 Unit No. 1

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE (Each unit)	300	max.	volts	←
GRID-No. 3 (SUPPRESSOR-GRID) VOLTAGE (Each unit):				
Peak-positive value	50	max.	volts	
Negative-bias value	0	max.	volts	
Positive-bias value	3	max.	volts	
GRID-No. 2 (SCREEN-GRID) VOLTAGE	150	max.	volts	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:				
Negative-bias value	50	max.	volts	
CATHODE CURRENT	12	max.	ma	
GRID-No. 2 INPUT	0.75	max.	watt	
PLATE DISSIPATION (Each unit)	1.1	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	

Maximum Circuit Values:

Grid-No. 3-Circuit Resistance (Each unit)	0.5	max.	megohm
Grid-No. 1-Circuit Resistance ^a	0.5	max.	megohm

^a without external shield.

^b Adjusted to give a dc grid-No. 1 current of 100 microamperes.

^c with plate and grid No. 3 of the other unit connected to ground.

^d The dc component must not exceed 100 volts.

← Indicates a change.

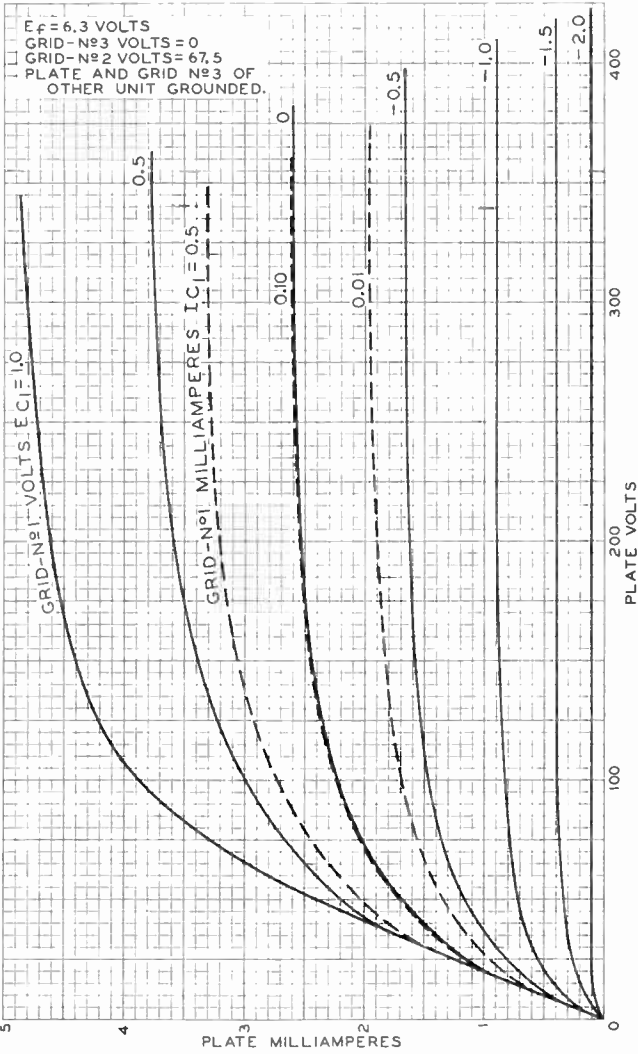




6BU8

AVERAGE PLATE CHARACTERISTICS EACH UNIT

6BU8

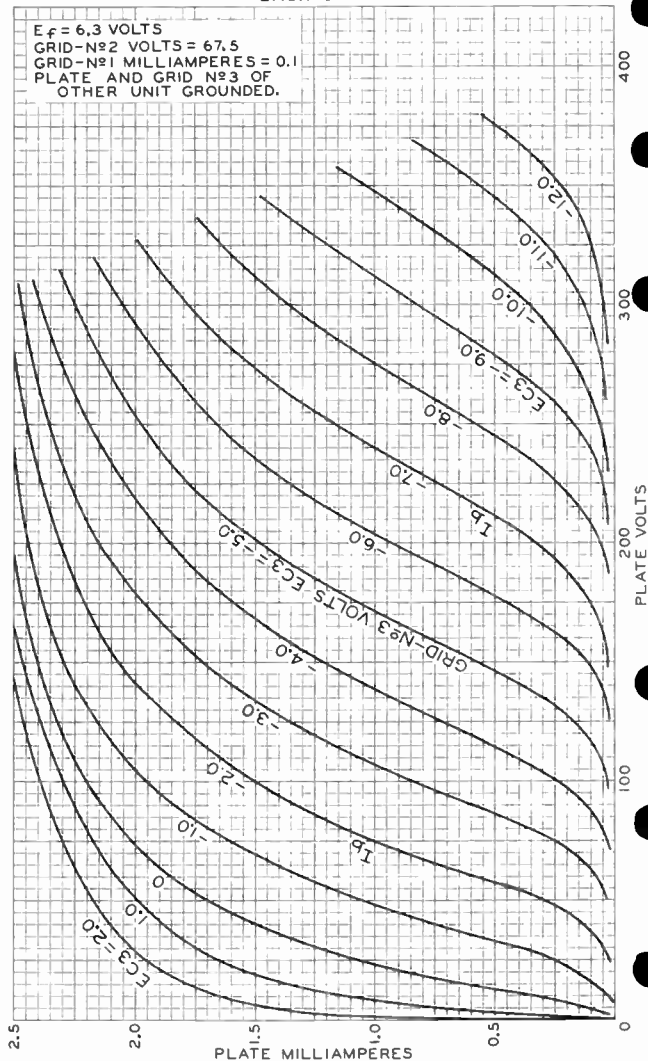


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6BU8

AVERAGE PLATE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

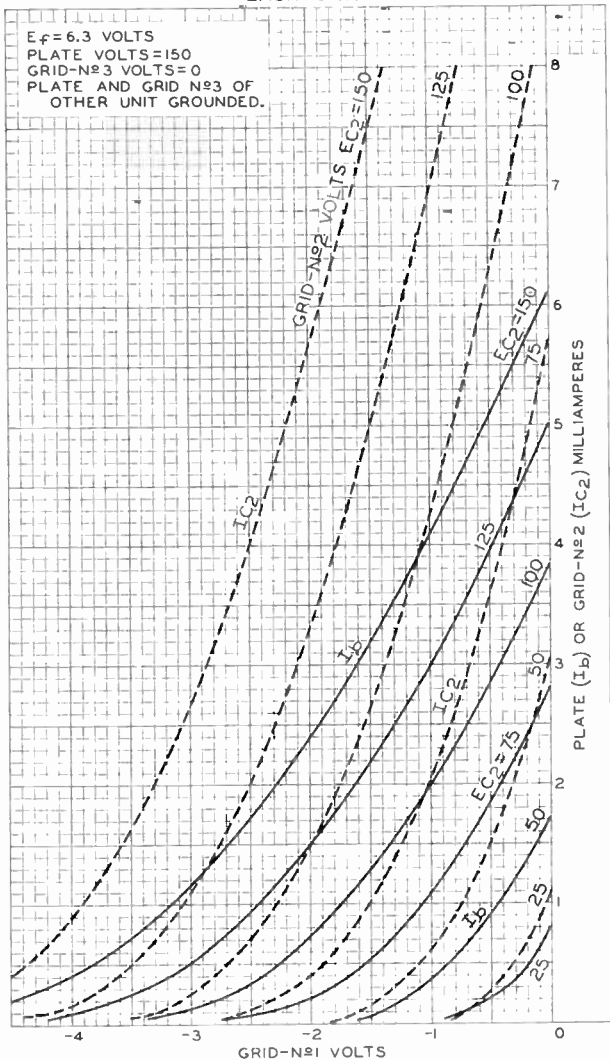
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6BU8

6BU8

AVERAGE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

92CM-9433

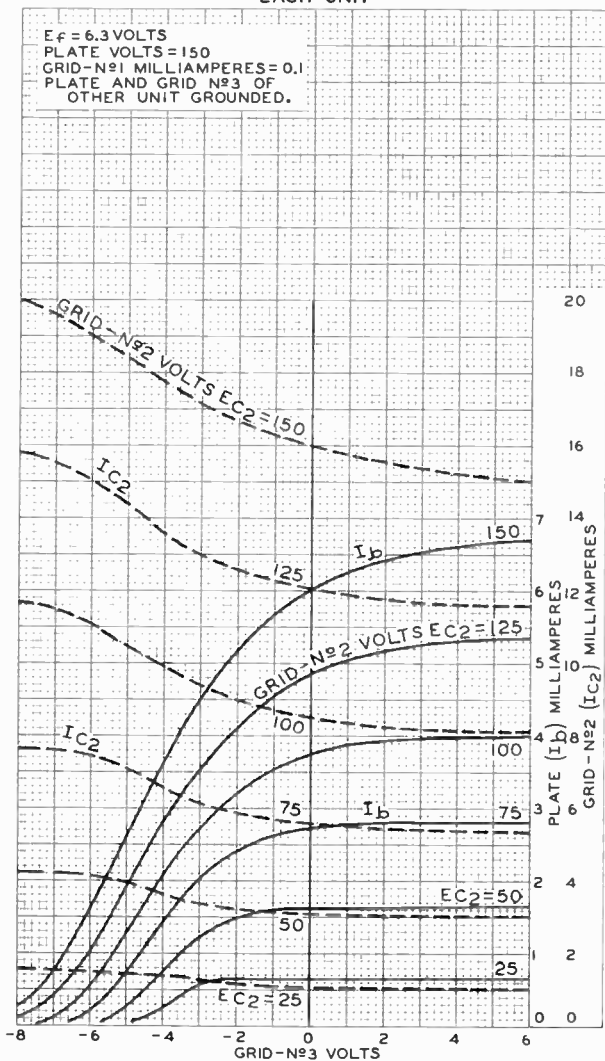
RADCO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6BU8



6BU8

AVERAGE CHARACTERISTICS EACH UNIT



Twin Diode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.45	amp

Direct Interelectrode Capacitances:^a*Pentode Unit:*

Grid No.1 to plate	0.02 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4.8	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	μf

Diode Units:

Diode-No.1 plate to cathode and heater	1.3	μf
Diode-No.2 plate to cathode and heater	1.2	μf
Pentode grid No.1 to either diode plate	0.006 max.	μf

Characteristics, Class A₁ Amplifier (Pentode Unit):

Plate Supply Voltage	250	volts
Grid-No.2 Supply Voltage	110	volts
Cathode Resistor	68	ohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	5200	μmhos
Grid-No.2 Current	3.5	ma
Plate Current	10	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 10$	-10	volts

Mechanical:

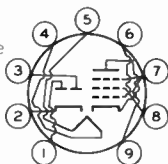
Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)



6BW8

Basing Designation for BOTTOM VIEW. 9HK

- Pin 1 - Diode
Plate No.2
- Pin 2 - Diode Cathode
- Pin 3 - Diode
Plate No.1
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Pentode
Grid No.1



- Pin 7 - Pentode
Cathode,
Grid No.3,
Internal
Shield
- Pin 8 - Pentode
Grid No.2
- Pin 9 - Pentode
Plate

PENTODE UNIT — AMPLIFIER — Class A₁

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 max. watts
- PEAK HEATER-CATHODE VOLTAGE:

 - Heater negative with respect to cathode. 200 max. volts
 - Heater positive with respect to cathode. 200^b max. volts

Maximum Circuit Values:

- Grid-No.1-Circuit Resistance:

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

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

- PLATE CURRENT. 5 max. ma
- PEAK HEATER-CATHODE VOLTAGE:

 - Heater negative with respect to cathode. 200 max. volts
 - Heater positive with respect to cathode. 200^b max. volts

Characteristics, Instantaneous Test Condition:

- Plate Current for plate volts = 5. 20 ma

^a without external shield.

^b The dc component must not exceed 100 volts.





6BY6

6BY6

PENTAGRID AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 0.3 amp

Direct Interelectrode Capacitances:

Grid No.1 to Plate 0.08 max. μ f

Grid No.3 to Plate 0.35 max. μ f

Grid No.1 to Grid No.3 0.15 max. μ f

Grid No.1 to All Other Electrodes
and Heater 5.4 μ f

Grid No.3 to All Other Electrodes
and Heater 6.9 μ f

Plate to All Other Electrodes
and Heater 7.6 μ f

Characteristics, Class A₁ Amplifier:

Plate Voltage 250 volts

Grids-No.2-and-No.4 Voltage 100 volts

Grid-No.3 Voltage -2.5 volts

Grid-No.1 Voltage -2.5 volts

Grid-No.3-to-Plate Transconductance 500 μ hos

Grid-No.1-to-Plate Transconductance 1900 μ hos

Plate Current 6.5 ma

Grids-No.2-and-No.4 Current 9 ma

Grid-No.3 Volts (Approx.) for plate
current of 35 μ amp and grid-No.1
volts = -4 -15 volts

Grid-No.1 Volts (Approx.) for plate
current of 35 μ amp and grid-No.3
volts = 0 -12 volts

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" \pm 3/32"

Maximum Diameter 3/4"

Bulb T-5-1/2

Base Small-Button Miniature 7-Pin (JETEC No.E7-1)

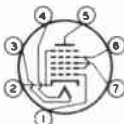
BOTTOM VIEW

Pin 1: Grid No.1

Pin 2: Cathode,
Grid No.5

Pin 3: Heater

Pin 4: Heater



Pin 5: Plate

Pin 6: Grid No.2,
Grid No.4

Pin 7: Grid No.3

*: with no external shield.

6BY6



6BY6

PENTAGRID AMPLIFIER

GATED AMPLIFIER SERVICE

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max. volts
GRIDS-No.2-and-No.4 VOLTAGE	See Rating Curve at front of this Section
GRIDS-No.2-and-No.4 SUPPLY VOLTAGE	300 max. volts
GRID-No.3 SUPPLY VOLTAGE:	
Negative Bias Value	50 max. volts
Positive Bias Value	0 max. volts
Positive Peak Value	25 max. volts
GRID-No.1 SUPPLY VOLTAGE:	
Negative Bias Value	100 max. volts
PLATE DISSIPATION	2 max. watts
GRID-No.3 INPUT	0.1 max. watt
GRIDS-No.2-and-No.4 INPUT	1 max. watt
GRID-No.1 INPUT	0.1 max. watt
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode	200 max. volts
Heater positive with respect to cathode	200 [#] max. volts

Characteristics as Sync Separator and Sync Clipper:

Plate Voltage	10	volts
Grid-No.3 Voltage	0	volts
Grids-No.2-and-No.4 Voltage	25	volts
Grid-No.1 Voltage	0	volts
Plate Current	1.4	ma
Grids-No.2-and-No.4 Current	3.5	ma
Grid-No.3 Bias Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.1 voltage of 0 volts, and plate current of 50 μ amp	-2.5	volts
Grid-No.1 Bias Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.3 voltage of 0 volts, and plate current of 50 μ amp	-2.3	volts

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

The dc component must not exceed 100 volts.



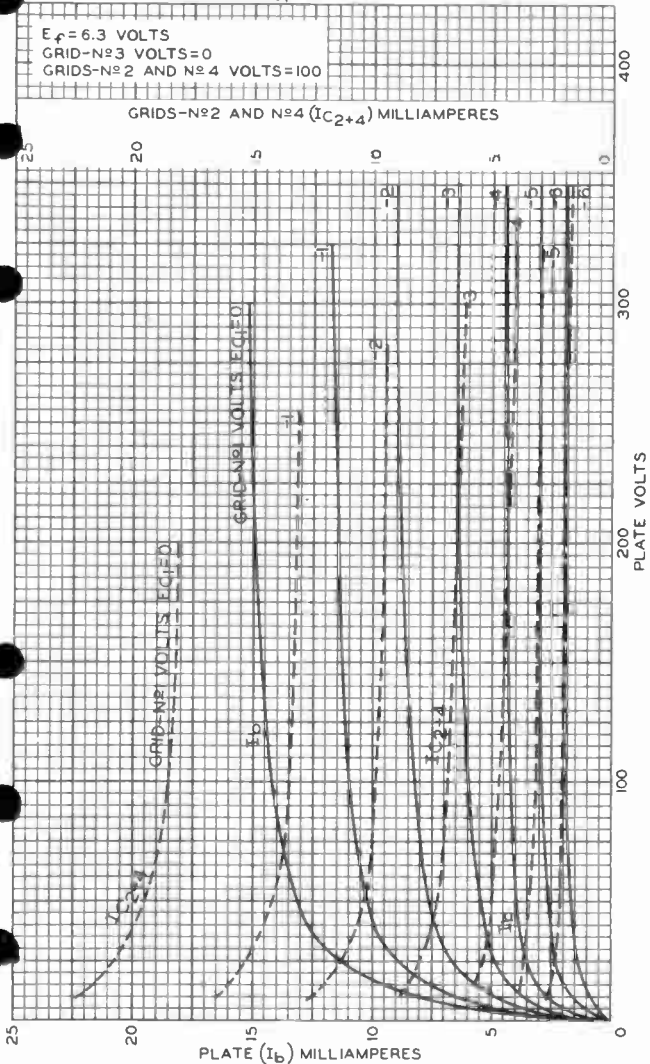
6BY6

AVERAGE OPERATION CHARACTERISTICS
WITH E_{C1} AS VARIABLE

6BY6

$E_f = 6.3$ VOLTS
GRID-N°3 VOLTS=0
GRIDS-N°2 AND N°4 VOLTS=100

GRIDS-N°2 AND N°4 (I_{C2+4}) MILLIAMPERES

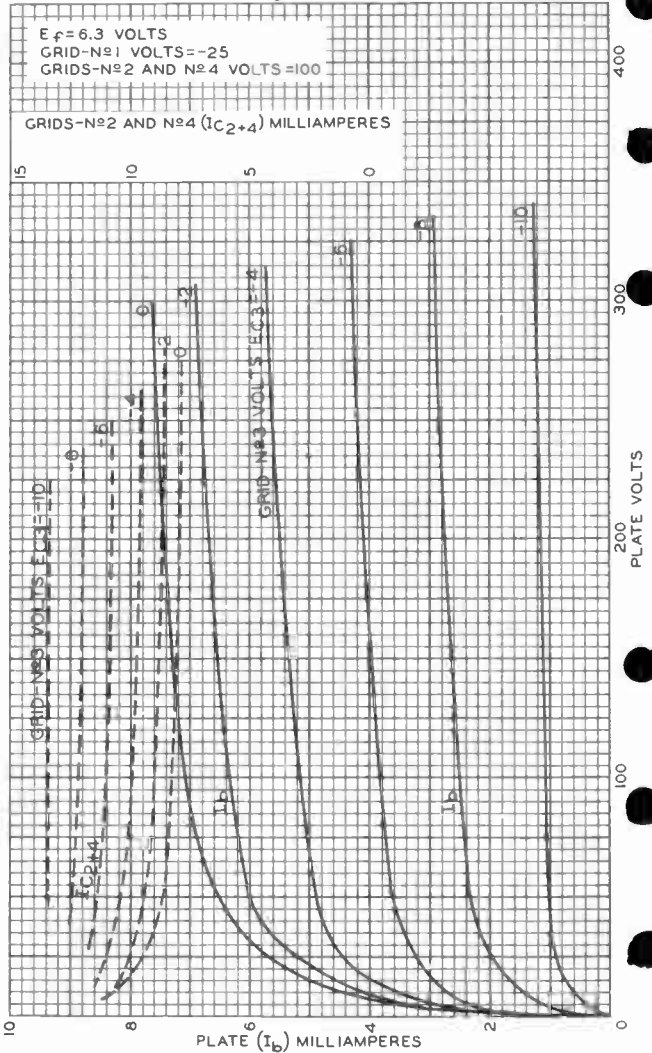


6BY6



6BY6

AVERAGE OPERATION CHARACTERISTICS WITH E_{C3} AS VARIABLE



NOV. 5, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, PHILADELPHIA, NEW JERSEY

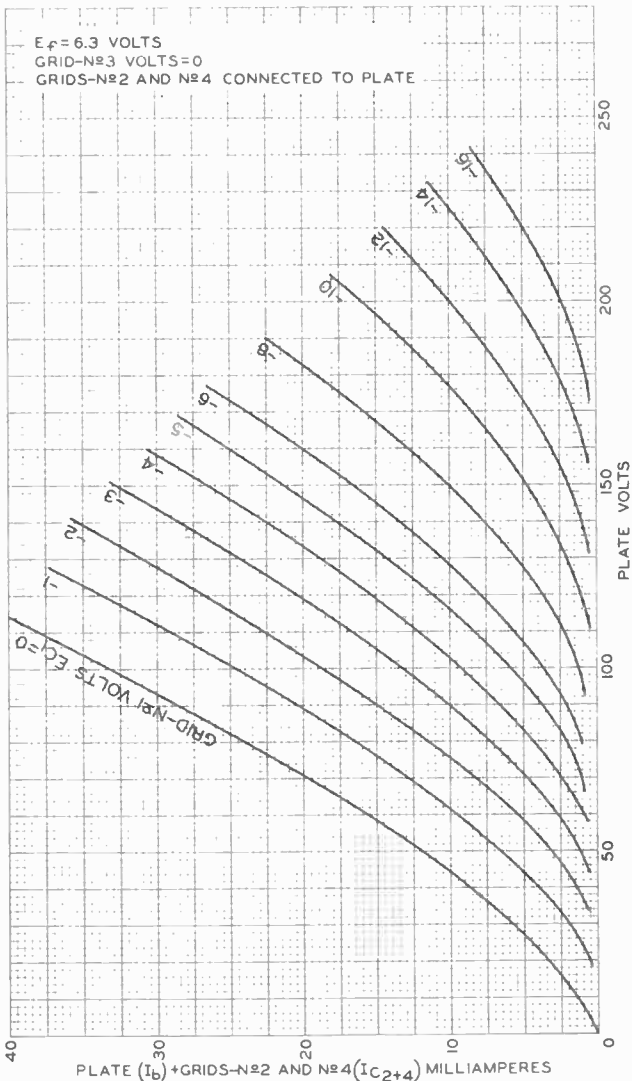
92CM-8139



6BY6

6BY6

AVERAGE PLATE CHARACTERISTICS



NOV. 5, 1953

TUBE DEPARTMENT

92CM-8138

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY





6BY8

6BY8

DIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	. . . . . ac or dc volts
Current	0.6	. . . . . amp
Warm-up time (Average).	11	. . . . . sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:°

Diode Unit:

Plate to cathode, pentode		
plate, pentode grid No.3 & internal shield, pentode		
grid No.2, pentode grid No.1, pentode cathode, and heater.	4.8*	μf

Pentode Unit:

Grid No.1 to plate.	0.0035 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater.	5	μf

Characteristics, Class A₁ Amplifier (Pentode Unit):

Plate-Supply Voltage.	100	250	volts
Grid No.3 (Suppressor Grid)	Connected to cathode at socket		
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 $\mu a = 10$	-4.2	-6.5	volts

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 (JETEC No. E9-1)

0.°: See next page.



6BY8

DIODE—SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW 9FN

Pin 1—Pentode

Grid No.1

Pin 2—Pentode

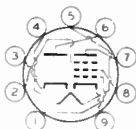
Grid No.3,

Internal

Shield

Pin 3—Diode

Cathode



Pin 4—Heater

Pin 5—Heater

Pin 6—Diode Plate

Pin 7—Pentode Plate

Pin 8—Pentode

Grid No.2

Pin 9—Pentode

Cathode

PENTODE UNIT — AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. 300 max. volts

GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE. 0 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:

Negative-bias value. 50 max. volts

Positive-bias value. 0 max. volts

GRID-No.2 INPUT:

For grid-No.2 voltages up to 150 volts. 0.65 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. 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-No.1—Circuit Resistance:

For fixed-bias operation 0.25 max. megohm

For cathode-bias operation 1 max. megohm

DIODE UNIT

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE 430 max. volts

PLATE CURRENT:

Peak 180 max. ma

DC 45 max. ma

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts

Heater positive with respect to cathode. 200[▲] max. volts○ with external shield JETEC No.315 connected to pentode cathode (pin 9)
except as noted.

● with external shield JETEC No.315 connected to ground.

▲ The dc component must not exceed 100 volts.



6BY8

6BY8

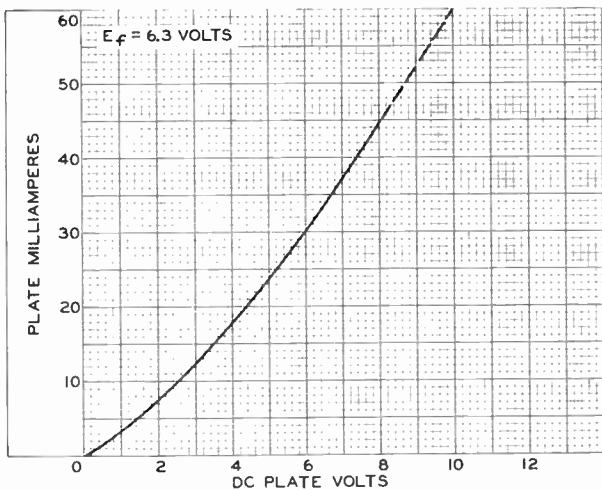
DIODE—SHARP-CUTOFF PENTODE

CURVES
shown under Type 6AU6 also apply to the
pentode unit of the 6BY8

9-58

TEMPERATURE DATA 2

AVERAGE PLATE CHARACTERISTIC DIODE UNIT



92CS-9616

ELECTRON TUBE DIVISION

RCA CORPORATION, 1230 AVENUE OF THE STARS, WASHINGTON, D.C. 20044

World Radio History





6BZ6

SEMIREMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

6BZ6

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.3	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^o</i>	
Grid No.1 to plate	0.025 max.	0.015 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7	7	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2	3	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	125	volts
Grid No.3	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.26	megohm
Transconductance	8000	μmhos
Plate Current	14	ma
Grid-No.2 Current	3.6	ma
Grid-No.1 Voltage (Approx.) for trans- conductance (μmhos) = 50	-19	volts
Grid-No.1 Voltage (Approx.) for trans- conductance (μmhos) = 700 and cathode resistor (ohms) = 0	-4.5	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"
Diameter	0.650" to 0.750"
Dimensional Outline	<i>See General Section</i>
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

← Indicates a change.

6BZ6



6BZ6

SEMIREMOTE-CUTOFF PENTODE

AMPLIFIER — Class A₁

→ 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:			
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
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-No.1-Circuit Resistance:

For fixed-bias operation.	0.25	max.	megohm
For cathode-bias operation.	1	max.	megohm

[○] with external shield JEDEC No.316 connected to cathode.

[▲] The dc component must not exceed 100 volts.

→ Indicates a change.



6BZ6

9BZ6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 GRID - No 3 VOLTS = 0
 GRID - No 2 VOLTS = 125

GRID - No 1 VOLTS $E_{C1} = -1$

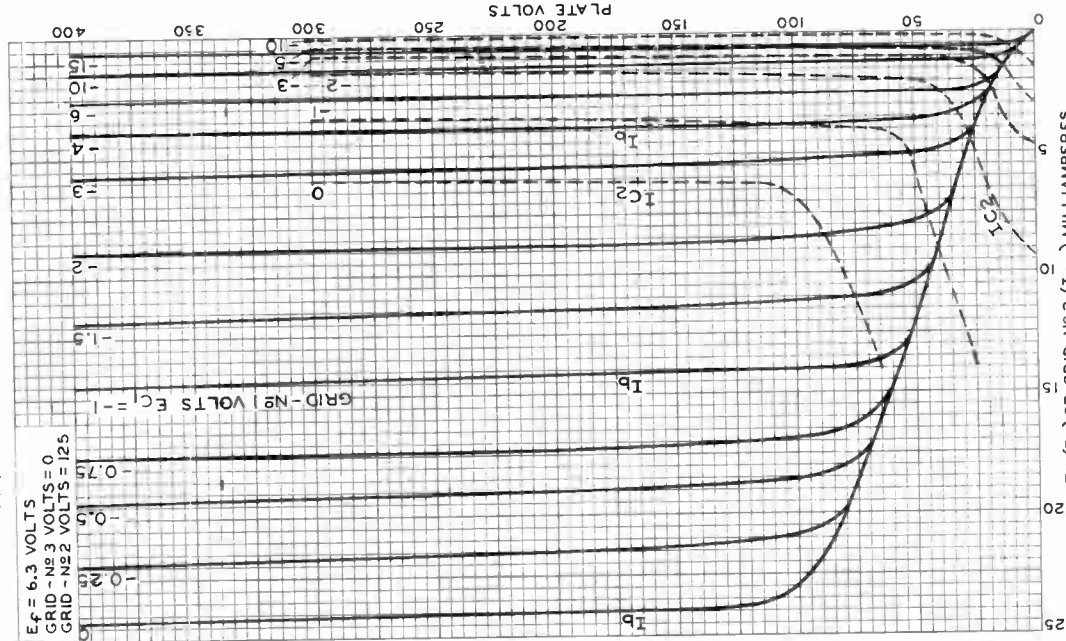


PLATE (I_p) OR GRID-NO 2 (I_{C2}) MILLIAMPERES

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

92CM-8508R2

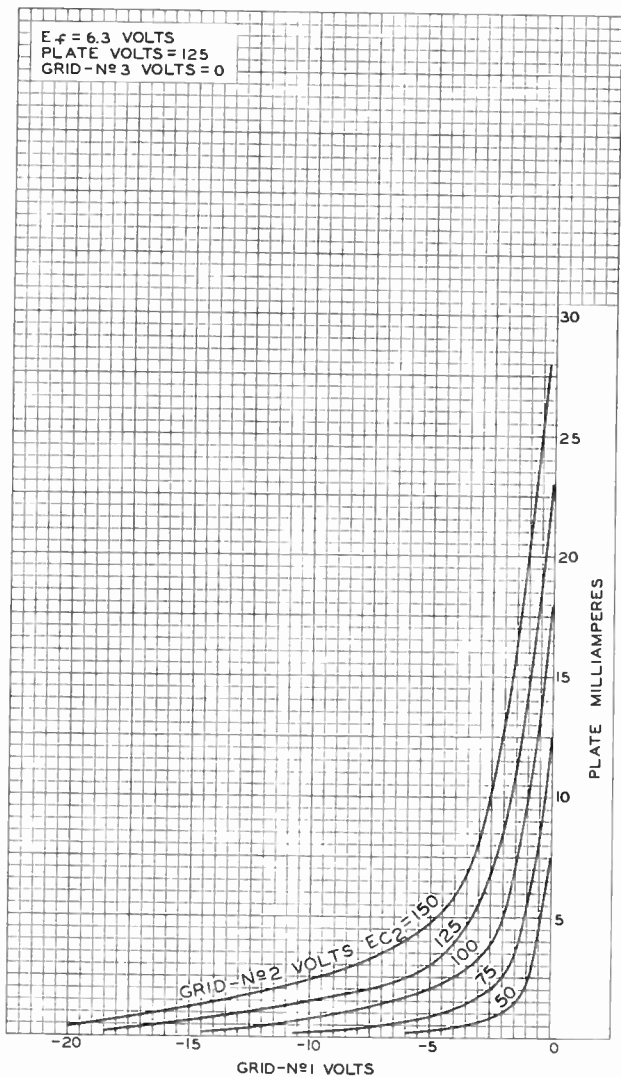
6BZ6



6BZ6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 125
 GRID-Nº3 VOLTS = 0



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92 CM-9481R1

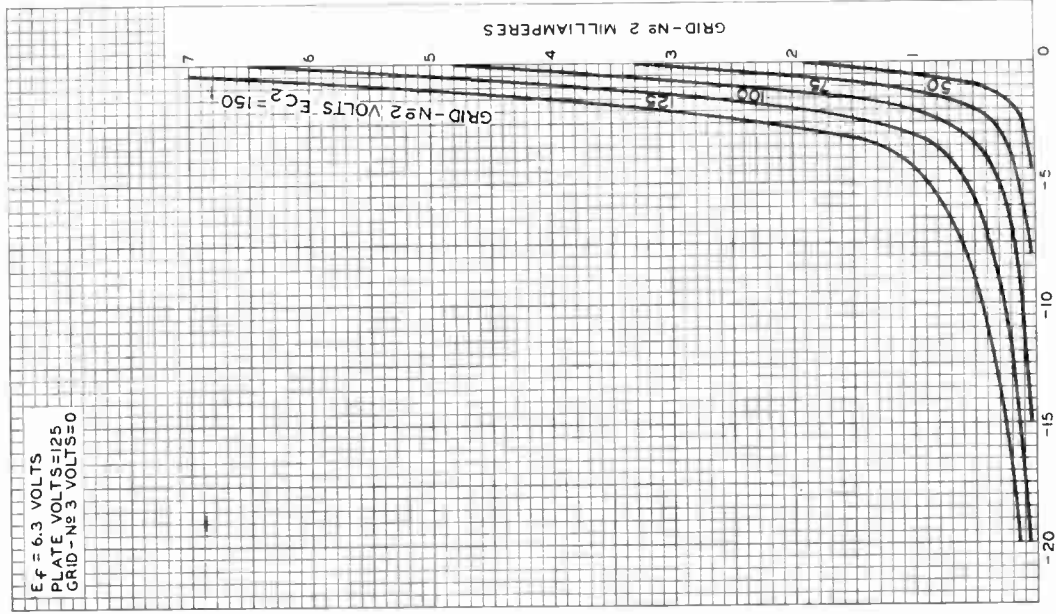


6BZ6

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AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 125
GRID - No 3 VOLTS = 0

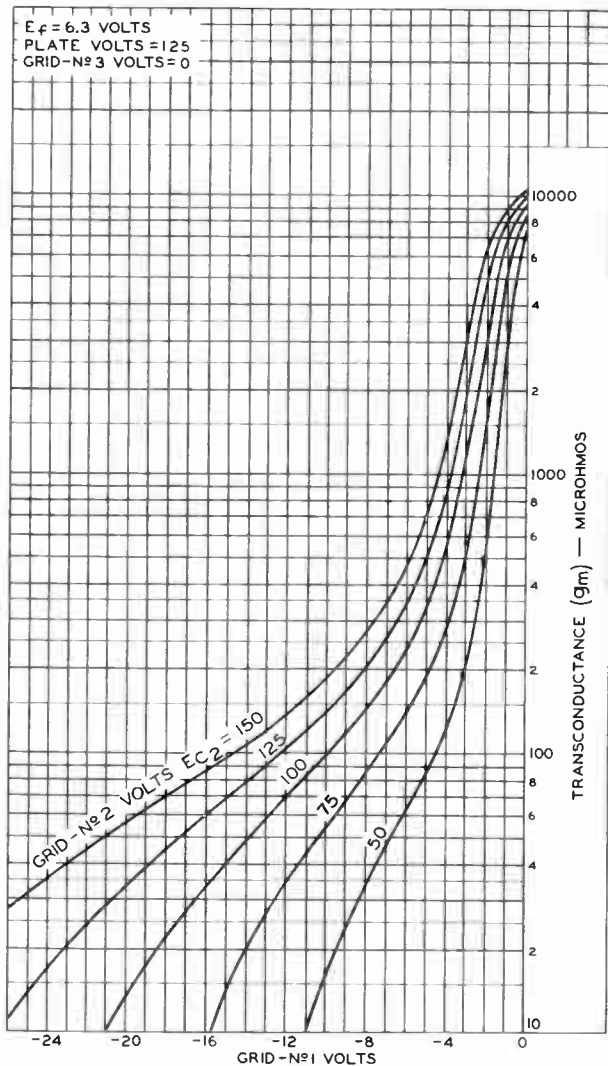


6BZ6



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AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History

92CM-8509R1

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For TV Tuners Using Direct-Coupled Cathode-Drive Circuits

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.4	amp

Direct Inter-electrode Capacitances:^a

	Unit No. 1	Unit No. 2	
Grid to plate	1.2	1.2	μf
Grid to cathode, internal shield, and heater	2.6	-	μf
Plate to cathode, internal shield, and heater	1.2	-	μf
Plate to cathode	0.12	0.12	μf
Heater to cathode	2.6	2.6	μf
Cathode to grid, internal shield, and heater	-	5	μf
Plate to grid, internal shield, and heater	-	2.2	μf
Plate of unit No.1 to plate of unit No.2	0.010 max.		μf
Plate of unit No.2 to plate and grid of unit No.1	0.024 max.		μf

Characteristics, Class A₁ Amplifier (Each Unit):

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 = 100	-7	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 <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)

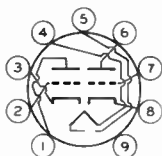
← Indicates a change.



6BZ7

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 A₁

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	250 ^b max.	volts
PLATE DISSIPATION.	2 max.	watts
CATHODE CURRENT.	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 ^b max.	volts
Heater positive with respect to cathode.	200 ^c max.	volts

→ Maximum Circuit Values:

Grid-Circuit Resistance. 0.5 max. megohm

^a with external shield JEDEC No.315 connected to internal shield.

→ ^b Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

^c The dc component must not exceed 100 volts.

→ Indicates a change.

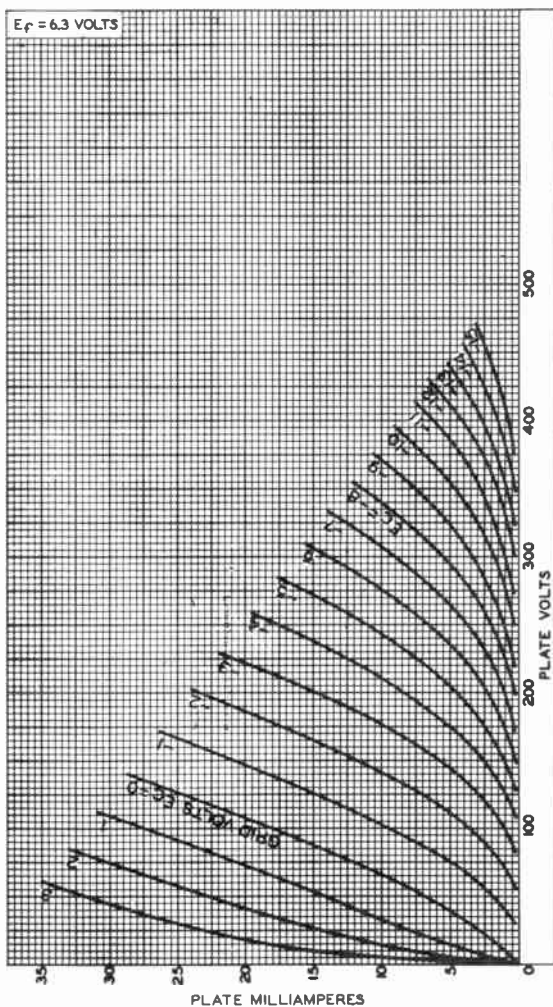
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



AVERAGE PLATE CHARACTERISTICS

Each Unit



92CM-9231



RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.

DATA 2
1-62





6C4

6C4

MEDIUM-MU TRIODE

For use in FM and other HF circuits

GENERAL DATA**Electrical:**

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 0.15 amp

Direct Interelectrode Capacitances:^oGrid to plate 1.6 $\mu\mu\text{f}$ Grid to cathode and heater 1.8 $\mu\mu\text{f}$ Plate to cathode and heater 1.3 $\mu\mu\text{f}$ **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" $\pm 3/32$ "

Maximum Diameter 3/4"

Bulb T-5-1/2

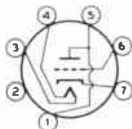
Base Small-Button Miniature 7-Pin (JETEC No. E7-1)

Basing Designation for BOTTOM VIEW 6BG

Pin 1 - Plate

Pin 2 - Internal Connection
Do Not Use

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid

Pin 7 - Cathode

AMPLIFIER - Class A₁**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE 300 max. volts

PLATE DISSIPATION 3.5 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . 200 max. volts

Heater positive with respect to cathode . . 200[■] max. volts**Characteristics:**

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

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation 0.25 max. megohm

For cathode-bias operation 1.0 max. megohm

^o with no external shield.[■]: See next page.

—Indicates a change.

NOV. 5, 1954

TUBE DIVISION

DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

6C4



6C4

MEDIUM-MU TRIODE

Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED AMPLIFIER CHART No. 10*
at front of this Section.

RF POWER AMPLIFIER & OSCILLATOR—Class C Telegraphy

Maximum Ratings, Design-Center Values:

DC PLATE VOLTAGE	300 max.	volts
DC GRID VOLTAGE	-50 max.	volts
DC PLATE CURRENT	25 max.	ma
DC GRID CURRENT	8 max.	ma
PLATE DISSIPATION	5 max.	watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^{max.}	volts

Typical Operation at Frequencies up to 50 Mc:•

DC Plate Voltage	300	volts
DC Grid Voltage	-27	volts
DC Plate Current	25	ma
DC Grid Current (Approx.)	7	ma
Driving Power (Approx.)	0.35	watt
Useful Power Output (Approx.)	5.5	watts

• The dc component must not exceed 100 volts.

• Approximately 2.5 watts can be obtained when the 6C4 is used at 150 Mc as an oscillator with grid resistor of 10000 ohms and maximum rated input.

→ indicates a change.

NOV. 5, 1954

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA 1

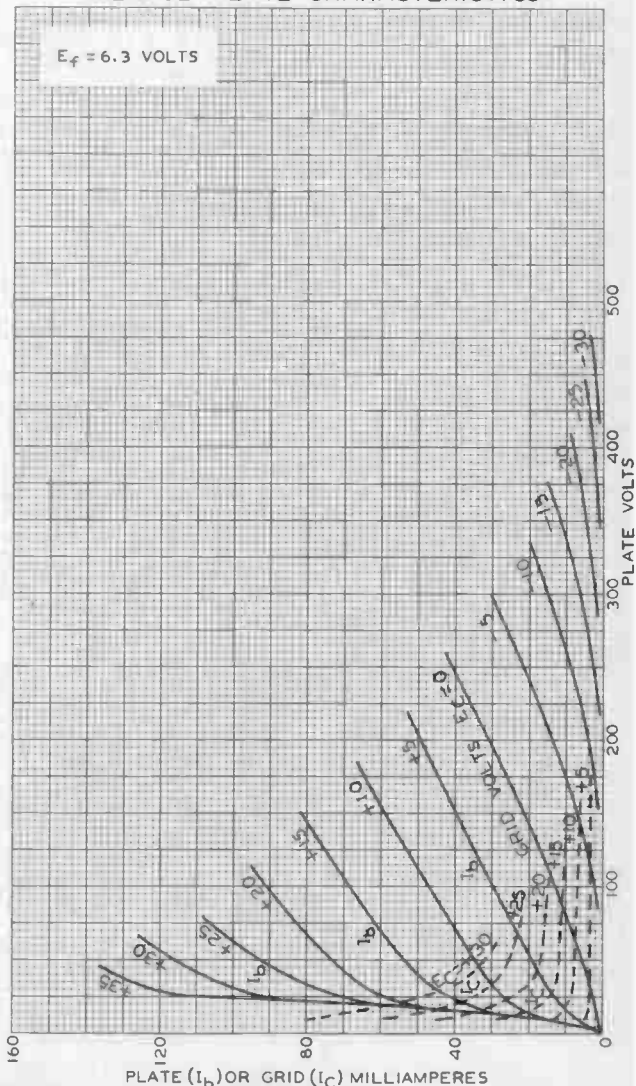


6C4

6C4

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS



MARCH 16, 1942

PLATE (I_b) OR GRID (I_c) MILLIAMPERES

RCA RADIODIVISION

RCA MANUFACTURING COMPANY, INC.

World Radio History

92C-6378

6CA



6C4

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS

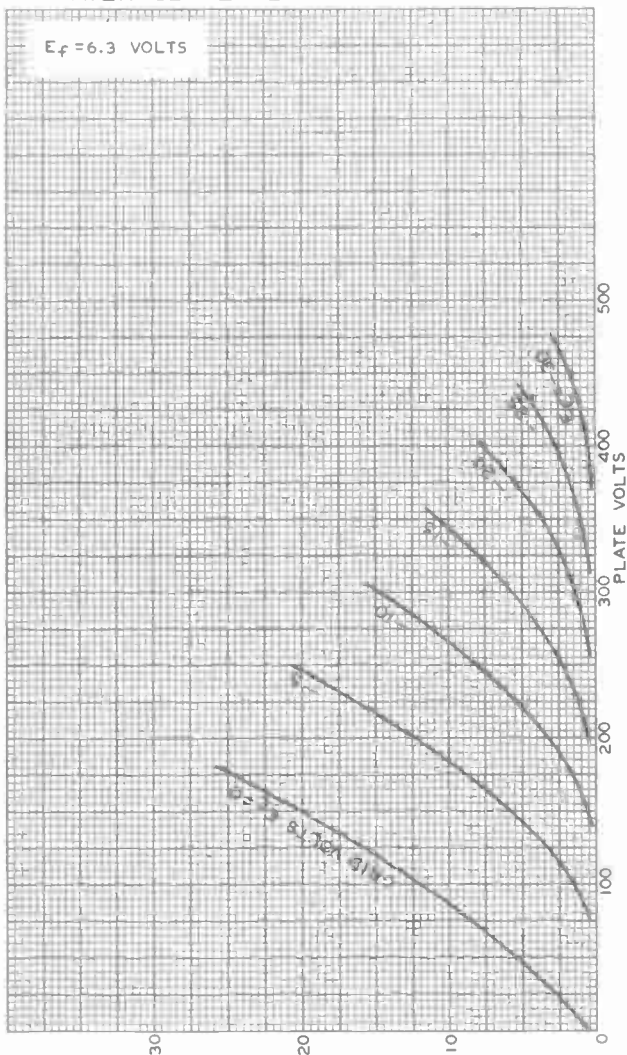


PLATE MILLIAMPERES

MARCH 14, 1942

RCA RADIONRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6377

World Radio History

Full-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 volts
Current	1 amp

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" \pm 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9M

Pin 1 - Plate No.1
 Pin 2 - No Connection
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater



Pin 6 - No Connection
 Pin 7 - Plate No.2
 Pin 8 - No Connection
 Pin 9 - No Connection

FULL-WAVE RECTIFIER

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE	1000 max. volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS):	
With capacitor-input to filter	350 max. volts
PEAK PLATE CURRENT PER PLATE	450 max. ma
DC OUTPUT CURRENT	150 max. ma
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE:	

Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of tubes. If capacitor-input circuits are to be used, protect the circuits against possible adverse effects of hot-switching by the use of a circuit arrangement which will limit the maximum peak current value per plate to a value of 1 ampere during the initial cycles of the hot-switching transient.

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . 500 max. volts



6CA4

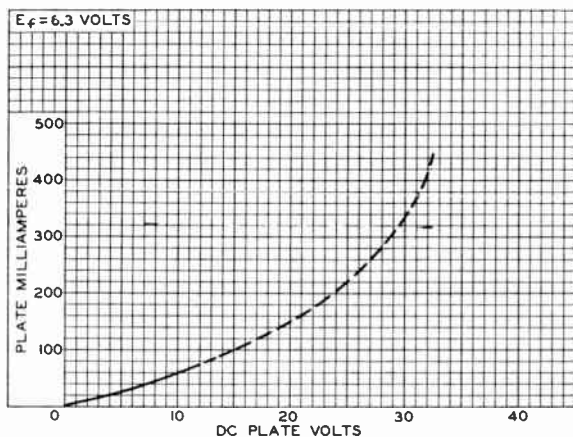
Typical Operation:

With capacitor input to filter

AC Plate-To-Plate Supply				
Voltage (RMS)	500	600	700	volts
Filter-Input Capacitor	50	50	50	μ f
Total Effective Plate-Supply				
Impedance Per Plate	150	200	240	ohms
DC Output Voltage at Input to				
Filter (Approx.) for dc output				
ma. = 150.	245	293	347	volts

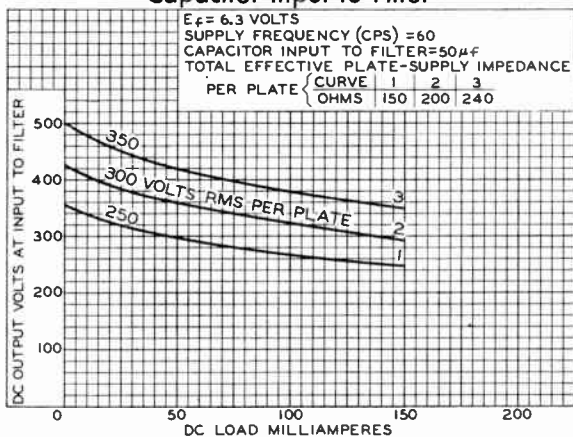


AVERAGE PLATE CHARACTERISTIC Each Unit



92CS-10378

OPERATION CHARACTERISTICS Capacitor Input to Filter



92CS-10379





Beam Power Tube

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	1.2	amp

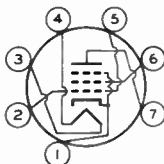
Direct Interelectrode Capacitances (Approx.):^a

Grid No.1 to plate	0.5	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μf
Plate to cathode & grid No.3, grid No.2, and heater	9	μf

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" \pm 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7CV

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



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

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	130	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	130	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
GRID-No.2 INPUT	1.4	max.	watts
PLATE DISSIPATION	5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^b	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	180	max.	°C

Typical Operation and Characteristics:

Plate Voltage	110	125	volts
Grid-No.2 Voltage	110	125	volts



6CA5

Grid-No.1 Voltage	-4	-4.5	volts
Peak AF Grid-No.1 Voltage	4	4.5	volts
Zero-Signal Plate Current	32	37	ma
Max.-Signal Plate Current	31	36	ma
Zero-Signal Grid-No.2 Current	3.5	4	ma
Max.-Signal Grid-No.2 Current	7.5	11	ma
Plate Resistance (Approx.)	16000	15000	ohms
Transconductance	8100	9200	μ mhos
Load Resistance	3500	4500	ohms
Total Harmonic Distortion	5	6	%
Max.-Signal Power Output	1.1	1.5	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

^a without external shield.

^b The dc component must not exceed 100 volts.





6CB5-A

BEAM POWER TUBE

6CB5-A

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) $6.3 \pm 10\%$ volts

Current 2.5 amp

Direct Interelectrode Capacitances (Approx.):⁰

Grid No.1 to plate. 0.4 μ f

Grid No.1 to cathode & grid No.3,
grid No.2, and heater 22 μ f

Plate to cathode & grid No.3,
grid No.2, and heater 10 μ f

Characteristics, Class A₁ Amplifier:

Plate Voltage 75 175 volts

Grid-No.2 Voltage 150 175 volts

Grid-No.1 Voltage 0 -30 volts

Mu-Factor, Grid No.2 to Grid No.1 - 3.8

Plate Resistance (Approx.) - 5000 ohms

Transconductance. - 8800 μ mhos

Plate Current 460^o 90 ma

Grid-No.2 Current 42^o 6 ma

Grid-No.1 Voltage (Approx.)
for plate ma. = 1 - -60 volts

Mechanical:

Operating Position. Any

Maximum Overall Length. 5"

Seated Length 4-1/4" \pm 3/16"

Maximum Diameter. 1-23/32"

Bulb. T12

Cap. Small (JEDEC No.C1-1)

Base. Short Jumbo-Shell Octal 8-Pin

with External Barriers (JEDEC Group 1, No.88-71),
or Short Medium-Shell Octal 8-Pin

with External Barriers, Style B (JEDEC Group 1, No.88-118)

Basing Designation for BOTTOM VIEW. 8GD

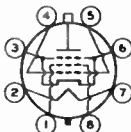
Pin 1-Grid No.2

Pin 2-Heater

Pin 3-Cathode,
Grid No.3

Pin 4-Grid No.1

Pin 5-Grid No.1



Pin 6 - Cathode,

Grid No.3

Pin 7 - Heater

Pin 8 - Grid No.2

Cap - Plate

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^o

DC (Including boost) PLATE VOLTAGE. . . 880 max. volts

PEAK POSITIVE-PULSE PLATE VOLTAGE^o. . . 6800 max. volts

^o Indicates a change.

6CB5-A



6CB5-A

BEAM POWER TUBE

PEAK NEGATIVE-PULSE PLATE VOLTAGE . . .	1650	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . .	220	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . .	-55	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE .	220	max.	volts
CATHODE CURRENT:			
Peak.	850	max.	ma
DC.	240	max.	ma
GRID-No.2 INPUT	4	max.	watts
PLATE DISSIPATION†.	26	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-No.1-Circuit Resistance:

For grid-resistor-bias operation. . . 0.47 max. megohm

○ Without external shield.

* These values can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

□ 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.

† An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

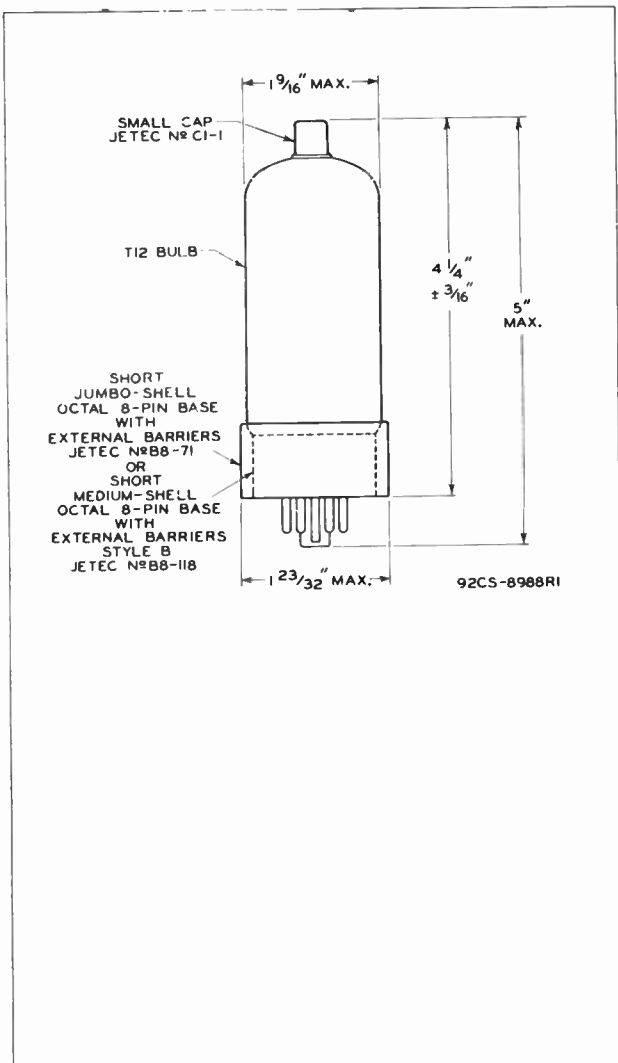
▲ The dc component must not exceed 100 volts.



6CB5-A

6CB5-A

BEAM POWER TUBE

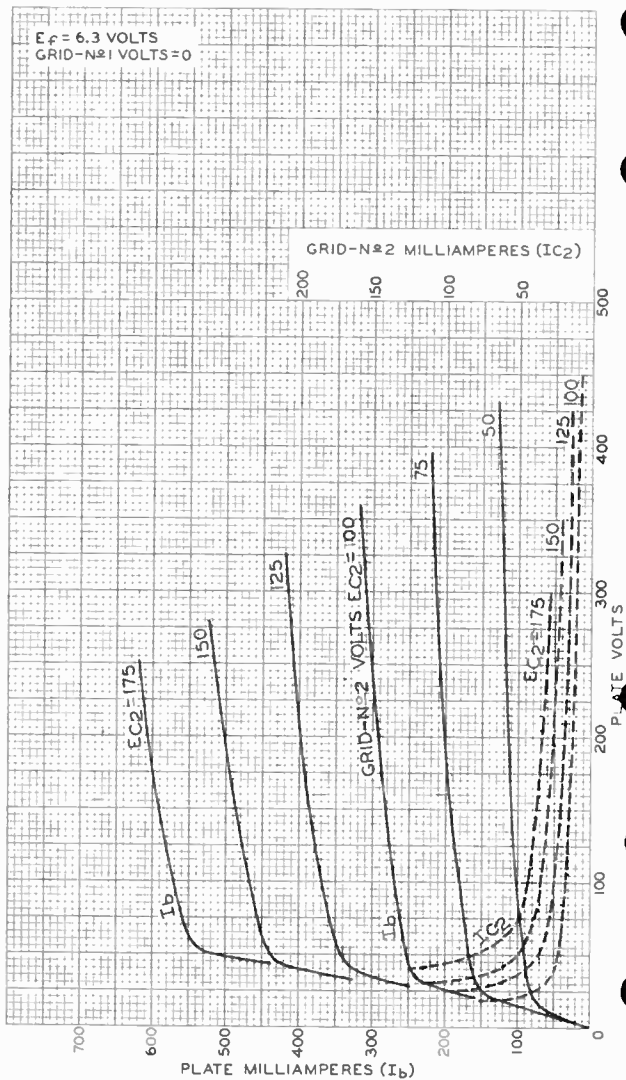


6CB5-A



6CB5-A

AVERAGE CHARACTERISTICS

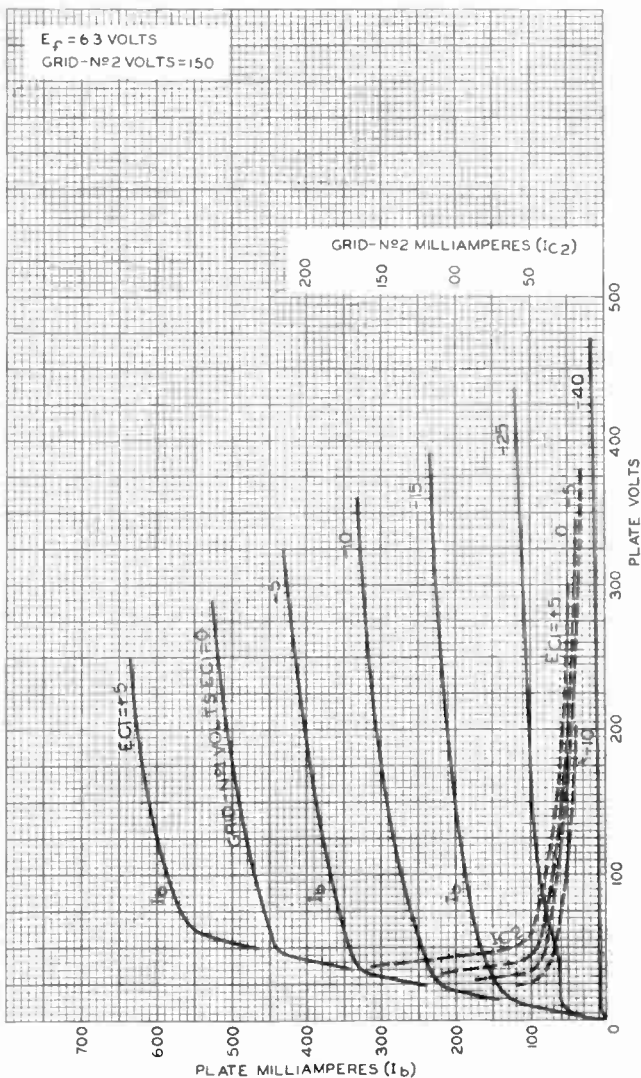




6CB5-A

6CB5-A

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8436





6CB6

6CB6

SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
Grid No.1 to plate	0.020 max.	0.010 max.	μ f
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	6.5	μ f
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	1.9	3.0	μ f

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" \pm 3/32"
Maximum Diameter	3-4"
Bulb	T-5-1/2
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

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max. volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	300 max. volts
GRID-No.2 VOLTAGE	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section
PLATE DISSIPATION	2 max. watts
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

^o with external shield JETEC No.316 connected to cathode.

← Indicates a change.

MAR. 1, 1955

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB6



6CB6

SHARP-CUTOFF PENTODE

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 [▲] max.	volts

Typical Operation and Characteristics:

Plate Voltage	200	volts
Grid No.3 (Suppressor)	Connected to cathode at socket	
Grid-No.2 Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.)	0.6	megohm
Transconductance	6200	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp.	-8	volts
Plate Current	9.5	ma
Grid-No.2 Current	2.8	ma

▲ The dc component must not exceed 100 volts.

→ Indicates a change.

MAR. 1, 1955

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

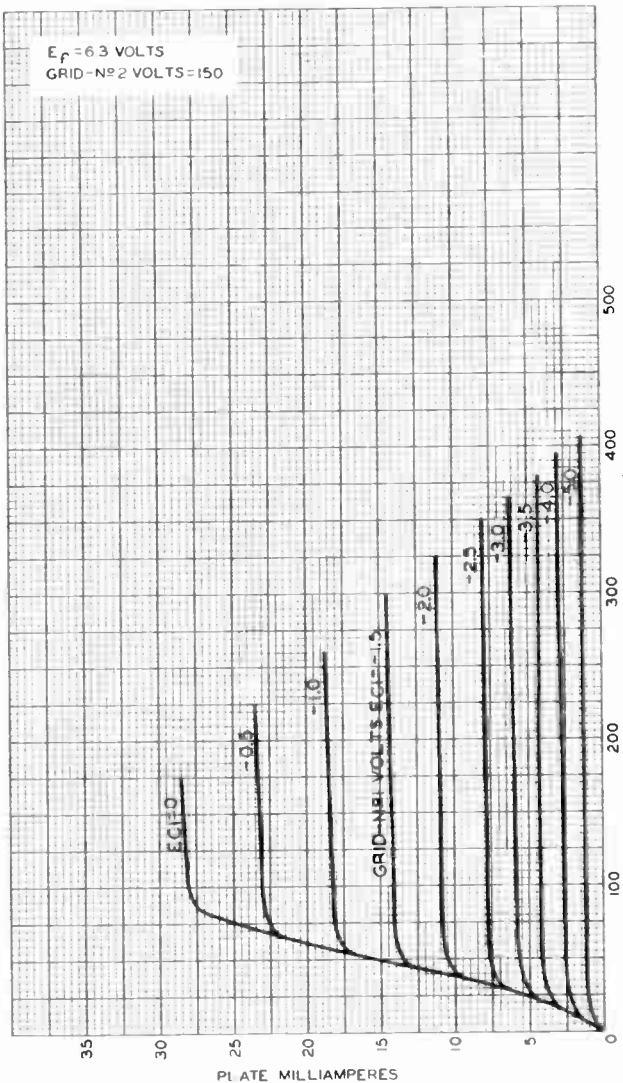
World Radio History



6CB6

6CB6

AVERAGE PLATE CHARACTERISTICS



SEPT. 30, 1949

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, N. J.

92CM-7378

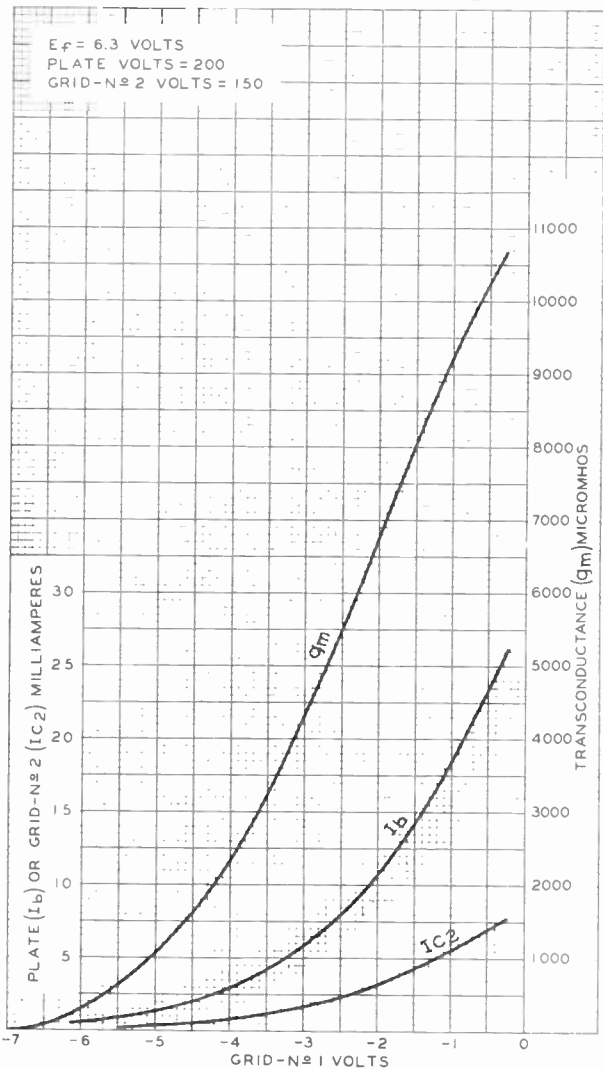
6CB6



6CB6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 200
GRID-N^o 2 VOLTS = 150



SEPT. 28, 1949

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-7375



6CB6-A

6CB6-A

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage.	6.3	ac or dc volts
Current.	0.3 ± 6%	amp
Warm-up time (average)	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
Grid No.1 to plate.	0.025 max.	0.015 max.	μf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater.	6.5	6.5	μf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater.	2	3	μf

Characteristics, Class A₁ Amplifier:

Plate-Supply Voltage.	125	125	volts
Grid-No.3	♦	♦	
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
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)

^o, ♦: See next page.

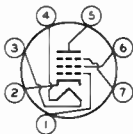


6CB6-A

SHARP-CUTOFF PENTODE

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 A₁

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:

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

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-No.1-Circuit Resistance:

For fixed-bias operation. 0.25 max. megohm

For cathode-bias operation. 1 max. megohm

○ With external shield JEDEC No.316 connected to cathode.

◆ Connected to cathode at socket.

▲ The dc component must not exceed 100 volts.

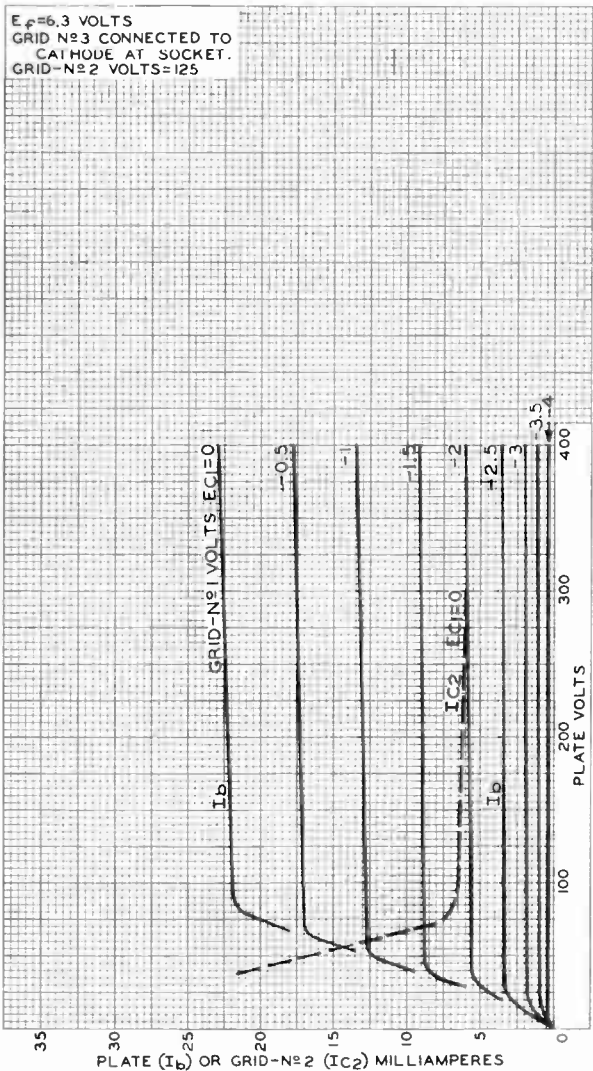


6CB6-A

6CB6-A

AVERAGE CHARACTERISTICS

$E_p = 6.3$ VOLTS
 GRID N^o3 CONNECTED TO
 CATHODE AT SOCKET.
 GRID-N^o2 VOLTS = 125



ELECTRON TUBE DIVISION

92CM-9854

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

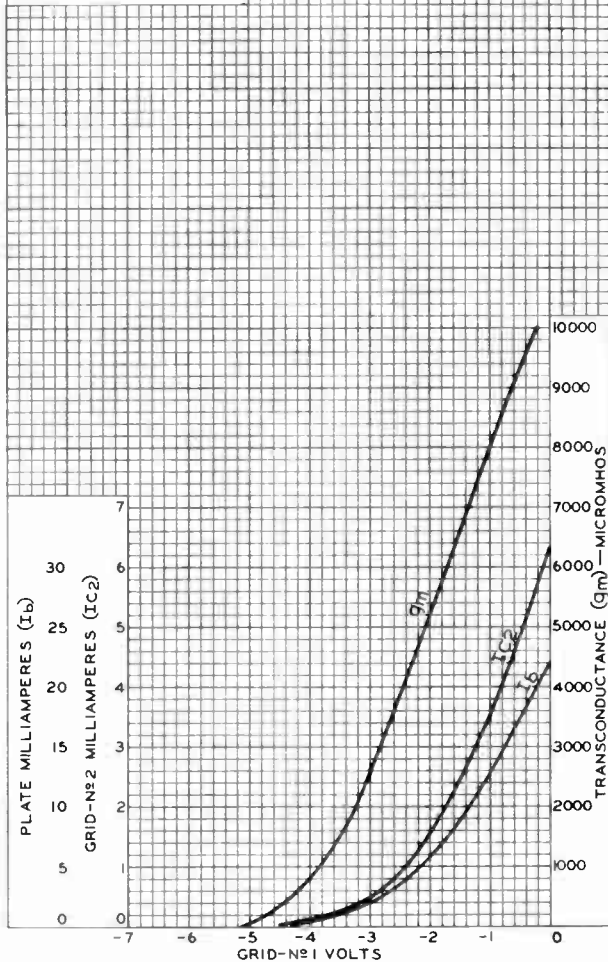
6CB6-A



6CB6-A

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 125
 GRID N°3 CONNECTED TO
 CATHODE AT SOCKET.
 GRID-N°2 VOLTS = 125





6CD6-GA

6CD6-GA BEAM POWER TUBE

Superevac Type 6CD6 G

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	2.5	amp

Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate.	1.1	μ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater	22	μ f
Plate to cathode & grid No.3, grid No.2, and heater	8.5	μ f

Characteristics, Class A₁ Amplifier:

Plate Voltage	60	175	volts
Grid-No.2 (Screen-Grid) Voltage	100	175	volts
Grid-No.1 (Control-Grid) Voltage.	0	-30	volts
Mu-Factor, Grid No.2 to Grid No.1	-	3.9	
Plate Resistance (Approx.).	-	7200	ohms
Transconductance.	-	7700	μ mbos
Plate Current	230*	75	ma
Grid-No.2 Current	21*	5.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma	-	-55	volts

Mechanical:

Mounting Position Vertical, base up or down, or
horizontal with pins 2 and 7 in vertical plane

Maximum Overall Length 5"

Seated Length 4-1/4" \pm 3/16"

Maximum Diameter 1-9/16"

Pulb. T-12

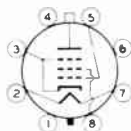
Cap. Small (JEDEC No. C1-1)

Base. Short Medium-Shell Octal 8-Pin

with External Barriers, Style A (JEDEC No. B8-110),
or Short Medium-Shell Octal 8-Pin
with External Barriers, Style B (JEDEC No. B8-118)

Basing Designation for BOTTOM VIEW. 5BT

Pin 1 - No Connection	Pin 5 - Grid No. 1
Pin 2 - Heater	Pin 6 - No Connection
Pin 3 - Cathode, Grid No. 3	Pin 7 - Heater
Pin 4 - No Connection	Pin 8 - Grid No. 2
	Cap - Plate



^o without external shield.

* The μ values can be measured by a method involving a current wave form such that the cathode current will be kept within ratings in order to prevent damage to the tube.



6CD6-GA

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

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

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) [‡]	7000 [■]	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	175	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	200	max.	volts
CATHODE CURRENT:			
Peak	700	max.	ma
Average	200	max.	ma
GRID-No.2 INPUT	3	max.	watts
PLATE DISSIPATION†	20	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)	225	max.	°C

Maximum Circuit Values:

Grid-No.1-circuit Resistance:

For grid-resistor-bias operation† 0.47 max. megohm

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

■ Under no circumstances should this absolute value be exceeded.

‡ 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.

† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

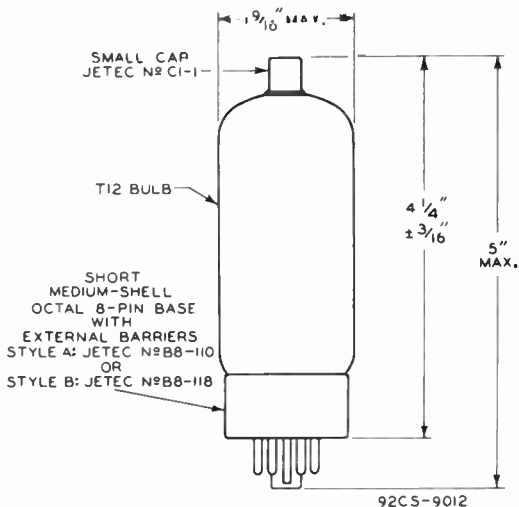
▲ The dc component must not exceed 100 volts.



6CD6-GA

BEAM POWER TUBE

6CD6-GA

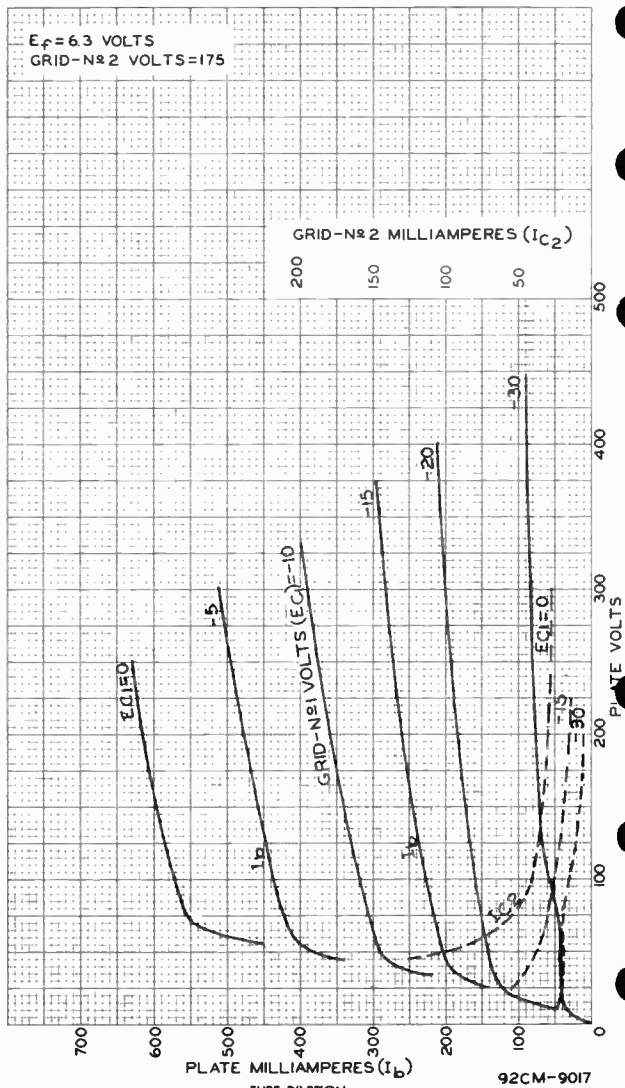


6CD6-GA



6CD6-GA

AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

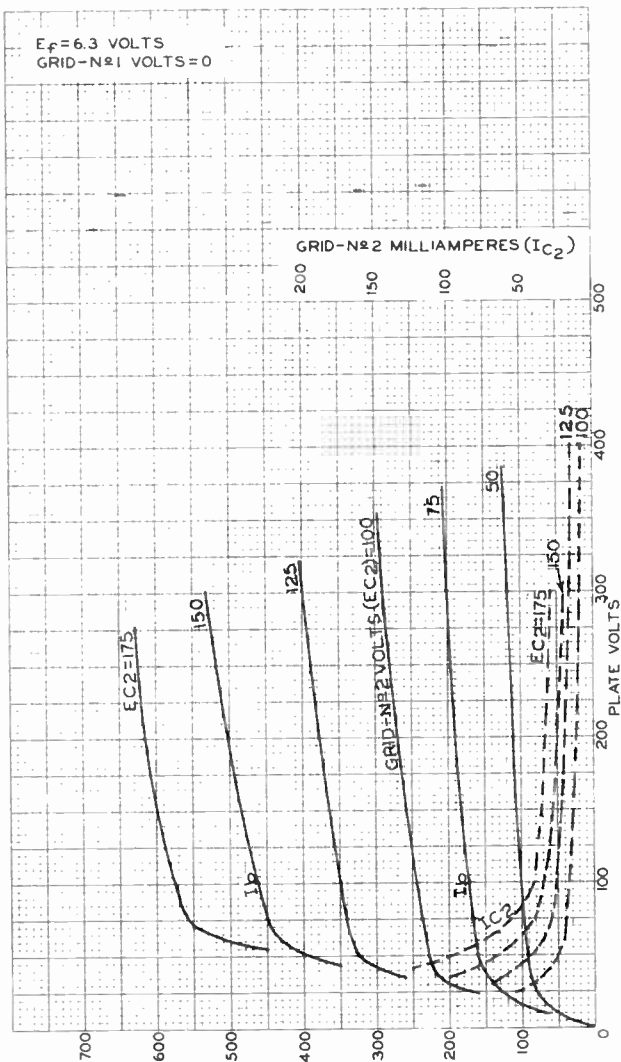


6CD6-GA

6CD6-GA

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-N \neq 1 VOLTS = 0



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9016



Half-Wave Vacuum Rectifier

Duodecar Type
Pressure-Welded Cathode Coating
For Color-TV Damper-Diode Applications

ELECTRICAL CHARACTERISTICS - Bogy Values

Heater Voltage, ac or dc	E_h	6.3	V
Heater Current	I_h	2.5	A
Direct Interelectrode Capacitances: ^a			
Plate to cathode and heater	$c_{p(k+h)}$	13	pF
Cathode to plate and heater	$c_{k(p+h)}$	18	pF
Heater to cathode	c_{h-k}	5.5	pF
Instantaneous Tube Voltage			
Drop for instantaneous plate current (i_b) = 680 mA	e_b	20	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.375 in (85.72 mm)
Maximum Seated Length	3.000 in (76.2 mm)
Maximum Diameter	1.188 in (30.1 mm)
Envelope	JEDEC T9
Base ^b	Duodecar 12-Pin with Exhaust Tip (JEDEC E12-70)
Terminal Diagram	JEDEC 12GK
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS - Design-Maximum Values^c

*For operation as a Damper Tube in Color-TV Receivers
utilizing a 525-line, 30-frame system*

Peak Inverse Plate Voltage. - e_{bm}	5000 ^d	V				
Heater-Cathode Voltage:						
Peak	e_{hkm}	<table> <tbody> <tr> <td>+300</td> <td>V</td> </tr> <tr> <td>-5000</td> <td>V</td> </tr> </tbody> </table>	+300	V	-5000	V
+300	V					
-5000	V					
Average ^e	$E_{hk(av)}$	<table> <tbody> <tr> <td>+100</td> <td>V</td> </tr> <tr> <td>-900</td> <td>V</td> </tr> </tbody> </table>	+100	V	-900	V
+100	V					
-900	V					
Heater Voltage, ac or dc	E_h	5.7 to 6.9 V				
Plate Current:						
Peak	i_{bm}	1500 mA				
Average ^e	$I_{b(av)}$	350 mA				
Plate Dissipation	P_b	11 W				

Envelope Temperature (at hottest point on envelope surface) T_E 220 °C

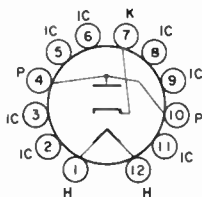
- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- ^b Designed to mate with Duodecar 12-Contact Socket generally available from your local RCA Distributor.
- ^c As defined in the current issue of EIA Standard RS-239.
- ^d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- ^e Measured with a dc meter.

OPERATING CONSIDERATIONS

Socket terminals 2, 3, 5, 6, 8, 9 and 11 should not be used as tie points for external-circuit components. It is recommended that the socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

TERMINAL DIAGRAM (Bottom View)

- Pin 1: Heater
- Pin 2: Do Not Use
- Pin 3: Do Not Use
- Pin 4: Plate
- Pin 5: Do Not Use
- Pin 6: Do Not Use
- Pin 7: Cathode
- Pin 8: Do Not Use
- Pin 9: Do Not Use
- Pin 10: Plate
- Pin 11: Do Not Use
- Pin 12: Heater



JEDEC 12GK

Half-Wave Vacuum Rectifier

Duodecar Type
Pressure-Welded Cathode Coating
For Color-TV Damper-Diode Applications

ELECTRICAL CHARACTERISTICS – Bagey Values

Heater Voltage, ac or dc . . .	E_h	6.3	V
Heater Current	I_h	1.8	A
Direct Interelectrode Capacitances: ^o			
Plate to cathode and heater . . .	$c_{p(k+h)}$	13	pF
Cathode to plate and heater . . .	$c_{k(p+h)}$	16	pF
Heater to cathode	c_{h-k}	4.0	pF
Instantaneous Tube Voltage Drop for instantaneous plate current (i_b) = 700 mA			
	e_b	25	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.375 in (85.72 mm)
Maximum Seated Length	3.000 in (76.2 mm)
Maximum Diameter	1.188 in (30.1 mm)
Envelope	JEDEC T9
Base ^b	Duodecar 12-Pin with Exhaust Tip (JEDEC E12-70)
Terminal Diagram	JEDEC 12HF
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS – Design-Maximum Values^c

*For operation as a Damper Tube in Color-TV Receivers
utilizing a 525-line, 30-frame system*

Peak Inverse Plate Voltage . . .	$-e_{bm}$	5000 ^d	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	+300	V
		-5000	V
Average ^e	$E_{hk(av)}$	+100	V
		-900	V
Heater Voltage, ac or dc . . .	E_h	5.7 to 6.9	V
Plate Current:			
Peak	i_{bm}	2100	mA
Average ^e	$I_{b(av)}$	350	mA
Plate Dissipation	P_b	6.5	W

6CG3

Envelope Temperature (at hottest point on envelope surface) T_E 220 °C

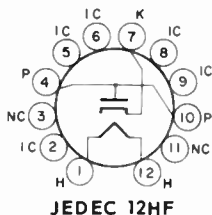
- a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- b Designed to mate with Duodecar 12-Contact Socket generally available from your local RCA Distributor.
- c As defined in the current issue of EIA Standard RS-239.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- e Measured with a dc meter.

OPERATING CONSIDERATIONS

Socket terminals 2, 5, 6, 8 and 9 should not be used as tie points for external-circuit components. It is recommended that the socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

TERMINAL DIAGRAM (Bottom View)

- Pin 1: Heater
- Pin 2: Do Not Use
- Pin 3: No Internal Connection
- Pin 4: Plate
- Pin 5: Do Not Use
- Pin 6: Do Not Use
- Pin 7: Cathode
- Pin 8: Do Not Use
- Pin 9: Do Not Use
- Pin 10: Plate
- Pin 11: No Internal Connection
- Pin 12: Heater



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	0.3	vults
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield [▲]	
<i>Triode Unit:</i>			
Grid to plate	1.5	1.5	μμf
Grid to cathode & pentode grid No.3, and heater	2	2.4	μμf
Plate to cathode & pentode grid No.3, and heater	0.5	1	μμf
<i>Pentode Unit:</i>			
Grid No.1 to plate	0.09 max.	0.06 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	4.6	4.8	μμf
Plate to cathode & grid No.3, grid No.2, and heater	0.9	1.6	μμf
Pentode grid No.1 to triode plate	0.05 max.	0.04 max.	μμf
Pentode plate to triode plate	0.05 max.	0.008 max.	μμf
Heater to cathode	6.5	6.5 [●]	μμf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Voltage	125	100 125	vults
Grid No.3	-	Connected to cathode at socket	
Grid-No.2 Voltage	-	70 125	vults
Grid-No.1 Voltage	-1	- -1	vult
Amplification Factor	40	- -	
Plate Resistance (Approx.)	6000	- 300000	ohms
Transconductance	6500	5700 5500	μmhos
Plate Current	12	- 9	ma
Grid-No.2 Current	-	- 2.2	ma
Grid-No.1 Voltage (Approx.) for plate μ _a = 20	-7	- -6.5	vults

▲ Indicates a change.

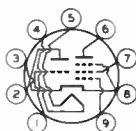


6CG8-A

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. 9GF

Pin 1 - Triode Grid
 Pin 2 - Triode Plate
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Pentode Plate



Pin 7 - Pentode
 Grid No.2
 Pin 8 - Pentode
 Grid No.3,
 Cathode
 Pin 9 - Pentode
 Grid No.1

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit
PLATE VOLTAGE	275 max.	275 max. volts
GRID No.3 (SUPPRESSOR GRID)	-	Connect to cathode at socket
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	-	275 max. volts
GRID-No.2 VOLTAGE	-	See <i>Grid-No.2 Input</i> <i>Rating Chart</i> 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 137.5 volts	-	0.45 max. watt
For grid-No.2 voltages between 137.5 and 275 volts	-	See <i>Grid-No.2 Input</i> <i>Rating Chart</i> at front of Receiving Tube Section
PLATE DISSIPATION	1.7 max.	2.3 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

▲ with external shield JEDEC No.315 connected to cathode except as noted.
 ● with external shield JEDEC No.315 connected to pentode plate.
 ★ The dc component must not exceed 100 volts.

Curves shown under Type 6X8 also apply to the 6CG8-A

→ Indicates a change.



Half-Wave Vacuum Rectifier

Novar Type

For Color-TV Damper-Diode Applications

ELECTRICAL CHARACTERISTICS — Bogey Values

Heater Voltage, ac or dc	E_h	6.3	V
Heater Current	I_h	1.8	A
Direct Interelectrode Capacitances: ^a			
Plate to cathode and heater . .	$c_{p(k+h)}$	13	pf
Cathode to plate and heater . .	$c_{k(p+h)}$	16	pf
Heater to cathode	c_{h-k}	4.0	pf
Instantaneous Tube Voltage			
Drop for instantaneous plate current (i_b) = 700 mA . .	e_b	25	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.380 in (85.85 mm)
Maximum Seated Length	3.000 in (76.20 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Base ^b	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-89)
Terminal Diagram	JEDEC 9HP
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS — Design-Maximum Values^c

For operation as a Damper Tube in Color-TV Receivers utilizing a 525-line, 30-frame system

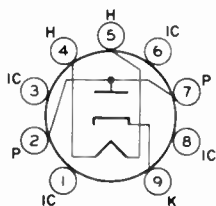
Peak Inverse Plate Voltage. — e_{bm}	5500 ^d	V				
Heater-Cathode Voltage:						
Peak	e_{hkm}	<table> <tbody> <tr> <td>{ +300</td> <td>V</td> </tr> <tr> <td>{ -5500</td> <td>V</td> </tr> </tbody> </table>	{ +300	V	{ -5500	V
{ +300	V					
{ -5500	V					
Average ^e	$E_{hk(av)}$	<table> <tbody> <tr> <td>{ +100</td> <td>V</td> </tr> <tr> <td>{ -900</td> <td>V</td> </tr> </tbody> </table>	{ +100	V	{ -900	V
{ +100	V					
{ -900	V					
Heater Voltage, ac or dc . . .	E_h	5.7 to 6.9 V				
Plate Current:						
Peak	i_{bm}	2100 mA				
Average ^e	$I_{b(av)}$	350 mA				
Plate Dissipation	P_b	6.5 W				
Envelope Temperature (at hottest point on envelope surface)	T_E	220 °C				

- a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- b Designed to mate with Novar 9-Contact Socket generally available from your local RCA Distributor.
- c As defined in the current issue of EIA Standard RS-239.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- e Measured with a dc meter.

OPERATING CONSIDERATIONS

Socket terminals 1, 3, 6, and 8 should not be used as tie points for external-circuit components. It is recommended that the socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

TERMINAL DIAGRAM (Bottom View)



JEDEC 9HP

- Pin 1 - Do Not Use
- Pin 2 - Plate
- Pin 3 - Do Not Use
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Do Not Use
- Pin 7 - Plate
- Pin 8 - Do Not Use
- Pin 9 - Cathode

Half-Wave Vacuum Rectifier

Novar Type

For Black-and-White-TV Damper Diode Applications

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc E_h		6.3	V
Heater Current I_h		1.2	A
Direct Interelectrode Capacitances: ^a			
Plate to cathode and heater	$c_{p(k+h)}$	6.5	pF
Cathode to plate and heater	$c_{k(p+h)}$	9.0	pF
Heater to cathode	c_{hk}	3.0	pF
Instantaneous Tube Voltage Drop for instantaneous plate current (i_b) = 350 mA	e_b	16	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length (l_m)	3.410in. (86.61 mm)
Maximum Seated Length (l_{sm})	3.030in. (76.96 mm)
Maximum Diameter (d_m)	1.188in. (30.1 mm)
Envelope	JEDEC Designation T9
Base ^b	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC Designation E9-89)

Terminal Connections

(See *TERMINAL DIAGRAM*) JEDEC Designation 9HP

Type of Cathode Coated Unipotential

Operating Position Any

MAXIMUM RATINGS – Design-Maximum Values^c

For operation as a Damper Tube in Black-and-White-TV Receivers utilizing a 525-line, 30-frame system^d

Peak Inverse Plate Voltage . . .	$-e_{bm}$	5200 ^e	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	$\left\{ \begin{array}{l} +300 \\ -5200 \end{array} \right.$	V
			V
Average ^f	$E_{hk(av)}$	$\left\{ \begin{array}{l} +100 \\ -900 \end{array} \right.$	V
			V
Heater Voltage	E_h	5.7 to 6.9	V



Electronic
Components

DATA
8-69

6CK3

Plate Current:

Peak	i_{bm}	1200	mA
Average ^f	$I_{b(av)}$	250	mA
Plate Dissipation	P_b	6.5	W
Envelope Temperature (at hot-test point on envelope surface) T_E		220	°C

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b Designed to mate with Novar 9-Contact Socket generally available from your local RCA Distributor.

^c As defined in the current issue of EIA Standard RS-239.

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

^e This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 52-line, 30-frame system, 15% on one horizontal scanning cycle is 10 μ s.

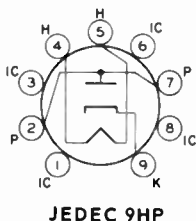
^f Measured with a dc meter.

OPERATING CONSIDERATIONS

Socket terminals 1, 3, 6, and 8 should not be used as tie points for external-circuit components. It is recommended that these socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Do Not Use
- Pin 2 - Plate
- Pin 3 - Do Not Use
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Do Not Use
- Pin 7 - Plate
- Pin 8 - Do Not Use
- Pin 9 - Cathode



Half-Wave Vacuum Rectifier

NOVAR TYPE

PRESSURE-WELDED CATHODE COATING

For Color-TV Damper-Diode Applications

ELECTRICAL CHARACTERISTICS

Bogey Values

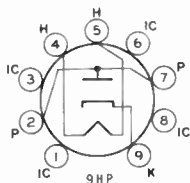
Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	1.2	A
Direct Interelectrode Capacitances			
Without external grids:			
Plate to cathode and heater	$C_p(k+h)$	6.5	pF
Cathode to plate and heater	$C_k(p+h)$	9.0	pF
Heater to cathode	C_{h-k}	3.0	pF
Instantaneous Tube Voltage Drop	e_b	16	V
For instantaneous plate current (I_p) = 50 mA			

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005 in
Maximum Seated Length	2.625 in
Maximum Diameter	1.188 in
Dimensional Outline	See <i>General Section</i>
Envelope	T9
Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-89)

TERMINAL DIAGRAM (Bottom View)

Pin 1 - Do Not Use
 Pin 2 - Plate
 Pin 3 - Do Not Use
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Do Not Use
 Pin 7 - Plate
 Pin 8 - Do Not Use
 Pin 9 - Cathode



DESIGN-MAXIMUM RATINGS

For operation as a Damper Tube in Black-and-White TV Receivers utilizing a 525-line, 30-frame system

Peak Inverse Plate Voltage	$-e_{bm}$	5500 ^a	V
Heater-Cathode Voltage			
Peak	e_{hkm}	+300	V
		-5500	V
Average ^b	$E_{hk(av)}$	+100	V
		-900	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9	V



6CL3

Plate Current

Peak	i_{bm}	1300	mA
Average	$I_b(av)$	250	mA
Plate Dissipation	P_b	8.5	W
Envelope Temperature	T_E	220	°C

At hottest point on envelope surface

- ^a This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- ^b Measured with a dc meter.

OPERATING CONSIDERATIONS

Socket terminals 1, 3, 6, and 8 should not be used as tie points for external-circuit components. It is recommended that these socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.





6CL6

6CL6

POWER PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.65	amp

Direct Interelectrode Capacitances (without external shield):

Grid No.1 to Plate	0.120	μ f
Input	11	μ f
Output	5.5	μ f

Characteristics, Amplifier Class A₁:

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 Signal Voltage	3	volts
Zero-Signal DC Plate Current	30	ma
Max.-Signal DC Plate Current	31	ma
Zero-Signal DC Grid-No.2 Current	7	ma
Max.-Signal DC Grid-No.2 Current	7.2	ma
Plate Resistance (Approx.)	0.15	megohm
Transconductance	11000	μ mhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μ amp	-14	volts
Load Resistance	7500	ohms
Total Harmonic Distortion	8	per cent
Max.-Signal Power Output	2.8	watts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (excluding tip)	2" \pm 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

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max.	volts
PLATE SUPPLY VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR)VOLTAGE	0 max.	volts

SEPT. 1, 1952

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6CL6



6CL6

POWER PENTODE

GRID-No.2 (SCREEN) VOLTAGE	See Rating Curve at front of this Section
GRID-No.2 SUPPLY VOLTAGE	300 max. volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:	
Negative bias value	50 max. volts
Positive bias value	0 max. volts
PLATE DISSIPATION	7.5 max. watts
GRID-No.2 INPUT	1.7 max. watts
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)	200 max. °C

Typical Operation in 4-Mc Bandwidth Video Amplifier

Circuit of Fig. 1:

Plate Supply Voltage	300	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	300	volts
Grid-No.1 Bias Voltage	-2	volts
Grid-No.1 Signal Voltage (Peak to Peak) .	3	volts
Grid-No.2 Resistor	24000	ohms
Grid-No.1 Resistor	0.1	megohm
Load Resistor	3900	ohms
Zero-Signal Plate Current	30	ma
Zero-Signal Grid-No.2 Current	7.0	ma
Voltage Output (Peak to Peak)	132	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

SEPT. 1, 1952

TUBE DEPARTMENT

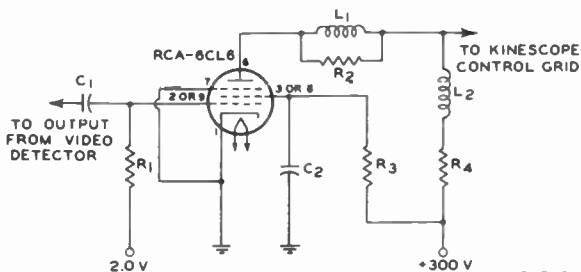
TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

POWER PENTODE

*Fig. 1 - Typical Video Voltage Amplifier Circuit
Having Bandwidth of 4 Mc.*



92CS-7804

C1: 0.1 μ f, 400 volts
 C2: 4 μ f, 400 volts
 L1: Peaking Coil, 180 μ h
 L2: Peaking Coil, 120 μ h

R1: 100000 ohms, 0.5 watt
 R2: 47000 ohms, 0.5 watt
 R3: 24000 ohms, 2 watts
 R4: 3900 ohms, 5 watts
 non-inductive type

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.

6CL6



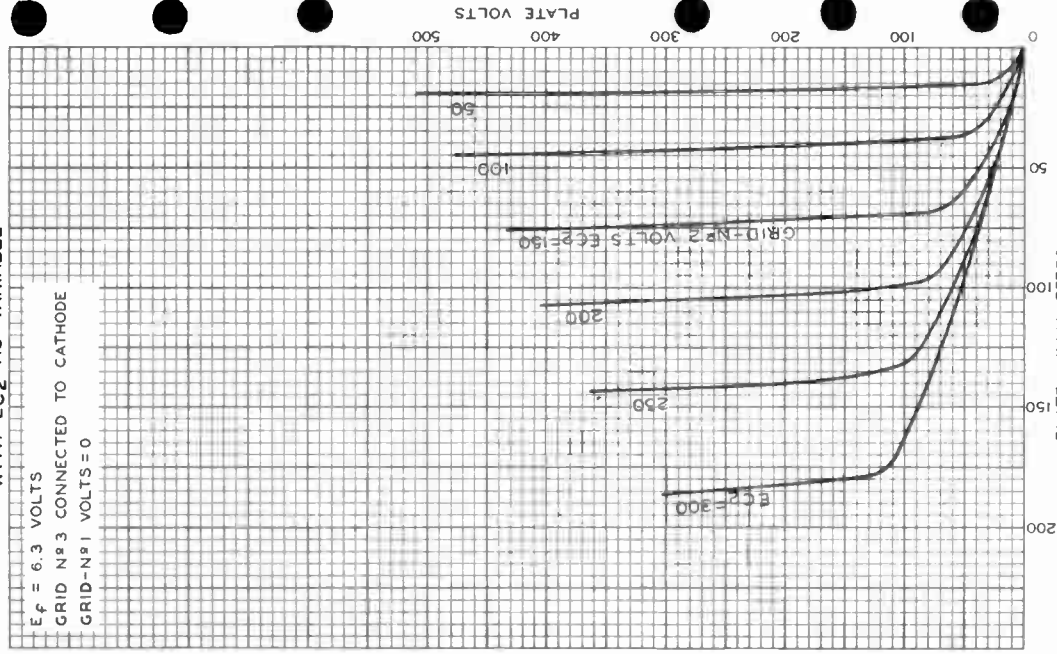
6CL6

AVERAGE PLATE CHARACTERISTICS WITH EC2 AS VARIABLE

$E_f = 6.3$ VOLTS

GRID N₃ CONNECTED TO CATHODE

GRID-N₁ VOLTS = 0



MAY 22, 1952

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7803



6CL6

6CL6

AVERAGE PLATE CHARACTERISTICS WITH E_{C1} AS VARIABLE

$E_f = 6.3$ VOLTS
GRID No 3 CONNECTED TO CATHODE
GRID-No 2 VOLTS = 150

GRID-No 1 (I_{C1}) MILLIAMPERES

30 20 10 0

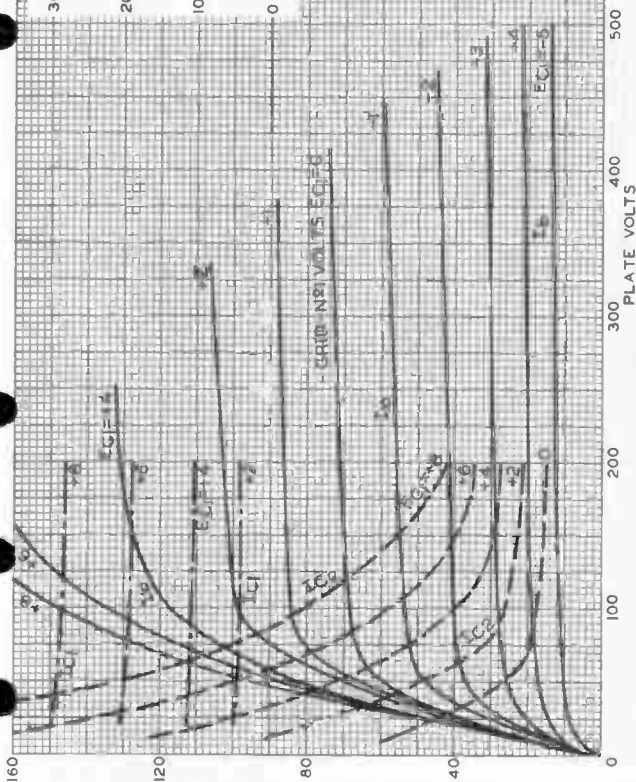


PLATE (I_B) OR GRID-No 2 (I_{C2}) MILLIAMPERES

MAY 22, 1952

TUBE DEPARTMENT

92CM - 7802

RAD. CO CORPORATION OF AMERICA HARRISON, NEW JERSEY

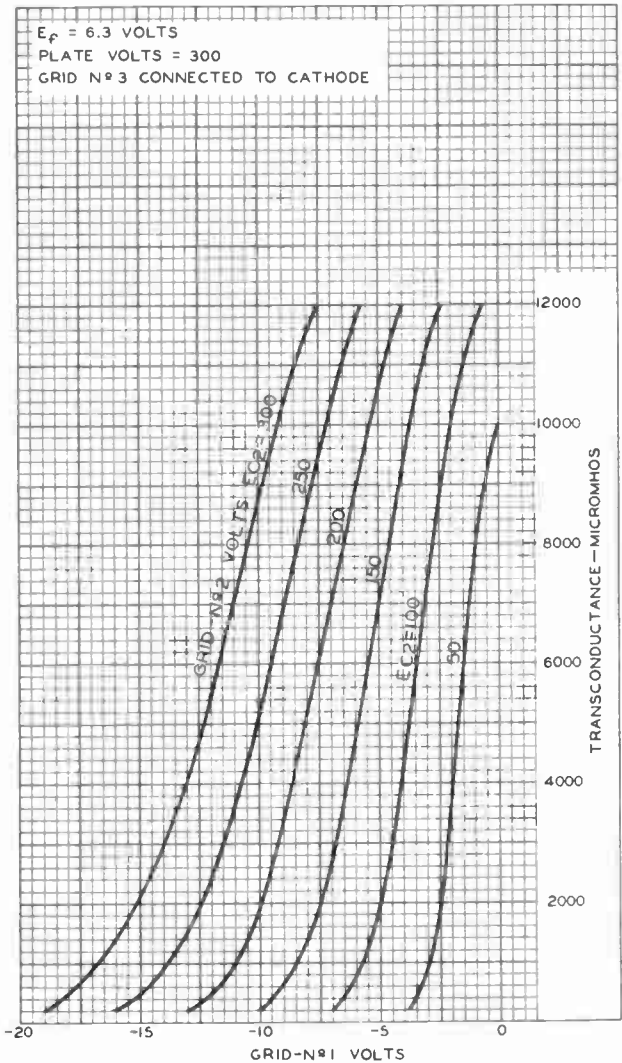
6CL6



6CL6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 300
GRID N°3 CONNECTED TO CATHODE



MAY 21, 1952

TUBE DEPARTMENT

92CM-7801

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

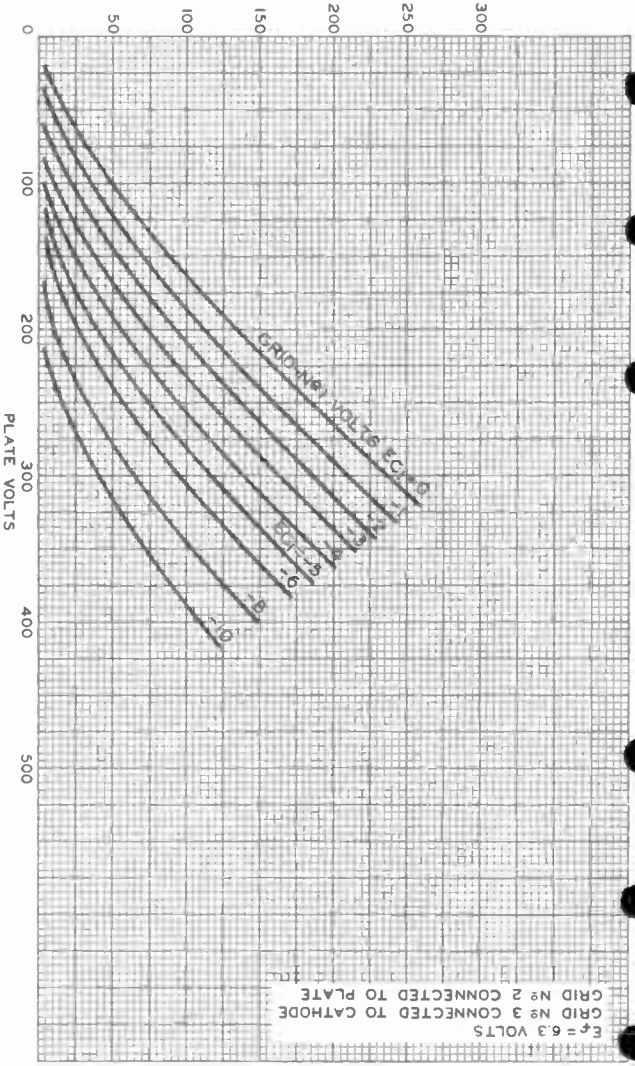
World Radio History

MAY 26, 1952

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-7808

TUBE DEPARTMENT
PLATE MILLIAMPERES



$E_f = 6.3$ VOLTS
GRID No 3 CONNECTED TO CATHODE
GRID No 2 CONNECTED TO PLATE

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION

6CL6



World Radio History

6CL6





6CL8

6CL8

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

*Intended for use as VHF oscillator and mixer
in TV receivers having series heater-string arrangement*

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage.	6.3	ac or dc volts
Current.	0.45	amp
Warm-up time (Average).	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
<i>Triode Unit:</i>			
Grid to plate.	1.8	1.8	μmf
Grid to cathode and heater	2.7	2.7	μmf
Plate to cathode and heater.	0.4	1.2	μmf
<i>Tetrode Unit:</i>			
Grid No.1 to plate	0.028 max.	0.016 max.	μmf
Grid No.1 to cathode, grid No.2, and heater.	5	5	μmf
Plate to cathode, grid No.2, and heater	2	3	μmf
Heater to cathode.	2.5	2.5 [•]	μmf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Tetrode Unit	
Plate Voltage.	125	125	volts
Grid-No.2 (Screen-Grid) Voltage.	-	125	volts
Grid-No.1 (Control-Grid) Voltage.	-	-1	volt
Cathode Resistor	56	-	ohms
Amplification Factor	40	-	
Plate Resistance (Approx.)	5000	100000	ohms
Transconductance	8000	5800	μmhos
Plate Current.	15	12	ma
Grid-No.2 Current.	-	4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu\text{a.} = 10$	-9	-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" \pm 3/32"

^o, [•]: See next page.



6CL8

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

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 9FX

Pin 1—Triode Grid
 Pin 2—Triode Plate
 Pin 3—Triode
 Cathode
 Pin 4—Heater
 Pin 5—Heater
 Pin 6—Tetrode Plate



Pin 7—Tetrode
 Grid No.2
 Pin 8—Tetrode
 Cathode
 Pin 9—Tetrode
 Grid No.1

CONVERTER SERVICE

Maximum Ratings, Design-Center Values:

	Triode Unit as Osc.	Tetrode Unit as Mixer	
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	2.7 max.	2.8 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

Maximum Circuit Values:

	Triode Unit	Tetrode 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.



6CL8

6CL8

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

- 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.
- ▲ The dc component must not exceed 100 volts.





6CL8-A

6CL8-A MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE.

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
<i>Triode Unit:</i>			
Grid to plate	1.8	1.8	μf
Grid to cathode, tetrode cathode & internal shield, and heater	2.8	2.8	μf
Plate to cathode, tetrode cathode & internal shield, and heater	1.5	2	μf
<i>Tetrode Unit:</i>			
Grid No.1 to plate	0.02 max.	0.01 max.	μf
Grid No.1 to cathode & internal shield, grid No.2, and heater	5	5	μf
Plate to cathode & internal shield, grid No.2, and heater	2	3	μf
Tetrode grid No.1 to triode plate	0.015 max.	0.01 max.	μf
Tetrode plate to triode plate	0.15 max.	0.03 max.	μf
Heater to cathode (Each Unit) .	3	3	μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Tetrode Unit	
Plate Voltage	125	100	125 volts
Grid-No.2 Voltage	-	70	125 volts
Grid-No.1 Voltage	-1	-	-1 volt
Amplification Factor	40	-	-
Plate Resistance (Approx.) . . .	5000	-	200000 ohms
Transconductance	8000	7000	6500 μmhos
Plate Current	14	-	12 ma
Grid-No.2 Current	-	-	4 ma
Grid-No.1 Voltage (Approx.) for plate μ _a = 20	-9	-	-9 volts

← Indicates a change.

6CL8-A



6CL8-A

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

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" \pm 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. 9FX

Pin 1 - Triode Grid
 Pin 2 - Triode Plate
 Pin 3 - Triode
 Cathode
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Tetrode Plate



Pin 7 - Tetrode
 Grid No. 2
 Pin 8 - Tetrode
 Cathode,
 Internal
 Shield
 Pin 9 - Tetrode
 Grid No. 1

CONVERTER

Maximum Ratings, Design-Maximum Values:

	Triode Unit as Osc.	Tetrode 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.	2.5 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

→ Indicates a change.



6CL8-A

6CL8-A

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Tetrode Unit</i>	
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

○ with external shield JEDEC No.315 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.



Half-Wave Vacuum Rectifier

NOVAR TYPE

"PRESSURE-WELDED" CATHODE COATING

For Color-TV Damper-Diode Applications

ELECTRICAL CHARACTERISTICS

Bogey Values

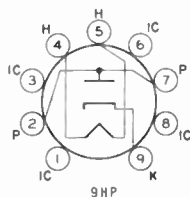
Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	2.4	A
Direct Interelectrode Capacitances Without external shields:			
Heater to cathode and heater	$c_p(k+h)$	20	pF
Cathode to plate and heater	$c_k(p+h)$	18	pF
Heater to cathode	c_{h-k}	4.0	pF
Instantaneous Tube Voltage Drop	e_b	10	V
for instantaneous plate current (i _b) = 250 mA			

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005 in
Maximum Seated Length	2.625 in
Maximum Diameter	1.188 in
Dimensional Outline	See <i>General Section</i>
Envelope . . . . .	. . . . .T9
Base	Small-Button Novar 9-Pin With Exhaust Tip (JEDEC E9-89)

TERMINAL DIAGRAM (Bottom View)

Pin 1 - Do Not Use
 Pin 2 - Plate
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Heater
 Pin 7 - Do Not Use
 Pin 8 - Plate
 Pin 9 - Do Not Use
 Pin 10 - Cathode



DESIGN-MAXIMUM RATINGS

*For operation as a Damper Tube in Color TV
 Receivers utilizing a 525-line, 30-frame system*

Peak Inverse Plate Voltage	$-e_{bm}$	5500 ^a	V
Heater-Cathode Voltage			
DC	e_{hkm}	+300	V
AC		-5500	V
Average	$E_{hk(av)}$	+100	V
Peak		-900	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9	V



6CM3

Plate Current

Peak i_{bm} 1700 mA
Average $I_b(av)$ 400 mA

Plate Dissipation P_b 12 W

^a This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.

OPERATING CONSIDERATIONS

Socket terminals 1, 3, 6, and 8 should not be used as tie points for external-circuit components. It is recommended that these socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.





6CM6

6CM6

BEAM POWER TUBE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	. . . . .	ac or dc volts
Current	0.45	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate	0.7	μ f
Grid No.1 to cathode, grid No.3, grid No.2, and heater	8	μ f
Plate to cathode, grid No.3, grid No.2, and heater	8.5	μ f

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" \pm 3/32"
Diameter	0.750" to 0.675"
Dimensional Outline	See General Section
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW	9CK

Pin 1-Grid No.2
 Pin 2-No Connection
 Pin 3-Grid No.1
 Pin 4-Heater
 Pin 5-Heater



Pin 6-Grid No.1
 Pin 7-Cathode,
 Grid No.3
 Pin 8-No Connection
 Pin 9-Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	315	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285	max.	volts
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 [▲]	max.	volts

Typical Operation and Characteristics:

Plate Voltage	180	250	315	volts
Grid-No.2 Voltage	180	250	225	volts
Grid-No.1 (Control-Grid) Voltage	-8.5	-12.5	-13	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	13	volts
Zero-Signal Plate Current	29	45	34	ma
Max.-Signal Plate Current	30	47	35	ma
Zero-Signal Grid-No.2 Current	3	4.5	2.2	ma
Max.-Signal Grid-No.2 Current	4	7	6	ma

^o, [▲]: See next page.



6CM6

BEAM POWER TUBE

Plate Resistance (Approx.)	50000	50000	80000	ohms
Transconductance	3700	4100	3750	μ mhos
Load Resistance	5500	5000	8500	ohms
Total Harmonic Distortion	8	8	12	%
Max.-Signal Power Output	2	4.5	5.5	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

VERTICAL-DEFLECTION AMPLIFIER**Maximum Ratings, Design-Center Values Except as Noted:***For operation in a 525-line, 30-frame system*[□]

DC PLATE VOLTAGE	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#] (Absolute maximum)	2000 [■] max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	120 max.	ma
DC	40 max.	ma
GRID-No.2 INPLT	1.75 max.	watts
PLATE DISSIPATION	8 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-No.1-Circuit Resistance:

For cathode-bias operation	2.2 max.	megohms
--------------------------------------	----------	---------

VERTICAL-DEFLECTION AMPLIFIER*Triode Connection*[†]**Maximum Ratings, Design-Center Values Except as Noted:**

DC PLATE VOLTAGE	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#] (Absolute maximum)	2000 [■] max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	120 max.	ma
DC	40 max.	ma
PLATE DISSIPATION	9 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 [▲] max.	volts

□, ▲, #, ■, †: See next page.



6CM6

6CM6

BEAM POWER TUBE

Characteristics:

Plate Voltage	250	volts
Grid-No.1 Voltage	-12.5	volts
Amplification Factor	9.8	
Plate Resistance (Approx.)	1960	ohms
Transconductance	5000	μ hos
Plate Current	49.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.5	-37	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
For cathode-bias operation. 2.2 max. megohms

- C without external shield.
- ▲ The dc component must not exceed 100 volts.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- * This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.
- Under no circumstances should this absolute value be exceeded.
- † Grid-No.2 connected to plate.

CURVES

shown under Types 6V6 and 6V6-GT, within ratings,
also apply to the 6CM6



Medium-Mu Dual Triode

With Dissimilar Units

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Tripotential Cathodes:

voltage (AC or DC)	1.2	voltage
current	0.1 ± ± 6	amp ←
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances (Approx.):^a

	Unit No. 1	Unit No. 2	
Grid to plate	3.8	5	μf
Grid to cathode and heater	?	1.5	μf
Plate to cathode and heater	0.5	1.4	μf

Characteristics, Class A₁ Amplifier:

	Unit No. 1	Unit No. 2	
Plate Voltage	200	150	volts
Grid voltage	-7	-8	volts
Amplification Factor	21	16	ib
Plate Resistance (Approx.)	1200	4100	ohms
Transconductance	2000	4100	μmhos
Plate Current	5	20	ma
Plate Current for grid volts = -10	-1	-	ma
Grid Voltage (Approx.) for plate μa = 10	-14	-	volts

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	0.710" to 0.714"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Novel 9-Pin (G-9-C No. F9-1)
Basing Deviation for BOTTOM VIEW	±.005

Pin 1 - Plate of
Unit No. 2

Pin 2 - No Connection

Pin 3 - Cathode of
Unit No. 1

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Plate of
Unit No. 1

Pin 7 - Grid of
Unit No. 1

Pin 8 - Grid of
Unit No. 2

Pin 9 - Cathode of
Unit No. 2

← Indicate change.



VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

→ Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC PLATE VOLTAGE.	550 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	220 max.	volts
CATHODE CURRENT:		
Peak.	77 max.	ma
Average	17 max.	ma
PLATE DISSIPATION	1.45 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 ^c max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias, grid-resistor-bias, or cathode-bias operation.	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

→ Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC PLATE VOLTAGE.	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^d	2200 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	220 max.	volts
CATHODE CURRENT:		
Peak.	77 max.	ma
Average	22 max.	ma
PLATE DISSIPATION	6 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 ^c max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation.	1 max.	megohm
For cathode-bias operation.	2.5 max.	megohms

^a without external shield.

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

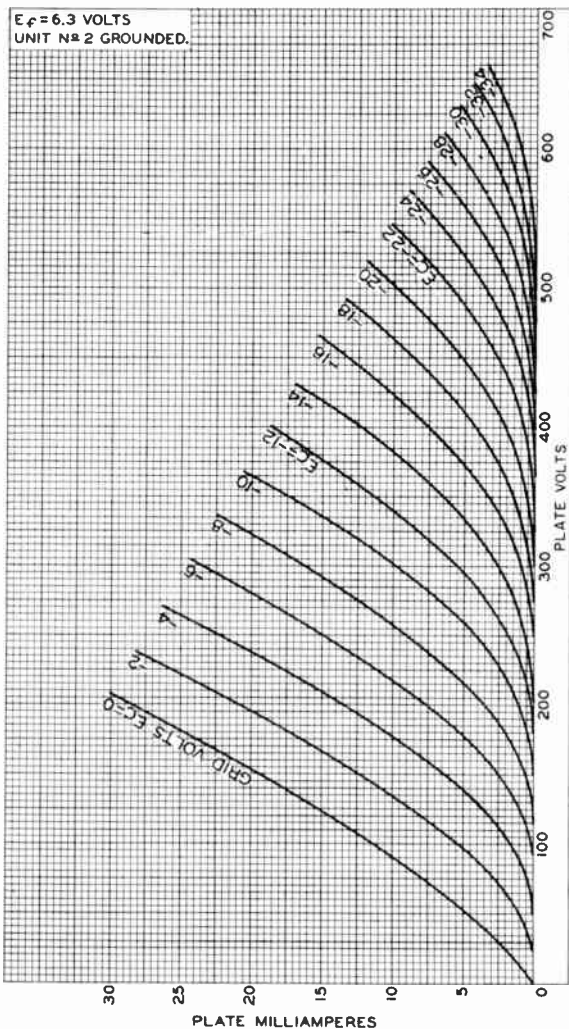
^c The dc component must not exceed 100 volts.

^d This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

→ Indicates a change.



AVERAGE PLATE CHARACTERISTICS Unit No.1

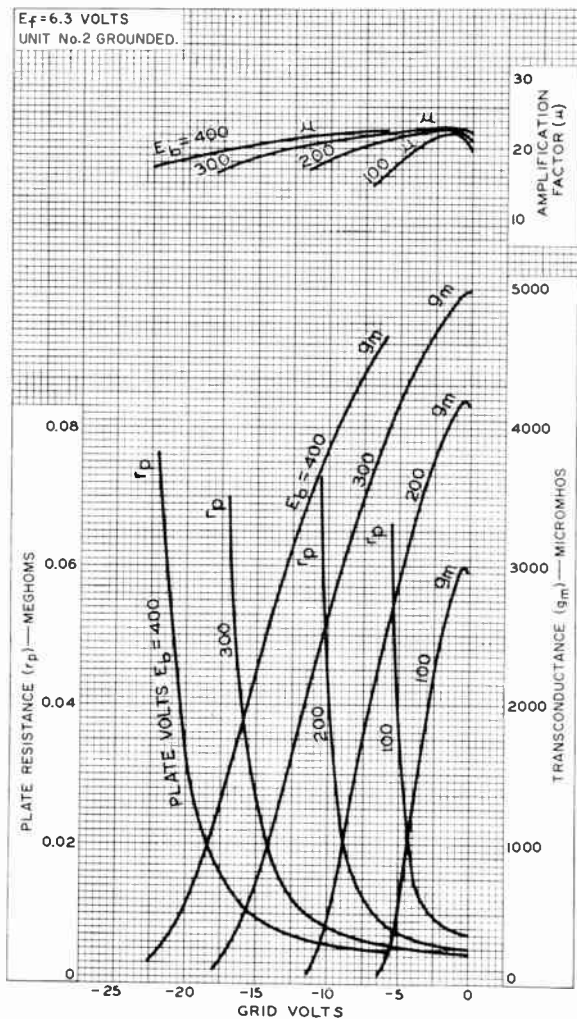


92CM-8617



AVERAGE CHARACTERISTICS Unit No.1

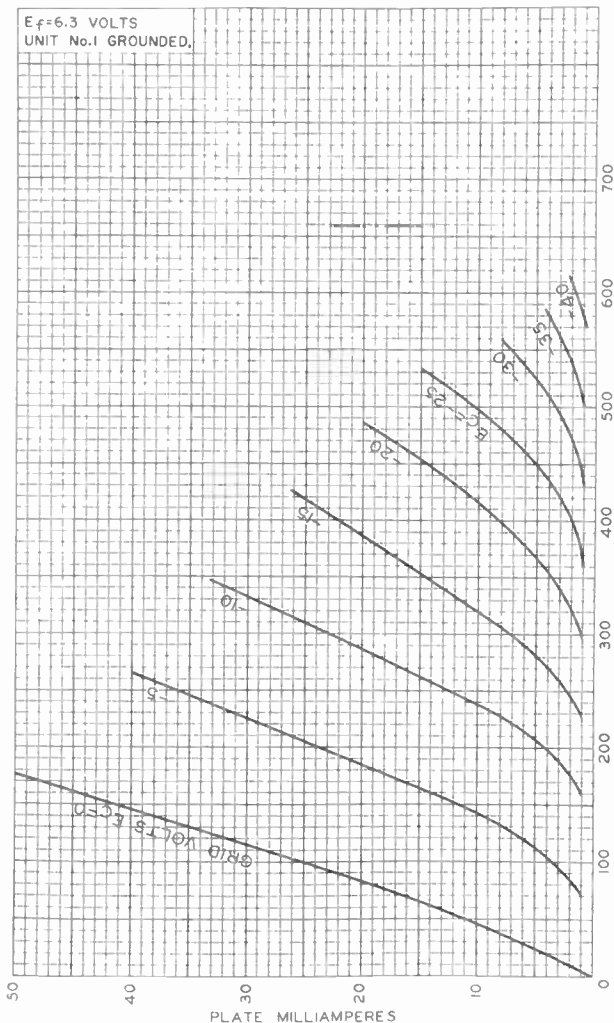
$E_f = 6.3$ VOLTS
UNIT No.2 GROUNDED.



92CM-8616R1

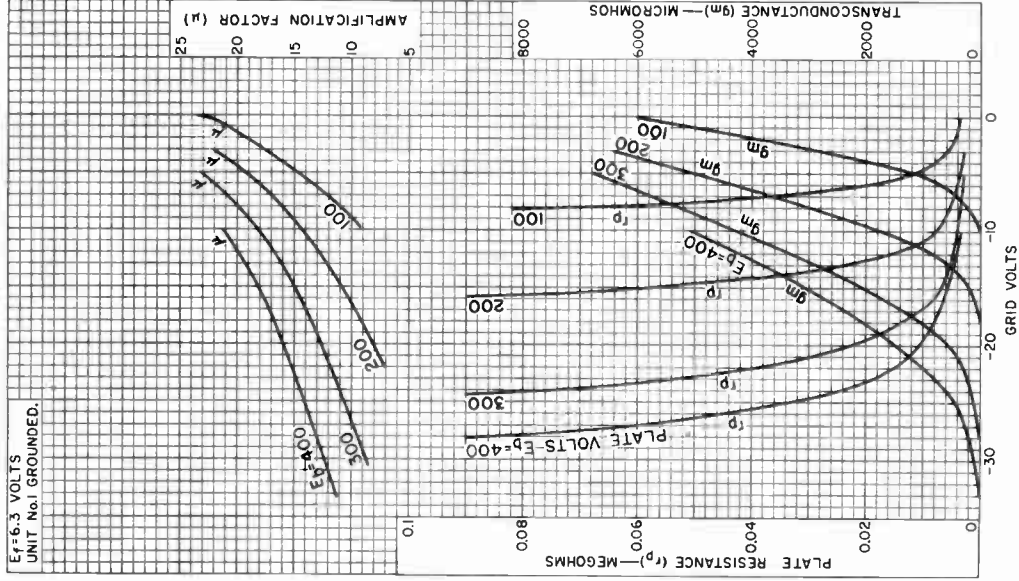
6CM7

AVERAGE PLATE CHARACTERISTICS Unit No.2



6CM7

AVERAGE CHARACTERISTICS Unit No.2



92CM-8613RI

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Twin Diode—High-Mu Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Heater-section

arrangement *Parallel* *Series* *Series*

Voltage

(AC or DC), 3.15^a 6.3^b 6.3 ± 0.6 voltsCurrent . . . 0.600 ± 0.010 0.300 ± 0.020 0.300^c amp

Warm-up time

(Average) . . . 11 11 - sec

Peak heater-cathode voltage (Each unit):

Heater negative with

respect to cathode 200 max. volts

Heater positive with

respect to cathode 200^d max. voltsDirect Interelectrode Capacitances (Approx.):^e*Triode Unit:*

Grid to plate 1.8 pf

Grid to cathode and heater 1.5 pf

Plate to cathode and heater 0.5 pf

*Diode Units:*Diode-No.1 plate to cathode of diodes No.1
and No.2 & internal shield, and heater. 3.6 pfDiode-No.2 plate to cathode of diodes No.1
and No.2 & internal shield, and heater. 3.6 pf

Triode grid to either diode plate 0.006 pf

Characteristics, Class A₁ Amplifier (Triode Unit):

Plate Voltage 100 250 volts

Grid Voltage -1 -3 volts

Amplification Factor 70 70

Plate Resistance (Approx.) 54000 58000 ohms

Transconductance 1300 1200 μ hos

Plate Current 0.8 1 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)

← Indicates a change.



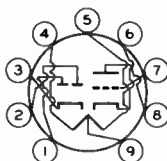
6CN7

Basing Designation for BOTTOM VIEW. 9EN

Pin 1 - Diode-No.2
Plate

Pin 2 - Diode-No.1
Plate

Pin 3 - Cathode of
Diodes No.1
& No.2,
Internal
Shield



Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Triode
Cathode

Pin 7 - Triode Grid

Pin 8 - Triode Plate

Pin 9 - Heater Tap

TRIODE UNIT — AMPLIFIER — Class A₁

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE 330 max. volts

GRID VOLTAGE:

Positive-bias value 0 max. volts

PLATE DISSIPATION 1.1 max. watts

Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED AMPLIFIER CHART No.7*
at front of this section

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

PLATE CURRENT 5.5 max. ma

Characteristics, *Instantaneous Value:*

Plate Current for plate volts = 5 20 ma

^a At heater amperes = 0.600.

^b At heater amperes = 0.300.

^c At heater volts = 6.3

^d The dc component must not exceed 100 volts.

^e Without external shield.

CURVES

For Triode shown under Type 6T8A also apply to the 6CN7



Half-Wave Vacuum Rectifier

GENERAL DATA

Electrical:Heater Characteristics and Ratings (*Design-Maximum 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^a 5500^b max. voltsHeater positive with respect to cathode 300^c max. voltsDirect Interelectrode Capacitances (Approx.):^dPlate to cathode and heater 8.5 μf Cathode to plate and heater 11.5 μf Heater to cathode 4 μf **Mechanical:**

Operating Position Any

Type of Cathode Coated Unipotential

Maximum Overall Length 3-13/16"

Maximum Seated Length 3-1/4"

Maximum Diameter 1-9/32"

Bulb T9

Bases (Alternates):

Intermediate-Shell Octal with External Barriers:

5-Pin, Arrangement 2 (JEDEC Group 1, No.85-147)

Short Intermediate-Shell Octal with External Barriers:

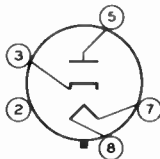
5-Pin, Arrangement 2 (JEDEC Group 1, No.85-85)

Basing Designation for BOTTOM VIEW 4CG

Pin 2 - Do Not Use^e

Pin 3 - Cathode

Pin 5 - Plate



Pin 7 - Heater

Pin 8 - Heater

DAMPER SERVICE**Maximum Ratings, Design-Maximum Values:***For operation in a 525-line, 30-frame system^f*PEAK INVERSE PLATE VOLTAGE^a 5500 max. volts

PEAK PLATE CURRENT 1200 max. ma

DC PLATE CURRENT 190 max. ma

PLATE DISSIPATION 6.5 max. watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 250 25 volts



6CQ4

- a This rating is applicable when the duty cycle of the voltage pulse does 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.
- b The dc component must not exceed 900 volts.
- c The dc component must not exceed 100 volts.
- d without external shield.
- e socket terminals 1, 2, 4, and 6 should not be used as tie points.
- f As prescribed in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.



Medium-Mu Triode— Sharp-Cutoff Tetrode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

voltage (AC or DC)	0.3	volts
Current	0.45 ± 6%	amp ←
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield[▲]</i>	
<i>Triode Unit:</i>			
Grid to plate	1.8	1.8	μf
Grid to cathode and heater	2.7	2.7	μf
Plate to cathode and heater	0.4	1.2	μf
<i>Tetrode Unit:</i>			
Grid No.1 to plate	0.019 max.	0.015 max.	μf
Grid No.1 to cathode & internal shield, grid No.2, and heater	5	5	μf
Plate to cathode & internal shield, grid No.2, and heater	2.5	3.3	μf
Tetrode plate to triode plate	0.07 max.	0.01 max.	μf
Heater to cathode (Each unit)	3	3 [•]	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Tetrode Unit</i>	
Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	—	125	volts
Grid-No.1 Supply Voltage	—	-1	volt
Cathode Resistor	56	—	ohms
Amplification Factor	40	—	
Plate Resistance (Approx.)	5000	140000	ohms
Transconductance	8000	5800	μmhos
Plate Current	15	12	ma
Grid-No.2 Current	—	4.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-7	-7	volts

Mechanical:

Operating Position Any

← Indicates a crane.



6CQ8

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 9GE

Pin 1 - Triode Plate
 Pin 2 - Tetrode
 Grid No.1
 Pin 3 - Tetrode
 Grid No.2
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Tetrode Plate



Pin 7 - Tetrode
 Cathode,
 Internal
 Shield
 Pin 8 - Triode
 Cathode
 Pin 9 - Triode
 Grid

AMPLIFIER — Class A₁

→ Maximum Ratings, Design-Maximum Values:

	Triode Unit	Tetrode Unit	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	330 max.	volts
GRID-No.2 VOLTAGE	-	See <i>Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
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	-	0.7 max.	watt
For grid-No.2 voltages between 165 and 330 volts		See <i>Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID INPUT	0.55 max.	-	watt
PLATE DISSIPATION	3.1 max.	3.2 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

Maximum Circuit Values:

	Triode Unit	Tetrode 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

→ Indicates a change.

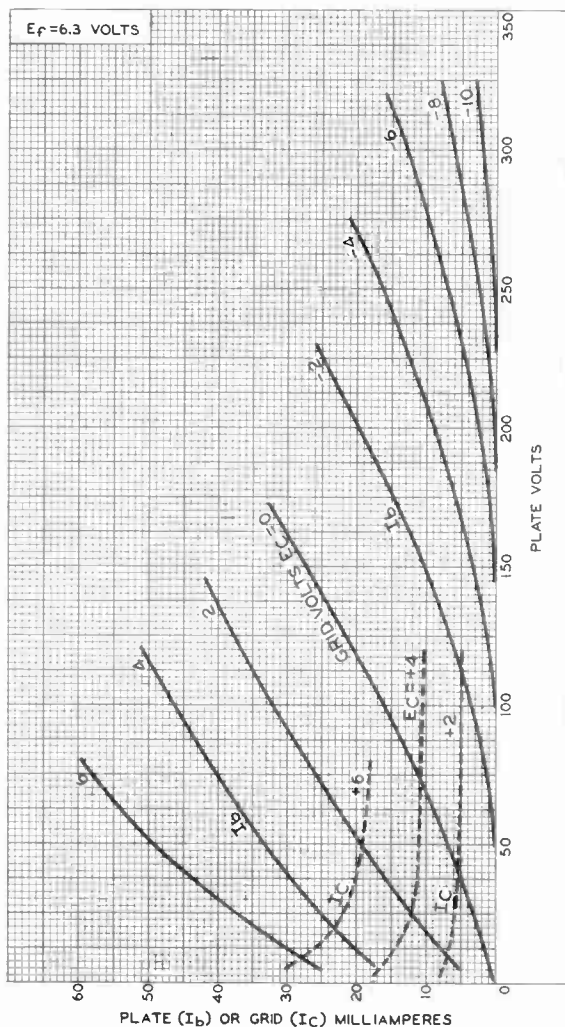


- ▲ With external shield JEDEC No.315 connected to cathode of unit under test except as noted.
- With external shield JEDEC No.315 connected to ground.
- ★ The dc component must not exceed 100 volts.



6CQ8

AVERAGE CHARACTERISTICS Triode Unit



92CM-9190R1

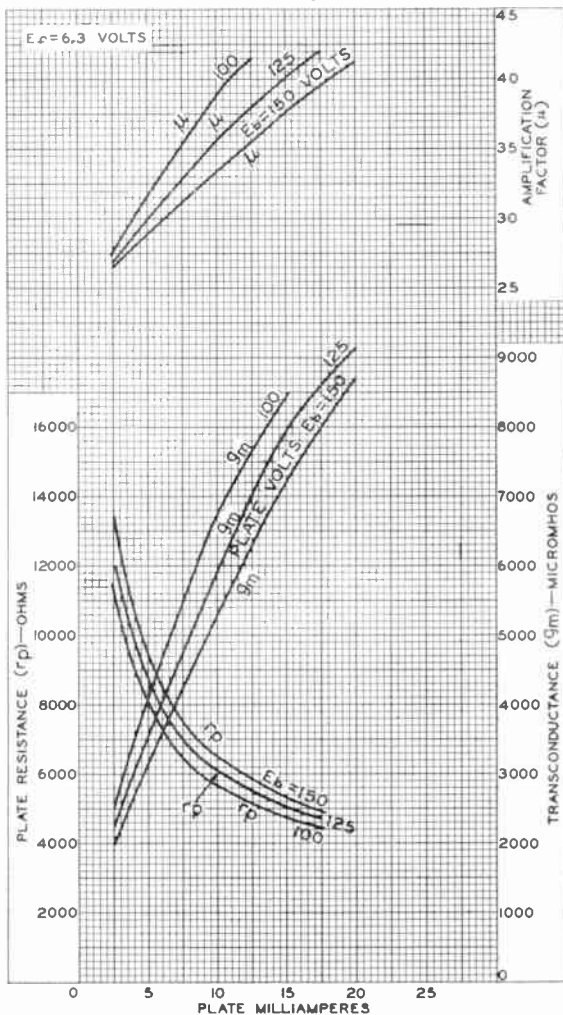
RADIO CORPORATION OF AMERICA
Electron Tube Division

World Radio History

Harrison, N. J.



AVERAGE CHARACTERISTICS Triode Unit



92CM-7871RI

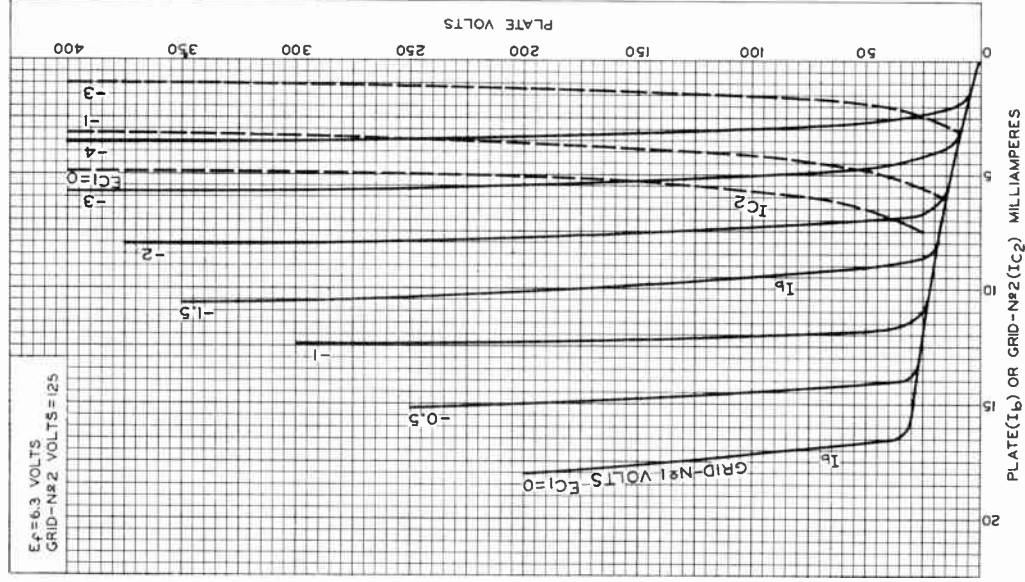


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Electron Tube Division Harrison, N. J.

DATA 3
3-61

6CQ8

AVERAGE CHARACTERISTICS Tetrode Unit



92CM-9197

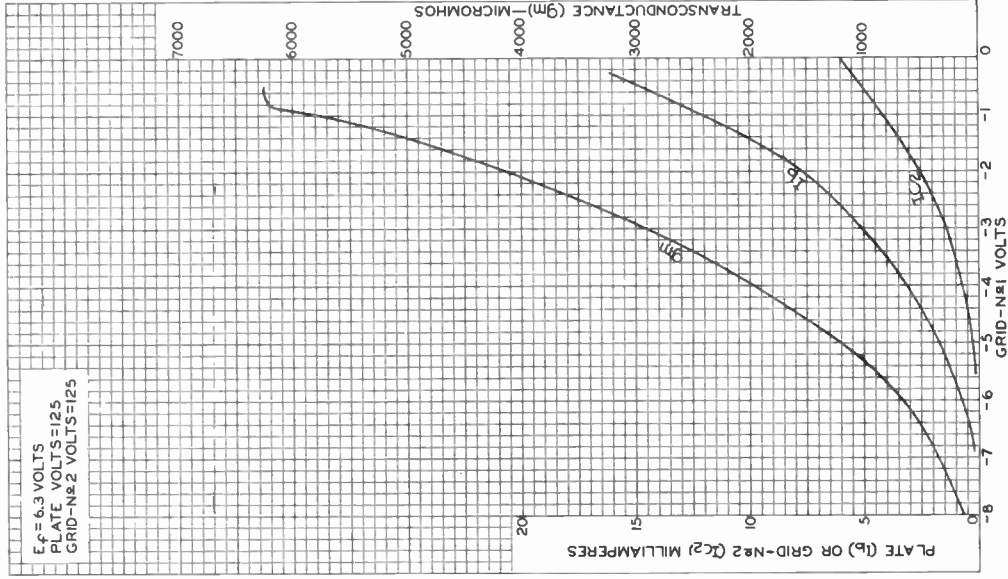
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Electron Tube Division

Harrison, N. J.



6CQ8

AVERAGE CHARACTERISTICS Tetrode Unit



92CM-9195



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 4
3-61





6CS6

6CS6

PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc	volts
Current	0.5		amp

Direct Interelectrode Capacitances (Approx.):

Grid No.1 to plate	0.07 max.	μ mf
Grid No.3 to plate	0.36 max.	μ mf
Grid No.1 to grid No.3	0.22 max.	μ mf
Grid No.1 to cathode & grid No.5, grid No.4 & grid No.2, grid No.3, and heater	5.5	μ mf
Grid No.3 to cathode & grid No.5, grid No.4 & grid No.2, grid No.1, and heater	7	μ mf
Plate to cathode & grid No.5, grid No.4 & grid No.2, grid No.3, grid No.1, and heater	7.5	μ mf

Characteristics, Class A₁ Amplifier:

Plate Voltage	100	100	volts
Grid-No.2 & Grid-No.4 Voltage	30	30	volts
Grid-No.3 Voltage	-1	0	volt
Grid-No.1 Voltage	-1	-1	volt
Plate Resistance (Approx.)	0.7	1	megohm
Grid-No.3-to-Plate Transconductance	1500	-	μ hos
Grid-No.1-to-Plate Transconductance	-	1100	μ hos
Plate Current	0.2	1	ma
Grid-No.2 & Grid-No.4 Current	5.5	1.3	ma
Grid-No.3 Voltage (Approx.) for plate current of 50 μ amp	-1.2	-	volts
Grid-No.1 Voltage (Approx.) for plate current of 50 μ amp	-	-2.5	volts

Mechanical:

Mounting Position Any

Maximum Overall Length 2-1/8"

Maximum Seating Length 1-7/8"

Length, Base to Cathode (Excluding tip) 1-1/2" \pm 3/32"

Maximum Diameter 3/4"

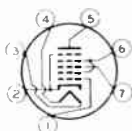
Dimensional Outline See General Section

bulb 7-5-1/2

base Small-button Miniature 7-Pin (JETEC No.E7-1)

Base Designation for BOTTOM VIEW 7CH

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,
Grid No.4
Pin 7 - Grid No.3

⁰ without external shield.

← Indicates a change.

6CS6



6CS6

PENTAGRID AMPLIFIER

GATED AMPLIFIER SERVICE

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE.	300 max.	volts
GRID-No.2 & GRID-No.4 SUPPLY VOLTAGE . . .	300 max.	volts
GRID-No.2 & GRID-No.4 VOLTAGE. . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION.	1 max.	watt
GRID-No.2 & GRID-No.4 INPUT:		
For grid-No.2 & grid-No.4 voltages		
up to 150 volts.	1 max.	watt
For grid-No.2 & grid-No.4 voltages		
between 150 and 300 volts. . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
CATHODE CURRENT.	14 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 [▲] max.	volts

Typical Operation as Sync Separator and Sync Clipper:

Plate Voltage.	10	volts
Grid-No.2 & Grid-No.4 Voltage.	30	volts
Grid-No.3 Voltage.	0	volts
Grid-No.1 Voltage.	0	volts
→ Plate Current.	2.0	ma
→ Grid-No.2 & Grid-No.4 Current.	4.5	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.47 max.	megohm
Grid-No.3-Circuit Resistance	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

→ Indicates a change.



6CS6

6CS6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 GRID-Nº3 VOLTS = 0
 GRIDS-Nº2 & Nº4 VOLTS = 30

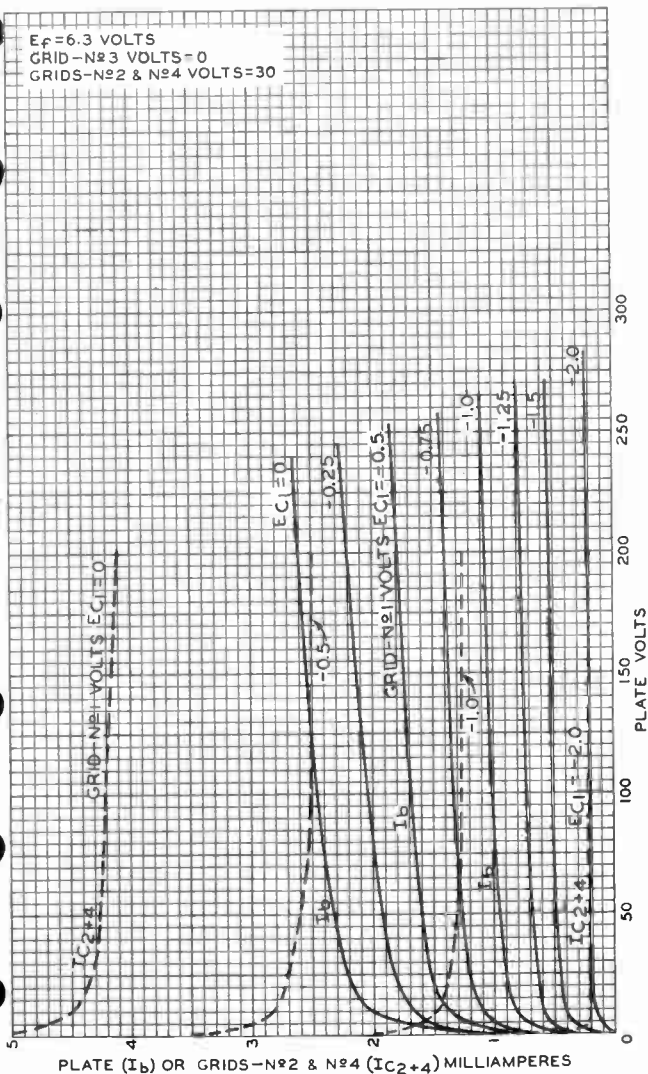


PLATE (I_b) OR GRIDS-Nº2 & Nº4 (I_{C2+4}) MILLIAMPERES

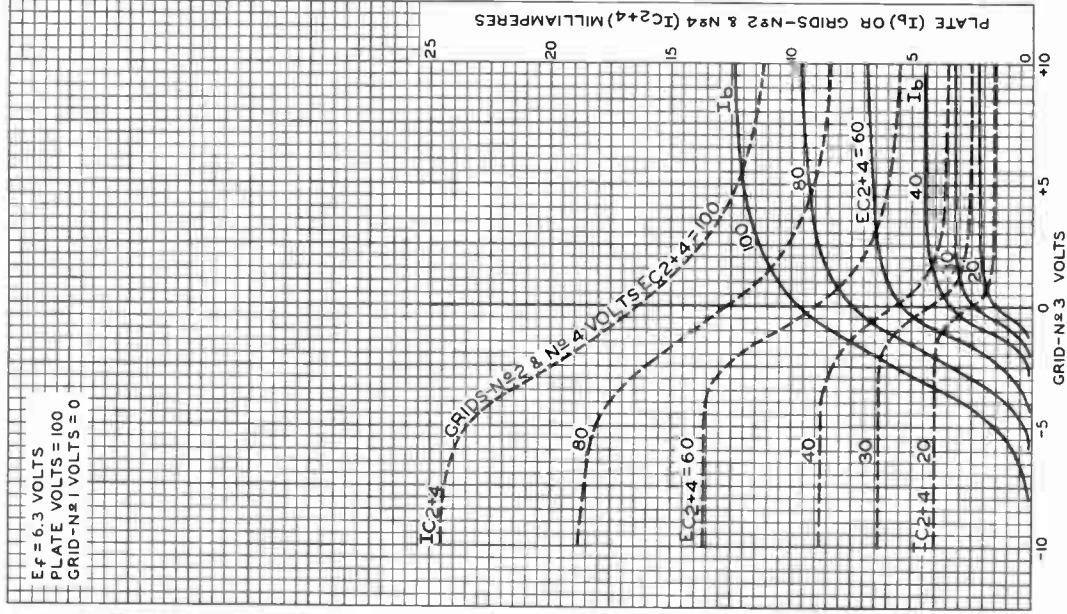
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8922

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 100
 GRID-N \neq 1 VOLTS = 0





6CS7

6CS7

MEDIUM-MU DUAL TRIODE

With Dissimilar Units

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.6	amp
Warm-up time (Average)	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):^o

	Unit No. 1 Oscillator	Unit No. 2 Amplifier	
Grid to plate	2.6	2.6	μμf
Grid to cathode and heater..	1.8	3	μμf
Plate to cathode and heater.	0.5	0.5	μμf

Characteristics, Class A₁ Amplifier:

	Unit No. 1 Oscillator	Unit No. 2 Amplifier	
Plate Voltage	250	250	volts
Grid Voltage	-8.5	-10.5	volts
Amplification Factor	17	15.5	
Plate Resistance (Approx.)	7700	3450	ohms
Transconductance	2200	4500	μmhos
Plate Current	10.5	19	ma
Plate Current for grid volts = -16.	-	3	ma
Grid Voltage (Approx.) for plate current of:			
10 microamperes	-24	-	volts
50 microamperes	-	-22	volts

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

^o: See next page.

6CS7



6CS7

MEDIUM-MU DUAL TRIODE

With Dissimilar Units

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

Pin 1 - Plate of Unit No. 2
 Pin 2 - No Connection
 Pin 3 - Grid 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 - Cathode of Unit No. 2

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Center Values:

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

DC PLATE VOLTAGE	500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400 max.	volts
CATHODE CURRENT:		
Peak	70 max.	ma
DC	20 max.	ma
PLATE DISSIPATION	1.25 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 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Center Values Except as Noted:

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

DC PLATE VOLTAGE	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#]		
(Absolute maximum)	2200 [■] max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	105 max.	ma
DC	30 max.	ma
PLATE DISSIPATION	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 [▲] max.	volts

□, ▲, #, ■: See next page.



6CS7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

6CS7

Maximum Circuit Values:

Grid-Circuit Resistance. 2.2 max. megohms

- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- ▲ The dc component must not exceed 100 volts.
- * This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.
- Under no circumstances should this absolute value be exceeded.
- Without external shield.



Half-Wave Rectifier

9-Pin Miniature Type

$$i_{bm} = 1200 \text{ max. mA}$$

$$P_b = 4.75 \text{ max. W}$$

For Black-and-White and Small-Screen Color-TV
Damper Diode Applications

ELECTRICAL CHARACTERISTICS - Bogey Values

Heater Voltage, ac or dc, E_h 6.3 V

Heater Current I_h 1.2 A

Direct Interelectrode

Capacitances:^a

Plate to cathode

and heater $c_{p(k+h)}$ 12.0 μF

Cathode to plate

and heater $c_{k(p+h)}$ 9.5 μF

Heater to cathode c_{hk} 2.8 μF

Instantaneous Tube Voltage

Drop for instantaneous

plate current (i_b) = 350 mA. e_b 16 V

MECHANICAL CHARACTERISTICS

Maximum Overall Length (l_m) 3.125 in (79.37 mm)

Maximum Seated Length (l_{sm}) 2.875 in (73.02 mm)

Maximum Diameter (d_m) 0.875 in (22.22 mm)

Envelope JEDEC Designation 6-1/2

Base Small-Button Noval 9-Pin JEDEC Designation E9-1

Terminal Connections

(See *TERMINAL DIAGRAM*) JEDEC Designation 9RX

Type of Cathode Coated Unipotential

Operating Position Any

MAXIMUM RATINGS - Design-Maximum Values^b

For operation as a Damper Tube in TV Receivers utilizing a
525-line, 30-frame system^c

Peak Inverse Plate Voltage. . $-e_{bm}$ 5000^d V

Heater-Cathode Voltage:

Peak e_{hkm} $\left\{ \begin{array}{l} +300 \\ -5000 \end{array} \right.$ V

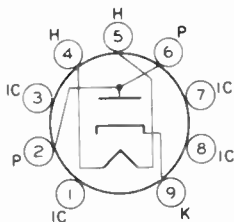
6CT3

Average ^e	$E_{hk(av)}$	$\left\{ \begin{array}{l} +100 \\ -900 \end{array} \right.$	V
Heater Voltage, ac or dc . . .	E_h		5.7 to 6.9	V
Plate Current:			
Peak	i_{bm}	1200	mA
Average ^e	$I_{b(av)}$	250	mA
Plate Dissipation	P_b	4.75	W
Envelope Temperature (at hottest point on envelope surface)			
	T_E	220	°C

- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- ^b As defined in the current issue of EIA Standard RS-239.
- ^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- ^e Measured with a dc meter.

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Do Not Use
- Pin 2 - Plate
- Pin 3 - Do Not Use
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Plate
- Pin 7 - Do Not Use
- Pin 8 - Do Not Use
- Pin 9 - Cathode



JEDEC 9RX

OPERATING CONSIDERATIONS

Socket terminals 1, 3, 7, and 8 should not be used as tie points for external-circuit components. It is recommended that these socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

6CU5

Beam Power Tube

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at r.3 volts.	1.2	amp

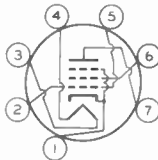
Direct Interelectrode Capacitances
(Approx.)^a

Grid No.1 to plate.	0.6	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13	μf
Plate to cathode & grid No.3, grid No.2, and heater	8.5	μf

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 <i>General Section</i>
Bulb.	T5-1/2
Base.	Small-Button Miniature 7-Pin (JFDEC No.E7-1)
Basing Designation for BOTTOM VIFW.	7CV

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



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

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	150	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	130	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
PLATE DISSIPATION	7	max.	watts
GRID-No.2 INPUT	1.4	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^b	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).	220	max.	°C

← Indicates a change.



6CU5

Typical Operation and Characteristics:

Plate Voltage	120	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts
Zero-Signal Plate Current	49	ma
Max.-Signal Plate Current	50	ma
Zero-Signal Grid-No.2 Current	4	ma
Max.-Signal Grid-No.2 Current	8.5	ma
Plate Resistance (Approx.)	10000	ohms
Transconductance	7500	μ mhos
Load Resistance	2500	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output	2.3	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

^a without external shield.

^b The dc component must not exceed 100 volts.

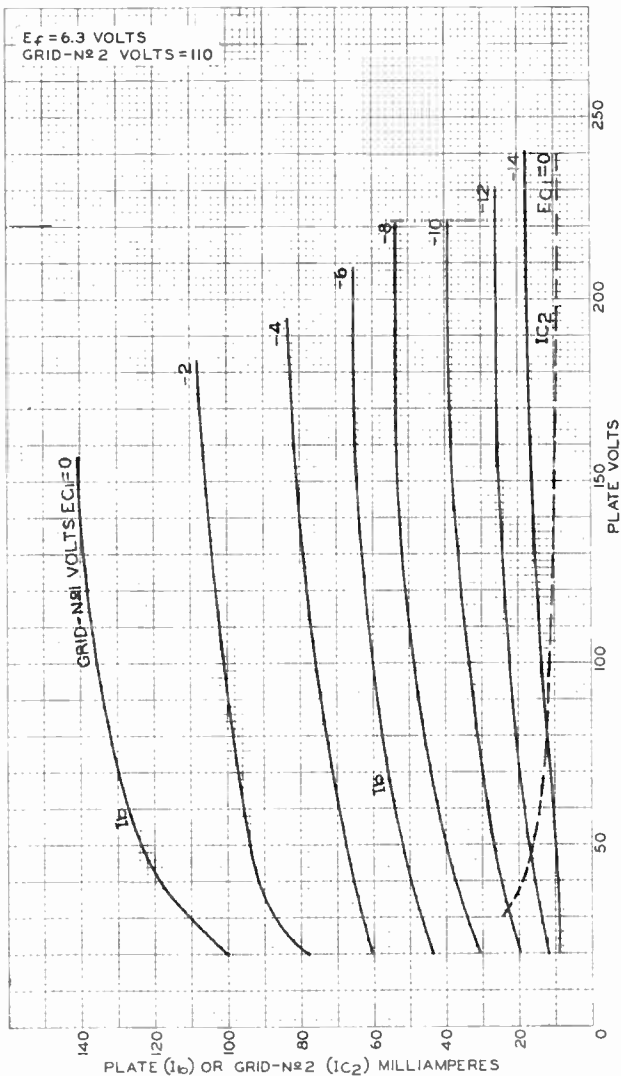




6CU5

6CU5

AVERAGE CHARACTERISTICS



TUBE DIVISION

92CM-8908RI

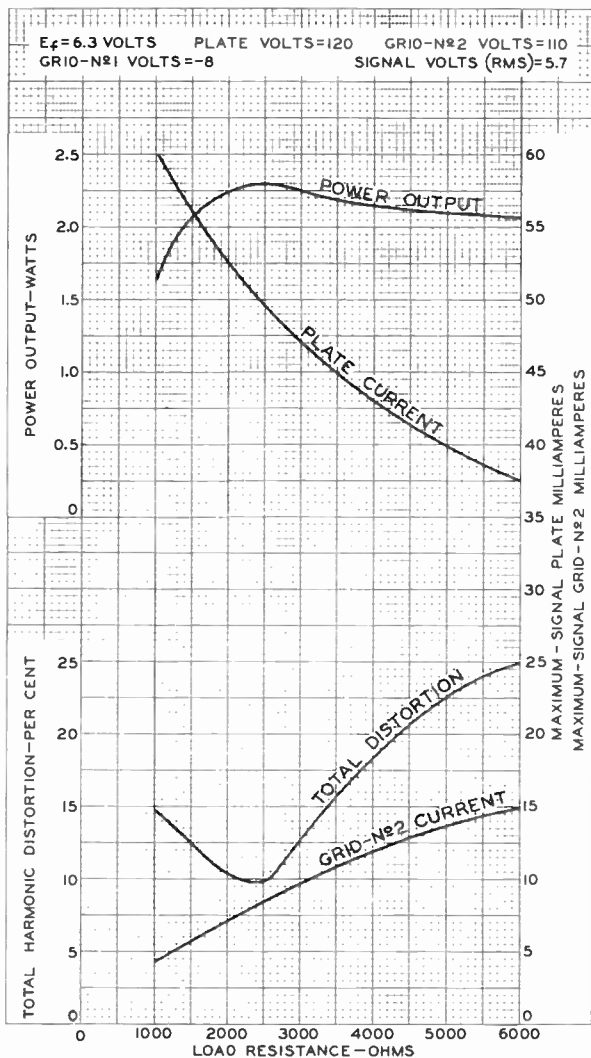
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CU5



6CU5

OPERATION CHARACTERISTICS





6CU8

6CU8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:⁰

Triode Unit:

Grid to plate	1.6	μf
Grid to cathode & pentode grid No.3 & internal shield, and heater	1.9	μf
Plate to cathode & pentode grid No.3 & internal shield, and heater	1.6	μf

Pentode Unit:

Grid No.1 to plate	0.025 max.	μf
Grid No.1 cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	7	μf
Plate to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	2.4	μf
Pentode grid No.1 to triode plate	0.03 max.	μf
Pentode plate to triode plate	0.07 max.	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	—	125	volts
Grid-No.1 Voltage	-1	0	volts
Cathode Resistor	0	56	ohms
Amplification Factor	24	—	
Plate Resistance (Approx.)	4100	170000	ohms
Transconductance	5800	7800	μmhos
Plate Current	17	12	ma
Grid-No.2 Current	—	3.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-12	-6	volts
Grid-No.1 Voltage (Approx.) for plate ma = 1.6, and cathode resistor (ohms) = 0	—	-3	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"

← Indicates a change.

6CU8



6CU8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Length, Base Seat to Bulb Top (Excluding tip) . . . 1-9/16" \pm 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 9GM

Pin 1—Triode
Cathode,
Pentode
Grid No.3,
Internal
Shield
Pin 2—Pentode
Plate
Pin 3—Pentode
Grid No.2



Pin 4—Heater
Pin 5—Heater
Pin 6—Pentode
Cathode
Pin 7—Pentode
Grid No.1
Pin 8—Triode
Grid
Pin 9—Triode
Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unst	Pentode Unst	
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	2.8 max.	2.3 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

⁰ Without external shield.

[▲] The dc component must not exceed 100 volts.

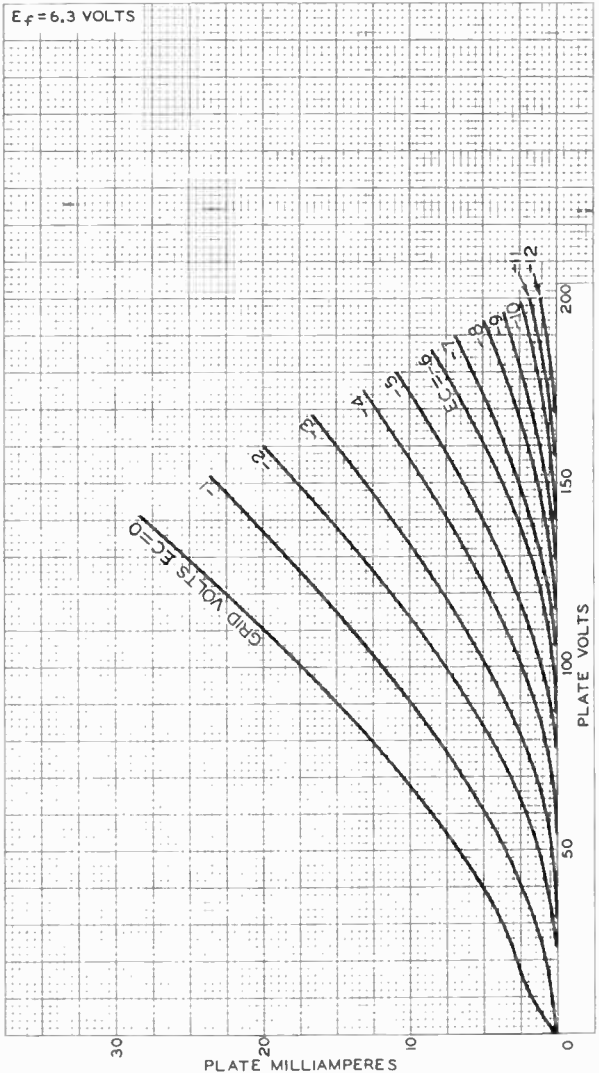
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6CU8

6CU8

AVERAGE PLATE CHARACTERISTICS TRIODE UNIT



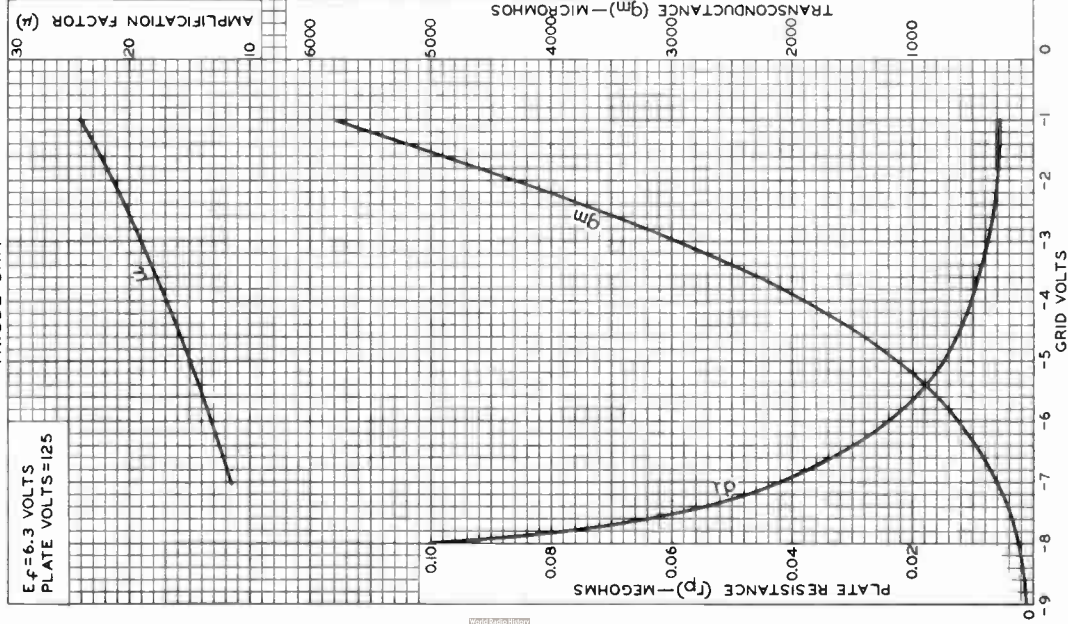
6CU8



6CU8

AVERAGE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$ VOLTS
PLATE VOLTS = 125



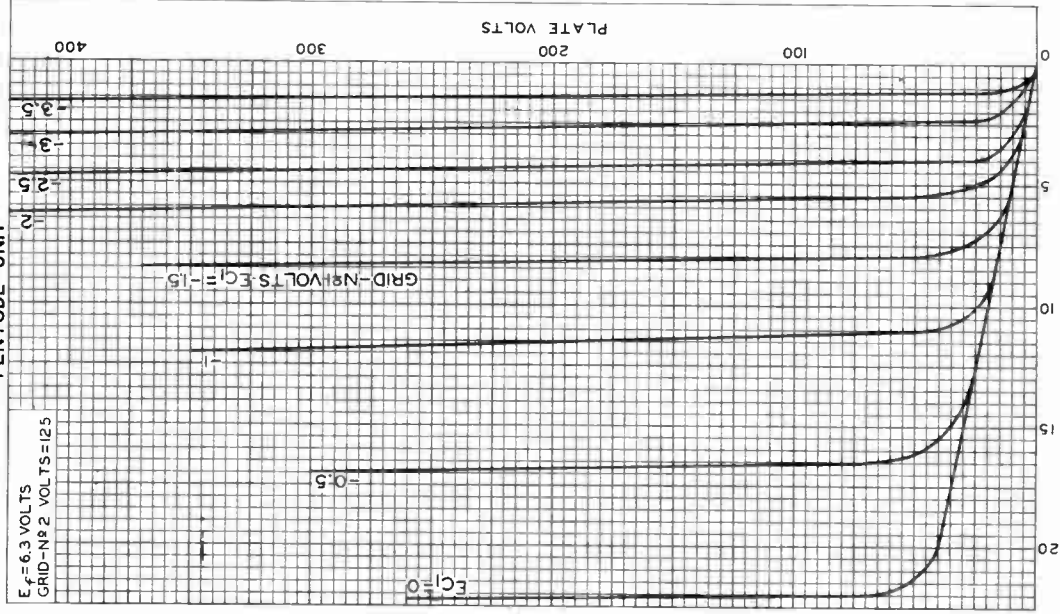


6CU8

6CU8

AVERAGE PLATE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
GRID-N & 2 VOLTS = 12.5



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-10646

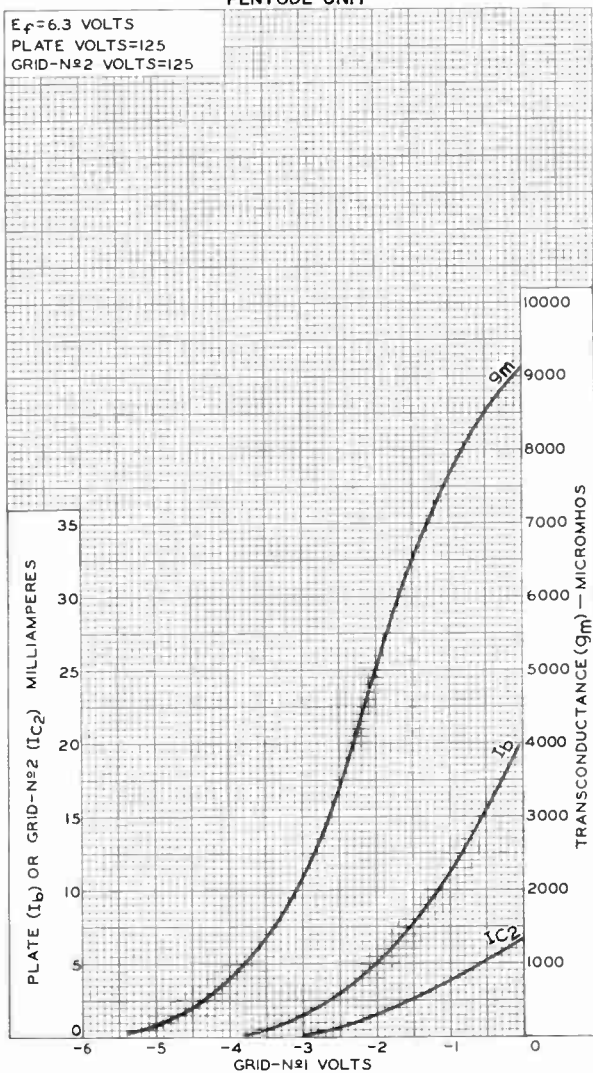
6CU8



6CU8

AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 125
 GRID-N $\#$ 2 VOLTS = 125



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-8208RI

High-Mu Triode

NUVISTOR TYPE

For Use as Grounded-Cathode, Neutralized RF-Amplifier
Tube in Tuners of VHF Television and FM Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (<i>Design-Maximum Values</i>):		
voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.135	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.):		
Grid to plate	0.92	pf
Grid to cathode, shell, and heater	4.3	pf
Plate to cathode, shell, and heater	1.8	pf
Plate to cathode	0.18	pf
Heater to cathode	1.6	pf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	110	volts
Grid Supply Voltage	0	volts
Cathode Resistor	130	ohms
Amplification Factor	65	
Plate Resistance (Approx.)	6600	ohms
Transconductance	9600	μmhos
Plate Current	7	ma
Grid Voltage (Approx.) for plate $\mu_p = 10$	-4	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	0.800"
Maximum Seated Length	0.625"
Maximum Diameter	0.440"
Envelope	Metal Shell MT4
Socket	Cinch Mfg. Corp. No. 133 65 10 001, Industrial Electronic Hardware Co. No. Nu 5044 or No. Nu 5060, or equivalent
Base	Medium Ceramic-Wafer Twelvar 5-Pin (JEDEC No. E5-65)

← Indicates a change.



6CW4

Basing Designation for BOTTOM VIEW. 12AQ

- Pin 1^a - Do Not Use
- Pin 2 - Plate
- Pin 3 - Same as Pin 1
- Pin 4 - Grid
- Pin 5 - Same as Pin 1
- Pin 6 - Same as Pin 1
- Pin 7 - Same as Pin 1
- Pin 8 - Cathode
- Pin 9 - Same as Pin 1
- Pin 10 - Heater
- Pin 12 - Heater



AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE.	300 ^b max.	volts
→ PLATE VOLTAGE	135 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Peak-positive value	0 max.	volts
CATHODE CURRENT	15 max.	ma
→ PLATE DISSIPATION:		
With a minimum series plate-circuit resistance of 5000 ohms	1.5 max.	watts
For lower values of series plate-circuit resistance.	See accompanying <i>Plate-Dissipation-Rating Chart</i>	

Typical Operation:

Plate Voltage	70	volts
Grid Supply Voltage	0	volts
Grid Resistor	47000	ohms
Amplification Factor.	68	
Plate Resistance (Approx.).	5440	ohms
Transconductance.	12500	μmhos
→ Plate Current	7.2	ma

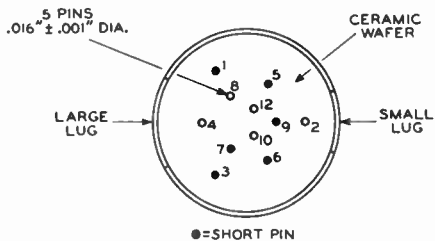
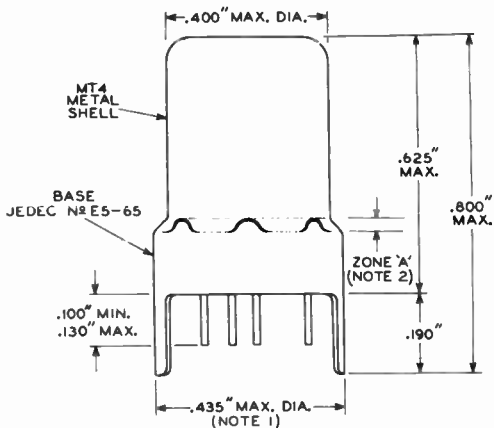
Maximum Circuit Values:

Grid-Circuit Resistance: ^c		
For fixed-bias operation.	0.5 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

- ^a Pin 1 is of a length such that its end does not touch the socket insertion plane.
- ^b A plate supply voltage of 300 volts may be used provided sufficient plate-circuit resistance and agc voltage are used to limit the voltage at the plate of the tube to 135 volts under conditions of maximum-rated plate dissipation (1.5 watts).
- ^c For operation at metal-shell temperatures up to 135° C.

→ Indicates a change.





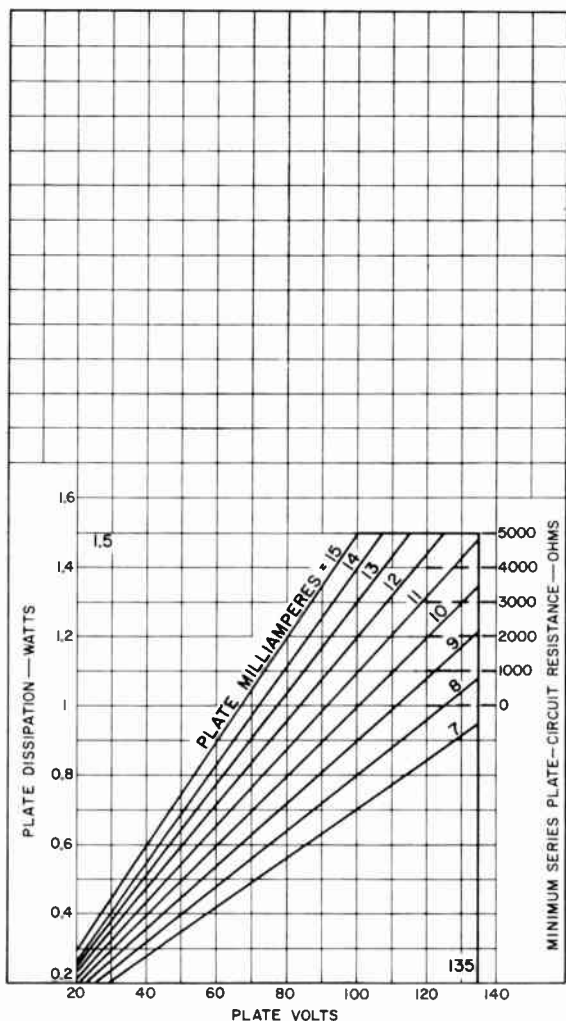
92CS-10970R3

NOTE 1: MAXIMUM OUTSIDE DIAMETER OF 0.440" IS PERMITTED ALONG 0.190" LUG LENGTH.

NOTE 2: SHELL TEMPERATURE SHOULD BE MEASURED IN ZONE "A" BETWEEN BROKEN LINES.



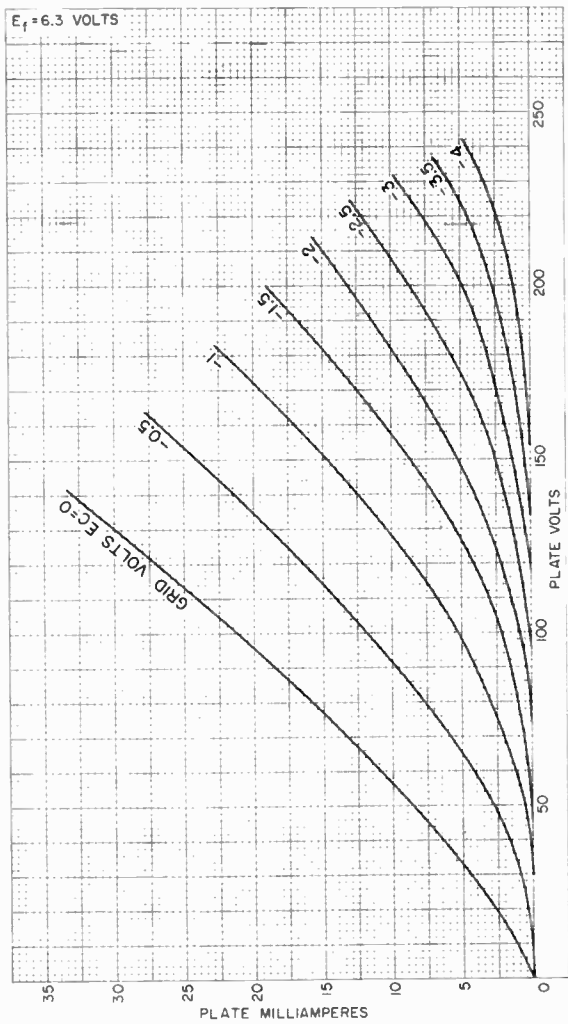
PLATE-DISSIPATION-RATING CHART



92CM-11681



AVERAGE PLATE CHARACTERISTICS

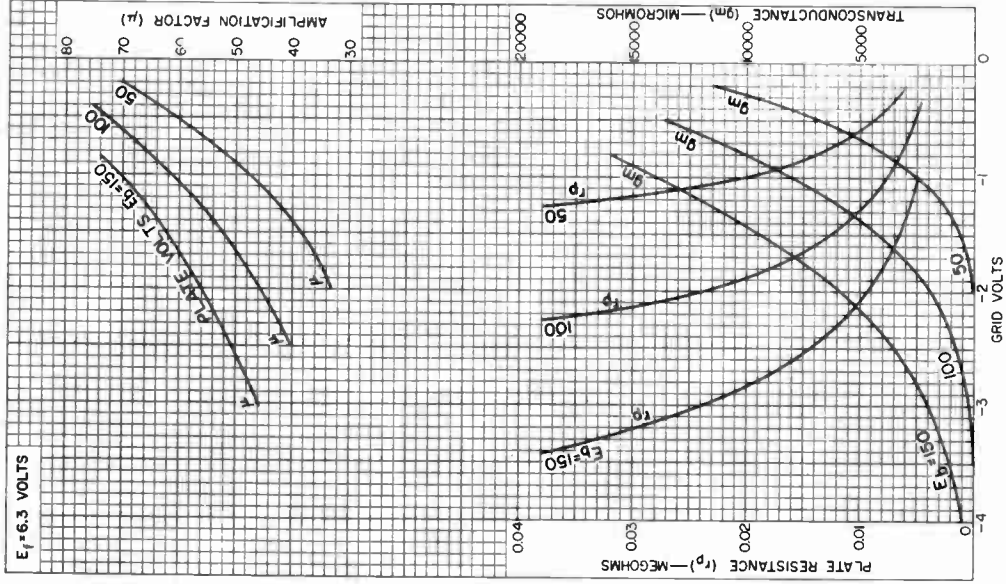


92CM-10524RI



6CW4

AVERAGE CHARACTERISTICS



92CM-10520R1

RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.





6CX8

6CX8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.75	amp

Direct Interelectrode Capacitances:⁰

Triode Unit:

Grid to plate	4.4	μμf
Grid to cathode and heater	2.2	μμf
Plate to cathode and heater	0.38	μμf

Pentode Unit:

Grid No.1 to plate	0.06	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	9	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	4.4	μμf
Triode grid to pentode plate	0.018 max.	μμf
Pentode grid No.1 to triode plate	0.005 max.	μμf
Pentode plate to triode plate	0.17 max.	μμf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage	150	40 200	volts
Grid-No.2 Supply Voltage	-	125 125	volts
Grid-No.1 Voltage	-	0 -	volts
Cathode Resistor	150	- 68	ohms
Amplification Factor	40	- -	
Plate Resistance (Approx.)	8700	- 70000	ohms
Transconductance	4600	- 10000	μμhos
Plate Current	9.2	40* 24	ma
Grid-No.2 Current	-	15.5* 5.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-5	- -8.5	volts

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)

6CX8



6CX8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW. 9DX

Pin 1—Triode
Cathode

Pin 2—Triode
Grid

Pin 3—Triode
Plate

Pin 4—Heater

Pin 5—Heater



Pin 6—Pentode
Cathode,
Grid No.3,
Internal
Shield

Pin 7—Pentode
Grid No.1

Pin 8—Pentode
Grid No.2

Pin 9—Pentode
Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
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.	—	1.1 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

PLATE DISSIPATION.	2 max.	5 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

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

[○] Without external shield.

^{*} This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

[▲] The dc component must not exceed 100 volts.



6CY5

6CY5 SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

For use as rf amplifier in VHF tuners of television receivers

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts	←
Current	0.2	amp	

Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate	0.03	μmf	
Grid No.1 to cathode & internal shield, grid No.2, and heater	4.5	μmf	
Plate to cathode & internal shield, grid No.2, and heater	3	μmf	

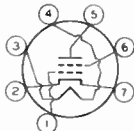
Characteristics, Class A₁ Amplifier:

Plate Voltage	125	volts	
Grid-No.2 Voltage	80	volts	
Grid-No.1 Voltage	-1	volt	
Plate Resistance (Approx.)	0.1	megohm	
Transconductance	8000	μmhos	
Plate Current	10	ma	
Grid-No.2 Current	1.5	ma	
Grid-No.1 Voltage (Approx.) for plate μ a = 20	-6	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	7EW		

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 - Cathode,
Internal
Shield

AMPLIFIER — Class A₁

Maximum Ratings, Design-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		

← Indicates a change.

6CY5



6CY5

SHARP-CUTOFF TETRODE

GRID-NO.1 (CONTROL-GRID) VOLTAGE:

Positive-bias value. 0 max. volts

CATHODE CURRENT. 20 max. ma

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. 2 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . 100 max. volts

Heater positive with respect to cathode. . 100 max. volts

Maximum Circuit Values:

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

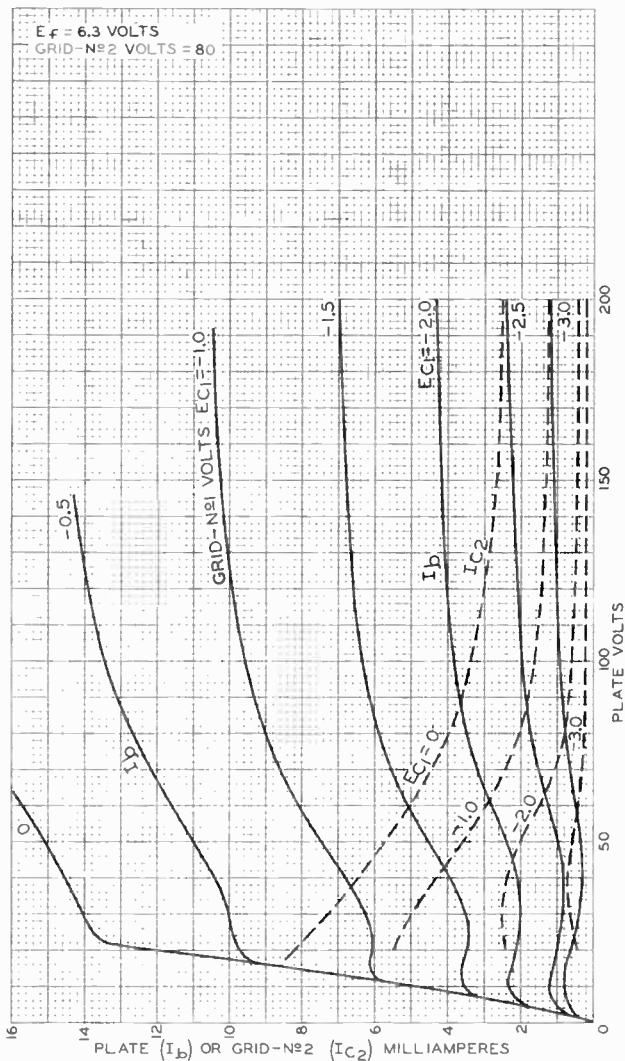
^o With external shield JEDEC No.316 connected to cathode.



6CY5

6CY5

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-9518

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

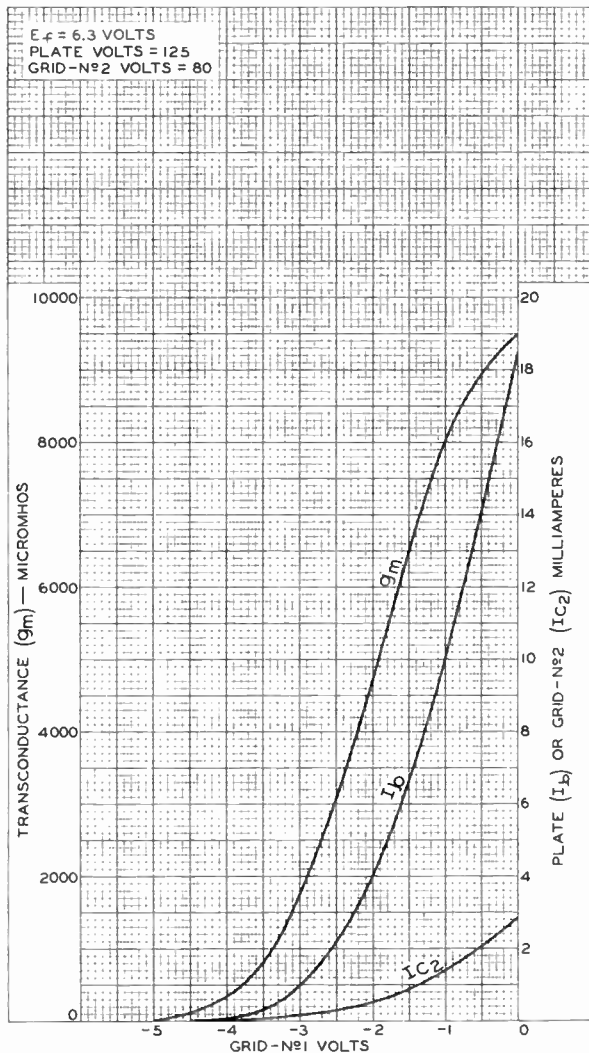
World Radio History

6CY5



6CY5

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-9519

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6CY7

6CY7

DUAL TRIODE With High-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.75	amp

Direct Interelectrode Capacitances (Approx.):⁰

	Unit No.1	Unit No.2	
Grid to plate	1.8	4.4	μμf
Grid to cathode and heater.	1.5	5	μμf
Plate to cathode and heater	0.3	1	μμf

Characteristics, Class A₁ Amplifier:

	Unit No.1	Unit No.2	
Plate Supply Voltage.	250	60 150	volts
Grid Voltage.	-3	0 -	volts
Cathode Resistor.	-	- 620	ohms
Amplification Factor.	68	- 5	
Plate Resistance (Approx.).	52000	- 920	ohms
Transconductance.	1300	- 5400	μmhos
Plate Current	1.2	80 30	ma
Plate Current for grid volts = -30	-	- 3.5	ma
Grid Voltage (Approx.) for plate μa = 10	-5.5	- -	volts
Grid Voltage (Approx.) for plate μa = 200.	-	- -40	volts

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.	9LG

- Pin 1 - Plate of Unit No.2
- Pin 2 - Internal Connection—Do Not Use
- Pin 3 - Grid 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 - Cathode of Unit No.2

6CY7



6CY7

DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

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

DC PLATE VOLTAGE.	350 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400 max.	volts
PLATE DISSIPATION	1 max.	watt
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	2.2 max.	megohms
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VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

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

DC PLATE VOLTAGE.	350 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#]	1800 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	120 max.	ma
Average	35 max.	ma
PLATE DISSIPATION	5.5 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 cathode-bias operation.	2.2 max.	megohms

[○] without external shield.[■] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.[□] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.[▲] The dc component must not exceed 100 volts.[#] This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

Beam Power Tube

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:▲

Grid No.1 to plate	0.4 max.	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	9	μf
Plate to cathode & grid No.3, grid No.2, and heater	6	μf

Characteristics, Class A₁ Amplifier:

Plate Voltage	75	250	volts
Grid-No.2 Voltage	250	250	volts
Grid-No.1 Voltage	0	-15	volts ←
Plate Resistance (Approx.)	-	73000	ohms
Transconductance	-	4800	μmhos
Plate Current	130●	46	ma
Grid-No.2 Current	16●	4.6	ma
Grid-No.1 Voltage (Approx.) for plate μ _a = 100	-	-40	volts ←

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Maximum Diameter . . . . .	.0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9HN

Pin 1 - Grid No.2
 Pin 2 - No Connection
 Pin 3 - Grid No.1
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Grid No.1



Pin 7 - Cathode,
 Grid No.3
 Pin 8 - Internal
 Connection—
 Do Not Use
 Pin 9 - Plate

← Indicates a change.



VERTICAL-DEFLECTION AMPLIFIER

→ Maximum Ratings, Design-Maximum Values:

*For operation in a 525-line, 30-frame system**

DC PLATE VOLTAGE.	350	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [◆]	2200	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE.	315	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE.	275	max.	volts
CATHODE CURRENT:			
Peak.	155	max.	ma
Average	45	max.	ma
GRID-No.2 INPUT	2.2	max.	watts
PLATE DISSIPATION	10	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-No.1-Circuit Resistance:

For fixed-bias operation.	0.5	max.	megohm
For cathode-bias operation.	1	max.	megohm

▲ Without external shield.

● This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

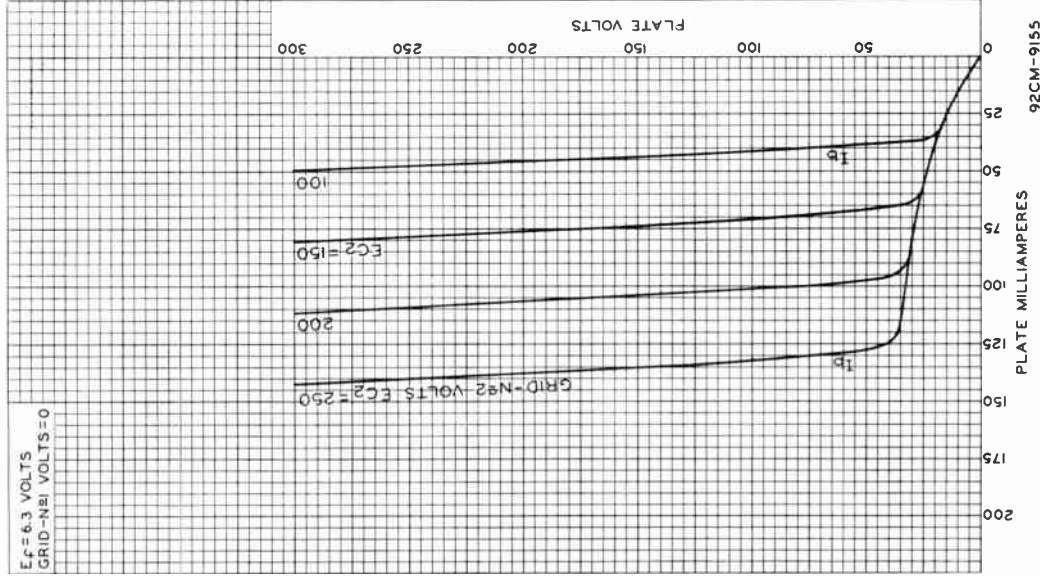
◆ This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

♣ The dc component must not exceed 100 volts.

→ Indicates a change.

6CZ5

AVERAGE PLATE CHARACTERISTICS



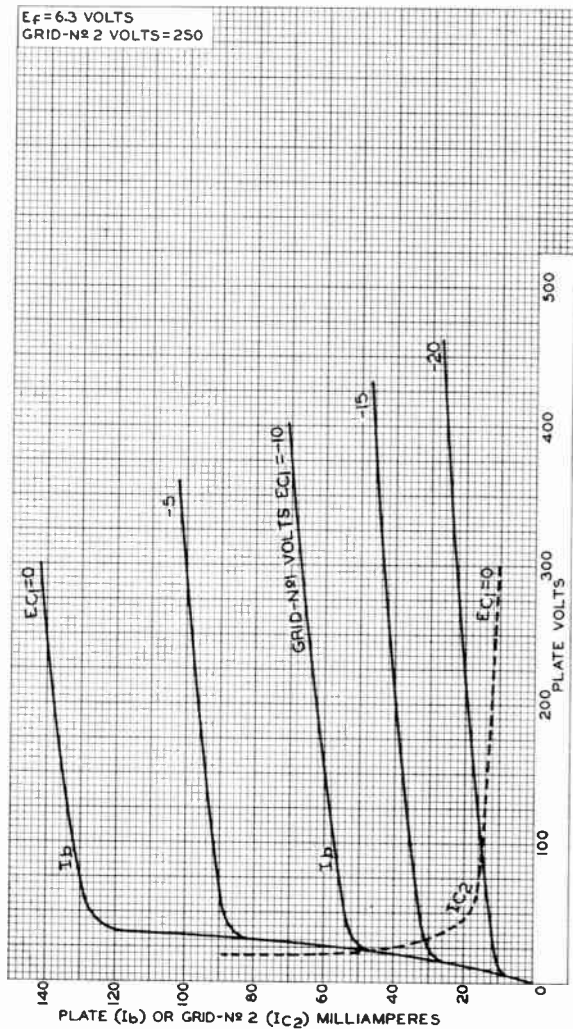
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.

DATA 2
1-61

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 GRID-Nº 2 VOLTS = 250

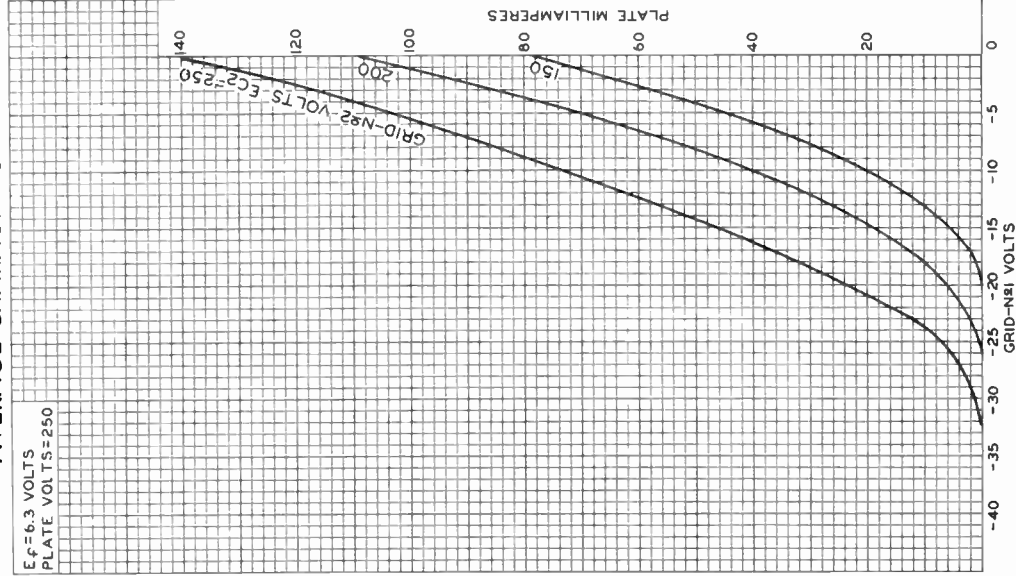


92CM-9157

6CZ5

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 250



92CM-9156RI



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 3
1-61





6D8-G

6D8-G



PENTAGRID CONVERTER

Heater[■] Coated Unipotential Cathode

Voltage	6.3	a-c or d-c volts
Current	0.15	amp.

Direct Interelectrode Capacitances: *

Grid #4 to Plate	0.20 $\mu\mu\text{f}$
Grid #4 to Grid #2	0.20 $\mu\mu\text{f}$
Grid #4 to Grid #1	0.16 $\mu\mu\text{f}$
Grid #1 to Grid #2	1.1 $\mu\mu\text{f}$
Grid #4 to All Other Electrodes (R-F Input)	8 $\mu\mu\text{f}$
Grid #2 to All Other Electrodes Except Grid #1 (Osc. Output)	4.5 $\mu\mu\text{f}$
Grid #1 to All Other Electrodes Except Grid #2 (Osc. Input)	5.5 $\mu\mu\text{f}$
Plate to All Other Electrodes (Mixer Output)	11 $\mu\mu\text{f}$

Overall Length 4-7/32" to 4-15/32"

Maximum Diameter 1-9/16"

Bulb ST-12

Cap Skirted Miniature

Base Small Shell Octal 8-Pin

Pin 1 - No Connection

Pin 2 - Heater

Pin 3 - Plate

Pin 4 - Grids #3 & #5

Pin 5 - Grid #1



Pin 6 - Grid #2

Pin 7 - Heater

Pin 8 - Cathode

Cap - Grid #4

Mounting Position BOTTOM VIEW (G-8A) Any

CONVERTER SERVICE

Plate Voltage	300 max. volts
Screen (Grids #3 & #5) Voltage	100 max. volts
Screen Supply Voltage	300 max. volts
Anode-Grid (Grid #2) Voltage	200 max. volts
Anode-Grid Supply Voltage**	300 max. volts
Control-Grid (Grid #4) Voltage	0 min. volts
Plate Dissipation	1.0 max. watt
Screen Dissipation	0.3 max. watt
Anode-Grid Dissipation	0.75 max. watt
Total Cathode Current	13 max. ma.

Typical Operation:

Plate Voltage	135	250	volts
Screen Voltage	67.5	100	volts
Anode-Grid Supply Voltage	135	250**	volts
Control-Grid Voltage	-3	-3	volts
Osc.-Grid (Grid #1) Resistor	50000	50000	ohms
Plate Resistance (approx.)	0.6	0.4	ohms
Conversion Transconductance	325	550	μmhos
Conversion Transcond. (approx.)	5*	6**	μmhos
Plate Current	1.5	3.5	ma.
Screen Current	1.7	2.6	ma.
Anode-Grid Current	3	4.3	ma.
Oscillator-Grid Current	0.2	0.4	ma.
Total Cathode Current	6.4	10.8	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 close-fitting shield connected to cathode.

** Anode-grid supply voltages in excess of 200 volts require use of 20000-ohm voltage-dropping resistor by-passed by 0.1 μf condenser.

• With -25 volts on Grid #4. •• With -35 volts on Grid #4.

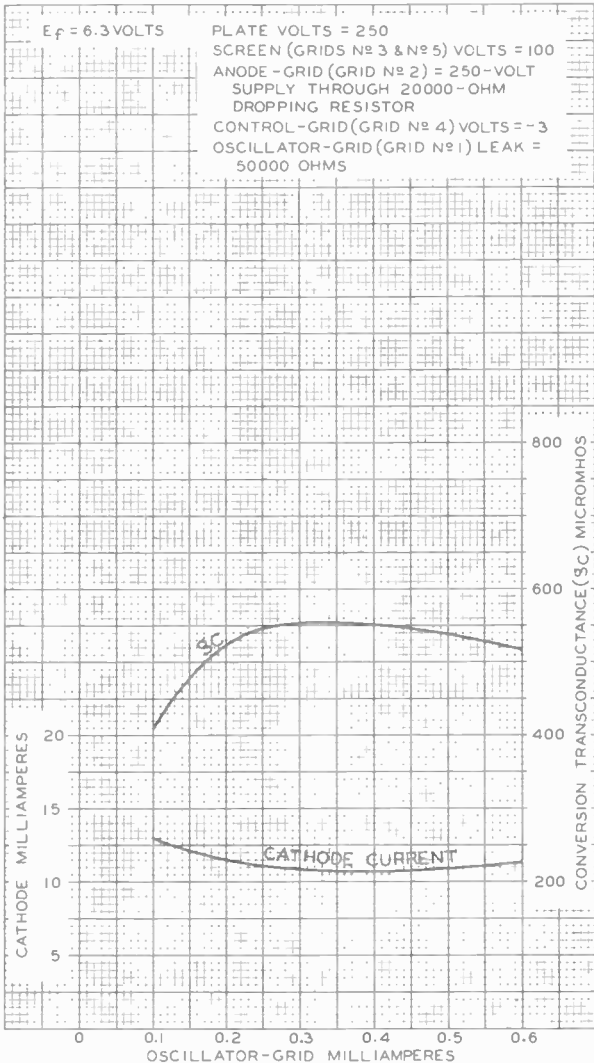
For Typical Circuit and Coil Design Details, refer to Type 2A7.

6D8-G



6D8-G

OPERATION CHARACTERISTICS
WITH 50000-OHM OSCILLATOR-GRID LEAK



JAN. 16, 1940

RCA RADOTRON DIVISION
 RCA MANUFACTURING COMPANY, INC.
 World Radio History

92C-6129



6DA4

6DA4

HALF-WAVE VACUUM RECTIFIER

For television damper service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.2	amp

Direct Interelectrode Capacitances (Approx.):⁹

Plate to cathode and heater	6	μμf
Cathode to plate and heater	8	μμf
Heater to cathode	3	μμf

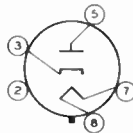
Mechanical:

Operating Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Dimensional Outline	See General Section

Bulb T9
 Base Intermediate-Shell Octal 5-Pin,
 Arrangement 2 (JEDEC Group 1, No. B5-82),
 Intermediate-Shell Octal 6-Pin,
 Arrangement 1 (JEDEC Group 1, No. B6-8),
 Short Intermediate-Shell Octal 5-Pin
 with External Barriers, Arrangement 2
 (JEDEC Group 1, No. B5-85), or
 Short Intermediate-Shell Octal 6-Pin
 with External Barriers, Arrangement 1
 (JEDEC Group 1, No. B6-60)

Basing Designation for BOTTOM VIEW 4CG

Pin 1 ♦ - Same as
 Pin 2
 Pin 2 - Internal
 Connection -
 Do Not Use



Pin 3 - Cathode
 Pin 5 - Plate
 Pin 7 - Heater
 Pin 8 - Heater

DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

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

PEAK INVERSE PLATE VOLTAGE	4400 max.	volts
PEAK PLATE CURRENT	900 max.	ma
DC PLATE CURRENT	155 max.	ma
PLATE DISSIPATION	5.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	4400 [▲] max.	volts
Heater positive with respect to cathode	300 [*] max.	volts



6DA4

HALF-WAVE VACUUM RECTIFIER

Characteristics:

Tube-Voltage Drop for plate

ma. = 250 22 volts

⊃ without external shield.

◆ On the 5-pin bases, pin 1 as well as pins 4 and 6 is omitted.

● Socket terminals 1, 2, 4 and 6 should not be used as tie points.

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

• This rating is applicable when the duty cycle of the voltage pulse does 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.

▲ The dc component must not exceed 900 volts.

※ The dc component must not exceed 100 volts.

Beam Power Tube

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.): ^a		
Grid No.1 to plate	0.2	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13	μf
Plate to cathode & grid No.3, grid No.2, and heater	8	μf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/4"
Maximum Seated Length	2-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	2-1/8" \pm 3/32"
Diameter	0.750" to 0.875"
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. 19-1)
Basing Designation for BOTTOM VIEW	9GR

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



Pin 7 - Cathode,
 Grid No.3
 Pin 8 - Internal Con-
 nection—
 Do Not Use
 Pin 9 - Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	150	max.	volts
GRID-No.2 INPUT	1.25	max.	watts
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^b	max.	volts

Typical Operation and Characteristics:

Plate Supply Voltage	110	200	volts
Grid-No.2 Supply Voltage	110	125	volts
Grid-No.1 (Control-grid) Voltage	-7.5	-	volts
Cathode Resistor	-	180	ohms



6DB5

Peak AF Grid-No.1 Voltage.	7.5	8.5	volts
Zero-Signal Plate Current.	49	46	ma
Max.-Signal Plate Current.	50	47	ma
Zero-Signal Grid-No.2 Current.	4	2.2	ma
Max.-Signal Grid-No.2 Current.	10	8.5	ma
Plate Resistance (Approx.)	13000	28000	ohms
Transconductance	8000	8000	μ mhos
Load Resistance.	2000	4000	ohms
Total Harmonic Distortion.	10	10	%
Max.-Signal Power Output	2.1	3.8	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system^c

DC PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) ^d	2000 ^e max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	150 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	200 max.	ma
Average.	55 max.	ma
GRID-No.2 INPUT.	1.25 max.	watts
PLATE DISSIPATION.	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^b max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

^a Without external shield.

^b The dc component must not exceed 100 volts.

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

^d This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

^e Under no circumstances should this absolute value be exceeded.





6DC6

6DC6

SEMIREMOTE-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 0.3 amp

Direct Interelectrode Capacitances (No external shield):

Grid No.1 to plate 0.02 max. $\mu\mu\text{f}$

Input 6.5 $\mu\mu\text{f}$

Output 2 $\mu\mu\text{f}$

Mechanical:

Maximum Overall Length 2-1/8"

Maximum Seated Length 1-7/8"

Length, Base Seat to Bulb Top
(Excluding tip) 1-1/2" $\pm 3/32$ "

Maximum Diameter 3/4"

Bulb T-5-1/2

Base Small-Button Miniature 7-Pin (JETEC No.E7-1)

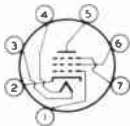
Basing Designation for BOTTOM VIEW 7CM

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

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE 300 max. volts

GRID-No.3 (SUPPRESSOR) VOLTAGE 0 max. volts

GRID-No.2 SUPPLY VOLTAGE 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE See Rating Curve at
front of this Section

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Positive bias value 0 max. volts

PLATE DISSIPATION 2 max. watts

GRID-No.2 INPUT 0.5 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200[▲] max. volts

Typical Operation and Characteristics:

Plate Supply Voltage 200 volts

Grid No.3 Connected to cathode at socket

Grid-No.2 Voltage 150 volts

Cathode-Bias Resistor 180 ohms

Plate Resistance (Approx.) 0.5 megohm

[▲] The dc component must not exceed 100 volts.

6DC6



6DC6

SEMIREMOTE-CUTOFF PENTODE

Transconductance	5500	μ mhos
Grid-No.1 Voltage (Approx.) for transconductance of 50 μ mhos	-12.5	volts
Plate Current	9	ma
Grid-No.2 Current	3	ma

Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1.0 max.	megohm

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6DC6

6DC6

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID - No 3 VOLTS = 0
GRID - No 2 VOLTS = 150

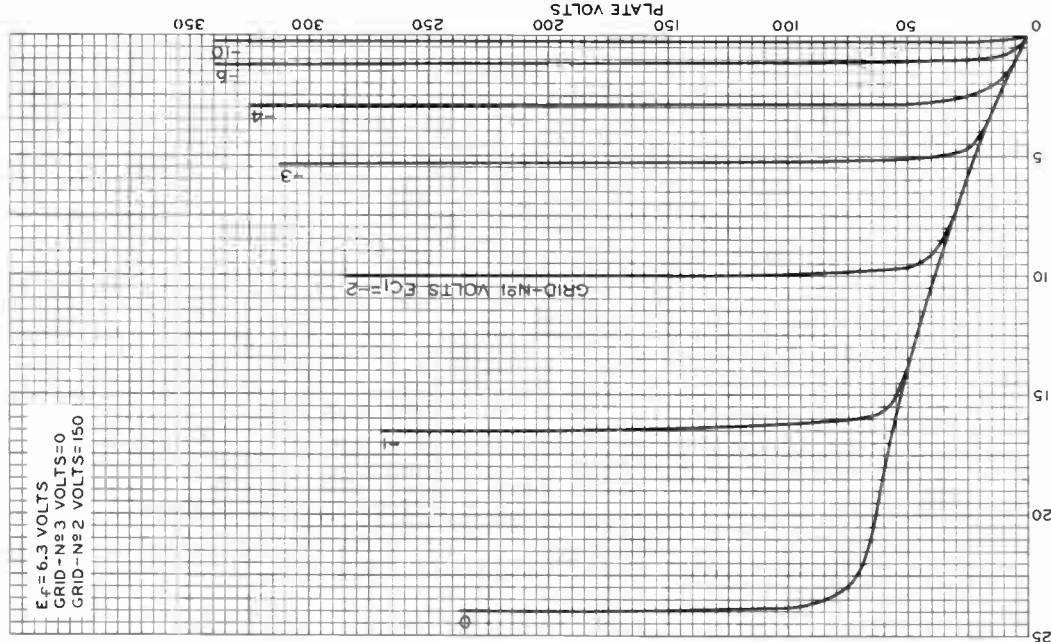


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

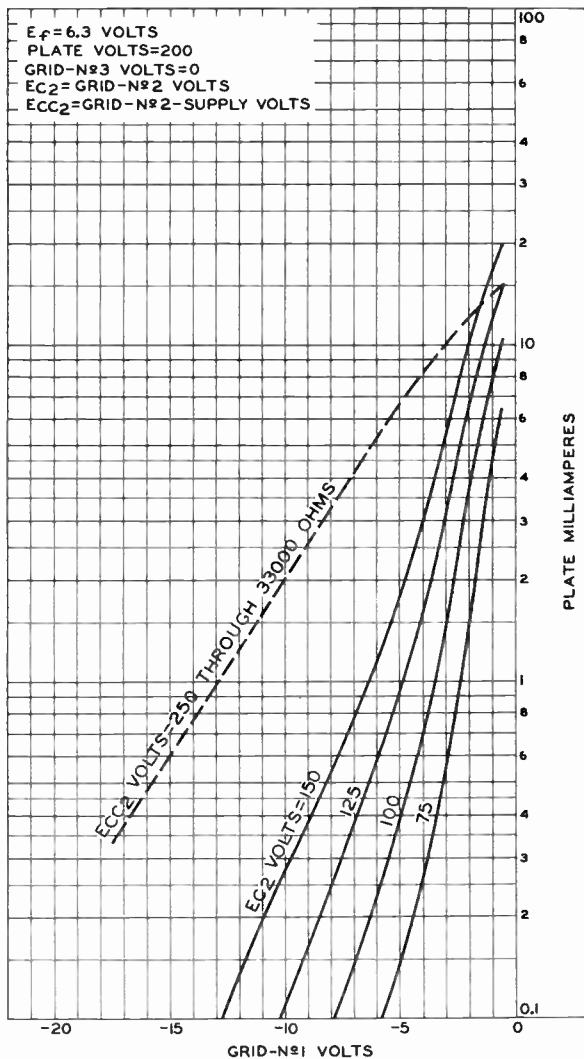
92CM-8330RI

6DC6



6DC6

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

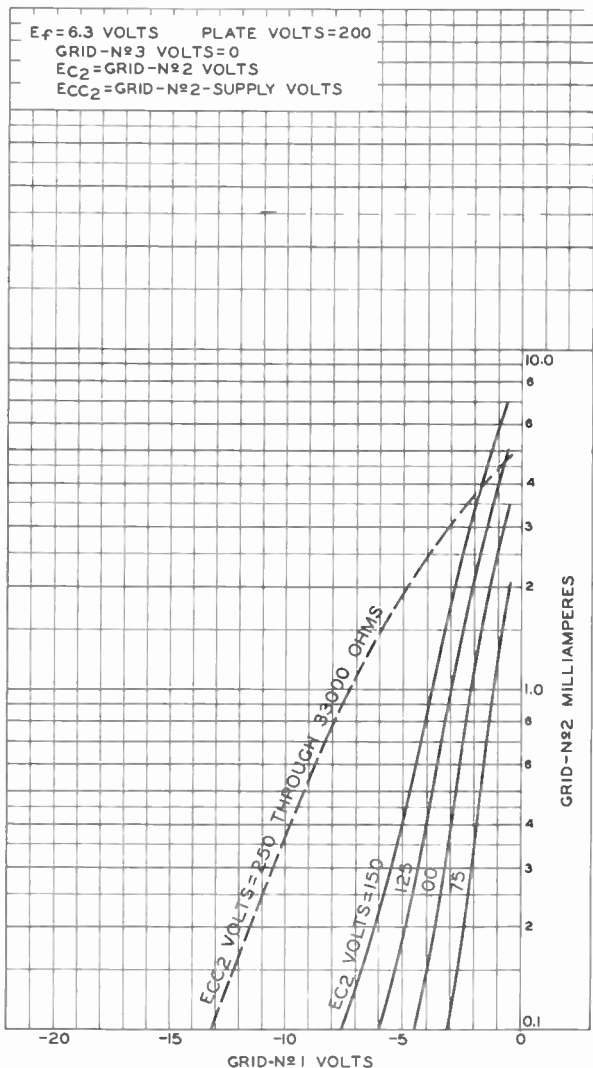
92CM-8337



6DC6

6DC6

AVERAGE CHARACTERISTICS



JUNE 15, 1954

TUBE DIVISION

92CM-8338

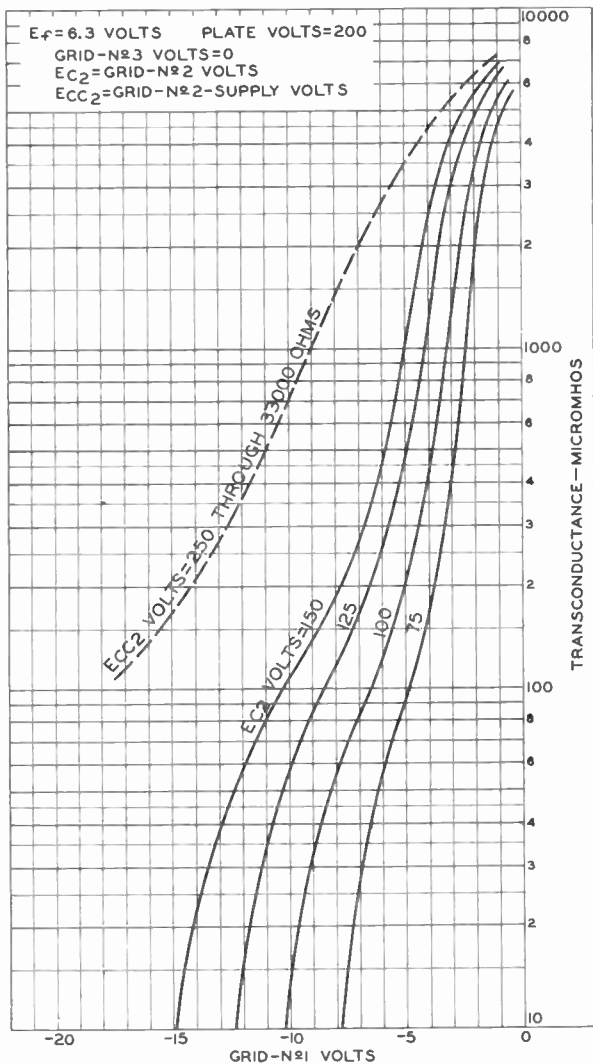
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DC6



6DC6

AVERAGE CHARACTERISTICS



JUNE 15, 1954

 TUBE DIVISION
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8336

Half-Wave Vacuum Rectifier

For Television Damper Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	1.6	amp

Direct Interelectrode Capacitances

(Approx.):^a

Plate to cathode and heater	8.5	μf
Cathode to plate and heater	11.5	μf
Heater to cathode	4	μf

Mechanical:

Operating Position. Any

Maximum Overall Length. 3-13/16"

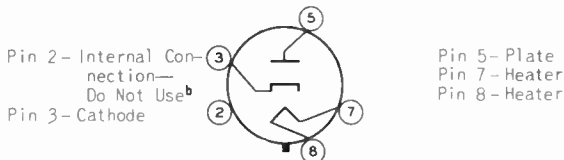
Maximum Seated Length. 3-1/4"

Maximum Diameter. 1-9/32" ←

Bulb. T9

Base. Short Intermediate-Shell Octal 5-Pin
with External Barriers, Arrangement 2
(JEDEC Group 1, No. B5-85)

Basing Designation for BOTTOM VIEW. 4CG



DAMPER SERVICE

Maximum Ratings, Design-Maximum Values: ←

For operation in a 525-line, 30-frame system^c

PEAK INVERSE PLATE VOLTAGE ^d	5500	max.	volts
PEAK PLATE CURRENT.	1100	max.	ma
DC PLATE CURRENT.	180	max.	ma
PLATE DISSIPATION	6.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode ^d	5500 ^e	max.	volts
Heater positive with respect to cathode	300 ^f	max.	volts

Characteristics, Instantaneous Value: ←

Tube Voltage Drop for plate ma. = 350 34 volts

^a without external shield.

^b Socket terminals 1, 2, 4 and 6 should not be used as tie points.

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

← Indicates a change.



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

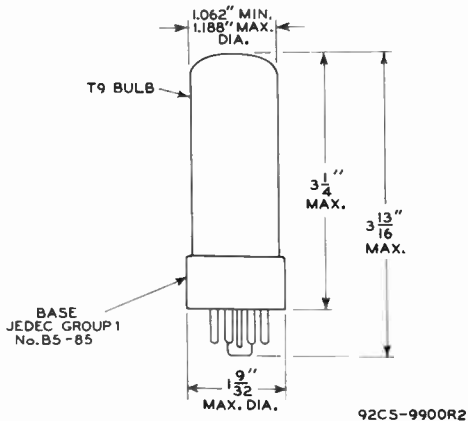
DATA
1-62

6DE4

- d This rating is applicable where the duration of the voltage pulse does 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.
- e The dc component must not exceed 900 volts.
- f The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

It is recommended that socket clips for pins 1, 2, 4, and 6 be removed to reduce the possibility of arc-over and to minimize leakage.





6DE6

6DE6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 10%	volts
Current	0.3	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^o</i>	
Grid No.1 to plate	0.025 max.	0.015 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	6.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2	3	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	125	volts
Grid No.3	↓	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	8000	μmhos
Plate Current	15.5	ma
Grid-No.2 Current	4.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-9	volts
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 700 and cathode resistor (ohms) = 0	-5.5	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"
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)

← Indicates a change.

6DE6

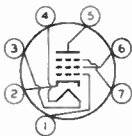


6DE6

SHARP-CUTOFF PENTODE

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 A₁→ **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:

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 be-

tween 165 and 330 volts. See Grid-No.2 Input

Rating Chart at front of Receiving Tube Section

PLATE DISSIPATION. 2.3 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-No.1-Circuit Resistance:

For fixed-bias operation 0.25 max. megohm

For cathode-bias operation 1 max. megohm

^o with external shield JEDEC No.316 connected to cathode.[♦] Connected to cathode at socket.[▲] The dc component must not exceed 100 volts.

→ Indicates a change.

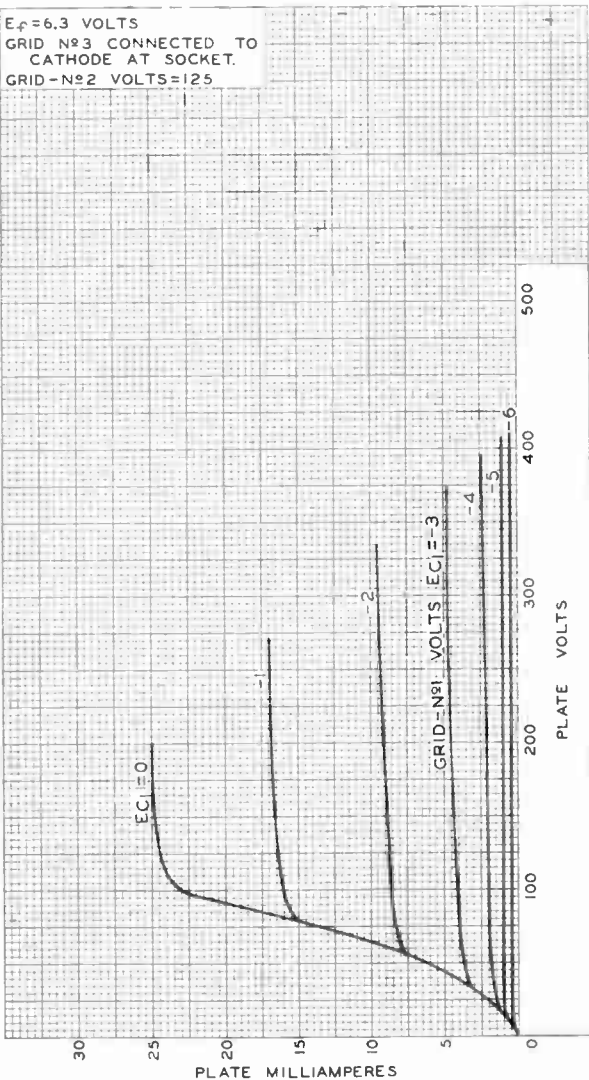


6DE6

6DE6

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID N°3 CONNECTED TO
CATHODE AT SOCKET.
GRID-N°2 VOLTS = 125



ELECTRON TUBE DIVISION

92CM-8578RI

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

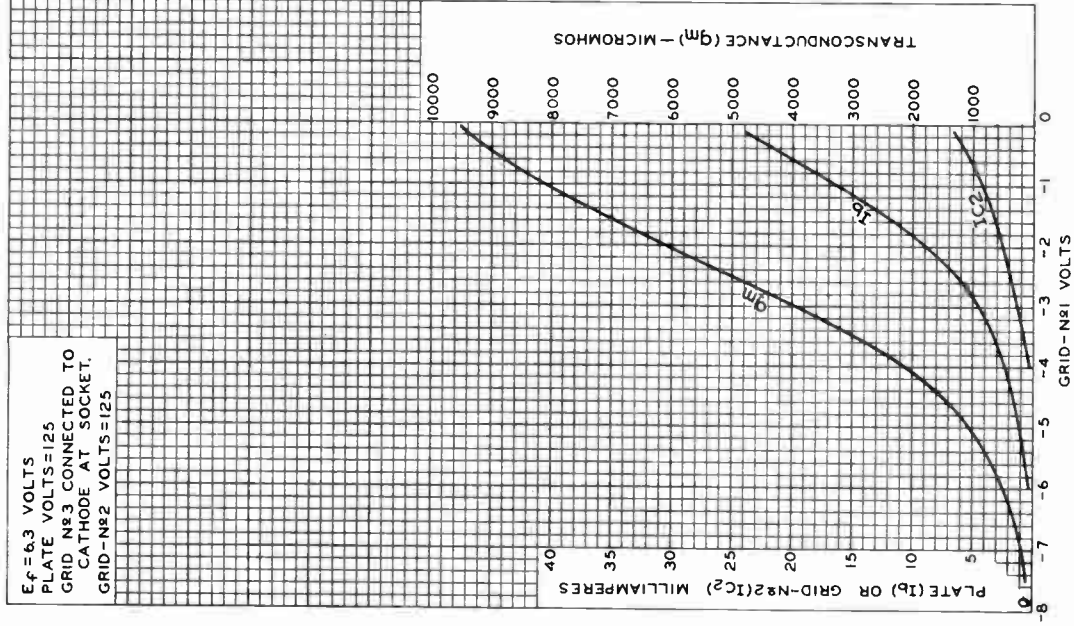
6DE6



6DE6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 125
 GRID N \circ 3 CONNECTED TO
 CATHODE AT SOCKET.
 GRID-N \circ 2 VOLTS = 125



Dual Triode

With Medium-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (<i>Design-Maximum Values</i>):			
Voltage (AC or DC)	6.3 ± 0.6	volts	
Current at heater volts = 6.3	0.90W		amp
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^a	max.	volts
Direct Interelectrode Capacitances (Approx.): ^b			
	<i>Unit No. 1</i>	<i>Unit No. 2</i>	
Grid to plate	4.0	8.5	μμf
Grid to cathode and heater	2.2	5.5	μμf
Plate to cathode and heater	0.52	1.0	μμf

Characteristics, Class A₁ Amplifier:

	<i>Unit No. 1</i>	<i>Unit No. 2</i>	
Plate Voltage	250	60 150	volts
Grid Voltage	-11	0 -17.5	volts
Amplification Factor	17.5	- 6	
Plate Resistance (Approx.)	8750	- 925	ohms
Transconductance	2000	- 6500	μmhos
Plate Current	5.5	80 ^c 35	ma
Plate Current for grid volts = -24	-	- 10	ma
Grid Voltage (Approx.) for plate $\mu a = 10$	-20	- -	volts
Grid Voltage (Approx.) for plate $\mu a = 50$	-	- -44	volts

Mechanical:

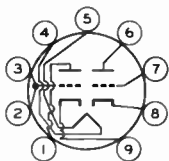
Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)



6DE7

Basing Designation for BOTTOM VIEW. 9HF

Pin 1 - Plate of Unit No.2
 Pin 2 - Grid of Unit No.2
 Pin 3 - Grid 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 - Cathode of Unit No.2

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC PLATE VOLTAGE.	330 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400 max.	volts
CATHODE CURRENT:.		
Peak.	77 max.	ma
Average	22 max.	ma
→ PLATE DISSIPATION	1.5 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:
 For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC PLATE VOLTAGE.	275 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^a	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	7 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:
 For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

^a The dc component must not exceed 100 volts.

^b without external shield.

^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

→ Indicates a change.





6DE7

6DE7

DUAL TRIODE
With Medium-Mu Unit and Low-Mu Unit

* This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

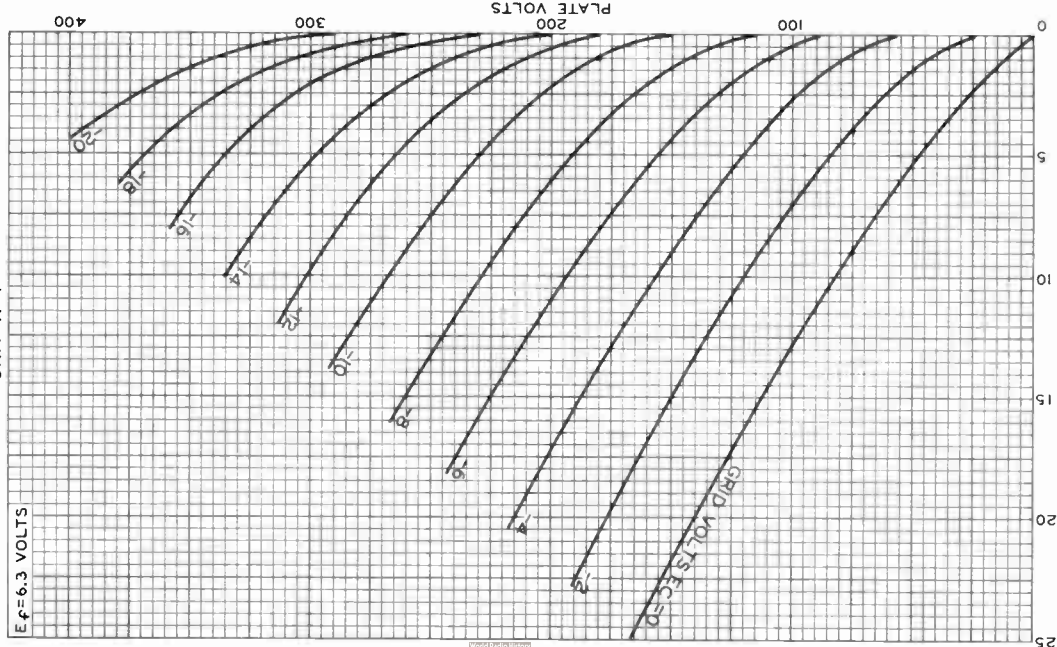


6DE7

AVERAGE PLATE CHARACTERISTICS

UNIT N21

$E_f = 6.3$ VOLTS



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92CM-9988

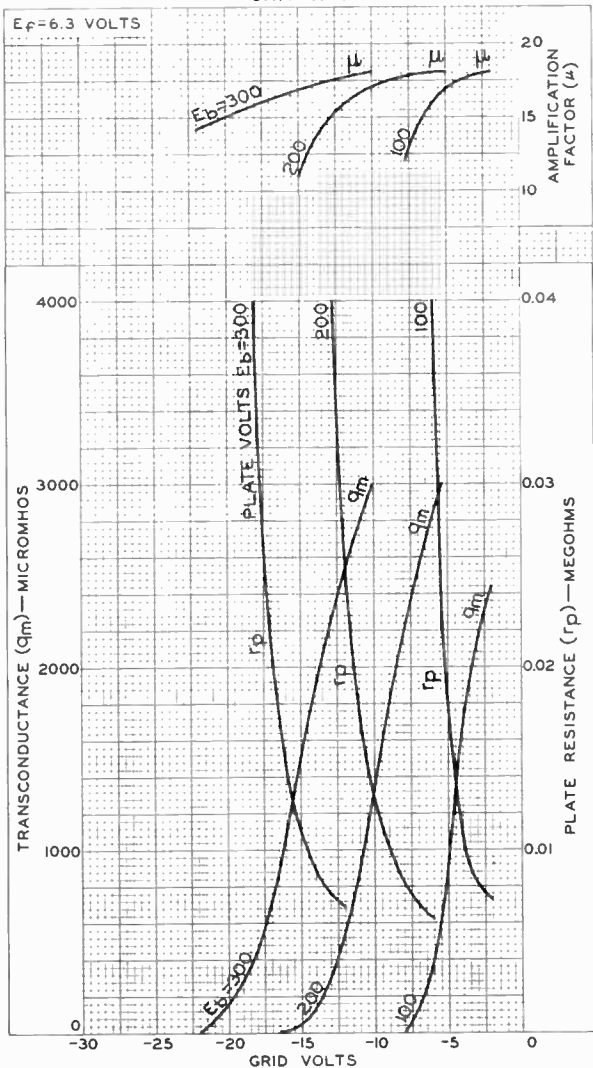
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AVERAGE CHARACTERISTICS UNIT №1



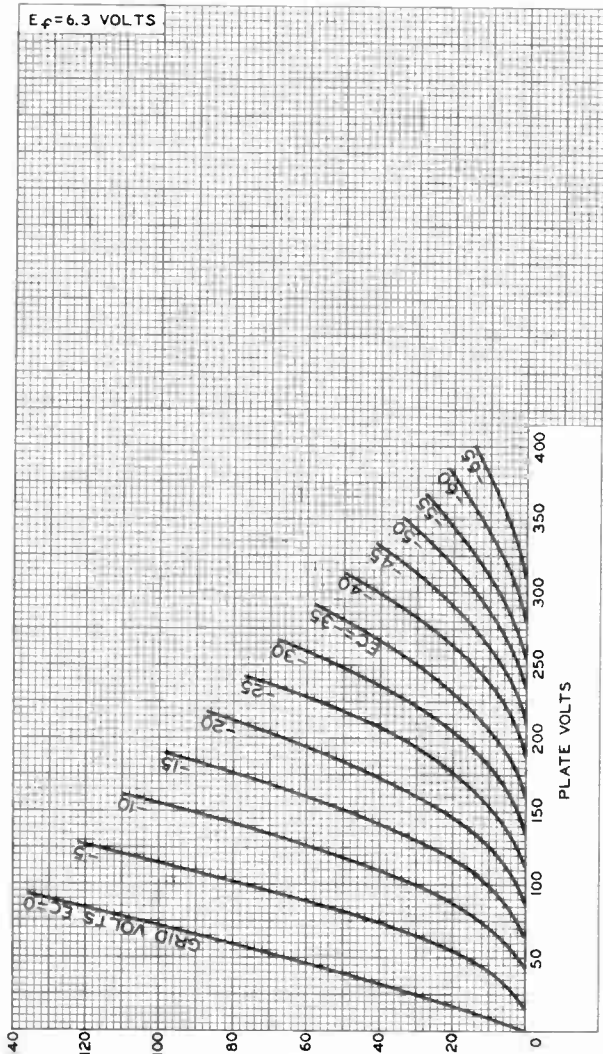
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AVERAGE PLATE CHARACTERISTICS
UNIT No 2

$E_f = 6.3$ VOLTS



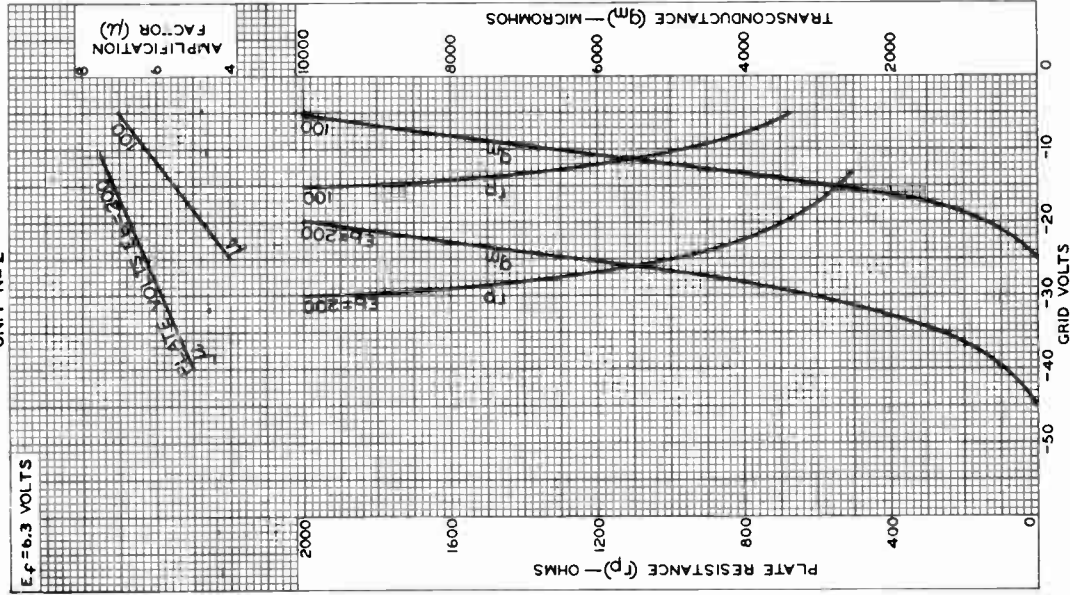


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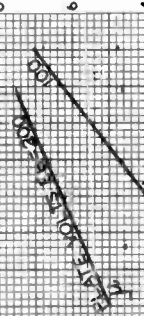
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AVERAGE CHARACTERISTICS UNIT No 2

$E_f = 6.3$ VOLTS



APPLICATION FACTOR (μ)







6DG6-GT

6DG6-GT

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	1.2	amp

Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate	0.6	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.2, grid No.2, and heater	15	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater	10	$\mu\mu\text{f}$

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Dimensional Outline	See General Section

Bult. T-9
 Base. Intermediate-Shell Octal 7-Pin (JETEC No.87-7),
 Short Intermediate-Shell Octal 7-Pin
 with External Barriers (JETEC No.87-59),
 Intermediate-Shell Octal 6-Pin (JETEC No.86-81),
 or Short Intermediate-Shell Octal 6-Pin
 with External Barriers (JETEC No.86-84)

Basing Designation for BOTTOM VIEW. 7S

- Pin 1 \blacklozenge - No Connection
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode,
Grid No.3

AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	200 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	125 max.	volts
PLATE DISSIPATION	10 max.	watts
GRID-No.2 INPUT	1.25 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 and Characteristics:

Plate Voltage	110	200	volts
Grid-No.2 Voltage	110	125	volts
Grid-No.1 (Control-Grid) voltage.	-7.5	0	volts

^o without external shield.

\blacklozenge On the 6-pin bases, pin 1 as well as pin 6 is omitted.

6DG6-GT



6DG6-GT

BEAM POWER TUBE

Peak AF Grid-No.1 Voltage	7.5	8.5	volts
Cathode Resistor	0	180	ohms
Zero-Signal Plate Current	49	46	ma
Max.-Signal Plate Current	50	47	ma
Zero-Signal Grid-No.2 Current	4	2.2	ma
Max.-Signal Grid-No.2 Current	10	8.5	ma
Plate Resistance (Approx.)	13000	28000	ohms
Transconductance	8000	8000	μ hos
Load Resistance	2000	4000	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output	2.1	3.8	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

Curves shown under Type 50L6-GT also apply to the 6DG6-GT



6DK6

6DK6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts

Current 0.3 amp

Direct Interelectrode Capacitances:0

Grid No.1 to plate 0.02 max. μ f

Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater 6.3 μ f

Plate to cathode, grid No.3 & internal shield, grid No.2, and heater. 1.9 μ f

Characteristics, Class A₁ Amplifier:

Plate-Supply Voltage 125 volts

Grid-No.3 *Connected to cathode at socket*

Grid-No.2-Supply Voltage 125 volts

Cathode Resistor 56 ohms

Plate Resistance (Approx.) 0.35 megohm

Transconductance 9800 μ hos

Plate Current 12 ma

Grid-No.2 Current 3.8 ma

Grid-No.1 Voltage (Approx.) for plate μ a = 20 -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" \pm 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

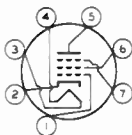
Pin 1-Grid No.1

Pin 2-Cathode

Pin 3-Heater

Pin 4-Heater

Pin 5-Plate



Pin 6-Grid No.2

Pin 7-Grid No.3,

Internal

Shield

AMPLIFIER — Class A₁

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

0: See next page.

6DK6



6DK6

SHARP-CUTOFF PENTODE

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

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-No.1-Circuit Resistance:

For fixed-bias operation 0.25 max. megohm

For cathode-bias operation 1 max. megohm

[○] Without external shield.

[▲] The dc component must not exceed 100 volts.



6DK6

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AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID N°3 CONNECTED TO
CATHODE AT SOCKET.
GRID-N°2 VOLTS = 125

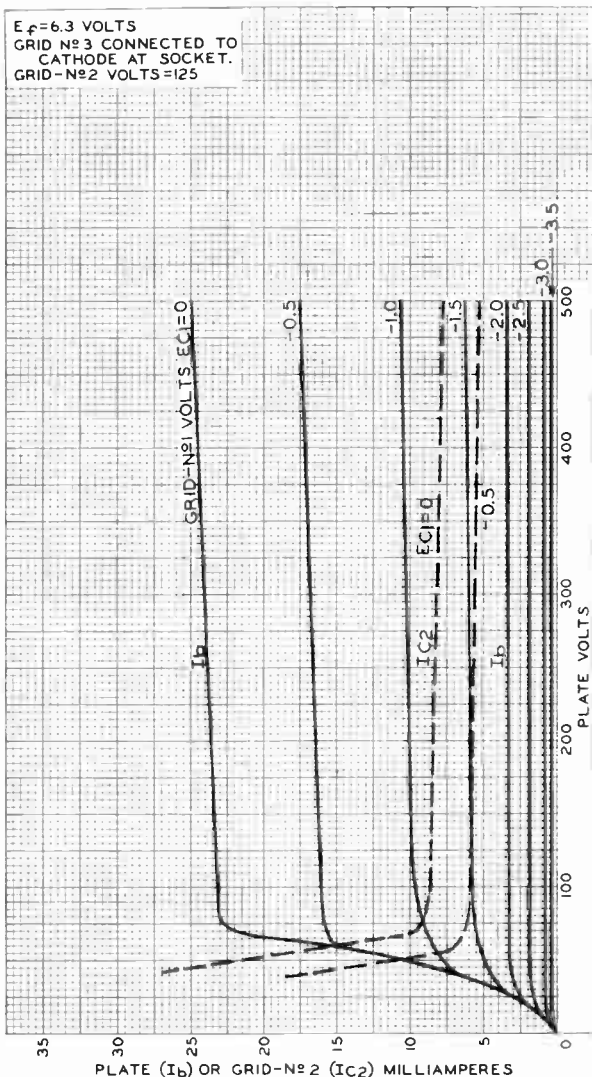


PLATE (I_b) OR GRID-N°2 (I_{C2}) MILLIAMPERES

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92CM-9851R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

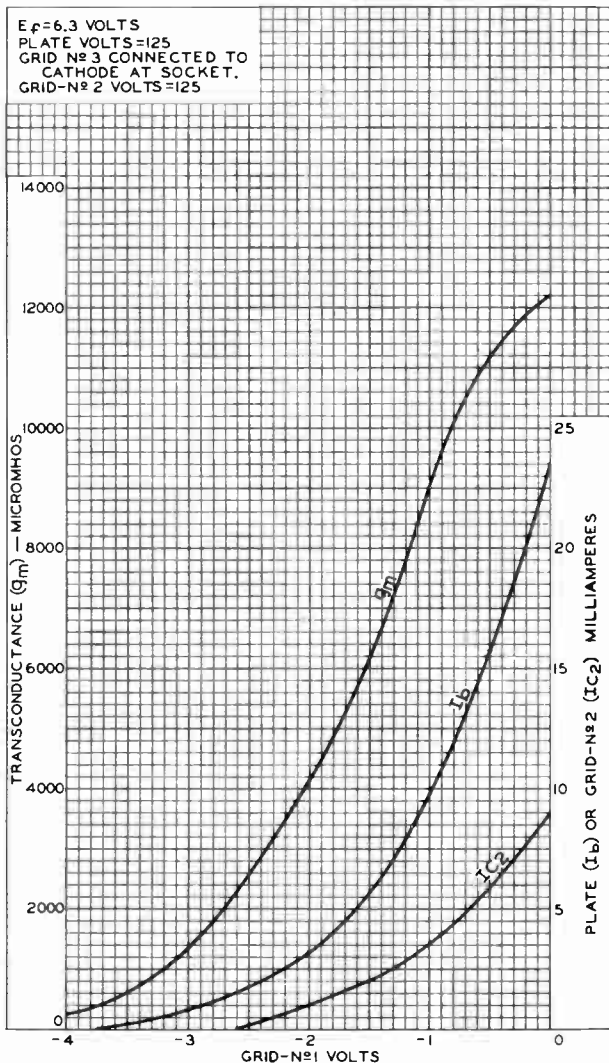
World Radio History

6DK6



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AVERAGE CHARACTERISTICS



Half-Wave Vacuum Rectifier

NOVAR TYPE

- Top Cap Cathode Connection
- Pressure-Welded Cathode Coating
- RCA Dark Heater
- Voltage Drop: $E_b = 25V$ for $I_b = 800$ mA

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc	I_h	6.3	V
Heater Current	I_h	2.3	A
Direct Interelectrode Capacitances: ^a			
Plate to cathode and heater	$C_{p(k+h)}$	17.0	pf
Cathode to plate and heater	$C_{k(p+h)}$	13.0	pf
Heater to cathode	C_{h-k}	4.4	pf
Instantaneous Tube Voltage			
Drop for instantaneous plate current (i_b) = 800 mA	e_b	25	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.850 in (97.79 mm)
Maximum Seated Length	3.470 in (88.1 mm)
Maximum Diameter	1.188 in (30.1 mm)
Envelope	JEDEC T9
Top Cap	Small embossed (JEDEC C1-2, C1-3 or C1-33)
Base ^b	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-89)
Terminal Diagram	JEDEC 9GD
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS – Design-Maximum Values^c

For operation as a Damper Tube in Color-TV Receivers utilizing a 525-line, 30-frame system

Peak Inverse Plate Voltage	$-e_{bm}$	6500 ^d	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	} +300 -6500 +100 -900	V
Average ^e	$E_{hk(av)}$		V
			V

6DL3

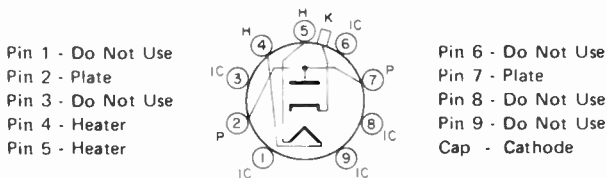
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V
Plate Current:			
Peak	i_{bm}	1800	mA
Average ^e	$I_{b(av)}$	400	mA
Plate Dissipation	P_b	11.0	W
Envelope Temperature (at hottest point on envelope surface)	T_E	220	°C

- a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.
- b Designed to mate with Novar 9-Contact Socket generally available from your local RCA Distributor.
- c As defined in the current issue of EIA Standard RS-239A.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- e Measured with a dc meter.

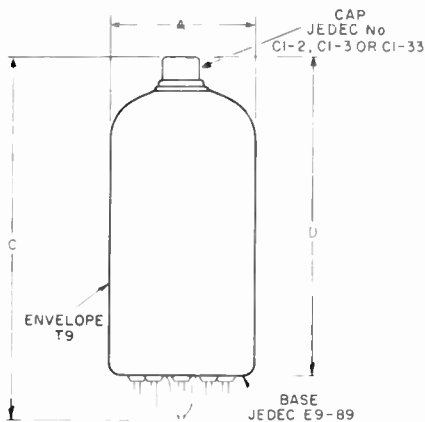
OPERATING CONSIDERATIONS

Socket terminals 1, 3, 6, 8 and 9 should not be used as tie points for external-circuit components. It is recommended that the socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

TERMINAL DIAGRAM – JEDEC 9GD (Bottom View)



DIMENSIONAL OUTLINE



92CS-17941

DIMENSION	INCHES			MILLIMETERS		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.062*	—	1.188	27.0*	—	30.1
C	—	—	3.850	—	—	97.79
D	—	—	3.470	—	—	88.1
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION						
* Applies to the minimum diameter except in the area of the seal.						



Half-Wave Vacuum Rectifier

For Color-TV Damper – Diode Applications

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc	E_h	6.3	V
Heater Current	I_h	2.4	A
Direct Interelectrode Capacitance: ^a			
Plate to cathode and heater	$c_{p(k+h)}$	13	pF
Cathode to plate and heater	$c_{k(p+h)}$	16	pF
Heater to cathode	c_{h-k}	4.0	pF
Instantaneous Tube Voltage			
Drop for instantaneous plate current (i_b) = 350 mA	e_b	14	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.380 in (85.85 mm)
Maximum Seated Length	3.000 in (76.20 mm)
Maximum Diameter	1.188 in (30.17 mm)
Envelope	JEDEC T9
Base ^b	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-89)
Terminal Diagram	JEDEC 9HP
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS – Design-Maximum Values^c

For operation as a Damper Tube in Color-TV Receivers utilizing a 525-line, 30-frame system

Peak Inverse Plate Voltage, $-e_{bim}$	5500 ^d	V						
Heater-Cathode Voltage:								
Peak	e_{hkm}	<table border="0" style="display: inline-table; vertical-align: middle;"> <tr> <td style="font-size: 2em; vertical-align: middle;">}</td> <td>+300</td> <td>V</td> </tr> <tr> <td style="font-size: 2em; vertical-align: middle;">}</td> <td>-5500</td> <td>V</td> </tr> </table>	}	+300	V	}	-5500	V
}	+300	V						
}	-5500	V						
Average ^e	$E_{hk(av)}$	<table border="0" style="display: inline-table; vertical-align: middle;"> <tr> <td style="font-size: 2em; vertical-align: middle;">}</td> <td>+100</td> <td>V</td> </tr> <tr> <td style="font-size: 2em; vertical-align: middle;">}</td> <td>-900</td> <td>V</td> </tr> </table>	}	+100	V	}	-900	V
}	+100	V						
}	-900	V						
Heater Voltage, ac or dc	E_h	5.7 to 6.9 V						
Plate Current:								
Peak	I_{hm}	2100 mA						
Average ^e	$I_{b(av)}$	350 mA						
Plate Dissipation	P_b	9.0 W						
Envelope Temperature (at hottest point on envelope surface)	T_E	220 °C						

6DN3

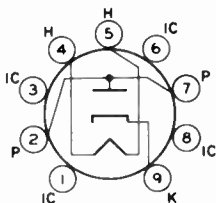
- a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- b Designed to mate with Novar 9-Contact Socket generally available from your local RCA Distributor.
- c As defined in the current issue of EIA Standard RS-239.
- d This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- e Measured with a dc meter.

OPERATING CONSIDERATIONS

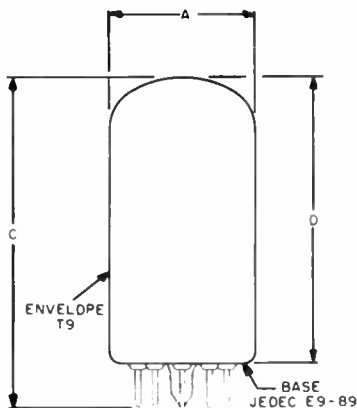
Socket terminals 1, 3, 6, and 8 should not be used as tie points for external-circuit components. It is recommended that the socket tabs be removed to reduce the possibility of arc-over and to minimize leakage.

TERMINAL DIAGRAM (Bottom View) - JEDEC 9HP

- Pin 1 - Do Not Use
- Pin 2 - Plate
- Pin 3 - Do Not Use
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Do Not Use
- Pin 7 - Plate
- Pin 8 - Do Not Use
- Pin 9 - Cathode



DIMENSIONAL OUTLINE - JEDEC 9-111



92CS (3350R)

DIMENSION	INCHES			MILLIMETERS		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.062*	—	1.188	26.96*	—	30.17
C	—	—	3.380	—	—	85.85
D	—	—	3.000	—	—	76.20
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION						
* Applies to the minimum diameter except in the area of the seal.						





6DN7

6DN7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) 6.3 ± 10% volts
Current 0.9 amp

Direct Interelectrode Capacitances (Approx.):⁰

Table with 3 columns: Electrode pair, Unit No. 1, Unit No. 2, and unit (μμf). Rows include Grid to plate, Grid to cathode and heater, and Plate to cathode and heater.

Characteristics, Class A₁ Amplifier:

Table with 3 columns: Parameter, Unit No. 1, Unit No. 2, and unit. Rows include Plate Voltage, Grid Voltage, Amplification Factor, Plate Resistance, Transconductance, Plate Current, and Grid Voltage for various plate currents.

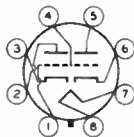
Mechanical:

Operating Position Any
Maximum Overall Length 3"
Maximum Seated Length 2-7/16"
Maximum Diameter 1-9/32"
Bulb T9
Base Intermediate-Shell Octal 8-Pin

with External Barriers (JEDEC Group 1, B8-142)

Basing Designation for BOTTOM VIEW 8BD

Pin 1 - Grid of Unit No. 1
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

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

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

DC PLATE VOLTAGE 350 max. volts

6DN7



6DN7

MEDIUM-MU DUAL TRIODE

With Dissimilar Units

PEAK NEGATIVE-PULSE GRID VOLTAGE.	400	max.	volts
PLATE DISSIPATION	1	max.	watt
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.	2.2	max.	megohms
For cathode-bias operation.	2.2	max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

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

DC PLATE VOLTAGE.	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE#.	2500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250	max.	volts
CATHODE CURRENT:			
Peak.	150	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	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.	2.2	max.	megohms
-----------------------------------	-----	------	---------

[○] Without external shield.

* This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

[▲] The dc component must not exceed 100 volts.

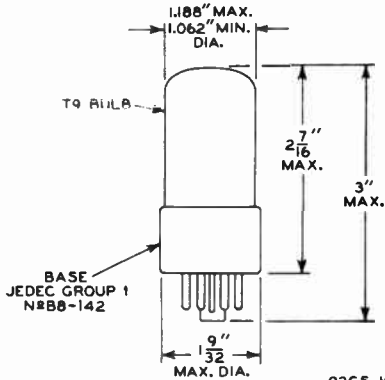
[#] This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



6DN7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

6DN7





Beam Power Tube

For Use as a Horizontal-Deflection Amplifier Tube
in Color and Black-and-White Television Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	2.500	amp
Peak heater-cathode voltage; Heater negative with respect to cathode.	200	max. volts
Heater positive with respect to cathode.	200 ^a	max. volts

Direct Interelectrode Capacitances:^b

Grid No.1 to plate.	0.5	pf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	23.0	pf
Plate to cathode & grid No.3, grid No.2, and heater	11.0	pf

Characteristics, Class A₁ Amplifier:

		Triode Con- nec- tion ^c		
Plate Voltage	70	175	125	volts
Grid No.2 (Screen-Grid) Voltage	125	125	-	volts
Grid No.1 (Control-Grid) Voltage.	0	-25	-25	volts
Amplification Factor.	-	-	3.3	
Plate Resistance (Approx.).	-	5500	-	ohms
Transconductance.	-	10500	-	μmhos
Plate Current	550 ^d	110	-	ma
Grid-No.2 Current	42 ^d	5	-	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-55	-	volts

Mechanical:

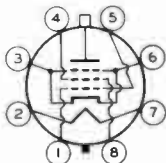
Operating Position.	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length.	5"
Seated Length	4-1/4" ± 3/16"
Maximum Diameter.	1-9/16"
Bulb.	T12
Cap	Small (JEDEC No. C1-1)
Base.	Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JEDEC No. B8-118)



6DQ5

Basing Designation for BOTTOM VIEW. BA

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



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

HORIZONTAL-DEFLECTION AMPLIFIER

→ Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC PLATE-SUPPLY VOLTAGE	990 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^f	650 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1100 max.	volts
DC GRID-No. 2 (SCREEN-GRID) VOLTAGE	190 max.	volts
PEAK NEGATIVE-PULSE GRID-No. 1 VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	1100 max.	ma
Average	315 max.	ma
GRID-No. 2 INPUT	3.2 max.	watts
PLATE DISSIPATION ^g	24 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	72(1) max.	°C

Maximum Circuit Values:

Grid-No. 1-Circuit Resistance:

For grid-resistor-bias operation^g 0.47 max. megohm

- ^a The dc component must not exceed 100 volts.
- ^b without external shield.
- ^c with grid No. 2 connected to plate.
- ^d These values can be measured by a method involving a recurrent wave form such that the plate dissipation, grid-No. 2 input, and cathode current will be kept within ratings in order to prevent damage to the tube.
- ^e As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^f This rating is applicable where the duration of the voltage pulse does 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.
- ^g It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value be employed.

→ Indicates a change.

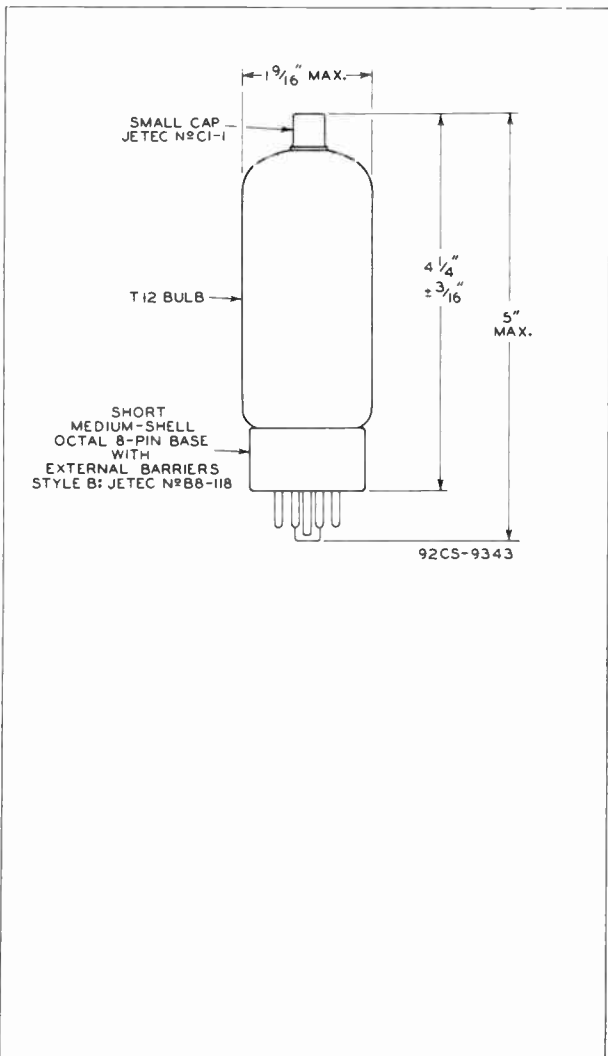




6DQ5

6DQ5

BEAM POWER TUBE

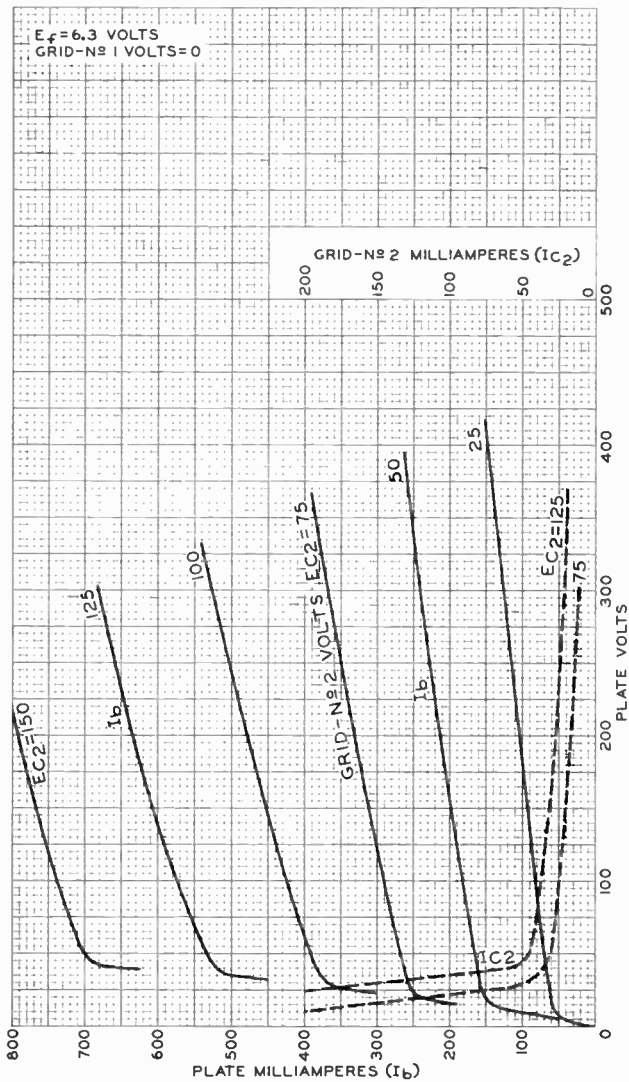


6DQ5



6DQ5

AVERAGE CHARACTERISTICS

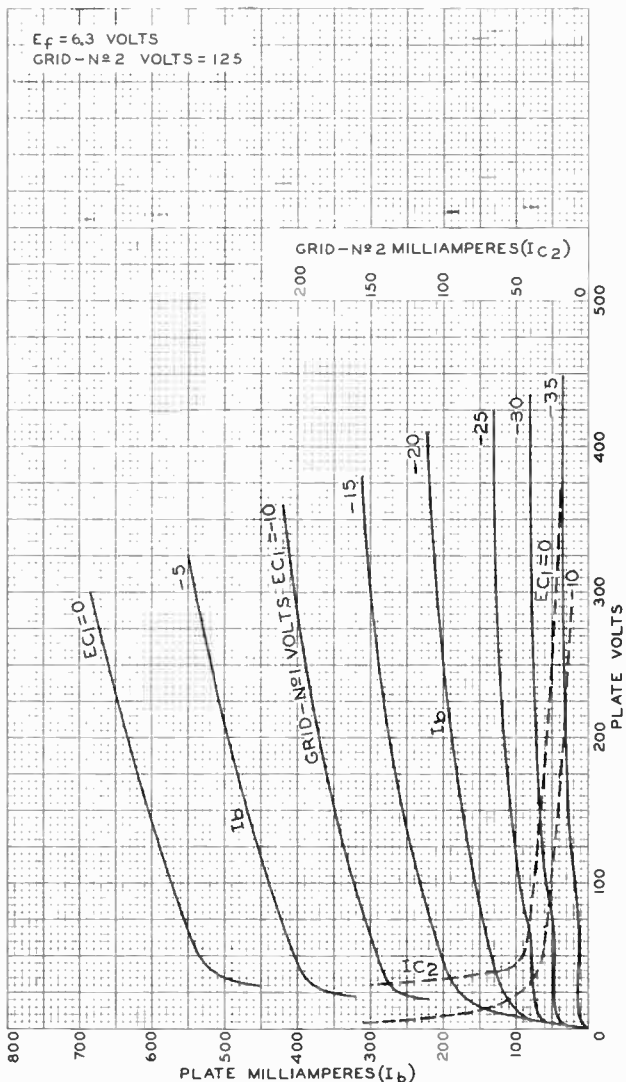




6DQ5

6DQ5

AVERAGE CHARACTERISTICS

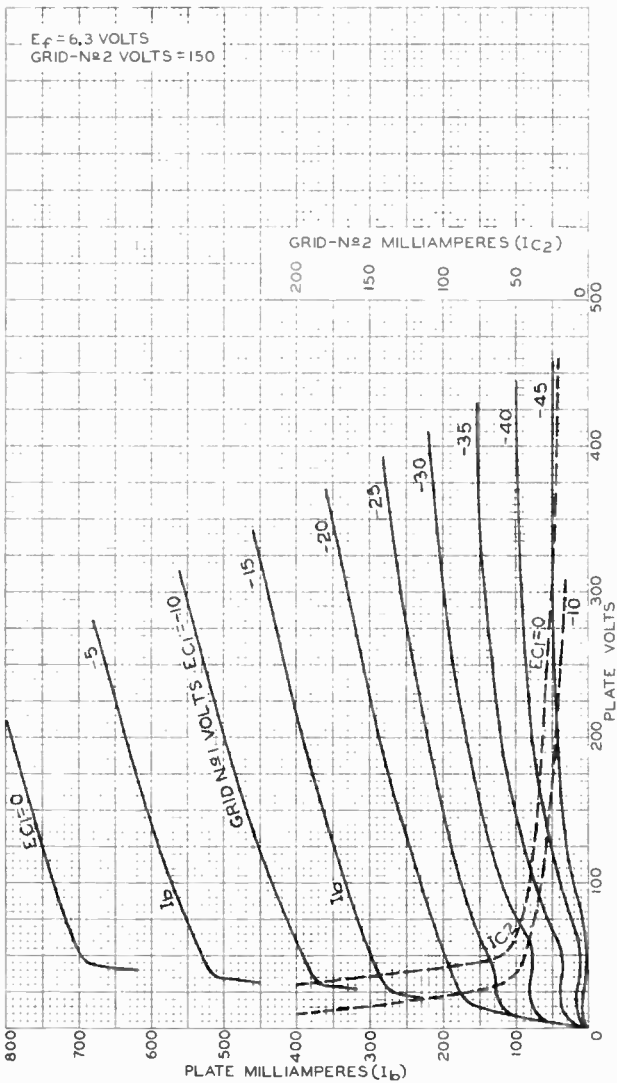


6DQ5



6DQ5

AVERAGE CHARACTERISTICS



92CM-9310

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

World Radio History



6DR7

6DR7

DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
 Voltage 6.3 ± 10% ac or dc volts
 Current 0.9 amp
 Direct Interelectrode Capacitances (Approx.):⁰

	Unit No.1	Unit No.2	
Grid to plate	4.5	8.5	μμf
Grid to cathode and heater . . .	2.2	5.5	μμf
Plate to cathode and heater . . .	0.34	1	μμf

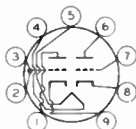
Characteristics, Class A₁ Amplifier:

	Unit No.1	Unit No.2	
Plate Voltage	250	150	volts
Grid Voltage	-3	-17.5	volts
Amplification Factor	68	6	
Plate Resistance (Approx.)	40000	925	ohms
Transconductance	1600	6500	μmhos
Plate Current	1.4	35	ma
Plate Current for plate volts = 60 and grid volts = 0	-	80	ma
Plate Current for grid volts = -24. Grid Voltage (Approx.) for plate μa = 10	-	10	ma
Grid Voltage (Approx.) for plate μa = 10	-5.5	-	volts
Grid Voltage (Approx.) for plate μa = 50	-	-44	volts

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 9HF

Pin 1 - Plate of Unit No.2
 Pin 2 - Grid of Unit No.2
 Pin 3 - Grid 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 - Cathode of Unit No.2



6DR7

DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^o

DC PLATE VOLTAGE	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
CATHODE CURRENT:			
Peak	70	max.	ma
Average.	20	max.	ma
PLATE DISSIPATION.	1	max.	watt
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 grid-resistor-bias or cathode-

bias operation 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^o

DC PLATE VOLTAGE	275	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE [#]	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	175	max.	ma
Average.	50	max.	ma
PLATE DISSIPATION.	7	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 grid-resistor-bias or cathode-

bias operation 2.2 max. megohms

^o Without external shield.

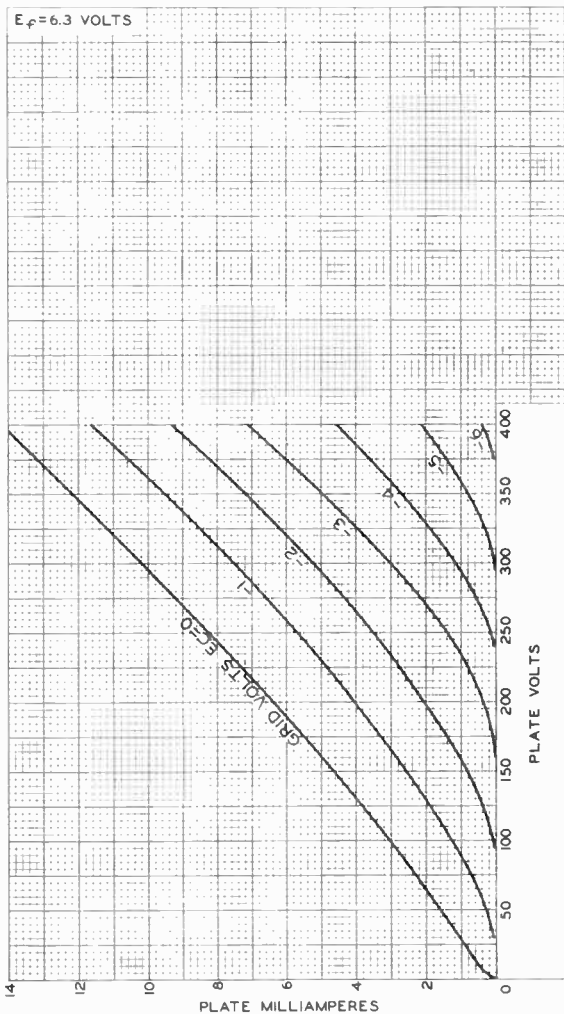
^{*} As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

[#] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

[■] The dc component must not exceed 100 volts.

AVERAGE PLATE CHARACTERISTICS

Unit No.1



92CM-9912



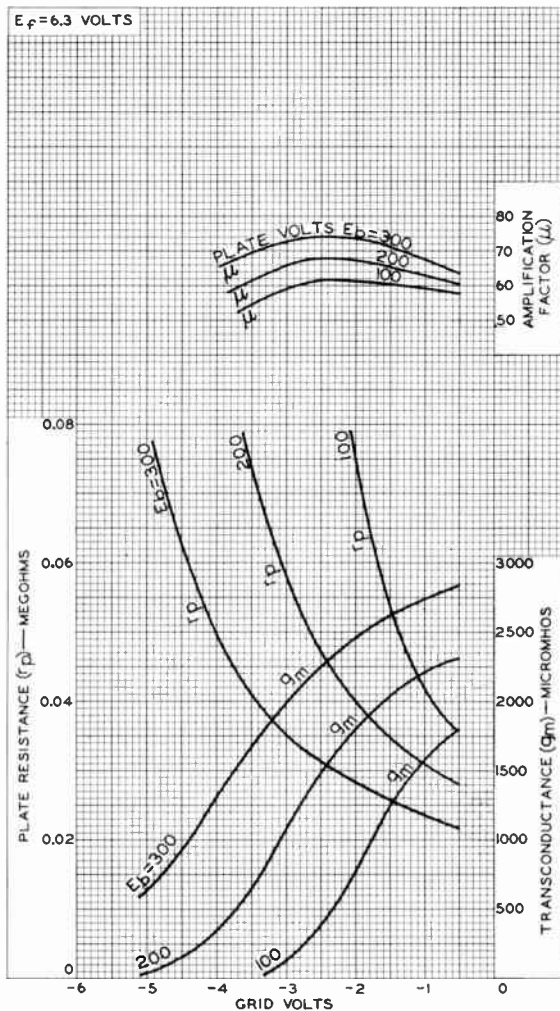
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.

DATA 2
1-62

AVERAGE CHARACTERISTICS

Unit No.1



92CM-9915R1





6DR7

6DR7

AVERAGE PLATE CHARACTERISTICS

UNIT No 2

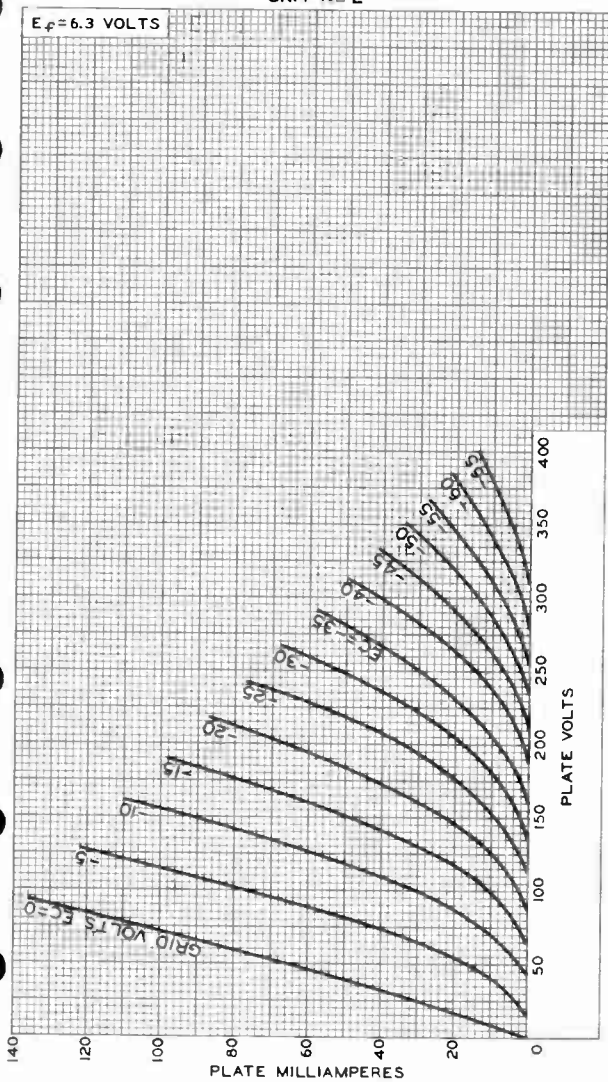


PLATE MILLIAMPERES
ELECTRON TUBE DIVISION

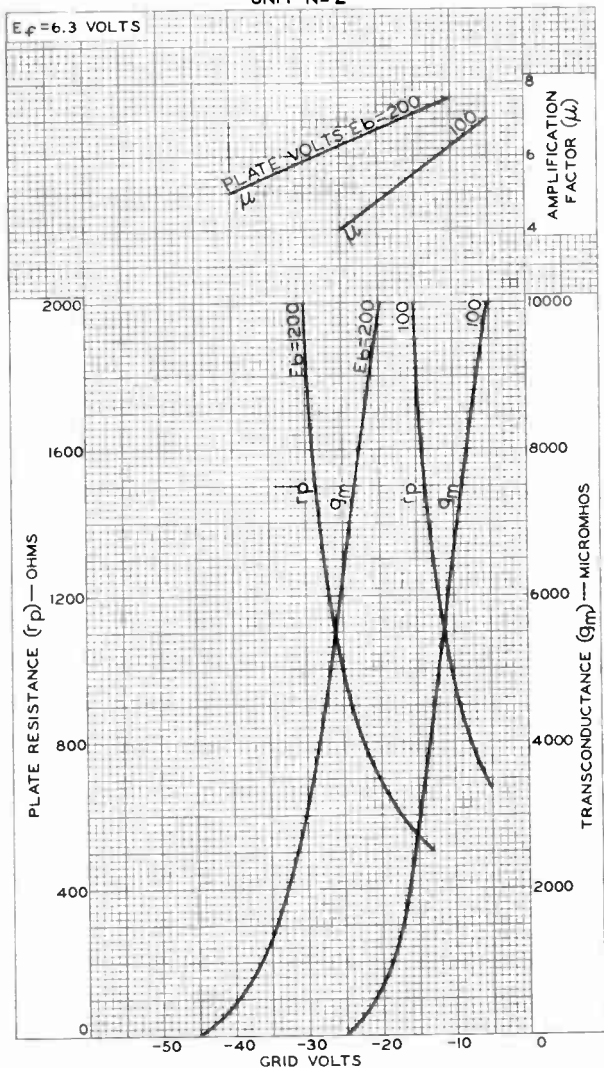
6DR7



6DR7

AVERAGE CHARACTERISTICS

UNIT No 2



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

World Radio History

92CM-9914

High-Mu Triode

NUVISTOR TYPE

HAVING EXTENDED CUTOFF CHARACTERISTIC

For Use as Grounded-Cathode, Neutralized RF-Amplifier
Tube in Tuners of VHF Television and FM Receivers
Featuring Improved Weak-Signal-Area Reception

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (<i>Design-Maximum Values</i>):		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.135	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.):		
Grid to plate	0.92	μf
Grid to cathode, shell, and heater.	4.3	μf
Plate to cathode, shell, and heater	1.8	μf
Plate to cathode.	0.18	μf
Heater to cathode	1.6	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage.	110	volts
Grid Supply Voltage	0	volts
Cathode Resistor.	130	ohms
Amplification Factor.	63	
Plate Resistance (Approx.)	7000	ohms
Transconductance.	9000	μmhos
Plate Current	6.5	ma
Grid Voltage (Approx.) for plate $\mu_a = 100$	-5	volts
Grid Voltage (Approx.) for plate $\mu_a = 10$	-6.8	volts

Mechanical:

Operating Position.	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length.	0.800"
Maximum Seated Length	0.625"
Maximum Diameter.	0.440"
Envelope.	Metal Shell MT4
Socket. . . . .	.Cinch Mfg. Corp. No.133 65 10 001, ← Industrial Electronic Hardware Co. No. Nu 5044 or No. Nu 5060, or equivalent
Base.	Medium Ceramic-Wafer Twelvar 5-Pin (JEDEC No.E5-65)

← Indicates a change.



6DS4

Basing Designation for BOTTOM VIEW. 12AQ

- Pin 1^a - Do Not Use
- Pin 2 - Plate
- Pin 3 - Same as Pin 1
- Pin 4 - Grid
- Pin 5 - Same as Pin 1
- Pin 6 - Same as Pin 1
- Pin 7 - Same as Pin 1
- Pin 8 - Cathode
- Pin 9 - Same as Pin 1
- Pin 10 - Heater
- Pin 12 - Heater



AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE.	300 ^b max.	volts
PLATE VOLTAGE	135 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Peak-positive value	0 max.	volts
CATHODE CURRENT	15 max.	ma
→ PLATE DISSIPATION:		
With a minimum series plate-circuit resistance of 5000 ohms	1.5 max.	watts
For lower values of series plate-circuit resistance.	See accompanying <i>Plate-Dissipation-Rating Chart</i>	

Typical Operation:

Plate Voltage	70	volts
Grid Supply Voltage	0	volts
Grid Resistor	47000	ohms
Amplification Factor.	68	
Plate Resistance (Approx.).	5440	ohms
Transconductance.	12500	μmhos
→ Plate Current	7	ma

Maximum Circuit Values:

Grid-Circuit Resistance: ^c		
For fixed-bias operation.	0.5 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

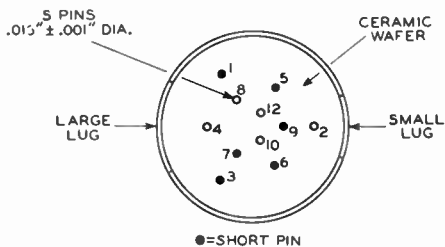
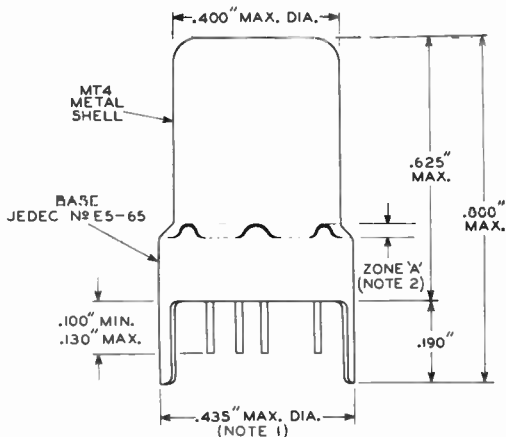
^a Pin 1 is of a length such that its end does not touch the socket insertion plane.

→ ^b A plate supply voltage of 300 volts may be used provided sufficient plate-circuit resistance and agc voltage are used to limit the voltage at the plate of the tube to 135 volts under conditions of maximum-rated plate dissipation (1.5 watts).

→ ^c For operation at metal-shell temperatures up to 135° C.

→ Indicates a change.





92CS-10970R3

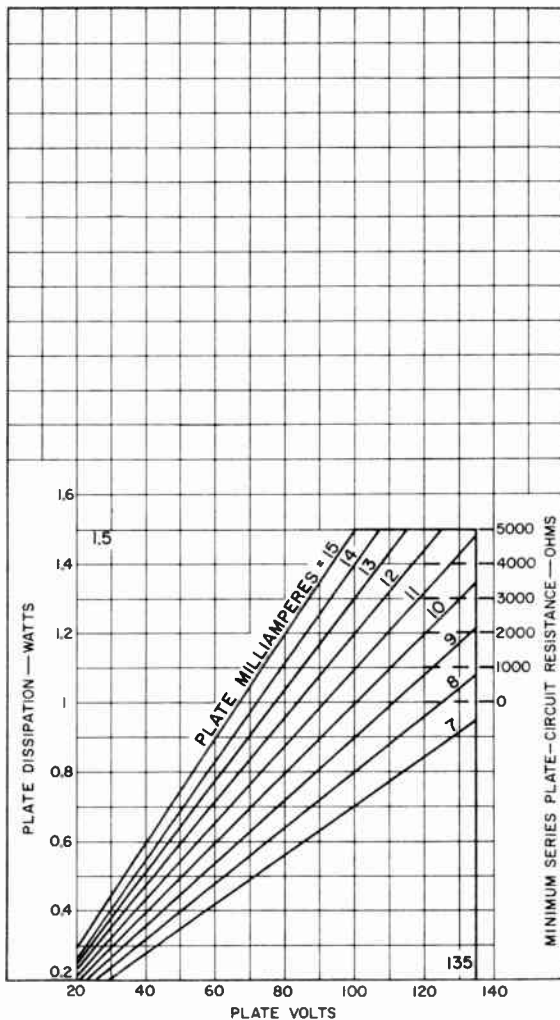
NOTE 1: MAXIMUM OUTSIDE DIAMETER OF 0.440" IS PERMITTED ALONG 0.190" LUG LENGTH.

NOTE 2: SHELL TEMPERATURE SHOULD BE MEASURED IN ZONE "A" BETWEEN BROKEN LINES.



6DS4

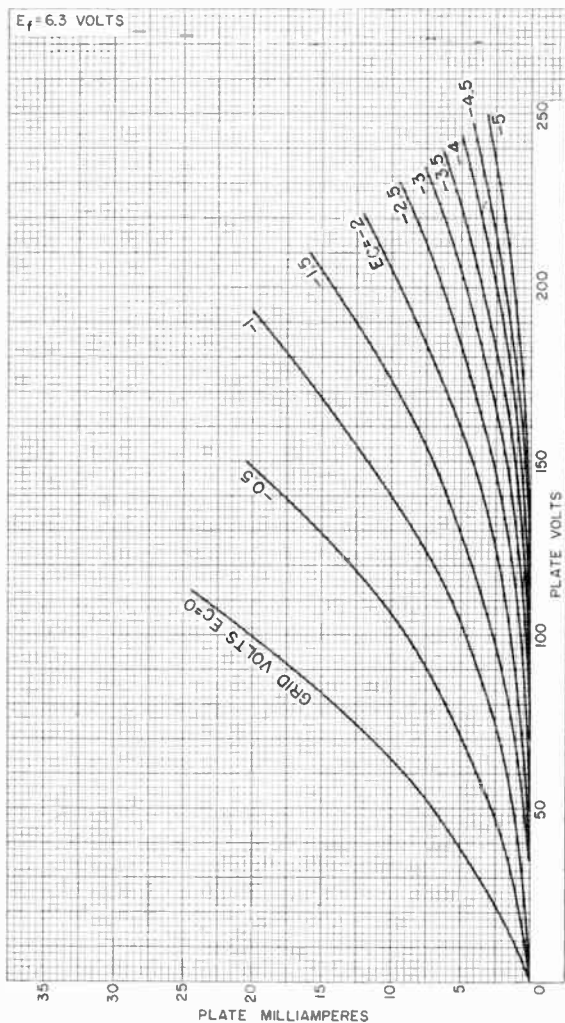
PLATE-DISSIPATION-RATING CHART



92CM-1168f



AVERAGE PLATE CHARACTERISTICS



92CM-11209



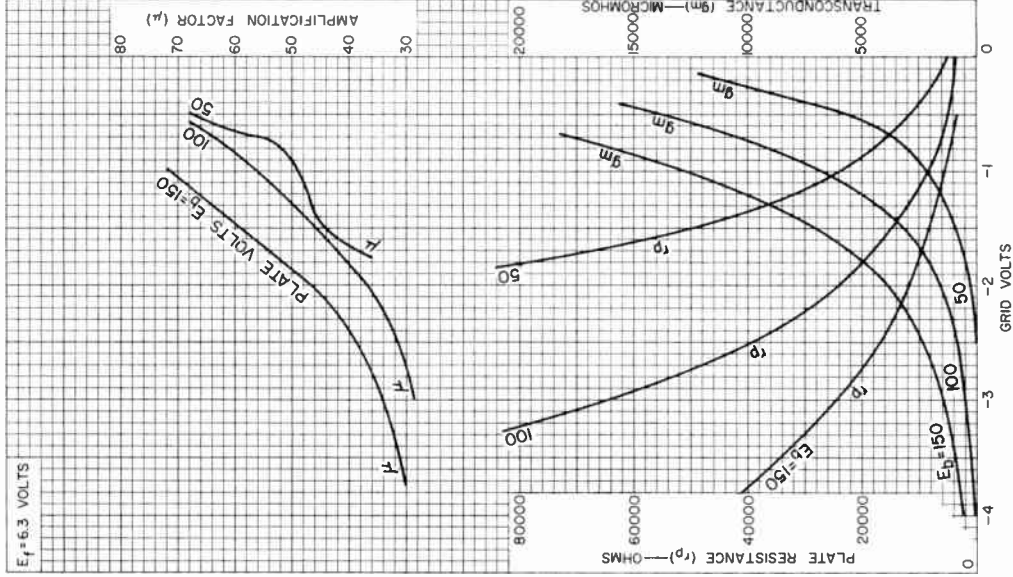
RADIO CORPORATION OF AMERICA
 Electron Tube Division

Harrison, N. J

DATA 3
 1-63

6DS4

AVERAGE CHARACTERISTICS



92CM-11210

RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.



Beam Power Tube

7-PIN MINIATURE TYPE

For Audio Output Service in TV and Radio Receivers

ELECTRICAL CHARACTERISTICS - Bogey Values^a

Heater Voltage, ac or dc	E_h	6.3	V
Heater Current	I_h	0.8	A
Direct Interelectrode Capacitances: ^b			
Grid No.1 to plate	c_{g1-p}	0.19	pF
Input: G1 to (K, G3, G2, H) . . .	c_i	9.5	pF'
Output: P to (K, G3, G2, H) . . .	c_o	6.3	pF

TYPICAL OPERATION AND CHARACTERISTICS

Cathode-Bias Operation

For the following characteristics, see Conditions below:

Zero-Signal Plate Current . . .	I_b	34.5	27	mA
Max.-Signal Plate Current . . .	$I_{b(max.-sig.)}$	32.5	25	mA
Zero-Signal Grid-No.2 Current .	I_{c2}	3.5	3	mA
Max.-Signal Grid-No.2 Current .	$I_{c2(max.-sig.)}$	9	9	mA
Plate Resistance (Approx.) . . .	r_p	28000	28000	Ω
Transconductance	g_m	6000	5800	μmho
Load Resistance	R_l	6000	8000	Ω
Total Harmonic Distortion. . .	D_t	10	10	%
Max.-Signal Power Output . . .	P_o	2.8	3.6	W

Conditions:

Heater Voltage	E_h	6.3	6.3	V
Plate Supply Voltage	E_{bb}	200	250	V
Grid-No.2 Voltage	E_{c2}	200	200	V
Cathode-Bias Resistor	R_k	180	270	Ω
Peak AF Grid-No.1 Voltage . . .	e_{clm}	7.5	9.2	V

Fixed-Bias Operation

For the following characteristics, see Conditions below:

Zero-Signal Plate Current . . .	I_b	35	29	mA
Max.-Signal Plate Current . . .	$I_{b(max.-sig.)}$	36	32	mA
Zero-Signal Grid-No.2 Current .	I_{c2}	3	3	mA
Max.-Signal Grid-No.2 Current .	$I_{c2(max.-sig.)}$	9	10	mA
Plate Resistance (Approx.) . . .	r_p	28000	28000	Ω
Transconductance	g_m	6000	5800	μmho
Load Resistance	R_l	6000	8000	Ω

6DS5

Total Harmonic Distortion	D_t	9	10	%
Max.-Signal Power Output	P_o	3	3.8	W
<i>Conditions:</i>				
Heater Voltage	E_h	6.3	6.3	V
Plate Voltage	E_b	200	250	V
Grid-No.2 Voltage	E_{c2}	200	200	V
Grid-No.1 (Control-Grid) Voltage	E_{c1}	-7.5	-8.5	V
Peak AF Grid-No.1 Voltage	e_{c1m}	7.5	8.5	V

MECHANICAL CHARACTERISTICS

Dimensional Outline	JEDEC 5-3		
Maximum Overall Length	2.625 in (66.67 mm)		
Maximum Seated Length	2.375 in (60.32 mm)		
Maximum Diameter	0.750 in (19.05 mm)		
Bulb	T 5-1/2		
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)		
Terminal Connections (See <i>TERMINAL DIAGRAM</i>)	JEDEC Designation 7BZ		
Type of Cathode	Coated Unipotential		
Mounting Position	Any		

MAXIMUM RATINGS – Design-Maximum Values^c

Plate Voltage	E_b	275	V
Grid-No.2 Voltage	E_{c2}	275	V
Grid-No.1 Voltage:			
Positive bias value	E_{c1}	0	V
Plate Dissipation	P_b	9	W
Grid-No.2 Input	P_{g2}	2.2	W
Heater Voltage	E_h	5.7 to 6.9	V
Heater-Cathode Voltage:			
Peak	E_{hkm}	+200	V
DC	E_{hk}	100	V
Envelope Temperature (At hottest point on envelope surface)	T_E	250	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:	$R_{g1(ckt)}$		
For fixed-bias operation		0.1	MΩ
For cathode-bias operation		1.0	MΩ

a Unless otherwise specified.

b Without external shield. Measured in accordance with the current issue of EIA Standard RS-191.

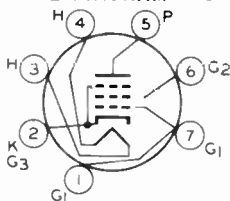
c As defined in the current issue of EIA Standard RS-239.



**Electronic
Components**

DATA 1

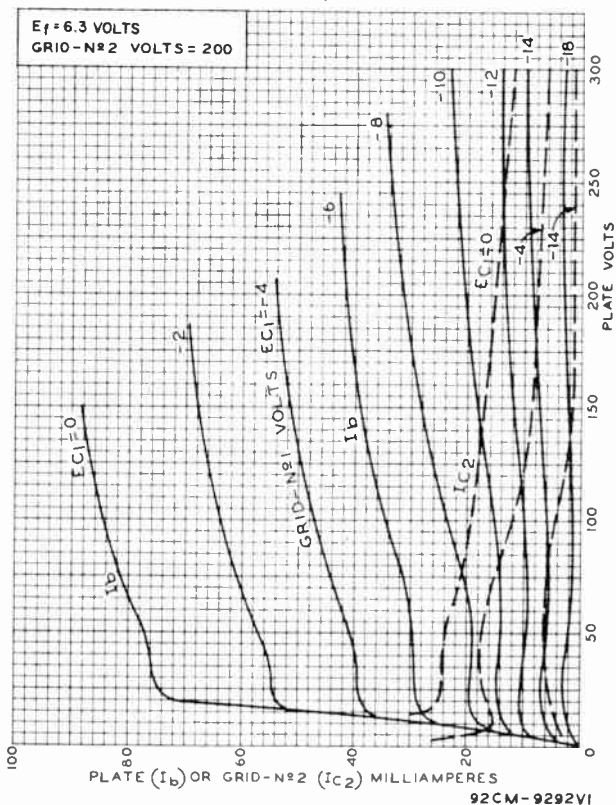
TERMINAL DIAGRAM - Bottom View



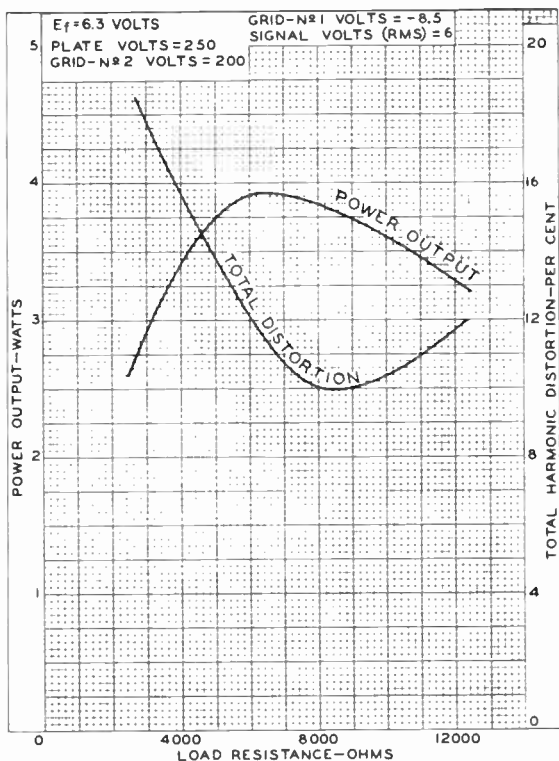
JEDEC 7BZ

- 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

AVERAGE CHARACTERISTICS



OPERATION CHARACTERISTICS



92CM-9293VI



6DT5

BEAM POWER TUBE

9-PIN MINIATURE TYPE

6DT5

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.2	amp

Direct Interelectrode Capacitances

(Approx.):⁰

Grid No.1 to plate	0.57	μmf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	12.5	μmf
Plate to cathode & grid No.3, grid No.2, and heater	4.9	μmf

Characteristics, Class A₁ Amplifier:

Plate Voltage	60	80	250	volts
Grid-No.2 Voltage	150	250	250	volts
Grid-No.1 Voltage	0	0	-16.5	volts
Transconductance	-	-	6200	μmhos
Plate Current	95	195	44	ma
Grid-No.2 Current	8.5	19	1.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 100	-	-	-35	volts

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	9HN

- Pin 1 - Grid No.2
- Pin 2 - No Connection
- Pin 3 - Grid No.1
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.1



- Pin 7 - Cathode,
Grid No.3
- Pin 8 - Internal
Connection—
Do Not Use
- Pin 9 - Plate

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

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

DC PLATE VOLTAGE	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE#	2200 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	250 max.	volts

6DT5



6DT5

BEAM POWER TUBE

CATHODE CURRENT:

Peak	190	max.	ma
Average	55	max.	ma
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	9	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-No.1-Circuit Resistance:

For fixed-bias operation	0.5	max.	megohm
For cathode-bias operation	1	max.	megohm

○ Without external shield.

■ This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

* This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

▲ The dc component must not exceed 100 volts.

Sharp-Cutoff Pentode With Two Independent Control Grids

7-PIN MINIATURE TYPE
For FM Detector Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp

Direct Interelectrode Capacitances
(Approx.):[▲]

Grid No.1 to plate	0.02	μf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	5.8	μf
Grid No.3 to plate	1.7	μf
Grid No.1 to grid No.3	0.1	μf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	6.1	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	150	volts
Grid No.3	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage	100	volts
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1350	μmhos
Transconductance, Grid No.3 to Plate	51 [†]	μmhos
Plate Current	1.55	ma
Grid-No.2 Current	1.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-5.2	volts
Grid-No.3 Voltage (Approx.) for plate μa = 10	-4.2	volts

Mechanical:

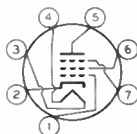
Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)



6DT6-A

Basing Designation for BOTTOM VIEW. 7EN

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

FM DETECTOR

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	330 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE	28 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
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	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts.	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION.	1.7 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:

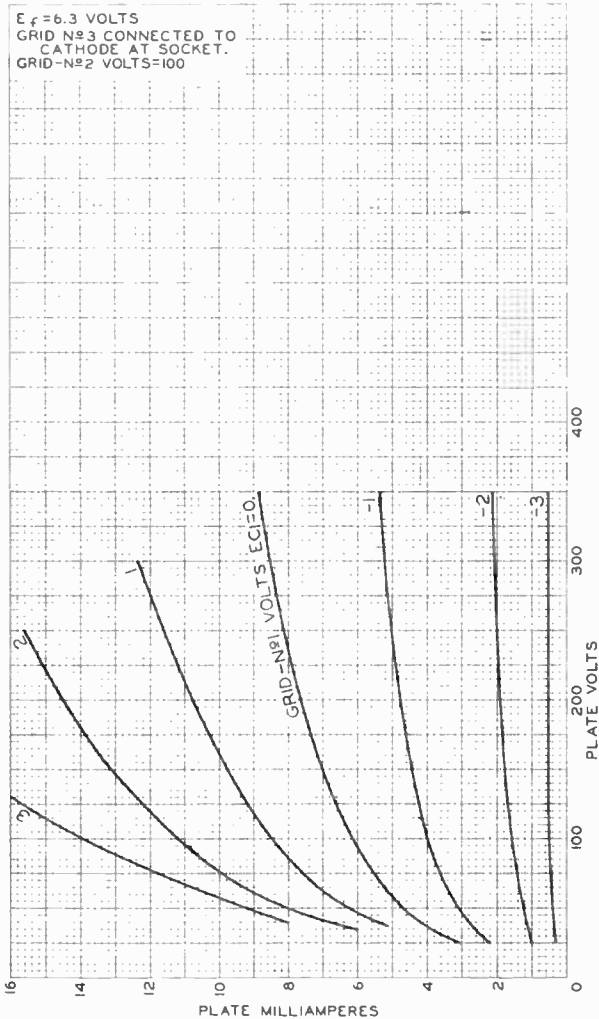
Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	0.5 max.	megohm

- ▲ with external shield JEDEC No.316 connected to cathode.
- The dc component must not exceed 100 volts.



AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
 GRID N^o3 CONNECTED TO
 CATHODE AT SOCKET.
 GRID-N^o2 VOLTS=100

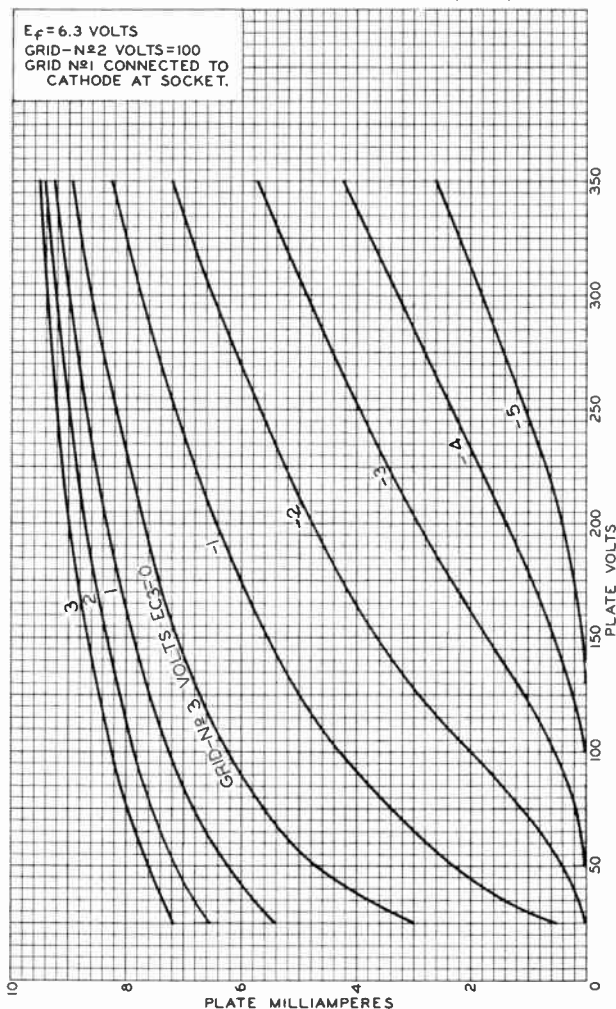


92CM-8827R2



6DT6-A

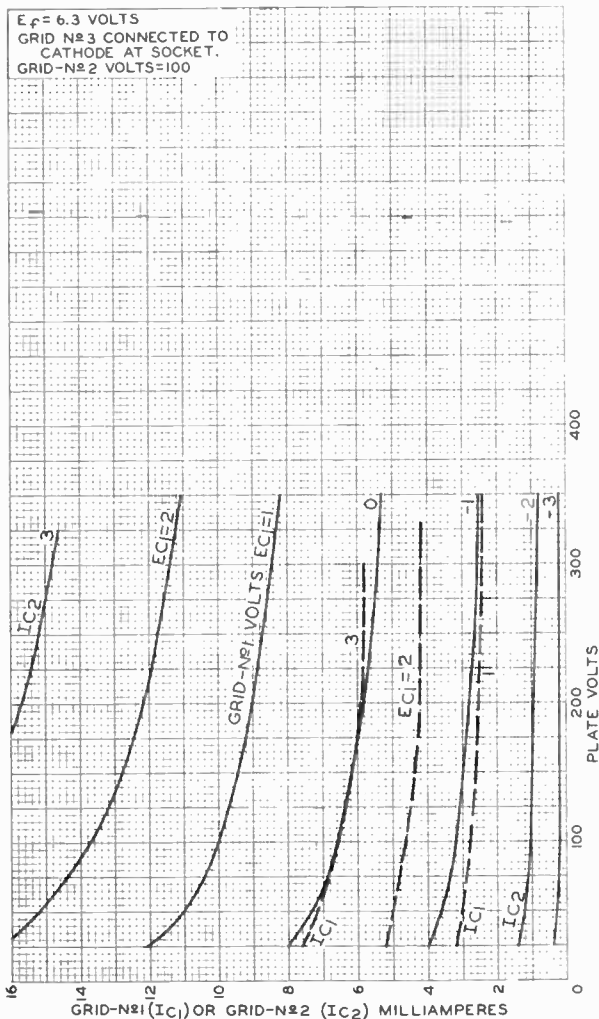
AVERAGE PLATE CHARACTERISTICS



92CM-8830R2



AVERAGE CHARACTERISTICS

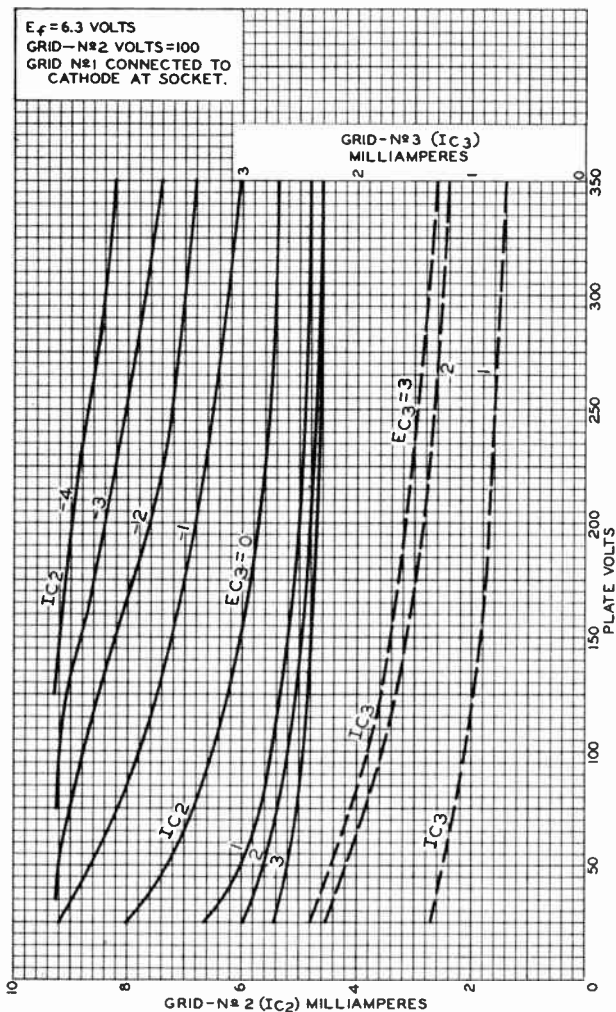


92CM-8828R2



6DT6-A

AVERAGE CHARACTERISTICS



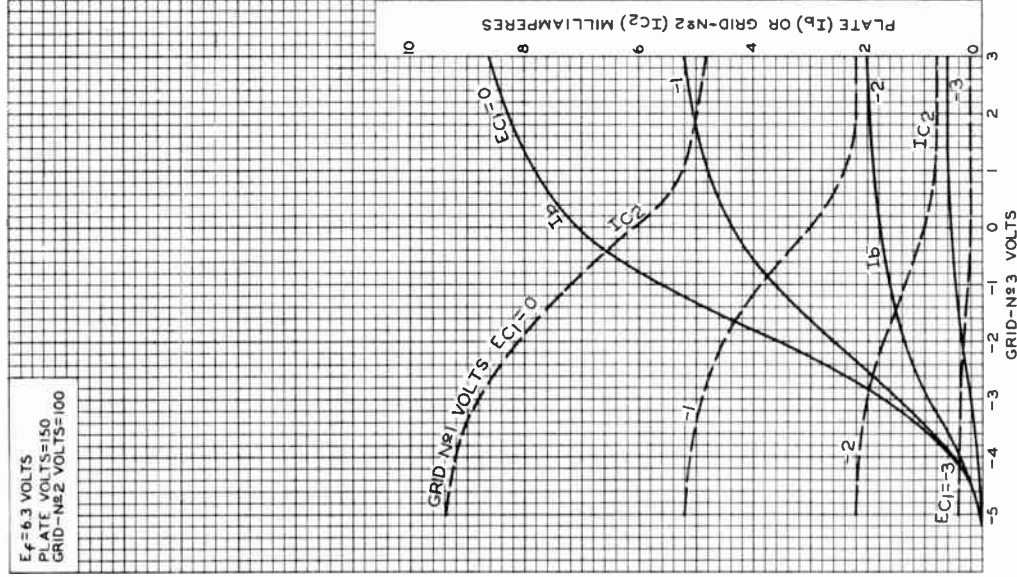
92CM-8829R2



6DT6-A

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 150
GRID-N#2 VOLTS = 100



92CM-8826RI



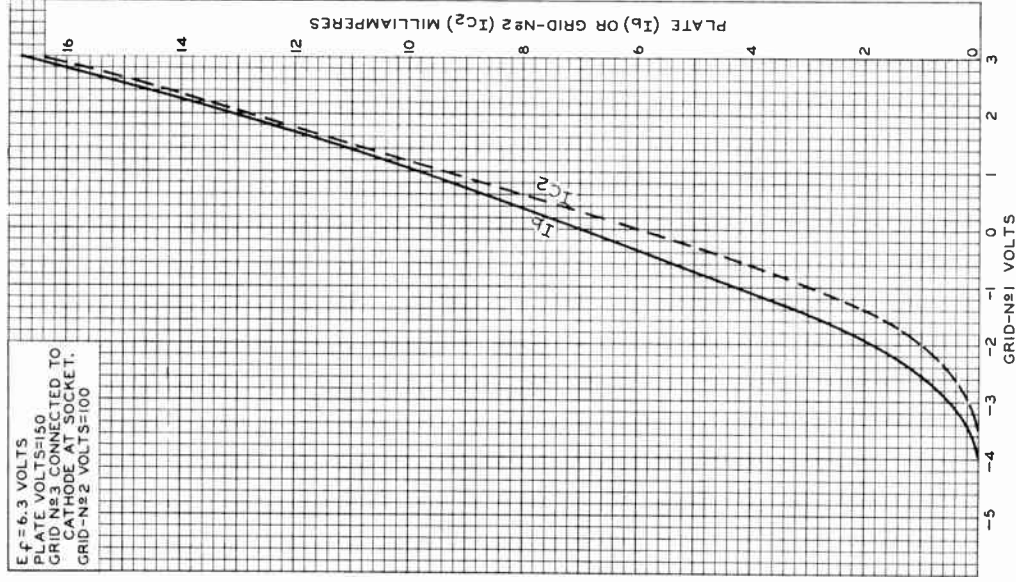
RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 4
1-61

6DT6-A

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS=150
GRID-N₃ CONNECTED TO
CATHODE AT SOCKET.
GRID-N₂ VOLTS=100



92CM-8825R1

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.





6DT8

6DT8

HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage 6.3 ac or dc volts

Current 0.3 amp

Direct Interelectrode Capacitances (Approx.):

Unit No. 1 Unit No. 2

Grid-Drive Operation:^oGrid to plate 1.6 1.6 $\mu\mu\text{f}$ Grid to cathode, internal shield, and heater. 2.7 2.7 $\mu\mu\text{f}$ Plate to cathode, internal shield, and heater. 1.6 1.6 $\mu\mu\text{f}$ Heater to cathode^o. 3 3 $\mu\mu\text{f}$ Cathode-Drive Operation:^oCathode to grid, internal shield, and heater. - 5.3 $\mu\mu\text{f}$ Plate to grid, internal shield, and heater. - 2.8 $\mu\mu\text{f}$ Characteristics, Class A₁ Amplifier (Each Unit):

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 current of 10 μa -5 -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" \pm 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)

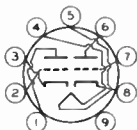
Basins Designation for BOTTOM VIEW. 9AJ

Pin 1 - Plate of Unit No. 2 Pin 6 - Plate of Unit No. 1

Pin 2 - Grid of Unit No. 2 Pin 7 - Grid of Unit No. 1

Pin 3 - Cathode of Unit No. 2 Pin 8 - Cathode of Unit No. 1

Pin 4 - Heater Pin 9 - Internal Shield

^o with external shield JETEC No. 315 connected to cathode of unit under test except as noted.^o, ^o: See next page.

6DT8



6DT8

HIGH-MU TWIN TRIODE

AMPLIFIER — Class A₁

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300	max.	volts
GRID VOLTAGE:			
Negative bias value	50	max.	volts
PLATE DISSIPATION	2.5	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

- with external shield JETEC No.315 connected to ground.
- with external shield JETEC No.315 connected to grid of unit under test.
- ▲ The dc component must not exceed 100 volts.



6DT8

6DT8

AVERAGE PLATE CHARACTERISTICS EACH UNIT

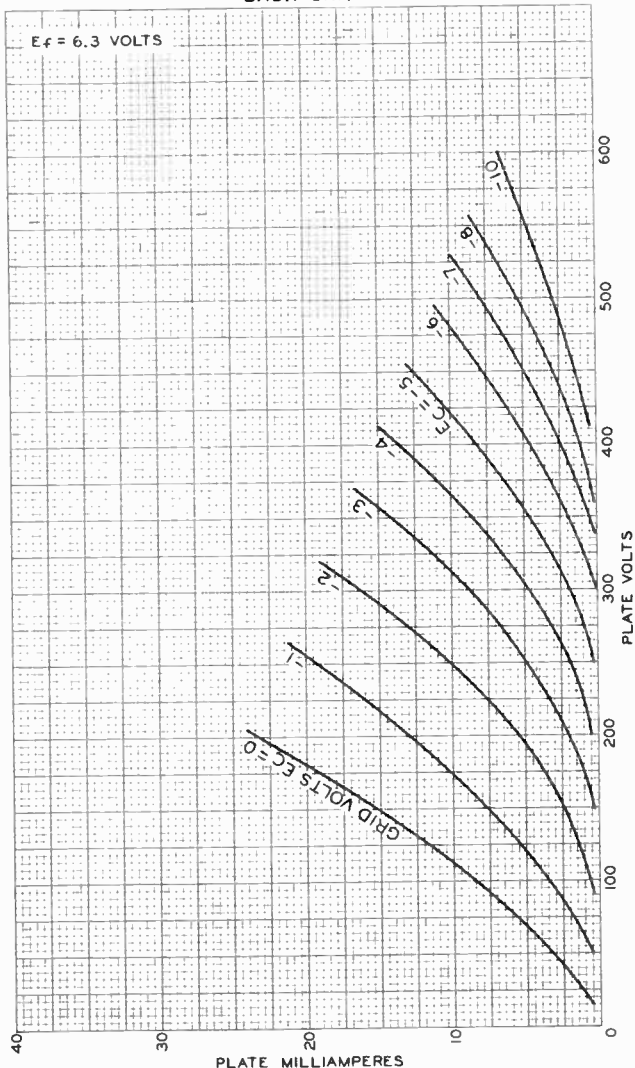


PLATE MILLIAMPERES

PLATE VOLTS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

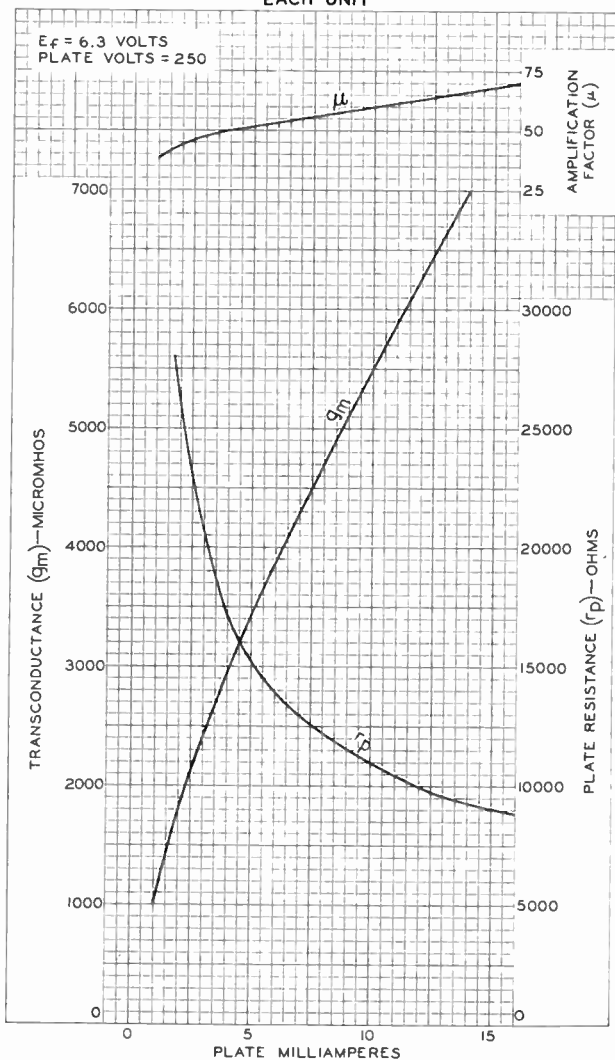
92CM-9397

6DT8



6DT8

AVERAGE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-9396

Medium-Mu Triode

NUVISTOR TYPE

Having Gold-Plated Envelope and Base Pins to Assure Positive Grounding and Low Pin-Contact Resistance for Oscillator Applications at UHF Frequencies

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (<i>Design-Maximum Values</i>):		
voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.135	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.):		
Grid to plate	1.8	pf
Grid to cathode, shell, and heater	4.4	pf
Plate to cathode, shell, and heater	1.9	pf
Plate to cathode	0.25	pf
Heater to cathode	1.4	pf
Grid to cathode	3.7	pf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	75	volts
Cathode Resistor	100	ohms
Amplification Factor	35	
Plate Resistance (Approx.)	3100	ohms
Transconductance	11500	μmhos
Plate Current	10.5	ma
Grid Voltage (Approx.) for plate μa = 10.	-7	volts

Mechanical:

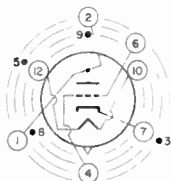
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	0.800"
Maximum Seated Length	0.625"
Maximum Diameter	0.440"
Envelope	Metal Shell MT4
Socket	Industrial Electronic Hardware Corp. No. MSN0707-1, or equivalent
Base	Medium Ceramic-Wafer Twelvar 7-Pin (JEDEC No. E7-83)



6DV4

Basing Designation for BOTTOM VIEW. 12EA

- Pin 1 - Plate
- Pin 2 - Plate
- Pin 3^a - Do Not Use
- Pin 4 - Grid
- Pin 5 - Same as Pin 3
- Pin 6 - Grid
- Pin 7 - Cathode
- Pin 8 - Same as Pin 3
- Pin 9 - Same as Pin 3
- Pin 10 - Heater
- Pin 12 - Heater



INDEX = LARGE LUG
● = SHORT PIN

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE.	300 ^b max.	volts
PLATE VOLTAGE	125 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Peak-positive value	2 max.	volts
CATHODE CURRENT	15 max.	ma
PLATE DISSIPATION	1 max.	watt

Typical Operation:

4s oscillator at 950 Mc

Plate Voltage	60	volts
Grid Voltage.	-2	volts
Grid Resistor	5600	ohms
Plate Current	8	ma
Grid Current.	350	μa

Maximum Circuit Values:

Grid-Circuit Resistance:^c

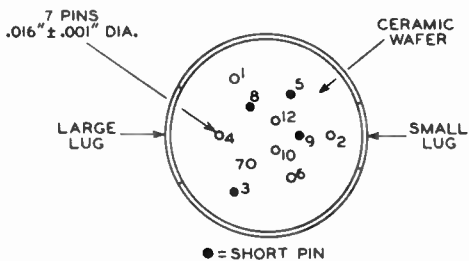
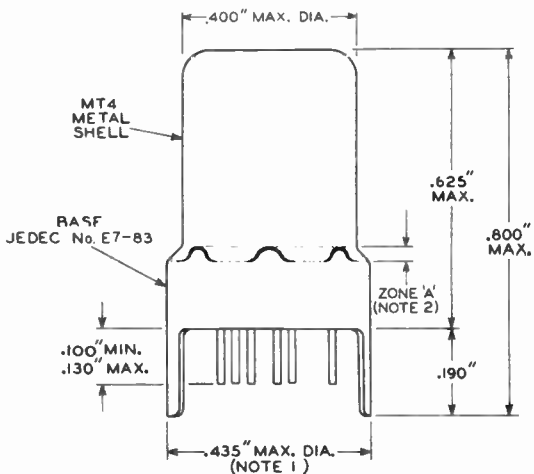
For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.2 max.	megohm

^a Pin 3 is of a length such that its end does not touch the socket insertion plane.

^b A plate supply voltage of 300 volts may be used provided that a sufficiently large resistor is used in the plate circuit to limit the plate dissipation to one watt under any condition of operation.

^c For operation at metal-shell temperatures up to 135° C.





92CS-11782R1

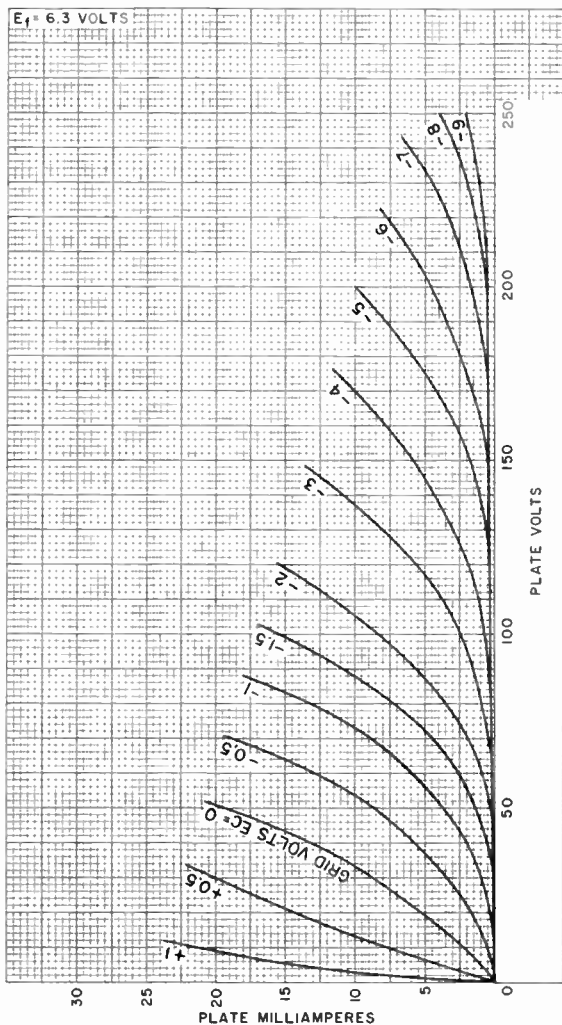
NOTE 1: MAXIMUM OUTSIDE DIAMETER OF 0.440" IS PERMITTED ALONG 0.190" LUG LENGTH.

NOTE 2: SHELL TEMPERATURE SHOULD BE MEASURED IN ZONE "A" BETWEEN BROKEN LINES.



6DV4

AVERAGE PLATE CHARACTERISTICS



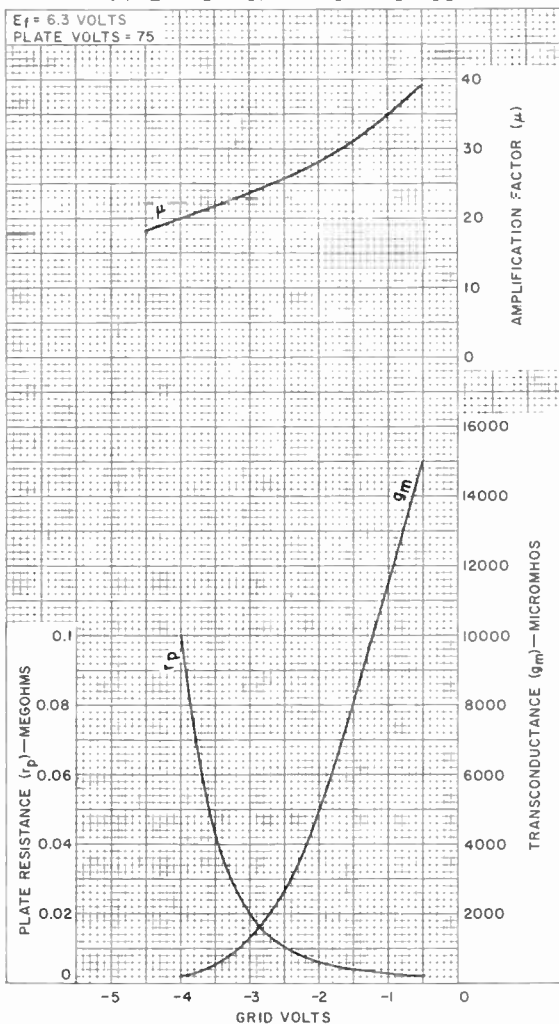
92CM-11781

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



AVERAGE CHARACTERISTICS

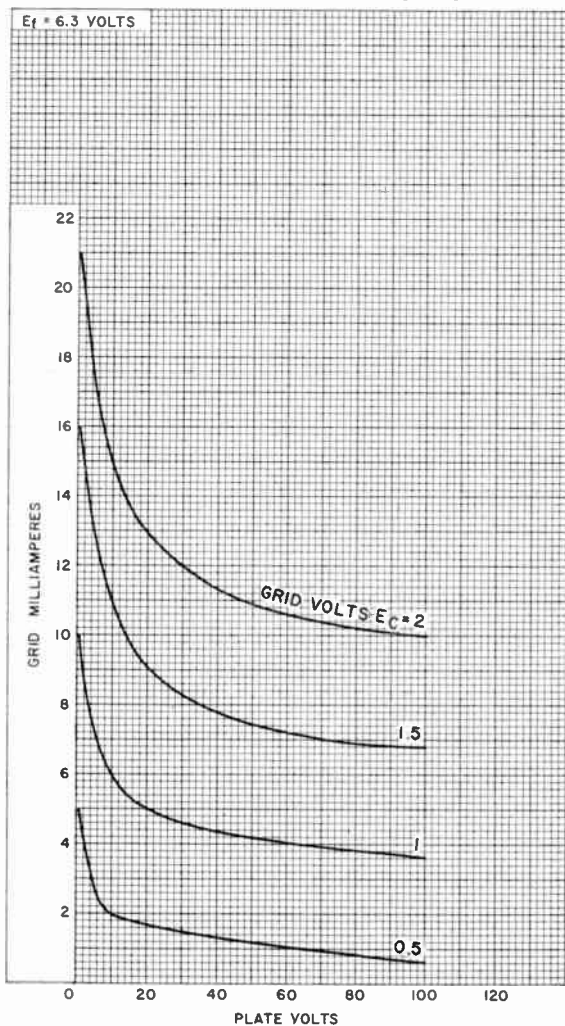


92CM-11780



6DV4

AVERAGE CHARACTERISTICS



92CM-11779



Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp

Maximum heater-cathode voltage:

Heater negative with

respect to cathode:^a

Peak	5500	volts
----------------	------	-------

DC component	900	volts
------------------------	-----	-------

Heater positive with

respect to cathode:

Peak	300	volts
----------------	-----	-------

DC component	100	volts
------------------------	-----	-------

Direct Interelectrode Capacitances

(Approx.):^b

Plate to cathode and heater	6.5	pt
---------------------------------------	-----	----

Cathode to plate and heater	9.0	pt
---------------------------------------	-----	----

Heater to cathode	2.2	pt
-----------------------------	-----	----

Mechanical:

Operating Position	Any
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Type of Cathode	Coated Unipotential
---------------------------	---------------------

Maximum Overall Length	3.005"
----------------------------------	--------

Seated Length	2.375" to 2.625"
-------------------------	------------------

Diameter	1.062" to 1.188"
--------------------	------------------

Dimensional Outline (JEDEC 12-99)	See <i>General Section</i>
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Bulb	T9
----------------	----

Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-89)
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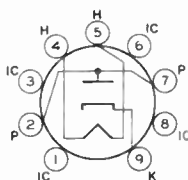
Basing Designation for BOTTOM VIEW	9HP
--	-----

Pin 1 - Do Not Use^c

Pin 2 - Plate

Pin 3 - Do Not Use^c

Pin 4 - Heater



Pin 5 - Heater

Pin 6 - Do Not Use^c

Pin 7 - Plate

Pin 8 - Do Not Use^c

Pin 9 - Cathode



6DW4B

DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

Peak Inverse Plate Voltage ^a	5500	volts
Peak Plate Current	1300	ma
DC Plate Current	250	ma
Plate Dissipation	8.5	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 350 25 volts

^a This rating is applicable when the duration of the voltage pulse does 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.

^b without external shield.

^c Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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



High-Mu Triode— Sharp-Cutoff Pentode

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 voltage = 6.3 0.720 amp

Peak heater-cathode voltage

(Each unit):

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200 max. volts

Direct Interelectrode Capacitances:^a

Triode Unit:

Grid to plate 2.7 μf

Grid to all other elements except plate 4.0 μf

Plate to all other elements except grid 2.3 μf

Grid to heater 0.1 max. μf

Pentode Unit:

Grid No.1 to plate 0.1 max. μf

Grid No.1 to all other elements except plate 9.0 μf

Plate to all other elements except grid No.1 4.5 μf

Grid No.1 to heater 0.1 max. μf

Triode plate to pentode grid No.1 0.01 max. μf

Triode grid to pentode grid No.1 0.01 max. μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>			
Plate Voltage	200	170	200	220	volts
Grid-No.2 Voltage	-	170	200	220	volts
Grid-No.1 Voltage	-1.7	-2.1	-2.9	-3.4	volts
Amplification Factor	65	-	-	-	
Mu Factor, Grid No.2 to					
Grid No.1	-	36	36	36	
Plate Resistance (Approx.)	-	0.1	0.13	0.15	megohm
Transconductance	4000	11000	10400	10000	μmhos
Plate Current	3	18	18	18	ma
Grid-No.2 Current	-	3	3	3	ma

Mechanical:

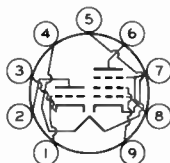
Operating Position Any
Type of Cathodes Coated Unipotential
Maximum Overall Length 2-5/8"
Maximum Seated Length 2-3/8"



6DX8

Length, Base Seat to Bulb Top (Excluding tip) . . . 2" \pm 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 9HX

Pin 1 - Triode
 Grid
 Pin 2 - Triode
 Plate
 Pin 3 - Triode
 Cathode
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Pentode
 Plate



Pin 7 - Pentode
 Grid No.3,
 Pentode
 Cathode,
 Internal
 Shield
 Pin 8 - Pentode
 Grid No.1
 Pin 9 - Pentode
 Grid No.2

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

	Triode Unit	Pentode Unit	
PLATE SUPPLY VOLTAGE	550 max.	550 max.	volts
PEAK PLATE VOLTAGE with maximum plate ma. = 0.1 ^b	600 max.	—	volts
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	—	550 max.	volts
GRID-No.2 VOLTAGE	—	300 max.	volts
CATHODE CURRENT	12 max.	40 max.	ma
GRID-No.2 INPUT	—	1.7 max.	watts
PLATE DISSIPATION	1 max.	4 max.	watts

Typical Operation (Pentode Unit):

As video-output tube

Plate Supply Voltage	170	200	220	volts
Series Plate Resistor	3000	3000	3000	ohms
Grid-No.2 Voltage	170	200	220	volts
Grid-No.1 Voltage	-2	-2.8	-3.3	volts
Transconductance	10400	10000	9700	μ mhos
Plate Current	18	18	18	ma
Grid-No.2 Current	3.2	3.1	3.1	ma

Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance: For fixed-bias operation	1 max.	1 max.	megohm
For cathode-bias operation	3 max.	2 max.	megohms

^a without external shield.

^b with duty factor = 0.18 maximum and pulse duration = 18 microseconds maximum.



Medium-Mu Triode

7-PIN MINIATURE TYPE

For UHF-Oscillator Service in TV Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.225	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	50	max. volts
Heater positive with respect to cathode	50 ^a	max. volts

Direct Interelectrode Capacitances (Approx):^b

Grid to plate	1.8	pf
Grid to cathode and heater	2.2	pf
Plate to cathode and heater	1.3	pf

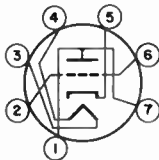
Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	80	volts
Plate Resistor	2700	ohms
Amplification Factor	14	
Plate Resistance (Approx)	2000	ohms
Transconductance	6700	μmhos
Plate Current	15	ma
Grid Voltage (Approx) for plate $\mu_a = 20$	-11	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 <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7DK

Pin 1 - Plate
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Cathode
Pin 6 - Grid
Pin 7 - Plate

6DZ4

UHF OSCILLATOR

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	135 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
GRID CURRENT	2 max.	ma
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	2.3 max.	watts

Typical Operation:^c

At frequency of 1000 Mc

Plate Supply Voltage	135	volts
Plate-Circuit Resistance	2700	ohms
Grid Resistor	10000	ohms
Plate Current	15.5	ma
Grid Current (Approx)	800	μ a

Maximum Circuit Values:

Grid-Circuit Resistance:

- For fixed-bias operation Not recommended
- For cathode-bias operation 0.5 max. megohm

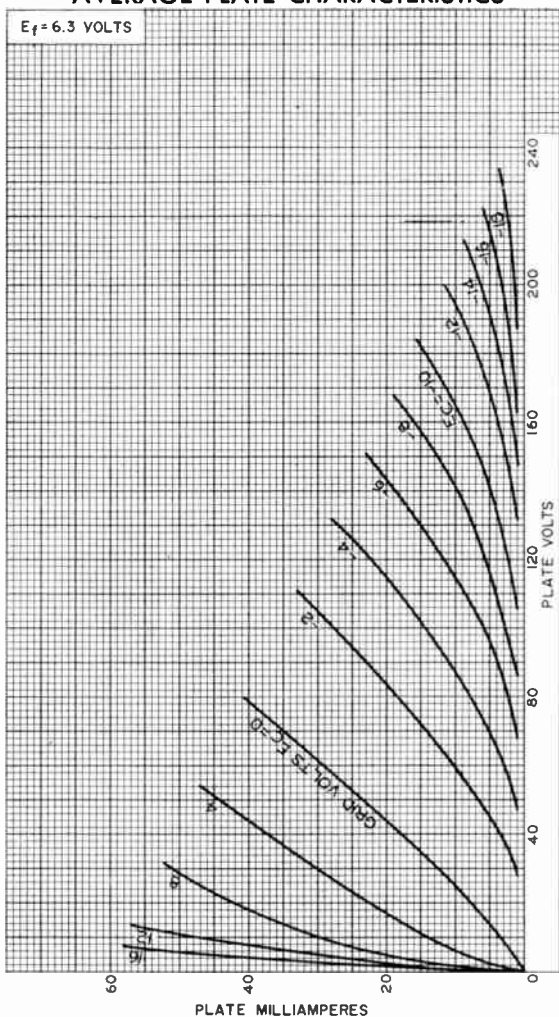
^a The dc component must not exceed 25 volts.

^b with external shield JEDEC No.316 connected to cathode.

^c Measured in JEDEC STANDARD OSCILLATION TEST SET No.400 with external, added resistance in plate circuit.



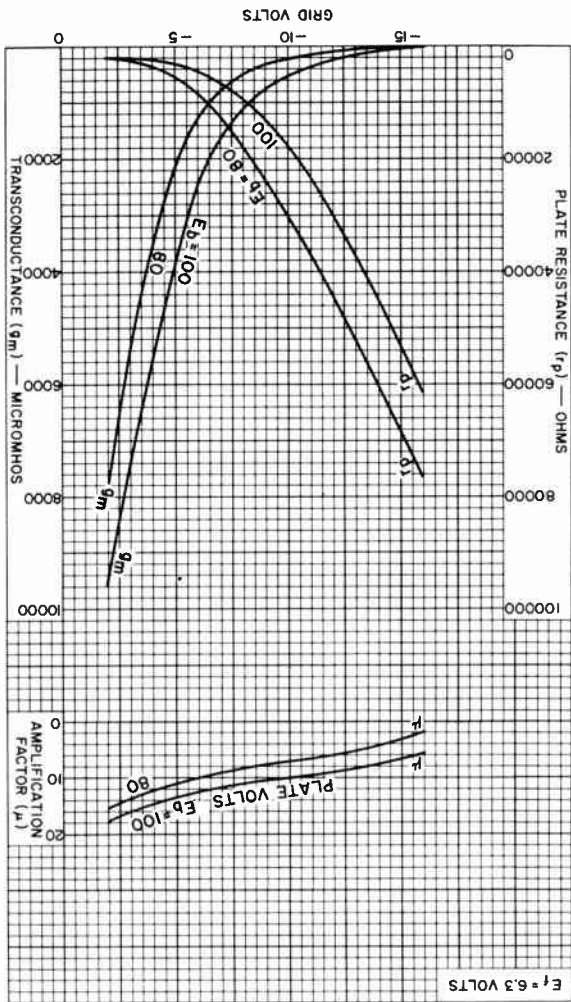
AVERAGE PLATE CHARACTERISTICS



92CM-7756



AVERAGE CHARACTERISTICS



92CM - 7758RI

RADIO CORPORATION OF AMERICA
Harrison, N. J.

Electron Tube Division





6E5

6E5

ELECTRON-RAY TUBE

INDICATOR TYPE WITH TRIODE UNIT

Heater	Coated unipotential Cathode		
Voltage	6.3	a-c or d-c volts	
Current	0.3	amp.	
Overall Length		4" ± 3/16"	←
Seated Height		3-3/8" ± 3/16"	←
Maximum Diameter		1-3/16"	
Bulb		T-9	
Base		Small 6-Pin	
Pin 1 - Heater		Pin 4 - Target	
Pin 2 - Plate		Pin 5 - Cathode	
Pin 3 - Grid		Pin 6 - Heater	
Mounting Position	BOTTOM VIEW (6R)	Any*	←



Maximum and Minimum Ratings Are Design-Center Values

INDICATOR SERVICE

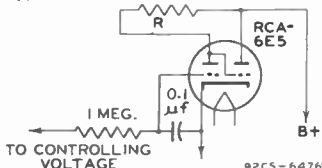
Plate-Supply Voltage		250 max. volts	
Target Voltage		{ 250 max. volts	←
		{ 125 min. volts	
		{ 90 max. volts	
D-C Heater-Cathode Potential			
Typical Operation:			←
Plate and Target Supply	125	250	volts
Series Triode-Plate Resistor**	1	1	megohm
Target Current*** †	0.8	2	ma.
Triode-Plate Current***	0.1	0.2	ma.
Triode-Grid Voltage (Approx.):			
For shadow angle of 0°	-4.0	-7.5	volts
For shadow angle of 90°	0	0	volts

* The plane of the ray-control electrode passes through pins No. 2 and No. 5.

** Designated as R in circuit diagram. † Subject to wide variations.

*** For zero triode-grid voltage. ← Indicates a change.

The 6E5 is a high-vacuum type of tube designed to indicate visually the effect of change in the controlling voltage. For different controlling voltages, the shaded pattern produced on the fluorescent target varies through an angle from 90° to approximately 0°. The extent of the shaded area is controlled by the voltage on the ray-control electrode which is an extension of the triode plate between cathode and target. The voltage on the ray-control electrode is determined by the voltage applied to the grid of the triode connected as a d-c amplifier as shown in the circuit. A decrease in triode-grid bias decreases the voltage on the ray-control electrode; conversely, an increase produces an increased voltage on the ray-control electrode. In the practical use of the 6E5 as a tuning indicator, controlling voltage applied to the triode-grid is obtained from a suitable point in the a.v.c. circuit.



92CS-6476V

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations. ← Indicates a change.

DEC. 15, 1944

RCA VICTOR DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6E5

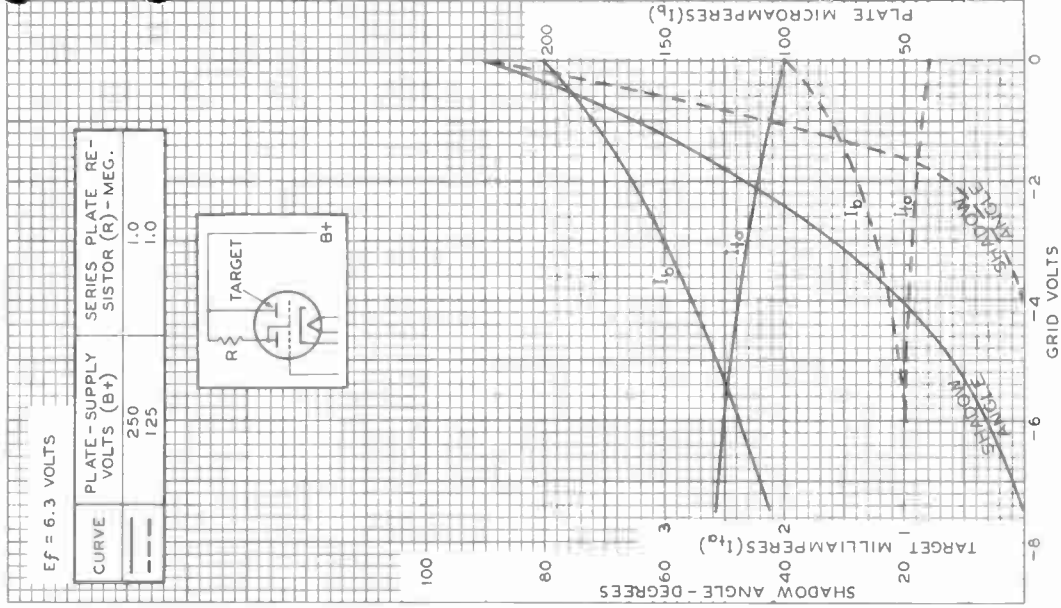
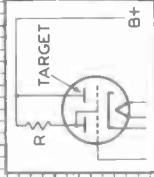


6E5

AVERAGE CONTROL CHARACTERISTICS

 $E_f = 6.3$ VOLTS

CURVE	PLATE - SUPPLY VOLTS (B+)	SERIES PLATE RESISTOR (R) - MEG.	RE-PLATE RESISTOR (R) - MEG.
—	250	1.0	1.0
- - -	125	1.0	1.0



OCT. 12, 1944

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

92CM-4422R4

Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	1.05	amp

Direct Interelectrode Capacitances

(Approx.)^a

	Unit No. 1	Unit No. 2	
Grid to plate	4	8	μμf
Grid to cathode and heater. . .	2.2	6	μμf
Plate to cathode and heater . .	0.6	1.3	μμf

Characteristics, Class A₁ Amplifier:

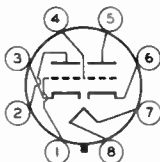
	Unit No. 1	Unit No. 2	
Plate Voltage	250	60 175	volts
Grid Voltage.	-3	0 -25	volts
Amplification Factor.	66	- 5.5	
Plate Resistance (Approx.). . . .	30000	- 920	ohms
Transconductance.	2200	- 6000	μmhos
Plate Current	2	100 ^b 40	ma
Grid Voltage (Approx.) for plate μ _a = 20	-5.3	- -	volts
Grid Voltage (Approx.) for plate μ _a = 200.	-	- -45	volts

Mechanical:

Operating Position.	Any
Maximum Overall Length.	3"
Maximum Seated Length	2-7/16"
Maximum Diameter.	1-9/32"
Bulb.	T9
Base.	Intermediate-Shell Octal 8-Pin (JEDEC Group 1, 88-6)

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



VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC PLATE VOLTAGE.	350 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400 max.	volts
PLATE DISSIPATION	1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^d max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation.	1 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC PLATE VOLTAGE.	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^e	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	10 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

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation.	1 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

^a without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

^d The dc component must not exceed 100 volts.

^e This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 0%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^a	
<i>Triode Unit:</i>			
Grid to plate	1.7	1.7	μf
Grid to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater.	3	3.2	μf
Plate to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater.	1.4	1.9	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate.	0.02 max.	0.01 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid-No.2, and heater.	5	5	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	3.4	μf
Heater to cathode (Each unit)	3	3 ^b	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate-Supply Voltage.	150	125	volts
Grid-No.2 Voltage	-	125	volts
Grid-No.1 Voltage	-	-1	volt
Cathode Resistor.	56	-	ohms
Amplification Factor.	40	-	
Plate Resistance (Approx.)	5000	200000	ohms
Transconductance.	8500	6400	μmhos
Plate Current	18	12	ma
Grid-No.2 Current	-	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-12	-9	volts

← Indicates a change.

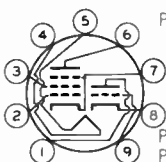


6EA8

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. 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 A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
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	2.5 max.	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200 max.	200 max.	volts
Heater positive with respect to cathode.	200 ^c max.	200 ^c max.	volts

^a with external shield JEDEC No.315 connected to cathode of unit under test except as noted.

^b with external shield JEDEC No.315 connected to ground.

^c The dc component must not exceed 100 volts.

→ Indicates a change.

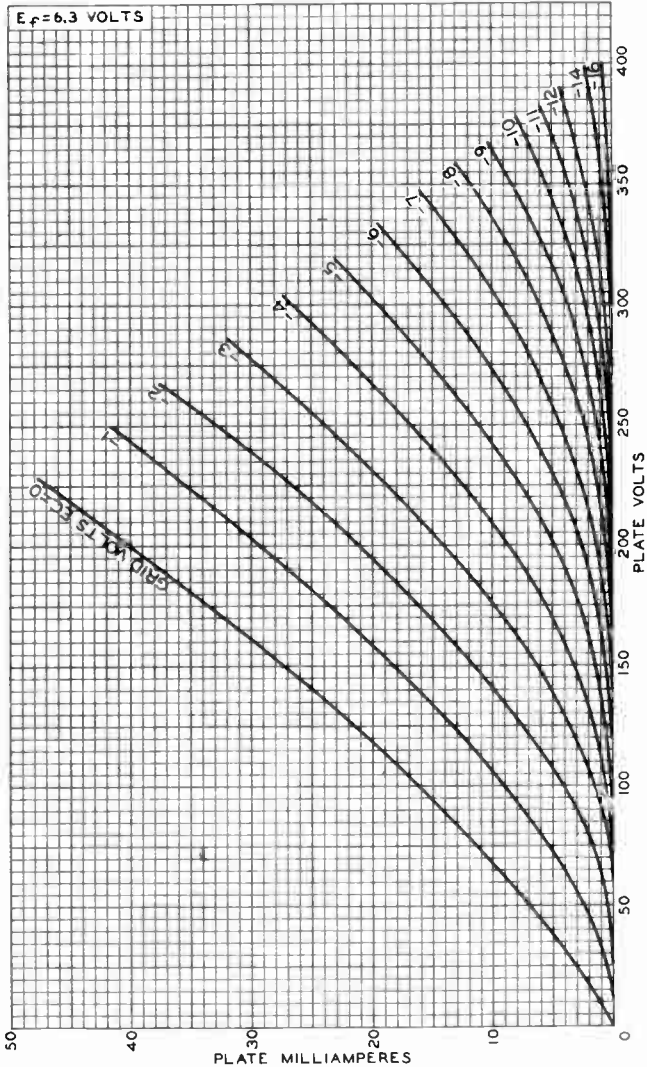




6EA8

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT

6EA8



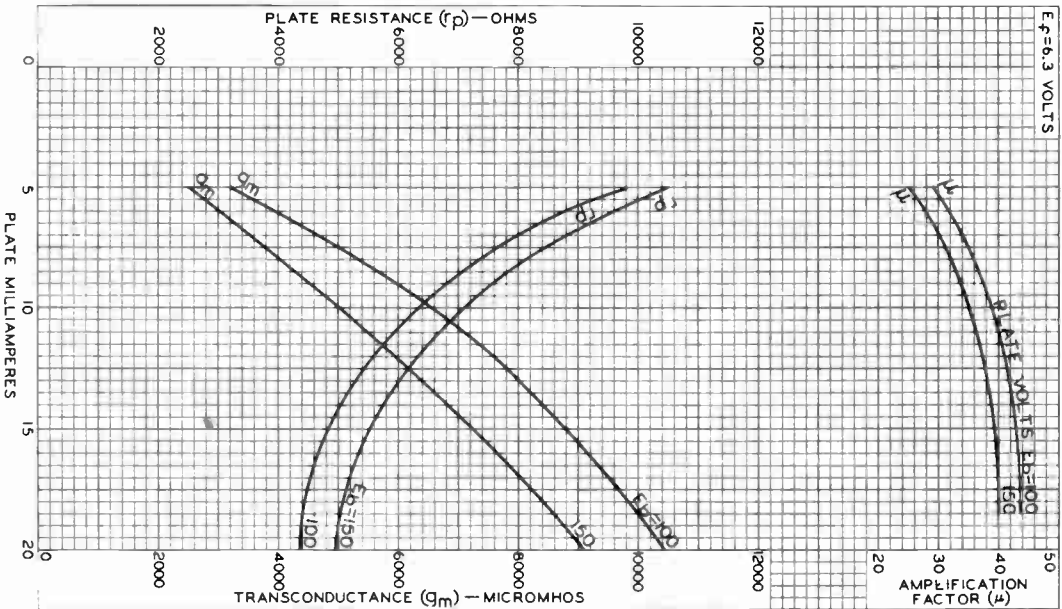
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AVERAGE CHARACTERISTICS

TRIODE UNIT

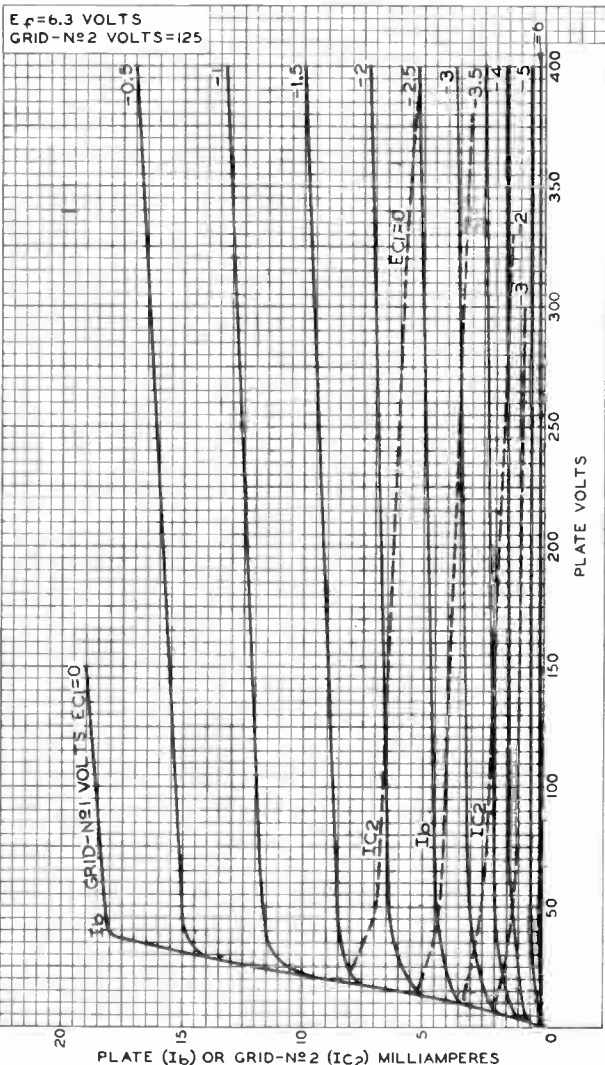




6EA8

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AVERAGE CHARACTERISTICS PENTODE UNIT



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-9867

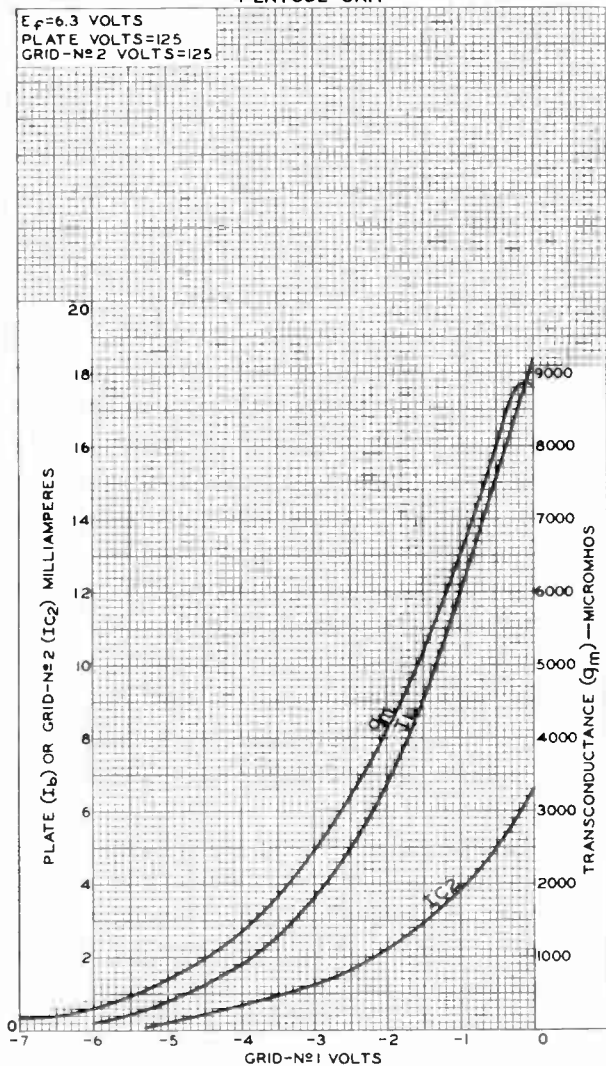
6EA8



6EA8

AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 125
 GRID-N \circ 2 VOLTS = 125



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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-9868



6EB8

6EB8

HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage. 6.3 ± 10% . . . ac or dc volts

Current. 0.75 amp

Direct Interelectrode Capacitances:⁰

Triode Unit:

Grid to plate. 4.4 μf

Grid to cathode and heater . . . 2.4 μf

Plate to cathode and heater. . . 0.36 μf

Pentode Unit:

Grid No.1 to plate 0.1 max. μf

Grid No.1 to cathode &
internal shield & grid
No.3, grid No.2, and
heater 11 μf

Plate to cathode & internal
shield & grid No.3, grid
No.2, and heater 4.2 μf

Triode grid to pentode plate . . . 0.018 max. μf

Pentode grid No.1 to triode plate. 0.005 max. μf

Pentode plate to triode plate. . . 0.17 max. μf

Characteristics. Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage	250	45 200	volts
Grid-No.2 Supply Voltage	-	125 125	volts
Grid-No.1 Voltage.	-2	0 -	volts
Cathode Resistor	-	- 68	ohms
Amplification Factor	100	- -	
Plate Resistance (Approx.) . . .	37000	- 75000	ohms
Transconductance	2700	- 12500	μmhos
Plate Current.	2	40* 25	ma
Grid-No.2 Current.	-	15* 7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-	- -9	volts
Grid Voltage (Approx.) for plate μa = 20.	-5	- -	volts

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

6EB8



6EB8

HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

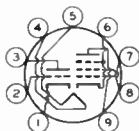
Base Small-Button Noval 9-Pin (JEDEC No. E9-1)

Basing Designation for BOTTOM VIEW 9DX

Pin 1 - Triode
CathodePin 2 - Triode
GridPin 3 - Triode
Plate

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Pentode
Cathode,
Grid No. 3,
Internal
ShieldPin 7 - Pentode
Grid No. 1Pin 8 - Pentode
Grid No. 2Pin 9 - Pentode
Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
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

	Triode Unit	Pentode Unit	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1 max.	5 max.	watts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 165 volts	-	1.1 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

	Triode Unit	Pentode Unit	
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

Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No. 1-Circuit Resistance:			
For fixed-bias operation	0.5 max.	0.25 max.	megohms
For cathode-bias operation	1 max.	1 max.	megohms



6EB8

6EB8

HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

- Without external shield.
- This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ▲ The dc component must not exceed 100 volts.

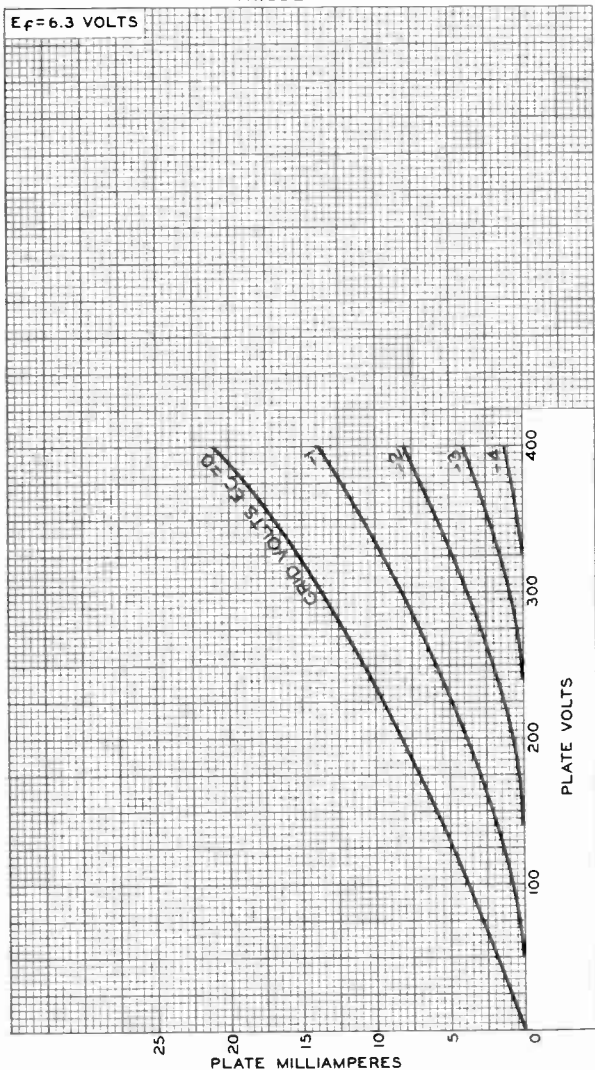
6EB8



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AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT

$E_f = 6.3$ VOLTS



25
20
15
10
5
0
PLATE MILLIAMPERES

400
300
200
100
0
PLATE VOLTS

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

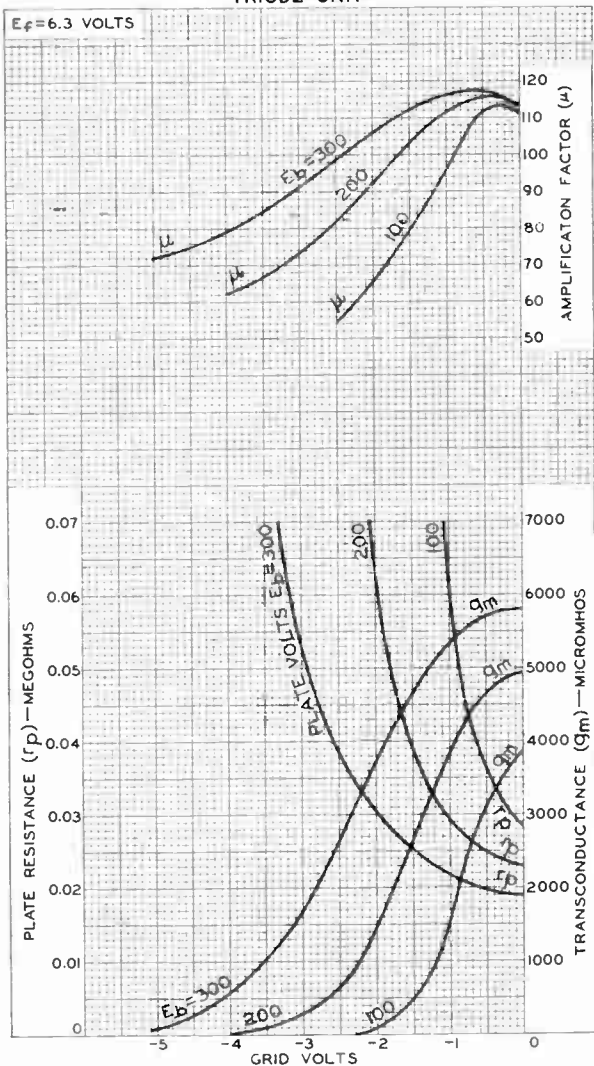
92CM-9907R1



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6EB8

AVERAGE CHARACTERISTICS TRIODE UNIT



6EB8



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AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
GRID-N^o2 VOLTS = 125

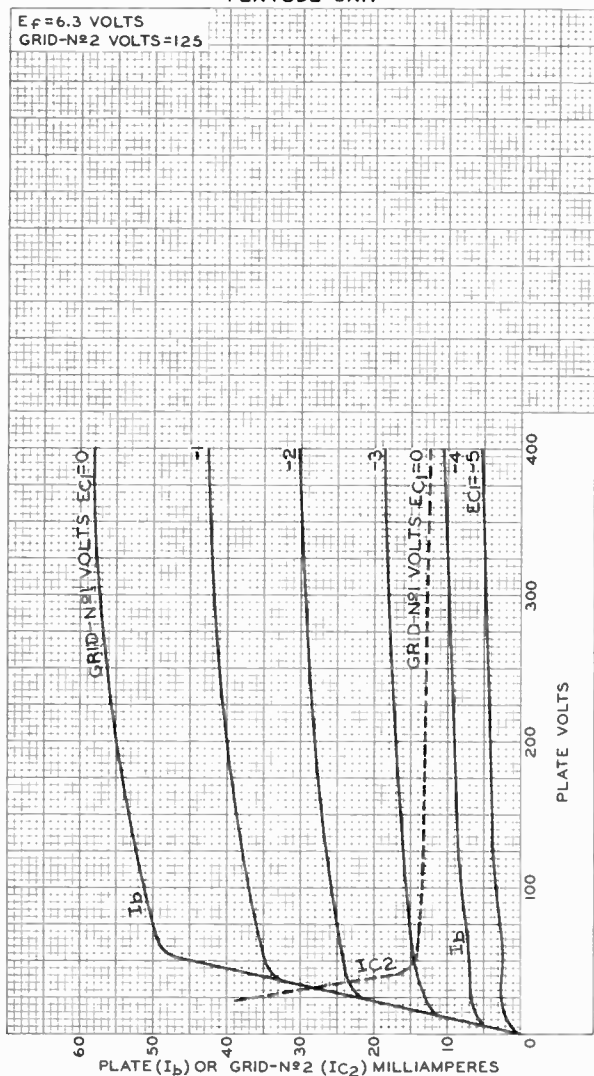


PLATE (I_b) OR GRID-N^o2 (I_{c2}) MILLIAMPERES

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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9906

World Radio History

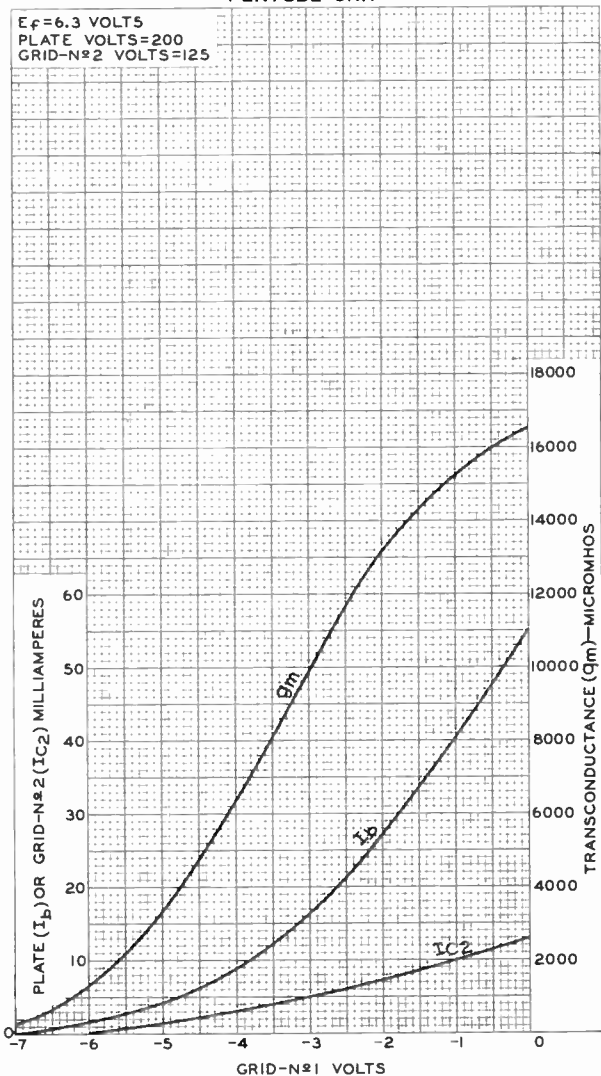


6EB8

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AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$ VOLTS
PLATE VOLTS = 200
GRID-N $\#$ 2 VOLTS = 125



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9905



Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratios (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:		
Heater negative with respect to cathode	150 max.	volts
Heater positive with respect to cathode	150 max.	volts

Direct Interelectrode Capacitances:^a

Grid No.1 to plate	0.005 max.	μf
Grid No.1 to cathode, grid No.3, grid No.2, internal shield, and heater	9	μf
Plate to cathode, grid No.3, grid No.2, internal shield, and heater	3	μf

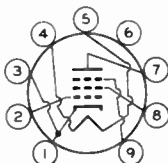
Characteristics, Class A₁ Amplifier:

Plate Voltage	200	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Voltage	90	volts
Grid-No.1 Voltage	-2	volts
Plate Resistance (Approx.)	0.5	megohm
Transconductance	12500	μmhos
Plate Current	12	ma
Grid-No.2 Current	4.5	ma

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-13/32"
Maximum Seated Length	2-5/32"
Length, Base Seat to Bulb Top (Excluding tip)	1-25/32" ± 3/32"
Diameter	0.750" to 0.875"
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9A0

- Pin 1 - Cathode
- Pin 2 - Grid No.1
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Internal Shield
- Pin 7 - Plate
- Pin 8 - Grid No.2
- Pin 9 - Grid No.3



6EH7

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE SUPPLY VOLTAGE	550 max.	volts
PLATE VOLTAGE	250 max.	volts
GRID No.3 (SUPPRESSOR GRID)	<i>Connect to cathode at socket</i>	
GRID No.2 (SCREEN-GRID) SUPPLY VOLTAGE	550 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
CATHODE CURRENT	20 max.	ma
GRID-No.2 INPUT	0.65 max.	watt
PLATE DISSIPATION	2.5 max.	watts

Typical Operation:

Plate Voltage	200	200	200	200	volts
Grid No.3	<i>Connected to cathode at socket</i>				
Grid-No.2 Supply Voltage	200	200	200	200	volts
Grid-No.2 Series Resistor	22000	22000	22000	22000	ohms
Grid-No.1 Voltage	-19.5	-9.5	-6.5	-2	volts
Transconductance	125	625	1250	12500	μ mbos
RMS Grid-No.1 Voltage for cross-modulation factor = 0.01	450	160	100	-	mv

Maximum Circuit Values:

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

^a without external shield.



Sharp-Cutoff Pentode

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:

Heater negative with respect to cathode.	150 max.	volts
--	----------	-------

Heater positive with respect to cathode.	150 max.	volts
--	----------	-------

Direct Interelectrode Capacitances:^a

Grid No.1 to plate.	0.005 max.	μf
-----------------------------	------------	----

Grid No.1 to cathode, grid No.3, grid No.2, internal shield, and heater	10	μf
---	----	----

Plate to cathode, grid No.3, grid No.2, internal shield, and heater	3	μf
---	---	----

Characteristics, Class A₁ Amplifier:

Plate Voltage	190	200	volts
-------------------------	-----	-----	-------

Grid No.3	<i>Connected to cathode at socket</i>		
---------------------	---------------------------------------	--	--

Grid-No.2 Voltage	190	200	volts
-----------------------------	-----	-----	-------

Grid-No.1 Voltage	-2.35	-2.5	volts
-----------------------------	-------	------	-------

Plate Resistance (Approx.)	0.35	0.35	megohm
--------------------------------------	------	------	--------

Transconductance	15000	15000	μmhos
----------------------------	-------	-------	-------

Plate Current	10	10	ma
-------------------------	----	----	----

Grid-No.2 Current	4.1	4.1	ma
-----------------------------	-----	-----	----

Mechanical:

Operating Position	Any
------------------------------	-----

Type of Cathode	Coated Unipotential
---------------------------	---------------------

Maximum Overall Length	2-13/32"
----------------------------------	----------

Maximum Seated Length	2-5/32"
---------------------------------	---------

Length, Base Seat to Bulb Top (Excluding tip)	1-25/32" ± 3/32"
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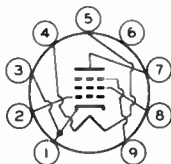
Diameter	0.750" to 0.875"
--------------------	------------------

Bulb	T6-1/2
----------------	--------

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

Pin 1 - Cathode
 Pin 2 - Grid No.1
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater



Pin 6 - Internal
 Shield
 Pin 7 - Plate
 Pin 8 - Grid No.2
 Pin 9 - Grid No.3



6EJ7

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE SUPPLY VOLTAGE	550 max.	volts
PLATE VOLTAGE	250 max.	volts
GRID No.3 (SUPPRESSOR GRID)	<i>Connect to cathode at socket</i>	
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	550 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
CATHODE CURRENT	25 max.	ma
GRID-No.2 INPUT	0.9 max.	watt
PLATE DISSIPATION	2.5 max.	watts

Maximum Circuit Values:

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

^a without external shield.



Beam Power Tube

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	0.8	amp

Direct Inter-electrode Capacitances:^a

Grid No. 1 to plate	0.7 max.	μ mf
Grid No. 1 to cathode & grid No. 3, grid No. 2, and heater	10	μ mf
Plate to cathode & grid No. 3, grid No. 2, and heater	5.1	μ mf

Characteristics, Class A₁ Amplifier:

Plate Voltage	60	250	volts
Grid-No. 2 Voltage	250	250	volts
Grid-No. 1 Voltage	0	-18	volts
Mu Factor, Grid No. 1 to Grid No. 2	-	8.7	
Plate Resistance (Approx.)	-	0.05	megohm
Transconductance	-	5100	μ mhos
Plate Current	180 ^b	40	ma
Grid-No. 2 Current	30 ^b	3	ma
Grid-No. 1 Voltage (Approx.) for plate ma. = 0.2	-	-37	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (excluding tip)	2-7/16" \pm \pm 1/32"
Diameter	0.750" to 0.850"
Dimensional Outline	See General Section
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (J&DEC No. F9-1)
Basing Designation for BOTTOM VIEW	9HN

Pin 1 - Grid No. 2
 Pin 2 - No Connection
 Pin 3 - Grid No. 1
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Grid No. 1



Pin 7 - Cathode,
 Grid No. 3
 Pin 8 - Internal
 Connection—
 Do Not Use
 Pin 9 - Plate

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system^c

DC PLATE VOLTAGE	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) ^d	2200 ^e max.	volts

← Indicates a change.



6EM5

DC GRID-No.2 (SCREEN-GRID) VOLTAGE.	285	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE.	250	max.	volts
CATHODE CURRENT:			
Peak.	210	max.	ma
Average	60	max.	ma
GRID-No.2 INPUT	1.5	max.	watts
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^f	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).			
	250	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	2.2	max.	megohms
For cathode-bias operation.	2.2	max.	megohms

^a Without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

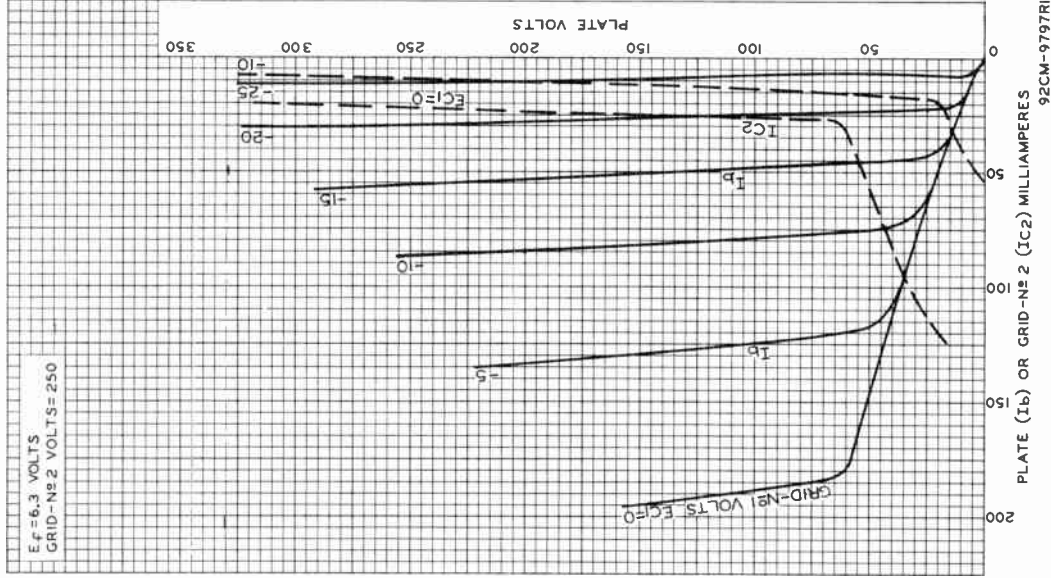
^d This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

^e Under no circumstances should this absolute-maximum value be exceeded.

^f The dc component must not exceed 100 volts.

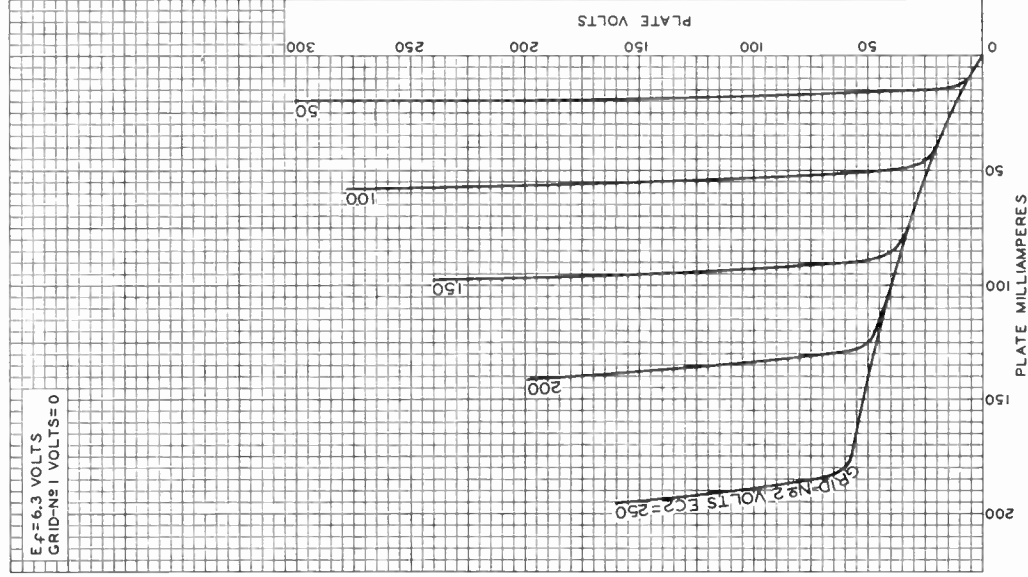


AVERAGE CHARACTERISTICS



6EM5

AVERAGE PLATE CHARACTERISTICS

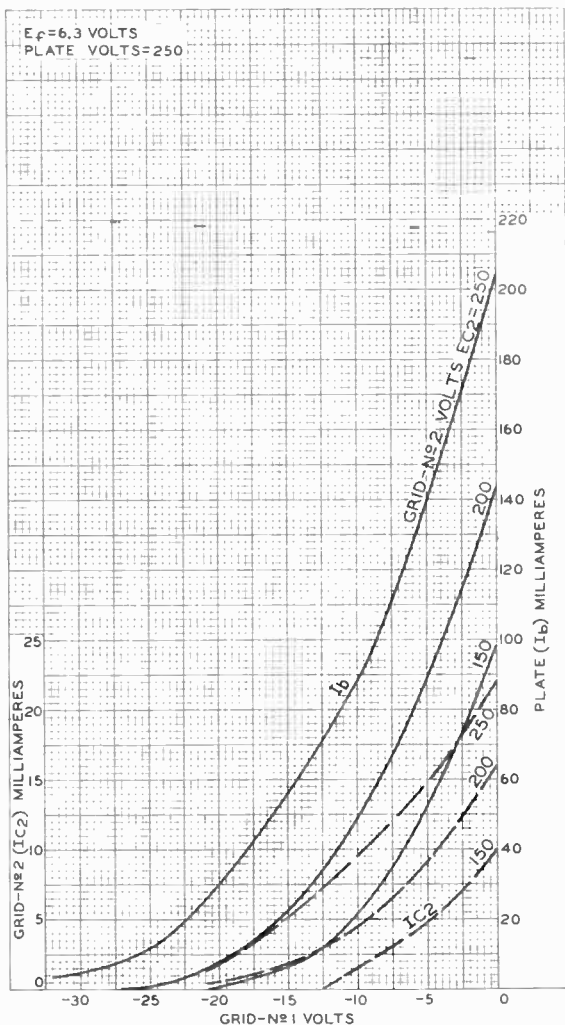


92CM-9672



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

AVERAGE CHARACTERISTICS



92CM-9673RI





Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) 6.3 ± 10% volts

Current at 6.3 volts 0.925 amp

Direct Interelectrode Capacitances (Approx.):^a

	Unit No. 1	Unit No. 2	
Grid to plate	4.8	10	μμf
Grid to cathode and heater. . .	2.2	7	μμf
Plate to cathode and heater . .	0.6	1.8	μμf

Characteristics, Class A₁ Amplifier:

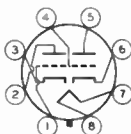
	Unit No. 1	Unit No. 2	
Plate Voltage	250	150	volts
Grid Voltage	-3	-20	volts
Amplification Factor	68	5.4	
Plate Resistance (Approx.) . . .	40000	750	ohms
Transconductance	1600	7200	μmhos
Plate Current	1.4	50	ma
Plate Current for plate volts = 60 and grid volts = 0	-	95	ma
Plate Current for grid volts = -28 .	-	10	ma
Grid Voltage (Approx.) for plate μa = 10	-5.5	-	volts
Grid Voltage (Approx.) for plate μa = 100	-	-45	volts

Mechanical:

- Operating Position Any
- Maximum Overall Length 2-7/8" ←
- Maximum Seated Length 2-5/16" ←
- Maximum Diameter 1-9/32"
- Bulb T9
- Base Short Intermediate-Shell Octal 8-Pin
with External Barriers (JEDEC Group 1, B8-58)

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

← Indicates a change.



6EM7

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC PLATE VOLTAGE	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
CATHODE CURRENT:			
Peak	77	max.	ma
Average	22	max.	ma
PLATE DISSIPATION	1.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^c	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC PLATE VOLTAGE	330	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^d	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	175	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^c	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

^a without external shield.

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

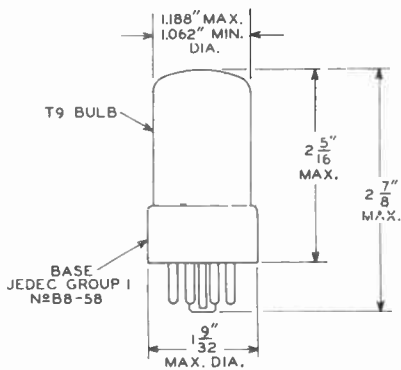
^c The dc component must not exceed 100 volts.

^d This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

OPERATING CONSIDERATIONS

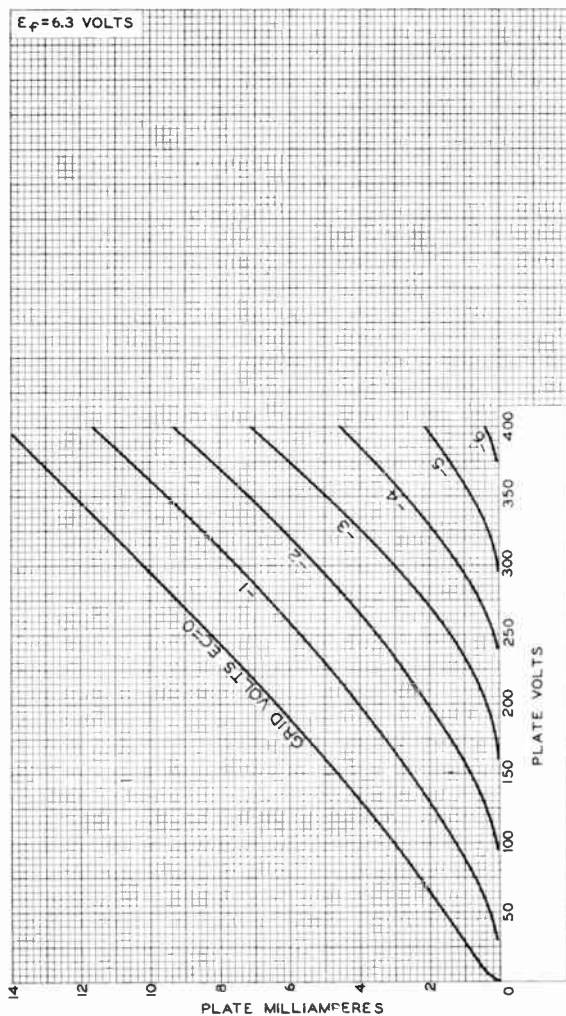
The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided.





6EM7

AVERAGE PLATE CHARACTERISTICS Unit No.1



92CM-9912

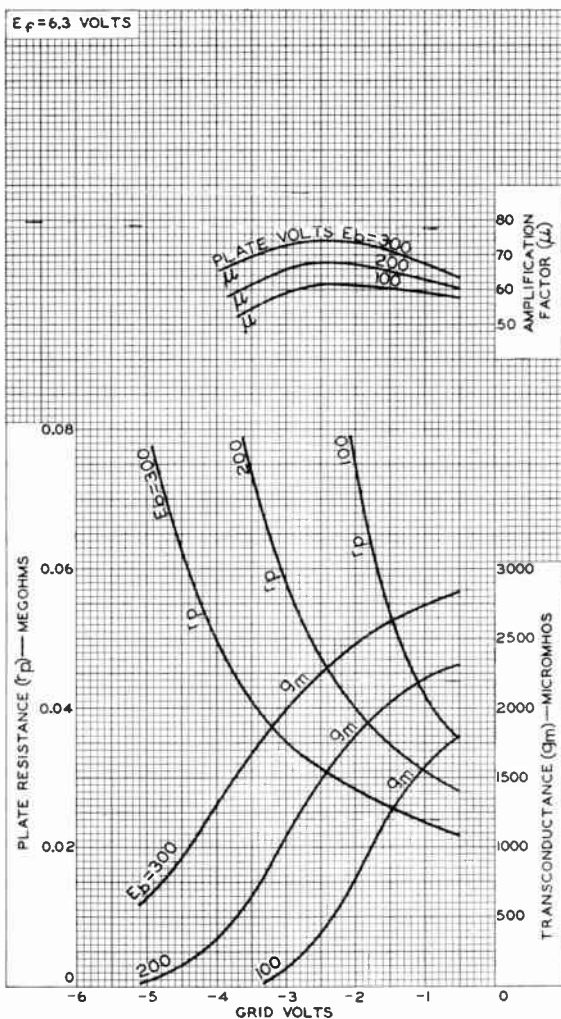
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



AVERAGE CHARACTERISTICS

Unit No.1

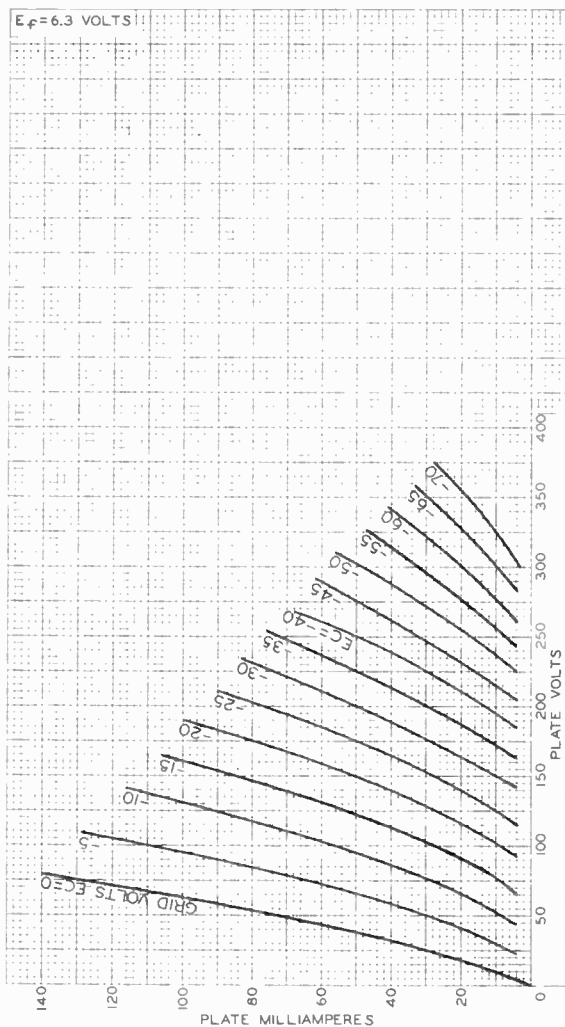


92CM-9915RI



6EM7

AVERAGE PLATE CHARACTERISTICS Unit No.2



92CM-10466

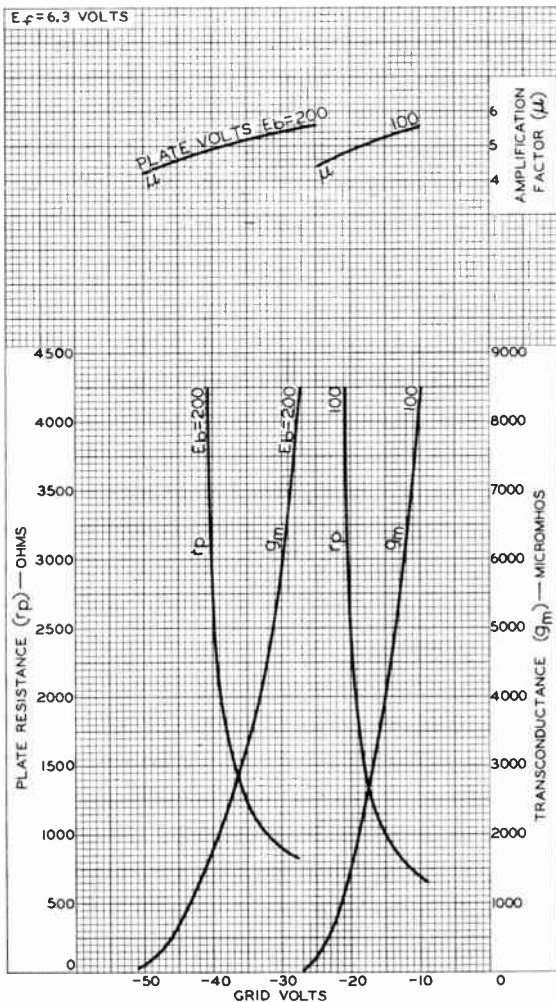
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



World Radio History

AVERAGE CHARACTERISTICS Unit No. 2



92CM-10467





Sharp-Cutoff Beam Triode

High Voltage, Low-Current Type Shunt Voltage-Regulator For DC Power Supplies in Color-TV Receivers

Designed to minimize X-radiation.

Max. DC Plate Volts
= 30000 V

Max. Plate Dissipation
= 40 watts

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc	E_h	6.3	V
Heater Current	I_h	0.2	A
Direct Interelectrode Capacitances (approx.)			
Grid to plate	c_{g-p}	1.0	pF
Input: G to (K,H)	c_i	2.6	pF
Output: P to (K,H)	c_o	1.0	pF
Amplification Factor (Approx.)	μ	2000	

MECHANICAL CHARACTERISTICS

Maximum Overall Length	5.00 in (127.0 mm)
Maximum Seated Length	4.4375 in (112.7 mm)
Maximum Diameter	1.562 in (39.6 mm)
Envelope	JEDEC T12
Cap	Small (JEDEC No. C1-50)
Base	Short Medium-Shell Octal 8-Pin With External Barriers, Style B (JEDEC Group 1, No. B8-118)
Terminal Diagram	JEDEC 8NH
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS^a

SHUNT VOLTAGE-REGULATOR SERVICE

DC Plate Voltage (absolute maximum)	E_b	30000	V
Unregulated DC Supply Voltage	E_{bb}	60000	V
Grid Voltage:			
Negative dc value	$-E_c$	135	V
Negative peak value for 20 seconds maximum during equipment warm-up period	$-E_{cm}$	440	V
DC Plate Current (absolute maximum)	I_b	1.6	mA
Plate Dissipation (absolute maximum)	P_b	40	W
Peak heater-cathode voltage:			
Heater negative with respect to cathode	$-E_{hk}$	450 ^b	V
Heater positive with respect to cathode	$+E_{hk}$	Not Recommended	

6EN4

Heater Voltage (absolute maximum)	E_h	6.9	V
Heater Voltage (absolute minimum)	E_h	5.7	V

MAXIMUM CIRCUIT VALUES:

Grid-Circuit Resistance	$R_{g(CKT)}$	3	M Ω
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Typical Operation:

As Shunt Voltage-Regulator Tube in Accompanying Circuit

Unregulated Supply:

DC Voltage	36000	V
Equivalent resistance	11	M Ω

Voltage Divider Values:

R_1 (5 watts)	220	M Ω
R_2 (2 watts)	1	M Ω
R_3 (½ watt)	0.82	M Ω

Reference Voltage Supply:

DC Value	200	V
Equivalent resistance	1000	Ω

Effective Grid-Plate

Transconductance	200	μ mhos
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DC Plate Current:

For load current of 0 ma	1000	μ A
For load current of 1 ma	45	μ A

Regulated DC Output Voltage:

For load current of 0 ma	25000	V
For load current of 1 ma	24500	V

^a As defined in the current issue of EIA Standard RS-239A.

^b Sufficient impedance should be used in series with the cathode to limit the cathode current under prolonged short-circuit conditions to 450 mA. This protective impedance will minimize the danger of heater burnout in case of a momentary internal arc within the tube.

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

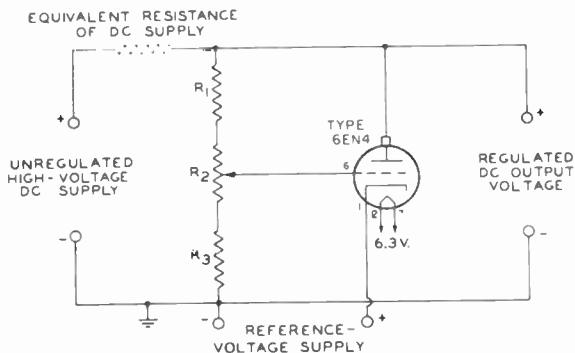
	Note	Min.	Max.	
Grid Voltage (1)	1	-7	-	V
Grid Voltage (2)	2	-	-40	V
Grid Voltage Change	3	-	9	V

Note 1: With dc plate voltage of 30000 V and dc plate current of 1 mA.

Note 2: With dc plate voltage of 30000 V and dc plate current of 0.1 mA.

Note 3: Difference between grid voltage (1) and grid voltage (2).

SHUNT VOLTAGE-REGULATOR CIRCUIT



Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6EN4.

OPERATING CONSIDERATIONS

The *base pins* of the 6EN4 fit the standard octal socket. Socket terminals for pins 3, 4 and 8 *should not be used for tie points*. If this precaution is not followed, tube performance may be adversely affected.

The 6EN4 may exhibit a blue glow on the upper half of the inner surface of the bulb wall under normal operating conditions. This effect is caused by fluorescence and is not to be mistaken for gas.

The *plate* of the 6EN4 shows a dull red color when the tube is operated at maximum plate dissipation. Connection to the plate cap should be made by a suitable connector with flexible lead to prevent any strain on the seal of the cap.

The *bulb* of the 6EN4 becomes hot during operation. To insure adequate cooling, it is essential that free circulation of air be provided around the 6EN4. The bulb will eventually darken during service. This darkening is normal and has no effect on tube performance.

6EN4

X-RADIATION CHARACTERISTIC

X-Radiation, Maximum

Statistical Value Controlled On A Lot

Sampling Basis 0.5mR/hr

X-Radiation is measured in accordance with JEDEC Publication No. 67 A, "Recommended Practice for Measurement of X-Radiation from Receiving Tubes", and controlled in accordance with JEDEC Publication No. 73 A, "Recommended Practice for Quality Control of X-Radiation Emitted from High Voltage Rectifier and Shunt Regulator Receiving Tubes".

Operation of the 6EN4 outside of the absolute values indicated above may result in either temporary or permanent changes in the X-radiation characteristic of the tube. Equipment design must be such that these absolute values are not exceeded.

WARNING

X-Radiation

The high voltage associated with the 6EN4 result in production of X-Radiation which may constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Equipment design must provide for this shielding.

Precautions must be exercised during the servicing of equipment employing the 6EN4 to assure that the high voltage is adjusted to the recommended value and that any shielding components are replaced to their intended positions before the equipment is operated.

SHOCK HAZARD

The high voltages at which the 6EN4 is operated can be extremely dangerous to the user or serviceman. Extreme care should be taken in the use of, and for the servicing and adjustment of, any high voltage circuit.

Precautions must be exercised during the replacement or servicing of the 6FN4 in equipment to assure that the high voltage output terminal is properly grounded while inserting or removing the tube from its socket or while connecting or disconnecting the top cap connector.

THE EQUIPMENT MANUFACTURER SHOULD PROVIDE A WARNING LABEL IN AN APPROPRIATE POSITION ON THE EQUIPMENT TO ADVISE THE SERVICEMAN OF ALL PRECAUTIONS HEREIN.

TERMINAL DIAGRAM – JEDEC 8NH – Bottom View

Pin 1: Cathode, Internal Shield

Pin 2: Heater

Pin 3: Do Not Use

Pin 4: Do Not Use

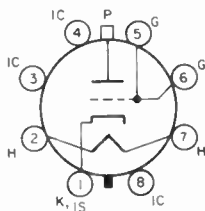
Pin 5: Grid

Pin 6: Grid

Pin 7: Heater

Pin 8: Do Not Use

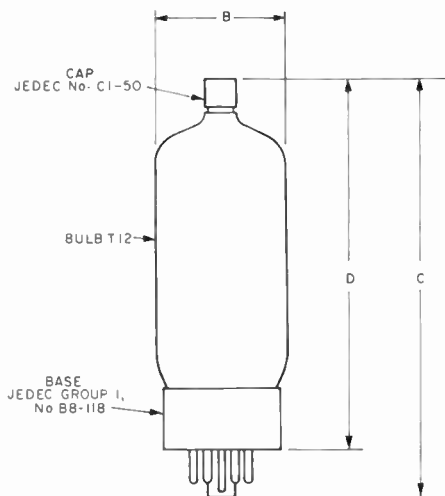
Cap : Plate



Note: For new equipment design make grid connection to pin 6 only.

6EN4

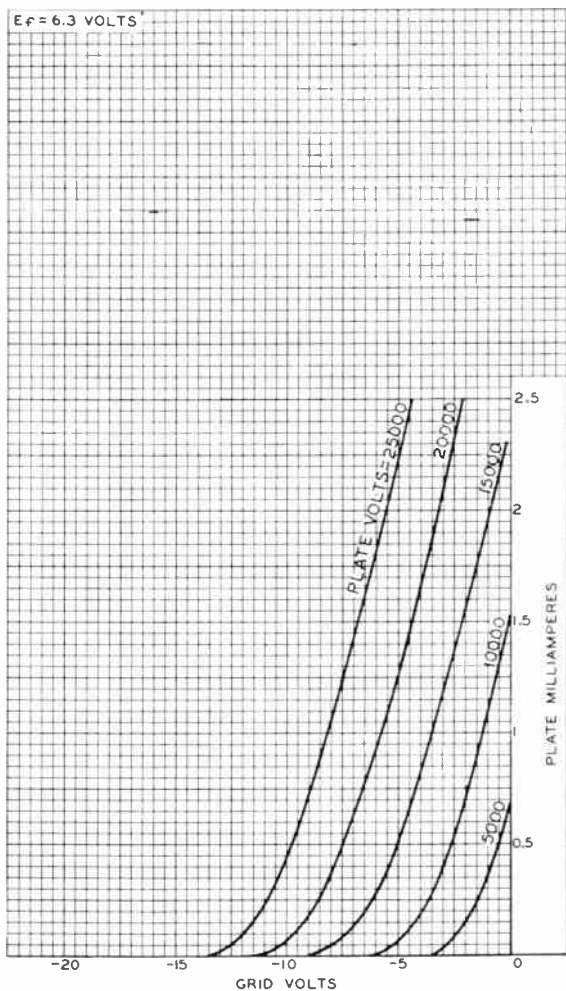
DIMENSIONAL OUTLINE



DI- MEN- SION	INCHES			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
B	1.438	—	1.562	36.6	—	39.6
C	—	—	5.00	—	—	127.0
D	4.0625	4.25	4.4375	103.2	108.0	112.7

MILLIMETER DIMENSION DERIVED
FROM INCH DIMENSION

AVERAGE TRANSFER CHARACTERISTICS



92CM-8432RI



Diode—Remote-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp

Direct Interelectrode Capacitances:▲

Pentode Unit:

Grid No.1 to plate	0.002 max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, internal shield, and heater	5.5	μμf
Plate to cathode, grid No.3, grid No.2, internal shield, and heater	5	μμf
Pentode grid No.1 to diode plate . .	0.0015 max.	μμf
Pentode plate to diode plate	0.095	μμf

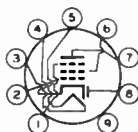
Characteristics, Class A₁ Amplifier (Pentode Unit):

Plate Voltage	100	volts
Grid No.3	Connected to cathode at socket	
Internal Shield	Connected to cathode at socket	
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	3800	μmhos
Plate Current	9	ma
Grid-No.2 Current	3.5	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 40 . . .	-20	volts

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 <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9LQ

Pin 1—Pentode
Grid No.3
Pin 2—Pentode
Grid No.1
Pin 3—Cathode
Pin 4—Heater
Pin 5—Heater



Pin 6—Pentode
Grid No.2
Pin 7—Pentode
Plate
Pin 8—Diode Plate
Pin 9—Internal
Shield



6EQ7

PENTODE UNIT — AMPLIFIER — CLASS A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE:			
Positive value	300	max.	volts
Negative value	300	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . .	300	max.	volts
GRID-No.2 VOLTAGE	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
Negative-bias value	50	max.	volts
GRID-No.3 INPUT	0.2	max.	watt
GRID-No.2 INPUT:			
For grid-No.2 voltages up to			
150 volts	0.6	max.	watt
For grid-No.2 voltages between 150			
and 300 volts	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>		
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
BULB TEMPERATURE (At hottest point on			
bulb surface)	150	max.	°C

DIODE UNIT

Maximum Ratings, Design-Maximum Values:

PLATE CURRENT	1	max.	ma
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Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 10.	2	ma
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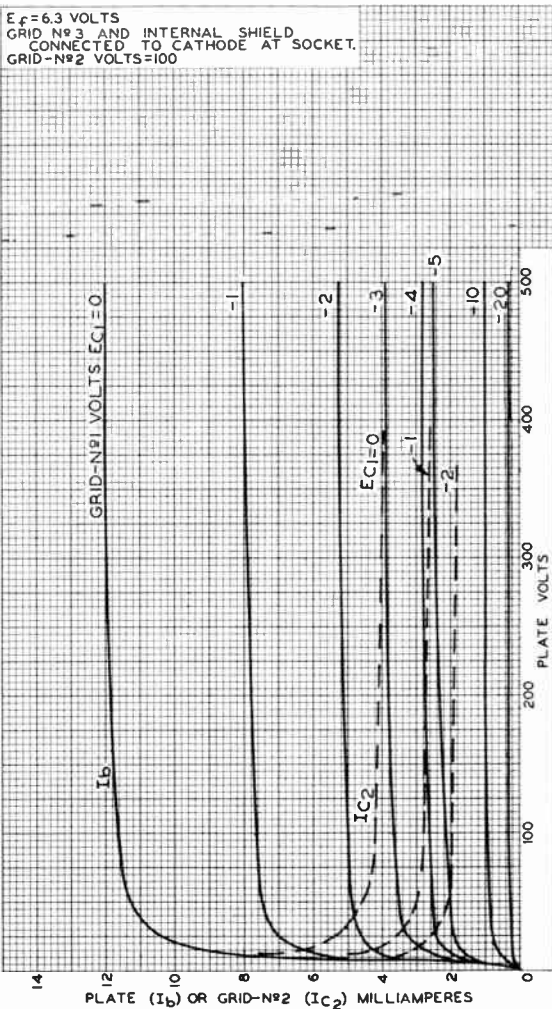
▲ without external shield.

● The dc component must not exceed 100 volts.



AVERAGE CHARACTERISTICS

Pentode Unit



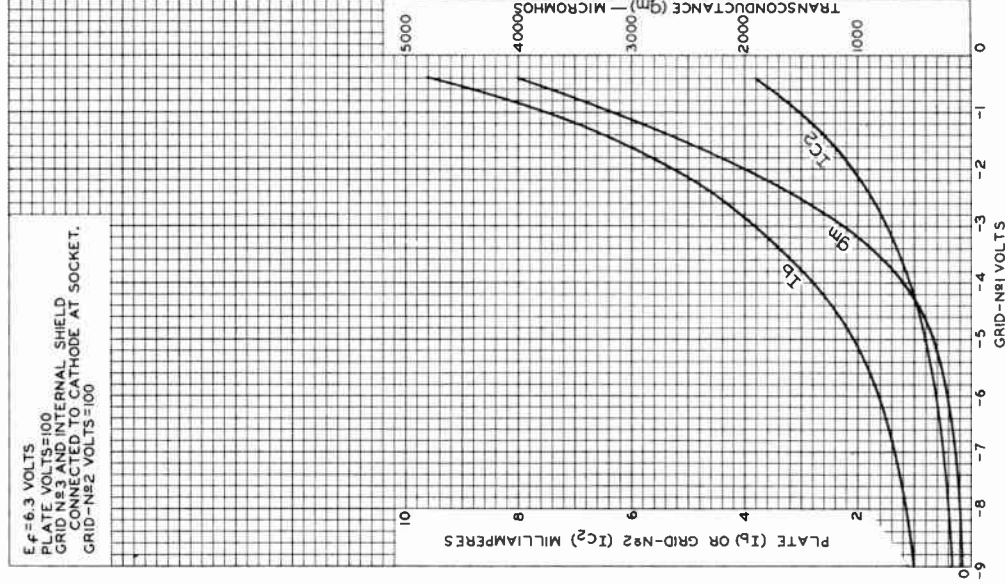
92CM-10680



6EQ7

AVERAGE CHARACTERISTICS Pentode Unit

$E_f = 6.3$ VOLTS
PLATE VOLTS=100
GRID N₃ AND INTERNAL SHIELD
CONNECTED TO CATHODE AT SOCKET.
GRID-N₂ VOLTS=100



92CM-10674

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



High-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	0.18	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ⁿ	
Grid to plate	0.38	0.36	μf
Grid to cathode, internal shield, and heater.	4.4	4.4	μf
Plate to cathode, internal shield, and heater.	3	4	μf
Grid to heater.	0.28 max.	0.28 max.	μf
Plate to cathode.	0.24	0.2	μf
Cathode to grid	3.1	3.1	μf
Heater to cathode	2.5	2.5	μf

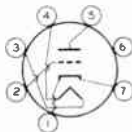
Characteristics, Class A₁ Amplifier:

Plate Voltage	200	volts
Grid Voltage	-1.2	volts
Amplification Factor	80	
Plate Resistance (Approx.)	8000	ohms
Transconductance	10500	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for transconductance (μmhos) = 500.	-3.8	volts
Grid Voltage (Approx.) for transconductance (μmhos) = 100.	-5.6	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" \pm 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7FP

Pin 1 - Cathode
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Plate
Pin 6 - Internal
Shield
Pin 7 - Cathode

← Indicates a change.



6ER5

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	250 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	100 max.	volts
Heater positive with respect to cathode .	100 max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	1 max.	megohm
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○ with external shield JEDEC No.316 connected to cathode except as noted.

● with external shield JEDEC No.316 connected to ground.

→ Indicates a change.



High-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.2	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^a	
Grid to plate	0.5 max.	0.5 max.	μf
Grid to cathode, internal shield, and heater	3.2	3.2	μf
Plate to cathode, internal shield, and heater	3.2	4	μf

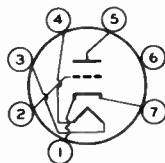
Characteristics, Class A₁ Amplifier:

Plate Voltage	200	volts
Grid Voltage	-1	volt
Amplification Factor	75	
Plate Resistance (Approx.)	8000	ohms
Transconductance	9000	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate $\mu_a = 100$	-6	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 <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7FP

Pin 1 - Cathode
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Plate
Pin 6 - Internal
Shield
Pin 7 - Cathode

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	250 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts



6ES5

CATHODE CURRENT 22 max. ma
PLATE DISSIPATION 2.2 max. watts
PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode . . 100 max. volts
Heater positive with respect to cathode . . 100 max. volts

Maximum Circuit Values:

Grid-Circuit Resistance 1 max. megohm

^a With external shield JEDEC No.316 connected to cathode.



Variable-Mu Twin Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

voltage (AC or DC)	6.3	volts
Current	0.365	amp

Direct Interelectrode Capacitance^a:

	Without External Shield	With external Shield ^a	
Grid to plate (Each unit) . . .	1.9	1.9	μf
Plate to cathode (Each unit). .	0.18	0.17	μf
Heater to cathode (Each unit). .	3	^b	μf
Plate of unit No.2 to plate of unit No.1.	0.04 max.	0.015 max.	μf
Plate of unit No.2 to grid of unit No.1.	0.003 max.	0.003 max.	μf
Grid of unit No.1 to cathode of unit No.2.	0.002 max.	0.002 max.	μf

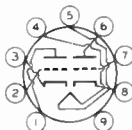
Characteristics, Class A₁ Amplifier (Each Unit):

Plate Voltage	90	90	90	volts
Grid Voltage.	-1.2	-5	-9	volts
Plate Resistance (Approx.).	2500	-	-	ohms
Transconductance.	12500	625	125	μmhos
Plate Current	15	-	-	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" \pm 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
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



6ES8

AMPLIFIER — Cascode Type

Maximum Ratings, Design-Center Values:

PLATE SUPPLY VOLTAGE		
with plate current = 0	550 max.	volts
PLATE VOLTAGE (Each Unit)	130 max.	volts
GRID VOLTAGE:		
Negative-bias value (Each Unit)	50 max.	volts
CATHODE CURRENT (Each Unit)	22 max.	ma
PLATE DISSIPATION (Each Unit)	1.8 max.	watts
HEATER-CATHODE VOLTAGE:		
<i>Unit No. 1:</i> ^c		
RMS voltage between cathode and heater	50 max.	volts
<i>Unit No. 2:</i> ^d		
RMS voltage between cathode and heater ^e	50 max.	volts
DC voltage between cathode and heater ^e	130 max.	volts

Typical Operation:

In a cascode-type circuit with the grid of the output unit connected to a voltage divider^f

Supply Voltage	180	volts
Plate Current	15	ma
Transconductance	12500	μmhos
Noise Figure ^g	6.5	db
Grid Voltage (Approx.) for		
transconductance (μmhos) = 125	-9	volts
Input Voltage for cross-modulation		
factor = 0.01 and transconductance		
(μmhos) = 125	500	millivolts

Maximum Circuit Values:

Grid-Circuit Resistance (Each Unit) . . .	1 max.	megohm
---	--------	--------

^a With external shield JEDEC No. 315 connected to cathode of unit under test except as noted.

^b With external shield JEDEC No. 315 connected to ground.

^c Grounded-cathode input unit—pins 6, 7, and 8.

^d Grounded-grid output unit—pins 1, 2, and 3.

^e Cathode positive with respect to heater.

^f In order not to exceed the maximum-rated plate voltage when the cascode-type amplifier is controlled, it is necessary to use a voltage divider for the grid of the grounded-grid output unit.

^g Measured with tube operating in a television tuner.



High-Mu Twin Triode

9-PIN MINIATURE TYPE

For High-Fidelity Audio-Amplifier Applications Critical as to Noise and Hum

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp

Direct Interelectrode Capacitances

(Each Unit, Approx.):

Grid to plate	1.5	μf
Grid to cathode and heater	1.6	μf
Plate to cathode and heater	0.2	μf

Equivalent Noise and Hum Voltage

(Referenced to Grid, Each Unit):

Average Value (RMS) 1.8 μvolts

Measured in "true rms" units under the following conditions: Heater volts (AC)= 6.3; center-tap of heater transformer connected to ground; plate supply volts (DC)= 250; plate load resistor (megohms)= 0.1; cathode resistor (ohms)= 2700; cathode bypass capacitor (μf)= 100; grid resistor (ohms)= 0; amplifier frequency range 25 to 10000 cps.

Characteristics, Class A₁ Amplifier (Each Unit):

Plate Voltage	100	250	volts
Grid Voltage	-1	-2	volts
Amplification Factor	100	100	
Plate Resistance (Approx.)	80000	62500	ohms
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 9LS

Pin 1 - Heater

Pin 2 - Heater

Pin 3 - No Connection

Pin 4 - Cathode of Unit No. 2

Pin 5 - Grid of Unit No. 2

Pin 6 - Plate of Unit No. 2

Pin 7 - Plate of Unit No. 1

Pin 8 - Grid of Unit No. 1

Pin 9 - Cathode of Unit No. 1



6EU7

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.	1.2	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 [▲]	max.	volts

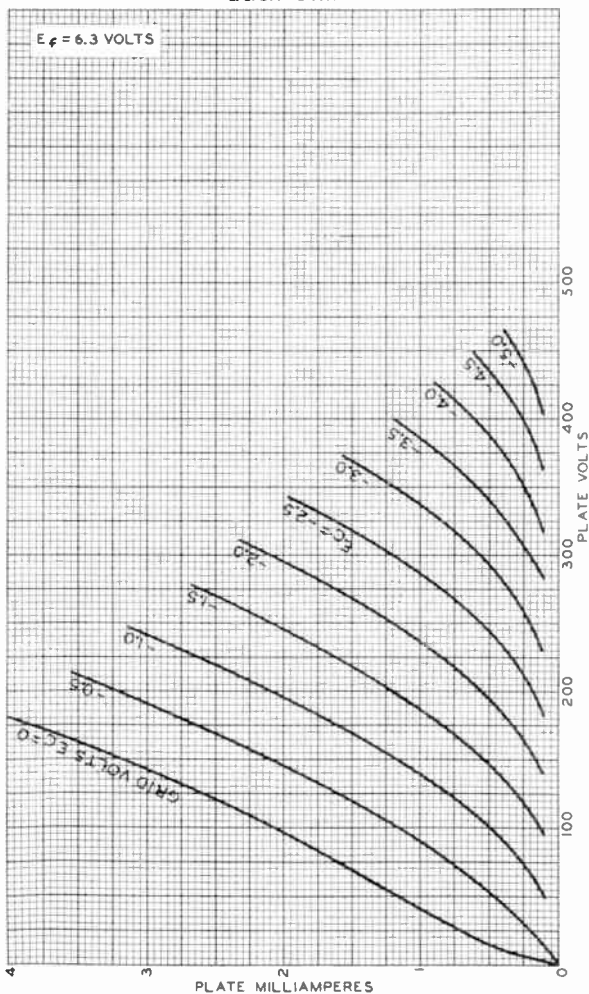
Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED-AMPLIFIER CHART No. 25*
at front of this Section

[▲] The dc component must not exceed 100 volts.



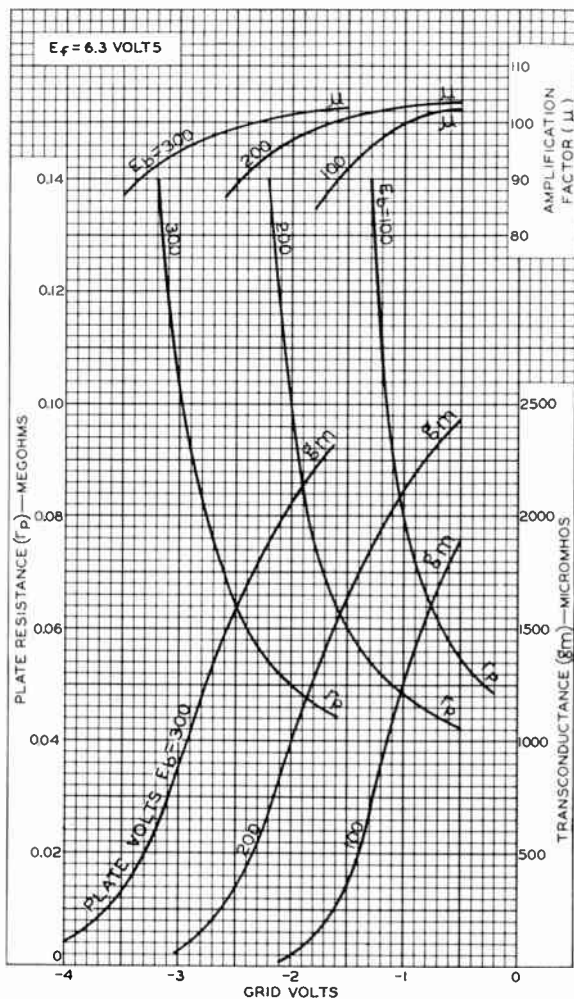
AVERAGE PLATE CHARACTERISTICS Each Unit



92CM-10470



AVERAGE CHARACTERISTICS Each Unit



92CM-10471



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volt
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^a	
<i>Triode Unit:</i>			
Grid to plate	1.7	1.7	μf
Grid to cathode and heater.	3	3.2	μf
Plate to cathode and heater.	1.6	1.1	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate.	0.02 max.	0.1 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5	5	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater.	2.6	3.4	μf
Heater to cathode (Each unit)	3.6	3.6 ^b	μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage.	150	125	volts
Grid-No.2 Supply Voltage.	—	125	volts
Grid-No.1 Voltage	—	-1	volt
Cathode Resistor.	56	—	ohms
Amplification Factor.	40	—	
Plate Resistance (Approx.)	5000	80000	ohms
Transconductance.	8500	6400	μhos
Plate Current	18	12	ma
Grid-No.2 Current	—	4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu = 10$	-12	-9	volts
Cathode Warm-Up Time ^c	35	—	sec

Mechanical:

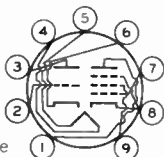
Operating Position.	Any
Maximum Overall Length.	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"



6EU8

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. 9JF

Pin 1 - Pentode Plate
 Pin 2 - Triode Grid
 Pin 3 - Triode Plate
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Triode Cathode



Pin 7 - Pentode Grid No.1
 Pin 8 - Pentode Cathode, Grid No.3, Internal Shield
 Pin 9 - Pentode Grid No.2

AMPLIFIER — Class A₁

Maximum Ratings, Design-Center Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
PLATE VOLTAGE.	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	330 max.	volts
GRID-No.2 VOLTAGE.	-	See <i>Grid-No.2 Input Rating Chart</i> 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 <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	
PLATE DISSIPATION.	3 max.	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200 ^d max.	200 ^d max.	volts

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Grid-No.1-Circuit Resistance . .	0.1 max.	0.1 max.	megohm

^a With external shield JEDEC No.315 connected to cathode of unit under test except as noted.

^b With external shield JEDEC No.315 connected to ground.

^c The time required for the transconductance to reach 6500 μ mhos when the tube is operated from a cold start with dc plate volts = 100, grid volts = 0, and heater volts = 5.5.

^d The dc component must not exceed 100 volts.



Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.2	amp

Direct Interelectrode Capacitances:^a

Grid No.1 to plate	0.035 max.	μf
Grid No.1 to cathode & internal shield, grid No.2, and heater	4.50	μf
Plate to cathode & internal shield, grid No.2, and heater	2.90	μf

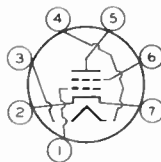
Characteristics, Class A₁ Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	80	volts
Grid-No.1 Voltage	-1	volt
Plate Resistance (Approx.)	0.15	megohm
Transconductance	8800	μmhos
Plate Current	11.5	ma
Grid-No.2 Current	0.9	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 100	-4.5	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"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7EW

- 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 - Cathode,
Internal
Shield

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	275 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	180 max.	volts
GRID-No.2 VOLTAGE	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	



6EV5

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Positive-bias value. 0 max. volts

CATHODE CURRENT. 20 max. ma

GRID-No.2 INPUT:

For grid-No.2 voltages up to 90 volts. . . 0.2 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. 3.25 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 100 max. volts

Heater positive with respect to cathode. 100^b max. volts

Maximum Circuit Values:

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

^a With external shield JEDEC No.316 connected to cathode.

^b The dc component must not exceed 50 volts.





6EW6

6EW6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) 6.3 ± 10% volts

Current 0.4 amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
Grid No.1 to plate	0.04 max.	0.03 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater.	10	10	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.4	3.4	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage 125 volts

Grid No.3 *Connected to cathode at socket*

Grid-No.2 Supply Voltage 125 volts

Cathode Resistor 56 ohms

Plate Resistance (Approx.) 0.2 megohm

Transconductance 14000 μmhos

Plate Current 11 ma

Grid-No.2 Current 3.2 ma

Grid-No.1 Voltage (Approx.) for
plate μ_a = 20 -3.5 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"

Diameter 0.650" to 0.750"

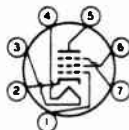
Dimensional Outline *See General Section*

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

6EW6



6EW6

SHARP-CUTOFF PENTODE

AMPLIFIER — Class A₁

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.	<i>See Grid-No.2 Input</i>	

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	0.65 max.	watt
For grid-No.2 voltages between 165 and 330 volts.	<i>See Grid-No.2 Input</i>	

Rating Chart at front of Receiving Tube Section

PLATE DISSIPATION.

3.1 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 [▲] max.	volts

[○] with external shield JEDEC No.316 connected to cathode.

[▲] The dc component must not exceed 100 volts.

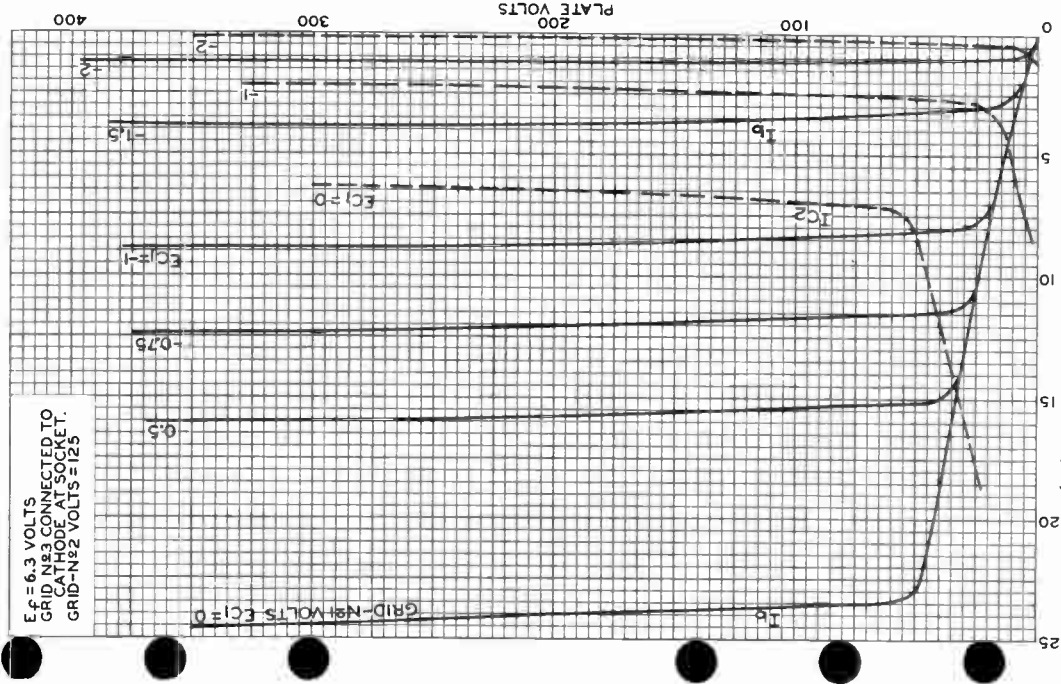


6EW6

9EW6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID N₃ CONNECTED TO
CATHODE AT SOCKET.
GRID-N₂ VOLTS = 125

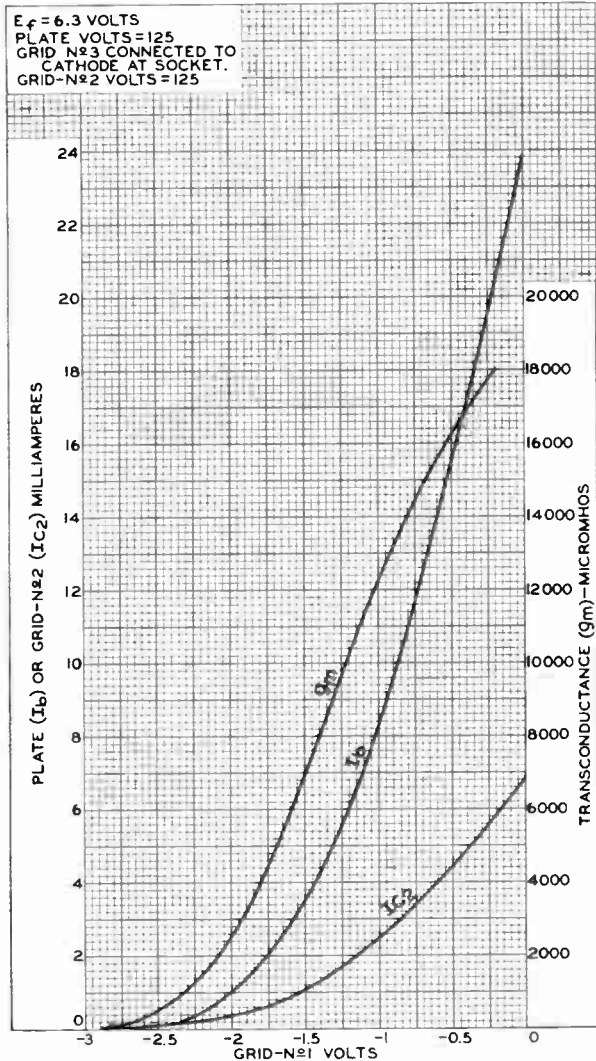


6EW6



6EW6

AVERAGE CHARACTERISTICS



Dual Triode

With Medium-Mu Unit and Low-Mu Unit

NEONOVAL TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.9	amps

Direct Interelectrode Capacitances (Approx.):^a

	Unit No. 1	Unit No. 2	
Grid to plate	4.2	9	μμf
Grid to cathode and heater. . .	2.2	7	μμf
Plate to cathode and heater . .	0.4	1.2	μμf

Characteristics, Class A₁ Amplifier:

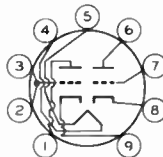
	Unit No. 1	Unit No. 2	
Plate Voltage	250	150	volts
Grid Voltage	-11	-17.5	volts
Amplification Factor	17.5	6	
Plate Resistance (Approx.)	8750	800	ohms
Transconductance	2000	7500	μmhos
Plate Current	5.5	45	ma
Plate Current for plate volts = 60 and grid volts = 0	-	95	ma
Plate Current for grid volts = -25	-	8	ma
Grid Voltage (Approx.) for plate μa = 10	-20	-	volts
Grid Voltage (Approx.) for plate μa = 100	-	-40	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2.93"
Maximum Seated Length	2.62"
Length, Base Seat to Bulb Top (Excluding tip)	2.07" to 2.31"
Diameter	1.062" to 1.188"
Bulb . . . . .	.T9
Base	Large-Button Neonoval 9-Pin (JEDEC No. E9-68)

Basing Designation for BOTTOM VIEW 9HF

- Pin 1 - Plate of Unit No. 2
- Pin 2 - Grid of Unit No. 2
- Pin 3 - Grid 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 - Cathode of Unit No. 2



VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC PLATE VOLTAGE.	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400	max.	volts
CATHODE CURRENT:			
Peak.	77	max.	ma
Average	22	max.	ma
PLATE DISSIPATION	1.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^c	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC PLATE VOLTAGE.	330	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^d	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250	max.	volts
CATHODE CURRENT:			
Peak.	175	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^c	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

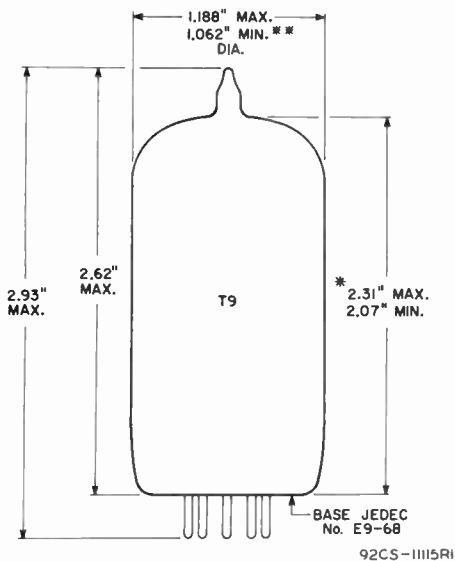
^a Without external shield.

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

^c The dc component must not exceed 100 volts.

^d This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



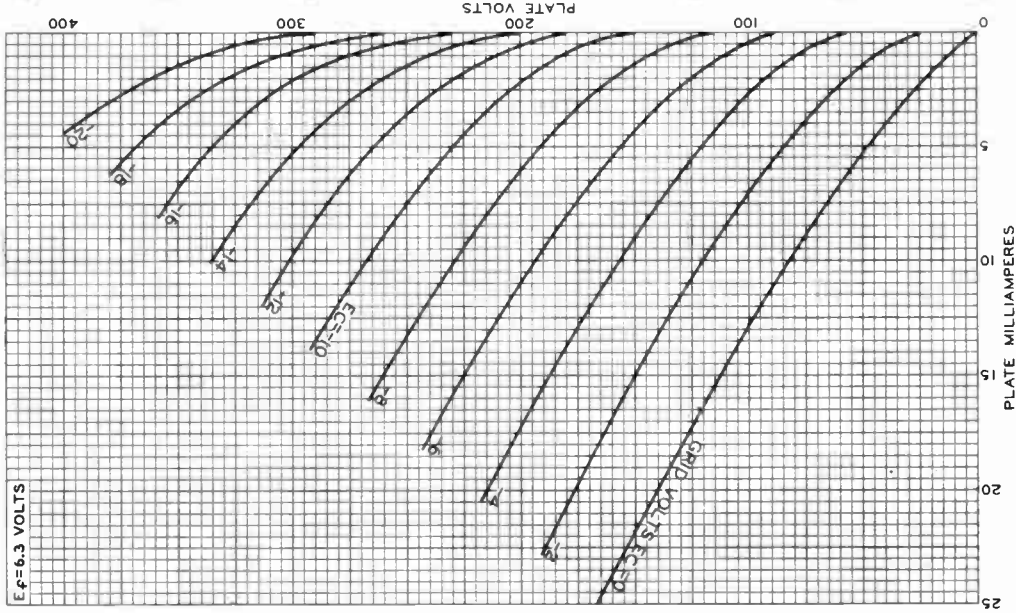


- * MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INTERNAL DIAMETER.
- ** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.



6EW7

AVERAGE PLATE CHARACTERISTICS Unit No.1



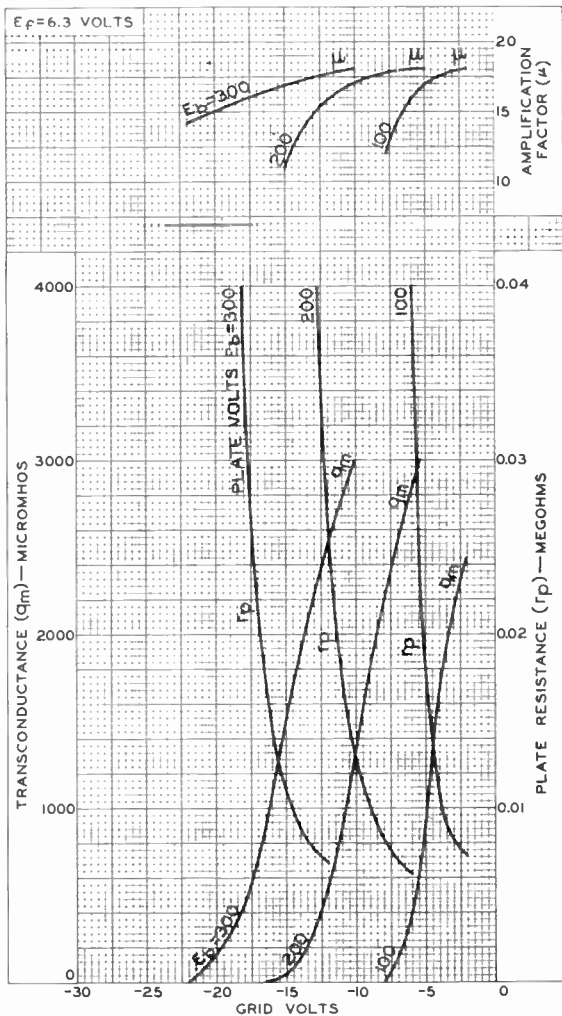
92CM-9988

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



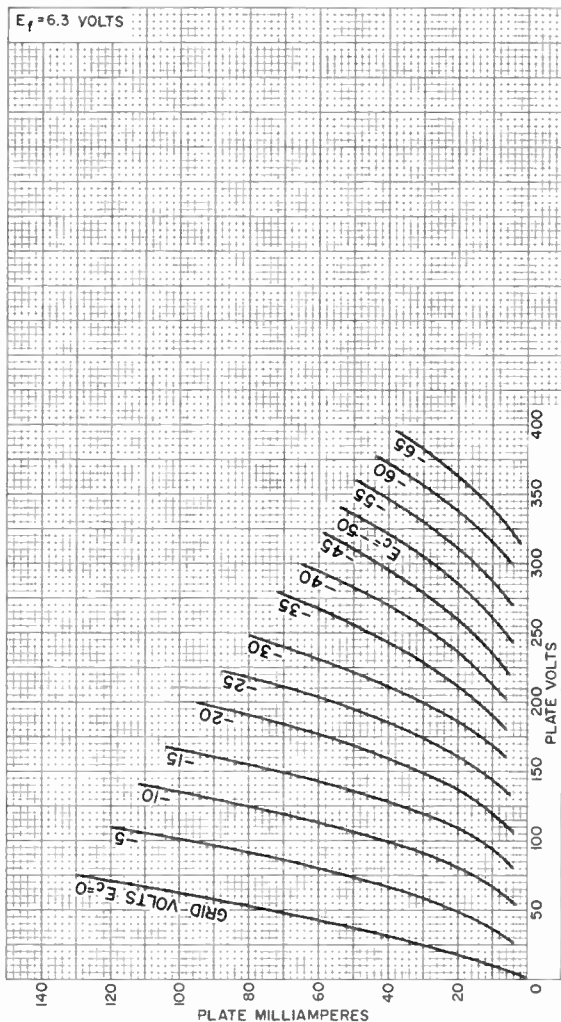
AVERAGE CHARACTERISTICS Unit No.1



92CM-9991



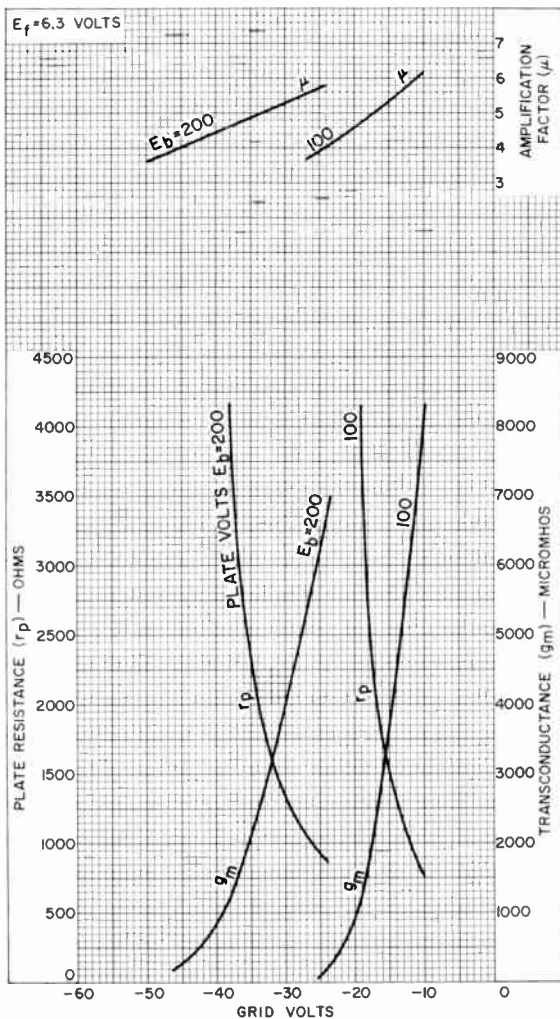
AVERAGE PLATE CHARACTERISTICS Unit No.2



92CM-11111



AVERAGE CHARACTERISTICS Unit No.2



92CM-11113





High-Mu Triple Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) 6.3 ± 10% volts

Current at 6.3 volts. 0.45 amp

Direct Interelectrode Capacitances
(Approx.):

	Without External Shield	With External Shield ^a	
Grid to plate (Each Unit)	1.5	1.5	μμf
Grid of unit No.1 to cathode of unit No.1 & cathode of unit No.2, and heater	2.4	2.6	μμf
Grid of unit No.2 to cathode of unit No.2 & cathode of unit No.1, and heater	2.4	2.6	μμf
Grid of unit No.3 to cathode of unit No.3 and heater	2.4	2.6	μμf
Plate of unit No.1 to cathode of unit No.1 & cathode of unit No.2, and heater	0.21	1.4	μμf
Plate of unit No.2 to cathode of unit No.2 & cathode of unit No.1, and heater	0.4	1.2	μμf
Plate of unit No.3 to cathode of unit No.3 and heater	0.36	1.2	μμf
Heater of unit No.3 to cathode of unit No.3.	0.17	0.15 ^b	μμf

Characteristics, Class A₁ Amplifier (Each Unit):

Plate Voltage 125 volts

Grid Voltage -1 volt

Amplification Factor 57

Plate Resistance (Approx.) 13600 ohms

Transconductance 4200 μmhos

Plate Current 4.2 ma

Grid Voltage (Approx.) for plate $\mu a = 20$ -4 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)



6EZ8

Basing Designation for BOTTOM VIEW. 9KA

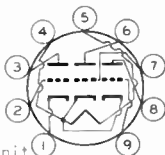
Pin 1 - Cathode of
Unit No.3

Pin 2 - Grid of
Unit No.3

Pin 3 - Plate of
Unit No.3

Pin 4 - Cathode of
Unit No.2.

Cathode of Unit
No.1, Heater



Pin 5 - Heater

Pin 6 - Plate of
Unit No.2

Pin 7 - Grid of
Unit No.2

Pin 8 - Plate of
Unit No.1

Pin 9 - Grid of
Unit No.1

AMPLIFIER — Class A₁

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, Design Maximum Values:

PLATE VOLTAGE 330 max. volts

GRID VOLTAGE:

Negative-bias value 50 max. volts

Positive-bias value 0 max. volts

PLATE DISSIPATION 2 max. watts

TOTAL PLATE DISSIPATION (ALL PLATES). 5 max. watts

HEATER-CATHODE VOLTAGE (Unit No.3):

Heater negative with respect to cathode . . 100 max. volts

Heater positive with respect to cathode . . 100 max. volts

^a with external shield JEDEC No.315 connected to cathode of unit under test except as noted.

^b with external shield JEDEC No.315 connected to ground.



Diode—Sharp-Cutoff Twin-Plate Tetrode

9-PIN MINIATURE TYPE

For Frequency-Divider and Complex-Wave-Generator
Circuits of Electronic Musical Instruments

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.7	amp

Direct Interelectrode Capacitances:▲

Tetrode Unit:

Grid No.1 to plate A	0.04	μμf
Grid No.1 to plate B	0.03 max.	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater . . .	5.5	μμf
Plate A to cathode & internal shield, grid No.2, and heater . . .	1.8	μμf
Plate B to cathode & internal shield, grid No.2, and heater . . .	1.8	μμf
Tetrode grid No.1 to diode plate . . .	0.022	μμf
Tetrode plate A to diode plate	0.02 max.	μμf
Tetrode plate B to diode plate	0.055	μμf

Characteristics, Class A₁ Amplifier (Tetrode Unit):*Plates A and B connected together*

Plate Voltage	100	volts
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	90000	ohms
Transconductance	3200	μmhos
Plate Current	3.8	ma
Grid-No.2 Current	1.7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-4	volts

Using either Plate A or B, with plate not in use connected to ground

Plate Voltage	100	volts
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	130000	ohms
Transconductance	1900	μmhos
Plate Current	2.2	ma
Grid-No.2 Current	3	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"



6FA7

Length, Base Seat to Bulb Top (Excluding tip) . . . 2" \pm 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. 9MR

Pin 1 - Tetrode

Plate B

Pin 2 - No Connection

Pin 3 - Diode Plate

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Cathode,
Internal
Shield

Pin 7 - Tetrode
Grid No. 1

Pin 8 - Tetrode
Grid No. 2

Pin 9 - Tetrode
Plate A

FREQUENCY-DIVIDER & COMPLEX-WAVE-GENERATOR SERVICE

TETRODE UNIT

Maximum Ratings, Design-Maximum Values:

PLATE A VOLTAGE 330 max. volts

PLATE B 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 50 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 A DISSIPATION 1.5 max. watts

PLATE B DISSIPATION 1.5 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-No. 1-Circuit Resistance:

For grid-No. 1-resistor-bias operation . 2.2 max. megohms

DIODE UNIT

Maximum Ratings, Design-Maximum Values:

PLATE CURRENT 1 max. ma

Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 10. 2 ma

* Without external shield.

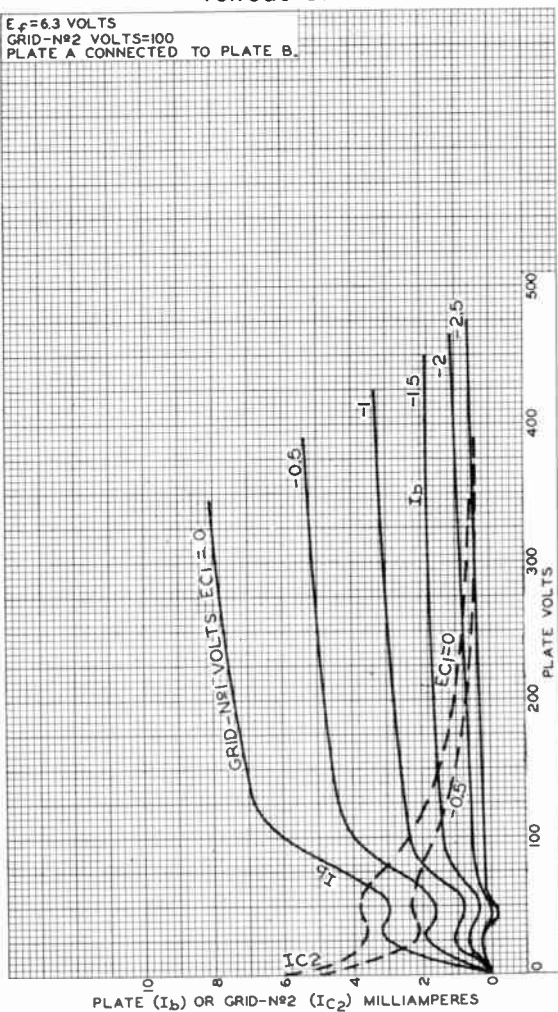
• The dc component must not exceed 100 volts.



AVERAGE CHARACTERISTICS

Tetrode Unit

$E_f = 6.3$ VOLTS
 GRID-N^o2 VOLTS=100
 PLATE A CONNECTED TO PLATE B.

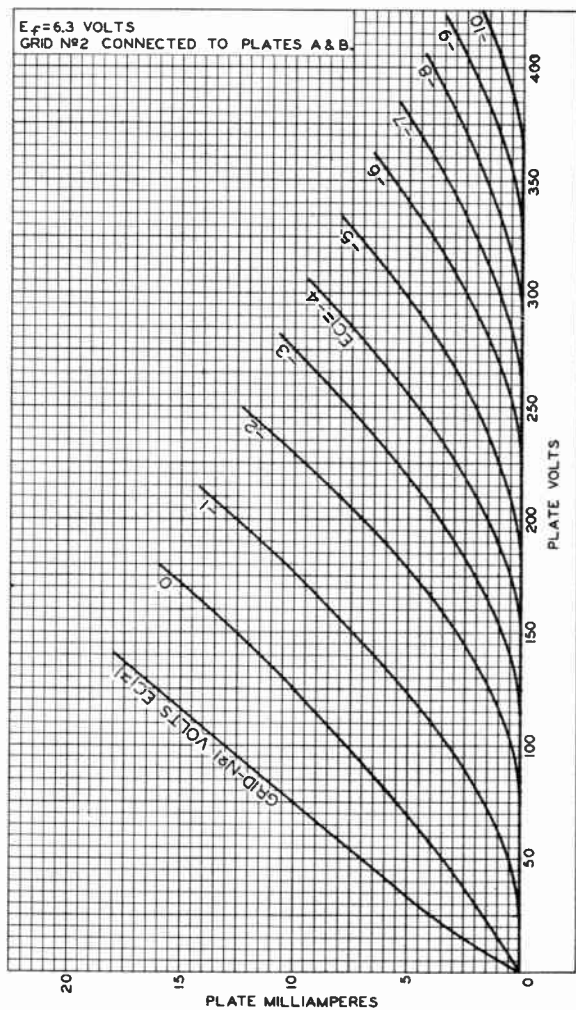


92CM-10693



6FA7

AVERAGE PLATE CHARACTERISTICS Tetrode Unit—Triode Connection



92CM-10695



Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC) 6.3 ± 0.6 volts
 Current at heater volts = 6.3 0.925 amp

Peak heater-cathode voltage (Each unit):

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200^a max. volts

Direct Interelectrode Capacitances (Approx.):^b

	Unit No. 1	Unit No. 2	
Grid to plate	4.5	10	$\mu\mu\text{f}$
Grid to cathode and heater . .	2.2	6.5	$\mu\mu\text{f}$
Plate to cathode and heater . .	0.4	1.2	$\mu\mu\text{f}$

Characteristics, Class A₁ Amplifier:

	Unit No. 1	Unit No. 2	
Plate Voltage	250	60 150	volts
Grid Voltage	-3	0 -17.5	volts
Amplification Factor	64	- 6	
Plate Resistance (Approx.) . . .	40000	- 800	ohms
Transconductance	1600	- 7500	μmhos
Plate Current	1.4	95 ^c 40	ma
Grid Voltage (Approx.) for plate $\mu\text{a} =$,			
10	-5.5	- -	volts
100	-	- -40	volts
Transconductance for plate ma. = 1	-	- 500	μmhos
Plate Current for grid volts = -25	-	- 6	ma

Mechanical:

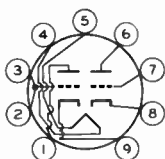
Operating Position Any
 Type of Cathodes Coated Unipotential
 Maximum Overall Length 2.900"
 Maximum Seated Length 2.620"
 Length, Base Seat to Bulb Top (Excluding tip) 2.070" to 2.310"
 Diameter 1.062" to 1.188"
 Bulb T9
 Base JEDEC No. E9-82



6FD7

Basing Designation for BOTTOM VIEW. 9HF

Pin 1 - Plate of Unit No.2
 Pin 2 - Grid of Unit No.2
 Pin 3 - Grid 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 - Cathode of Unit No.2

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC PLATE VOLTAGE.	330 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400 max.	volts
CATHODE CURRENT:		
Peak.	70 max.	ma
Average	20 max.	ma
PLATE DISSIPATION	1.5 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:
 For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

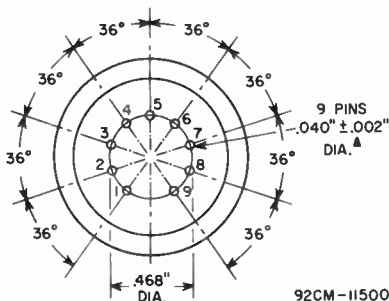
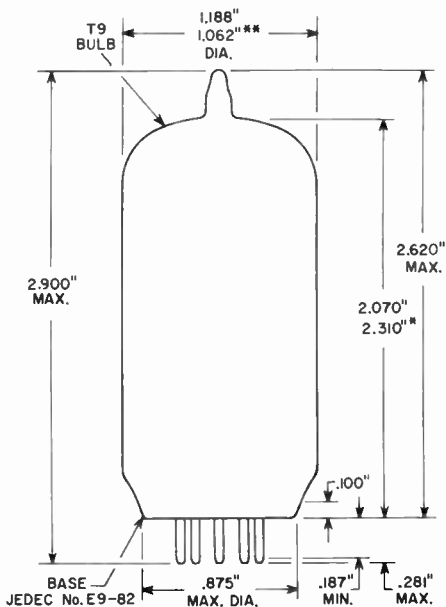
DC PLATE VOLTAGE.	330 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^e	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	10 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:
 For grid-resistor-bias or cathode-bias operation. 2.2 max. megohms

^a The dc component must not exceed 100 volts.
^b without external shield.
^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
^d As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
^e This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.





- ** APPLIES IN ZONE STARTING 0.625" FROM BASE SEAT.
- * MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.
- ▲ BASE-PIN CONTOUR AND GAUGE (JEDEC No. GE9-4) INFORMATION FOR THIS BASE IS THE SAME AS THAT SHOWN IN GENERAL SECTION FOR BASE JEDEC No. E9-6B (LARGE-BUTTON NEONOVAL 9-PIN).





Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	0.3 ^a	0.7 ± 0.6	volts
Current	0.450 ± 0.030	0.450 ^b	amp
Warm-up time (Average)	11	—	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^c	max.	volts

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^d	
<i>Triode Unit:</i>			
Grid to plate	1.8	1.8	μf
Grid to cathode & pentode grid No.3, and heater	3	3	μf
Plate to cathode & pentode grid No.3, and heater	1.3	1.9	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate	0.02 max.	0.01 max.	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	5	5	μf
Plate to cathode & grid No.3, grid No.2, and heater	2.4	3.4	μf
Heater to cathode & pentode grid No.3.	6	6 ^e	μf

Characteristics, Class A₁ Amplifier:

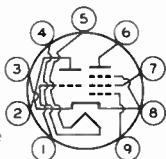
	Triode Unit	Pentode Unit		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	—	100	125	volts
Grid-No.1 Voltage	-1	0	-1	volts
Amplification Factor	43	—	—	
Plate Resistance (Approx.)	5700	—	180000	ohms
Transconductance	7500	7400	6000	μmhos
Plate Current	13	—	11	ma
Grid-No.2 Current	—	—	4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 30$	-6.5	—	-7.5	volts



Mechanical:

Operating Position	Any
Type of Cathode	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 <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW. 9GF	

- Pin 1 - Triode Grid
- Pin 2 - Triode Plate
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Pentode Plate



- Pin 7 - Pentode
Grid No. 2
- Pin 8 - Cathode,
Pentode
Grid No. 3
- Pin 9 - Pentode
Grid No. 1

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-NO. 2 (SCREEN-GRID) SUPPLY VOLTAGE	-	330 max.	volts
GRID-NO. 2 VOLTAGE	-	See <i>Grid-No. 2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
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 <i>Grid-No. 2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION	2.5 max.	3 max.	watts

^a At heater amperes = 0.450.

^b At heater volts = 6.3.

^c The dc component must not exceed 100 volts.

^d With external shield JEDEC No. 315 connected to cathode except as noted.

^e With external shield JEDEC No. 315 connected to ground.



High-Mu Triode

7-PIN MINIATURE TYPE
For VHF Tuner and Amplifier Applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.2	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^o	
Grid to plate.	0.6 max.	0.6 max.	μμf
Grid to cathode, internal shield, and heater	3.2	3.2	μμf
Plate to cathode, internal shield, and heater	3.2	4	μμf

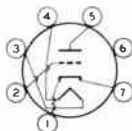
Characteristics, Class A₁ Amplifier:

Plate Voltage.	135	volts
Grid Voltage	-1	volt
Amplification Factor	50	
Plate Resistance (Approx.)	5600	ohms
Transconductance	9000	μmhos
Plate Current.	11	ma
Grid Voltage (Approx.) for plate $\mu_a = 100$	-5.5	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"
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 . . . . .	.7FP

Pin 1 - Cathode
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Plate
Pin 6 - Internal
Shield
Pin 7 - Cathode



6FH5

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	150 max.	volts
GRID VOLTAGE:		
Positive-bias value.	0 max.	volts
CATHODE CURRENT.	22 max.	ma
PLATE DISSIPATION.	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

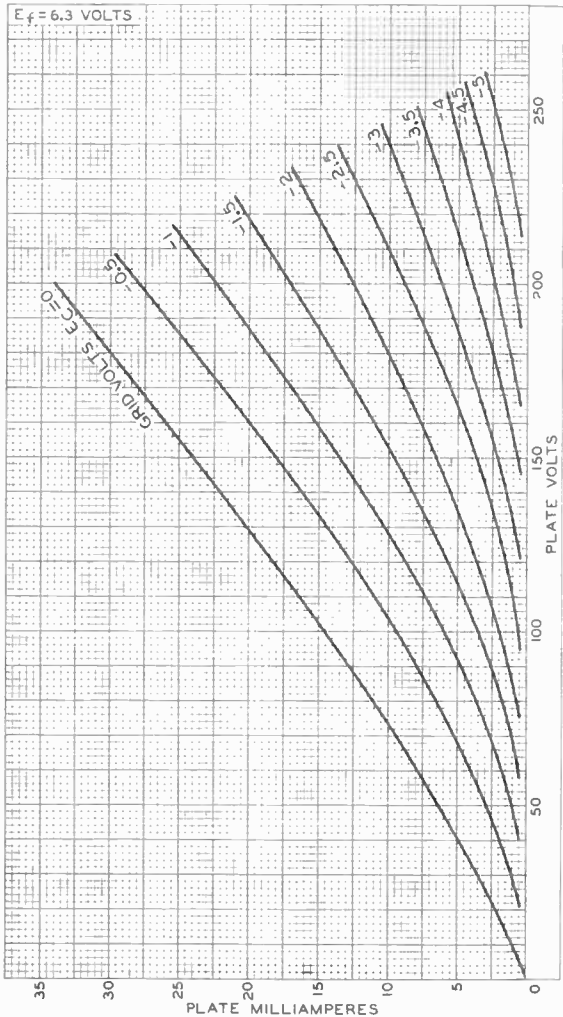
Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	1 max.	megohm

◊ With external shield JEDEC No. 316 connected to cathode.



AVERAGE PLATE CHARACTERISTICS



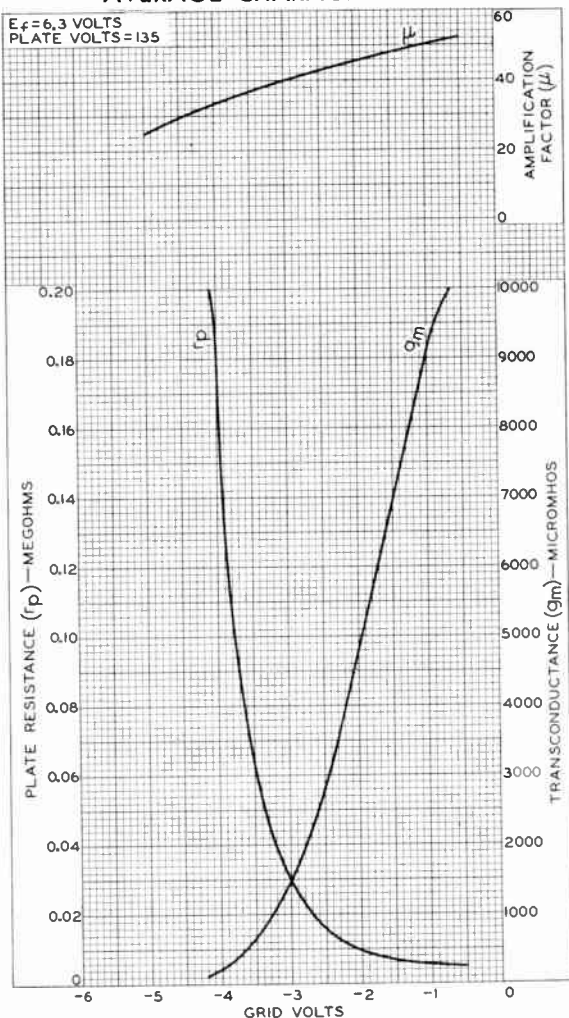
92CM-10355R1



6FH5

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 135



92CM-10354R1





6FH8

6FH8

MEDIUM-MU TRIODE— THREE-PLATE TETRODE

9-PIN MINIATURE TYPE

For harmonic-generator applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.45	amp

Direct Interelectrode Capacitances:⁰

Triode Unit:

Grid to plate	1.4	μf
Grid to cathode & heater	2.6	μf
Plate to cathode & heater	1	μf

Tetrode Unit:

Grid No.1 to plate No.1	0.06 max.	μf
Grid No.1 to cathode & heater, plate No.3, plate No.2, and grid No.2	4.5	μf
Plate No.1 to cathode & heater, plate No.3, plate No.2, and grid No.2	1.4	μf
Tetrode grid No.1 to triode plate . . .	0.35 max.	μf
Tetrode plate No.1 to triode plate . .	0.008 max.	μf

Characteristics, Class A₁ Amplifier:

Triode Unit

Plate Voltage	100	volts
Grid Voltage	-1	volt
Amplification Factor	40	
Plate Resistance (Approx.)	7400	ohms
Transconductance	5400	μmhos
Plate Current	7.9	ma
Grid Voltage (Approx.) for plate μa = 100	-1	volts

Tetrode Unit with plates No.2 and No.3 connected to cathode

Plate-No.1 Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	-2	volts
Plate-No.1 Resistance (Approx.)	0.75	megohm
Transconductance, Grid No.1 to Plate No.1	4400	μmhos
Plate-No.1 Current	7.3	ma
Grid-No.2 Current	1.4	ma
Grid-No.1 Voltage (Approx.) for plate-No.1 μa = 100	-7	volts

⁰ with external shield JEDEC No. 315 connected to cathode.



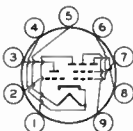
6FH8

MEDIUM-MU TRIODE— THREE-PLATE TETRODE

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" \pm 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. 9KP

Pin 1 - Tetrode
 Plate No. 3
 Pin 2 - Triode Grid
 Pin 3 - Triode Plate
 Pin 4 - Heater,
 Cathode
 Pin 5 - Heater



Pin 6 - Tetrode
 Grid No. 1
 Pin 7 - Tetrode
 Grid No. 2
 Pin 8 - Tetrode
 Plate No. 2
 Pin 9 - Tetrode
 Plate No. 1

HARMONIC-GENERATOR SERVICE

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Tetrode Unit	
PLATE VOLTAGE.	275 max.	-	volts
PLATE-No.1 VOLTAGE	-	275 max.	volts
PLATE-No.2 VOLTAGE	-	200 max.	volts
PLATE-No.3 VOLTAGE	-	200 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	275 max.	volts
GRID-No.2 VOLTAGE.	-	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No.1 (CONTROL- GRID) VOLTAGE:			
Negative-bias value.	40 max.	40 max.	volts
Positive-bias value.	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 137.5 volts.	-	0.45 max.	watt
For grid-No.2 voltages between 137.5 and 275 volts.	-	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION.	1.7 max.	-	watts
PLATE-No.1 DISSIPATION	-	2.3 max.	watts
PLATE-No.2 DISSIPATION	-	0.3 max.	watt
PLATE-No.3 DISSIPATION	-	0.3 max.	watt



6FH8

6FH8

MEDIUM-MU TRIODE— THREE-PLATE TETRODE

Typical Operation:

Tetrode Unit with separate plate operation

Plates—No.1, No.2, and No.3 Voltage	100	volts
Grid—No.2 Voltage	50	volts
Grid—No.1 Voltage	-1	volt
Plate—No.1 Current	1.6	ma
Plate—No.2 Current	0.04	ma
Plate—No.3 Current	0.04	ma
Grid—No.2 Current	0.3	ma
Transconductance (Approx.):		
Grid No.1 to plate No.1	2500	μ mhos
Grid No.1 to plate No.2	70	μ mhos
Grid No.1 to plate No.3	70	μ mhos

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Tetrode Unit</i>	
Grid—No.1—Circuit Resistance:			
For fixed-bias operation	0.5 max.	0.5 max.	megohm

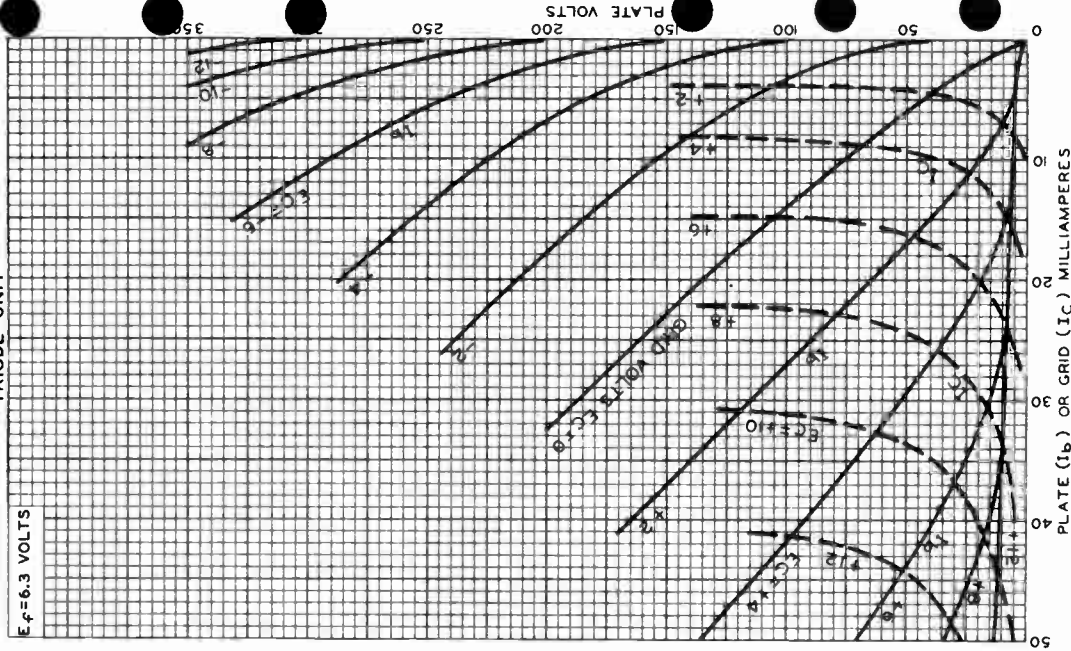
6FH8



6FH8

AVERAGE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$ VOLTS





6FH8

6FH8

AVERAGE CHARACTERISTICS TETRODE UNIT

$E_p = 6.3$ VOLTS
 PLATES NO 2 AND NO 3 CONN-
 CTED TO CATHODE.
 GRID-NO 2 VOLTS=150

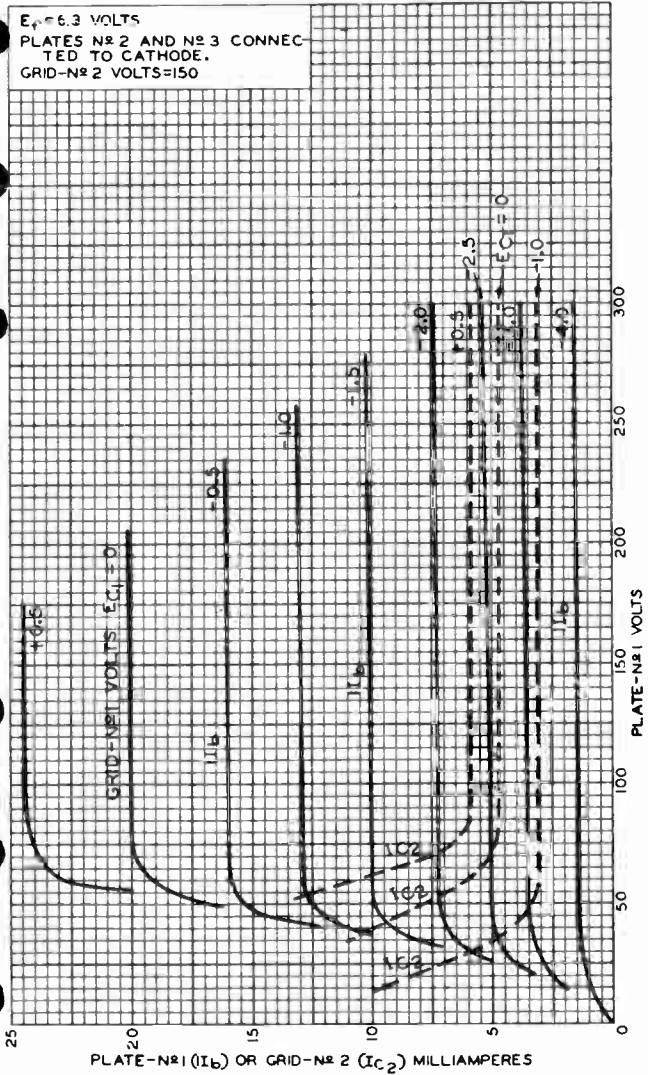


PLATE-NO 1 (I_b) OR GRID-NO 2 (I_{c2}) MILLIAMPERES

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

92CM-10221



Medium-Mu Dual Triode

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (Design Maximum Values):

Voltage (AC or DC) 6.3 ± 0.6 volts
 Current at heater volts = 6.3 0.900 amp

Peak heater-cathode voltage (Each unit):

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200^a max. volts

Direct Interelectrode Capacitances (Approx.):^b

	Unit No. 1	Unit No. 2	
Grid to plate	3.8	5.0	pf
Grid to cathode and heater	2.2	4.0	pf
Plate to cathode and heater	0.48	0.54	pf

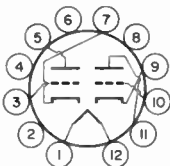
Characteristics, Class A₁ Amplifier:

	Unit No. 1	Unit No. 2	
Plate Voltage	250	150 250	volts
Grid Voltage	-8	0 -9.5	volts
Amplification Factor	22.5	- 15.4	
Plate Resistance (Approx.)	9000	- 2000	ohms
Transconductance	2500	- 7700	μ hos
Plate Current	8	68 ^c 41	ma
Grid Voltage (Approx.)			
for plate μ = 10	-18	- -	volts
Grid Voltage (Approx.)			
for plate μ = 50	-	- -23	volts

Mechanical:

Operating Position Any
 Type of Cathodes Coated Unipotential
 Maximum Overall Length 2.375"
 Seated Length 1.750" to 2.000"
 Diameter 1.062" to 1.188"
 Bulb T9
 Base Small-Button Duodecar 12-Pin (JEDEC No. F12-70)
 Basing Designation for BOTTOM VIEW 12BM^d

- | | |
|--------------------------------|-------------------------------|
| Pin 1 - Heater | Pin 8 - Same as Pin 2 |
| Pin 2 - No Internal Connection | Pin 9 - Cathode of Unit No. 1 |
| Pin 3 - Grid of Unit No. 2 | Pin 10 - Grid of Unit No. 1 |
| Pin 4 - Same as Pin 2 | Pin 11 - Plate of Unit No. 1 |
| Pin 5 - Plate of Unit No. 2 | Pin 12 - Heater |
| Pin 6 - Do Not Use | |
| Pin 7 - Cathode of Unit No. 2 | |



6FJ7

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

DC PLATE VOLTAGE.	350	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400	max.	volts
PLATE DISSIPATION	1	max.	watt

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias or cathode-bias operation. 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC PLATE VOLTAGE.	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^e	2500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250	max.	volts
CATHODE CURRENT:			
Peak.	150	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation. 2.2 max. megohms

^a The dc component must not exceed 100 volts.

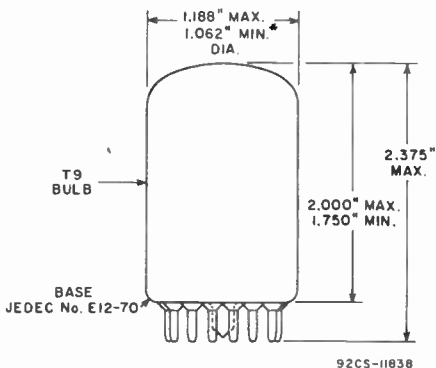
^b Without external shield.

^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

^e This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.





* APPLIES TO MINIMUM DIAMETER EXCEPT IN AREA OF SEAL.





Twin Diode—High-Mu Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	0.45	amp

Direct Interelectrode Capacitances
(Approx.):^a

Triode Unit:

Grid to plate	1.8	μμf
Grid to cathode and heater.	1.5	μμf
Plate to cathode and heater	0.16	μμf

Diode Units:

Diode-No.1 plate to triode grid	0.05	μμf
Diode-No.2 plate to triode grid	0.04	μμf
Diode-No.1 cathode to all other tube electrodes	4.6	μμf
Diode-No.2 cathode to all other tube electrodes	4.8	μμf
Diode-No.1 plate to cathode and heater.	2.4	μμf
Diode-No.2 plate to cathode and heater.	2.2	μμf

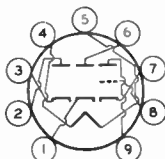
Characteristics, Class A₁ Amplifier (Triode Unit):

Plate Voltage	250	volts
Grid Voltage.	-3	volts
Amplification Factor.	70	
Plate Resistance (Approx.)	58000	ohms
Transconductance.	1200	μmhos
Plate Current	1	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 <i>General Section</i>
Bulb.	T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW.	9KR

Pin 1—Diode-No. 2
Cathode
Pin 2—Diode-No. 1
Plate
Pin 3—Diode-No. 1
Cathode
Pin 4—Heater



Pin 5—Heater
Pin 6—Diode-No. 2
Plate
Pin 7—Triode
Cathode
Pin 8—Triode Grid
Pin 9—Triode Plate



6FM8

TRIODE UNIT — AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	330	max.	volts
GRID VOLTAGE:			
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 ^b	max.	volts

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

PLATE CURRENT	5	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200	max.	volts
Heater positive with respect to cathode .	200 ^b	max.	volts

Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 5	20	ma
---	----	----

^a without external shield.

^b The dc component must not exceed 100 volts.



High-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.180	amp

Peak heater-cathode voltage:

Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Direct Inter-electrode Capacitances (Approx.):^a

Grid to plate	0.52	μf
Grid to cathode, internal shield, and heater	5.0	μf
Plate to cathode, internal shield, and heater	3.5	μf
Heater to cathode	2.5 ^b	μf

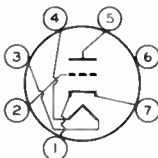
Characteristics, Class A₁ Amplifier:

Plate Voltage	135	volts
Grid Voltage	-1.2	volts
Amplification Factor	74	
Plate Resistance (Approx.)	6300	ohms
Transconductance	12000	μmhos
Plate Current	8.9	ma
Grid Voltage (Approx.) for plate $\mu_a = 100$	-4.5	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 <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW	7FP

Pin 1 - Cathode
 Pin 2 - Grid
 Pin 3 - Heater
 Pin 4 - Heater



Pin 5 - Plate
 Pin 6 - Internal Shield
 Pin 7 - Cathode



6FQ5A

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	200 max.	volts
GRID VOLTAGE:		
Negative-bias value.	50 max.	volts
CATHODE CURRENT.	22 max.	ma
PLATE DISSIPATION.	2.5 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For cathode-bias operation 1 max. megohm

^a with external shield JEDEC No.316 connected to cathode except as noted.

^b with external shield JEDEC No.316 connected to ground.

CURVES

shown under Type 6GK5 also apply to the 6FQ5A



Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances (Approx.):^a

	Unit No.1	Unit No.2	
Grid to plate	3.6	3.8	μf
Grid to cathode and heater	2.4	2.4	μf
Plate to cathode and heater	0.34	0.26	μf
Plate of unit No.1 to plate of unit No.2		1	μf

Characteristics, Class A₁ Amplifier (Each Unit):

Plate Voltage	90	250	volts
Grid Voltage	0	-8	volts
Amplification Factor	20	20	
Plate Resistance (Approx.)	6700	7700	ohms
Transconductance	3000	2600	μmhos
Plate Current	10	9	ma
Plate Current for grid volts = -12.5	-	1.3	ma
Grid Voltage (Approx.) for plate μa = 10	-7	-18	volts

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	9LP

Pin 1 - Plate of
Unit No.2Pin 2 - Grid of
Unit No.2Pin 3 - Cathode of
Unit No.2

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Plate of
Unit No.1Pin 7 - Grid of
Unit No.1Pin 8 - Cathode of
Unit No.1Pin 9 - No Connec-
tion

6FQ7

AMPLIFIER — Class A₁

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	330	max.	volts
GRID VOLTAGE:			
Positive-bias value.	0	max.	volts
CATHODE CURRENT.	22	max.	ma
PLATE DISSIPATION:			
Either plate	4	max.	watts
Both plates (Both units operating) . . .	5.7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. .	200	max.	volts
Heater positive with respect to cathode. .	200 ^b	max.	volts

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.29
at front of this section

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation	1	max.	megohm

HORIZONTAL-DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC PLATE VOLTAGE.	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	660	max.	volts
CATHODE CURRENT:			
Peak.	330	max.	ma
Average	22	max.	ma
PLATE DISSIPATION:			
Either plate.	4	max.	watts
Both plates (Both units operating). . .	5.7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200	max.	volts
Heater positive with respect to cathode .	200 ^b	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	2.2	max.	megohms
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VERTICAL-DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC PLATE VOLTAGE.	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	440	max.	volts
CATHODE CURRENT:			
Peak.	77	max.	ma
Average	22	max.	ma



PLATE DISSIPATION:

Either plate. 4 max. watts
Both plates (Both units operating). . . 5.7 max. watts

PEAK PLATE-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts
Heater positive with respect to cathode. 200^b max. volts

Maximum Circuit Values:

Grid-Circuit Resistance 2.2 max. megohms

^a Without external shield.

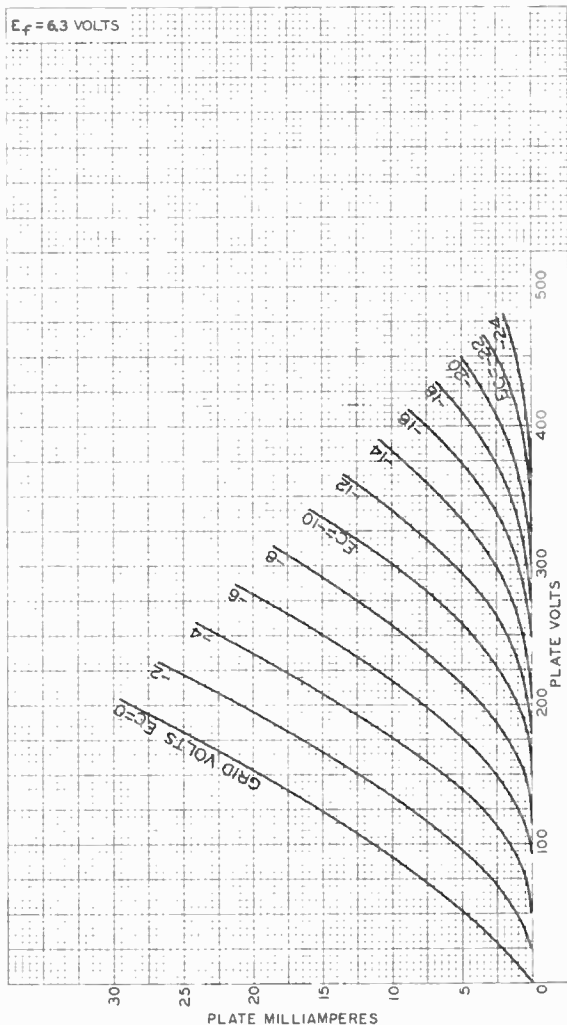
^b The dc component must not exceed 100 volts.

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



6FQ7

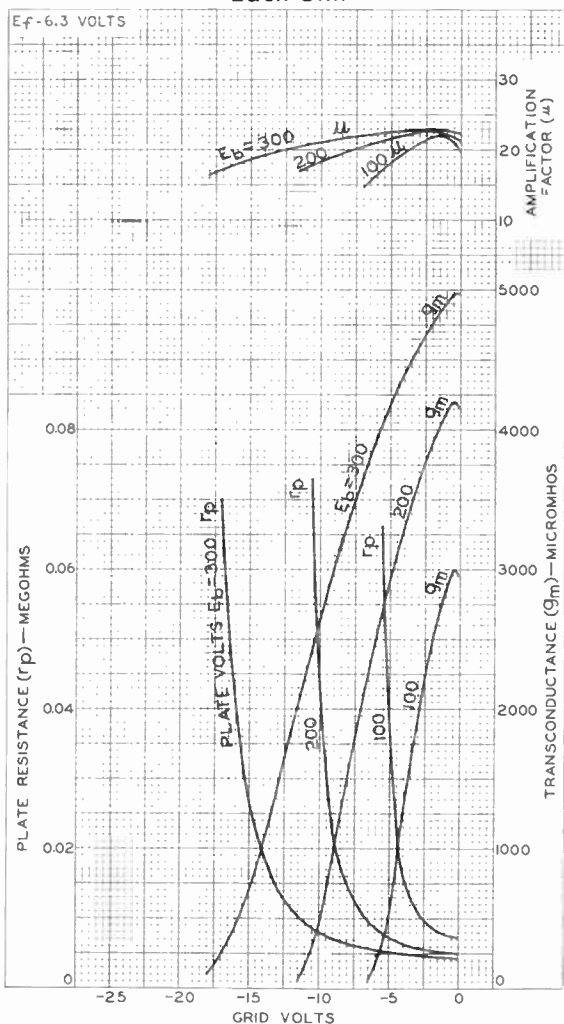
AVERAGE PLATE CHARACTERISTICS Each Unit



92CM-8442



AVERAGE CHARACTERISTICS Each Unit



92CM-8441R1





Beam Hexode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.200	amp

Peak heater-cathode voltage:

Heater negative with respect to cathode 200 ax. volts

Heater positive with respect to cathode 200^a max. volts

Direct Interelectrode Capacitances (Approx.):

	<i>Without External Shield</i>	<i>With External Shield^b</i>	
Grid No.1 to plate	0.03	0.016	μf
Grid No.1 to cathode & grid No.4 & grid No.2, grid No.3, and heater	4.8	4.8	μf
Plate to cathode & grid No.4 & grid No.2, grid No.3, and heater	2	2.8	μf

Characteristics, Class A₁ Amplifier:

Plate Voltage	275	volts
Grid-No.3 Voltage	135	volts
Grid-No.1 Voltage	-0.2	volt
Plate Resistance (Approx.)	0.24	megohm
Transconductance	10000	μmhos
Plate Current	9	ma
Grid-No.3 Current	0.17	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 100.	-5	volts

Mechanical:

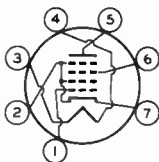
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)



6FS5

Basing Designation for BOTTOM VIEW. 7GA

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



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

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SCREEN-GRID) VOLTAGE	150 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
CATHODE CURRENT	20 max.	ma
GRID-No.3 INPUT	0.15 max.	watt
PLATE DISSIPATION	3.25 max.	watts

Maximum Circuit Values:

Grid-No.1—Circuit Resistance:

For fixed-bias operation. 0.5 max. megohm

^a The dc component must not exceed 100 volts.

^b With external shield JEDEC No.316 connected to pin 7.

OPERATING CONSIDERATIONS

This type has four grids—grid No.1 (Control grid), grid No.2 (Focusing grid), grid No.3 (Screen grid), and grid No.4 (Suppressor grid). Grid No.2 is (1) internally connected to cathode and grid No.4, (2) aligned with grid No.3, and (3) located between grids No.1 and No.3. The addition of grid No.2 results in an increase in the plate-current-to-screen-current ratio with subsequent noise reduction.





6FV6

6FV6

SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 10%	. . . . . ac or dc volts
Current	0.2	. . . . . amp

Direct Interelectrode Capacitances:⁰

Grid No.1 to plate	0.03 max.	μmf
Grid No.1 to cathode, grid No.2, internal shield, and heater.	4.5	μmf
Plate to cathode, grid No.2, internal shield, and heater.	3	μmf
Cathode to heater.	2.7 [•]	μmf

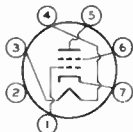
Characteristics, Class A₁ Amplifier:

Plate Voltage	125	volts
Grid-No.2 (Screen-grid) Voltage	80	volts
Grid-No.1 (Control-grid) Voltage	-1	volt
Plate Resistance (Approx.)	0.1	megohm
Transconductance	8000	μmhos
Plate Current	10	ma
Grid-No.2 Current	1.5	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 20$	-6	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. F7-1)
Basing Designation for BOTTOM VIEW	7FQ

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



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

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	275 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	

6FV6



6FV6

SHARP-CUTOFF TETRODE

GRID-NO.1 (CONTROL-GRID) VOLTAGE:

Positive-bias value.	0	max.	volts
CATHODE CURRENT.	20	max.	ma

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	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>		
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PLATE DISSIPATION.	2	max.	watts
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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-No.1-Circuit Resistance	0.5	max.	megohm
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○ with external shield JEDEC No.316 connected to cathode except as noted.

● with external shield JEDEC No.316 connected to ground.

* The dc component must not exceed 100 volts.

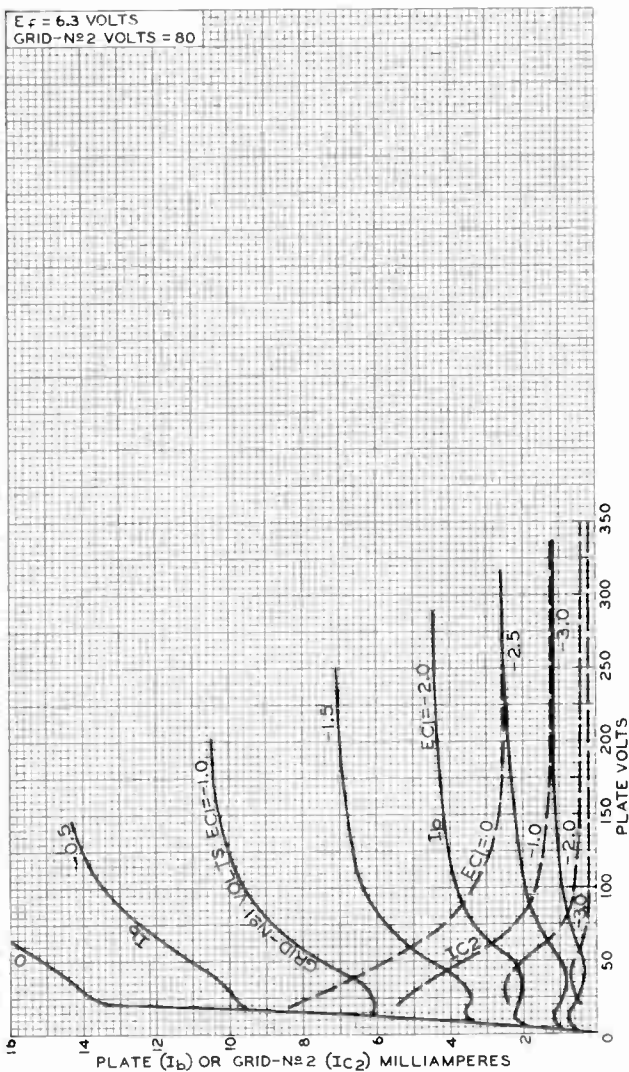


6FV6

6FV6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-Nº2 VOLTS = 80



ELECTRON TUBE DIVISION

92CM-10058

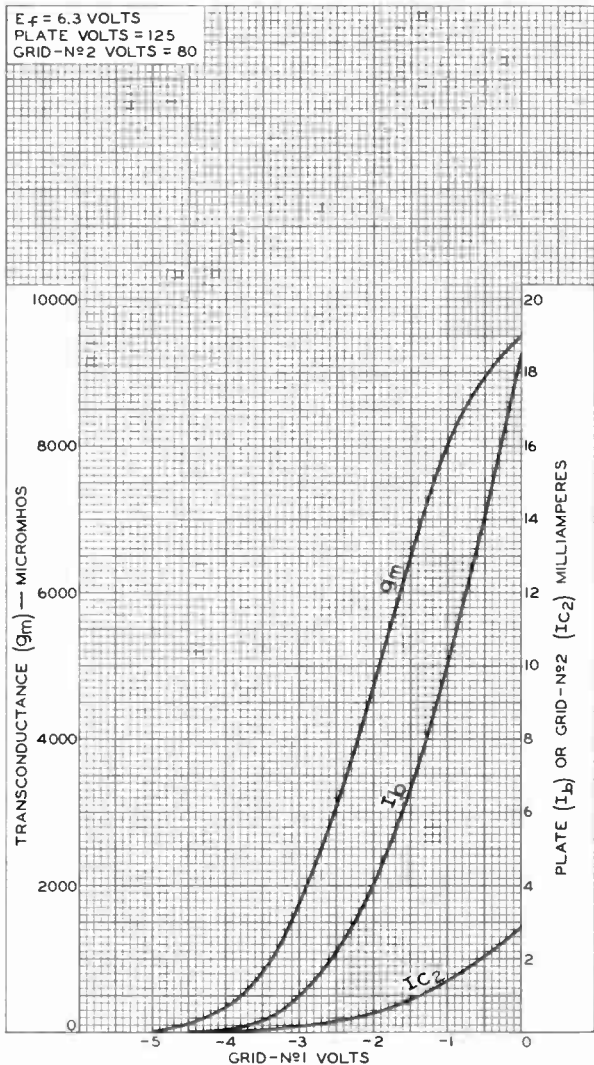
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6FV6



6FV6

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-9519

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

Beam Power Tube

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3 . . .	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

Direct Inter-Electrode Capacitances (Approx.):^b

Grid No.1 to plate	0.5	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15.0	μf
Plate to cathode & grid No.3, grid No.2, and heater	7.0	μf

Characteristics, Class A₁ Amplifier:

Plate Voltage	60	150	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Amplification Factor	-	4.4	-	
Plate Resistance (Approx.)	-	-	18000	ohms
Transconductance	-	-	7300	μmhos
Plate Current	345 ^c	-	65	ma
Grid-No.2 Current	27 ^c	-	1.8	ma
Grid-No.1 Voltage (Approx.)				
for plate ma. = 1	-	-	-42	volts
Grid-No.1 Voltage (Approx.)				
for peak positive-pulse plate volts = 5000, grid-No.2 volts = 150, and plate ma. = 1	-	-	-100	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-7/8"
Maximum Seated Length	3-5/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 6-Pin with External Barriers, Arrangement 1, Style A, (JEDEC Group 1. No. B6-112)



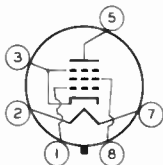
6FW5

Basing Designation for BOTTOM VIEW. 6CY

Pin 1—Grid No.1

Pin 2—Heater

Pin 3—Cathode,
Grid No.3



Pin 5—Plate

Pin 7—Heater

Pin 8—Grid No.2

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC PLATE VOLTAGE.	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^e	6500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE.	220 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55 max.	volts
CATHODE CURRENT:		
Peak.	610 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.6 max.	watts
PLATE DISSIPATION ^f	18 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface).	220 max.	°C

Maximum Circuit Values:

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

^a The dc component must not exceed 100 volts.

^b without external shield.

^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

^e This rating is applicable where the duration of the voltage pulse does 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.

^f An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



Beam Power Tube— Sharp-Cutoff Pentode

DUODECAR TYPE

GENERAL DATA

Electrical:

heater Characteristics (Grid No. 1):	
Voltage (AC or DC)	4.5 ± 0.1 volts
Current (1.4 × 10 ⁻⁴ watts)	1.00 ma
heater Characteristics (Grid No. 2):	
heater negative with respect to cathode	200 max. volts
heater positive with respect to cathode	200 max. volts
Current at collector electrode (Approx.)	20 ma

Beam Power Unit:

Grid No. 1 to plate	6.8	pf
Grid No. 1 to cathode & grid No. 3, grid No. 2, internal shield, and heater	12.0	pf
Grid No. 1 to cathode & grid No. 1, grid No. 2, internal shield, and heater	19.5	pf

Pentode Unit:

Grid No. 1 to plate	2.9	pf
Grid No. 1 to cathode, grid No. 2, grid No. 3, internal shield, and heater	7.5	pf
Grid No. 3 to cathode, grid No. 1, grid No. 2, plate, internal shield, and heater	7.5	pf
Grid No. 1 to grid No. 3	0.25	pf
Plate of beam power unit to plate of pentode unit	0.12	pf

Characteristics, Class A₁ Amplifier (Pentode Unit):

Plate Supply Voltage	150	volts
Grid-No. 3 Supply Voltage	Connected to cathode at socket	
Grid-No. 2 Supply Voltage	100	volts
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No. 1 to Plate	1000	μmhos
Transconductance, Grid No. 3 to Plate	400	μmhos
Plate Current	1.3	ma
Grid-No. 2 Current	2	ma
Grid-No. 1 Voltage (Approx.) for plate $\mu a = 10$	-4.5	volts
Grid-No. 3 Voltage (Approx.) for plate $\mu a = 10$	-4.5	volts

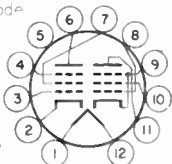


6G11

Mechanical:

Operating Position.	Any
Type of Cathodes.	Coated Unipotential
Maximum Overall Length.	2.375"
Seated Length.	1.750" to 2.000"
Diameter.	1.062" to 1.188"
Bulb.	T9
Base.	Small-Button Duodecar 12-Pin (JEDIC No. E12-70)
Basing Designation for BOTTOM VIEW.	12BU

Pin 1 - Heater	Pin 8 - Beam Power Grid No.1
Pin 2 - Pentode Cathode	Pin 9 - Beam Power Cathode, Beam Power Plate
Pin 3 - Pentode Grid No.1	Pin 10 - Beam Power Grid No.2
Pin 4 - Pentode Grid No.3	Pin 11 - Beam Power Plate
Pin 5 - Internal Shield	Pin 12 - Heater
Pin 6 - Pentode Plate	
Pin 7 - Pentode Grid No.2	



PENTODE UNIT — FM SOUND DETECTOR

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	330 max.	volts
GRID-No.3 (SUPPLY-GRID) VOLTAGE	28 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.	volts
PLATE DISSIPATION	1.7 max.	watts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts	1.1 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	

BEAM POWER UNIT — AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	150 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	135 max.	volts
AVERAGE CATHODE CURRENT.	65 max.	ma
PLATE DISSIPATION.	6.5 max.	watts
GRID-No.2 INPUT.	1.8 max.	watts

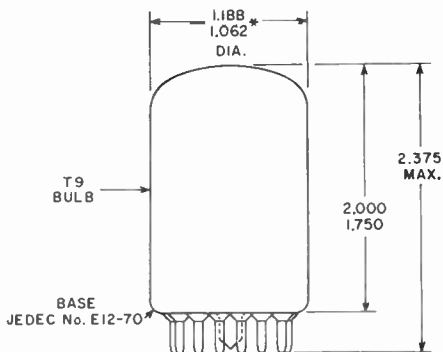
Typical Operation and Characteristics:

Plate Voltage.	120	volts
Grid-No.2 Voltage.	110	volts
Grid-No.1 (Control-Grid) Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts



Zero-Signal Plate Current. . . . .	.49	ma
Max.-Signal Plate Current.	50	ma
Zero-Signal Grid-No.2 Current.	4	ma
Max. Signal Grid-No.2 Current.	8.5	ma
Plate Resistance (Approx.)	10000	ohms
Transconductance	7500	μ mhos
Load Resistance.	2500	ohms
Total Harmonic Distortion.	10	per cent
Max.-Signal Power Output	2.3	watts

- ^a The dc component must not exceed 100 volts.
- ^b without external shield.



92CS-11838R1

DIMENSIONS IN INCHES

* APPLIES TO MINIMUM DIAMETER EXCEPT IN AREA OF SEAL.





Beam Power Tube

MAGNOVAL TYPE

ELECTRICAL

Heater Characteristics and Ratings

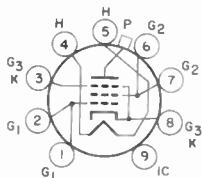
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 v	1.380	A
Maximum heater-cathode voltage		
Heater negative with respect to cathode:		
Peak	250	V
DC component	125	V
Heater positive with respect to cathode:		
Peak	250	V
DC component	125	V

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	4.125 in
Maximum Seated Length	3.750 in
Diameter	1.062 to 1.188 in
Envelope	JEDEC T9
Cap.	Skirted Miniature (JEDEC No. C1-2)
Base	Small-Button Magnoval 9-Pin (JEDEC No. E9-23) ←

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Grid-No.1
- Pin 2 - Grid-No.1
- Pin 3 - Cathode,
Grid No.3
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.2
- Pin 7 - Grid No.2
- Pin 8 - Cathode,
Grid No.3
- Pin 9 - Do Not Use
Cap - Plate



9HH

CHARACTERISTICS, INSTANTANEOUS VALUES^a

Plate Voltage	75	V
Grid-No.2 (Screen-Grid) Voltage	200	V
Grid-No.1 (Control-Grid) Voltage	-10	V
Plate Current	440	mA
Grid-No.2 Current	37	mA

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values

For operation in a 525-line, 30-frame system

DC Plate-Supply Voltage	275	V
Peak Positive-Pulse Plate Voltage ^b	7700	V
DC Grid-No.2 Voltage	275	V

← Indicates a change.



6GB5

Average Cathode Current	275	mA
Grid-No.2 Input ^c	5	W
Plate Dissipation ^d	17	W

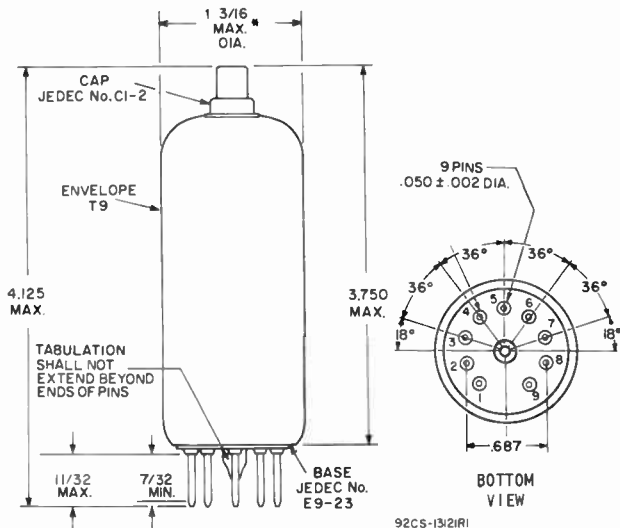
MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance

Without grid current	0.5	MΩ
With grid current (Horizontal output service only).	2.2	MΩ

- a Not to be tested under D^a conditions.
- b This rating is applicable where the duration of the voltage pulse does 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.
- c Grid-No.2 input may reach 6 watts for plate-dissipation values below 11 watts.
- d An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES

For pin alignment use gauge No. GE9-2.

* Applies in zone starting 0.375 inch from base seat.



Power Pentode

NEONOVAL TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp

Peak heater-cathode voltage:

Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^a	max.	volts

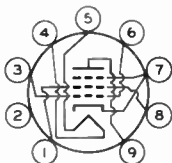
Direct Interelectrode Capacitances (Approx.):^b

Grid No.1 to plate	0.9	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	18.0	μf
Plate to cathode & grid No.3, grid No.2 and heater	7.0	μf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.230"
Maximum Seated Length	2.920"
Length, Base Seat to Bulb Top (Excluding tip)	2.370" to 2.610"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Large-Button Neonoval 9-Pin (JEDEC No. E9-68)
Basing Designation for BOTTOM VIEW	9EU

Pin 1 - Grid No.2
 Pin 2 - No Internal Connection
 Pin 3 - Grid No.1
 Pin 4 - Heater
 Pin 5 - Heater



Pin 6 - Grid No.1
 Pin 7 - Cathode, Grid No.3
 Pin 8 - Grid No.2
 Pin 9 - Plate

AF POWER AMPLIFIER — Class A₁Maximum Ratings, *Design-Maximum Values*:

PLATE VOLTAGE	220	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	140	max.	volts
GRID-No.2 INPUT	1.4	max.	watts
PLATE DISSIPATION	12	max.	watts



6GC5

Typical Operation and Characteristics:

	<i>Fixed Bias</i>	<i>Cathode Bias</i>	
Plate Supply Voltage.	110	200	volts
Grid-No.2 Supply Voltage.	110	125	volts
Grid-No.1 (Control-Grid) Voltage. .	-7.5	-	volts
Cathode Resistor.	-	180	ohms
Peak AF Grid-No.1 Voltage	7.5	8.5	volts
Zero-Signal Plate Current	49	46	ma
Max.-Signal Plate Current	50	47	ma
Zero-Signal Grid-No.2 Current . . .	4	2.2	ma
Max.-Signal Grid-No.2 Current . . .	10	8.5	ma
Plate Resistance (Approx.).	13000	28000	ohms
Transconductance.	8000	8000	μ mhos
Load Resistance	2000	4000	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output.	2.1	3.8	watts

Maximum Circuit Values:

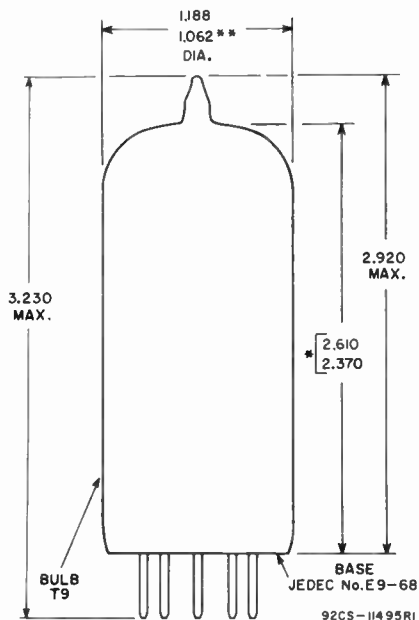
Grid-No.1-Circuit Resistance:

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

^a The dc component must not exceed 100 volts.

^b Without external shield.





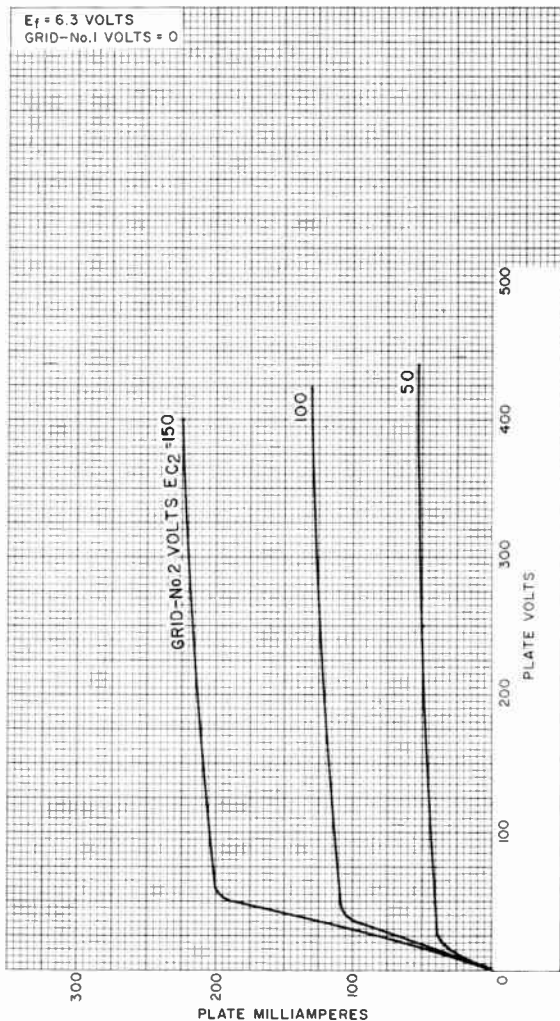
ALL DIMENSIONS IN INCHES

- ** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.
- * MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.



6GC5

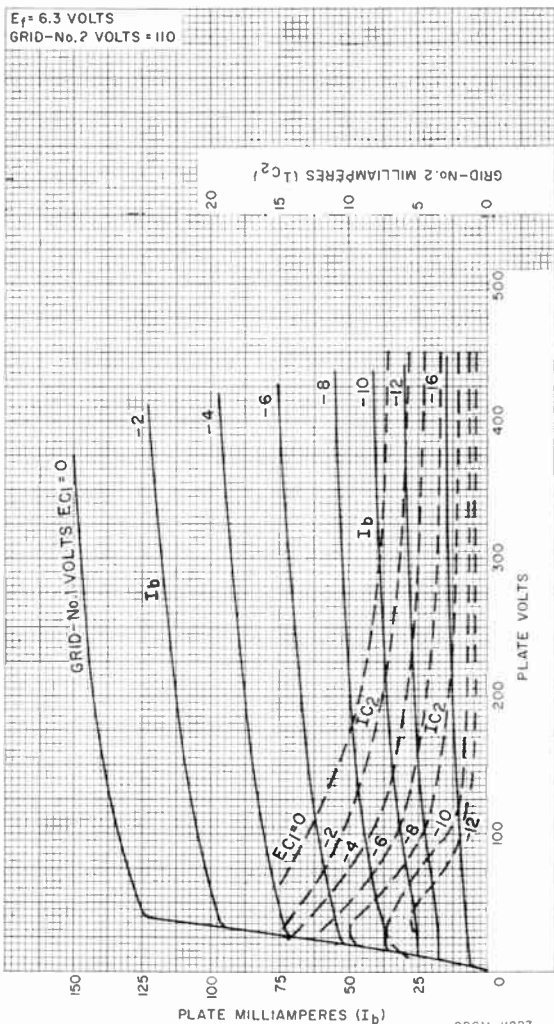
AVERAGE PLATE CHARACTERISTICS



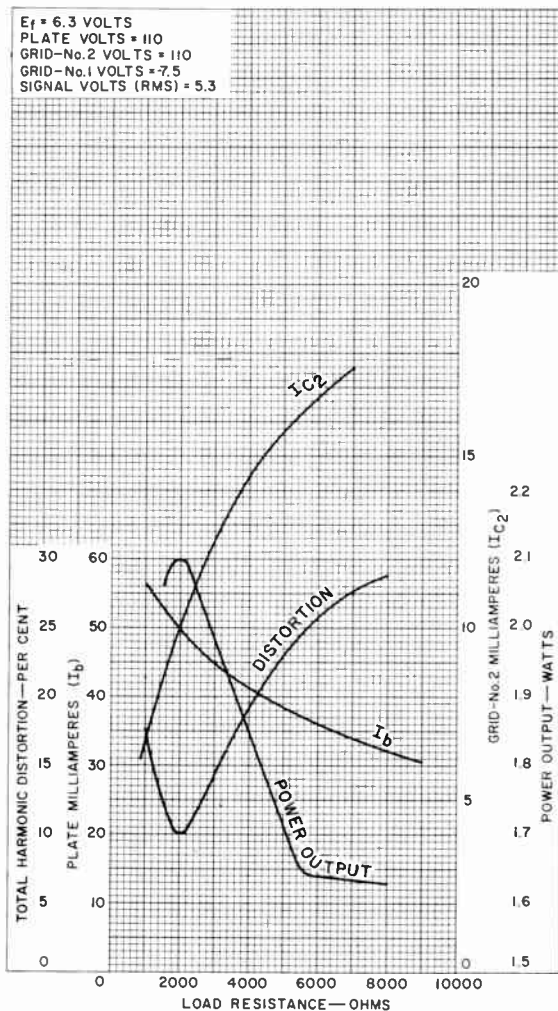
92CM-11824



AVERAGE CHARACTERISTICS



OPERATION CHARACTERISTICS



92CM-11828



Beam Power Tube

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp

Peak heater-cathode voltage:

Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 ^a	max. volts

Direct Interelectrode Capacitances (Approx.):^b

Grid No. 1 to plate	0.34	pf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	16.0	pf
Plate to cathode & grid No.3, grid No.2, and heater	7.0	pf

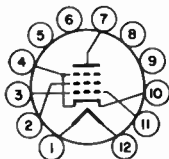
Characteristics, Class A₁ Amplifier:

Plate Voltage	60	150	250	5000	volts
Grid-No.2 Voltage	150	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	-	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.4	-	-	
Plate Resistance (Approx.)	-	-	18000	-	ohms
Transconductance	-	-	7300	-	μmhos
Plate Current	345 ^c	-	65	-	ma
Grid-No.2 Current	27 ^c	-	1.8	-	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-	-42	-100	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.875"
Seated Length	2.250" to 2.500"
Diameter	1.437" to 1.563"
Bulb	T12
Base	Large-Button Duodecar 12-Pin (JEDEC No.E12-74)
Basing Designation for BOTTOM VIEW	12BJ

- Pin 1 - Heater
- Pin 2 - Grid No.2
- Pin 3 - Grid No.1
- Pin 4 - Cathode, Grid No.3
- Pin 5 - Do Not Use^d
- Pin 6 - Do Not Use^d



- Pin 7 - Plate
- Pin 8 - Do Not Use^d
- Pin 9 - Do Not Use^d
- Pin 10 - Cathode, Grid No.3
- Pin 11 - Grid No.1
- Pin 12 - Heater



6GE5

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC PLATE-SUPPLY VOLTAGE	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^f	6500 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE.	220 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330 max.	volts
CATHODE CURRENT:		
Peak.	550 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.5 max.	watts
PLATE DISSIPATION ^g	17.5 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface).	220 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid resistor-bias operation. 1 max. megohm

^a The dc component must not exceed 100 volts.

^b without external shield.

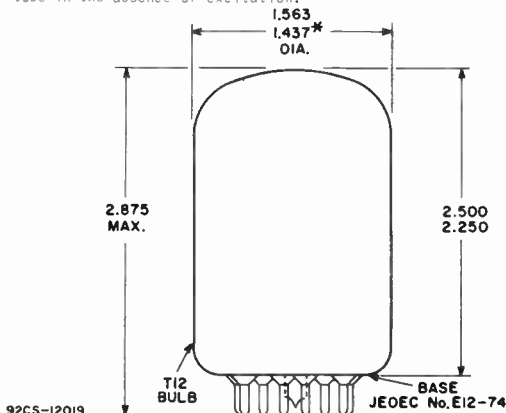
^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

^d socket terminals 5,6,8, and 9 should not be used as tie points.

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

^f This rating is applicable where the duration of the voltage pulse does 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.

^g An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



ALL DIMENSIONS IN INCHES
* APPLIES TO MINIMUM DIAMETER EXCEPT IN THE AREA OF THE SEAL.

Dual Triode

With High-Mu Unit and Low-Mu Unit

NOVAR TYPE

For Combined Vertical-Deflection-Oscillator
and-Amplifier Service in TV Receivers

Electrical:

Heater Characteristics and Ratings:

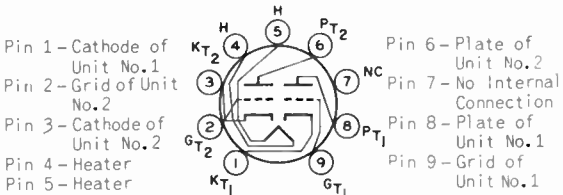
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.905	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

Direct Interelectrode Capacitances (Approx.):

	Unit No. 1	Unit No. 2	
Grid to plate	4.6	9.0	pf
G to (K,H)	2.4	6.5	pf
P to (K,H)	0.26	1.4	pf

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.380"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See <i>General Section</i>
Bulb	T9
Base	Small-Button Novar, 9-Pin with Exhaust Tip (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW	9QD



Characteristics, Class A₁ Amplifier:

	Unit No. 1	Unit No. 2	
Plate Voltage	250	60 150 250	volts
Grid Voltage	-3	0 -20 -28	volts
Amplification Factor	64	- 5.4 -	
Plate Resistance (Approx.)	40000	- 750 -	ohms
Plate Current	1.4	95 50 10	ma
Grid-Voltage (Approx.) for			
plate μ = 10	-5.5	- - -	volts
100	-	- -45 -	volts



6GF7A

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^b

DC Plate Voltage	330	max.	volts
Peak Negative Pulse-Grid Voltage	400	max.	volts
Cathode Current:			
Peak	77	max.	ma
Average.	22	max.	ma
Plate Dissipation.	1.5	max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation	2.2	max.	megohms
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VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values Except as Noted:

For operation in a 525-line, 30-frame system^b

DC Plate Voltage	330	max.	volts
Peak Positive-Pulse Plate Voltage (Absolute-maximum value) ^c	1500 ^d	max.	volts
Peak Negative-Pulse Grid Voltage	250	max.	volts
Cathode Current:			
Peak	175	max.	ma
Average.	50	max.	ma
Plate Dissipation.	11	max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias operation	2.2	max.	megohms
For cathode-bias operation	2.2	max.	megohms

a The dc component must not exceed 100 volts.

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

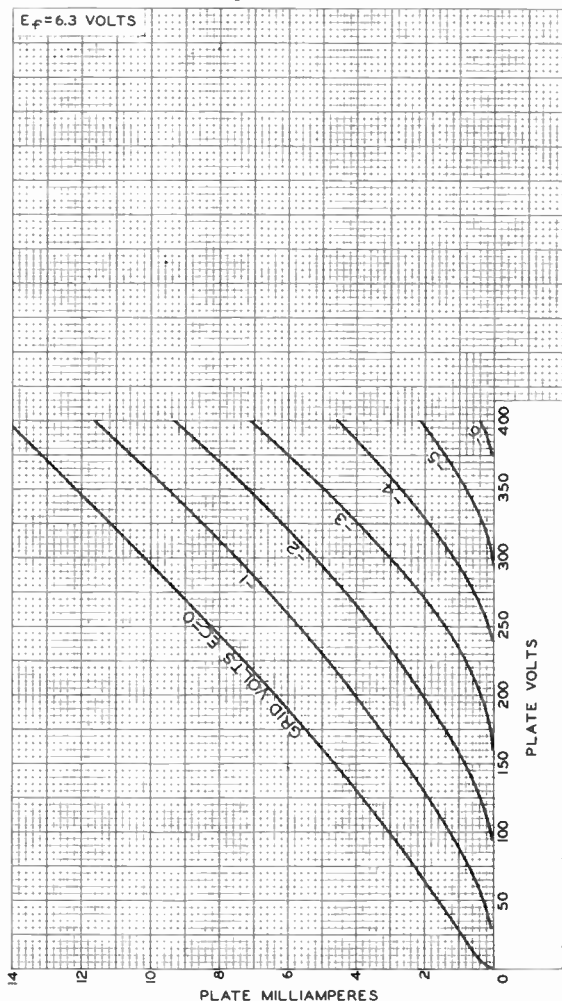
c This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

d Under no circumstances should this absolute-maximum value be exceeded.



AVERAGE PLATE CHARACTERISTICS

Unit No.1

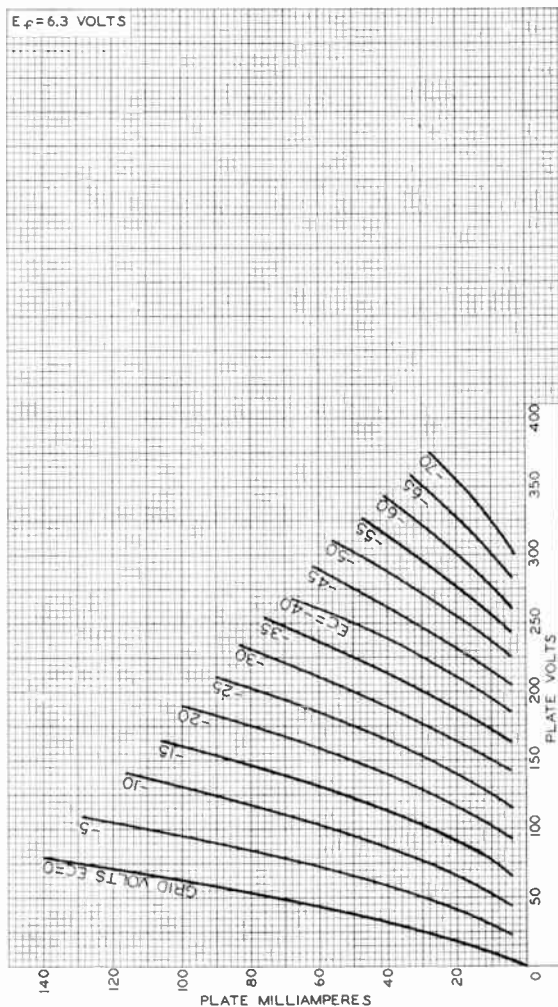


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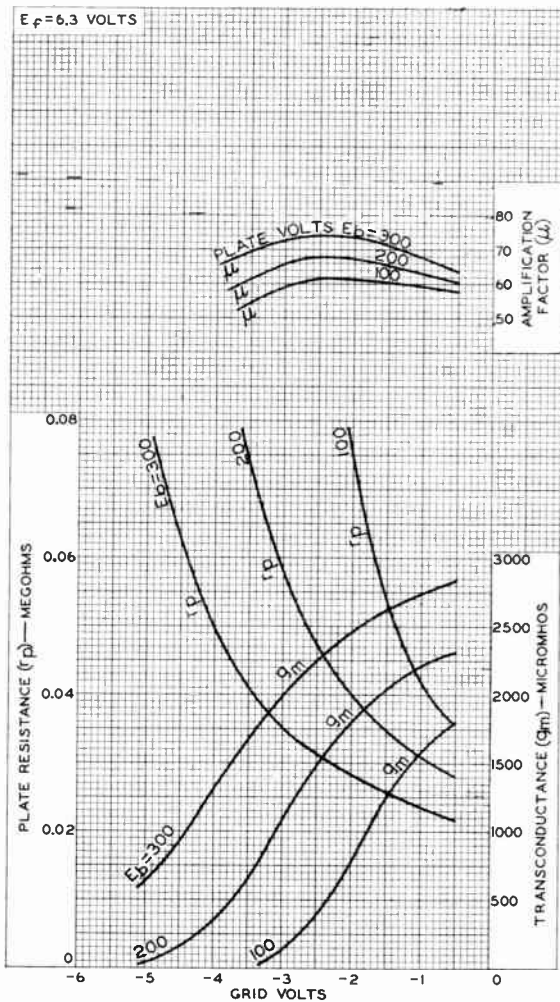
AVERAGE PLATE CHARACTERISTICS Unit No.2



92CM-10466



AVERAGE CHARACTERISTICS Unit No.1

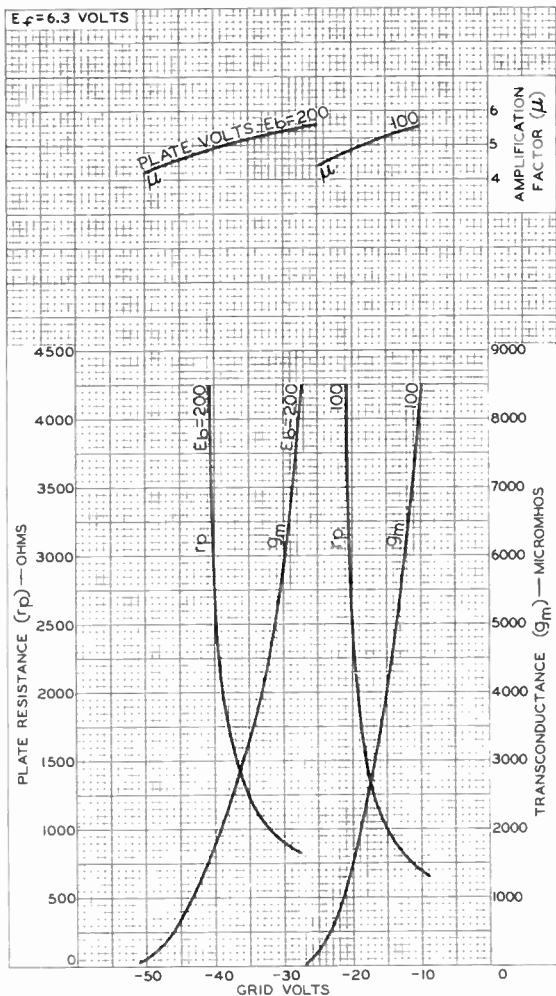


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6GF7A

AVERAGE CHARACTERISTICS Unit No.2



92CM-10467



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Multivibrator-Type Horizontal-Deflection Oscillator, AGC Amplifier, and Sync-Separator Applications

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450 ^b	amp
Warm-up time (Average)	11	—	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode		200 max.	volts
Heater positive with respect to cathode		200 ^c max.	volts

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^d</i>	
<i>Triode Unit:</i>			
Grid to plate	1.7	1.7	pf
Grid to cathode, pentode grid No.3 & pentode cathode & internal shield, and heater.	3.0	3.2	pf
Plate to cathode, pentode grid No.3 & pentode cathode & internal shield, and heater.	1.4	1.9	pf
Heater to cathode	3.0	3.0 ^e	pf
<i>Pentode Unit:</i>			
Grid No.1 to plate.	0.02 max.	0.01 max.	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5.0	5.0	pf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater.	2.6	3.4	pf
Heater to cathode & grid No.3 & internal shield	3.0	3.0 ^e	pf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	—	125	volts
Grid-No.1 Voltage	-1	-1	volt
Amplification Factor	46	—	
Plate Resistance (Approx.)	5400	200000	ohms
Transconductance.	8500	7500	μmhos



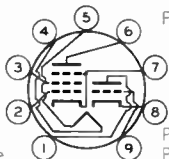
6GH8A

Plate Current	13.5	12	ma
Grid-No.2 Current	-	4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 10$	-8	-8	volts

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" \pm 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
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

HORIZONTAL-DEFLECTION OSCILLATOR

For operation in a 525-line, 30-frame system^f

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	330 max.	350 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	-	330 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
Peak-negative value	-	175 max.	volts
PLATE DISSIPATION	2.5 max.	2.5 max.	watts
GRID-No.2 INPUT	-	0.55 max.	watts
CATHODE CURRENT:			
Peak	-	300 max.	ma
Average	-	20 max.	ma

Maximum Circuit Values (Each Unit):

Grid-No.1-Circuit Resistance: For fixed-bias or cathode-bias operation.	2.2 max.	megohms
---	----------	---------

- a At heater amperes = 0.450.
- b At heater volts = 6.3.
- c The dc component must not exceed 100 volts.
- d with external shield JEDEC No. 315 connected to cathode of unit under test except as noted.
- e with external shield JEDEC No. 315 connected to ground.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.



INTERELECTRODE LEAKAGE

Leakage Resistance between Plate of Each Unit and All Other Electrodes of both units tied together 100 min. megohms

This test is performed under the following conditions: heater volts = 6.3; and plate 300 volts negative with respect to all other electrodes tied together.

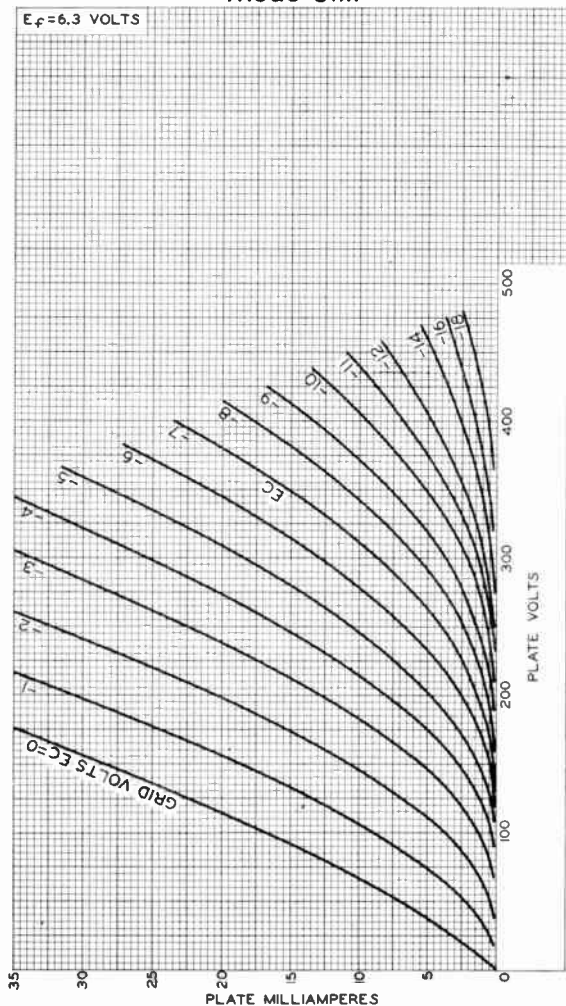
Leakage Resistance between Grid No.1 of Each Unit and All Other Electrodes of both units tied together , 100 min. megohms

This test is performed under the following conditions: heater volts = 6.3, and grid 100 volts negative with respect to all other electrodes tied together.



6GH8A

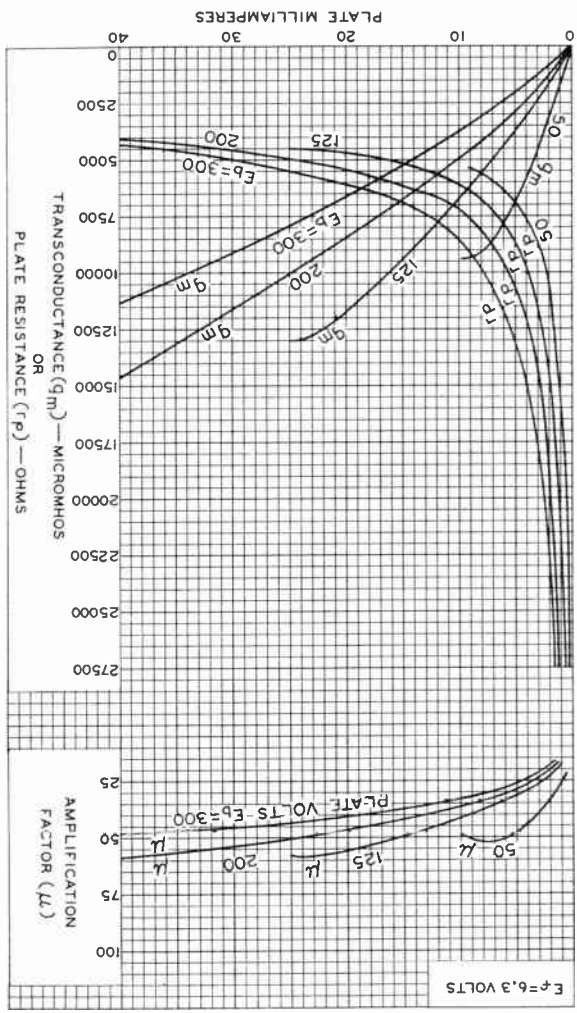
AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-10421R1



92CM-10428

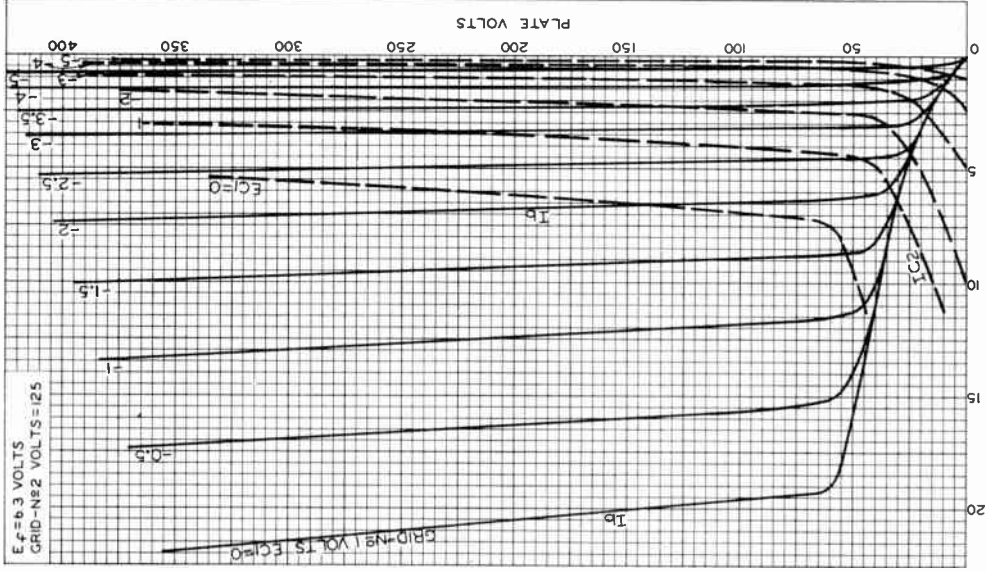


AVERAGE CHARACTERISTICS
Triode Unit

6GH8A

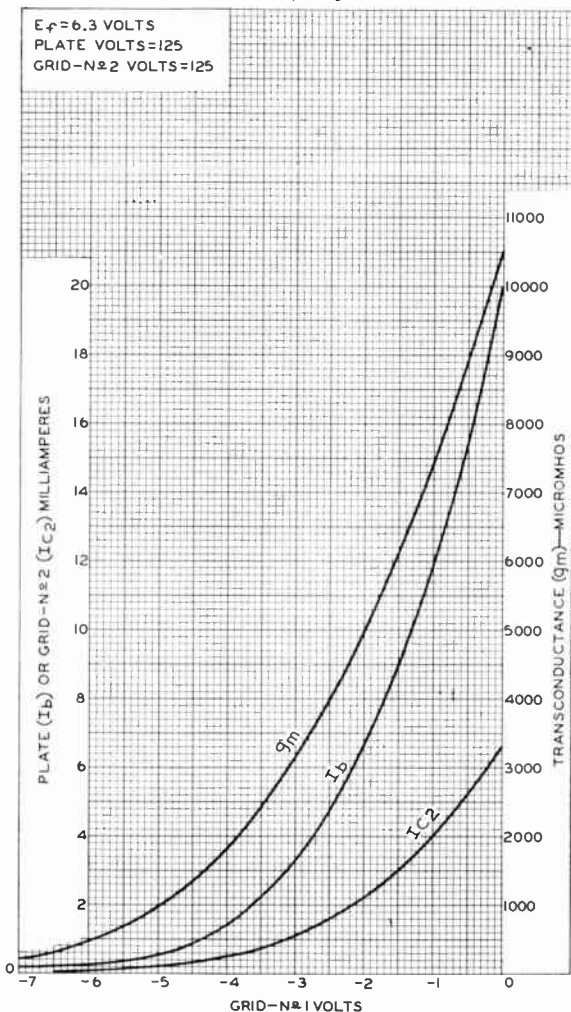
6GH8A

AVERAGE CHARACTERISTICS Pentode Unit



6GH8A

AVERAGE CHARACTERISTICS Pentode Unit



92CM-10417





Beam Power Tube

NOVAR TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.2	amp

μ-Factor, Grid No.2 to Grid No.1 for
plate volts = 150, grid-No.2 volts =
150, grid-No.1 volts = 22.5

4.4

Direct Interelectrode Capacitances

(Approx.):^a

Grid No.1 to plate	0.26	μmf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μmf
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μmf

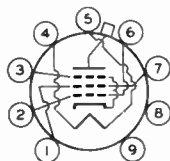
Characteristics, Class A₁ Amplifier:

Plate Voltage	60	250	volts
Grid-No.2 Voltage	150	150	volts
Grid-No.1 Voltage	0	-22.5	volts
Plate Resistance (Approx.)	-	15000	ohms
Transconductance	-	7100	μmhos
Plate Current	390 ^b	70	ma
Grid No.2 Current	32 ^b	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-42	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3.55"
Seated Length	3.04" ± 0.13"
Diameter	1.438" to 1.562"
Bulb	T12
Cap	Skirted Miniature (JEDEC C1-2 or C1-3)
Socket	Cinch Mfg. Co. No.149 1900 24, Industrial Electronic Hardware Co. No. S0-0968-M, or equivalent
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW	9NM

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



Pin 6-Grid No.1
Pin 7-Grid No.2
Pin 8-Do Not Use
Pin 9-Do Not Use
Cap-Plate



6GJ5

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC PLATE-SUPPLY VOLTAGE	770	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^d	6500	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE.	220	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330	max.	volts
CATHODE CURRENT:			
Peak.	550	max.	ma
Average	175	max.	ma
GRID-No.2 INPUT	3.5	max.	watts
PLATE DISSIPATION ^e	17.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^f	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).	240	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid resistor-bias operation. 1 max. megohm

^a without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

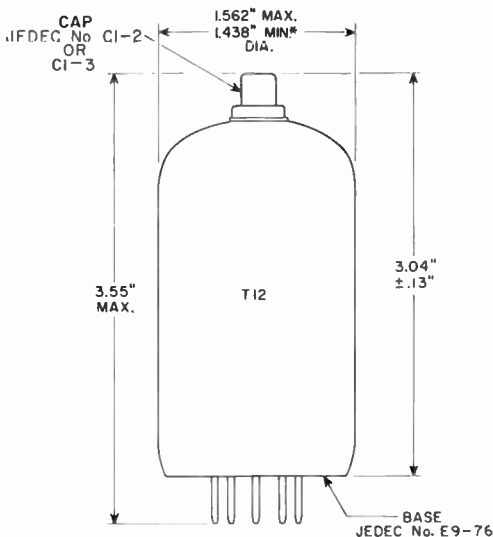
^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

^d This rating is applicable where the duration of the voltage pulse does 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.

^e An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

^f The dc component must not exceed 100 volts.





92CS-11127RI

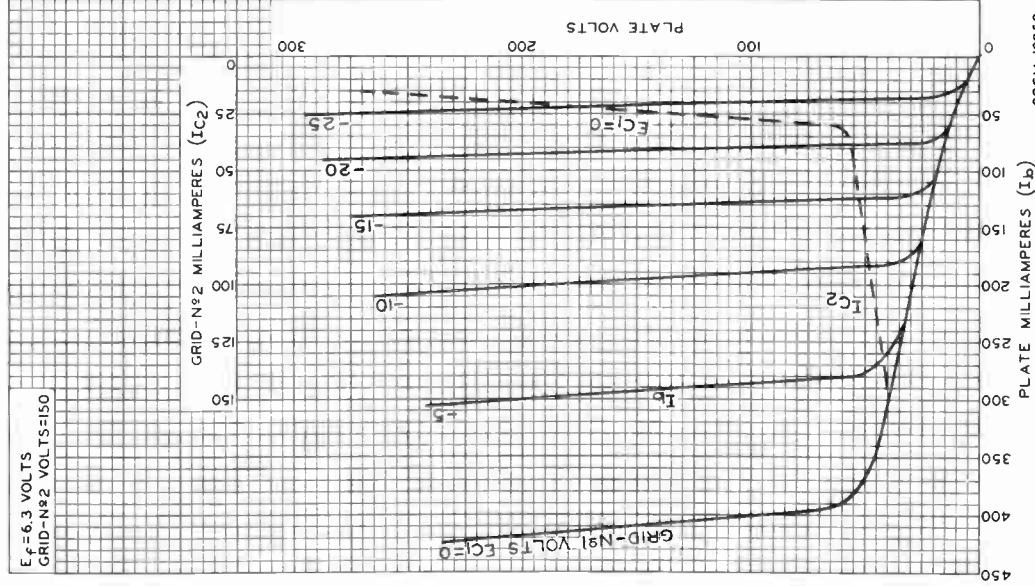
* APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.



6GJ5

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-N#2 VOLTS=150



92CM-10859

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



6GJ5A

Beam Power Tube

NOVAR TYPE

For Horizontal-Deflection-Amplifier
Service in Black-and-White TV Receivers

Electrical:

Heater Ratings and Characteristics:

Voltage (AC or DC) 6.3 ± 0.6 volts
Current at heater volts = 6.3 1.200 amp

Peak heater-cathode voltage:

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200 max.^a volts

Direct Interelectrode Capacitances (Approx.):^b

Grid No. 1 to plate 0.26 pf

Input: G1 to (K, G3, G2, H) 15.0 pf

Output: P to (K, G3, G2, H) 6.5 pf

Mechanical:

Operating Position Any

Type of Cathode Coated Unipotential

Maximum Overall Length 3.505"

Seated Length 2.875" to 3.125"

Diameter 1.438" to 1.562"

Dimensional Outline See *General Section*

Bulb T12

Cap Skirted Miniature (JEDEC C1-2 or C1-3)

Base Large-Button Novar 9-Pin with Exhaust Tip

(JEDEC No. E9-88)

Basing Designation for BOTTOM VIEW 90K

Pin 1-Grid No. 2

Pin 2-Grid No. 1

Pin 3-Cathode.

Grid No. 3

Pin 4-Heater

Pin 5-Heater

Pin 6-Grid No. 1

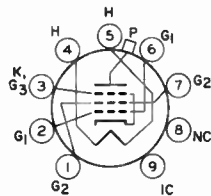
Pin 7-Grid No. 2

Pin 8-No Internal

Connection

Pin 9-Do Not Use

Cap-Plate



Characteristics, Class A₁ Amplifier:

	Triode Connection		Pentode Connection		
Plate voltage	150	60	250		volts
Grid-No. 2 Voltage	150	150	150		volts
Grid-No. 1 Voltage	-22.5	0	-22.5		volts
Mu-factor, Grid No. 2 to Grid No. 1	4.4	-	-		
Plate Resistance (Approx.)	-	-	15000		ohms
Transconductance	-	-	7100		μmhos



6GJ5A

	Triode Connection	Pentode Connection	
Plate Current	-	390 ^c	70 ma
Grid-No.2 Current	-	32 ^c	2.1 ma
Grid-No.1 Voltage (Approx.) for plate ma = 1.	-	-	-42 volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC Plate-Supply Voltage	770	max.	volts
Peak Positive-Pulse Plate Voltage ^e	6500	max.	volts
Peak Negative-Pulse Plate Voltage	1500	max.	volts
DC Grid-No.2 (Screen-Grid) Voltage.	220	max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55	max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330	max.	volts
Cathode Current:			
Peak.	550	max.	ma
Average	175	max.	ma
Grid-No.2 Input	3.5	max.	watts
Plate Dissipation ^f	17.5	max.	watts
Bulb Temperature (At hottest point on bulb surface).	240	max.	°C

Maximum Circuit Values:

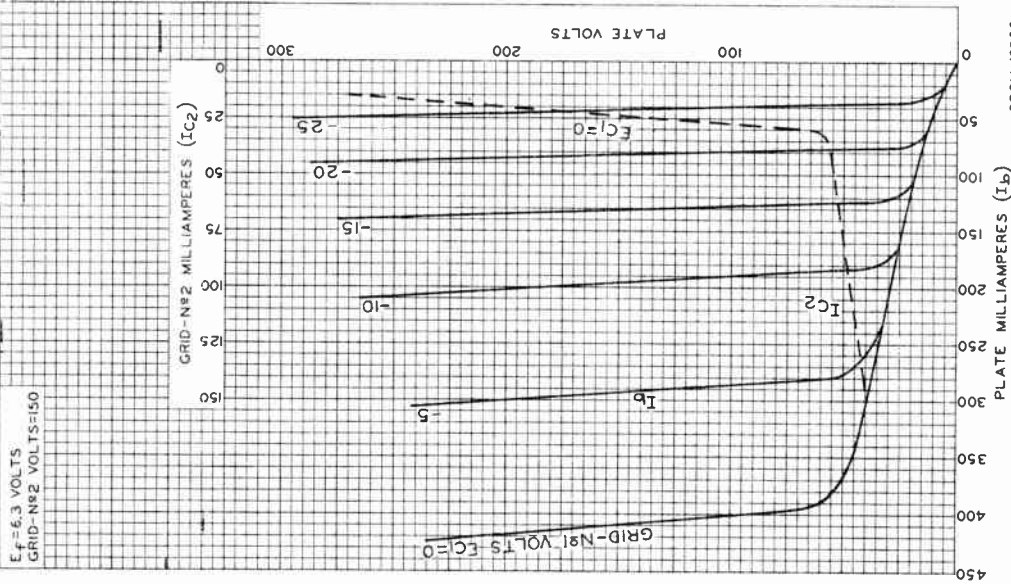
Grid-No.1-Circuit Resistance: For grid resistor-bias operation.	1	max.	megohm
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- ^a The dc component must not exceed 100 volts.
- ^b without external shield.
- ^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ^d As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- ^e This rating is applicable where the duration of the voltage pulse does 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.
- ^f An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



6GJ5A

AVERAGE CHARACTERISTICS



92CM-10859



RADIO CORPORATION OF AMERICA
Electronic Components and Devices

Harrison, N. J.

DATA 2
10-64



Medium-Mu Triode— Sharp-Cutoff Pentode

ELECTRICAL

Heater Characteristics and Ratings

voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	0.410	A
Heater-cathode voltage ^a	110 max	V

Direct Interelectrode Capacitances (Approx.)

Triode Unit

P ₁ to G ₁	1.8	pF
G ₁ to K, H	3.3	pF
P ₁ to all except G ₁ P	1.7	pF

Pentode Unit (With external shield)

Input	6.2	pF
Output	3.5	pF
P _p to G ₁ P	0.009	pF
G ₁ P to G ₂ P	1.5	pF

Between Triode and Pentode Units

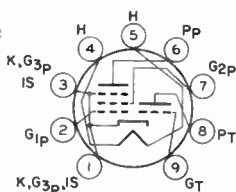
P _T to P _p	0.025 max	pF
P _p to G _T	0.01 max	pF
P _T to G ₁ P	0.01 max	pF
G _T to G ₁ P	0.01 max	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2 in
Maximum Seated Length	1-3/4 in
Diameter	0.750 to 0.875 in
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)

TERMINAL DIAGRAM (Bottom View)

- Pin 1—Cathode, Pentode Grid No. 3, Internal Shield
- Pin 2—Pentode Grid No. 1
- Pin 3—Same as Pin 2
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Pentode Plate
- Pin 7—Pentode Grid No. 2
- Pin 8—Triode Plate
- Pin 9—Triode Grid



90A

CHARACTERISTICS

	Triode Unit	Pentode Unit	
Plate Voltage	100	170	V
Grid-No. 2 Voltage	-	120	V
Grid-No. 1 Voltage	-3	-1.2	V
Amplification Factor	20	55 ^b	



	<i>Triode</i>	<i>Pentode</i>	
	<i>Unit</i>	<i>Unit</i>	
Plate Resistance (Approx.)	-	0.35	MΩ
Transconductance	9000	11000	μmhos
Plate Current.	15	10	mA
Grid No.2 Current.	-	3	mA

DESIGN-MAXIMUM RATINGS

	<i>Triode</i>	<i>Pentode</i>	
	<i>Unit</i>	<i>Unit</i>	
Plate-Supply Voltage	600	600	V
DC Plate Voltage	140	275	V
Grid-No.2 Supply Voltage	-	600	V
DC Grid-No.2 (Screen-Grid) Voltage . .	-	275	V
DC Grid-No.1 (Control-Grid) Voltage. .	-	-50	V
Cathode Current.	22	20	mA
Plate Dissipation.	1.8	2.4	W
Grid-No.2 Input ^C	-	0.55	W

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance

For fixed-bias operation	0.5	1	MΩ
For cathode-bias operation	0.5	2.2	MΩ

^a The hum should be minimized in intercarrier receiver applications by limiting the heater-cathode voltage to 100 volts rms, and in AM receivers to 50 volts rms.

^b Grid No.2 to grid No.1, approximate value.

^c When control grid bias is between -1.5 and -2 volts, screen dissipation is limited to 0.50 watt. When this bias is greater than -2 volts, maximum screen dissipation is 0.30 watt.



High-Mu Triode

7-PIN MINIATURE TYPE
For VHF-Amplifier Applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	0.18	amp
Direct Inter-electrode Capacitance (Approx.) ^a		
Grid to plate	0.52	μf
Grid to cathode, internal shield, and heater.	5	μf
Plate to cathode, internal shield, and heater.	3.5	μf
Heater to cathode	2.5 ^b	μf

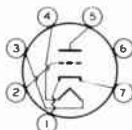
Characteristics, Class A₁ Amplifier:

Plate Voltage	135	volts
Grid Voltage.	-1	volt
Amplification Factor.	78	
Plate Resistance (Approx.)	5400	ohms
Transconductance.	15000	μmhos
Plate Current	11.5	ma
Grid Voltage (Approx.) for transconductance (μmhos) =		
150	-4.2	volts
1500.	-2.5	volts
Input Resistance ^c	275	ohms
Input Capacitance ^c	11.2	μf
Noise Figure ^d	4.7	db

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 <i>General Section</i>
Bulb.	T5-1/2
Base.	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW.	7FP

Pin 1 - Cathode
Pin 2 - Grid
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Plate
Pin 6 - Internal Shield
Pin 7 - Cathode



6GK5

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	200 max.	volts
GRID VOLTAGE:		
Negative-bias value.	50 max.	volts
Positive-bias value.	0 max.	volts
AVERAGE CATHODE CURRENT.	22 max.	ma
PLATE DISSIPATION.	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For cathode-bias operation 1 max. megohm

^a with external shield JEDEC No.316 connected to cathode except as noted.

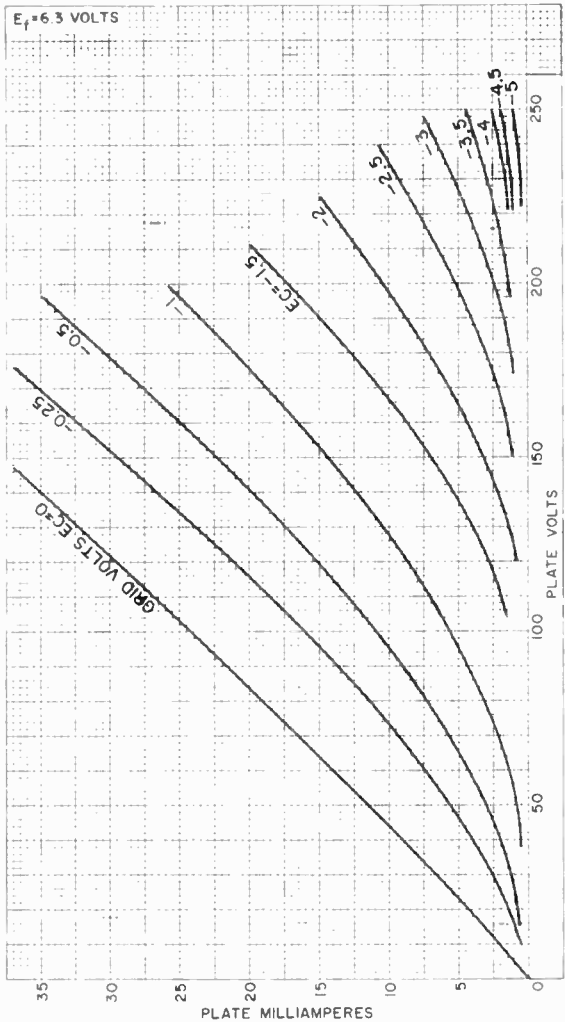
^b with external shield JEDEC No.316 and internal shield connected to ground.

^c Measured at 200 Mc with heater volts = 6.3 and plate effectively grounded for rf voltages.

^d For a neutralized triode amplifier at a frequency of 200 Mc with signal-source impedance adjusted for minimum noise output.



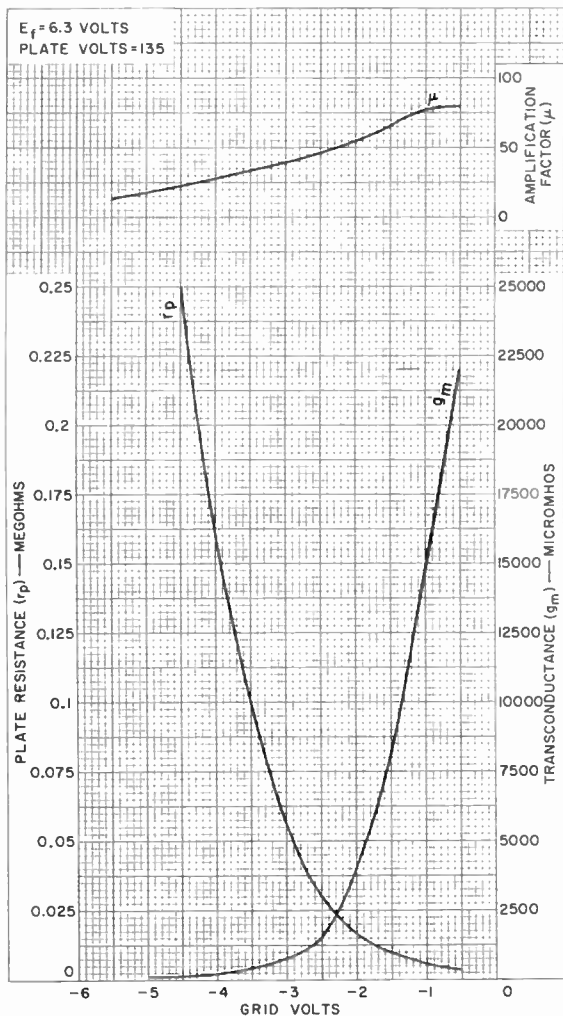
AVERAGE PLATE CHARACTERISTICS



92CM-11024



AVERAGE CHARACTERISTICS



92CM-11023



Power Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.76	amp

Direct Interelectrode Capacitances:^a

Grid No. 1 to plate	0.14 max.	μf
Grid No. 1 to cathode, grid No. 3 & internal shield, grid No. 2, and heater	10	μf
Plate to cathode, grid No. 3 & internal shield, grid No. 2, and heater	7	μf

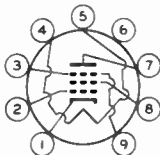
Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	250	volts
Grid-No. 2 Supply Voltage	250	volts
Cathode Resistor	135	ohms
Mu-Factor, Grid No. 2 to Grid No. 1	19	
Plate Resistance (Approx.)	38000	ohms
Transconductance	11300	μmhos
Plate Current	48	ma
Grid-No. 2 Current	5.5	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW	9GK

- Pin 1 - Cathode
- Pin 2 - Grid No. 1
- Pin 3 - Grid No. 3,
Internal
Shield
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - No Connection
- Pin 7 - Plate
- Pin 8 - Grid No. 2
- Pin 9 - Grid No. 3,
Internal
Shield

AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE	600 max.	volts
PLATE VOLTAGE	330 max.	volts
GRID-NO. 2 SUPPLY VOLTAGE	600 max.	volts
GRID-NO. 2 (SCREEN-GRID) VOLTAGE	330 max.	volts



6GK6

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Negative-bias value	100 max.	volts
CATHODE CURRENT	65 max.	ma

GRID-No.2 INPUT:

Peak	4 max.	watts
Average	2 max.	watts
PLATE DISSIPATION	13.2 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:

Plate Supply Voltage.	250	volts
Grid-No.2 Supply Voltage.	250	volts
Cathode Resistor.	135	ohms
Peak AF Grid-No.1 Voltage	7.3	volts
Zero-Signal Plate Current	48	ma
Max.-Signal Plate Current	50.6	ma
Zero-Signal Grid-No.2 Current	5.5	ma
Max.-Signal Grid-No.2 Current	10	ma
Effective Load Resistance	5200	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output.	5.7	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.3 max.	megohm
For cathode-bias operation.	1 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB₁

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE.	600 max.	volts
PLATE VOLTAGE	330 max.	volts
GRID-No.2 SUPPLY VOLTAGE.	600 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	330 max.	volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Negative-bias value	100 max.	volts
CATHODE CURRENT	65 max.	ma

GRID-No.2 INPUT:

Peak	4 max.	watts
Average	2 max.	watts
PLATE DISSIPATION	13.2 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:

Values are for 2 tubes

Plate Supply Voltage.	250	300	volts
Grid-No.2 Supply Voltage.	250	300	volts
Cathode Resistor.	130	130	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage.	22.4	28	volts
Zero-Signal Plate Current	62	72	ma



Max.-Signal Plate Current	75	92	ma
Zero-Signal Grid-No.2 Current	7	8	ma
Max.-Signal Grid-No.2 Current	15	22	ma
Effective Load Resistance (Plate to plate). 8000	8000		ohms
Total Harmonic Distortion	3	4	%
Max.-Signal Power Output	11	17	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.3 max.	megohm
For cathode-bias operation	1 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class B

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE	600 max.	volts
PLATE VOLTAGE	330 max.	volts
GRID-No.2 SUPPLY VOLTAGE	600 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	330 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
CATHODE CURRENT	65 max.	ma
GRID-No.2 INPUT:		
Peak	4 max.	watts
Average	2 max.	watts
PLATE DISSIPATION	13.2 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:

Values are for 2 tubes

Plate Voltage	250	300	volts
Grid-No.2 Voltage	250	300	volts
Grid-No.1 Voltage	-11.6	-14.7	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage.	22.4	28	volts
Zero-Signal Plate Current	20	15	ma
Max.-Signal Plate Current	75	92	ma
Zero-Signal Grid-No.2 Current	2.2	1.6	ma
Max.-Signal Grid-No.2 Current	15	22	ma
Effective Load Resistance (Plate to plate). 8000	8000	8000	ohms
Total Harmonic Distortion	3	4	%
Max.-Signal Power Output	11	17	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.3 max.	megohm
For cathode-bias operation	1 max.	megohm

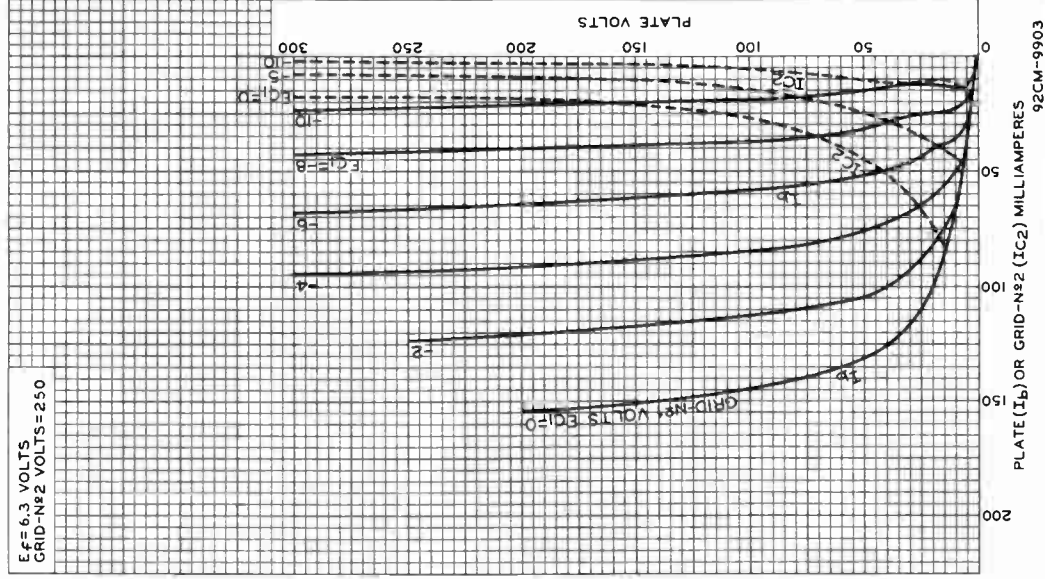
^a without external shield.



6GK6

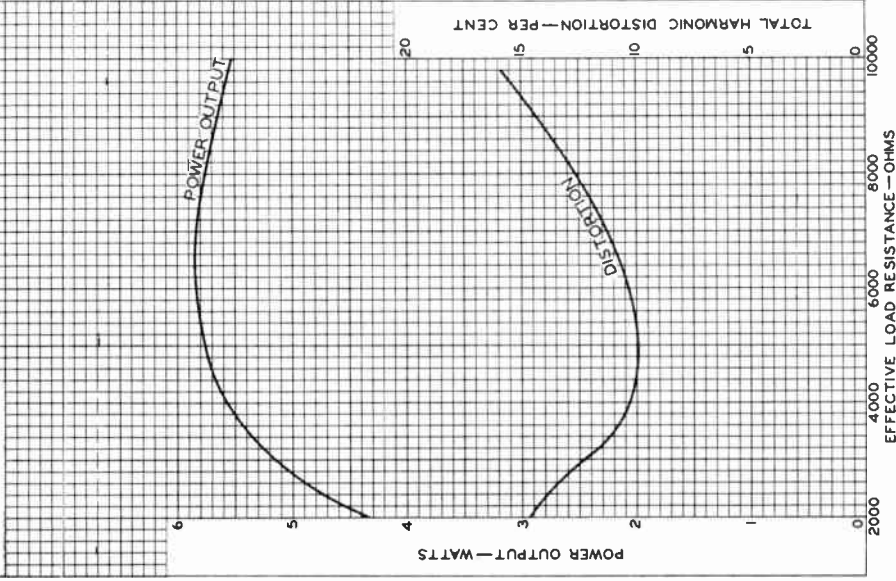
AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-N₂ VOLTS = 250



OPERATION CHARACTERISTICS

$E_f = 6.3$ VOLTS
 PLATE VOLTS = 250
 GRID-No 2 VOLTS = 250
 GRID-No 1 VOLTS = -7.3
 AF GRID-No 1 VOLTS
 (RMS) = 4.4



92CM-9902





Dual Triode With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volls
Current at heater volts = 6.3	1.05	amp

Peak heater-cathode voltage (Each unit):

Heater negative with respect to cathode	200 max.	volls
Heater positive with respect to cathode	200 ^a max.	volls

Direct Interelectrode Capacitances (Approx.):^b

	Unit No. 1	Unit No. 2	
Grid to plate	4.0	8.0	pf
Grid to cathode and heater	2.2	6.0	pf
Plate to cathode and heater	0.6	1.3	pf

Characteristics, Class A₁ Amplifier:

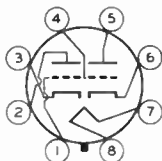
	Unit No. 1		Unit No. 2		
Plate Voltage	250	275	60	175	volls
Grid Voltage	-3	^c	0 ^d	-25	volls
Amplification Factor	66	-	-	5	
Plate Resistance (Approx.)	30000	-	-	780	ohms
Transconductance	2200	1600	-	6400	μmhos
Plate Current	2	13	100	46	ma
Grid Voltage (Approx.) for plate μa =					
20	-5.3	-	-	-	volls
200	-	-	-	-60	volls

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	3"
Maximum Seated Length	2-7/16"
Maximum Diameter	1-9/32"
Bulb	T9
Base	Intermediate-Shell Octal 8-Pin, (JEDEC Group 1, No. 88-6)

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



6GL7

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC PLATE VOLTAGE.	350 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400 max.	volts
PLATE DISSIPATION	1 max.	watt

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation.	1 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC PLATE VOLTAGE.	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^f	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	10 ^g max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation.	1 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

^a The dc component must not exceed 100 volts.

^b without external shield.

^c Adjusted for plate ma.=13.

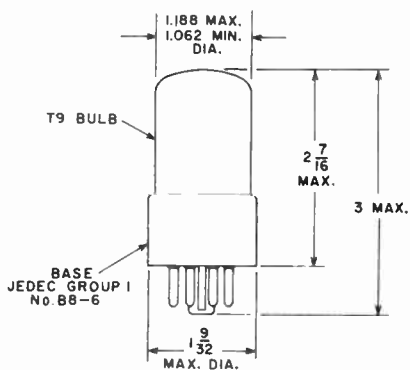
^d Applied for short interval (two seconds maximum) so as not to damage tube.

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

^f This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

^g In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.





ALL DIMENSIONS IN INCHES





Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Gain-Controlled, 40-Mc, Picture-IF Stages of TV Receivers

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.1	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^A	
Grid No.1 to plate.	0.036 max.	0.026 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . .	10	10	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater.	2.4	3.4	μμf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage.	125	volts
Grid No.3 and Internal Shield. .	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage.	125	volts
Cathode Resistor.	56	ohms
Plate Resistance (Approx.).	0.2	megohm
Transconductance.	13000	μmhos
Plate Current	14	ma
Grid-No.2 Current	3.4	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 60.	-15	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 <i>General Section</i>
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



6GM6

AMPLIFIER — Class A₁

Maximum Ratings, Design-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	0.65 max. watt
For grid-No.2 voltages be- tween 165 and 330 volts.	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section
PLATE DISSIPATION.	3.1 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode.	200 max. volts
Heater positive with respect to cathode.	200 [•] max. volts

▲ with external shield JEDEC No.316 connected to cathode.

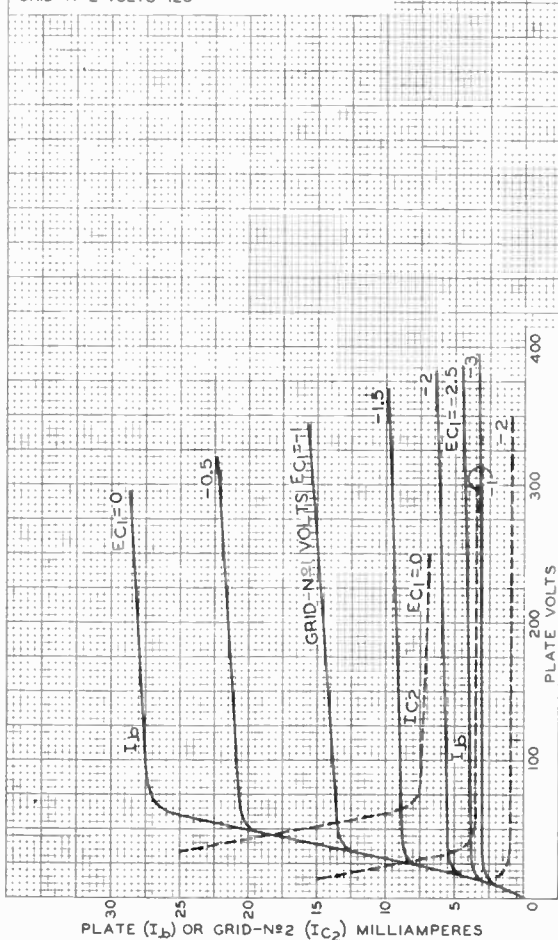
• The dc component must not exceed 100 volts.



AVERAGE CHARACTERISTICS

 $E_f = 6.3$ VOLTSGRID No 3 AND INTERNAL SHIELD CONNECTED
TO CATHODE AT SOCKET.

GRID-No 2 VOLTS = 125



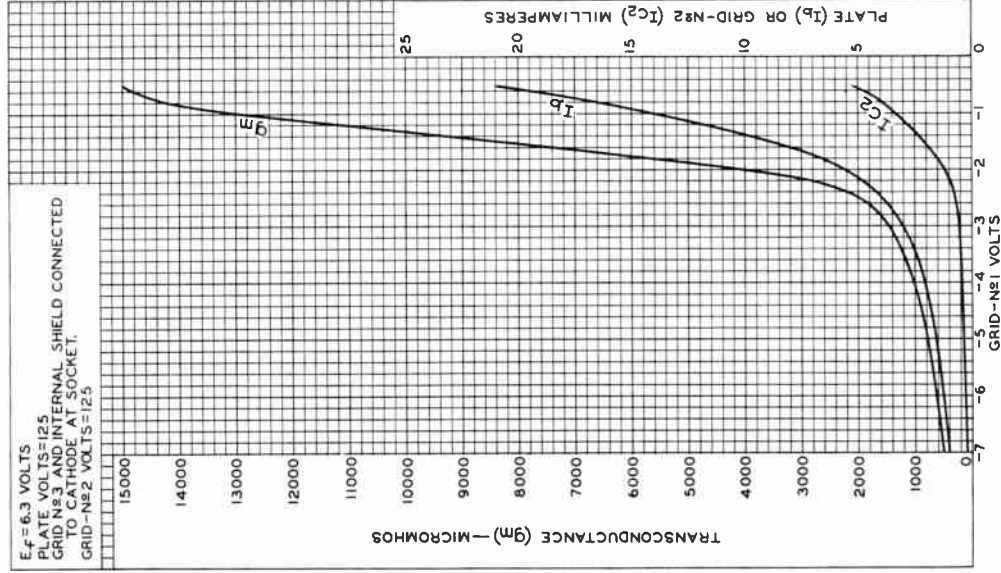
92CM-10390RI



6GM6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 125
GRID N₃ AND INTERNAL SHIELD CONNECTED
TO CATHODE AT SOCKET.
GRID-N₂ VOLTS = 12.5



92CM-10391RI

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	0.75	amp

Direct Interelectrode Capacitances:^a

Triode Unit:

Grid to plate	4.4	μf
Grid to cathode and heater.	2.4	μf
Plate to cathode and heater	0.36	μf

Pentode Unit:

Grid No.1 to plate.	0.1 max.	μf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater.	11	μf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater.	4.2	μf
Triode grid to pentode plate.	0.018 max.	μf
Pentode grid No.1 to triode plate	0.005 max.	μf
Pentode plate to triode plate	0.17 max.	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>		
Plate Supply Voltage.	250	60	200	volts
Grid-No.2 Supply Voltage.	—	150	150	volts
Grid-No.1 Voltage	-2	0	—	volts
Cathode Resistor.	—	—	100	ohms
Amplification Factor.	100	—	—	
Plate Resistance (Approx.).	37000	—	60000	ohms
Transconductance.	2700	—	11500	μmhos
Plate Current	2	55 ^b	25	ma
Grid-No.2 Current	—	18 ^b	5.5	ma
Grid-No.1 Voltage (Approx.) for plate μ _a = 100.	—	—	-10	volts
Grid Voltage (Approx.) for plate μ _a = 20	-5	—	—	volts

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.	0.150" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb.	T6-1/2



6GN8

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

Pin 1 - Triode Cathode	Pin 6 - Pentode Cathode.
Pin 2 - Triode Grid	Grid No. 3. Internal Shield
Pin 3 - Triode Plate	Pin 7 - Pentode Grid No. 1
Pin 4 - Heater	Pin 8 - Pentode Grid No. 2
Pin 5 - Heater	Pin 9 - Pentode Plate



AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
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
PLATE DISSIPATION	1 max.	5 max.	watts

GRID-NO. 2 INPUT:			
For grid-no. 2 voltages up to 165 volts	-	1.1 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

PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200 max.	200 max.	volts
Heater positive with respect to cathode.	200 ^c max.	200 ^c 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

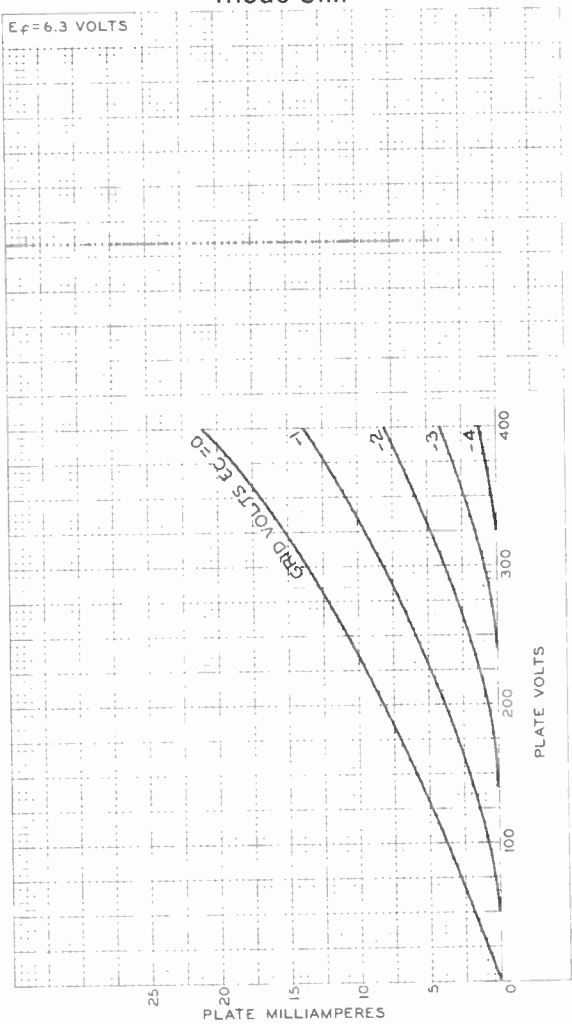
^a without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

^c The dc component must not exceed 100 volts.



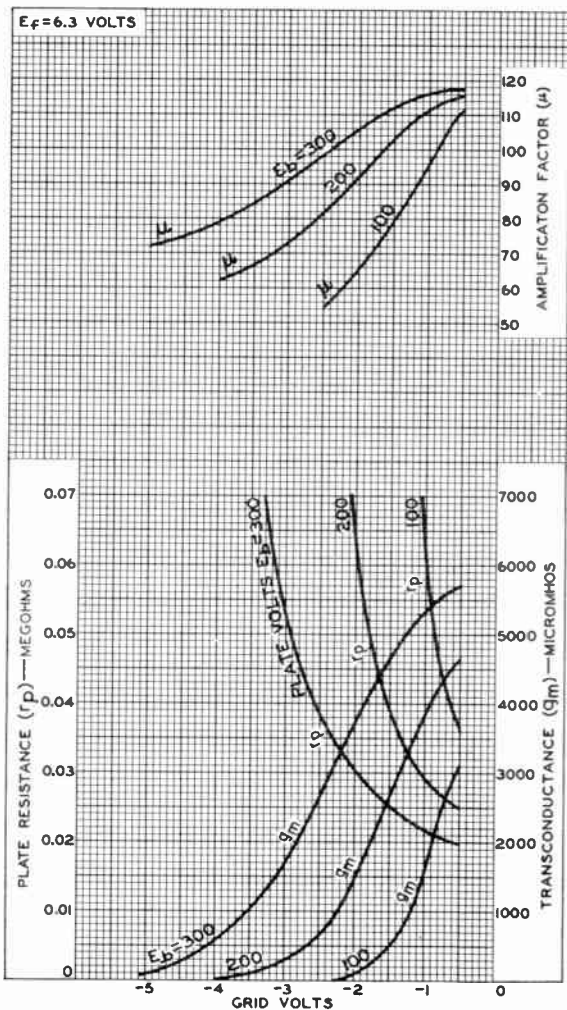
AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-9907R1



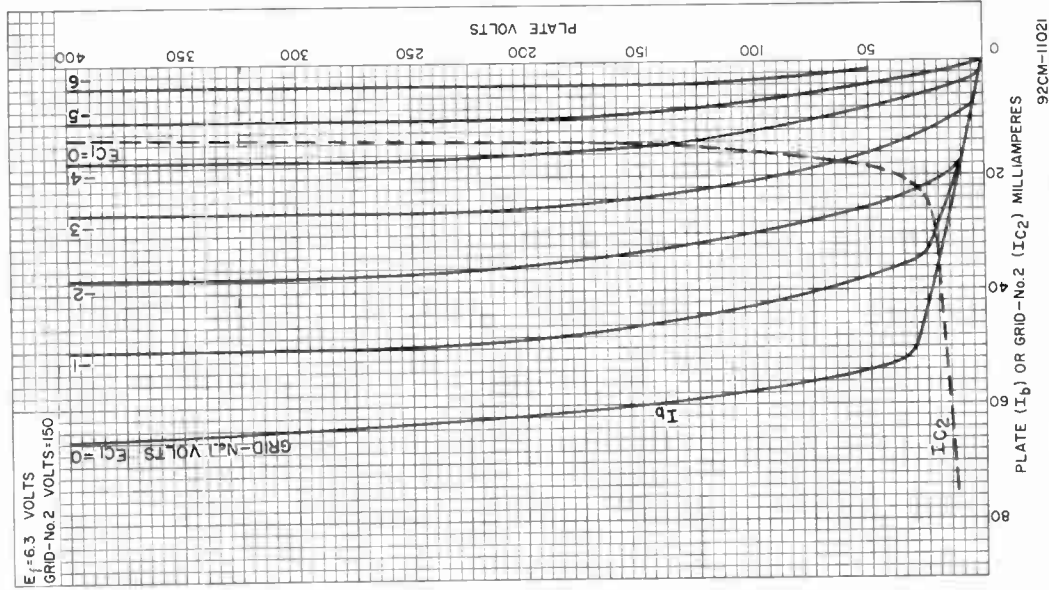
AVERAGE CHARACTERISTICS Triode Unit



92CM-11025

6GN8

AVERAGE CHARACTERISTICS Pentode Unit



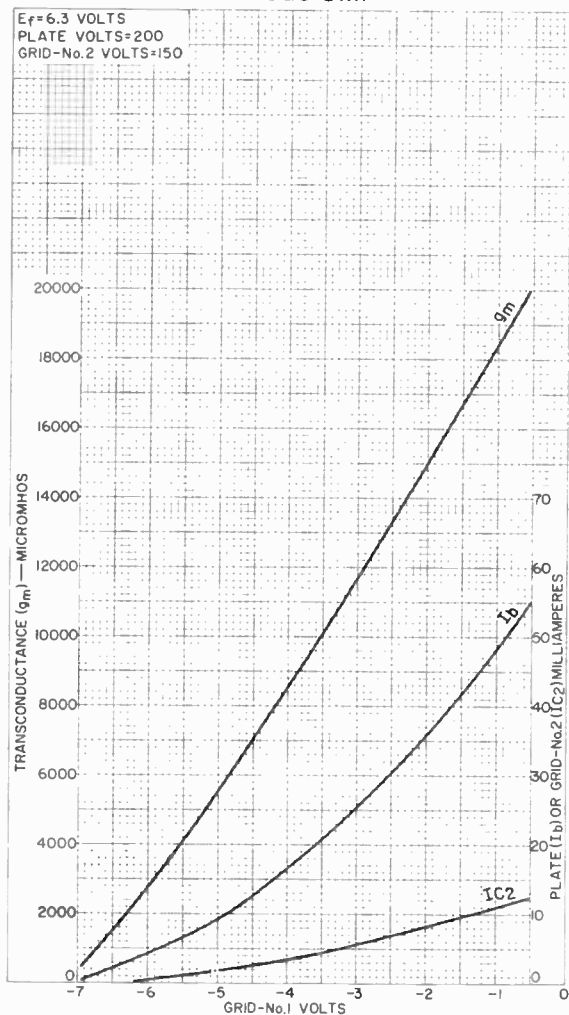
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.

DATA 3
5-61

6GN8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-11022

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Beam Power Tube

NOVAR TYPE

For TV Horizontal-Deflection-Amplifier Applications

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with		
respect to cathode	200 max.	volts
Heater positive with		
respect to cathode	200 ^a max.	volts

Direct Interelectrode Capacitances

(Approx.): ^b		
Grid No.1 to plate	0.26	pf
Grid No.1 to cathode & grid No.3,		
grid No.2, and heater	15.0	pf
Plate to cathode & grid No.3,		
grid No.2, and heater	6.5	pf

Characteristics, Class A₁ Amplifier:

			Triode Con- nec- tion ^c	
Plate Voltage	60	250	150	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Amplification Factor	-	-	4.4	
Plate Resistance (Approx.)	-	15000	-	ohms
Transconductance	-	7100	-	μmhos
Plate Current	390 ^d	70	-	ma
Grid-No.2 Current	32 ^d	2.1	-	ma
Grid-No.1 Voltage (Approx.) for				
plate ma. = 0.1	-	-42	-	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.410"
Maximum Seated Length	3.030"
Length, Base Seat to Bulb Top (Excluding tip)	2.510" to 2.690"
Diameter	1.438" to 1.562"
Bulb	T12
Socket . . . . .	.Cinch Mfg. Co. No.149 19 00 033, Industrial Electronic Hardware Co. No.S0-0968-SL1, or equivalent
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)

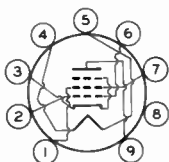
← Indicates a change.



6GT5

Basing Designation for BOTTOM VIEW. 9NZ

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



Pin 5 - Heater
 Pin 6 - Grid No.1
 Pin 7 - Grid No.2
 Pin 8 - Do Not Use
 Pin 9 - Plate

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC PLATE-SUPPLY VOLTAGE	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^f	6500 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	220 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330 max.	volts
CATHODE CURRENT:		
Peak	550 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.5 max.	watts
PLATE DISSIPATION ^g	17.5 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface).		
	240 max.	°C

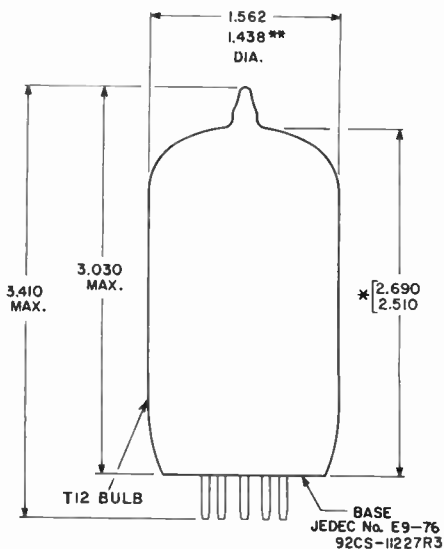
Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation. 1 max. megohm

- ^a The dc component must not exceed 100 volts.
- ^b Without external shield.
- ^c with grid No.2 connected to plate.
- ^d This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ^e As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^f This rating is applicable where the duration of the voltage pulse does 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.
- ^g An adequate bias resistor or other means is required to protect the tube in the absence of excitation.





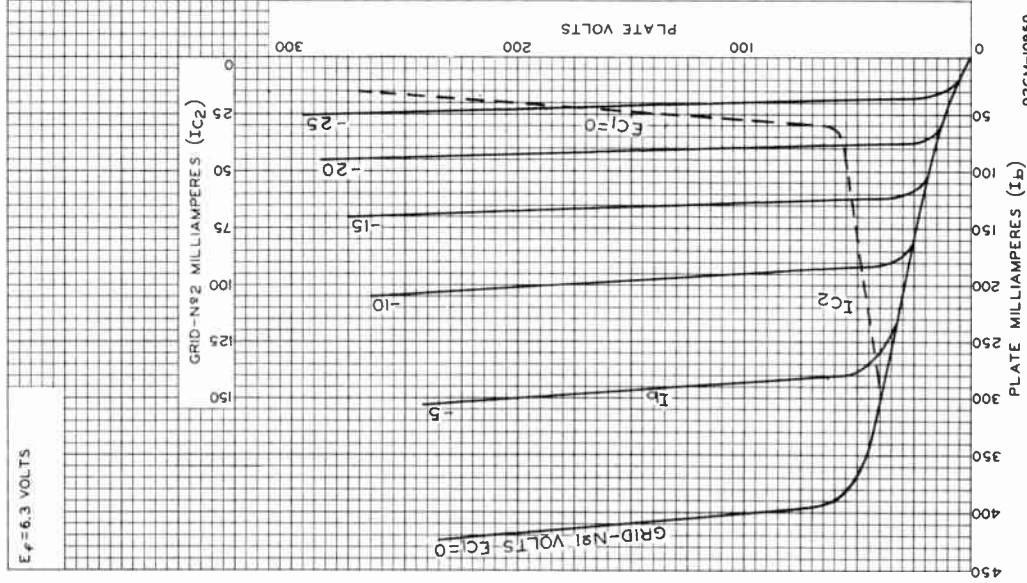
ALL DIMENSIONS IN INCHES

- ** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.
- ▣ MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.



6GT5

AVERAGE CHARACTERISTICS



6GT5A

Beam Power Tube

NOVAR TYPE

For Horizontal-Deflection-Amplifier
Service in Black-and-White TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC) 6.3 ± 0.6 volts
Current at heater volts = 6.3 1.200 amp

Peak heater-cathode voltage:

Heater negative with respect to cathode. 200 max. volts
Heater positive with respect to cathode. 200^a max. volts

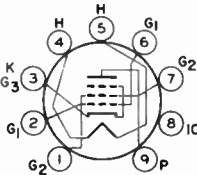
Direct Interelectrode Capacitances (Approx):^b

Grid No.1 to Plate 0.26 pf
Input: G1 to (K+G3,G2,H). 15.0 pf
Output: P to (K+G3,G2,H). 6.5 pf

Mechanical:

Operating Position Any
Type of Cathode Coated Unipotential
Maximum Overall Length 2.880"
Seated Length 2.250" to 2.500"
Diameter 1.438" to 1.562"
Dimensional Outline See *General Section*
Bulb T12
Base Large-Button Novar 9-Pin with Exhaust Tip
(JEDEC No. E9-88)
Basing Designation for BOTTOM VIEW 9NZ

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



Pin 5-Heater
Pin 6-Grid No.1
Pin 7-Grid No.2
Pin 8-Do Not Use
Pin 9-Plate

Characteristics, Class A₁ Amplifier:

	Triode Connection ^c	Pentode Connection	
Plate Voltage.	150	60	250 volts
Grid-No.2 Voltage.	150	150	150 volts
Grid-No.1 Voltage.	-22.5	0	-22.5 volts
Amplification Factor	4.4	-	-
Plate Resistance (Approx.)	-	-	15000 ohms
Transconductance	-	-	7100 μmhos
Plate Current.	-	390 ^d	70 ma
Grid-No.2 Current.	-	32 ^d	2.1 ma
Grid-No.1 Voltage (Approx.) for plate ma = 0.1	-	-	-42 volts



6GT5A

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC Plate-Supply Voltage.	770 max.	volts
Peak Positive-Pulse Plate Voltage ^f	6500 max.	volts
Peak Negative-Pulse Plate Voltage.	1500 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage.	-55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage.	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average.	175 max.	ma
Grid-No.2 Input.	3.5 max.	watts
Plate Dissipation ^g	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation 1 max. megohm

^a The dc component must not exceed 100 volts.

^b Without external shield.

^c With grid No.2 connected to plate.

^d This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

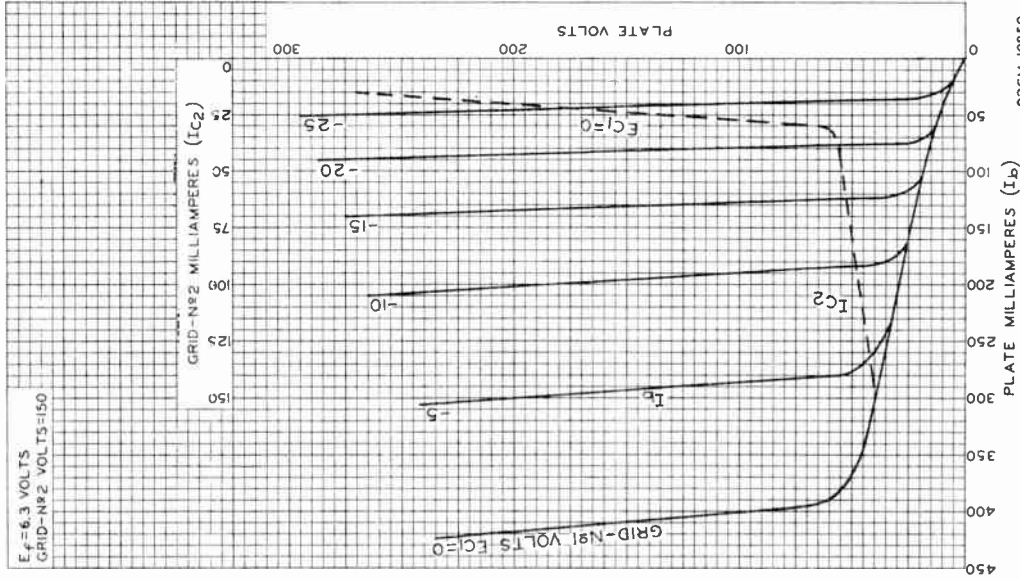
^f This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

^g An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



6GT5A

AVERAGE CHARACTERISTICS





Beam Hexode

ELECTRICAL

Heater Characteristics and Ratings

Voltage: 6.3 ± 0.6	V
Current: 0.220	A
Power: 200	V
Power: 200	V
Power: 100	V

Direct Interelectrode Capacitances (Approx.)

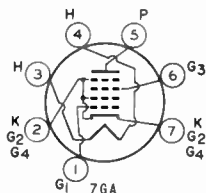
Grid-No.1 to Plate	0.018	pF
Grid-No.2 to Grid-No.1	7.0	pF
Grid-No.3 to Grid-No.2	3.2	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8 in
Maximum Seated Length	1-7/8 in
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2 ± 3/32 in
Diameter	0.650 to 0.750 in
Dimensional Outline (JEDEC No.5-2)	See General Section
Envelope	JEDEC T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Grid No.1
- Pin 2 - Grid No.2
- Pin 3 - Heater
- Pin 4 - Plate
- Pin 5 - Grid No.3
- Pin 6 - Grid No.2
- Pin 7 - Same as Pin 6



CHARACTERISTICS

Plate Voltage	135	275	V
Grid-No.3 Voltage	135	135	V
Grid-No.1 Voltage	-0.4	-0.4	V
Plate Resistance (Approx.)	0.67	0.165	MΩ
Transconductance	15000	15500	μmhos
Plate Current	9	10	mA
Grid-No.3 Current	0.25	0.17	mA
Grid-No.1 Voltage (Approx.)	-6.2	-6.5	V
for transconductance = 100 μmhos			
Noise Figure	5.9	5.7	dB
At 200 Mc/s			



6GU5

DESIGN-MAXIMUM RATINGS

Plate Voltage.	300	V
Grid-No. 3 (Screen-Grid) Voltage.	150	V
Grid-No. 1 (Control-Grid) Voltage		
Negative-bias value.	50	V
Positive-bias value.	0	V
Cathode Current.	20	mA
Grid-No. 3 Input.	0.15	W
Plate Dissipation.	3	W

MAXIMUM CIRCUIT VALUES

Grid-No. 1-Circuit Resistance		
For fixed-bias operation	0.5	M Ω



Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For Use in the Matrixing Circuits of Color TV Receivers.
Also Useful in Phase-Inverter and Multivibrator Circuits, and as a General-Purpose Amplifier Tube.

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC) 6.3^a 6.3 ± 0.6 volts

Current 0.600 + 0.040 0.600^b ma

warm-up time (Average) 11 - sec

Peak heater-cathode voltage

(Each unit):

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200^c max. volts

Direct Interelectrode Capacitances (Approx.):^d

	Unit		
	No. 1	No. 2	
Grid to plate	3.0	3.0	pf
Grid to cathode and heater	3.4	3.6	pf
Plate to cathode and heater	0.44	0.34	pf
Plate of unit No.1 to plate of unit No.2	1.0	1.0	pf

Characteristics, Class A₁ Amplifier (Each unit):

Plate Voltage 250 volts

Grid Voltage -23.5 volts

Amplification factor 17

Plate Resistance (Approx.) 5500 ohms

Trans conductance 3100 μmhos

Plate Current 11.5 ma

Plate Current for grid volts = -14 4 ma

Grid Voltage (Approx.) for plate μa = 50 -23 volts

Mechanical:

Operating Position Any

Type of Cathodes Coated Unipotential

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

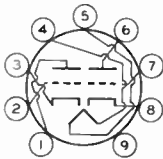
Base Small-Button Noval 9-Pin (JEDEC No. E9-1)



6GU7

Basing Designation for BOTTOM VIEW. 9LP

Pin 1 - Plate of
Triode No.2
Pin 2 - Grid of
Triode No.2
Pin 3 - Cathode of
Triode No.2
Pin 4 - Heater
Pin 5 - Heater



Pin 6 - Plate of
Triode No.1
Pin 7 - Grid of
Triode No.1
Pin 8 - Cathode of
Triode No.1
Pin 9 - No Internal
Connection

AMPLIFIER — Class A₁

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

Maximum Circuit Values:

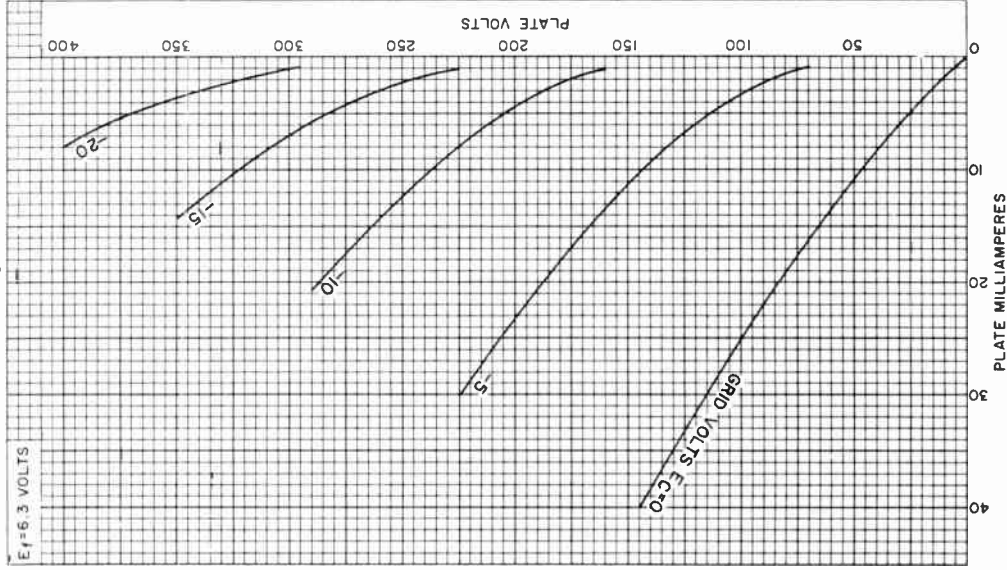
Grid-Circuit Resistance:
For fixed-bias operation 1 max. megohm

- a At heater amperes = 0.600.
- b At heater volts = 6.3.
- c The dc component must not exceed 100 volts.
- d without external shield.



6GU7

AVERAGE PLATE CHARACTERISTICS Each Unit



92CM-11966



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 2
4-63



Beam Power Tube

DUODECAR TYPE

Electrical:

Heater Characteristics and Rating:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

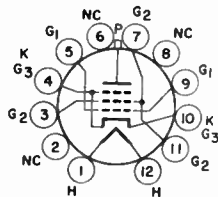
Direct Inter-electrode Capacitance (Approx.):^b

G1 to P	0.6	pf
Input: G1 to (K1G3, G2, H)	16	pf
Output: P to (K+G3, C2, H)	7.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.625"
Seated Length	2.000" to 2.250"
Diameter	1.437" to 1.563"
Dimensional Outline	See <i>General Section</i>
Bulb	112
Cap.	Skirted Miniature (JFDEC No. C1-3)
Base	Large-Button Duodecar 12-Pin (JEDEC No. F1-1)
Basing Designation for BOTTOM VIEW	12UF

- Pin 1 - Heater
- Pin 2 - No Internal Connection
- Pin 3 - Grid No. 2
- Pin 4 - Cathode, Grid No. 3
- Pin 5 - Grid No. 1
- Pin 6 - Same as Pin 2
- Pin 7 - Grid No. 2
- Pin 8 - Same as Pin 2
- Pin 9 - Grid No. 1
- Pin 10 - Same as Pin 4
- Pin 11 - Grid No. 2
- Pin 12 - Heater
- Cap - Plate



Characteristics, Class A₁ Amplifier:

			Triode Connec- tion ^c		
Plate Voltage	5000	60	250	150	volts
Grid-No. 2 Voltage	150	150	150	150	volts
Grid-No. 1 Voltage	-	0	-22.5	-22.5	volts
Amplification Factor	-	-	-	4.4	
Plate Resistance (Approx.)	-	-	18000	-	ohms
Transconductance	-	-	7300	-	μhos
Plate Current	-	345 ^d	65	-	ma
Grid-No. 2 Current	-	27 ^d	1.8	-	ma
Grid-No. 1 Voltage (Approx.) for plate ma. = 1	-100	-	-42	-	volts



6GV5

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC Plate-Supply Voltage	770 max.	volts
Peak Positive-Full-Plate Voltage ^f	6500 max.	volts
Peak Negative-Full-Plate Voltage	1500 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55 max.	volts
Peak Negative-Full-Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	150 max.	ma
Average	17½ max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation ^g	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation 1 max. megohm

- a This resistance must not exceed 100 volts.
- b without external shields.
- c with grid No.2 connected to plate.
- d This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- e As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- f This rating is applicable where the duration of the voltage pulse does 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.
- g An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



Beam Power Tube

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) 6.3 ± 10% volts
 Current at 6.3 volts 1.2 amp

Mu-Factor, Grid No.2 to Grid No.1

for plate volts = 150, grid-No.2
 volts = 150, grid-No.1 volts =
 -22.5 4.4

Direct Interelectrode Capacitances
 (Approx.):^a

Grid No.1 to plate 0.5 μμf
 Grid No.1 to cathode & grid No.3,
 grid No.2, and heater 17 μμf
 Plate to cathode & grid No.3,
 grid No.2, and heater 7 μμf

Characteristics, Class A₁ Amplifier:

Plate Voltage 60 250 volts
 Grid-No.2 Voltage 150 150 volts
 Grid-No.1 Voltage 0 -22.5 volts
 Plate Resistance (Approx.) - 15000 ohms
 Transconductance - 7100 μmhos
 Plate Current 390^b 70 ma
 Grid-No.2 Current 32^b 2.1 ma
 Grid-No.1 Voltage (Approx.) for
 plate ma. = 1 - -42 volts

Mechanical:

Operating Position Any
 Maximum Overall Length 4-1/4"
 Seated Length 3-1/2" ± 3/16"
 Diameter 1.438" to 1.562"
 Bulb T12
 Cap Skirted Miniature (JEDEC No.C1-3)
 Base Short Medium-Shell Octal 6-Pin
 with External Barriers, Style B, Arrangement 2
 (JEDEC No.86-122)
 Basing Designation for BOTTOM VIEW 6AM

Pin 2 - Heater
 Pin 3 - No Con-
 nection
 Pin 4 - Grid No.2
 Pin 5 - Grid No.1



Pin 7 - Heater
 Pin 8 - Cathode,
 Grid No.3
 Cap - Plate



6GW6

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC PLATE-SUPPLY VOLTAGE	770	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^d	6500	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE.	220	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330	max.	volts
CATHODE CURRENT:			
Peak.	550	max.	ma
Average	175	max.	ma
GRID-No.2 INPUT	3.5	max.	watts
PLATE DISSIPATION ^e	17.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^f	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).			
	240	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid resistor-bias operation. 1 max. megohm

^a Without external shield.

^b This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

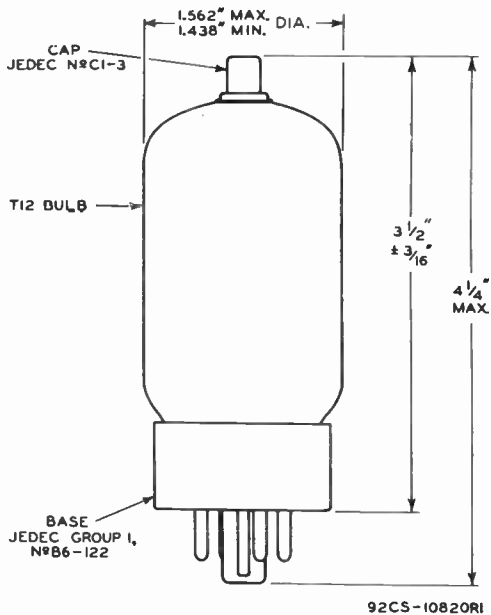
^c As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

^d This rating is applicable where the duration of the voltage pulse does 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.

^e An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

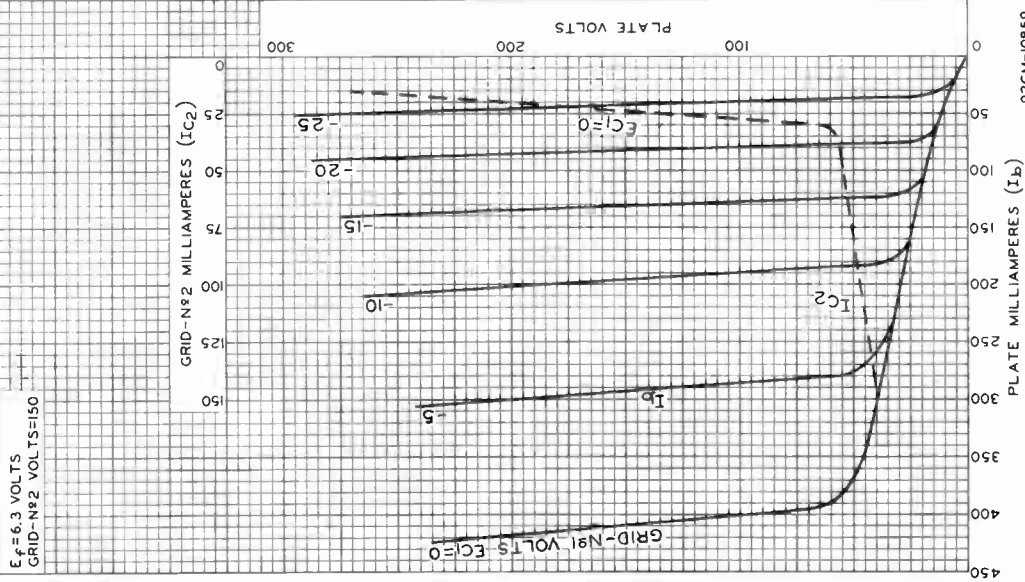
^f The dc component must not exceed 100 volts.





6GW6

AVERAGE CHARACTERISTICS



RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE
For FM Sound-Detector Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	$0.45 \pm 6\%$	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances
(Approx.):^a

Grid No.1 to plate	0.022	μf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	8	μf
Grid No.3 to plate	1.6	μf
Grid No.1 to grid No.3	0.11	μf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	7.5	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	150	volts
Grid-No.3 Supply Voltage	0	volts
Grid-No.2 Supply Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	180	ohms
Plate Resistance (Approx.)	0.14	megohm
Transconductance, Grid No.1 to Plate . .	3700	μmhos
Transconductance, Grid No.2 to Plate . .	750	μmhos
Plate Current	3.7	ma
Grid-No.2 Current	3	ma
Grid-No.1 Supply Voltage (Approx.) for plate $\mu\text{a} = 20$	-4.5	volts
Grid-No.3 Supply Voltage (Approx.) for plate $\mu\text{a} = 20$	-7	volts

Mechanical:

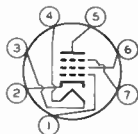
Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . .	1-1/2" \pm 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)



6GX6

Basing Designation for BOTTOM VIEW. 7EN

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

FM SOUND-DETECTOR SERVICE

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:			
Negative value (DC and Peak AC)	100	max.	volts
Positive value (DC and Peak AC)	25	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	300	max.	volts
GRID-No.2 VOLTAGE	See <i>Grid-No.2 Input Rating Chart</i> 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 150 volts.	1	max.	watt
For grid-No.2 voltages between 150 and 300 volts	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section		
GRID-No.3 INPUT	0.1	max.	watt
PLATE DISSIPATION	1.7	max.	watts
PFAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^b	max.	volts

Maximum Circuit Values:

Grid-No.3—Circuit Resistance.	0.68	max.	megohm
Grid-No.1—Circuit Resistance:			
For fixed-bias operation.	0.22	max.	megohm
For cathode-bias operation.	0.47	max.	megohm

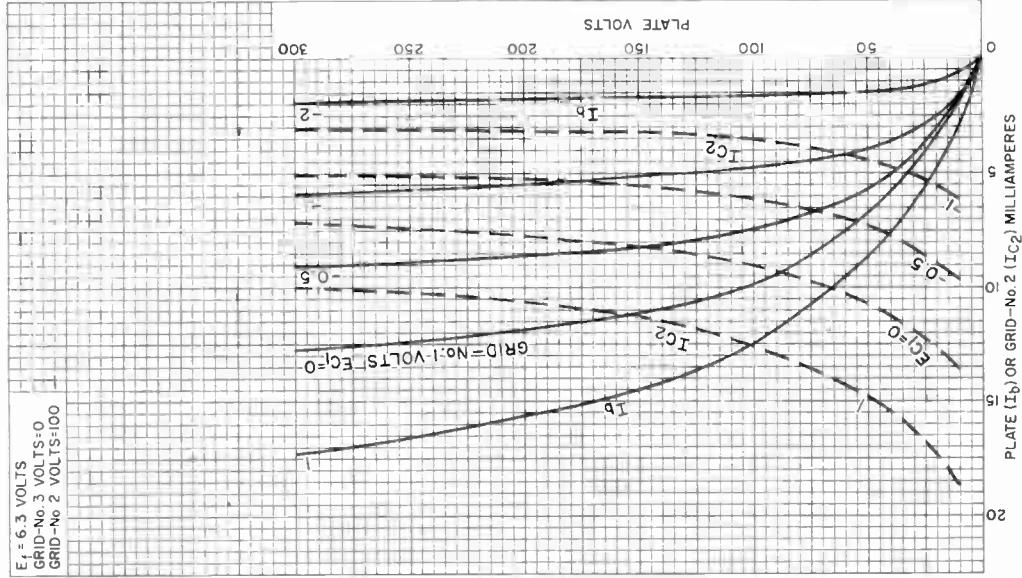
^a without external shield.

^b The dc component must not exceed 100 volts.



AVERAGE CHARACTERISTICS

$E_s = 6.3$ VOLTS
 GRID-No. 3 VOLTS=0
 GRID-No. 2 VOLTS=100



92CM-11002



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 Electron Tube Division

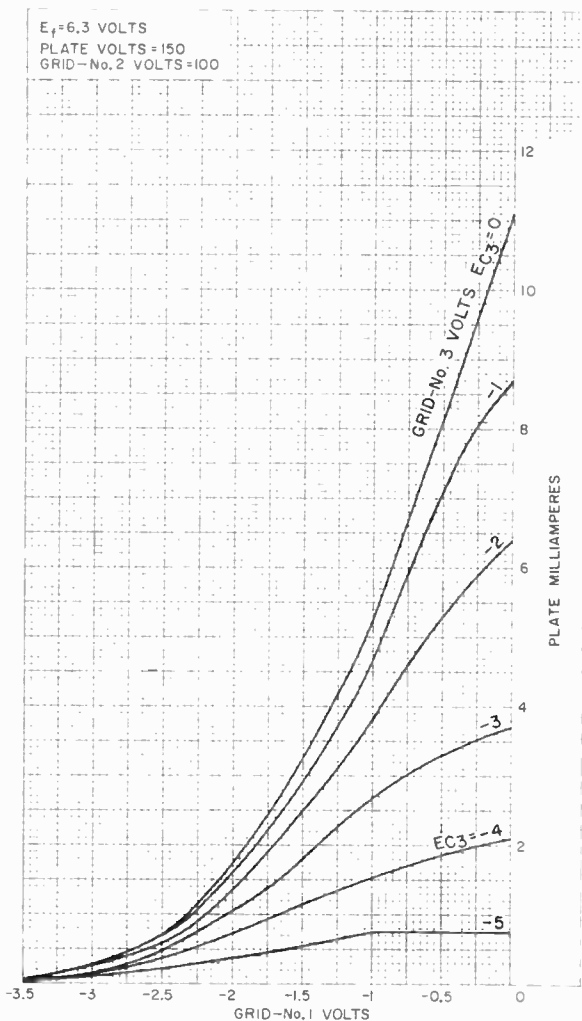
Harrison, N. J.

DATA 2
 5-61

6GX6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 150
GRID-No. 2 VOLTS = 100



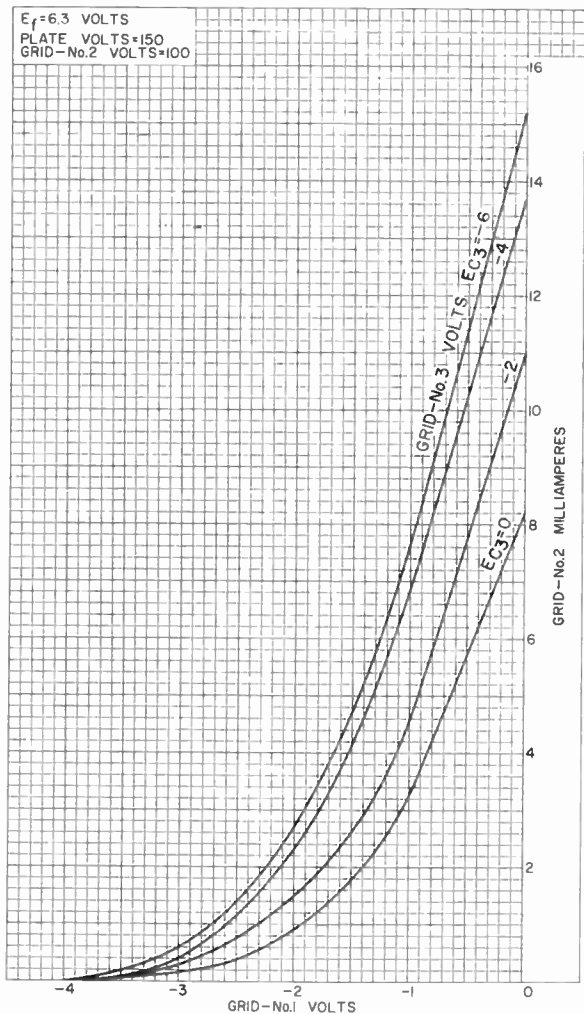
92CM-11005

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Electron Tube Division

Harrison, N. J.



AVERAGE CHARACTERISTICS



92CM-11007

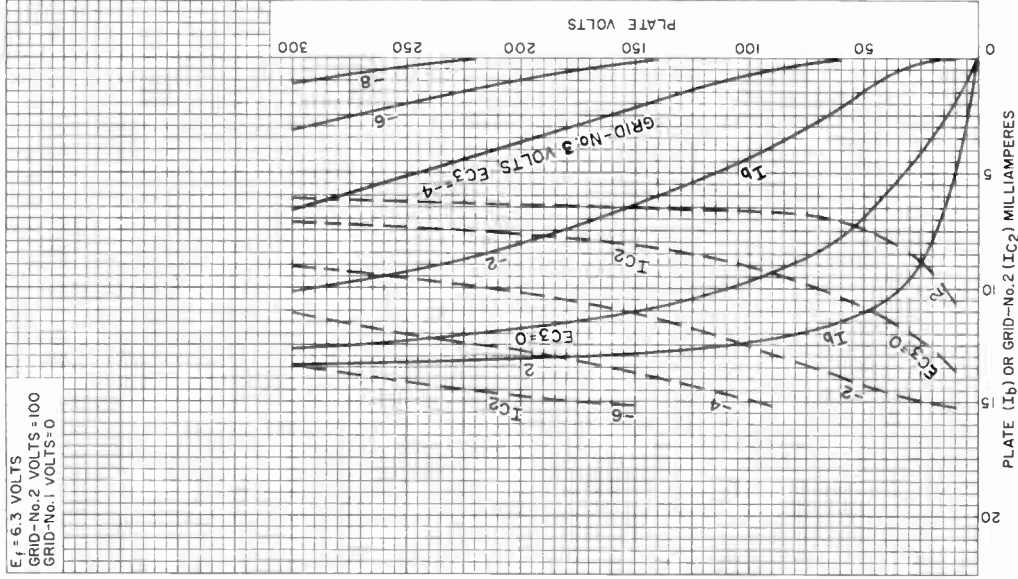


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 Electron Tube Division
 Harrison, N. J.

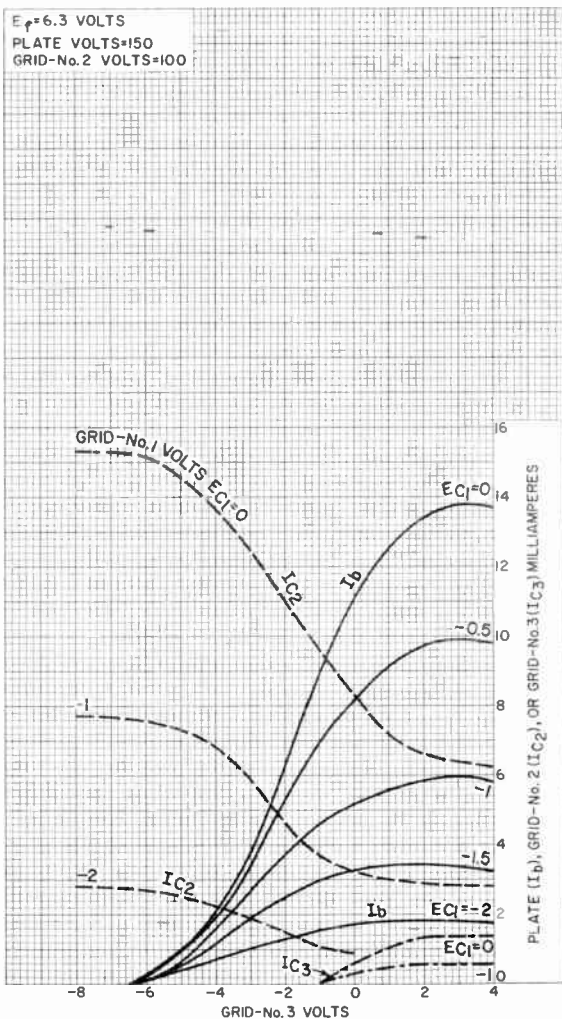
DATA 3
 5-61

6GX6

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



92CM-11006



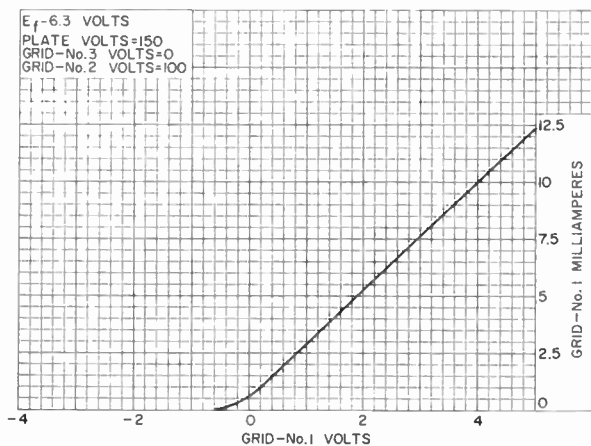
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 Electron Tube Division

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DATA 4
 5-61

6GX6

AVERAGE GRID-No.1 OPERATION CHARACTERISTIC



92CS-11004



Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	5.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Inter-electrode Capacitances
(Approx.):^a

Grid No.1 to plate	0.020	μmf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	6	μmf
Grid No.3 to plate	1.6	μmf
Grid No.1 to grid No.3	0.12	μmf
Grid No.2 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	6.5	μmf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	150	volts
Grid-No.3 Supply Voltage	0	volts
Grid-No.2 Supply Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	180	ohms
Plate Resistance (Approx.)	0.14	megohm
Transconductance, Grid No.1 to Plate	3700	μmhos
Transconductance, Grid No.3 to Plate	750	μmhos
Plate Current	3.7	ma
Grid-No.2 Current	3	ma
Grid-No.1 Supply Voltage (Approx.) for plate $\mu_a = 20$	-4.5	volts
Grid-No.3 Supply Voltage (Approx.) for plate $\mu_a = 20$	-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)



6GY6

Basing Designation for BOTTOM VIEW. 7EN

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

GATED AGC AMPLIFIER & NOISE INVERTER

For operation in a 525-line, 30-frame system^b

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	300	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^c	600	max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:			
Negative-bias value.	100	max.	volts
Positive-bias value.	0	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:			
Negative-bias value.	50	max.	volts
Positive-bias value.	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.	1.7	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

Maximum Circuit Values:

Grid-No.3-Circuit Resistance	0.68	max.	megohm
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.22	max.	megohm
For cathode-bias operation	0.47	max.	megohm

^a Without external shield.

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

^c This rating is applicable when the duration of the voltage pulse does 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.

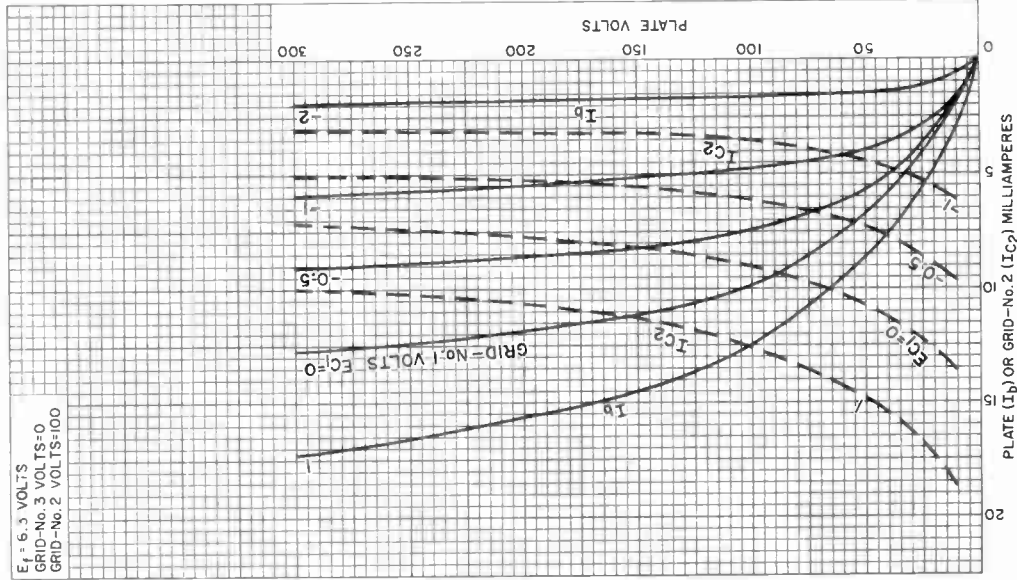
^d The dc component must not exceed 100 volts.



6GY6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-NO. 3 VOLTS=0
GRID-NO. 2 VOLTS=100



92CM-11002



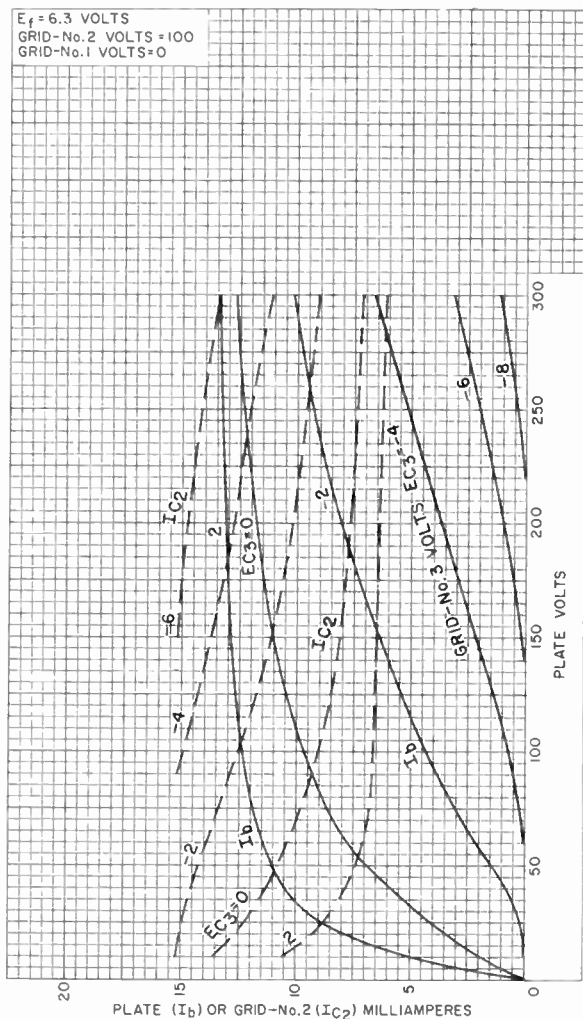
RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 2
5-61

6GY6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-NO.2 VOLTS = 100
GRID-NO.1 VOLTS = 0

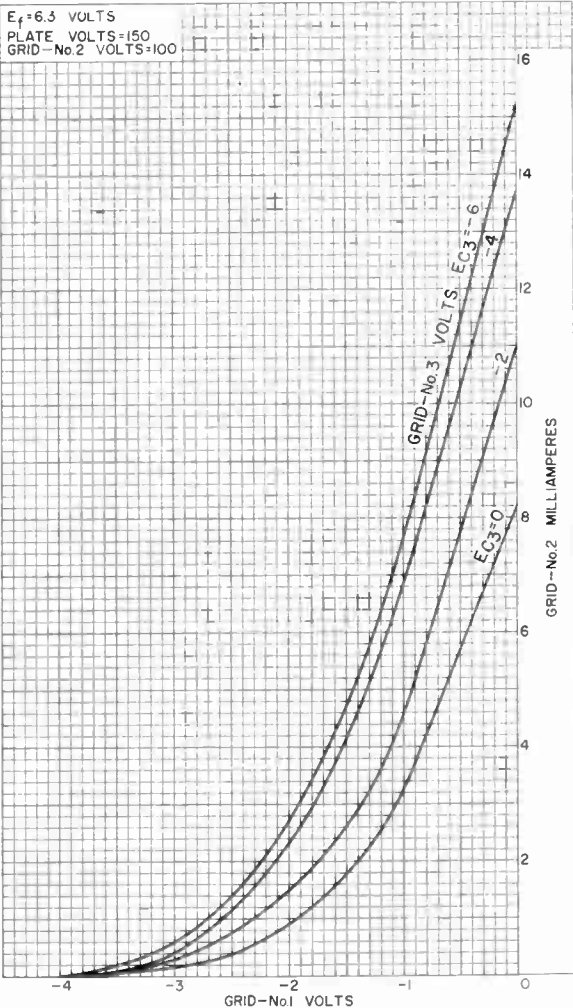


92CM-11003

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AVERAGE CHARACTERISTICS

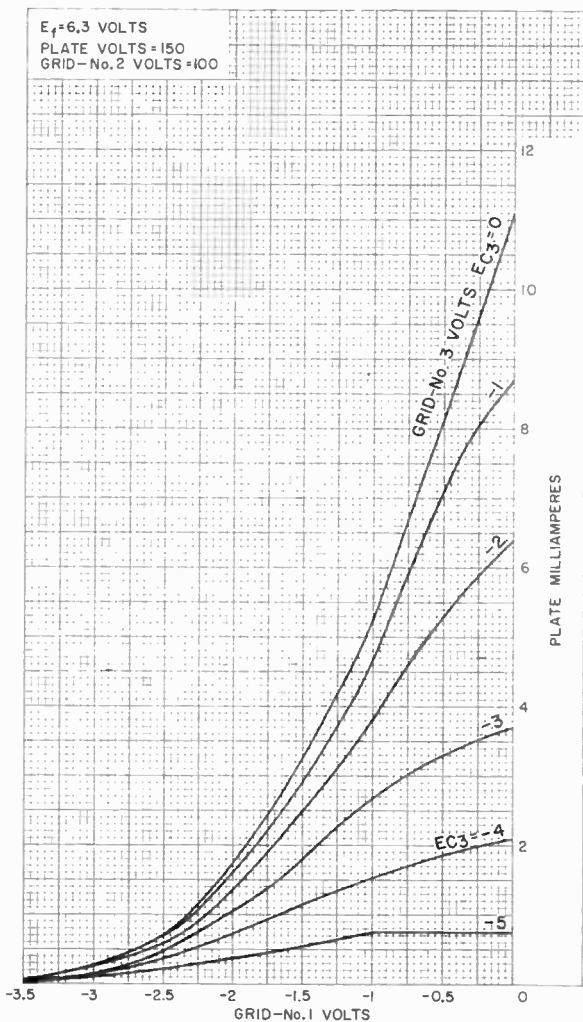


92CM-11007



6GY6

AVERAGE CHARACTERISTICS



92CM-11005

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Power Pentode

7-PIN MINIATURE

Electrical:

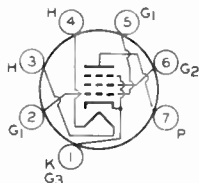
Heater Ratings and Characteristics:

Heater voltage (AC or DC)	6.3 ± 0.1	volt
Current at heater volts = 6.3	0.480	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 ^a	max. volts
Directly on enclosed supply line ^b		
Grid No. 1 to plate	0.24	pf
Input: G1 to (K+G3, G2, H)	8.5	pf
Output: P to (K+G3, G2, H)	3.8	pf

Mechanical:

Operating position	Any
Type of Cathode	Indirectly heated (in potential)
Maximum Overall Length	2-1/8"
Maximum Sealed Length	1-7/8"
Length, Base Set to Bulb Top (Excluding Tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See General Section
Bulb	Small-Button Miniature 7-Pin (JFDEC No. E7-1)
Basing Designation for ROTOM VIFs	7CV

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



Bulb Temperature (At hottest point on bulb surface) 200° C

AMPLIFIER —Class A₁

Maximum Ratings, Design-Maximum Values:

Plate Voltage	300	max. volts
Grid-No. 2 (Screen-Grid) Voltage	300	max. volts
Grid-No. 1 (Control-Grid) Voltage:		
Positive-bias value	0	max. volts
Average Cathode Current	30	max. ma
Grid-No. 2 Input	1.1	max. watts
Plate Dissipation	4.8	max. watts

Typical Operation and Characteristics:

	No	Bypass	
	By-passing Capacitor		
Plate Supply Voltage	250	250	volts
Grid-No. 2 Supply Voltage	250	250	volts



6GZ5

	<i>No</i>	<i>Bypass</i>	
	<i>Bypassing</i>	<i>Capacitor</i>	
Cathode Resistor	270	270	ohms
Peak AF Grid-No.1 Voltage	9.8	2	volts
Zero-Signal Plate Current	16	16	ma
Max.-Signal Plate Current	16	16	ma
Zero-Signal Grid-No.2 Current	2.7	2.7	ma
Max.-Signal Grid-No.2 Current	5	5	ma
Plate Resistance (Approx.)	-	0.15	megohm
Transconductance	-	8400	μ mhos
Load Resistance	15000	15000	ohms
Total Harmonic Distortion	10	10	percent
Power Output	1.8	1.1	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

for fixed-bias operation	0.5 max. megohm
for cathode-bias operation	1 max. megohm

^a The dc component must not exceed 100 volts.

^b Without external shield.



6H6
6H6-GT/G

6H6, 6H6-GT/G

TWIN DIODE

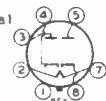
Heater	Coated Unipotential Cathodes	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.

	6H6	6H6-GT/G	
Direct Interelectrode Cap. ⁰			
Plate #1 to Cathode #1	3.0	3.0	μf
Plate #2 to Cathode #2	3.4	4.0	μf
Plate #1 to Plate #2	0.10 max.	0.10 max.	μf
Maximum Overall Length	1-3/4"	3-5/16"	
Maximum Seated Height	1-3/16"	2-3/4"	
Maximum Diameter	1-5/16"	1-5/16"	
Bulb	Metal Shell MT-8	T-9	

Base	{ Small Wafer { Octal 7-Pin	{ Intermed. Shell { Octal 7-Pin
Basing Designation	70	G-7Q
Pin 1 { 6H6, Shell 6H6-GT/G, Internal Shield		Pin 4 - Cathode #2
Pin 2 - Heater		Pin 5 - Plate #1
Pin 3 - Plate #2		Pin 7 - Heater
		Pin 8 - Cathode #1

RCA Socket

Mounting Position



BOTTOM VIEW

Stock No. 9924

Any

Maximum Ratings Are Design-Center Values

RECTIFIER OR DOUBLER

Peak Inverse Voltage	420 max. volts
Peak Plate Current per Plate	48 max. ma.
D-C Heater-Cathode Potential	330 max. volts

As Half-Wave Rectifier:*

A-C Plate Voltage per Plate (RMS)	117	150 max. volts
Total Effect. Plate-Supply Impedance per Plate [▲]	15 min.	40 min. ohms
D-C Output Current per Plate	8 max.	8 max. ma.

As Voltage Doubler:

	Half-Wave	Full-Wave
A-C Plate Voltage per Plate (RMS)	117	117 volts
Total Effect. Plate-Supply Impedance per Plate [▲]	30 min.	15 min. ohms
D-C Output Current	8 max.	8 max. ma.

⁰ With shell or external and internal shields connected to cathodes.

* In half-wave service, the two units may be used separately or in parallel.

▲ When a filter-input condenser 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.

Circuits for the 6H6 and 6H6-GT/G are the same as those shown under Type 2525.

← Indicates a change.

AUG. 1, 1942

RCA RADIODRON DIVISION
RCA MANUFACTURING COMPANY, INC.

World Radio History

DATA

6H6

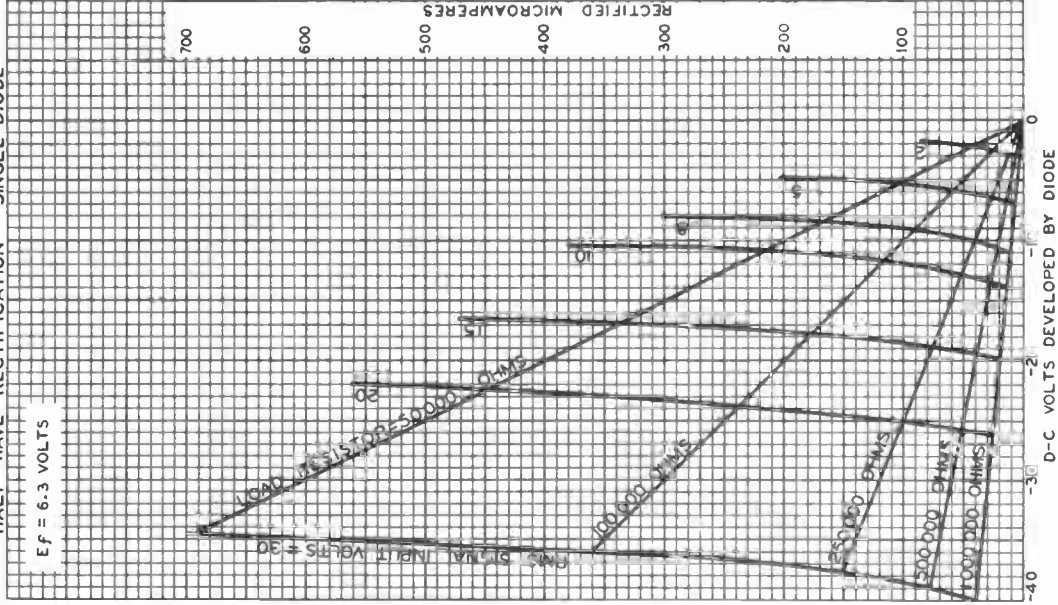


6H6

AVERAGE CHARACTERISTICS

HALF-WAVE RECTIFICATION - SINGLE DIODE

$E_f = 6.3$ VOLTS



Power Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.760	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 ^a	max. volts
Direct Interelectrode Capacitances (Approx.): ^b		
Grid No.1 to plate	0.18	μf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	13.0	μf
Plate to cathode, grid No.3, grid No.2, and heater	8.0	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	60	250	250	volts
Grid No.3	<i>Connected to cathode at socket</i>			
Grid-No.2 Supply Voltage	250	125	250	volts
Grid-No.1 Voltage	0	-	-	volts
Cathode Resistor	-	33	100	ohms
Mu-Factor, Grid No.2 to Grid No.1	-	-	33	
Plate Resistance (Approx.)	-	28000	24000	ohms
Transconductance	-	24000	20000	μmhos
Plate Current	150 ^c	40	40	ma
Grid-No.2 Current	37 ^c	4.2	6.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-	-6.4	-13	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Diameter	0.750" to 0.850"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Basing Designation for BOTTOM VIEW	9PU

- Pin 1 - Cathode
- Pin 2 - Grid No.1
- Pin 3 - Grid No.3
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Grid No.2
- Pin 7 - Plate
- Pin 8 - Grid No.2
- Pin 9 - Grid No.3



6HB6

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC PLATE VOLTAGE.	350 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^e . . .	2500 max.	volts
GRID No.3 (SUPPRESSOR GRID) . . .	<i>Connect to cathode at socket</i>	
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . .	300 max.	volts
GRID No.1 (CONTROL-GRID) VOLTAGE. . . .	-100 max.	volts
GRID-No.2 INPUT	2 max.	watts
PLATE DISSIPATION	10 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	1 max.	megohm
For cathode-bias operation.	2.2 max.	megohms

^a The dc component must not exceed 100 volts.

^b without external shield.

^c This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

^e This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For VHF Oscillator-Mixer Service in TV Receivers

Electrical:

Heater Characteristics and Rating:

Voltage (AC or DC)	6.3 ± 0.1^a	volts
Current (at rated voltage)	$0.45^{(b)}$	amp
Warm-up time (Average)	12	sec
Peak Heater-Cathode Voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^c max.	volts

Direct Inter-electrode Capacitances:^d

Triode Unit:

G_T to P_T	1.9	pf
Input: G_T to $(K+G_P+I_S, G_P, H)$	3.0	pf
Output: P_T to $(K+G_P+I_S, G_P, H)$	1.9	pf

Pentode Unit:

G_{1P} to P_{1P}	0.010 max.	pf
Input: G_{1P} to $(K+G_{2P}+I_S, G_{2P}, H)$	5.0	pf
Output: G_{1P} to $(K+G_{2P}+I_S, G_{2P}, H)$	3.4	pf
H to e	3.8	pf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage	150	125	volts
Grid-No.2 Supply Voltage	-	125	volts
Grid-No.1 Supply Voltage	0	-9	volts
Cathode Resistor	56	-	ohms
Amplification Factor	40	-	
Plate Resistance (Approx.)	5000	20000	ohms
Transconductance	8500	6400	μ mhos
Plate Current	18	12	ma
Grid-No.2 Current	-	4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 10$	-12	-9	volts

Mechanical:

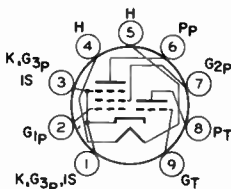
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding Tip)	1-9/16" \pm 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb	T6-1/2



6HB7

Base Small Button Novel 9-Pin (JEDEC No. E9-1)
 Rating designation for BOTTOM PLATE 90A

- Pin 1 - Cathode, Pentode
 Grid No. 3,
 Internal Shield
- Pin 2 - Pentode Grid No. 1
- Pin 3 - Screen Grid No. 1
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Pentode Plate
- Pin 7 - Pentode Grid No. 2
- Pin 8 - Triode Plate
- Pin 9 - Triode Grid



AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
Plate voltage	330 max.	350 max.	volt
Grid-No. 2 (Screen-Grid) Supply Voltage	-	330 max.	volt ^a
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 voltage up to 165 volts	-	0.55 max.	watt
for grid-No. 2 voltages between 165 and 350 volts	See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section		
Plate dissipation	2.5 max.	3.1 max.	watts

Maximum Circuit Values:

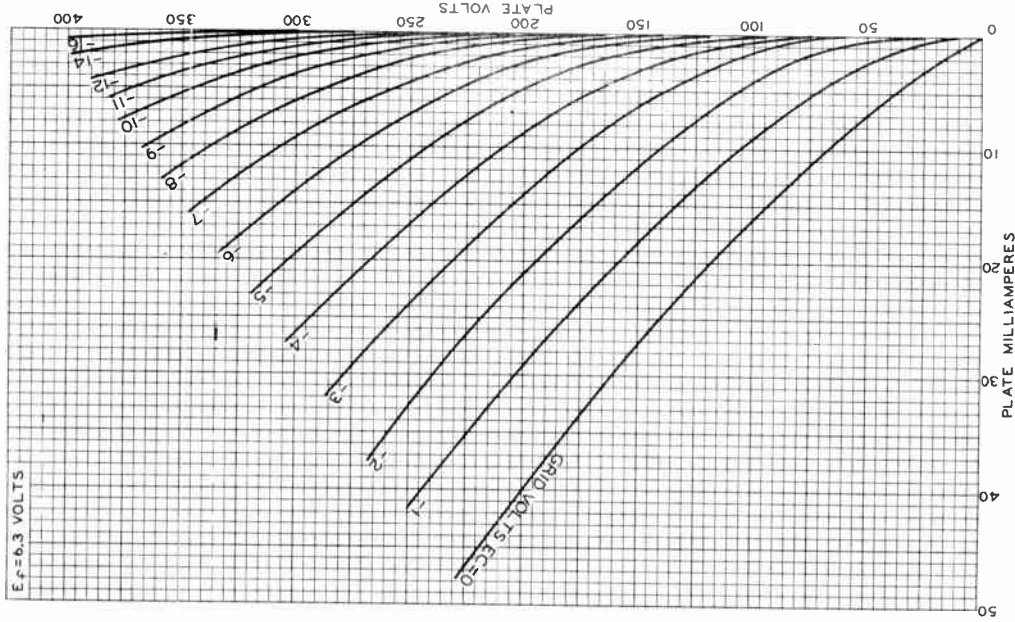
Grid-No. 1 Circuit Resistance:			
For fixed-bias operation	0.5 max.	0.25 max.	megohm
For cathode-bias operation	1.0 max.	0.5 max.	megohm

- a For parallel heater operation.
- b For series heater operation current must be limited to 0.450 ± 0.030 amperes.
- c The dc component must not exceed 100 volts.
- d with external shield JEDEC No. 315 connected to cathode except as noted.
- e with external shield JEDEC No. 315 connected to ground.



6HB7

AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-9866

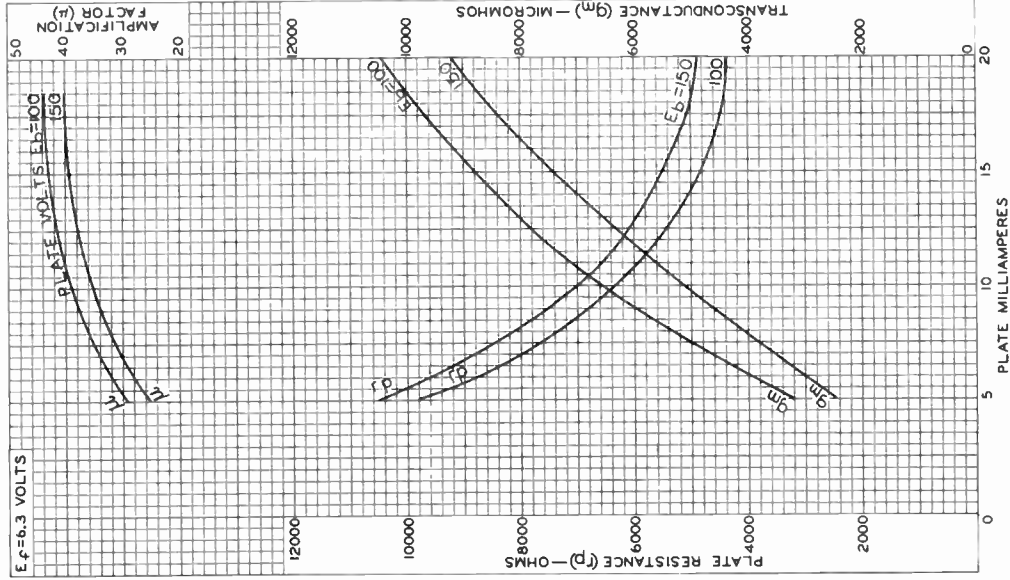


RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 2
3-04

6HB7

AVERAGE CHARACTERISTICS Triode Unit



92CM-9882RI

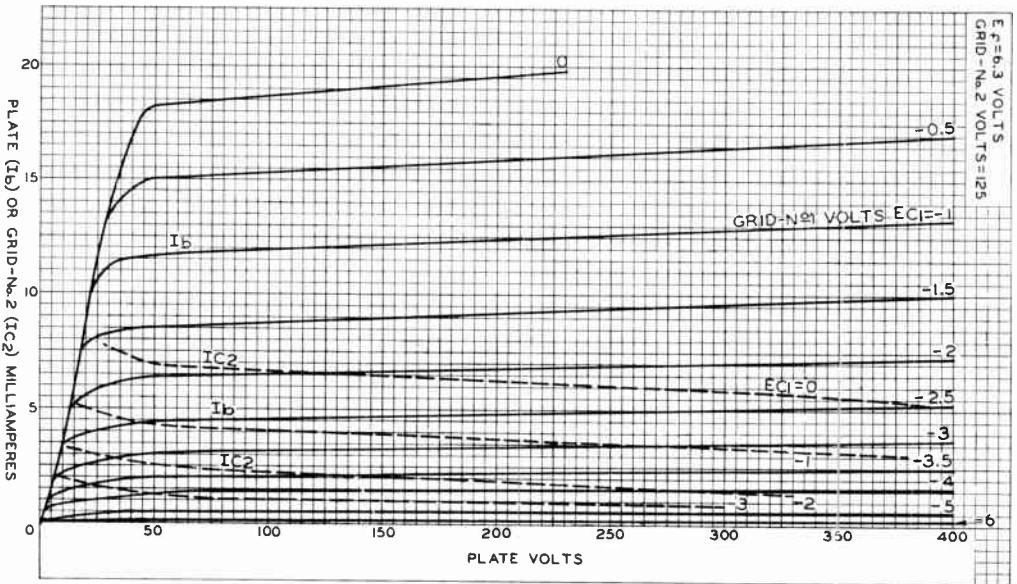
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6HB7

AVERAGE CHARACTERISTICS Pentode Unit



92CM-9867R1

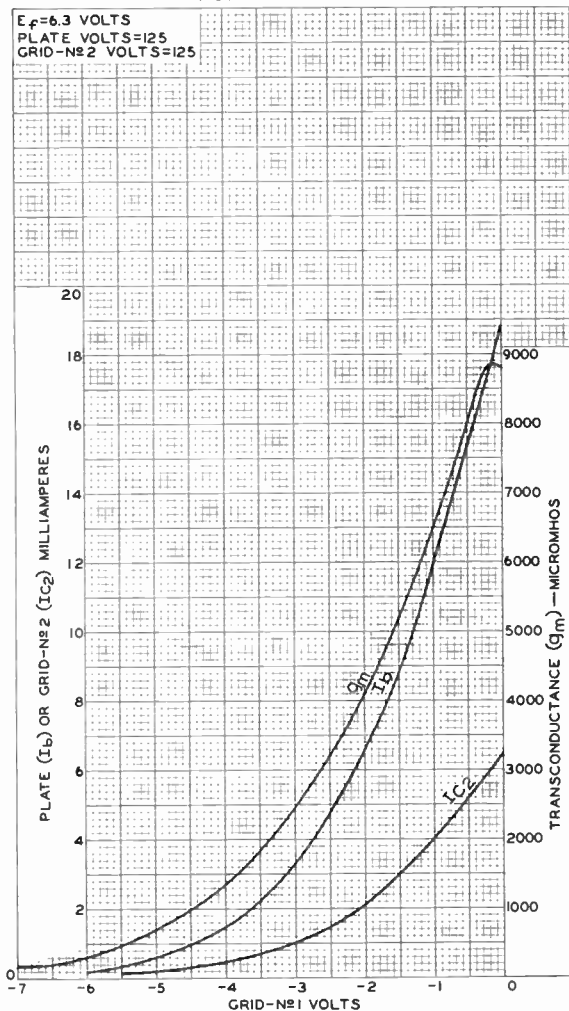
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DATA 3
3-64



6HB7

AVERAGE CHARACTERISTICS Pentode Unit



92CM-9868RI



Beam Power Tube

Duodecar Type

For Vertical-Deflection-Amplifier

Circuits in TV Receivers

ELECTRICAL CHARACTERISTICS - Bogy Values

Heater Voltage, ac or dc . . .	E_h	6.3	V
Heater Current	I_h	0.8	A
Direct Interelectrode Capacitances: ^a			
Grid No.1 to plate	c_{g1-p}	0.54	pF
Input: G1 to (K,G3,G2,H)	c_i	9.5	pF
Output: P to (K,G3,G2,H)	c_o	7.0	pF

For the following characteristics, see Conditions below:

Plate Resistance (approx.) . . .	r_p	—	50000	Ω
Transconductance	g_m	—	4100	μmho
DC Plate Current	I_b	180 ^b	43	mA
DC Grid-No.2 Current	I_{c2}	20 ^b	3.5	mA
Cutoff DC Grid-No.1 Voltage for $I_b = 100 \mu\text{A}$	$E_{c1(co)}$	—	-50	V

Conditions:

Heater Voltage	E_h	6.3	6.3	V
DC Plate Voltage	E_b	60	250	V
DC Grid-No.2 Voltage	E_{c2}	250	250	V
DC Grid-No.1 Voltage	E_{c1}	0 ^c	-20	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	2.875in (73.02 mm)
Maximum Seated Length	2.500in (63.5 mm)
Maximum Diameter	1.188in (30.1 mm)
Dimensional Outline	JEDEC 9-60
Envelope	JEDEC T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)
Terminal Diagram	JEDEC 12EY
Type of Cathode	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS - Design-Maximum Values^d

For operation as a Vertical-Deflection-Amplifier Tube in a 525-line, 30-frame system

DC Plate Supply Voltage	E_{bb}	350	V
Peak Positive-Pulse Plate Voltage ^e	e_{bm}	2500	V

6HE5

DC Grid-No.2 (Screen-Grid) Voltage .	E_{c2}	300	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	± 200	V
Average	E_{hk}	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	260	mA
Average	$I_{k(av)}$	75	mA
Grid-No.2 Input	P_{g2}	2.75	W
Plate Dissipation ^f	P_b	12	W
Envelope Temperature (at hottest point on envelope surface.)	T_E	200	°C

MAXIMUM CIRCUIT VALUES

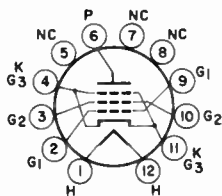
Grid-No.1-Circuit Resistance

With fixed bias	R_{g1}	1.0	$M\Omega$
With cathode bias	R_{g1}	2.2	$M\Omega$

- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- ^b This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- ^c Applied for two seconds maximum so as not to damage tube.
- ^d Unless otherwise specified, as defined in the current issue of EIA Standard RS-239.
- ^e This rating is applicable when the duration of the voltage pulse does not exceed 15% of one vertical scanning cycle. In a 525-line, 30-frame system, 15% of one vertical scanning cycle is 2.5 ms.
- ^f An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

TERMINAL DIAGRAM - Bottom View

- Pin 1 - Heater
- Pin 2 - Grid No.1
- Pin 3 - Grid No.2
- Pin 4 - Grid No.3, Cathode
- Pin 5 - No Connection
- Pin 6 - Plate
- Pin 7 - No Connection
- Pin 8 - No Connection
- Pin 9 - Grid No.1
- Pin 10 - Grid No.2
- Pin 11 - Grid No.3, Cathode
- Pin 12 - Heater



JEDEC 12EY



Electronic
Components

DATA

High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts.	0.15	amp

Direct Interelectrode Capacitances:▲

Triode Unit:

Grid to plate	3.5	μf
Grid to cathode, pentode cathode & grid No.3 & internal shield, and heater.	2.8	μf
Plate to cathode, pentode cathode & grid No.3 & internal shield, and heater.	2.6	μf

Pentode Unit:

Grid No.1 to plate.	0.1 max.	μf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater.	10	μf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater.	4.2	μf
Triode grid to pentode plate.	0.015 max.	μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage.	200	45	200 volts
Grid-No.2 Supply Voltage.	—	125	125 volts
Grid-No.1 Voltage	-2	0	— volts
Cathode Resistor.	—	—	68 ohms
Amplification Factor.	70	—	—
Plate Resistance (Approx.).	17500	—	75000 ohms
Transconductance.	4000	—	12500 μmhos
Plate Current	4	40	25 ma
Grid-No.2 Current	—	15	7 ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 100$	—	—	-9 volts
Grid-No.1 Voltage (Approx.) for plate $\mu a = 20$	-6	—	— volts

Mechanical:

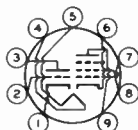
Operating Position.	Any
Maximum Overall Length.	2-5/8"
Maximum Seated Length	2-3/8"



6HF8

Length, Base Seat to Bulb Top (Excluding tip) . . . 2" \pm 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 9DX

Pin 1 - Triode
 Cathode
 Pin 2 - Triode
 Grid
 Pin 3 - Triode
 Plate
 Pin 4 - Heater
 Pin 5 - Heater



Pin 6 - Pentode
 Cathode,
 Grid No.3,
 Internal
 Shield
 Pin 7 - Pentode
 Grid No.1
 Pin 8 - Pentode
 Grid No.2
 Pin 9 - Pentode
 Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
PLATE VOLTAGE.	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	330 max.	volts
GRID-No.2 VOLTAGE.	-	See <i>Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
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.	-	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts.	-	See <i>Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION.	1 max.	5 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

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
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



▲ Without external shield.

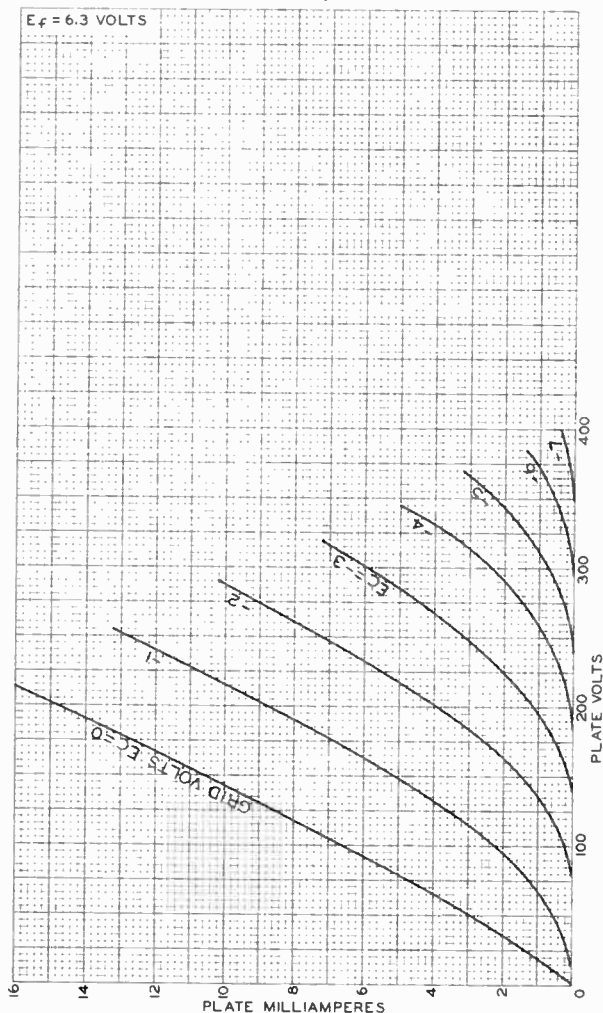
● This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

★ The dc component must not exceed 100 volts.



6HF8

AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-8644

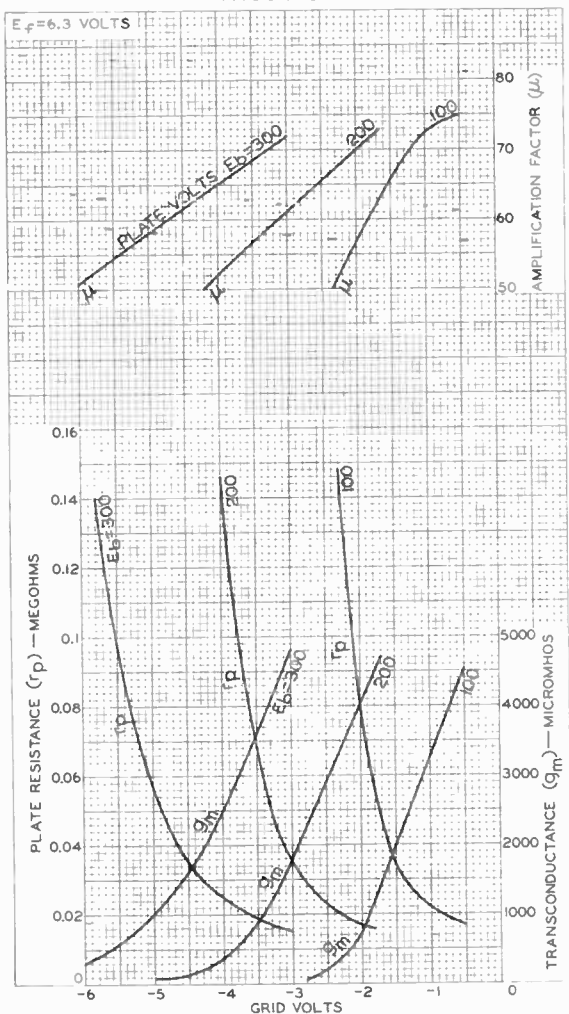
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



AVERAGE CHARACTERISTICS

Triode Unit



92CM-10874



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Electron Tube Division
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DATA 3
7-61

6HF8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-9906

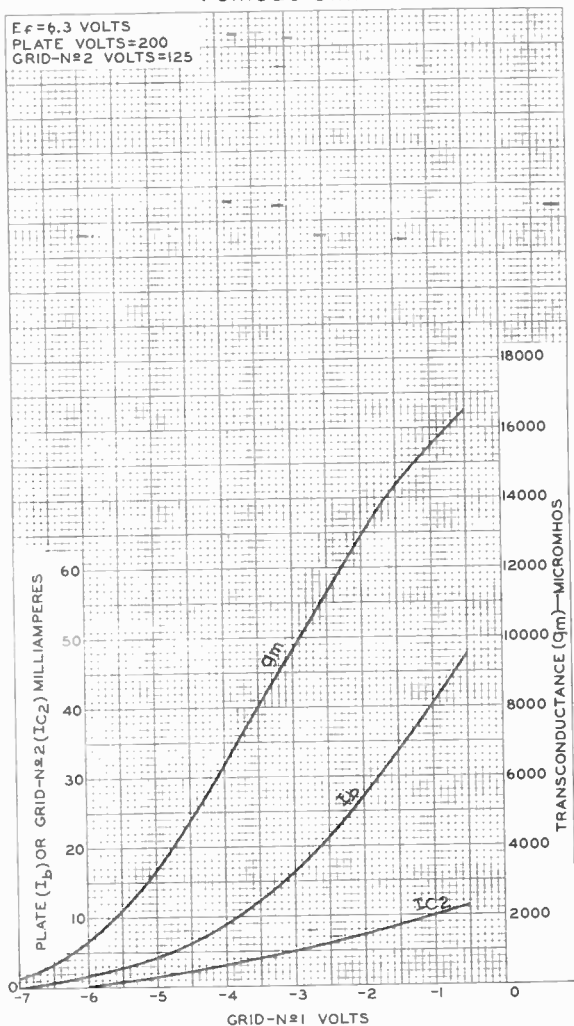
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AVERAGE CHARACTERISTICS

Pentode Unit



92CM-9905R1





Beam Power Tube

7-PIN MINIATURE TYPE
 CONTROLLED CATHODE WARM-UP TIME MINIMIZES
 EXTRANEIOUS SOUND DURING RECEIVER WARM UP.

For Use in the Audio Output Stages of Television Receivers

Electrical:

Heater Characteristics and Rating:

Voltage (AC or DC) 6.3 ± 0.1 volts
 Current at heater volts = 6.3 0.1-0 amp

Peak heater-cathode voltage:

Heater negative with respect to cathode 200 max. volts
 Heater positive with respect to cathode 200^a max. volts

Minimum Cathode Warm-up Time:^b

Heater volts = 6.3, plate and grid-1 voltage = 250, and cathode resistor (ohms) = 68^c 14 sec

Direct Inter-electrode Capacitance

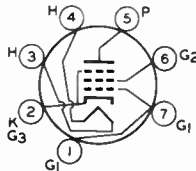
(Approx.):

G1 to P 0.4 pf
 Input: G1 to (K+G3, G2, H) 8.0 pf
 Output: P to (K+G3, G2, H) 8.5 pf

Mechanical:

Operating Position Any
 Type of Cathode Coated Unipotential
 Maximum Overall Length 2-5/8"
 Maximum Seated Length 2-3/8"
 Length, Base Seat to Bulb Top (Excluding Tip) 2" $\pm 3/12$ "
 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 7B7

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 A₁

Maximum Ratings, Design-Maximum Values:

Plate Voltage 275 max. volts
 Grid-No.2 (Screen-Grid) Voltage 275 max. volts
 Grid-No.2 Input 2 max. watts



6HG5

Plate Dissipation	12 max.	watts
Bulb Temperature (At hottest point on bulb surface)	250 max.	°C

Typical Operation and Characteristics:

Plate Voltage	180	250	volts
Grid-No.2 Voltage	180	250	volts
Grid-No.1 (Control-Grid) Voltage	-8.5	-12.5	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	volts
Zero-Signal Plate Current	29	45	ma
Max.-Signal Plate Current	30	47	ma
Zero-Signal Grid-No.2 Current	3	4.5	ma
Max.-Signal Grid-No.2 Current	4	7	ma
Plate Resistance (Approx.)	58000	52000	ohms
Transconductance	3700	4100	μmhos
Load Resistance	5500	5000	ohms
Total Harmonic Distortion	8	8	%
Max.-Signal Power Output	2	4.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

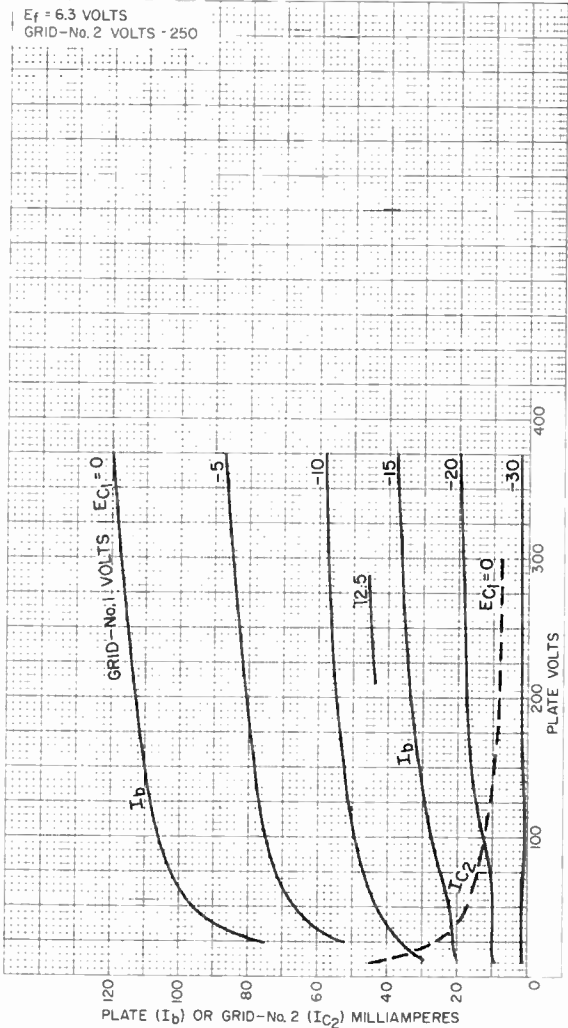
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

^a The dc component must not exceed 100 volts.

^b The time interval between the instant all electrode voltages are applied and the instant a current of one milliamperere flows in the plate circuit of the 6HG5.



AVERAGE CHARACTERISTICS

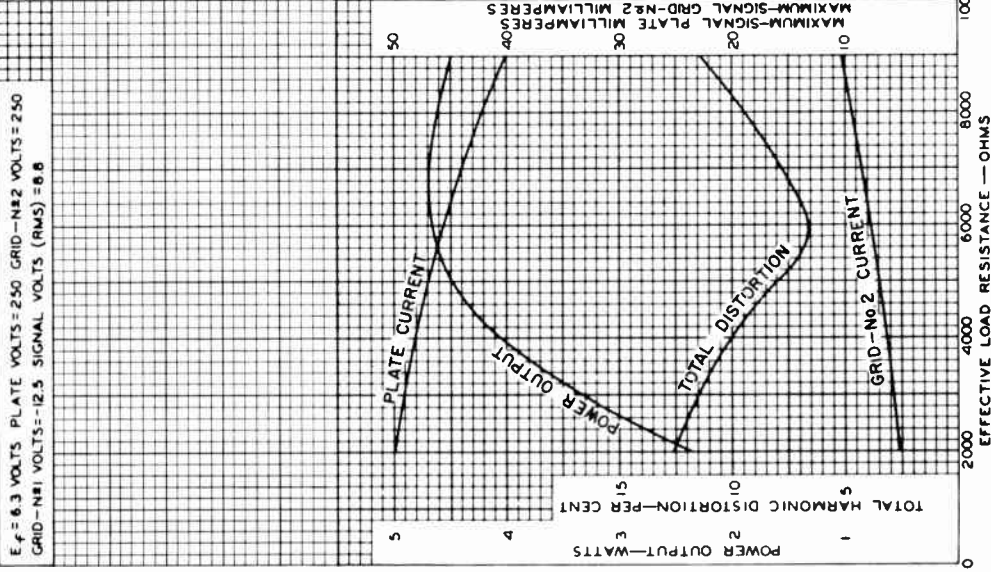


92CM-12368



6HG5

OPERATION CHARACTERISTICS



92CM-6339R2

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.



Diode—Sharp-Cutoff Pentode

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design—Maximum Values*):

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450 ^b	amp
Warm-up time (Average)	11	-	sec

Peak heater-cathode voltage (each unit):

Heater negative with respect to cathode	200 ^c max.	volts
Heater positive with respect to cathode	200 ^c max.	volts

Direct Interelectrode Capacitances:^d

Diode Unit:

Plate to cathode and heater	2.4	μμf
Cathode to plate and heater	3.0	μμf

Pentode Unit:

Grid No.1 to plate	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7.0	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	3.2	μμf
Diode plate to pentode grid No.1	0.005 max.	μμf
Diode cathode to pentode plate	0.15 max.	μμf
Diode plate to pentode plate	0.035 max.	μμf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	125	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.2	megohm
Transconductance	9300	μmhos
Plate Current	11.5	ma
Grid-No.2 Current	3.6	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 20$	-6	volts
Grid-No.1 Voltage (Approx.) for plate $ma = 2$, and cathode resistor (ohms) = 0	-3	volts

Mechanical:

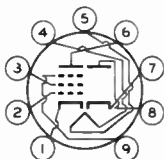
Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"



6HJ8

Diameter 0.750" to 0.875"
Dimensional Outline See *General Section*
Bulb 16-1/2
Base Small-button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for ROTARY VIEW 9CY

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



Pin 7 - Diode
Cathode
Pin 8 - Diode
Plate
Pin 9 - Pentode
Grid No. 3,
Internal
Shield

PENTODE UNIT — Class A₁ Amplifier

Maximum Ratings, Design-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 3.2 max. watts

Maximum Circuit Values:

Grid-No. 1-Circuit Resistance:
For fixed-bias operation 0.25 max. megohm
For cathode-bias operation 1 max. megohm

DIODE UNIT

Maximum Ratings, Design-Maximum Values:

DC PLATE CURRENT 5 max. ma

Characteristics, Instantaneous Value:

Plate Current for plate volts = 10 50 ma

- a At heater amperes = 0.450.
- b At heater volts = 6.3.
- c The dc component must not exceed 100 volts.
- d without external shield.



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Video and Bandpass Amplifier Applications in TV Receivers

Electrical:

Heater Characteristics and Rating:

Voltage—(AC or DC)	6.3 ± 0.6 ^a	volts
Current at heater volts = 6.3	0.600 ^b	amp
Warm-up time (Average)	11	sec
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 ma.	volts
Heater positive with respect to cathode	200 ^c max.	volts

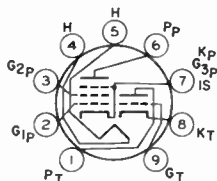
Direct Inter-electrode Capacitances:

	Without External Shield	With External Shield ^d	
<i>Triode Unit:</i>			
G _T to f _T	2.8	2.8	pf
Input: G _T to (K _T , K _P +G _{3P} +I _S , H)	2.8	3.0	pf
Output: P _T to (K _T , K _P +G _{3P} +I _S , H)	1.6	2.4	pf
<i>Pentode Unit:</i>			
G _{1P} to P _P	0.030 max.	0.026 max.	pf
Input: G _{1P} to (K _P +G _{3P} +I _S , G _{2P} , H)	7.5	7.5	pf
Output: P _P to (K _P +G _{3P} +I _S , G _{2P} , H)	2.4	3.0	pf

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 3AE

- 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,
Grid No.3,
Internal Shield
- Pin 8 - Triode Cathode
- Pin 9 - Triode Grid



6HL8

Characteristics:

	Triode Unit	Pentode Unit	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	-	125	volts
Grid-No.1 Voltage	-1	-1	volt
Amplification Factor	40	-	
Plate Resistance (Approx.)	5000	150000	ohms
Transconductance	7000	10000	μmhos
Plate Current	1.1 ^a	1 ^c	ma
Grid-No.2 Current	-	4.0	ma
Grid-No.1 Voltage (Approx.) for plate μ = 20	-	-7	volts

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
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 100 volts	-	0.50 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	2.5 max.	2.5 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For fixed-bias operation	1 max.	0.25 max.	megohm
For self-bias operation	1 max.	1 max.	megohm

^a For parallel heater operation.

^b For series heater operation current must be limited to 0.600 ± 0.040 amperes.

^c The dc component must not exceed 100 volts.

^d with external shield, JEDEC No.315, connected to cathode of unit under test.



6HM5/6HA5

High-Mu Triode

7-PIN MINIATURE TYPE

Useful as Grounded-Cathode RF-Amplifier Tube in VHF Tuners

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.180	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	110 max.	volts
Heater positive with respect to cathode	110 max.	volt

Direct Interelectrode Capacitances:^a

Grid to plate	0.36	pf
Grid to cathode, internal shield, external shield, and heater	4.3	pf
Plate to cathode, internal shield, external shield, and heater	2.9	pf
Cathode to plate	0.080	pf
Cathode to grid, internal shield, external shield, and heater	3.1	pf
Heater to cathode	2.3	pf
Heater to grid	0.070 max.	pf

Characteristics, Class A₁ Amplifier:

Plate Voltage	135	volts
Grid Voltage	-1	volt
Amplification Factor	72	
Plate Resistance (Approx.)	5000	ohms
Transconductance	14500	μmhos
Plate Current	11.5	ma
Grid Voltage (Approx.) for Transconductance (μmhos) = 150	-5.7	volts

Mechanical:

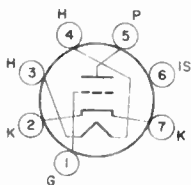
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No. E7-1)



6HM5/6HA5

.....

Plate Heater
 Filament Heater
 Filament Heater



.....

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

Plate Supply Voltage.....	150 max.	volt
Plate Voltage.....	200 max.	volt
Grid Voltage ^a	100 max.	volt
Control Grid Voltage.....	100 max.	volt
Control Grid Current.....	100 max.	ma
Plate Current.....	200 max.	ma

Typical Operation:

Plate Voltage.....	150	volt
Grid Voltage.....	100	volt
Plate Current.....	100	ma
Amplification Factor.....	40	
Plate Resistance.....	100	ohm
Transconductance.....	4	ma/volt
Plate Efficiency.....	20	per cent

Maximum Circuit Values:

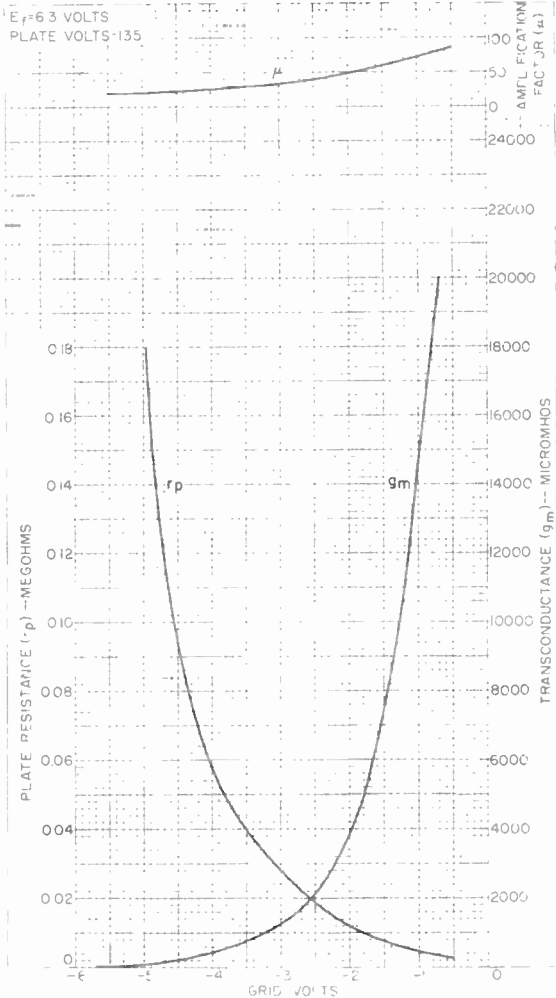
Grid Voltage.....	100	volt
Control Grid Voltage.....	100	volt
Control Grid Current.....	100	ma

^a with external ballast resistor connected to grid.



6HM5/6HA5

AVERAGE CHARACTERISTICS



92CM-12224

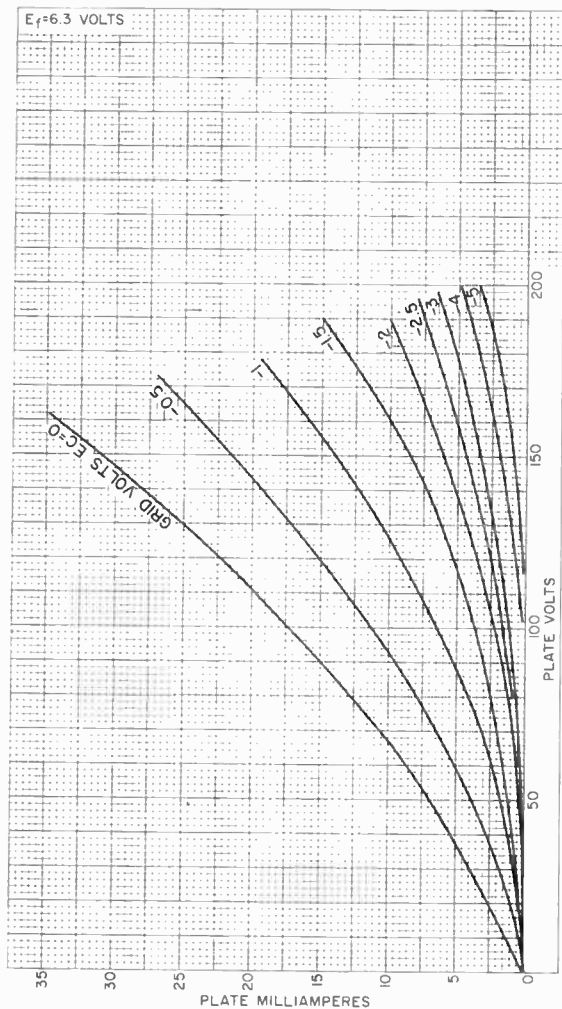


RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison N. J.

World Radio History

6HM5/6HA5

AVERAGE PLATE CHARACTERISTICS



92CM-12223



Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Intermediate-Frequency-Amplifier Applications in FM, AM, and AM/FM Receivers
With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (Design-Maximum Values):		
Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6 volts
Current	0.450 ± 0.030	0.450 ^b amp
Warm-up time (Average)	11	sec
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 ^c	max. volts
Direct Interelectrode Capacitances: ^d		
Grid No.1 to plate	0.006	max. μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	8.8	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.2	μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	200	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	115	volts
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	68	ohms
Plate Resistance (Approx.)	0.5	megohm
Transconductance	8500	μmhos
Plate Current	13.2	ma
Grid-No.2 Current	4.3	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 60	-15	volts

Mechanical:

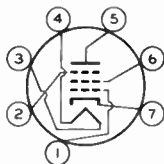
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See General Section
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)



6HR6

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 A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	300 max.	volts
GRID No.3 (SUPPRESSOR GRID)	Connect to cathode at socket	
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:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
GRID No.2 INPUT:		
For grid-No.2 voltages		
up to 150 volts	1 max.	watt
For grid-No.2 voltages be-		
tween 150 and 300 volts	See Grid-No.2 Input Rating Chart	at front of Receiving Tube Section
PLATE DISSIPATION	3 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

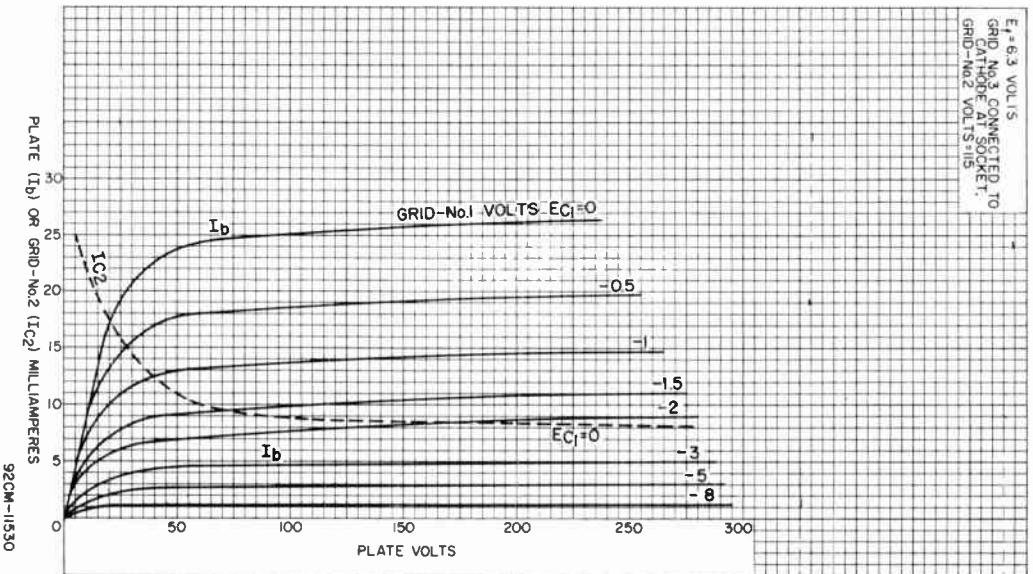
For fixed-bias operation.	0.5 max.	megohm
For cathode-bias operation.	1 max.	megohm

- a At heater amperes = 0.450.
- b At heater volts = 6.3.
- c The dc component must not exceed 100 volts.
- d without external shield.



6HR6

AVERAGE CHARACTERISTICS

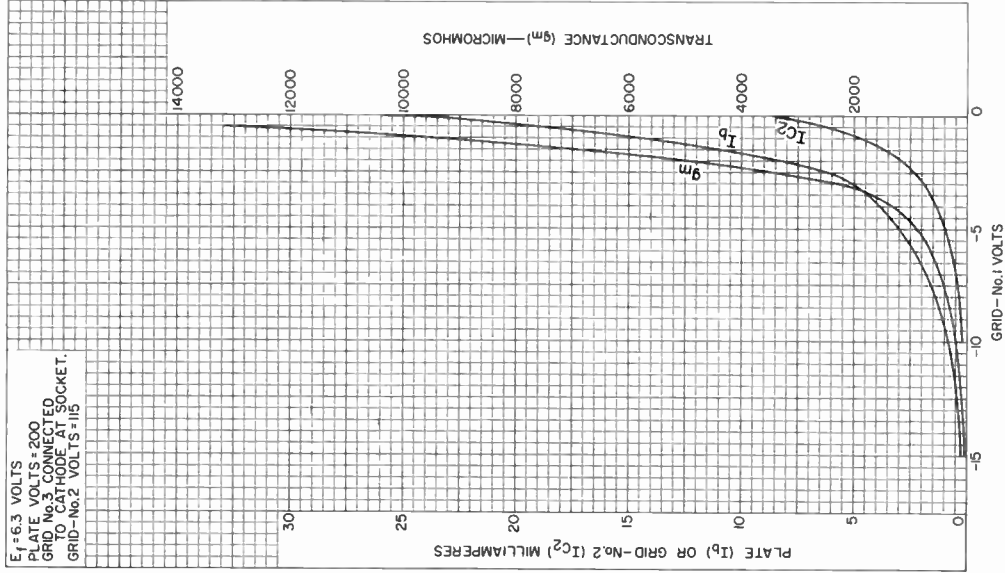


RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 2
5-62

6HR6

AVERAGE CHARACTERISTICS



92CM-11533

RADIO CORPORATION OF AMERICA
Electron Tube Division



Harrison, N. J.

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.0	volts
Current	0.450 ± 0.030	0.450 ^b	amp
Warm-up time (Average)	11	-	sec

Peak heater-cathode voltage:

Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^c	max.	volts

Direct Interelectrode Capacitances:^d

Grid No.1 to plate	0.006	max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	8.8		μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.2		μf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	75	150	volts
Grid No.3	Connected to cathode at socket		
Grid-No.2 Supply Voltage	75	75	volts
Grid-No.1 Supply Voltage	0	0	volts
Cathode Resistor	68	68	ohms
Amplification Factor ^e	50	-	
Plate Resistance (Approx.)	-	0.5	megohm
Transconductance	-	9500	μmhos
Plate Current	-	8.8	ma
Grid-No.2 Current	-	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-	-4	volts

Mechanical:

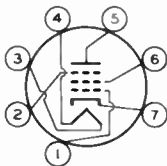
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	See <i>General Section</i>
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)



6HS6

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 A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. 300 max. volts
GRID No.3 (SUPPRESSOR GRID). . . Connect to cathode at socket
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:
Negative-bias value. 50 max. volts
Positive-bias value. 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. 3 max. watts

Maximum Circuit Values:

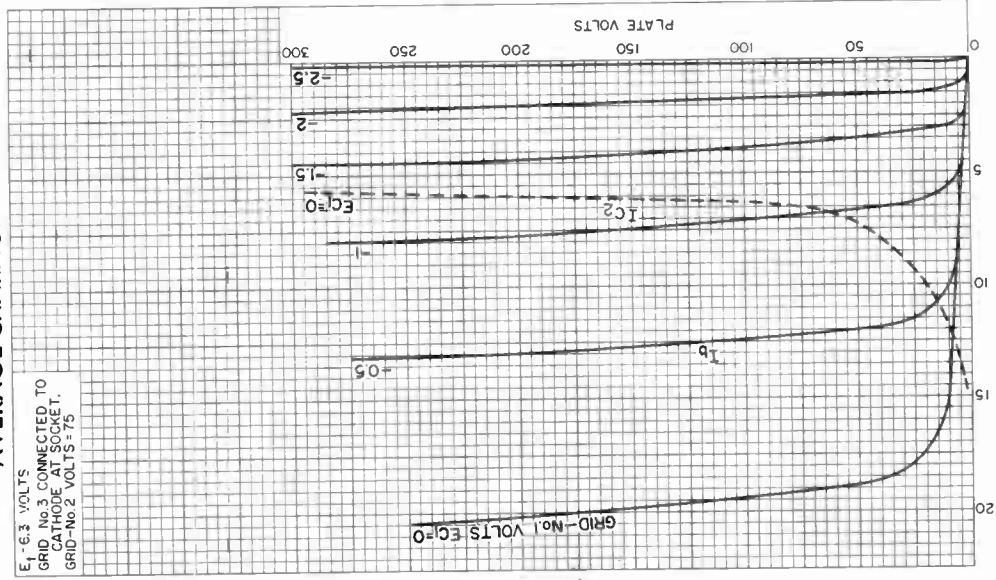
Grid-No.1-Circuit Resistance:
For fixed-bias operation 0.5 max. megohm
For cathode-bias operation 1 max. megohm

- ^a At heater amperes = 0.450.
- ^b At heater volts = 6.3.
- ^c The dc component must not exceed 100 volts.
- ^d without external shield.
- ^e Triode connection (Grid No.2 connected to plate).

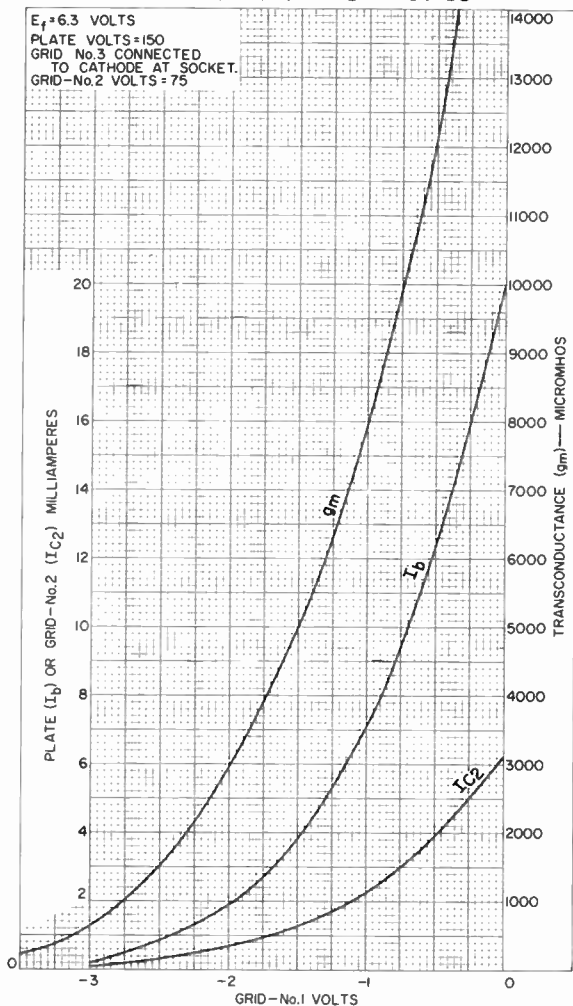


AVERAGE CHARACTERISTICS

E_1 - 6.3 VOLTS
 GRID No.3 CONNECTED TO
 CATHODE AT SOCKET.
 GRID-No.2 VOLTS = 75



AVERAGE CHARACTERISTICS



92CM-11484



Sharp-Cutoff Twin Pentode

With Common Cathode, Grid No.1, & Grid No.2

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC) 6.3 ± 0.6 volts

Current at heater volts = 6.3 0.30U amp

Peak heater-cathode voltage:

Heater negative with respect to cathode 200 max. volts

Heater positive with respect to cathode 200^a max. voltsDirect Interelectrode Capacitances:^b

Grid No.3 to plate (Each unit) 2.0 pf

Grid No.1 to all other electrodes 6.0 pf

Grid No.3 (Each unit) to all other electrodes 3.6 pf

Plate (Each unit) to all other electrodes 3.0 pf

Grid No.3 (Unit No.1) to grid No.3 (Unit No.2) 0.015 max. pf

Characteristics, Class A₁ Amplifier:*With one unit operating and plate and grid No.3 of other unit connected to ground*

Plate Voltage 100 100 volts

Grid-No.3 Voltage 0 0 volts

Grid-No.2 Voltage 67.5 67.5 volts

Grid-No.1 Voltage 0^c volts

Grid-No.3-to-Plate Transconductance - 450 μmhos

Grid-No.1-to-Plate Transconductance 1100 - μmhos

Plate Current - 2 ma

Grid-No.3 Voltage (Approx.) for plate μa = 100. - -3.5 volts ←

Grid-No.1 Voltage (Approx.) for plate μa = 100. - -2.3 volts

With both units operating

Plate Voltage (Each unit) 100 100 volts

Grid-No.3 Voltage (Each unit) -10 0 volts

Grid-No.2 Voltage 67.5 67.5 volts

Grid-No.1 Voltage 0^c volts

Plate Current (Each unit) - 2 ma

Grid-No.2 Current 7 4.4 ma

Cathode Current 7.1 8.5 ma

← Indicates a change.

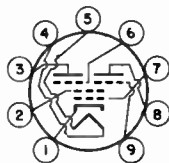


6HS8

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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 <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
→ Basing Designation for BOTTOM VIEW,	9FG

- Pin 1 - Cathode
- Pin 2 - Grid No. 2,
Internal
Shield
- Pin 3 - Plate of
Unit No. 2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Grid No. 3 of
Unit No. 2
- Pin 7 - Grid No. 1
Unit No. 1
- Pin 8 - Plate of
Unit No. 1
- Pin 9 - Grid No. 3 of
Unit No. 1

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE (Each unit)	300 max.	volts
GRID-No. 3 (SUPPRESSOR-GRID) VOLTAGE (Each unit):		
Peak positive value	50 max.	volts
DC negative value	50 max.	volts
DC positive value	3 max.	volts
GRID-No. 2 (SCREEN-GRID) VOLTAGE	150 max.	volts
GRID-No. 1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
CATHODE CURRENT	12 max.	ma
GRID-No. 2 INPUT	0.75 max.	watt
PLATE DISSIPATION (Each unit)	1.1 max.	watts

Maximum Circuit Values:

Grid-No. 3-Circuit Resistance (Each unit).	0.5 max.	megohm
Grid-No. 1-Circuit Resistance.	0.5 max.	megohm

^a The dc component must not exceed 100 volts.

^b without external shield.

^c Adjusted to give a dc grid-No. 1 current of 100 microamperes.

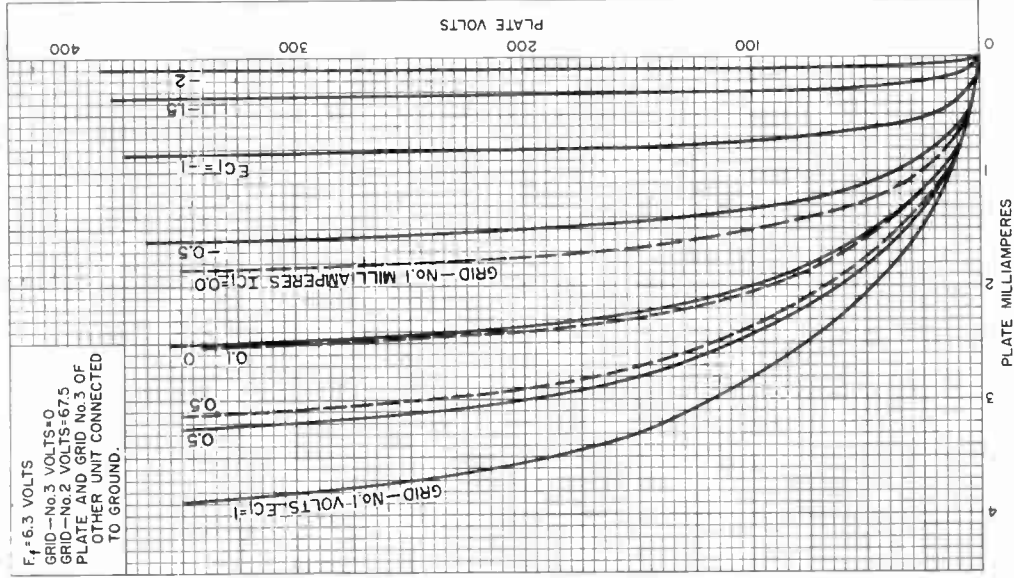
→ Indicates a change.



6HS8

AVERAGE PLATE CHARACTERISTICS Each Unit

$F_1 = 6.3$ VOLTS
GRID—No.3 VOLTS=0
GRID—No.2 VOLTS=67.5
PLATE AND GRID No.3 OF
OTHER UNIT CONNECTED
TO GROUND.



92CM-11099

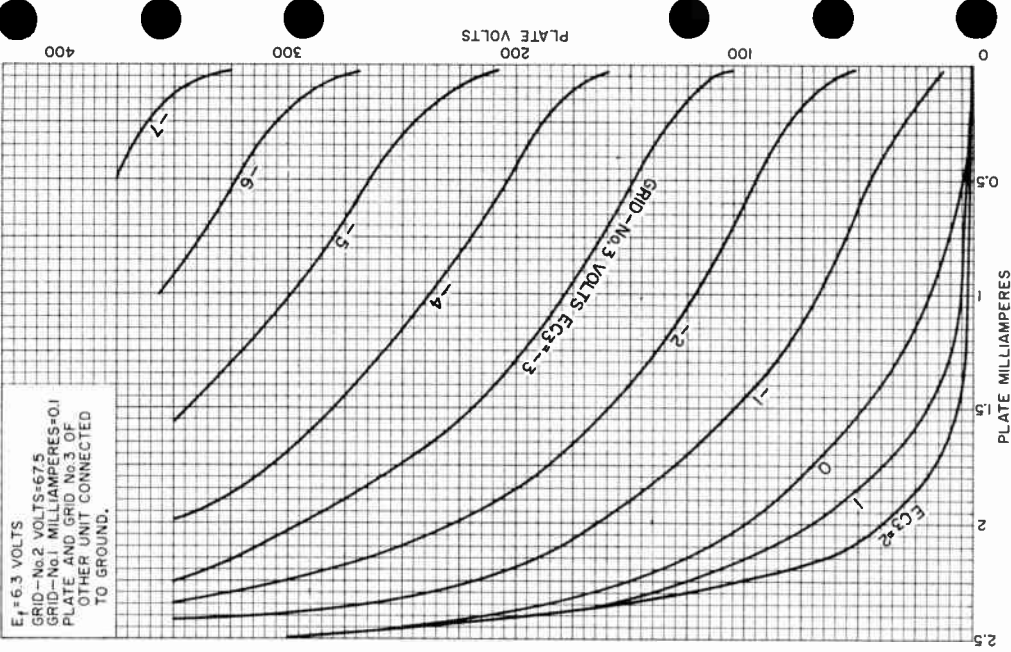


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Harrison, N. J.

DATA 2
1-62

6HS8

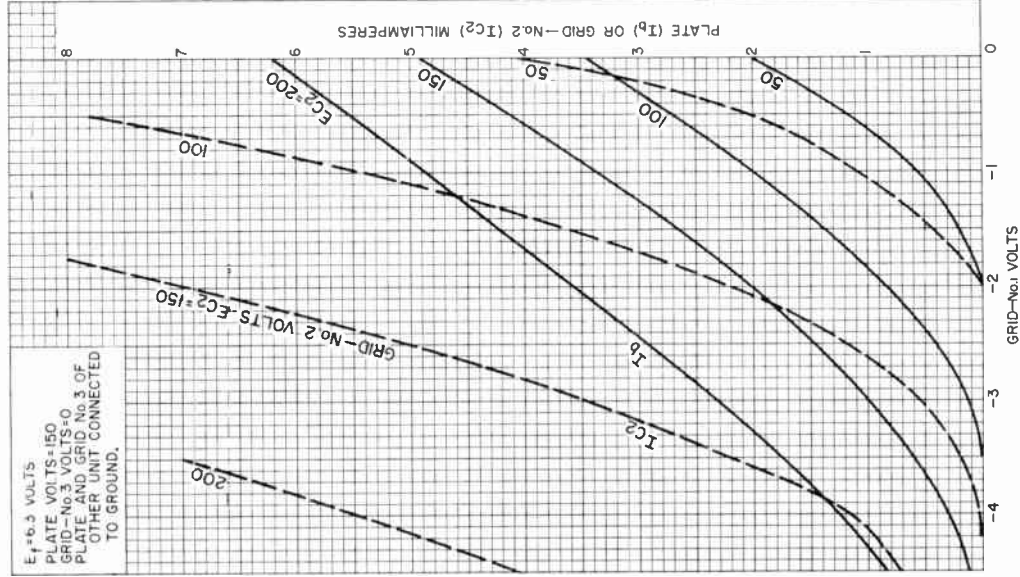
AVERAGE PLATE CHARACTERISTICS Each Unit



AVERAGE CHARACTERISTICS

Each Unit

$E_f = 6.5$ VOLTS
 PLATE VOLTS = 150
 GRID - No. 3, VOLTS = 0
 PLATE AND GRID No. 3, OF
 OTHER UNIT CONNECTED
 TO GROUND.

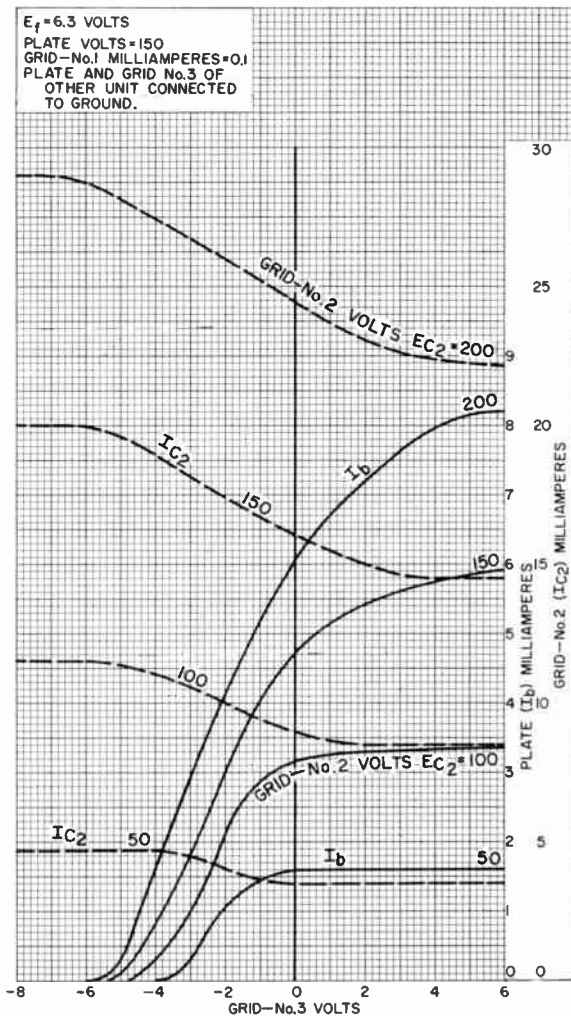


92CM-11104



6HS8

AVERAGE CHARACTERISTICS Each Unit



92CM-11105



Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:Heater Characteristics and Ratings (*Design-Maximum Values*):Voltage (AC or DC) 6.3^a 6.3 ± 0.6 voltsCurrent 0.450 ± 0.030 0.450^b amp

Warm-up time (Average) 11 - sec

Peak heater-cathode voltage:

Heater negative with

respect to cathode 200 max. volts

Heater positive with

respect to cathode 200^c max. volts

Direct Interelectrode Capacitances

(Approx):^d

Grid No.1 to plate 0.023 pf

Grid No.1 to cathode & internal

shield, grid No.3, grid No.2

& internal shield, and heater 8.2 pf

Grid No.1 to grid No.3 0.09 pf

Grid No.3 to plate 1.6 pf

Grid No.3 to cathode & internal

shield, plate, grid No.2 &

internal shield, grid No.1,

and heater 7.2 pf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage 150 volts

Grid-No.3 Supply Voltage 0 volts

Grid-No.2 Supply Voltage 100 volts

Grid-No.1 Supply Voltage 0 volts

Cathode Resistor 180 ohms

Plate Resistance (Approx.) 0.11 megohm

Transconductance, Grid No.1 to Plate 3400 μ hosTransconductance, Grid No.3 to Plate 600 μ hos

Plate Current 3.2 ma

Grid-No.2 Current 3.2 ma

Grid-No.1 Supply Voltage (Approx.)

for plate μ a = 20 -4.5 volts

Grid-No.3 Supply Voltage (Approx.)

for plate μ a = 20 -7 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"

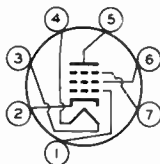
Diameter 0.650" to 0.750"



6HZ6

Bulb T5-1/2
 Base Small-Button Miniature 7-Pin (JEDEC No.E7-1)
 Basing Designation For BOTTOM VIEW 7EN

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



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

FM SOUND-DETECTOR SERVICE

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative value (DC and peak)	100 max.	volts
Positive value (DC and peak)	25 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE	See <i>Grid-No.2 Input Rating Chart</i> 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.3 INPUT	0.1 max.	watt
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts	1 max.	watt
For grid-No.2 voltages between 150 volts and 300 volts	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	
PLATE DISSIPATION	1.7 max.	watts

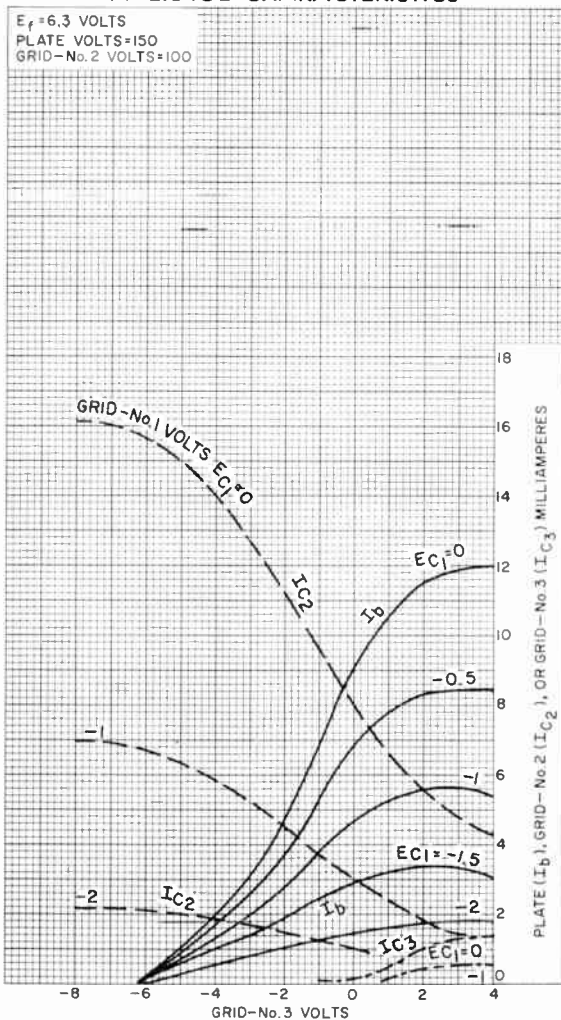
Maximum Circuit Values:

Grid-No.3-Circuit Resistance	0.68 max.	megohm
Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.22 max.	megohm
For cathode-bias operation	0.47 max.	megohm

- ^a At heater amperes = 0.450.
- ^b At heater volts = 6.3.
- ^c The dc component must not exceed 100 volts.
- ^d without external shield.



AVERAGE CHARACTERISTICS

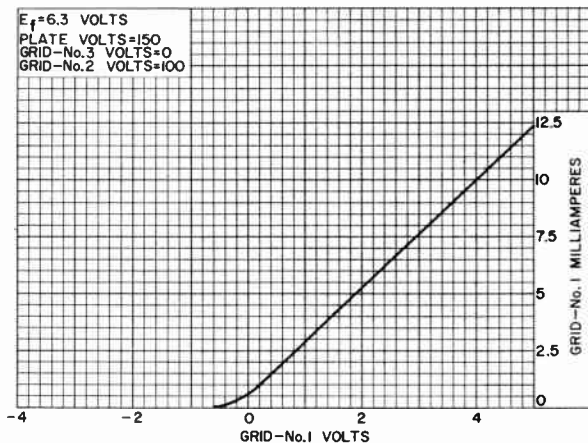


92CM-11789



6HZ6

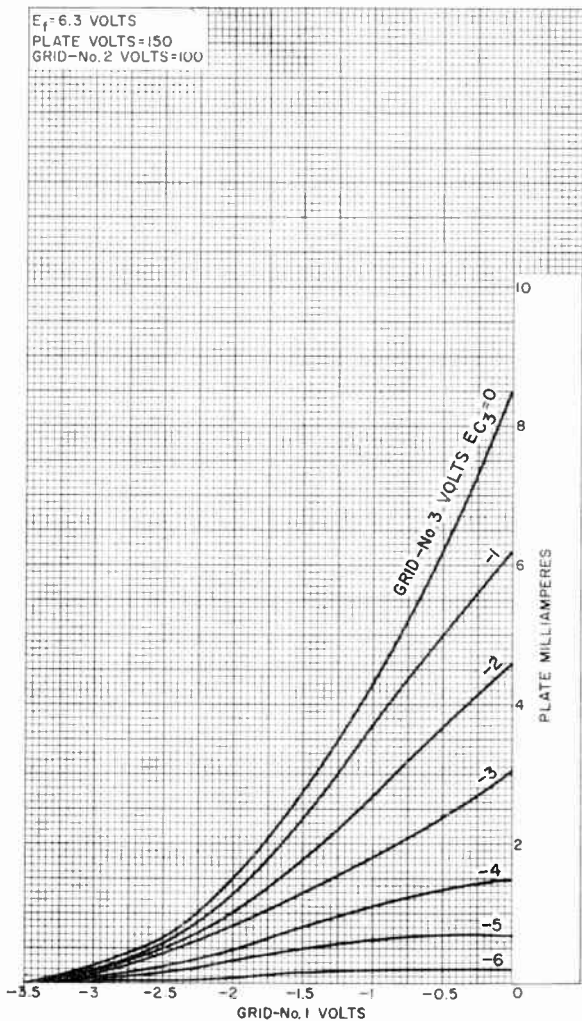
AVERAGE GRID-No.1 CHARACTERISTIC



92CS-11004



AVERAGE CHARACTERISTICS



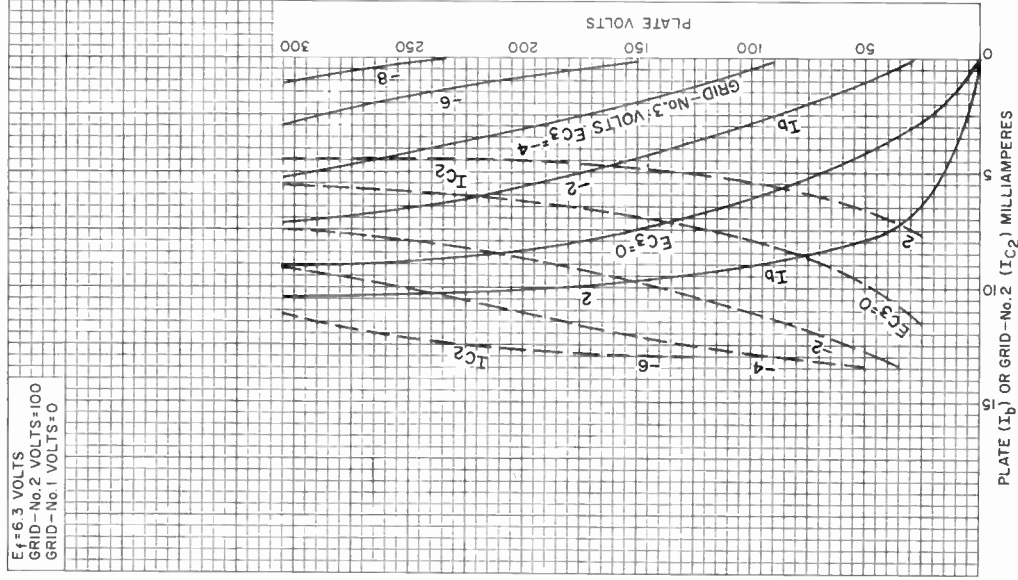
92CM-11788



6HZ6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-No. 2 VOLTS = 100
GRID-No. 1 VOLTS = 0



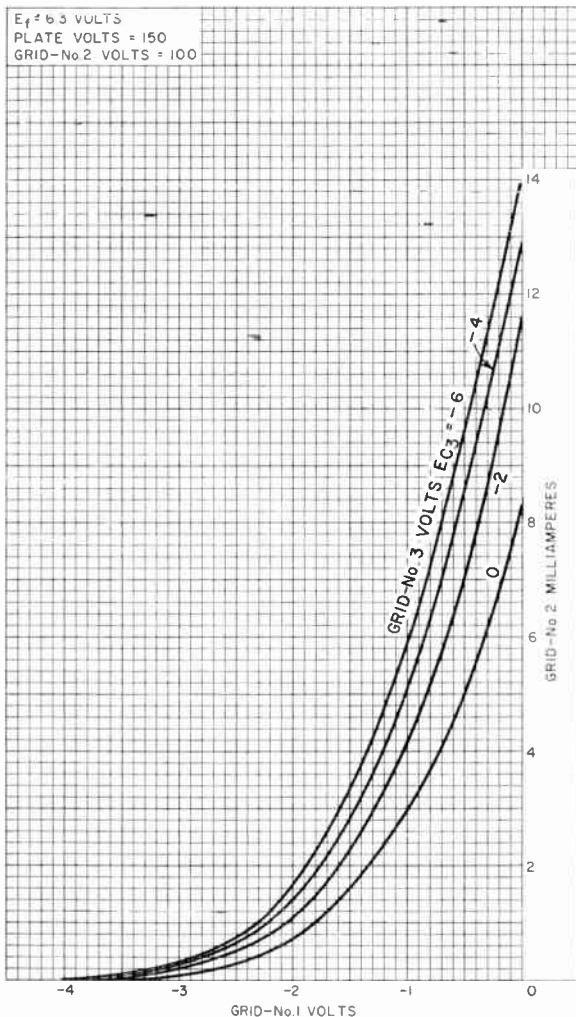
92CM-11793

Electron Tube Division

RADIO CORPORATION OF AMERICA
Harrison, N. J.



AVERAGE CHARACTERISTICS



92CM-11791



6HZ6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID-NO. 3 VOLTS = 0
GRID-NO. 2 VOLTS = 100

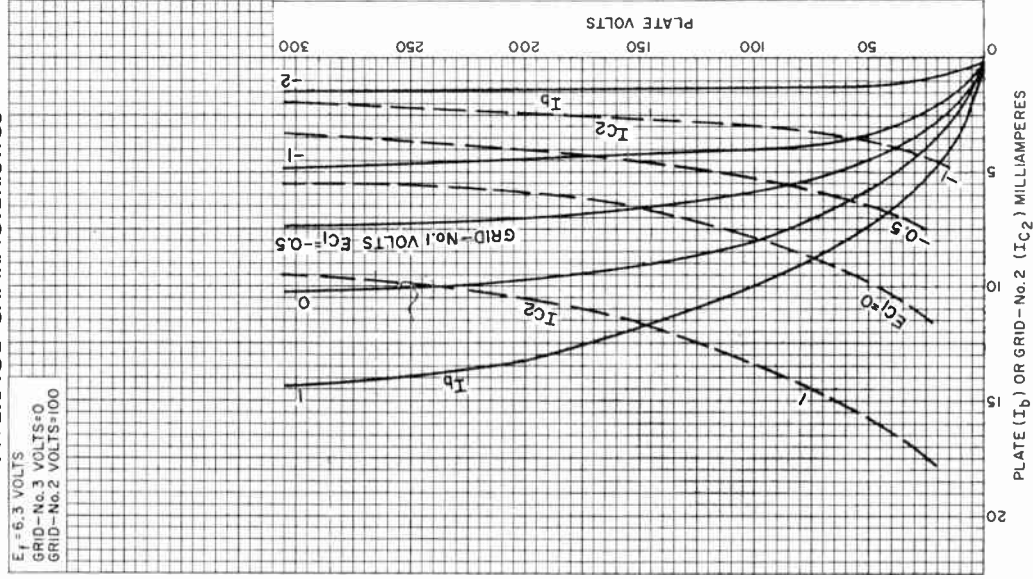


PLATE (I_b) OR GRID-NO. 2 (I_{c2}) MILLIAMPERES
92CM-11792

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Medium-Mu Twin Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield ^a	
<i>Unit No. 1</i>			
Grid to plate	1.6	1.5	μf
Grid to cathode and heater . . .	2.2	2.6	μf
Plate to cathode and heater . . .	0.4	1.6	μf
<i>Unit No. 2</i>			
Grid to plate	1.6	1.5	μf
Grid to cathode and heater . . .	2.2	2.6	μf
Plate to cathode and heater . . .	0.4	1	μf

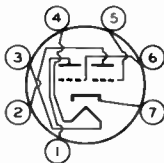
Characteristics, Class A₁ Amplifier (Each Unit):

Plate Supply Voltage	100	volts
Cathode Resistor ^b	50 ^c	ohms
Amplification Factor	38	
Plate Resistance (Approx.)	7100	ohms
Transconductance	5300	μhos
Plate Current	8.5	ma

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 . . . . .	.78F

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



6J6A

AMPLIFIER — Class A₁

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts
PLATE DISSIPATION	1.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	0.5 max.	megohm

RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy

Key-down conditions per tube without modulation

Values are for Each Unit

Maximum Ratings, Design-Center Values:

DC PLATE VOLTAGE	300 max.	volts
DC GRID VOLTAGE:		
Negative-bias value	40 max.	volts
Positive-bias value	0 max.	volts
DC PLATE CURRENT	15 max.	ma
DC GRID CURRENT	8 max.	ma
DC PLATE INPUT	4.5 max.	watts
PLATE DISSIPATION	1.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

Typical Push-Pull Operation at Frequencies up to 50 Mc:^d

Values are for Both Units

DC Plate Voltage	150	volts
DC Grid Voltage:		
From a fixed supply of	-10	volts
From a grid resistor of	625	ohms
From a cathode resistor of	220	ohms
DC Plate Current	30	ma
DC Grid Current (Approx.) ^e	16	ma
Driving Power (Approx.) ^e	0.35	watt
Useful Power Output (Approx.)	3.5	watts

^a With external shield JEDEC No.316 connected to cathode.

^b Fixed-bias operation is not recommended.

^c Value is for both units operating at the specified conditions.

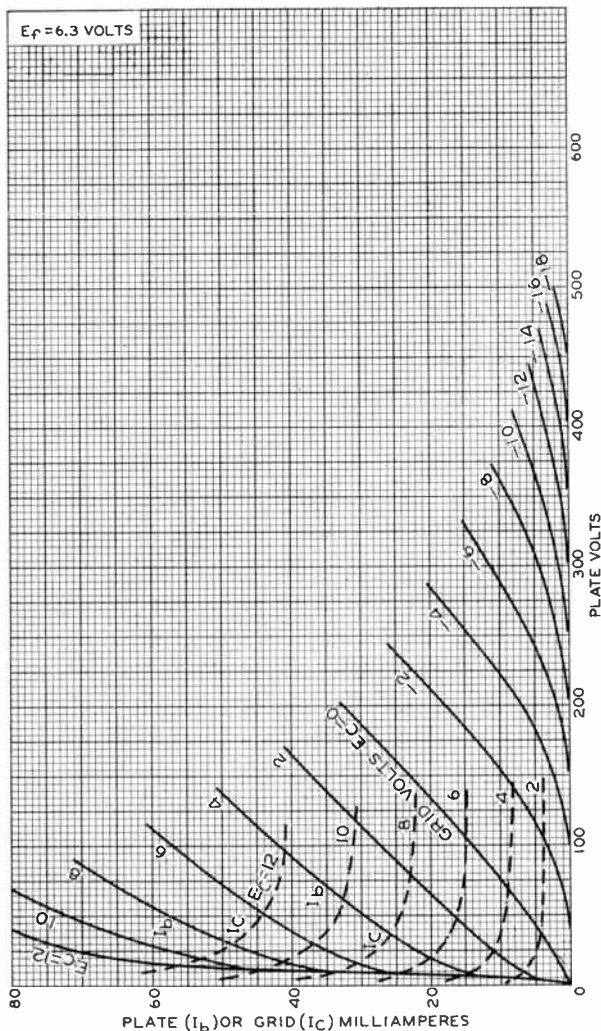
^d Approximately 1 watt can be obtained when the 6J6A is used at 250 Mc as a push-pull oscillator with a plate voltage of 150 volts, with maximum-rated plate dissipation, and with a grid resistor of 2000 ohms common to both units

^e For effect of load resistance on grid current and driving power, refer to **TUBE RATINGS—Grid Current and Driving Power** in the General Section.



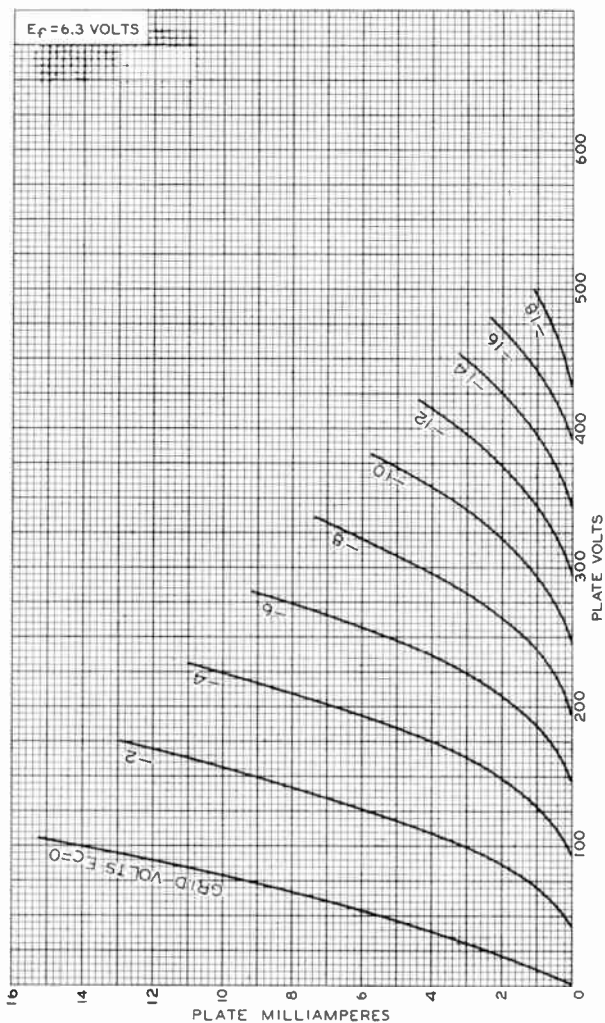
AVERAGE CHARACTERISTICS

Each Unit



6J6A

AVERAGE PLATE CHARACTERISTICS Each Unit



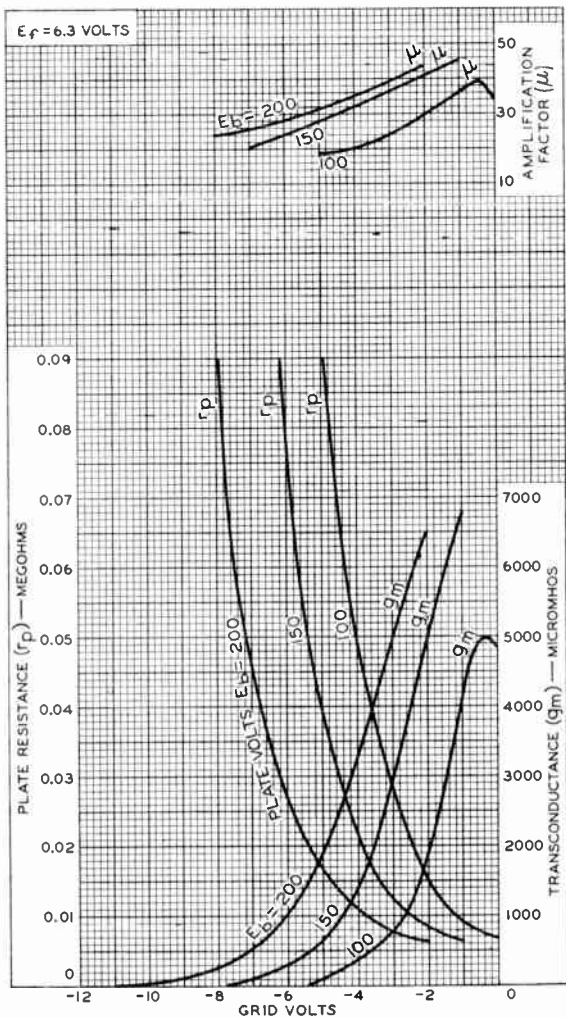
92CM-6402R1

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



AVERAGE CHARACTERISTICS Each Unit



92CM-7672R1





Pentode— Beam Power Tube

For Combined Limiter, Quadrature-Grid Discriminator, and Audio Power Output Applications in FM and TV Receivers

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6 volts
Current at heater volts = 6.3	0.950 amp
Peak heater-cathode voltage:	
Heater negative with respect to cathode	200 max. volts
Heater positive with respect to cathode	200 ^a max. volts

Direct Interelectrode Capacitances:^b

Beam Power Unit:

Grid No.1 to plate	0.2	pf
Input: $G1_B$ to ($K_B + G3_B, G2_B, H$)	11	pf
Output: P_B to ($K_B + G3_B, G2_B, H$)	7.0	pf

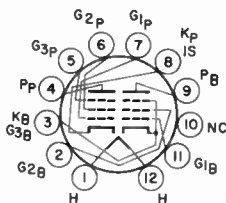
Pentode Unit:

Grid No.1 to plate	0.01	pf
$G1_P$ to ($K_P + IS, P_P, G3_P, G2_P, H$)	4.0	pf
$G3_P$ to ($K_P + IS, P_P, G2_P, G1_P, H$)	3.2	pf

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-58)	See General Section
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)
Rising Designation for BOTOM VIEW	12BT

- Pin 1 - Heater
- Pin 2 - Beam Power Grid No.2
- Pin 3 - Beam Power Cathode,
Beam Power Grid No.3
- Pin 4 - Pentode Plate
- Pin 5 - Pentode Grid No.3
- Pin 6 - Pentode Grid No.2
- Pin 7 - Pentode Grid No.1
- Pin 8 - Pentode Cathode,
Internal Shields
- Pin 9 - Beam Power Plate
- Pin 10 - No Internal Connection
- Pin 11 - Beam Power Grid No.1
- Pin 12 - Heater



PENTODE UNIT — LIMITER & DISCRIMINATOR SERVICE

Maximum Ratings, Design-Maximum Values:

Plate Supply Voltage	330	volts
Grid-No.3 (Quadrature-Grid) Voltage	^c	volts
Grid-No.2 (Accelerator-Grid) Voltage	110	volts
Grid-No.1 (Limiter-Grid) Voltage:		
Positive-peak value	60	volts
Cathode Current	13	ma

Typical Operation:

Input-Signal

Center Frequency	4.5	10.7	10.7	Mc
Plate Supply Voltage	270	85	285	volts
Plate Voltage	62	121	122	volts
Grid-No.3 Voltage	^c	^c	^c	^c volts
Grid-No.2 Voltage	100	-5	100	volts
Cathode-Circuit Resistance ^d	200-400	200-400	200-400	ohms
Peak AF Output Voltage	16.8	6	16.6	volts
Minimum Grid-No.1 Signal Voltage (RMS) for AM rejection ^d	2	1.25	2	volts
Minimum Grid-No.1 Signal Voltage (RMS) for limiting action ^e	1.25	1.25	1.25	volts
Plate Current	0.44	0.25	0.49	ma
Grid-No.2 Current	10	4.1	9.8	ma
Plate Load Resistor	0.33	0.085	0.33	megohm
Linearity Resistor	1000	470	1500	ohms
Integrating Capacitor	0.001	0.002	0.001	μ f
Coupling Capacitor	0.25	0.25	0.01	μ f
Frequency Deviation	± 25	± 75	± 75	kc
AM Rejection:				
For grid-No.1 signal volts (RMS) = 2	25	31	20	db
For grid-No.1 signal volts (RMS) = 3	30	30	29	db
Total Harmonic Distortion	1.8	2	1.6	%

BEAM POWER UNIT — AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

Plate Voltage	275	volts
Grid-No.2 (Screen-Grid) Voltage	275	volts
Plate Dissipation	10	watts
Grid-No.2 Input	2	watts

Typical Operation and Characteristics:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts



Zero-Signal Plate Current.	35	ma
Max.-Signal Plate Current.	39	ma
Zero-Signal Grid No.2 Current.	2.5	ma
Max.-Signal Grid No.2 Current.	7	ma
Plate Resistance (Approx.)	0.1	megohm
Transconductance	6500	μ mhos
Load Resistance.	5000	ohms
Total Harmonic Distortion.	10	%
Max.-Signal Power Output	4.2	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25	megohm
For cathode-bias operation	0.5	megohm

- a The dc component must not exceed 100 volts.
- b without external shield.
- c For proper operation of the pentode unit of the type shown in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the tuned circuit (L_1, C_6) should be sufficiently high to develop a 4-volt rms signal at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.
- It is recommended that L_1 be shunted by a capacitance of at least 10 μ mf. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L_1 , and a fixed capacitor.
- d The cathode-circuit resistance should be adjusted for maximum AM rejection at the AF output of the circuit at the specified grid-No.1 signal voltage. AM rejection is measured with an applied signal containing 30 per cent amplitude modulation and 30 per cent frequency modulation.
- e At signal levels above specified value, limiting is within ± 3 decibels.

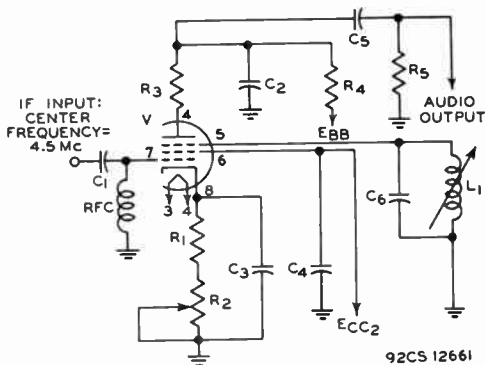
OPERATING CONSIDERATIONS FOR PENTODE UNIT

To insure proper phasing of the signal voltage developed at the quadrature grid, the components of the quadrature-grid circuit should be shielded from those of the control-grid circuit.

To obtain a symmetrical discriminator-response curve, the plate currents for no input signal and for unmodulated input signal should be equal. To assure this equality, it is necessary that the plate voltage and grid-No.2 voltage have the proper values.

The proper plate voltage for any grid-No.2 voltage may be determined from the accompanying *Operating Characteristics, Pentode Unit* curve. This curve may also be used to determine the average dynamic plate current for any combination of grid-No.2 voltage and plate voltage.



TYPICAL QUADRATURE-GRID-
FM-DETECTOR CIRCUIT

92CS 12661

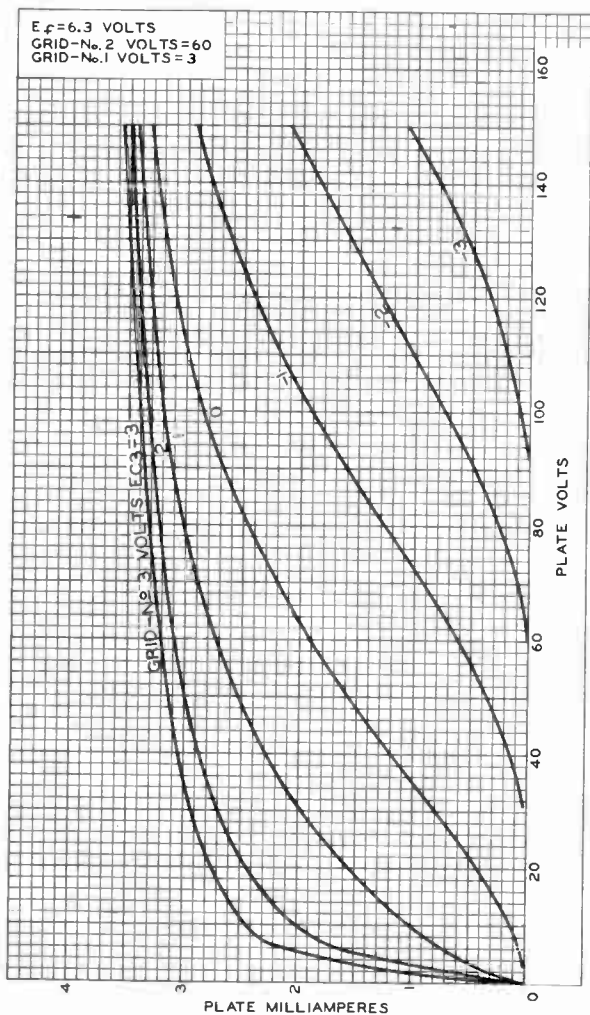
C_1 :	100 $\mu\mu\text{f}$	R_3 :	Linearity resistor, 1000 ohms
C_2 :	Integrating capacitor, 0.001 μf	R_4 :	Plate-load resistor, 0.33 megohm
C_3, C_4 :	0.01 μf	R_5 :	0.47 megohm
C_5 :	0.25 μf	V:	Pentode Unit of Electron-tube-type 6J10
C_6 :	10 $\mu\mu\text{f}^c$		
L_1 :	c		
R_1 :	200 ohms		
R_2 :	Cathode-bias potentiometer, 200 ohms		

^c For footnote see end of data.

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AVERAGE PLATE CHARACTERISTICS

Pentode Unit



92CM-10319



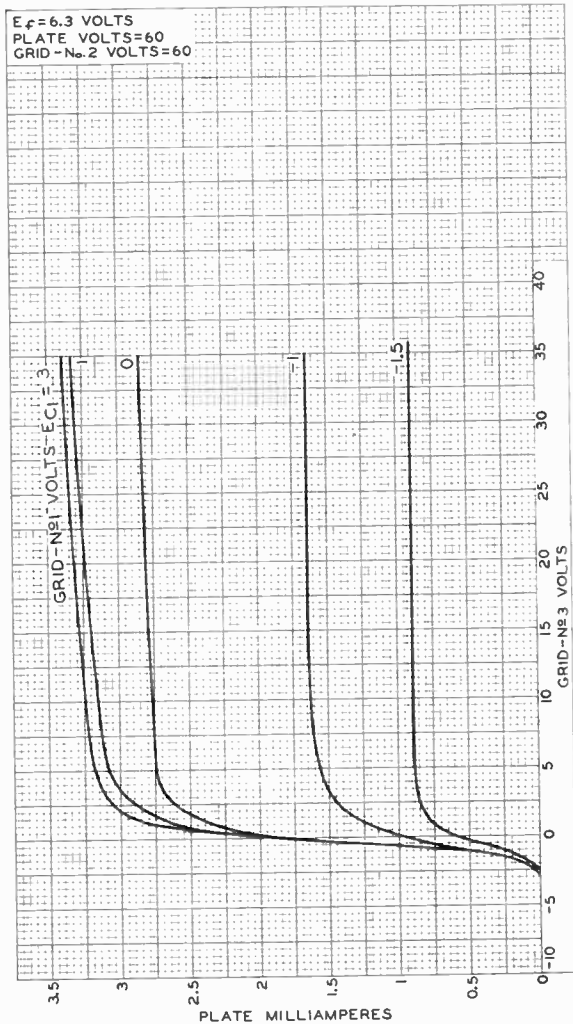
RADIO CORPORATION OF AMERICA
 Electronic Components and Devices Harrison, N. J.

World Radio History

DATA 3

-C-

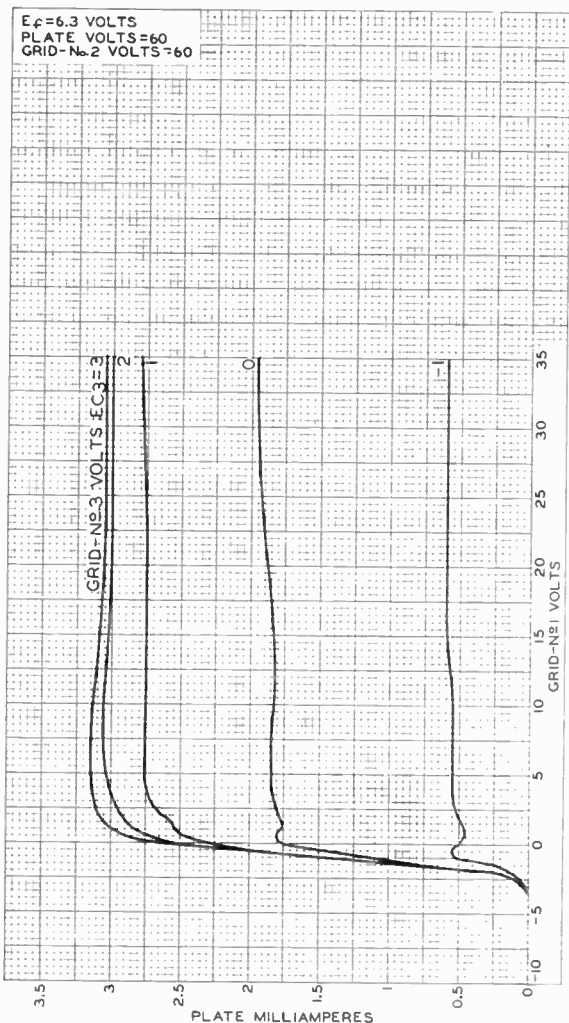
AVERAGE CHARACTERISTICS Pentode Unit



92CM-10320



AVERAGE CHARACTERISTICS Pentode Unit

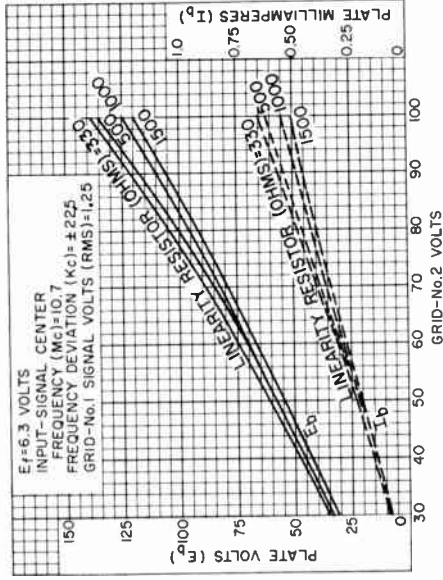


92CM-10322



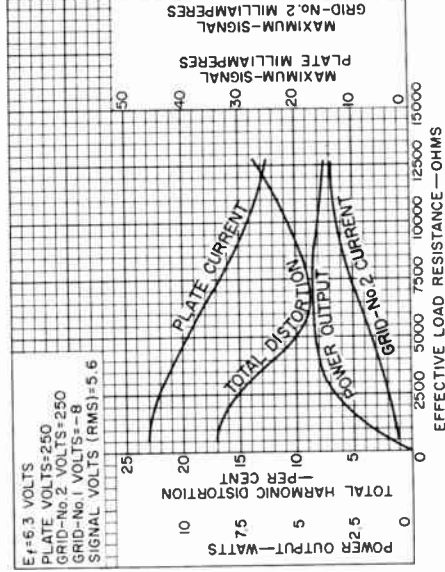
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 Electronic Components and Devices Harrison, N. J.

OPERATION CHARACTERISTICS Pentode Unit



92CS-12662

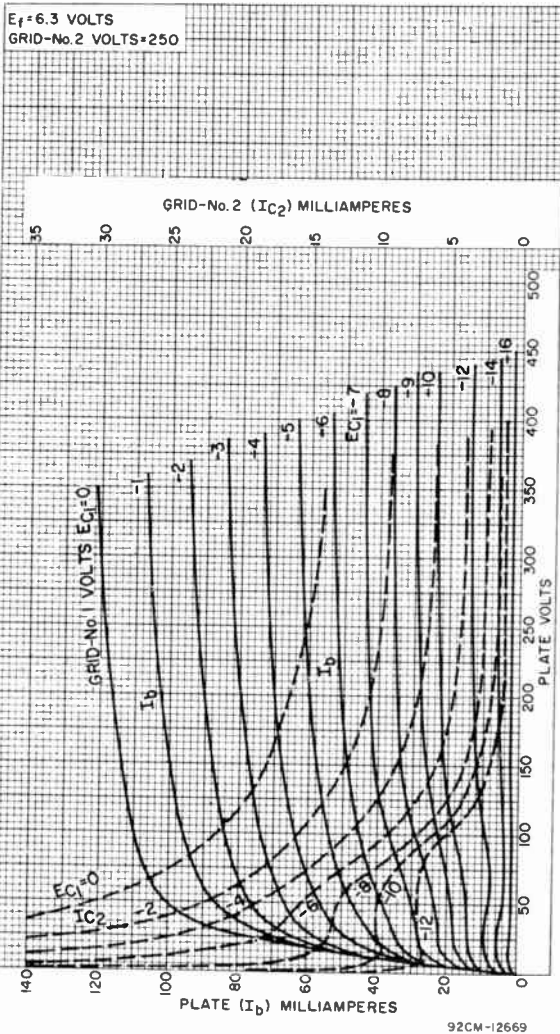
OPERATION CHARACTERISTICS Beam Power Unit



92CS-12663

AVERAGE CHARACTERISTICS

Beam Power Unit





6JB6A

Beam Power Tube

NOVAR TYPE

SEPARATE GRID-No.3 BASE-PIN TERMINAL FOR "SNIVETS" CONTROL^a

For Horizontal-Deflection-Amplifier
Service in Black-and-White TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC) 6.3 ± 0.6 volts
Current at heater volts = 6.3 1.200 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 (Approx.):^c

Grid No.1 to plate 0.2 pf

Input: G1 to (K+G3, G2, H) 15.0 pf

Output: P to (K+G3, G2, H) 6.0 pf

Mechanical:

Operating Position Any

Type of Cathode Coated Unipotential

Maximum Overall Length 3.505"

Seated Length 2.875" ± 3.125"

Diameter 1.438" ± 1.562"

Dimensional Outline See *General Section*

Bulb T12

Cap Skirted Miniature (JEDEC No. C1-2 or C1-3)

Base Large-Button Novar 9-Pin with Exhaust Tip

(JEDEC No. F9-88)

Basing Designation for BOTTOM VIEW 9QL

Pin 1-Grid No.2

Pin 2-Grid No.1

Pin 3-Cathode

Pin 4-Heater

Pin 5-Heater

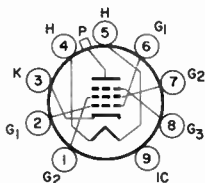
Pin 6-Grid No.1

Pin 7-Grid No.2

Pin 8-Grid No.3

Pin 9-Do Not Use

Cap-Plate



Characteristics, Class A₁ Amplifier:

	Triode Connection	Pentode Connection	
Plate Voltage	150	60	250 volts
Grid No.3	-	Connected to cathode	
		at socket	
Grid-No.2 Voltage	150	150	150 volts
Grid-No.1 Voltage	-22.5	0	-22.5 volts
Amplification Factor	4.4	-	-
Plate Resistance (Approx.)	-	-	15000 ohms



6JB6A

	Triode Connection	Pentode Connection	
Transconductance	-	-	7100 μ hos
Plate Current	-	390 ^d	70 ma
Grid-No.2 Current	-	32 ^d	2.1 ma
Grid-No.1 Voltage (Approx.) for plate current = 1 ma.	-	-	-42 volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^e

DC Plate-Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage ^f	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 Voltage ^a	70 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average	175 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation ^g	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface).	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor bias operation^f 1 max. megohm

^a A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.

^b The dc component must not exceed 100 volts.

^c Without external shield.

^d This value can be measured by a method involving a recurrent wave form such that the plate dissipation, grid-No.2 input, and cathode current will be kept within ratings in order to prevent damage to the tube.

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

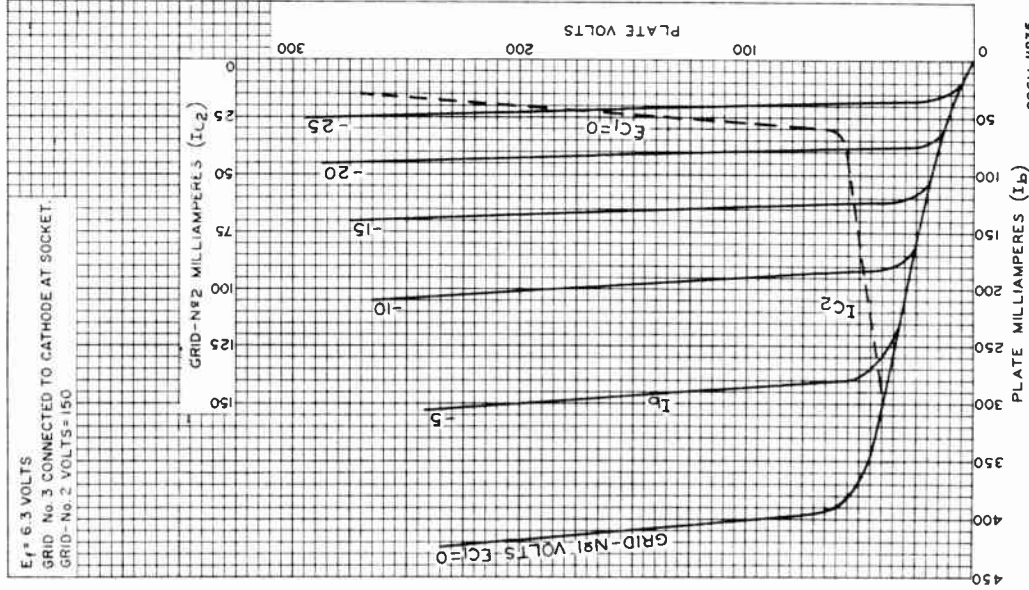
^f This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525 line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

^g It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.



6JB6A

AVERAGE CHARACTERISTICS



92CM-11835



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 2
10-64



Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

FRAME-GRID CONSTRUCTION

DARK HEATER

*For Use in RF Amplifier Stages of Color-
and Black-and-White TV Receivers*

ELECTRICAL CHARACTERISTICS

Bogey Values^a

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	0.300	A

Direct Interelectrode Capacitances

Without External Grids:

Grid-1 to Plate	C_{g1-p}	0.019 max	pF
Grid-1 to K. (Grid-1 to G. 2)	C_{c1}	8.5	pF
Grid-2 to Plate	C_o	3.0	pF

For the following characteristics, see Conditions

Plate Resistance (Approx.)	r_p	180	Ω
Transconductance	g_m	16000	μmho
DC Plate Current	I_b	14	mA
DC Grid-No.2 Current	I_{c2}	3.4	mA
Cutoff DC Grid-No.1 Voltage	$E_{c1}(co)$	-3	V

Plate A-1 (1)

Conditions

Heater Voltage	E_h	Bogey Value	V
DC Plate Supply Voltage	E_{bb}	125	V
Grid No.3.	-	Connected to cathode at socket	
DC Grid-No.2 Supply Voltage	E_{cc2}	125	V
Cathode Resistor	R_k	56	Ω

MECHANICAL CHARACTERISTICS

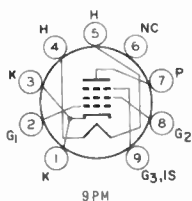
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.187 in
Maximum Seated Length	1.937 in
Length, Base Seat to Bulb Top	1.469 to 1.656 in
Maximum Diameter	0.875 in
Dimensional Outline (JEDEC 6-2)	See <i>General Section</i>
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)



6JC6A

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Cathode
- Pin 2 - Grid-No.1
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - No. Internal Connection
- Pin 7 - Plate
- Pin 8 - Grid-No.2
- Pin 9 - Grid-No.3



DESIGN-MAXIMUM RATINGS

For operation as a Class A₁ Amplifier Tube

DC Plate Voltage	E_b	330	V
Positive DC Grid-No.3 (Suppressor-Grid) Voltage	E_{c3}	0	V
DC Grid-No.2 (Screen-Grid) Supply Voltage	E_{cc2}	330	V
DC Grid-No.2 Voltage	E_{c2}	See Grid-No. 2	

Input Rating Chart

at front of Receiving Tube Section

DC Grid-No.1 (Control-Grid) Voltage			
Positive-bias value	E_{c1}	0	V
Heater-Cathode Voltage			
Peak	e_{hkm}	±200	V
DC	E_{hk}	100	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9	V
Grid-No.2 Input	P_{g2}		
For $E_{c2} < 165$ V	-	0.7	W
For $E_{c2} > 165$ V and ≤ 320 V	-	See Grid-No. 2	

Input Rating Chart

at front of Receiving Tube Section

Plate Dissipation	P_b	3.1	W
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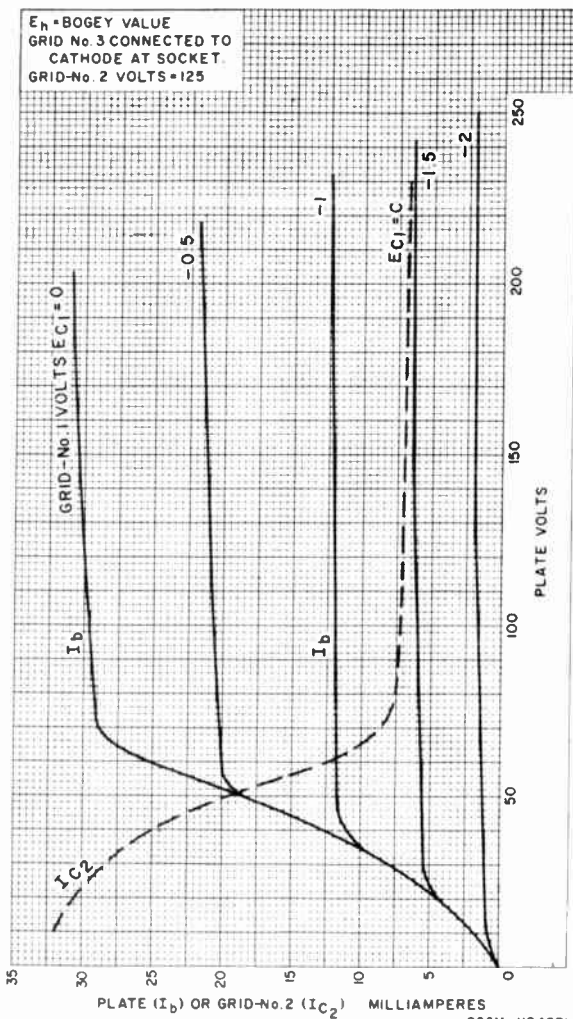
MAXIMUM CIRCUIT VALUES

Grid-No.1 Circuit Resistance	$R_{g1(ckt)}$		
For triode-bias operation	-	0.25	MΩ
For cathode-bias operation	-	1	MΩ

^a Unless otherwise specified.



Typical Characteristics



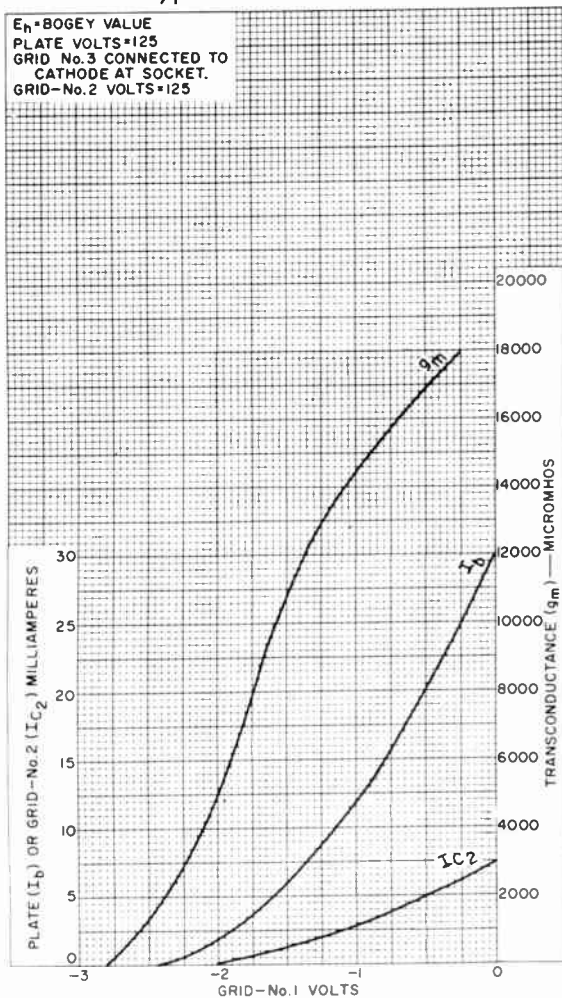
92CM-11948R1



RADIO CORPORATION OF AMERICA
 Electronic Components and Devices Harrison, N. J.

DATA 2
 10-66

Typical Characteristics



92CM - 11949R1



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	volts
Current	0.450 + 0.030	0.450 ^b	amp
Warm-up time (Average)	11	—	sec

Peak heater-cathode
voltage:

Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^c	max.	volts

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield^d</i>	
<i>Triode Unit:</i>			
Grid to plate	1.3	1.2	μf
Grid to cathode and heater	2.8	3.2	μf
Plate to cathode and heater	0.44	0.9	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate	0.038 max.	0.018 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4.8	5.0	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	0.9	1.6	μf
Pentode grid No.1 to triode plate	0.05 max.	0.036 max.	μf
Triode plate to pentode grid No.1	0.075 max.	0.012 max.	μf
Heater to cathode	6.5	6.5 ^e	μf

Characteristics, Class A₁ Amplifier:

	<i>Triode Unit</i>	<i>Pentode Unit</i>		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	—	70	125	volts
Grid-No.1 Voltage	-1	0	-1	volt
Amplification Factor	40	—	—	
Plate Resistance (Approx.)	6000	—	300000	ohms
Transconductance	6500	5700	5500	μmhos



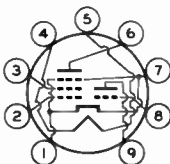
6JC8

	Triode Unit	Pentode Unit	
Plate Current	12	- 9	ma
Grid-No.2 Current	-	- 2.2	ma
Grid-No.1 Voltage (Approx.) for plate μ a = 20.	-7	- 6.5	volts

Mechanical:

Operating Position	Any
Type of Cathode	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" \pm 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9PA

- Pin 1 - Pentode
Grid No.3,
Cathode,
Internal
Shield
- 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
Grid No.3,
Cathode,
Internal
Shield
- Pin 8 - Triode Grid
- Pin 9 - Triode Plate

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	275 max.	275 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	275 max.	volts
GRID-No.2 VOLTAGE	-	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1.7 max.	2.3 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 137.5 volts	-	0.45 max.	watt
For grid-No.2 voltages between 137.5 and 275 volts	-	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	

Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	-	0.1 max.	megohm
For cathode-bias operation	-	0.5 max.	megohm



- a At heater amperes = 0.450.
- b At heater volts = 6.3.
- c The dc component must not exceed 100 volts.
- d With external shield JEDEC No.315 connected to pin 3 except as noted.
- e With external shield JEDEC No.315 connected to pin 6.





Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
FRAME-GRID CONSTRUCTION

For Use as High-Gain Intermediate-Frequency-Amplifier
Tube in Television Receivers. No External Shield Re-
quired. Cutoff Characteristic Approaching Semiremote.

GENERAL DATA

Electrical:

Heater Characteristics and Ratings.

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.	200 max.	volts
Heater positive with respect to cathode.	200 ^a max.	volts

Direct Interelectrode Capacitances:^b

Grid No.1 to plate.	0.019 max.	pf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater.	8.2	pf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater.	3.0	pf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage.	125	volts
Grid-No.3 Voltage	0	volts
Grid-No.2 Supply Voltage.	125	volts
Grid-No.1 Supply Voltage.	0	volts
Cathode Resistor.	56	ohms
Plate Resistance (Approx.).	160000	ohms
Transconductance.	14000	μmhos
Plate Current	15	ma
Grid-No.2 Current	4	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 600.	-4.5	volts

Mechanical:

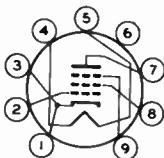
Operating Position.	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length.	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb.	T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC No.E9-1)



6JD6

Basing Designation for BOTTOM VIEW. 9PM

- Pin 1 -Cathode
- Pin 2 -Grid No.1
- Pin 3 -Cathode
- Pin 4 -Heater
- Pin 5 -Heater
- Pin 6 -No Internal Connection



- Pin 7 -Plate
- Pin 8 -Grid No.2
- Pin 9 -Grid No.3
- Internal Shield

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

- PLATE VOLTAGE 330 max. volts
- GRID-NO.3 (SUPPRESSOR-GRID) VOLTAGE:
 - Positive value. 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:
 - Positive-bias value 0 max. volts
- GRID-NO.2 INPUT:
 - For grid-No.2 voltages up to 165 volts 0.6 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 2.5 max. watts

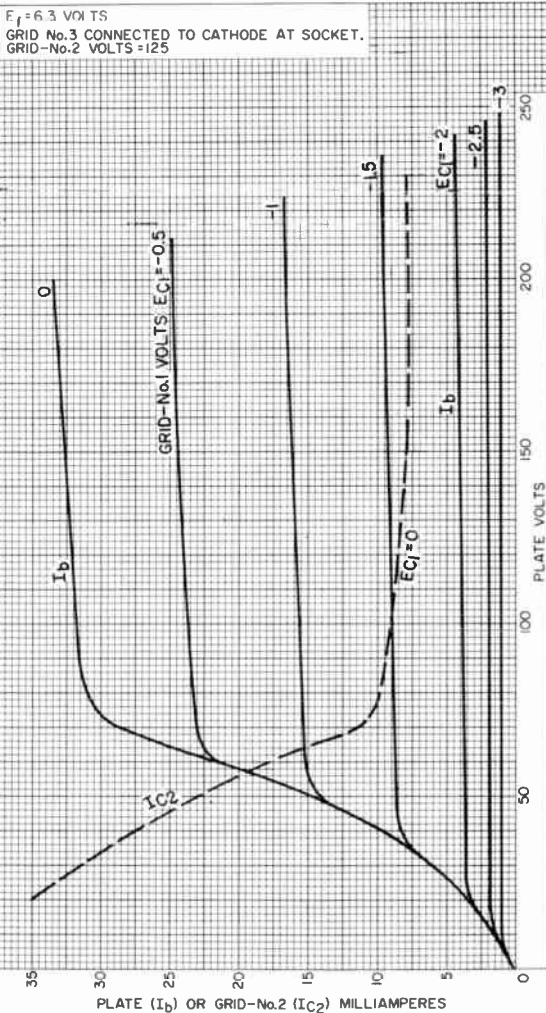
Maximum Circuit Values:

- Grid-No.1-Circuit Resistance:
 - For fixed-bias operation. 0.25 max. megohm
 - For cathode-bias operation. 1 max. megohm

^a The dc component must not exceed 100 volts.
^b without external shield.



AVERAGE CHARACTERISTICS



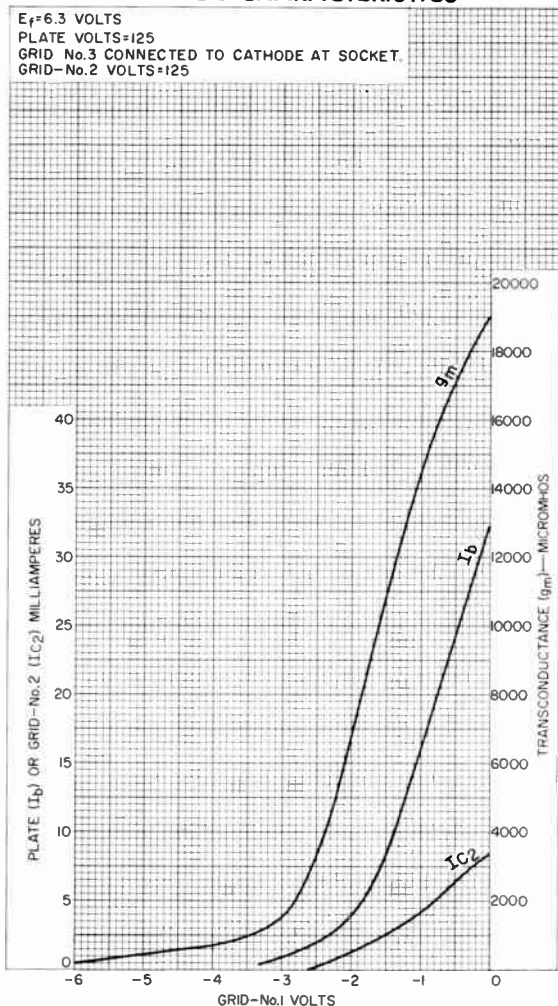
92CM-11951



6JD6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 125
GRID No. 3 CONNECTED TO CATHODE AT SOCKET,
GRID-No. 2 VOLTS = 125



92CM-11952R1

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Beam Power Tube

NOVAR TYPE

For Horizontal-Deflection-Amplifier Service
in Low-B+, Black-and-White TV Receivers

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	1.600	A
Maximum heater voltage		
Heater negative with respect to cathode:		
Peak	200	V
Heater positive with respect to cathode:		
Peak	200	V
DC component	100	V

Direct Interelectrode Capacitances (Approx.)^a

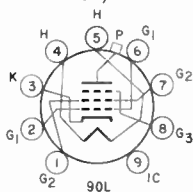
Grid No. 3 to plate	1.2	pF
Input: G ₁ to (K, G ₂ , G ₃)	22.0	pF
Output: P to (K, G ₂ , G ₃ , H)	9.0	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.550 in
Seated Length	2.910 to 3.170 in
Diameter	1.438 to 1.562 in
Dimensional Outline	See General Section
Bulb	T12
Cap	Skirted Miniature (JEDEC No. CI-2 or CI-3)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-88)

TERMINAL DIAGRAM (Bottom View)

Pin 1 - Grid No. 3
Pin 2 - Grid No. 2
Pin 3 - Cathode
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Grid No. 1
Pin 7 - Grid No. 2
Pin 8 - Grid No. 3
Pin 9 - Coated U.
Cap - Plate



CHARACTERISTICS

Peak Positive-Pulse Plate Voltage ^b	6500	-	-	V
Plate Voltage	-	50	130	V
Grid No. 3	Connected to cathode at socket			
Grid-No. 2 Voltage	125	125	125	V
Grid-No. 1 Voltage	-	0	-20	V
Plate Resistance (Approx.)	-	-	12000	Ω



6JF6

Transconductance	-	-	10000	μ mho
Plate Current	-	525 ^c	80	mA
Grid-No.2 Current		32 ^c	2.5	mA
Grid-No.1 Voltage (Approx.)	-125	-	-40	V

For plate $\mu A = 2$

Triode Amplification Factor (Triode connection: grid No.2 connected to plate at socket. Plate volts grid-No.2 volts = 125; grid-No.1 volts = -20)

-	-	4.1
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HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values

For operation in a 525-line, 30-frame system

DC Plate Supply Voltage	770	V
Peak Positive-Pulse Plate Voltage ^d	6500	V
Peak Negative-Pulse Plate Voltage	1500	V
DC Grid-No.3 Voltage ^e	100	V
DC Grid-No.2 (Screen-Grid) Voltage	220	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	330	V
Cathode Current		
Peak	950	mA
Average	275	mA
Grid-No.2 Input	3.5	W
Plate Dissipation ^f	17	W
Bulb Temperature	240	°C

At hottest point on bulb surface

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance

for grid-reel or for-bias operation ^f	0.47	M Ω
for plate-pulld operation	10	M Ω

(Horizontal-deflection circuits only)

^a Without external shield.

^b Under conditions shown in footnote^d.

^c This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

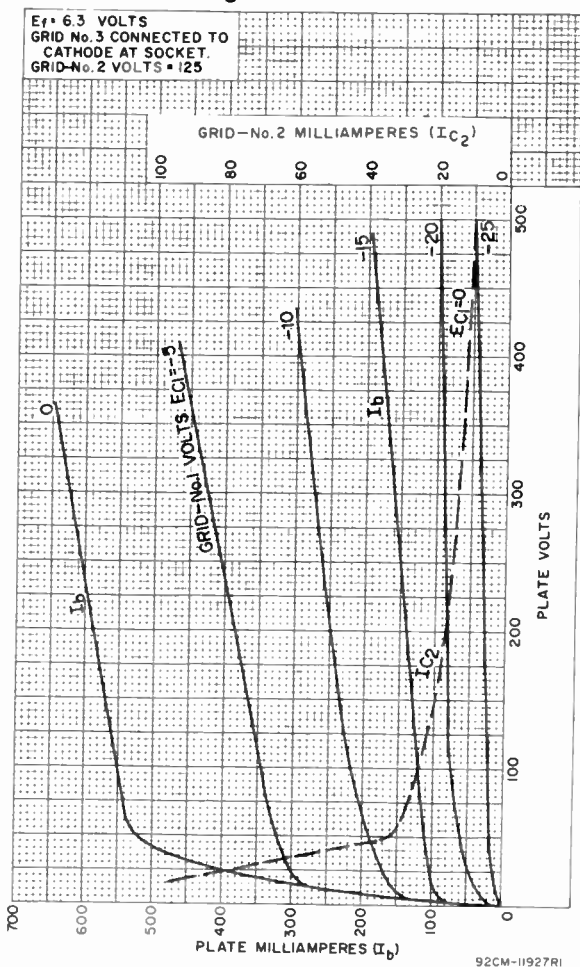
^d This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

^e In horizontal-deflection-amplifier service, a positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in both vhf and uhf television receivers. Atypical value for this voltage is 50 volts.

^f An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



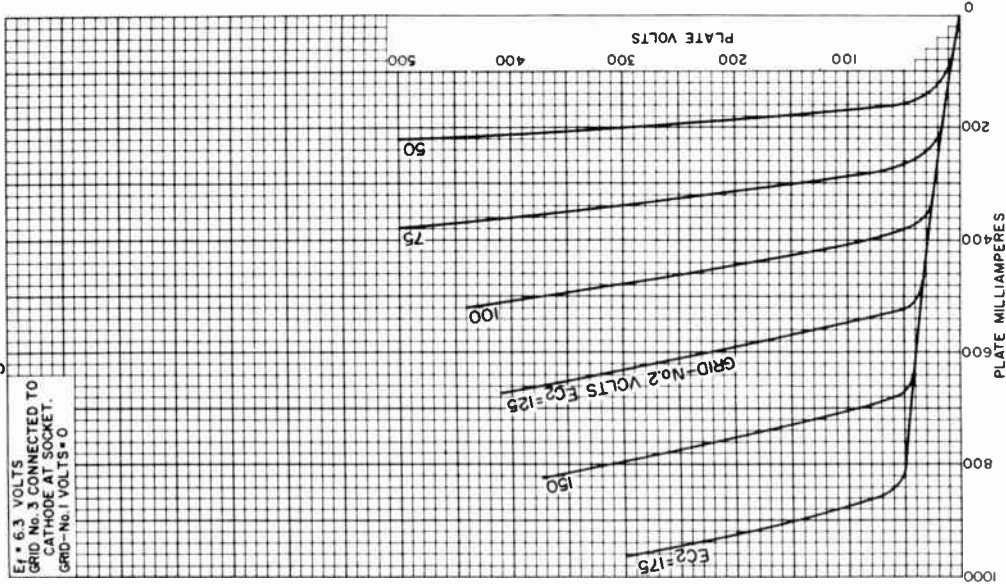
Average Characteristics



6JF6

Average Characteristics

$E_1 = 6.3$ VOLTS
GRID No. 3 CONNECTED TO
CATHODE AT SOCKET.
GRID-No. 1 VOLTS = 0



92CM-11923R2



Beam Power Tube

NOVAR TYPE

SEPARATE GRID-NO.3 BASE-PIN TERMINAL FOR "SNIVETS" CONTROL^a

For Horizontal-Deflection-Amplifier Service
in Low-B+ Black-and-White TV Receivers

Electrical:

Heater Characteristics and Ratings:

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	200 max.	volts
Heater positive with respect to cathode	200 ^b max.	volts

Direct Interelectrode Capacitances (Approx.)^c

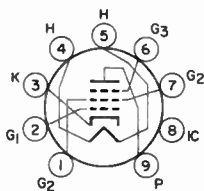
Grid No.1 to plate	0.7	pf
Input: G1 to (K,G3,G2,H)	22.0	pf
Output: P to (K,G3,G2,H)	9.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.130"
Seated Length	2.500" to 2.750"
Diameter	1.438" to 1.562"
Dimensional Outline	See General Section
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-88)

Basing Designation for BOTTOM VIEW 9QU

- Pin 1 - Grid No.2
- Pin 2 - Grid No.1
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.3
- Pin 7 - Grid No.2
- Pin 8 - Do Not Use
- Pin 9 - Plate



Characteristics, Class A₁ Amplifier:

	Triode Connection ^d	Pentode Connection	
Plate Voltage	125	50	130 volts
Grid No.3	Connected to cathode at socket		
Grid-No.2 Voltage	-	125	125 volts
Grid-No.1 Voltage	-20	0	-20 volts
Amplification Factor	4.1	-	-
Plate Resistance (Approx.)	-	-	12000 ohms
Transconductance	-	-	10000 μmhos
Plate Current	-	525 ^e	80 ma
Grid-No.2 Current	-	32 ^e	2.5 ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	-	-	-40 volts



6JG6A

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^f

DC Plate Supply Voltage.	770 max.	volts
Peak-Positive-Pulse Plate Voltage ^g	6500 max.	volts
Peak Negative-Pulse Plate Voltage.	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage ^a	75 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value.	55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage.	330 max.	volts
Cathode Current:		
Peak	950 max.	ma
Average.	275 max.	ma
Grid-No.2 Input.	3.5 max.	watts
Plate Dissipation ^h	17 max.	watts
Bulb Temperature (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

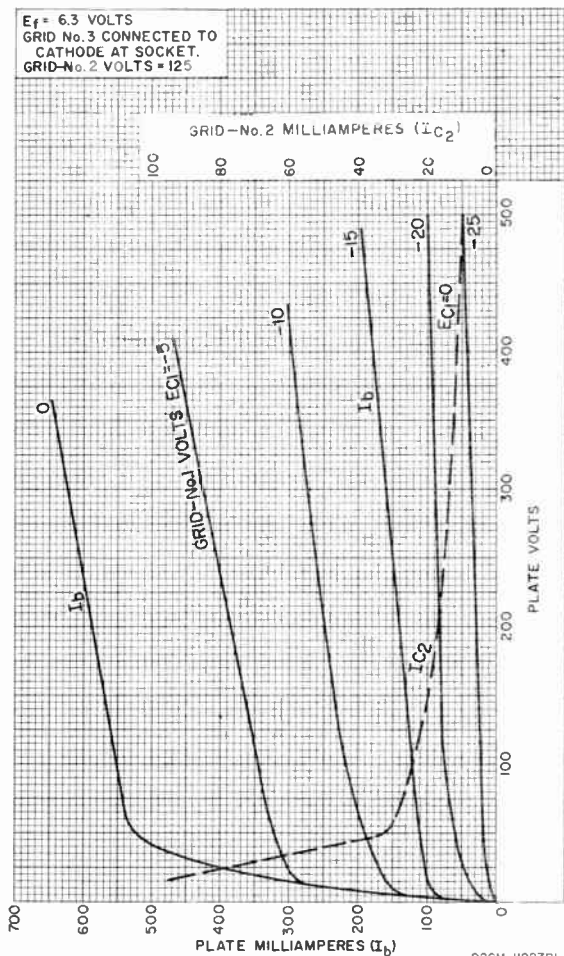
For grid-No.1-resistor-bias

operation. 2.2 max. megohms

- a A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.
- b The dc component must not exceed 100 volts.
- c without external shield.
- d with grid No.2 connected to plate at socket.
- e This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.
- f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- g This rating is applicable where the duration of the voltage pulse does 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.
- h An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



AVERAGE CHARACTERISTICS



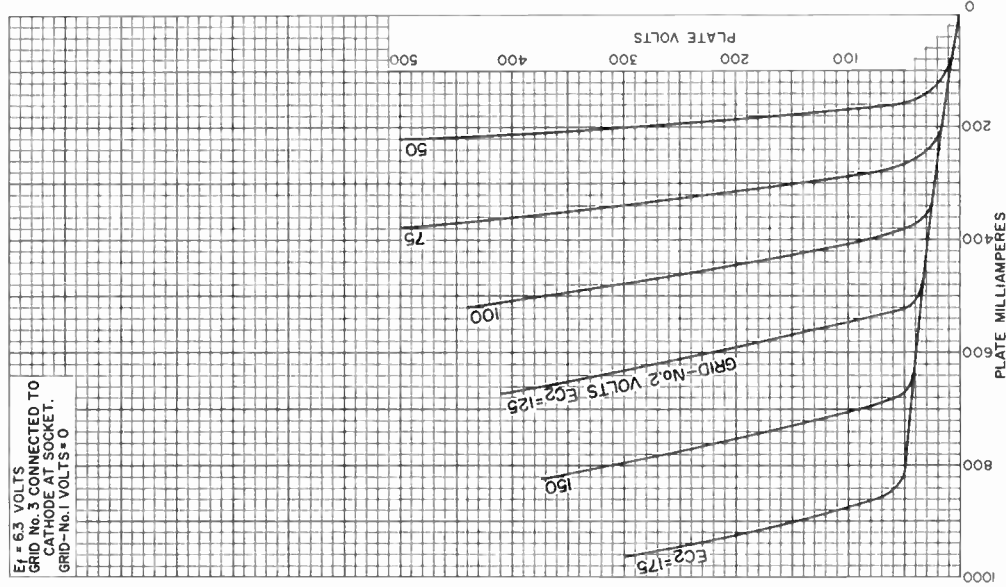
92CM-11927RI



6JG6A

AVERAGE PLATE CHARACTERISTICS

$E_1 = 6.3$ VOLTS
GRID No. 3 CONNECTED TO
CATHODE AT SOCKET.
GRID-No.1 VOLTS = 0



92CM-11923RI

RADIO CORPORATION OF AMERICA
Electronic Components and Devices

Harrison, N. J.



Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Use in Gain-Controlled Picture-IF
Amplifier Stages of Color TV Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater voltage = 6.3	0.700	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200	volts
Heater positive with respect to cathode	200 ^a	volts

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^b	
Grid No.1 to plate	0.025 max.	0.015 max.	pf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7	7	pf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2	3	pf

Characteristics, Class A₁ Amplifier:

Plate Supply Voltage	125	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.26	megohm
Transconductance	8000	μmhos
Plate Current	14	ma
Grid-No.2 Current	3.6	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 50 and cathode resistor (ohms) = 0	-19	volts
Transconductance Range for grid- No.1 volts = -4.5 and cathode resistor of 56 ohms	400 - 900	μmhos

Mechanical:

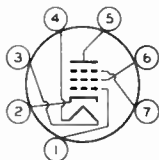
Mounting Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"



6JH6

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

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE 300 max. volts
GRID-No. 3 (SUPPRESSOR-GRID) VOLTAGE 0 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. volts

GRID-No. 2 INPUT:

For grid-No. 2 voltages

up to 150 volts 0.55 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 2.3 max. watts

Maximum Circuit Values:

Grid-No. 1-Circuit Resistance:

For fixed-bias operation. 0.25 max. megohm

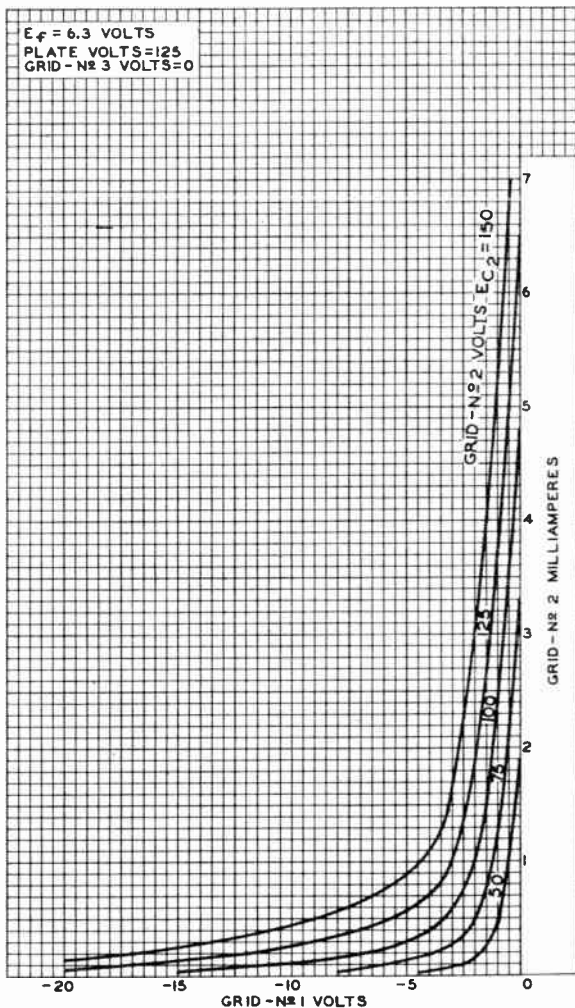
For cathode-bias operation. 1 max. megohm

^a The dc component must not exceed 100 volts.

^b With external shield JEDEC No. 316 connected to cathode.



AVERAGE CHARACTERISTICS



92CM-9485R1

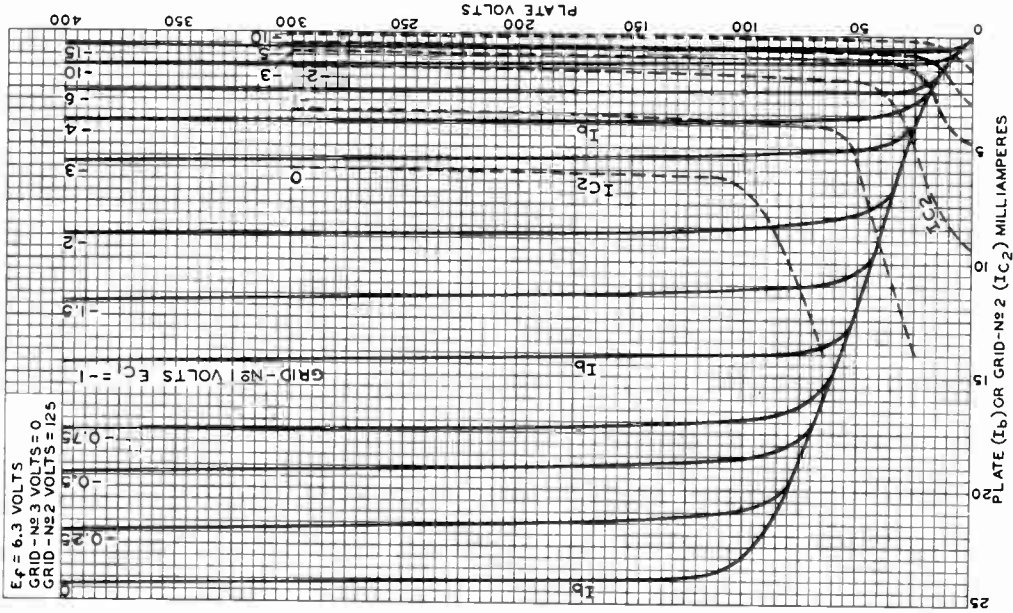


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 Harrison, N. J.

DATA 2
 4-63

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AVERAGE CHARACTERISTICS



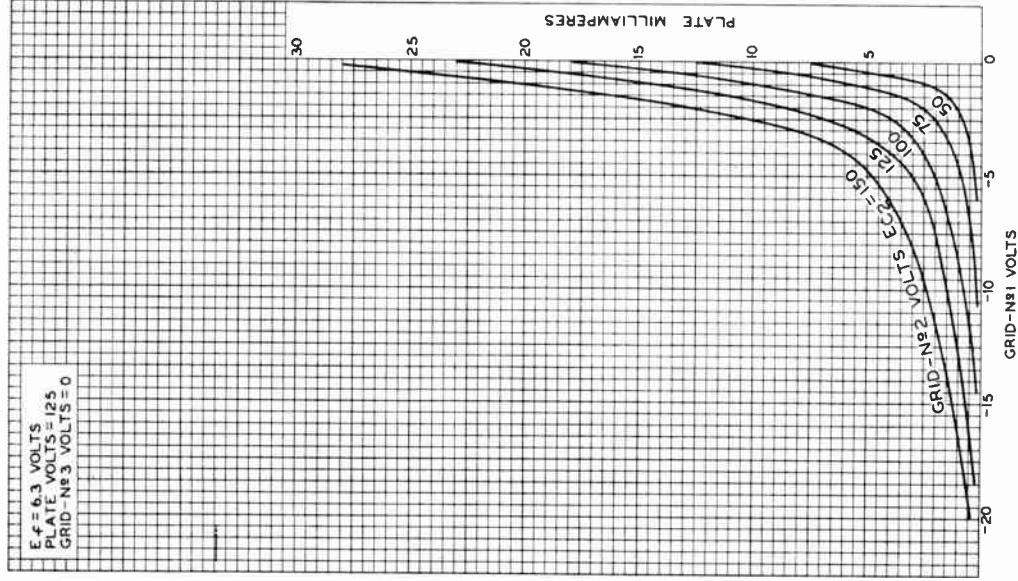
92CM-8508R2

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AVERAGE CHARACTERISTICS



92CM-948IRI

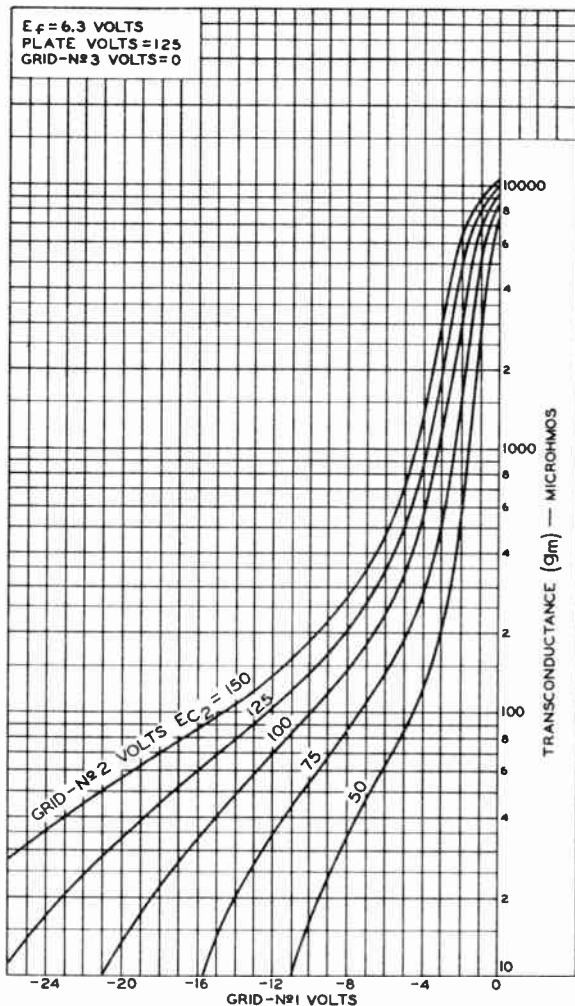


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DATA 3
4-63

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AVERAGE CHARACTERISTICS



92CM-8509R1



Beam-Deflection Tube

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (<i>Design-Maximum Values</i>):		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.300	amp
Direct Interelectrode Capacitances: ^a		
Grid No.1 to all other electrodes except both plates	1.0	μf
Grid No.1 to deflecting electrode No.1	0.04 max.	μf
Grid No.1 to deflecting electrode No.2	0.07 max.	μf
Plate No.1 to all other electrodes	5.0	μf
Plate No.2 to all other electrodes	5.0	μf
Plate No.1 to plate No.2	0.4	μf
Deflecting electrode No.1 to all other electrodes	4.8	μf
Deflecting electrode No.2 to all other electrodes	4.8	μf
Deflecting electrode No.1 to deflecting electrode No.2	0.38	μf

Characteristics, Class A₁ Amplifier:

*With both plates connected together and with both
deflecting electrodes connected to cathode at socket*

Plate-No.1 Supply Voltage	250	volts
Plate-No.2 Supply Voltage	250	volts
Grid-No.3 Voltage	250	volts
Cathode Resistor	220	ohms
Total Plate Current	14	ma
Grid-No.3 Current	1.5	ma
Transconductance	4400	μmhos
Grid-No.1 Voltage (Approx.) for total plate $\mu a = 10$	-13	volts

Mechanical:

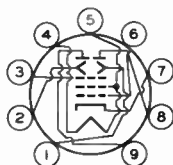
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)



6JH8

Basing Designation for BOTTOM VIEW. 9DP

- Pin 1 - Deflecting Electrode No. 2
- Pin 2 - Deflecting Electrode No. 1
- Pin 3 - Grid No. 3
- Pin 4 - Heater



- Pin 5^b - Heater, Internal Shield, Grid No. 2
- Pin 6 - Grid No. 1
- Pin 7 - Cathode
- Pin 8 - Plate No. 2
- Pin 9 - Plate No. 1

COLOR-TV DEMODULATOR

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE (Each plate)	330 max.	volts
PEAK DEFLECTING-ELECTRODE VOLTAGE (Each electrode):		
Negative value	165 max.	volts
Positive value	165 max.	volts
GRID-No. 3 (ACCELERATING-GRID) VOLTAGE	330 max.	volts
GRID-No. 2 (FOCUSING-GRID) VOLTAGE	<i>Connect to cathode at socket</i>	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value	0 max.	volts
GRID-No. 3 INPUT	1 max.	watt
CATHODE CURRENT	33 max.	ma
PLATE DISSIPATION (Each plate)	3 max.	watts

Typical Operation:

Plate Supply Voltage (Each plate)	250	volts
Grid-No. 3 Voltage	250	volts
Grid No. 2	<i>Connected to cathode at socket</i>	
Cathode Resistor	220	ohms
Maximum Deflecting-Electrode Switching Voltage ^c	20	volts
Deflecting-Electrode Voltage for minimum deflecting-electrode switching voltage ^c	-14	volts
Voltage Difference Between Deflecting Electrodes for plate-No. 1 current and plate-No. 2 current to be equal.	0	volts
Maximum Plate-No. 1 Current for deflecting-electrode-No. 1 volts = -15, and deflecting-electrode-No. 2 volts = +15.	0.7	ma
Maximum Plate-No. 2 Current for deflecting-electrode-No. 1 volts = +15, and deflecting-electrode-No. 2 volts = -15.	0.7	ma



Maximum Deflecting-Electrode-No.1

Current for deflecting-electrode-No.1 volts = +25,		
and deflecting-electrode-No.2		
volts = -25	0.1	ma

Maximum Deflecting-Electrode-No.2

Current for deflecting-electrode-No.1 volts = -25,		
and deflecting-electrode-No.2		
volts = +25	0.1	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.25 max.	megohm

^a without external shield.

^b Pin 5 should be connected directly to cathode at socket.

^c The Deflecting-Electrode Switching Voltage is the total voltage change on either deflecting electrode with an equal and opposite voltage change on the other deflecting electrode required to switch the plate current from one plate to the other plate.

OPERATING CONSIDERATIONS

This type should be located in equipment so that it is not subjected to stray magnetic fields which may affect the intrinsic operating plate-current balance.





Beam Power Tube

with an Integral Diode

9-PIN MINIATURE TYPE

PLATE DISSIPATION = 10 WATTS

DARK HEATER

*For Feedback-Stabilized Vertical Deflection
Amplifier Applications in Black-and-White and Color TV Receivers*

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	1.2	A
Direct Interelectrode Capacitances Without external shield			
Grid-No.1 to plate	e_{g1-p}	0.32	pF
Input: G1 to (ϕ , G3+P _D , G2, H)	c_i	13.0	pF
Output: P to (ϕ , G3+P _D , G2, H)	c_o	6.0	pF

For the following characteristics, see Conditions

Amplification Factor

(Triode Connection) ^a	μ	6.5	
Plate Resistance (Approx.)	r_p	10.5	k Ω
Transconductance	g_m	4200	μ mho
DC Plate Current	I_b	150 ^b	35 mA
DC Grid-No.2 Current	I_{c2}	20 ^b	2.5 mA
Cutoff DC Grid-No.1 Voltage	$E_{c1}(co)$	-37	V

Plate mA = 1

Instantaneous Diode-Plate-to-

Cathode-Voltage Drop for

instantaneous diode-plate current

($r_{b(d)}) = 2$ mA	$e_{b(d)}$	5	V
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Conditions

Heater	E_h	6.3	6.3	V
DC Plate Voltage	E_b	40	140	V
DC Grid-No.3 Voltage	E_{c3}	0	0	V
DC Grid-No.2 Voltage	E_{c2}	120	140	V
DC Grid-No.1 Voltage	E_{c1}	0	-18	V

MECHANICAL CHARACTERISTICS

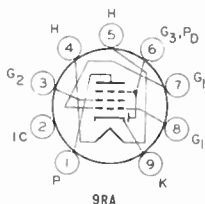
Operating Position	Any
Type of Cathode	Coated Unipotential
Dimensional Outline (JEDEC 6-4)	See General Section
Maximum Overall Length	3.062 in (77.77 mm)
Maximum Seated Length	2.812 in (71.42 mm)
Maximum Diameter	0.875 in (22.22 mm)
Envelope	JEDEC Designation T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC Designation E9-1)
Terminal Diagram	9RA



6JQ6

TERMINAL DIAGRAM (Bottom View)

Pin 1 - Plate
 Pin 2 - Do Not Use
 Pin 3 - Grid No. 2
 Pin 4 - Heater
 Pin 5 - Grid No. 1
 Pin 6 - Diode-Plate
 Pin 7 - Grid No. 1
 Pin 8 - Grid No. 1
 Pin 9 - Cathode



DESIGN-MAXIMUM RATINGS^c

For operation as a Feedback-Stabilized Vertical-Deflection-Amplifier Tube in Black-&-White & Color Television Receivers in a 525-line, 30-frame system

DC Plate Voltage	E_b	425	V
Peak Positive-Pulse Plate Voltage (Absolute-Maximum Value) ^d	e_{bm}	2000	V
DC Grid-No.3 & Diode-Plate Voltage	$E_{c3}, E_b(d)$	+10 -150	V V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	330	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	e_{c1m}	150	V
Heater-Cathode Voltage			
Peak	e_{hkm}	±200	V
Average ^e	$E_{hk(av)}$	100	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9	V
Cathode Current			
Peak	i_{km}	250	mA
Average ^e	$I_{k(av)}$	70	mA
Average Diode-Plate (& Grid-No.3) Current ^e	$I_b(av) (d)$	1	mA
Grid-No.2 Input	P_{g2}	2	W
Plate Dissipation	P_b	10	W
Envelope Temperature (At hottest point on envelope surface)	T_E	240	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	$R_{g1}(ckt)$		
for grid-No.1-resistor-bias operation	-	2.2	MΩ
for cathode-bias operation	-	2.2	MΩ

^a With grid No.3 and diode-plate connected to cathode and with grid No.2 connected to plate at socket.

^b This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.

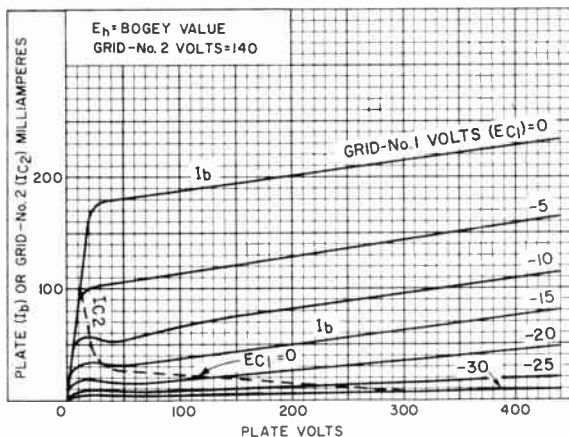
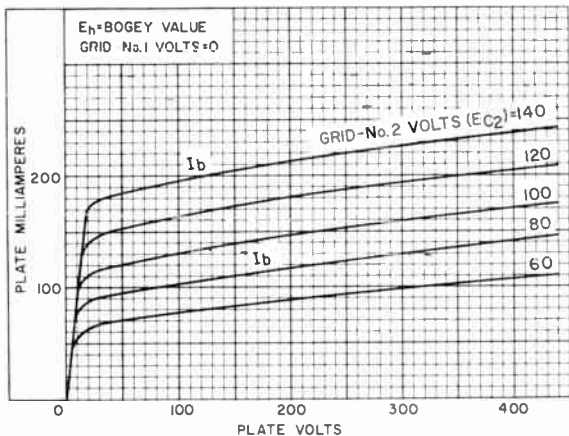
^c Unless otherwise specified.

^d This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 ms.

^e Measured with a dc meter.



Typical Characteristics





Beam Power Tube

Novar Type

For Horizontal-Deflection-Amplifier Service in
Low-B+, Black-and-White TV Receivers

ELECTRICAL CHARACTERISTICS - Bogey Values

Heater Voltage, ac or dc.	E_h	6.3	V
Heater Current	I_h	1.6	A
Direct Interelectrode Capacitances: ^a			
Grid No.1 to plate	c_{g1-p}	0.7	pF
Input: G1 to (K,G3,G2,H)	c_i	22.0	pF
Output: P to (K,G3,G2,H)	c_o	9.0	pF

For the following characteristics, see Conditions below:

Amplification Factor (Triode Connection) ^b	μ	-	-	4.7	-
Plate Resistance (Approx.)	r_p	-	-	18	k Ω
Transconductance	g_m	-	-	7000	μ mho
DC Plate Current	I_b	-	470 ^c	-	45 mA
DC Grid-No.2 Current	I_{c2}	-	32 ^c	-	1.5 mA
Cutoff DC Grid-No.1 Voltage for $I_b = 1$ mA	$E_{c1(co)}$	-75	-	-	-32 V

Conditions:

Heater Voltage	E_h	Bogey value			V
Peak Positive-Pulse Plate Voltage ^d	e_{bm}	6500	-	-	V
DC Plate Voltage	E_b	-	50	125	130 V
Grid No.3	-	Connected to cathode at socket			
DC Grid-No.2 Voltage	E_{c2}	125	125	125	125 V
DC Grid-No.1 Voltage	E_{c1}	-	0	-20	-20 V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	3.130 in (79.50 mm)
Maximum Seated Length	2.750 in (69.85 mm)
Maximum Diameter	1.562 in (39.67 mm)
Envelope	JEDEC Designation T12
Dimensional Outline	JEDEC Designation 12-96
Base ^e	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC Designation E9-88)
Terminal Connections (See TERMINAL DIAGRAM)	JEDEC Designation 9QU
Type of Cathode	Coated Unipotential
Operating Position	Any

6JR6

MAXIMUM RATINGS – Design Maximum Values^f

*For operation as a Horizontal-Deflection-Amplifier
Tube in a 525-line, 30-frame system*

DC Plate Supply Voltage	E_{bb}	770	V
Peak Positive-Pulse Plate Voltage ^g	e_{bm}	6500	V
Peak Negative-Pulse Plate Voltage	$-e_{bm}$	1500	V
DC Grid-No.3 Voltage ^h	E_{c3}	75	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	220	V
DC Grid-No.1 (Control-Grid) Voltage:			
Negative-bias value	$-E_{c1}$	55	V
Peak Negative-Pulse Grid No.1 Voltage	$-e_{clm}$	330	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	±200	V
Average	$E_{hk(av)}$	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	950	V
Average	$I_{k(av)}$	275	V
Grid-No.2 Input	P_{g2}	3.5	V
Plate Dissipation ^k	P_b	17	V
Envelope Temperature (at hottest point on envelope surface)	T_E	240	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance: $R_{g1(ckt)}$		
For grid-No.1-resistor-bias operation	0.47	MΩ
For plate-pulsed operation (horizontal-deflection circuits only)	10	MΩ

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b With Grid No.2 connected to plate at socket.

^c This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.

^d Under pulse-duration condition specified in Footnote 9.

^e Designed to mate with "Novar 9-contact" Socket generally available from your local RCA Distributor.

^f As defined in the current issue of EIA Standard RS-239.

^g This rating is applicable where the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μs.

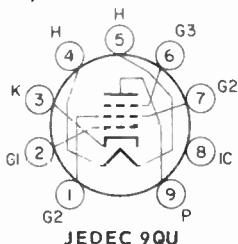
^h In horizontal-deflection-amplifier service, a positive voltage may be applied to grid No.3 to reduce interference

from "snivets" which may occur in both vhf and uhf television receivers. A typical operating value for this voltage is 30 V.

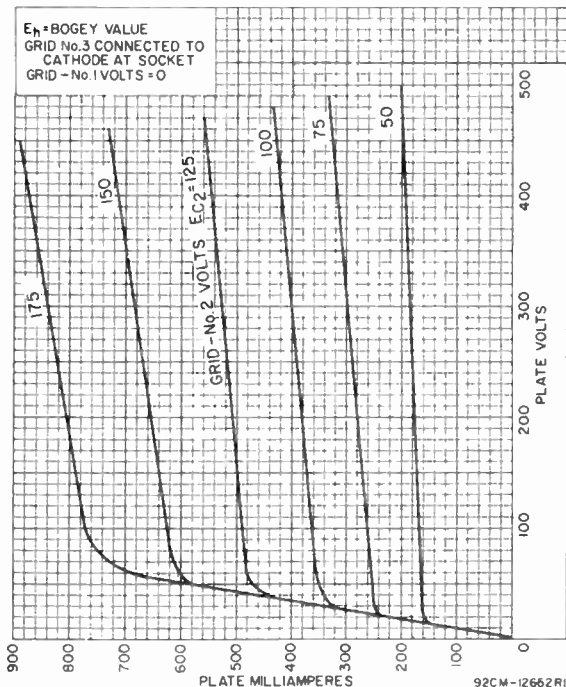
- k An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Grid No.2
- Pin 2 - Grid No.1
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.3
- Pin 7 - Grid No.2
- Pin 8 - Do Not Use
- Pin 9 - Plate

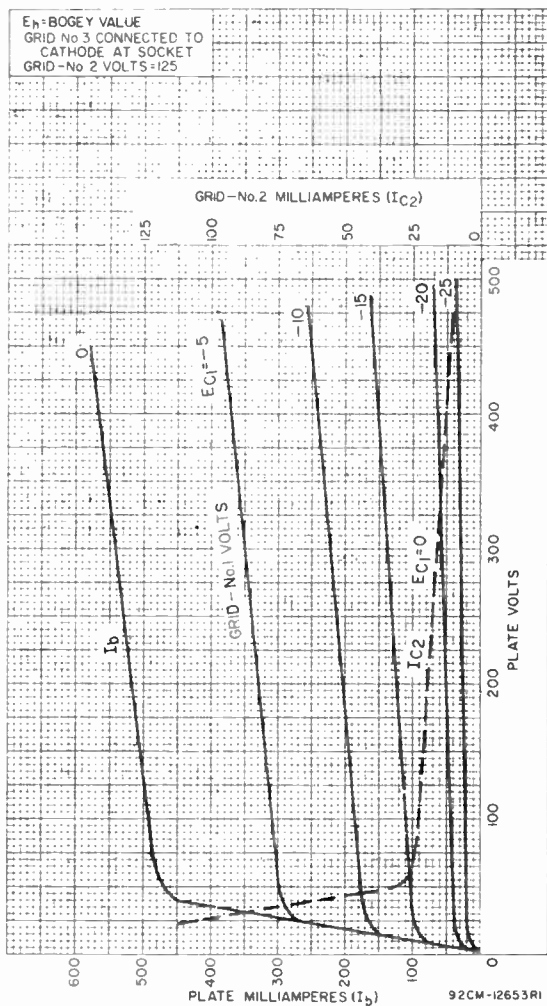


TYPICAL PLATE CHARACTERISTICS



6JR6

TYPICAL CHARACTERISTICS



Beam Power Tube

NOVAR TYPE

SEPARATE GRID-No. 3 BASE-PIN TERMINAL FOR "SNIVETS" CONTROL^a

For Horizontal-Deflection-Amplifier
Service in Black-and-White TV Receivers

Electrical:

Heater Ratings and Characteristics:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.20	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 ^b max.	volts

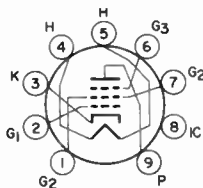
Direct Interelectrode Capacitances (Approx.):^c

Grid No. 1 to plate	0.26	pf
Input: G1 to (K, G3, G2, H)	15.0	pf
Output: P to (K, G3, G2, H)	6.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.880"
Seated Length	2.250" to 2.500"
Diameter	1.438" to 1.562"
Dimensional Outline	See General Section
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-88)
Basing Designation for BOTTOM VIEW	9QU

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



Pin 5 - Heater
Pin 6 - Grid No. 3
Pin 7 - Grid No. 2
Pin 8 - Do Not Use
Pin 9 - Plate

Characteristics, Class A₁ Amplifier:

	Triode Connection ^d	Pentode Connection	
Plate Voltage	150	60	250 volts
Grid No. 3	-	Connected to Cathode at socket	
Grid-No. 2 Voltage	150	150	150 volts
Grid-No. 1 Voltage	-22.5	0	-22.5 volts
Amplification Factor	4.4	-	-
Plate Resistance (Approx.)	-	-	15000 ohms
Transconductance	-	-	7100 μmhos



6JT6A

	Triode Connection ^d	Pentode Connection	
Plate Current.	-	390 ^e 70	ma
Grid-No.2 Current.	-	32 ^e 2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	-	-	-42 volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^f

DC Plate Supply Voltage.	770 max.	volts
Peak Positive-Pulse Plate Voltage ^g	6500 max.	volts
Peak Negative-Pulse Plate Voltage.	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage ^a	70 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value.	55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage.	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average.	175 max.	ma
Grid-No.2 Input.	3.5 max.	watts
Plate Dissipation ^h	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

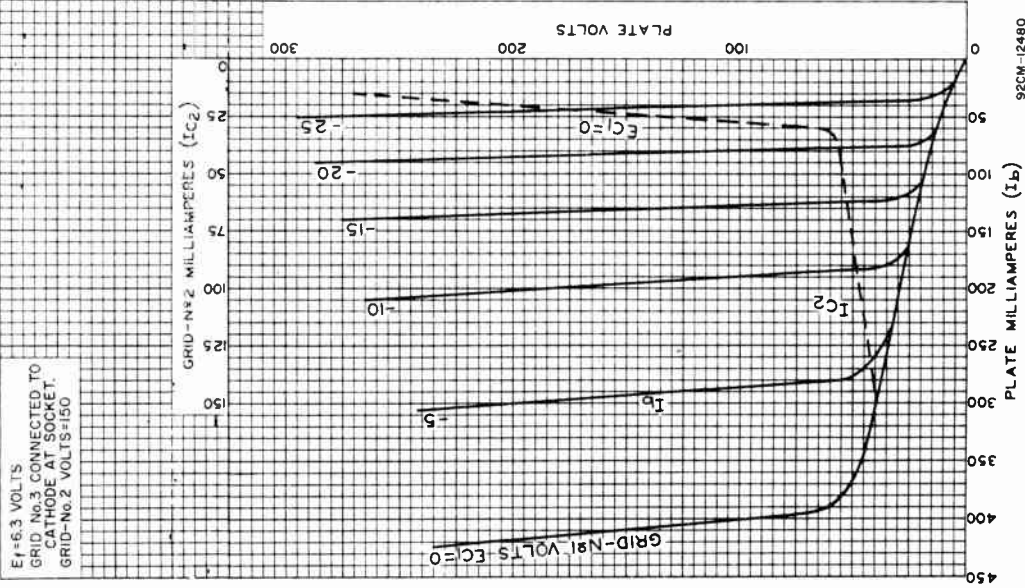
For grid-resistor-bias operation 1 max. megohm

- ^a A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.
- ^b The dc component must not exceed 100 volts.
- ^c without external shield.
- ^d With grid No.2 connected to plate at socket.
- ^e This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ^f As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- ^g This rating is applicable where the duration of the voltage pulse does 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.
- ^h An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



6JT6A

AVERAGE CHARACTERISTICS





Beam Power Tube

NOVAR TYPE

For Horizontal-Deflection-Amplifier Service
in Low-B, Black-and-White TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage (AC or DC)	E _h	6.3	V
Heater Current	I _h	1.600	A
Direct Interelectrode Capacitances Without external shields:			
Grid-No.3 to plate	C _{g1-p}	1.2	pF
Input: G1 to (K, G, G ₂ , G ₃)	C _i	22	pF
Output: F to (K, G, G ₂ , G ₃ , H)	C _o	9.0	pF

For the following characteristics, see Conditions

Amplification Factor	μ	-	-	4.7	-
Plate Resistance (Approx.)	r _p	-	-	18	k Ω
Transconductance	g _m	-	-	7000	μ mhos
DC Plate Current	I _b	-	470 ^b	-	45 mA
DC Grid-No.2 Current	I _{c2}	-	32 ^b	-	1.5 mA
Cutoff DC Grid-No.1 Voltage	E _{c1(c0)}	-75	-	-	-32 V

Plate μ A = 1

Conditions

Heater Voltage	E _h	Bogey value				V
Peak Positive-Pulse Plate Voltage ^c	e _{bm}	6500	-	-	-	V
DC Plate Voltage	E _b	-	50	125	130	V
Grid No.3	Connected to cathode at socket					
DC Grid-No.2 Voltage	E _{c2}	125	125	125	125	V
DC Grid-No.1 Voltage	E _{c1}	-	0	-20	-20	V

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.550 in
Maximum Seated Length	3.170 in
Maximum Diameter	1.562 in
Dimensional Outline	See General Section
Envelope	JEDEC T12
Top Cap	Skirted Miniature (JEDEC C1-2 or C1-3)
Bases (alternates)	

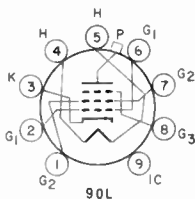
Large-Button (over 9-pin) with pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Large-Button (over 9-pin) with pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100



TERMINAL DIAGRAM (Bottom View)

- Pin 1—Grid No. 2
- Pin 2—Grid No. 1
- Pin 3—Cathode
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Grid No. 1
- Pin 7—Grid No. 2
- Pin 8—Grid No. 3
- Pin 9—Do not use
- Top Cap—Flt.



DESIGN-MAXIMUM RATINGS

For operation as a Horizontal-Deflection-Amplifier
Tube in a 525-line, 30-frame system

DC Plate Supply Voltage	Ebb	770	V
Peak Positive-Pulse Plate Voltage ^d . .	ebm	6500	V
Peak Negative-Pulse Plate Voltage . .	-ebm	1500	V
DC Grid-No.3 Voltage ^e	Ec3	75	V
DC Grid-No.2 (Screen-Grid) Voltage. .	Ec2	220	V
DC Grid-No.1 (Control-Grid) Voltage .	-Ec1	55	V
<i>Required bias value</i>			
Peak Negative-Pulse Grid-No.1 Voltage	-ec1m	330	V
Heater-Cathode Voltage			
Peak	ehkm	-200	V
Average	Ehk(av)	100	V
Heater Voltage (AC or DC)	Eh	5.7 to 6.9	V
Cathode Current			
Peak	ikm	950	mA
Average	Ik(av)	275	mA
Grid-No.2 Input	Pg2	3.5	W
Plate Dissipation ^f	Pb	17	W
Envelope Temperature.	TE	240	°C
<i>At hottest point on envelope surface</i>			

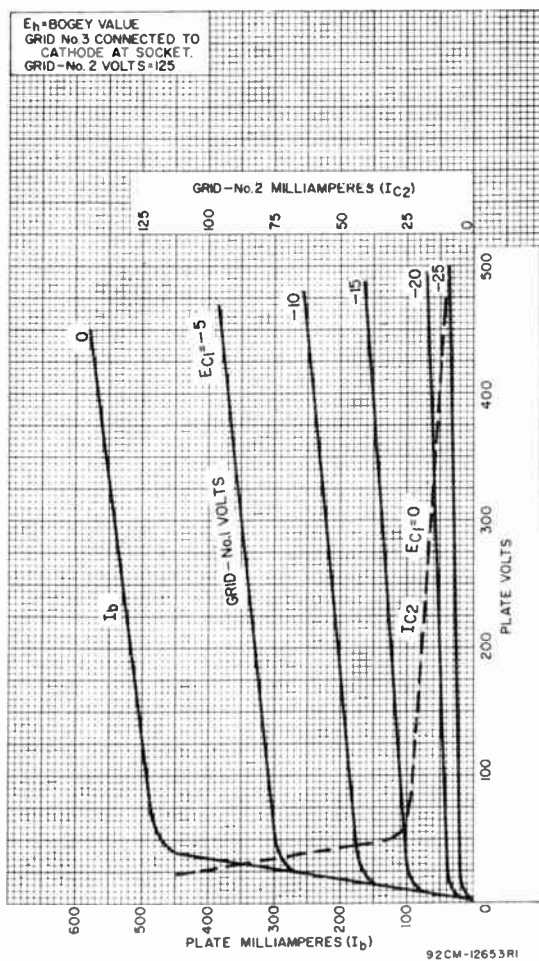
MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	Rg1(ckt)		
For grid-No.1-resistor-coupled operation	-	0.47	MΩ
For plate-puller operation Horizontal-deflection circuits only	-	10	MΩ

- ^a With grid No.2 connected to plate at socket.
- ^b This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- ^c Under pulse-duration condition specified in Footnote d.
- ^d This rating is applicable where the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μs.
- ^e In horizontal-deflection-amplifier service, a positive voltage may be applied to grid No.1 to reduce interference from "snitsets" which may occur in both vhf and uhf television receivers. A typical operating value for this voltage is 30 V.
- ^f An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

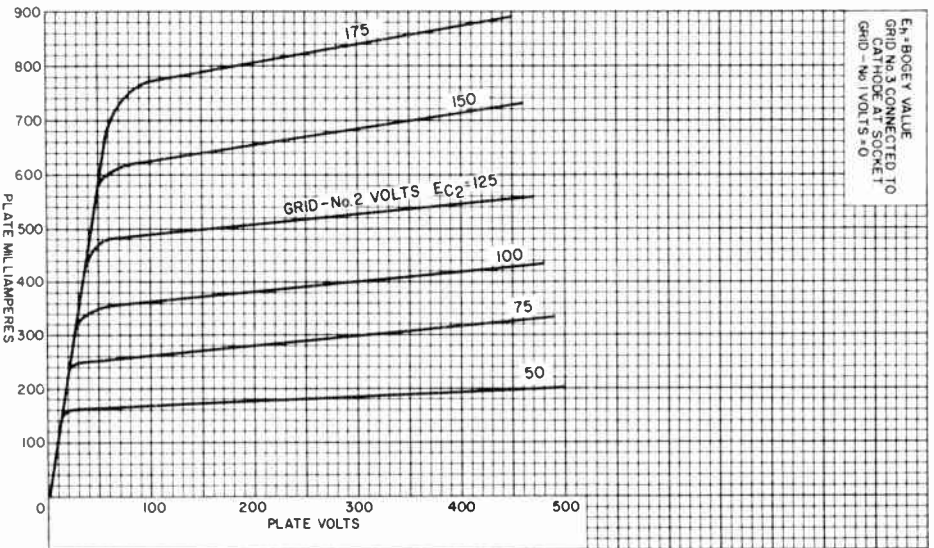


Typical Characteristics



6J06

Typical Plate Characteristics



DATA 7

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.



6JU8A

Quadruple Diode

9-PIN MINIATURE TYPE

For Phase-Detector and Noise-Immune Color-Killer Circuits in Color-Television Receivers, and for FM-Stereo-Multiplex Equipment

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volt-750 3	0.600	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

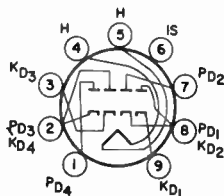
Direct Interelectrode Capacitances (Approx.):^a

P _{D1} +K _{D2} to K _{D1}	1.8	pf
P _{D1} +K _{D2} to P _{D2}	2.2	pf
P _{D2} to (IS,H)	0.62	pf
P _{D3} +K _{D4} to K _{D3}	1.9	pf
P _{D3} +K _{D4} to P _{D4}	2.2	pf
P _{D4} to (IS,H)	0.94	pf
K _{D1} to (IS,H)	1.8	pf
K _{D2} to (IS,H)	1.9	pf

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 (JFDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9PQ

- Pin 1 - Plate of Unit No.4
- Pin 2 - Plate of Unit No.3,
Cathode of Unit No.4
- Pin 3 - Cathode of Unit No.3
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Internal Shield
- Pin 7 - Plate of Unit No.2
- Pin 8 - Plate of Unit No.1,
Cathode of Unit No.2
- Pin 9 - Cathode of Unit No.1



6JU8A

Maximum Ratings, Design-Maximum Values:

Values are for Each Unit

Peak Inverse Plate Voltage.	300 max.	volts
Peak Plate Current.	54 max.	ma
DC Output Current	9 max.	ma

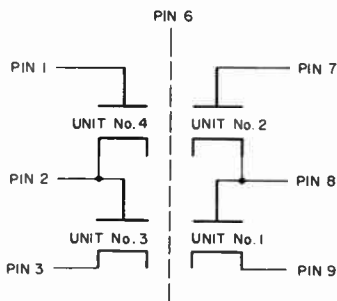
Characteristics, Instantaneous Value:

Values are for Each Unit

Plate Current for plate volts = 10	60	ma
--	----	----

^a without external shield.

ARRANGEMENT OF DIODE UNITS



92CS-11532R1



High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Sound-IF, Keyed-AGC, Sync-Separator, Sync-Amplifier,
Noise-Suppression Circuits, and Video Amplifier Service

GENERAL DATA

Electrical:

Heater Characteristics and Ratings.

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	volts
Current	0.600 ± 0.040	0.600 ^b	amp
Warm-up time (Average)	11	-	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode		200 max.	volts
Heater positive with respect to cathode		200 ^c max.	volts

Direct Interelectrode Capacitances:^d

Triode Unit:

Grid to plate	2.2	pf
Grid to cathode and heater	3.0	pf
Plate to cathode and heater	2.0	pf

Pentode Unit:

Grid No.1 to plate	0.08 max.	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2 and heater	8.0	pf
Pentode plate to pentode cathode & grid No.3 & internal shield, grid No.2 and heater	3.2	pf
Pentode grid No.1 to triode plate	0.012 max.	pf
Pentode plate to triode plate	0.24 max.	pf

Characteristics, Class A₁ Amplifier:

Triode Unit

Plate Voltage	200	volts
Grid-No.1 Voltage	-2	volts
Amplification Factor	70	
Plate Resistance (Approx.)	17500	ohms
Transconductance	4000	μmhos
Plate Current	4	ma



6JV8

Triode Unit

Grid-No.1 Voltage (Approx.)
for plate $\mu a = 20$ -5 volts

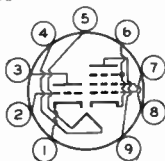
Pentode Unit

Plate Voltage	40	60	125	200	volts
Grid-No.2 Voltage	125	200	125	200	volts
Grid-No.1 Voltage	0	0	-1	-2.9	volts
Plate Resistance (Approx.) -	-	-	100000	150000	ohms
Transconductance.	-	-	11500	10700	μ mhos
Plate Current	28 ^e	51 ^e	22	22	ma
Grid-No.2 Current	9 ^e	14 ^e	4	4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 20$	-	-	-5.5	-9	volts

Mechanical:

Operating Position. Any
 Type of Cathodes. Coated Unipotential
 Maximum Overall Length. 2-5/8"
 Maximum Seated Length 2-3/8"
 Length from Base Seat to Bulb Top (Excluding tip) . 2" \pm 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. 9DX

Pin 1 -Triode Cathode
 Pin 2 -Triode Grid
 Pin 3 -Triode Plate
 Pin 4 -Heater
 Pin 5 -Heater
 Pin 6 -Pentode
 Cathode,
 Grid No.3,
 Internal
 Shield



Pin 7 -Pentode
 Grid No.1
 Pin 8 -Pentode
 Grid No.2
 Pin 9 -Pentode
 Plate

AMPLIFIER -Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-NO.2 (SCREEN-GRID) VOLTAGE	-	330 max.	volts
GRID-NO.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50 max.	50 max.	volts
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1.1 max.	4 max.	watts
GRID-NO.2 INPUT	-	1.7 max.	watts



Maximum Circuit Values:

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

a At heater amperes = 0.600.

b At heater volts = 6.3.

c The dc component must not exceed 100 volts.

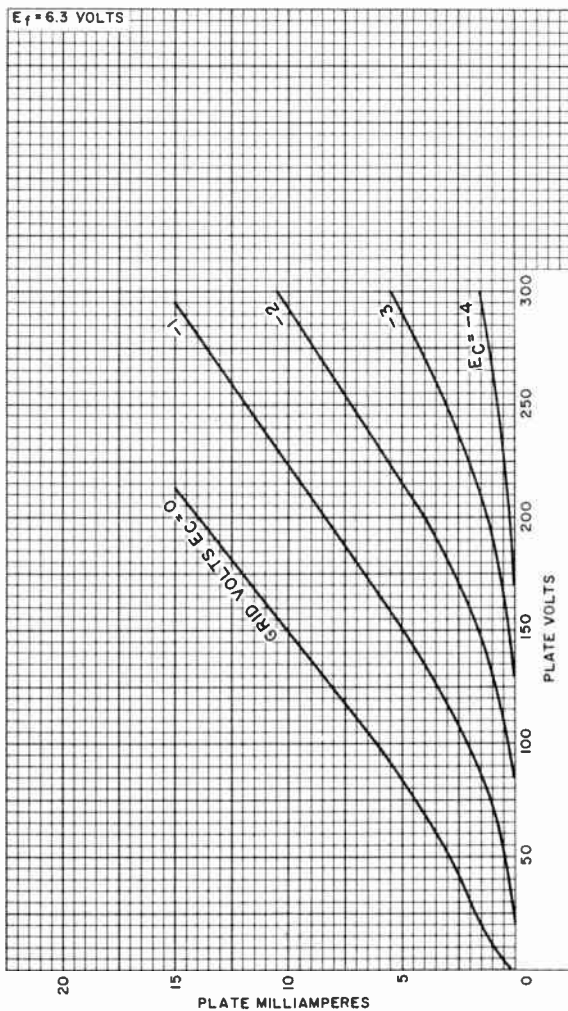
d without external shield.

e This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.



6JV8

AVERAGE PLATE CHARACTERISTICS Triode Unit

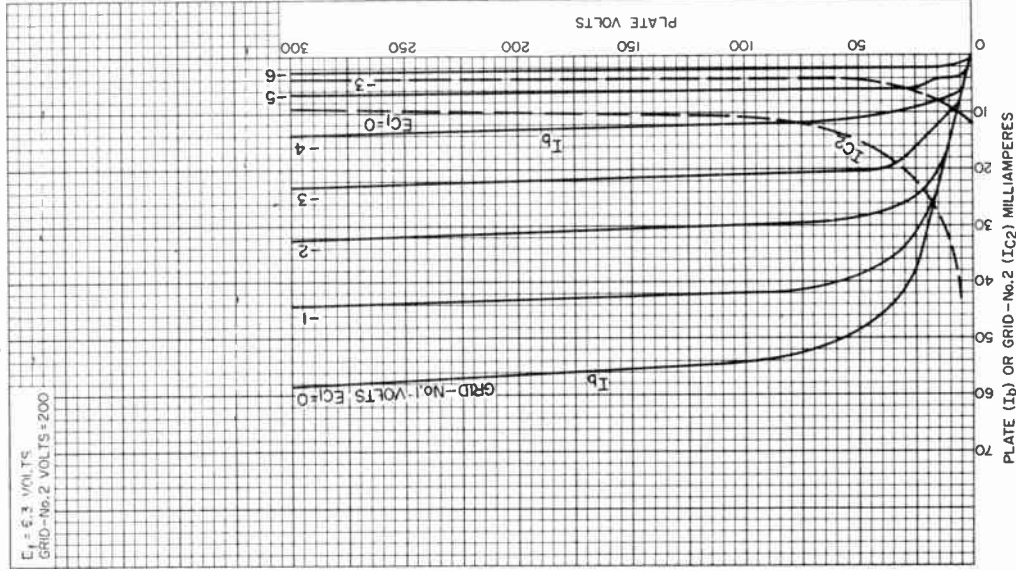


92CM-11960



6JV8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-11961

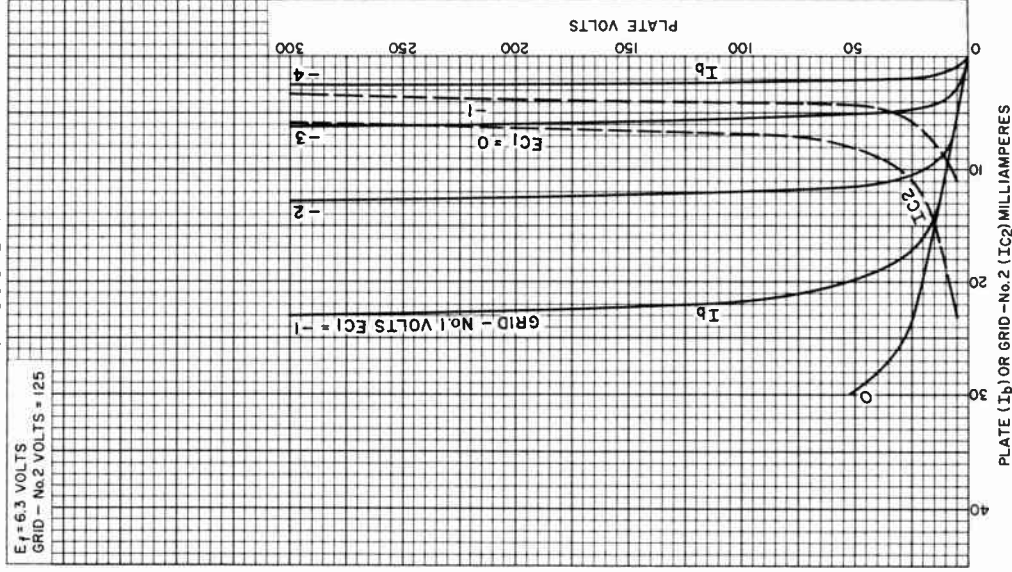


RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 3
6-63

6JV8

AVERAGE CHARACTERISTICS Pentode Unit



92CM - 11962



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

Medium-Mu Triode— Beam Power Tube

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp

Peak heater-cathode voltage (Each unit):

Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 ^a	max. volts

Direct Interelectrode Capacitances (Approx.):^b

Triode Unit:

G _T to P _T	3.6	pf
Input: G _T to (K _T , H)	2.2	pf
Output: P _T to (K _T , H)	0.7	pf

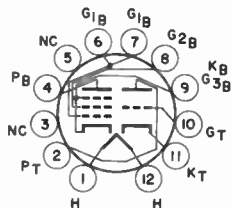
Beam Power Unit:

G _{1B} to P _B	0.34	pf
Input: G _{1B} to (K _B +G _{3B} , G _{2B} , H)	11.0	pf
Output: P _B to (K _B +G _{3B} , G _{2B} , H)	7.0	pf

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See <i>General Section</i>
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
Basing Designation for BOTTOM VIEW	12DZ

- Pin 1—Heater
- Pin 2—Triode Plate
- Pin 3—No Internal Connection
- Pin 4—Beam Power Plate
- Pin 5—Same as Pin 3
- Pin 6—Beam Power Grid No.1
- Pin 7—Beam Power Grid No.1
- Pin 8—Beam Power Grid No.2
- Pin 9—Beam Power Cathode,
Beam Power Grid No.3
- Pin 10—Triode Grid
- Pin 11—Triode Cathode
- Pin 12—Heater



Characteristics, Class A₁ Amplifier:

	Triode Unit	Beam Power Tube		
Plate Voltage	150	45	120	volts
Grid-No.2 Voltage	—	110	110	volts
Grid-No.1 Voltage	-5	C	-8	volts
Amplification Factor	20	—	—	



6JZ8

	Triode Unit	Beam Power Tube		
Plate Resistance (Approx.)	4500	-	1700	ohms
Transconductance	2350	-	1400	μmhos
Plate Current	5.5	122	46	ma
Grid-No.2 Current	-	16.5	3.5	ma
Grid-No.1 Voltage (Approx.)				
for plate $\mu_1=10$	-11	-	-	volts
100	-	-	-25	volts

VERTICAL-DEFLECTION OSCILLATOR

Triode Unit

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC Plate Voltage	250 max.	volts
Peak Negative-Pulse-Grid Voltage	400 max.	volts
Cathode Current:		
Peak	70 max.	ma
Average	20 max.	ma
Plate Dissipation	1 max.	watt

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Beam Power Unit

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^c

DC Plate Voltage	250 max.	volts
Peak Positive-Pulse Plate Voltage	2000 max.	volts
Grid No.2 Voltage	200 max.	volts
Cathode Current:		
Peak	245 max.	ma
Average	70 max.	ma
Plate Dissipation ^d	7 max.	watts
Grid-No.2 Input	1.8 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

^a The dc component must not exceed 100 volts.

^b without external shield.

^c This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

^d In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.



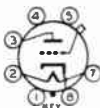


6K5-GT/G

6K5-GT/G

HIGH-MU TRIODE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances (Approx.):		
Grid to Plate	2.0	μf
Grid to Cathode	2.4	μf
Plate to Cathode	3.6	μf
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Cap		Skirted Miniature
Base	Small Wafer Octal 7-Pin, Sleeve	
Pin 1 - Base Sleeve	Pin 5 - No Connection	
Pin 2 - Heater	Pin 7 - Heater	
Pin 3 - Plate	Pin 8 - Cathode	
Pin 4 - No Connection	Cap - Grid	
Mounting Position		Any



BOTTOM VIEW (G-5U)

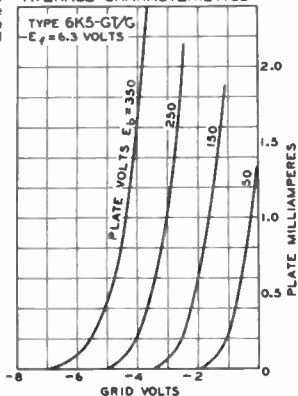
Maximum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage		250 max.	volts
Characteristics - Class A₁ Amplifier:			
Plate	100	250	volts
Grid	-1.5	-3	volts
Amp. Fact.	70	70 approx.	
Plate Res.	78000	50000 approx.	ohms
Transcond.	900	1400	μmhos
Plate Cur.	0.35	1.1	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.

AVERAGE CHARACTERISTICS



← Indicates a change.

92C-6154

Jan. 1, 1943

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

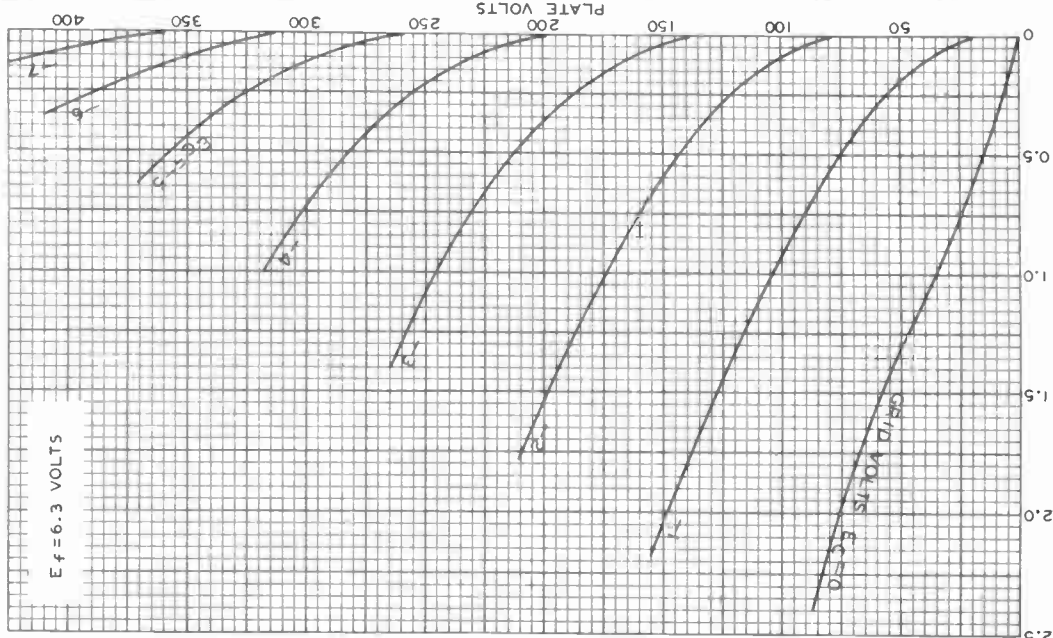
DATA



6K5-GT/G

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS



6K5-GT/G

World Precision

MAY 1, 1940

PLATE MILLIAMPERES
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARTFORD NEW JERSEY

92C-4785



6K6-GT

6K6-GT

POWER PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	. . . . .	ac or dc volts
Current	0.4	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):^o

Grid No.1 to plate.	0.5		μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	5.5		μf
Plate to cathode & grid No.3, grid No.2, and heater	6		μf

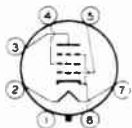
Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Dimensional Outline	See General Section

Bulb. T-9
 base. Intermediate-Shell Octal 7-Pin (JETEC No. E7-7),
 Short Intermediate-Shell Octal 7-Pin
 with External Barriers (JETEC No. E7-59),
 Intermediate-Shell Octal 6-Pin (JETEC No. E6-81),
 or Short Intermediate-Shell Octal 6-Pin
 with External Barriers (JETEC No. E6-84)

Easing Designation for BOTTOM VIEW 7S

- Pin 1 ♦ - No Connection
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode,
Grid No.3

AF POWER AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	315 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
GRID-No.2 INPUT	2.8 max.	watts
PLATE DISSIPATION	8.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 [▲] max.	volts

^o without external shield.

♦ Pin 1 as well as pin 6 is omitted on the 6-Pin bases.

[▲]: See next page.

← Indicates a change.

6K6-GT



6K6-GT

POWER PENTODE

Typical Operation and Characteristics:

Plate Voltage	100	250	315	volts
Grid-No.2 Voltage	100	250	250	volts
Grid-No.1 Voltage	-7	-18	-21	volts
Peak AF Grid-No.1 Voltage . .	7	18	21	volts
Zero-Signal Plate Current . .	9	32	25.5	ma
Max.-Signal Plate Current . .	9.5	33	28	ma
Zero-Signal Grid-No.2 Current	1.6	5.5	4	ma
Max.-Signal Grid-No.2 Current	3	10	9	ma
Plate Resistance (Approx.) . .	104000	90000	110000	ohms
Transconductance	1500	2300	2100	μmhos
Load Resistance	12000	7600	9000	ohms
Total Harmonic Distortion . .	11	11	15	%
Max.-Signal Power Output . .	0.35	3.4	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

PUSH-PULL AF POWER AMPLIFIER - Class A₁

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	315 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
GRID-No.2 INPUT	2.8 max.	watts
PLATE DISSIPATION	8.5 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200▲ max.	volts

Typical Operation:

Values are for 2 tubes

	Fixed Bias	Cathode Bias	
Plate Voltage	285	285	volts
Grid-No.2 Voltage	285	285	volts
Grid-No.1 Voltage	-25.5	-	volts
Cathode Resistor	-	400	ohms
Peak AF Grid-No.1-to- Grid-No.1 Voltage	51	51	volts
Zero-Signal Plate Current . .	55	55	ma
Max.-Signal Plate Current . .	72	51	ma
Zero-Signal Grid-No.2 Current	9	9	ma
Max.-Signal Grid-No.2 Current	17	13	ma

▲: See next page.

→ Indicates a change.



6K6-GT

6K6-GT

POWER PENTODE

	Fixed Bias	Cathode Bias	
Effective Load Resistance (Plate to plate)	12000	12000	ohms
Total Harmonic Distortion	6	4	%
Max.-Signal Power Output.	10.5	9.8	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

AF POWER AMPLIFIER - Class A₁

Triode Connection - Grid No.2 Connected to Plate

Characteristics:

Plate Voltage	250	volts
Grid-No.1 Voltage	-18	volts
Amplification Factor.	6.8	
Plate Resistance (Approx.)	2500	ohms
Transconductance.	2700	μmhos
Plate Current	37.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 0.5 ma	-48	volts

VERTICAL DEFLECTION AMPLIFIER

Triode Connection - Grid No.2 Connected to Plate

Maximum Ratings, Design-Center Values Except as Noted:

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

DC PLATE VOLTAGE.	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) [#]	1200 [■] max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	-250 max.	volts
CATHODE CURRENT:		
Peak	75 max.	ma
Average	25 max.	ma
PLATE DISSIPATION	7 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-No.1-Circuit Resistance:		
For cathode-bias operation.	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

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

This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 percent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

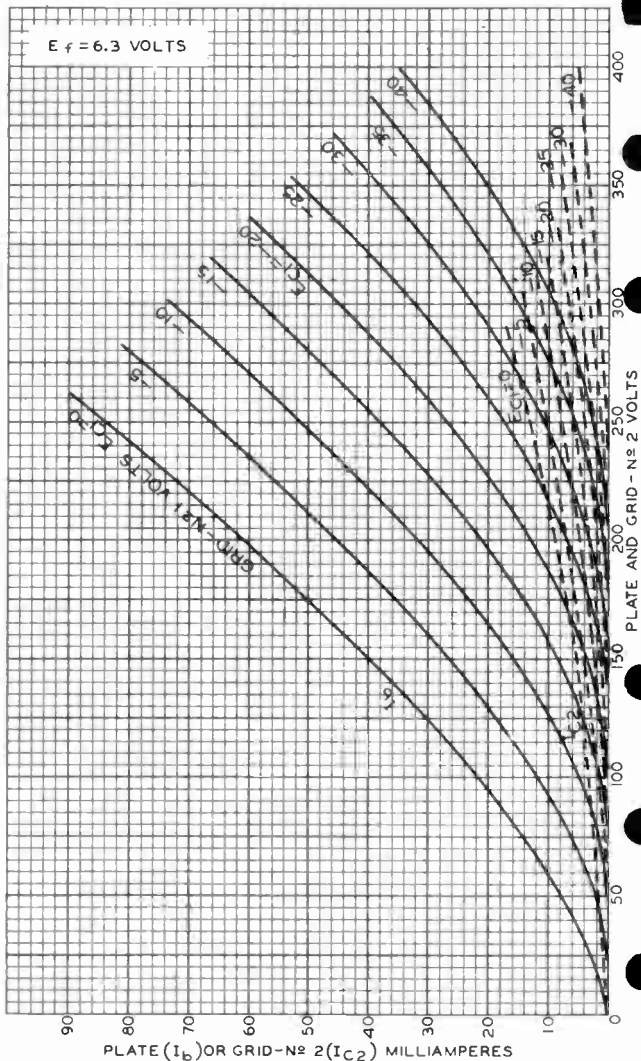
← Indicates a change.

6K6-GT



6K6-GT

AVERAGE CHARACTERISTICS



TUBE DIVISION
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92CM-5209R2

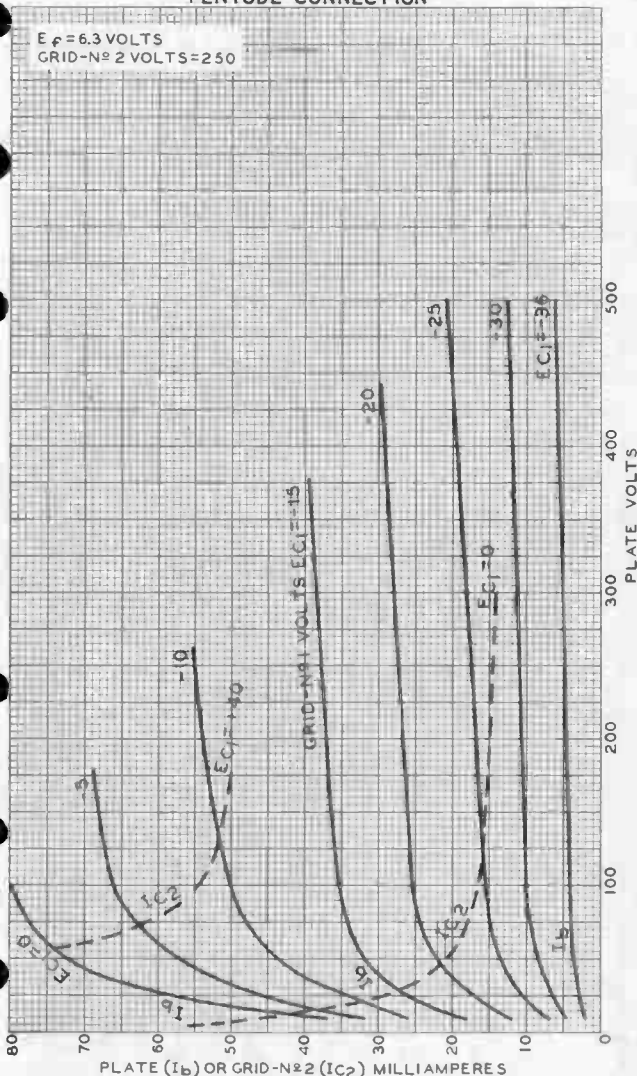


6K6-GT

6K6-GT

AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS
GRID-N^o 2 VOLTS = 250



FEB. 13, 1948

TUBE DEPARTMENT

92CM-4881R2

SAVO CORPORATION OF AMERICA, HARTFORD, CONNECTICUT

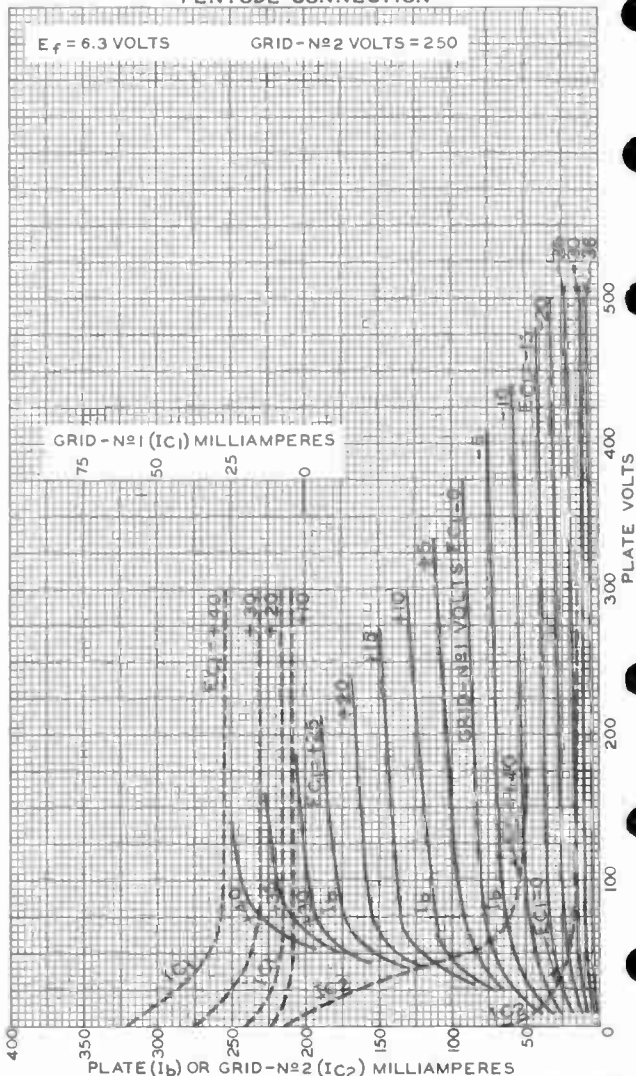
World Radio History

6K6-GT



6K6-GT

AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION



FEB. 13, 1948

TUBE DEPARTMENT

92CM-6311R1

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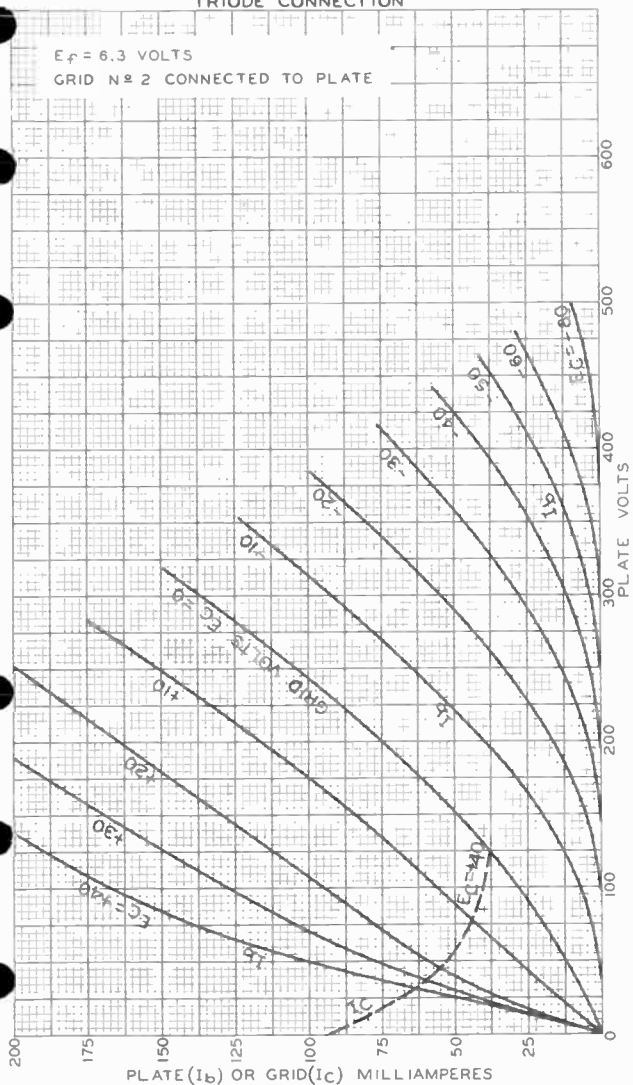
World Radio History



6K6-GT

6K6-GT AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$ VOLTS
GRID #2 CONNECTED TO PLATE



AUG. 18, 1941

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

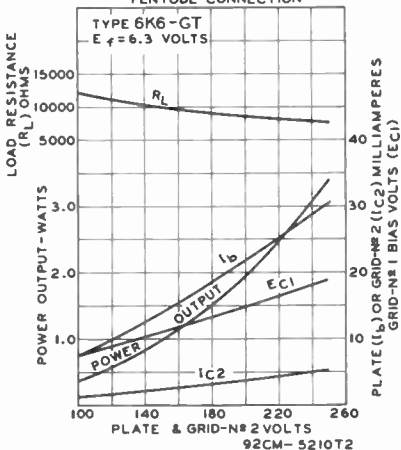
92CM-6313

6K6-GT

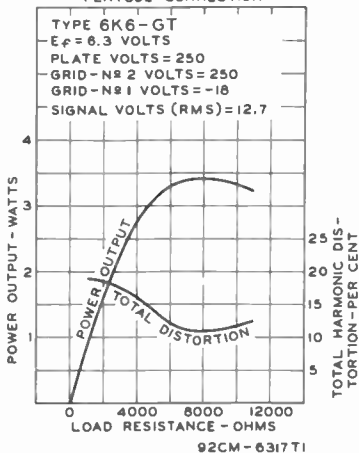


6K6-GT POWER PENTODE

OPERATION CHARACTERISTICS
PENTODE CONNECTION



OPERATION CHARACTERISTICS
PENTODE CONNECTION



OCTOBER 1, 1951

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

CE-5210T2 - 6317T1

Three-Unit Triode

With Medium-Mu Unit and Two High-Mu Units

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	2.5 ^a	2.5	volts
Current	0.600 ± 0.040	0.600 ^b	amp
Warm-up time (Average)	4 ^c	-	sec
Peak heater-cathode voltage (Each unit)	-	-	v
Heater negative with respect to cathode	200 ^d	-	v
Heater positive with respect to cathode	200 ^d	-	v

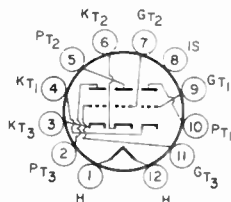
Direct Interelectrode Capacitances (p.f.):^d

	Unit No. 1	Unit No. 2	Unit No. 3
Grid to plate	1.5	1.5	1.5
Input: G to (K, IS, H)	1.5	1.5	1.5
Output: P to (K, IS, H)	1.5	0.7	1.5

Mechanical:

Operating Position	Any
Type of Cathodes	Indirectly Heated
Maximum Overall Length	1.875"
Seated Length	1.250" to 1.500"
Diameter	1.000" to 1.125"
Dimensional Outline (IEEE 4-6)	See General Section
Hull	79
Base	Small-Button Duodecar 12-Pin (JEDEC No. E11-70)
Basino Designation for BOTTOM VIEW	4.81

- Pin 1—Heater
- Pin 2—Plate of Unit No. 4
- Pin 3—Cathode of Unit No. 3
- Pin 4—Cathode of Unit No. 1
- Pin 5—Plate of Unit No. 2
- Pin 6—Cathode of Unit No. 2
- Pin 7—Grid of Unit No. 2
- Pin 8—Internal Shield
- Pin 9—Grid of Unit No. 1
- Pin 10—Plate of Unit No. 1
- Pin 11—Grid of Unit No. 3
- Pin 12—Heater



AMPLIFIER — Class A₁

Unit No. 1	Unit No. 2 or 3
------------	-----------------

Characteristics:

Plate Voltage	250	250	volts
Grid Voltage	-0.1	-2	volts



6K11/6Q11

	Unit No. 1	Unit No. 2 or 3	
Amplification Factor	17	100	
Plate Resistance (Approx.) . . .	7700	62500	ohms
Transconductance	2200	1600	μ mhos
Plate Current	10.5	1.2	ma
Grid Voltage (Approx.) for plate μ a = 10	-24	-	volts
Maximum Ratings, Design-Maximum Values:			
Plate Voltage	330	330	volts
Grid Voltage:			
Negative-bias value	50	50	volts
Positive-bias value	0	0	volts
Cathode Current	20		ma
Plate Dissipation	2.75	0.3	watts

- a At heater amperes = 0.600.
- b At heater volts = 6.3
- c The dc component must not exceed 100 volts.
- d without external shield.



High-Mu Triode—Sharp-Cutoff Pentode

Pentode Unit Has Two Independent Control Grids

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6	volts
Current	0.600 ± 0.040	0.600 ^b	amp
Warm-up time (Average)	11	—	sec

Peak heater-cathode
voltage:

Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^c	max.	volts

Direct Interelectrode Capacitances:^d

Triode Unit:

Grid to plate	2.2	μf
Grid to cathode & internal shield, and heater	2.8	μf
Plate to cathode & internal shield, and heater	2.2	μf

Pentode Unit:

Grid No.1 to plate	0.1	max.	μf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	9.5		μf
Grid No.1 to grid No.3	0.5		μf
Grid No.3 to plate	2.2		μf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	7.0.		μf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage	200	150	volts
Grid-No.3 Supply Voltage	—	0	volts
Grid-No.2 Supply Voltage	—	100	volts
Grid-No.1 Supply Voltage	-2	0	volts
Cathode Resistor	—	180	ohms
Amplification Factor	70	—	
Plate Resistance (Approx.)	17500	100000	ohms
Transconductance, Grid No.1 to Plate	4000	4400	μmhos
Transconductance, Grid No.3 to Plate	—	600	μmhos



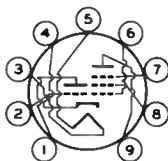
6KA8

Plate Current	4	4	ma
Grid-No.2 Current	-	2.8	ma
Grid-No.1 Supply Voltage (Approx.) for plate $\mu a =$			
10	-5	-	volts
20	-	-4	volts
Grid-No.3 Supply Voltage (Approx.) for plate $\mu a = 20$.	-	-7	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" \pm 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDFC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9PV

- Pin 1 - Triode Plate
- Pin 2 - Triode Grid
- Pin 3 - Cathode, Internal Shield
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Pentode Grid No.1
- Pin 7 - Pentode Grid No.3
- Pin 8 - Pentode Grid No.2
- Pin 9 - Pentode Plate

GATED AGC AMPLIFIER & NOISE INVERTER

Pentode Unit

For operation in a 525-line, 30-frame system⁶

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^f	600 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 (SCREEN-GRID)		
SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE	See <i>Grid-No.2 Input Rating Chart</i>	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 150 volts	1.1 max.	watts



For grid-No.2 voltages
between 150 volts and
300 volts.

See *Grid-No.2 Input Rating Chart*
at front of Receiving Tube Section

PLATE DISSIPATION. 2 max. watts

Maximum Circuit Values:

Grid-No.3-Circuit Resistance 0.68 max. megohm

Grid-No.1-Circuit Resistance:

For fixed-bias operation 0.5 max. megohm

For cathode-bias operation 1 max. megohm

AMPLIFIER — Class A₁

Triode Unit

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. 300 max. volts

GRID VOLTAGE:

Negative-bias value. 50 max. volts

Positive-bias value. 0 max. volts

PLATE DISSIPATION. 1.1 max. watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation 0.25 max. megohm

For cathode-bias operation 1 max. megohm

a At heater amperes = 0.600.

b At heater volts = 6.3.

c The dc component must not exceed 100 volts.

d Without external shield.

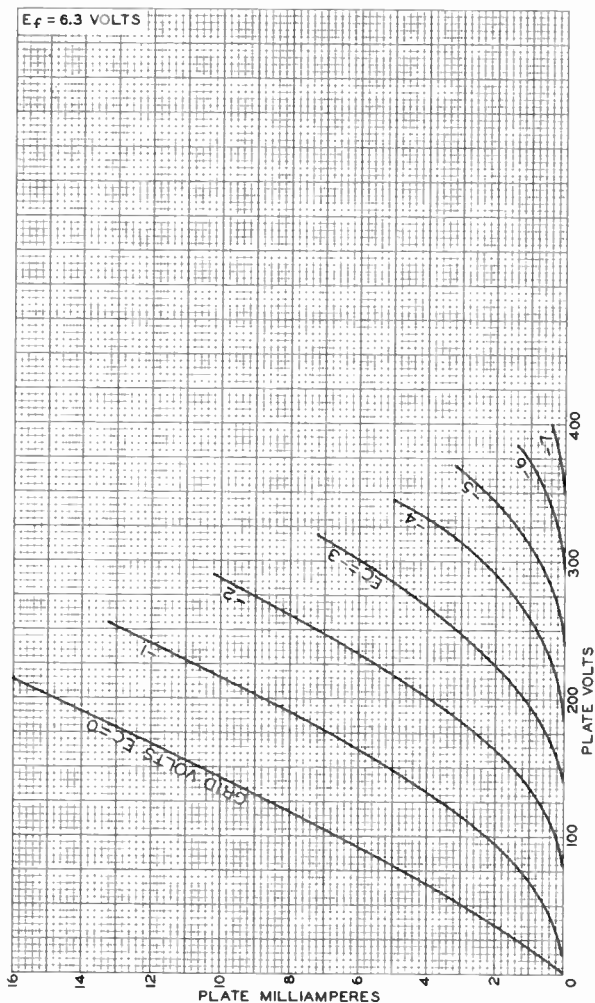
e As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

f This rating is applicable when the duration of the voltage pulse does 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.



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AVERAGE PLATE CHARACTERISTICS Triode Unit

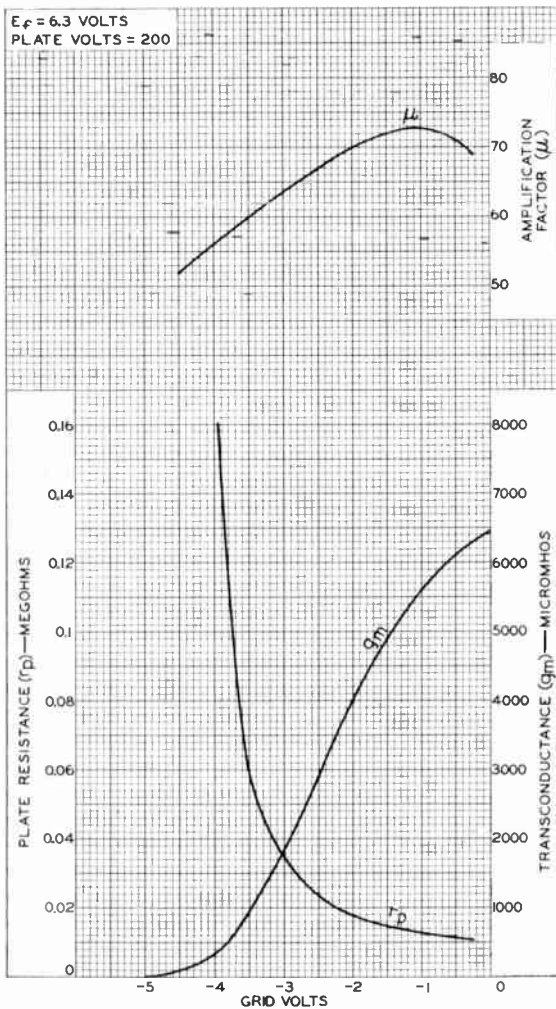


92CM-8644



AVERAGE CHARACTERISTICS

Triode Unit

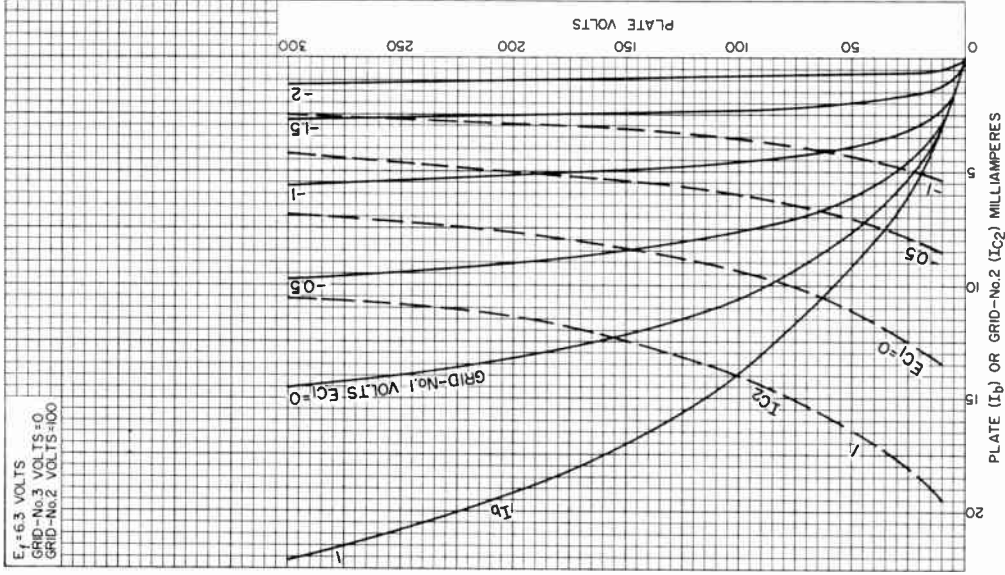


92CM-8647



6KA8

AVERAGE CHARACTERISTICS Pentode Unit



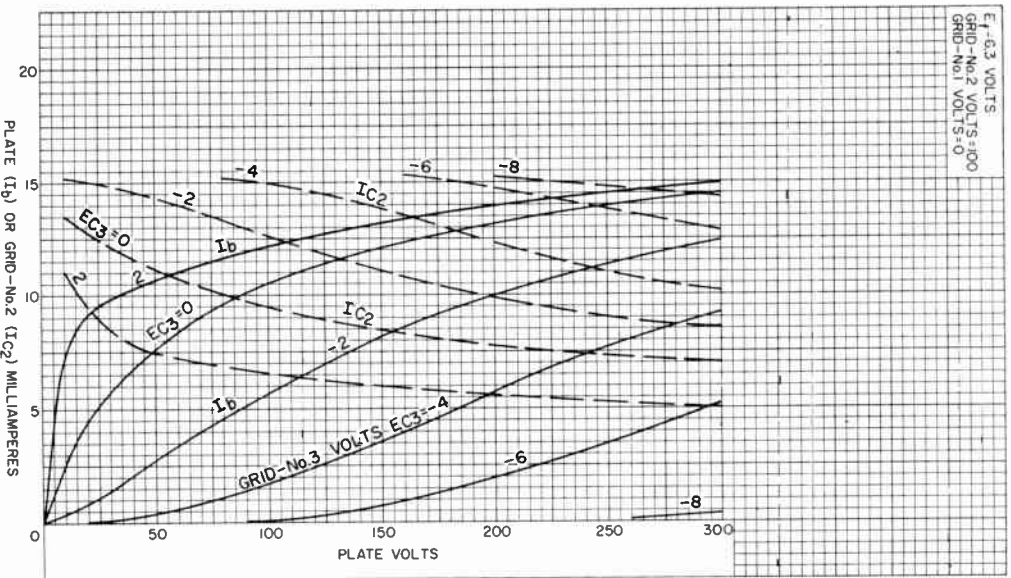
92CM-11594



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Electron Tube Division
Harrison, N. J.

6KA8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-11606

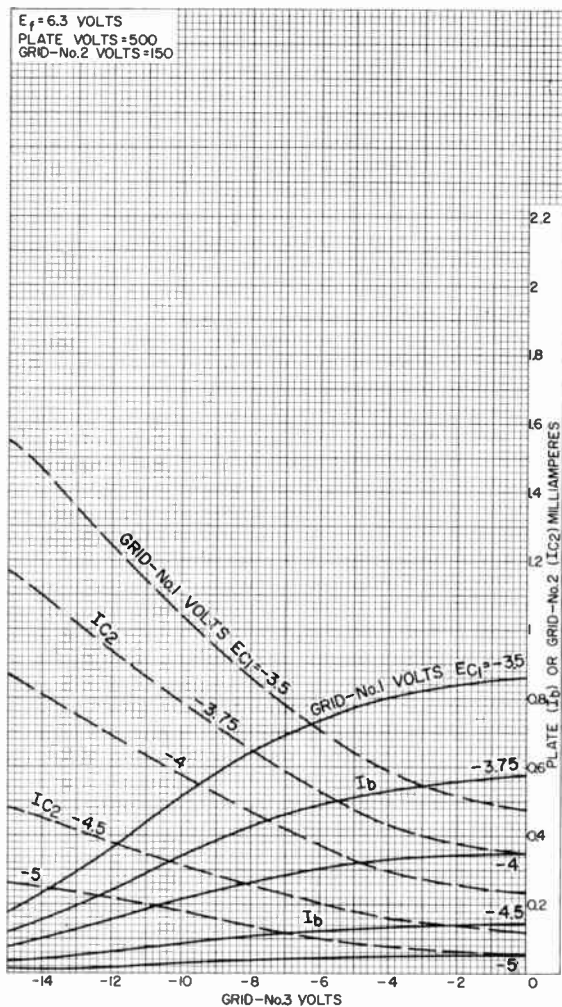


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Electron Tube Division
Harrison, N. J.

DATA 4
5-62

6KA8

AVERAGE CHARACTERISTICS Pentode Unit



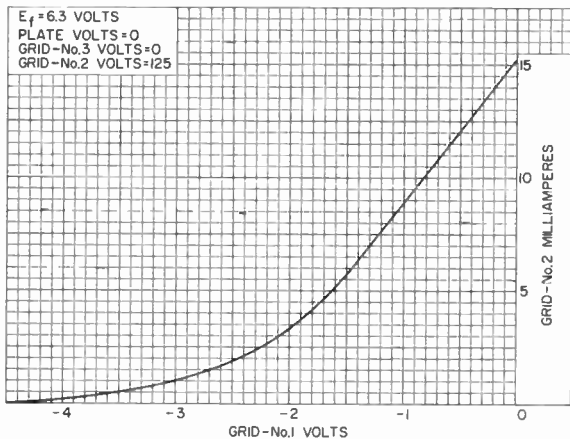
92CM-11600

RADIO CORPORATION OF AMERICA
Electron Tube Division

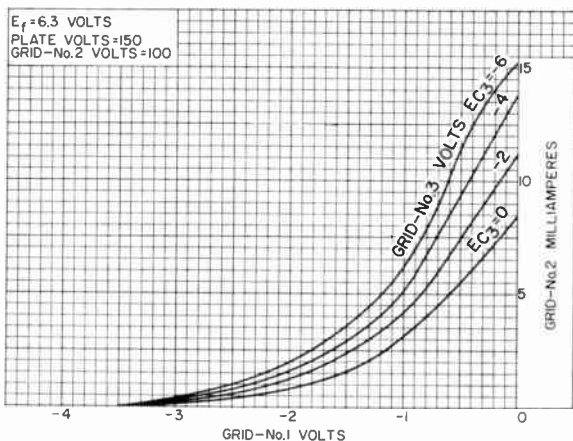
Harrison, N. J.



AVERAGE CHARACTERISTICS Pentode Unit



92CS-11603

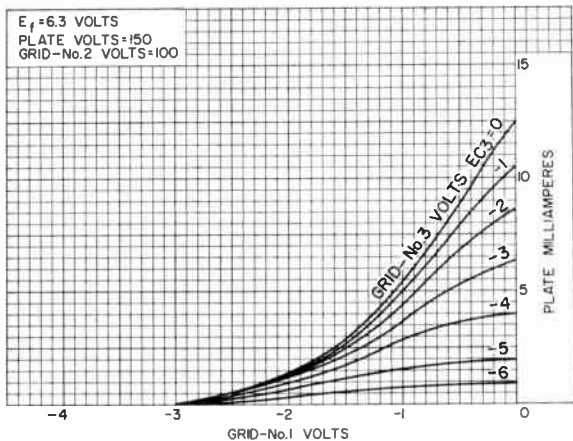


92CS-11596



6KA8

AVERAGE CHARACTERISTICS Pentode Unit



92CS-11614



Beam Power Tube

Duodecar Type

For Low B+ Horizontal-Deflection-Amplifier
Circuits of Color-TV Receivers

ELECTRICAL CHARACTERISTICS - Bogey Values

Heater Voltage, ac or dc.	E_h	6.3	V
Heater Current	I_h	2.85	A
Direct Interelectrode			
Capacitances (approx.): ^a			
Grid No.1 to plate	c_{g1-p}	0.8	pF
Input: G1 to (K,G3,G2,H)	c_i	40	pF
Output: P to (K,G3,G2,H)	c_o	16	pF

For the following characteristics, see Conditions below:

Amplification Factor

(Triode Connection) ^b	μ	-	-	-	4 ^c
Plate Resistance (approx.)	r_p	-	-	-	6000 Ω
Transconductance	g_m	-	-	-	14000 μmho
DC Plate Current	I_b	- 1100 ^d	780 ^d	100	mA
DC Grid-No.2 Current	I_{c2}	- 110 ^d	44 ^d	2	mA
Cutoff DC Grid-No.1 Voltage for $I_b = 1 \text{ mA}$	$E_{c1(\text{co})}$	-125	-	-	-40 V

Conditions:

Heater Voltage	E_h	← 6.3 →			V
Peak Positive-Pulse					
Plate Voltage ^e	e_{bm}	5000	-	-	- V
DC Plate Voltage	E_b	- 45	60	150	V
DC Grid-No.3 Voltage	Connected to cathode at socket				
DC Grid-No.2 Voltage	E_{c2}	110	160	110	110 V
DC Grid-No.1 Voltage	E_{c1}	- 0	0	-22.5	V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	4.625 in (117.47 mm)
Maximum Seated Length	4.250 in (107.95 mm)
Maximum Diameter	1.563 in (39.7 mm)
Dimensional Outline	JEDEC 12-118
Envelope	JEDEC T12
Top Cap ^f	Small (JEDEC C1-1)
Base	Large-Button Duodecar 12-Pin (JEDEC E12-74)

6KD6

Terminal Diagram JEDEC 12GW
 Type of Cathode Coated Unipotential
 Operating Position Any

MAXIMUM RATINGS – Design-Maximum Values^g

*For operation as a Horizontal-Deflection-Amplifier Tube
 in a 525-line, 30-frame system*

DC Plate Supply Voltage	E_{bb}	990	V
Peak Positive-Pulse Plate Voltage ^h	e_{bm}	7000 ^k	V
DC Grid-No.3 Voltage ^m	E_{c3}	20	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	200	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	e_{c1m}	250	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	±200	V
Average ⁿ	E_{hk}	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	1400	mA
Average ⁿ	$I_{k(av)}$	400	mA
Grid-No.2 Input	P_{g2}	5.0	W
Plate Dissipation ^p	P_b	33	W
Envelope Temperature	T_E	225 ^q	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	R_{g1}	2.2	MΩ
Grid-No.3-Circuit Resistance	R_{g3}	0.01	MΩ

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.

^c Conditions: $E_b = E_{c2} = 150$ V, $E_{c1} = -22.5$ V.

^d This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.

^e Under pulse-duration condition specified in Footnote h.

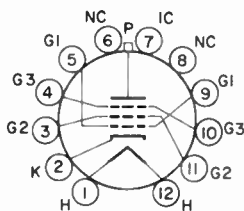
^f Designed to mate with connector of 0.250-inch cap, generally available from your local RCA distributor.

^g As defined in the current issue of EIA Standard RS-239, unless otherwise specified.

- ^h This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μ s.
- ^k Absolute-Maximum Value.
- ^m In horizontal-deflection-amplifier service, a positive voltage may be applied to grid No.3 to reduce interference from "snivets," which may occur in both vhf and uhf television receivers. A typical value for this voltage is 20 volts.
- ⁿ Measured with a DC meter.
- ^p An adequate bias resistor or other means is required to protect the tube in the absence of excitation.
- ^q This rating is applicable when measurement is made using a thermocouple attached to a 0.1-inch wide phosphor-bronze ring placed at the hottest location on the envelope. A maximum rating of 240°C is applicable to direct thermocouple measurements taken at the hottest point on the envelope surface.

TERMINAL DIAGRAM (Bottom View)

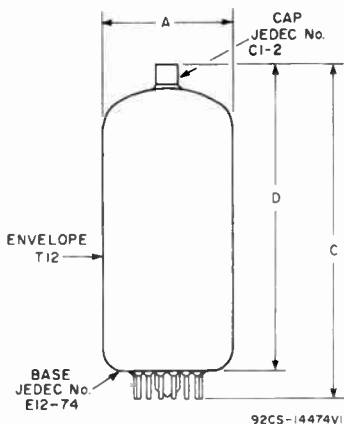
- Pin 1 - Heater
 Pin 2 - Cathode
 Pin 3 - Grid No.2
 Pin 4 - Grid No.3
 Pin 5 - Grid No.1
 Pin 6 - No Connection
 Pin 7 - Do Not Use
 Pin 8 - No Connection
 Pin 9 - Grid No.1
 Pin 10 - Grid No.3
 Pin 11 - Grid No.2
 Pin 12 - Heater
 Cap - Plate



JEDEC 12GW

6KD6

DIMENSIONAL OUTLINE (JEDEC No.12-118)



DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.437*	1.563	36.5*	39.7
C	—	4.625	—	117.47
D	—	4.250	—	107.95
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
FRAME-GRID PENTODE

For Combined Oscillator-Mixer Applications
in TV Receivers Having an IF of 40 Mc

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.400	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

Direct Interelectrode Capacitances:^b

Triode Unit:

Grid to plate	1.3	pf
Grid to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater	2.4	pf
Plate to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater	2.0	pf

Pentode Unit:

Grid No.1 to plate	0.015 max.	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5.0	pf
Plate to cathode & grid No.3, & internal shield, grid No.2, and heater	3.4	pf
Heater to triode cathode and pentode cathode	5.5 ^c	pf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	—	125	volts
Cathode Resistor	68	33	ohms
Amplification Factor	40	—	
Plate Resistance (Approx.)	5000	125000	ohms
Transconductance	8000	12000	μmhos
Plate Current	13	10	ma
Grid-No.2 Current	—	2.8	ma



6KE8

Grid-No.1 Voltage (Approx.)

for plate $\mu a =$

100	-5	-	volts
50.	-	-3	volts

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" \pm 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.	9DC

Pin 1 - Triode Plate

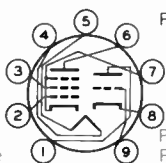
Pin 2 - Pentode
Grid No.1

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 A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	280 max.	280 max.	volts
GRID-No.2 SUPPLY VOLTAGE.	-	280 max.	volts
GRID-No.2 VOLTAGE	-	See <i>Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No.1 VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
CATHODE CURRENT	20 max.	20 max.	ma
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 140 volts	-	0.5 max.	watt
For grid-No.2 voltages between 140 and 280 volts	-	See <i>Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION	2 max.	2 max.	watts

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.	0.5 max.	megohm

^a The dc component must not exceed 100 volts.

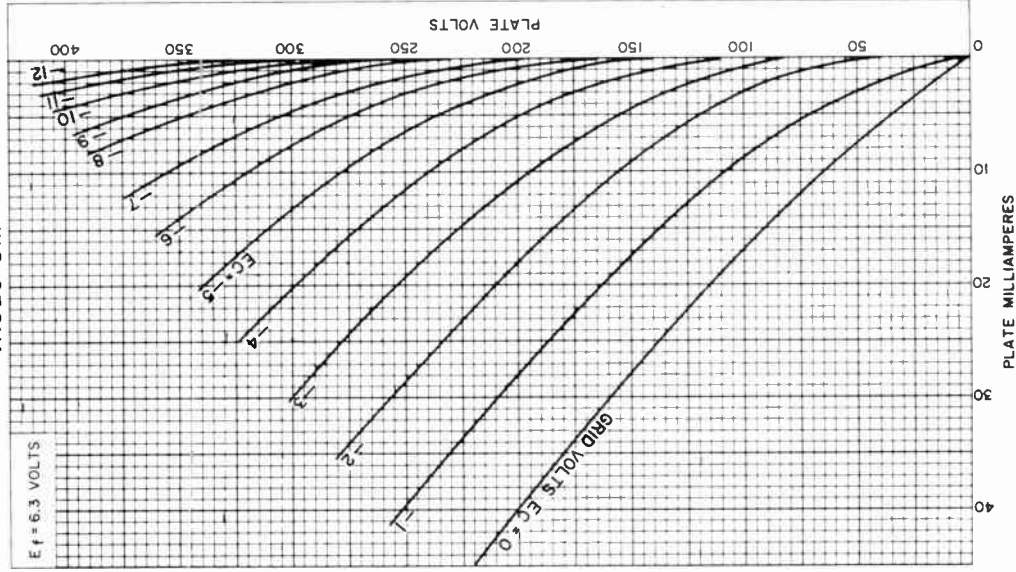
^b with external shield JEDEC No. 315 connected to cathode of unit under test except as noted.

^c with external shield JEDEC No. 315 connected to ground.



6KE8

AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-11897

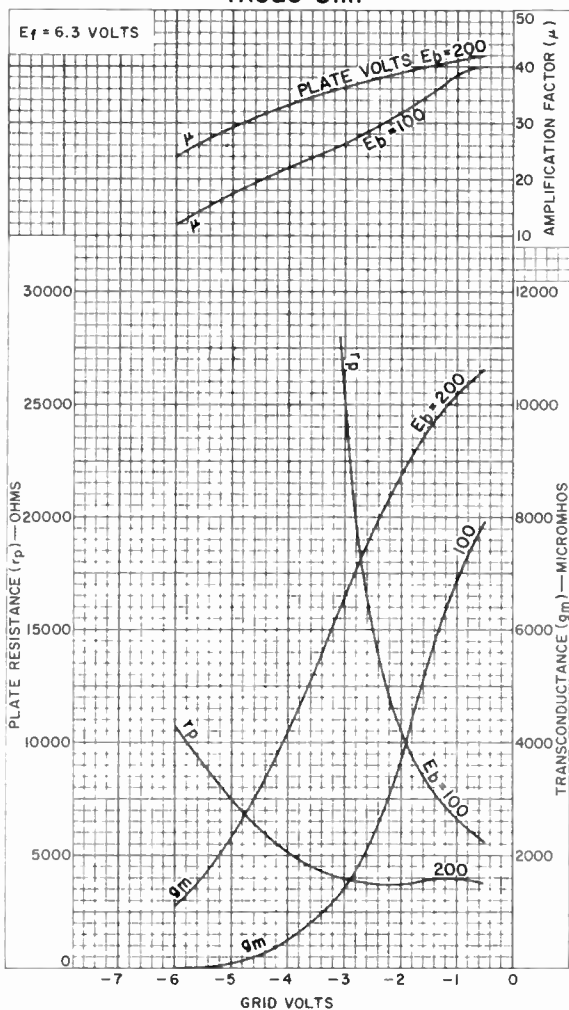


RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 2
4-63

6KE8

AVERAGE CHARACTERISTICS Triode Unit



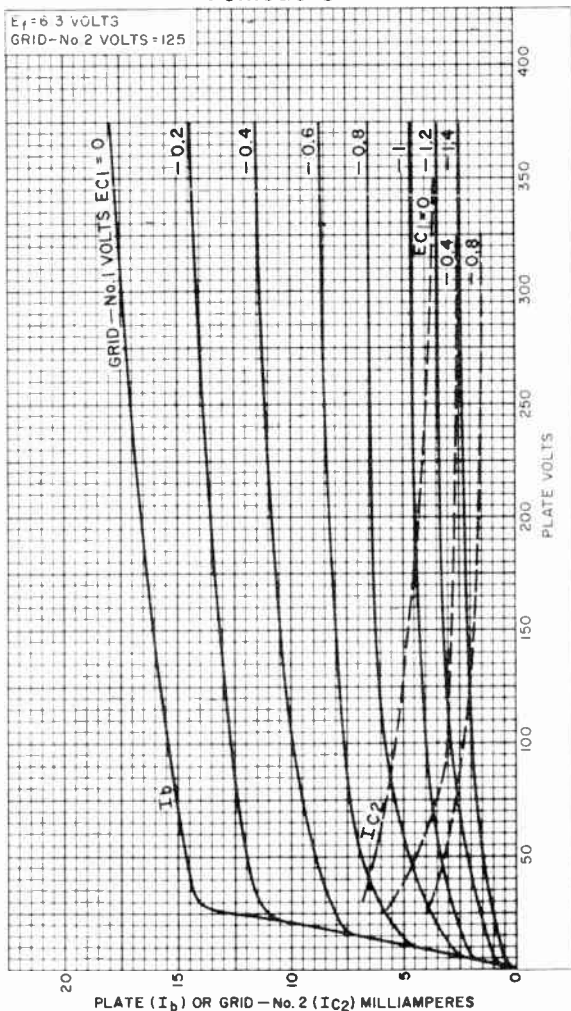
92CM-11901

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



AVERAGE CHARACTERISTICS Pentode Unit

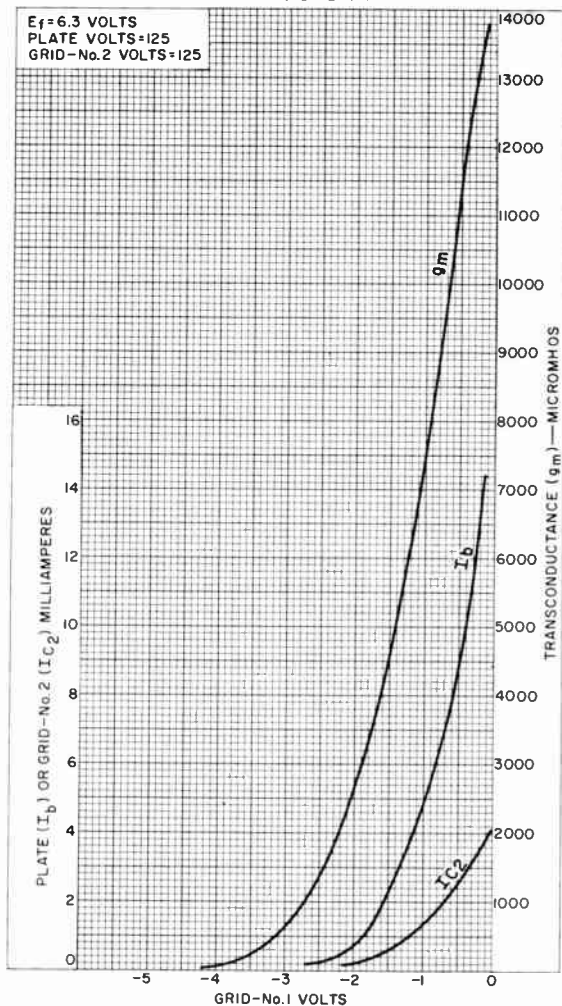


92CM-11903



6KE8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-11902

RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



Beam Power Tube

NOVAR TYPE

SPECIAL MULTIPLE-FIN PLATE STRUCTURE^a
SPECIALLY FORMULATED ENVELOPE GLASS^b

For Color-TV Horizontal-Deflection-Amplifier Applications

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3	1.600	A
Maximum heater-cathode voltage:		
Heater negative with respect to cathode:		
Peak	200	V
DC component	100	V
Heater positive with respect to cathode:		
Peak	200	V
DC component	100	V

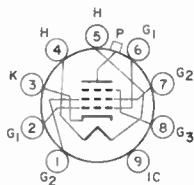
Direct Interelectrode Capacitances (Approx.)

Without external field		
Grids No. 1 to 2	1.2	pF
Input: G1 to (r, G ₂ , P, H)	22	pF
Output: P to (r, G ₃ , G ₂ , H)	9.0	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.550 in
Seated Length	2.910 to 3.170 in
Diameter	1.438 to 1.562 in
Dimensional Outline	See <i>General Section</i>
Bulb	T12
Cap	Skirted Miniature (JEDEC No. C1-2 or C1-3)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-88)
Basing Designation for BOTTOM VIEW	90L

- Pin 1 - Grid No. 1
- Pin 2 - Grid No. 2
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No. 1
- Pin 7 - Grid No. 2
- Pin 8 - Grid No. 3
- Pin 9 - Do Not Use
- Cap - Plate



CHARACTERISTICS

For the following characteristics, see Conditions

Amplification Factor	-	-	4	-
Triode Connection ^c				
Plate Resistance	-	-	-	6000 Ω
Transconductance	-	-	-	9500 μmho
DC Plate Current	-	560 ^d	-	80 mA



6KM6

DC Grid-No.2 Current	-	31 ^d	-	2.4	mA
Cutoff DC Grid-No.1 Voltage	-110	-	-	-42	V
Plate $\mu A = 1$					

Conditions

Heater Voltage	6.3	6.3	6.3	6.3	V
Peak Positive-Pulse Plate Voltage ^e	6500	-	-	-	V
DC Plate Voltage	-	60	140	140	V
DC Grid-No.3 Voltage	30	30	0	30	V
DC Grid-No.2 Voltage	140	140	140	140	V
DC Grid-No.1 Voltage	-	0	-24.5	-24.5	V

MAXIMUM RATINGS, DESIGN-MAXIMUM VALUES

For operation in a 525-line, 30-frame system

DC Plate Supply Voltage	770	V
Peak Positive-Pulse Plate Voltage ^e	6500	V
Peak Negative-Pulse Plate Voltage	1500	V
DC Grid-No.3 Voltage ^f	75	V
DC Grid-No.2 (Screen-Grid) Voltage	220	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	330	V
Cathode Current		
Peak	950	mA
Average	275	mA
Grid-No.2 Input	3.5	W
Plate Dissipation ^g	20	W
Envelope Temperature	240	°C
At hottest point on bulb surface		

MAXIMUM CIRCUIT VALUES

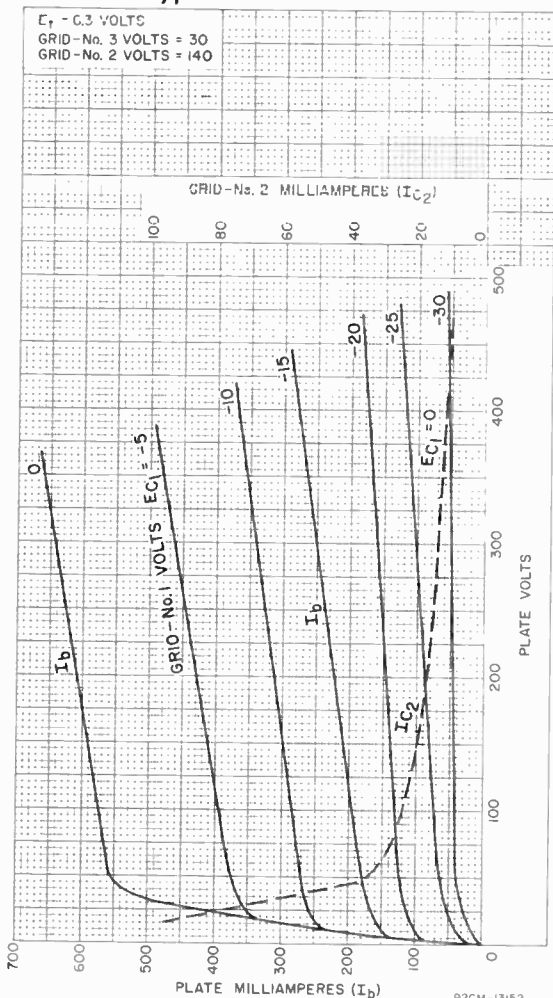
Grid-No.1-Circuit Resistance

For grid-No.1-resistor-bias operation	0.47	M Ω
for plate-pulsed operation	10	M Ω

- ^a Designed to minimize secondary-electron emission from plate and eliminate "knee" discontinuities in zero-bias region.
- ^b Designed to reduce glass problems after long periods of high-voltage and elevated temperature operation.
- ^c With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.
- ^d This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- ^e This rating is applicable where the duration of the voltage pulse does 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.
- ^f In horizontal-deflection-amplifier service, a positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in both vhf and uhf television receivers. A typical operating value for this voltage is 30 volts.
- ^g An adequate bias resistor or other means is required to protect the tube in the absence of excitation.



Typical Characteristics

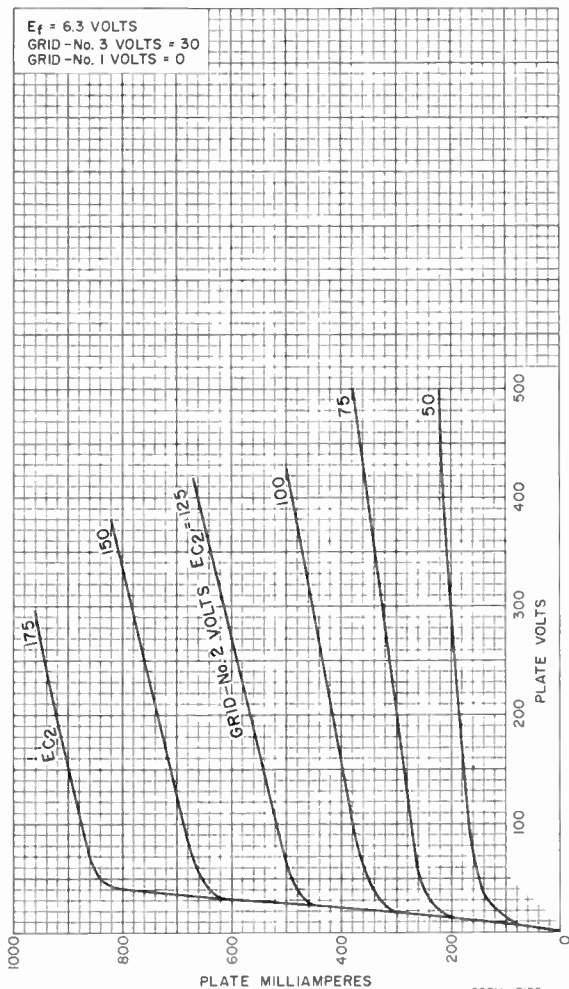


92CM-13152



RADIO CORPORATION OF AMERICA
 Electronic Components and Devices Harrison, N. J.

Typical Plate Characteristics



Diode— Sharp-Cutoff Three-Plate Tetrode

9-PIN MINIATURE TYPE

For Frequency-Divider and Complex-Wave-Generator Circuits of Electronic Musical Instruments

GENERAL DATA

Electrical:

Heater Characteristics and Ratings (*Design-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 200 max. volts

Heater positive with respect to cathode 200^a max. volts

Direct Interelectrode Capacitances:^b

Tetrode Unit:

Grid No.1 to plate 1A 0.02 max. pf

Grid No.1 to plate 1B 0.02 max. pf

Grid No.1 to plate 2 0.06 max. pf

Grid No.1 to cathode & internal shield, grid No.2, and heater 5.5 pf

Plate 1A to cathode & internal shield, grid No.2, and heater 1.2 pf

Plate 1B to cathode & internal shield, grid No.2, and heater 1.3 pf

Plate 2 to cathode & internal shield, grid No.2, and heater 1.8 pf

Tetrode grid No.1 to diode plate 0.024 max. pf

Tetrode plate 1A to diode plate 0.18 pf

Tetrode plate 1B to diode plate 0.024 pf

Tetrode plate 2 to diode plate 0.013 pf

Characteristics, Class A₁ Amplifier (Tetrode Unit):

Plates 1A, 1B, and 2 connected together at socket

Plate Voltage 100 volts

Grid-No.2 Voltage 100 volts

Grid-No.1 Supply Voltage 0 volts

Grid-No.1 Resistor (Bypassed) 2.2 megohms

Plate Resistance (Approx.) 30000 ohms

Transconductance 3400 μ mhos

Plate Current 4.2 ma

Grid-No.2 Current 1.7 ma

Grid-No.1 Voltage (Approx.)

for plate μ a = 20 -4 volts

Triode Connection—

Grid No.2 connected to plates 1A, 1B, and 2 at socket

Plate Voltage 100 volts

Grid-No.1 Supply Voltage 0 volts



6KM8

Grid-No.1 Resistor (Bypassed)	2.2	megohms
Transconductance	4500	μ hos
Amplification Factor	45	
Plate Current	5.5	ma

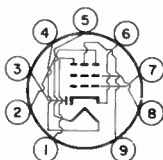
Separate plate operation, plates not under test grounded

Plate Voltage:		
Plate 1A.	100	volts
Plate 1B.	100	volts
Plate 2	100	volts
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage.	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Transconductance:		
Grid No.1 to plate 1A	2000	μ hos
Grid No.1 to plate 1B	2000	μ hos
Grid No.1 to plate 2.	1800	μ hos
Plate Resistance (Approx.):		
Plate 1A.	0.1	megohm
Plate 1B.	0.1	megohm
Plate 2	0.12	megohm
Plate Current:		
Plate 1A.	2.3	ma
Plate 1B.	2.3	ma
Plate 2	2.1	ma
Grid-No.2 Current:		
For plate 1A volts = 100.	3.8	ma
For plate 1B volts = 100.	3.8	ma
For plate 2 volts = 100	3.3	ma

Mechanical:

Operating Position.	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length.	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" \pm 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline	See <i>General Section</i>
Bulb.	T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW.	9Q6

Pin 1 - Tetrode Plate 1B	Pin 6 - Cathode, Internal Shield
Pin 2 - Tetrode Plate 1A	Pin 7 - Tetrode Grid No.1
Pin 3 - Diode Plate	Pin 8 - Tetrode Grid No.2
Pin 4 - Heater	Pin 9 - Tetrode Plate 2
Pin 5 - Heater	



FREQUENCY-DIVIDER & COMPLEX-WAVE-GENERATOR SERVICE

TETRODE UNIT

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE:

PLATE 1A.	330 max.	volts
PLATE 1B.	330 max.	volts
PLATE 2	330 max.	volts

GRID-No.2 (SCREEN-GRID)

SUPPLY VOLTAGE.	330 max.	volts
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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 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 1A DISSIPATION.	1 max.	watt
PLATE 1B DISSIPATION.	1 max.	watt
PLATE 2 DISSIPATION	1 max.	watt

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-No.1-resistor-
bias operation. 2.2 max. megohms

DIODE UNIT

Maximum Ratings, Design-Maximum Values:

PLATE CURRENT	1 max.	ma
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Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 10. . .	2	ma
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^a The dc component must not exceed 100 volts.

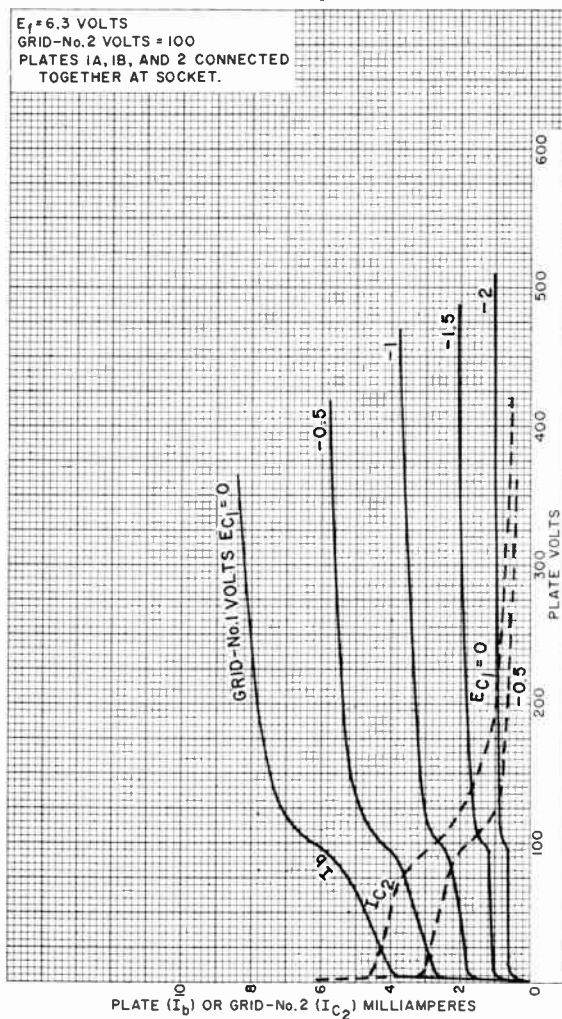
^b without external shield.



6KM8

AVERAGE CHARACTERISTICS Tetrode Unit

$E_f = 6.3$ VOLTS
GRID-NO. 2 VOLTS = 100
PLATES 1A, 1B, AND 2 CONNECTED
TOGETHER AT SOCKET.



92CM-11713R1

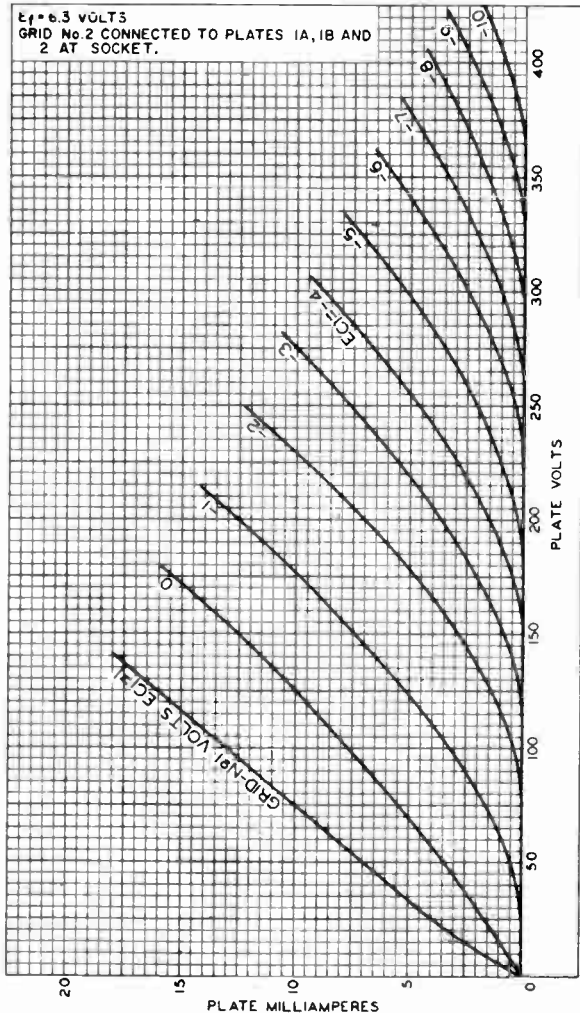
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



World Radio History

AVERAGE PLATE CHARACTERISTICS Tetrode Unit—Triode Connection



92CM-11748





Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

FRAME-GRID CONSTRUCTION

DARK HEATER

For High-Gain IF-Amplifier Applications in TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values^a

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	300	mA
Heater Warm-up Time	-	11	s

Direct Interelectrode Capacitances

Without external circuit

Grid No.1 to plate	C_{g1-p}	0.019 max	pF
Input: G1 to (K, G1 + IS, G2, H)	C_i	9.5	pF
Output: P to (V, G3 + IS, G2, H)	C_o	3	pF

For the following characteristics, see Conditions

Plate Resistance (Approx.)	r_p	160	-	Ω
Transconductance	g_m	18000	-	μ mho
DC Plate Current	I_b	17	-	mA
DC Grid-No.2 Current	I_{c2}	4.2	-	mA
Cutoff DC Grid-No.1 Voltage	$E_{c1(co)}$	-	-22	V

For $g_m = 10 \mu$ mho

Conditions

Heater Voltage	E_h	Bogey Value	V
DC Plate Supply Voltage	E_{bb}	125 170	V
DC Grid-No.3 Voltage	E_{c3}	0 0	V
DC Grid-No.2 Supply Voltage	E_{c2}	125 170	V
Grid No.1	-	Connected to negative end of R_k	
Cathode Resistor	R_k	56 56	Ω

MECHANICAL CHARACTERISTICS

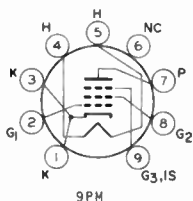
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.187 in
Maximum Seated Length	1.937 in
Maximum Diameter	0.875 in
Length, Base Seat to Bulb Top	1.469 to 1.656 in
Including tip	
Dimensional Outline (JEDEC 6-2)	See General Section
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)



6KT6

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Cathode
- Pin 2 - Grid-No.1
- Pin 3 - Heater
- Pin 4 - Heater
- Pin 5 - No. Internal Connection
- Pin 6 - Plate
- Pin 7 - Grid-No.2
- Pin 8 - Grid-No.3
- Pin 9 - Grid-No.3



DESIGN-MAXIMUM RATINGS

For operation as a Class A₁ Amplifier Tube in TV Receivers

DC Plate Voltage	E _b	330	V
DC Grid-No.3 (Suppressor-Grid) Voltage	E _{c3}	+0	V
DC Grid-No.2 (Screen-Grid) Supply Voltage	E _{cc2}	330	V
DC Grid-No.2 Voltage	E _{c2}	See Grid-No.2	

Input Rating Chart

at front of Receiving Tube Section			
DC Grid-No.1 (Control-Grid) Voltage	E _{c1}	+0	V
Heater-Cathode Voltage			
Peak	e _{hkm}	±200	V
Average	E _{hk(av)}	100	V
Heater Voltage (AC or DC)	E _h	5.7 to 6.9	V
Grid-No.2 Input	P _{g2}		
For e _{hkm}		0.6	W
For E _h	-	See Grid-No.2	

Input Rating Chart

at front of Receiving Tube Section			
Plate Dissipation	P _b	3.1	W

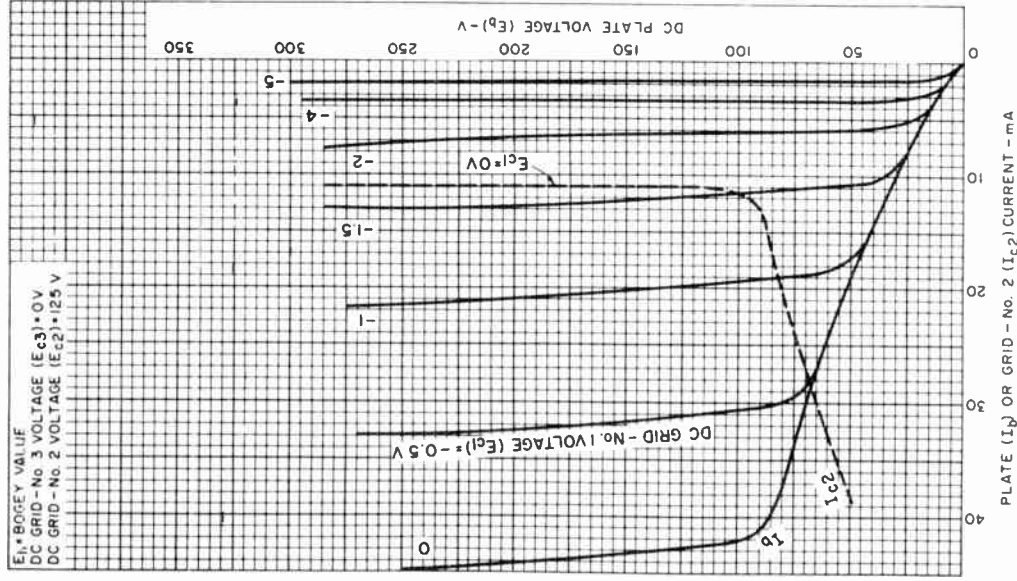
MAXIMUM CIRCUIT VALUES

Grid-No.1 Circuit Resistance	R _{g1(ckt)}		
for time-base operation		250	kΩ
for cathode bias operation	-	1	MΩ

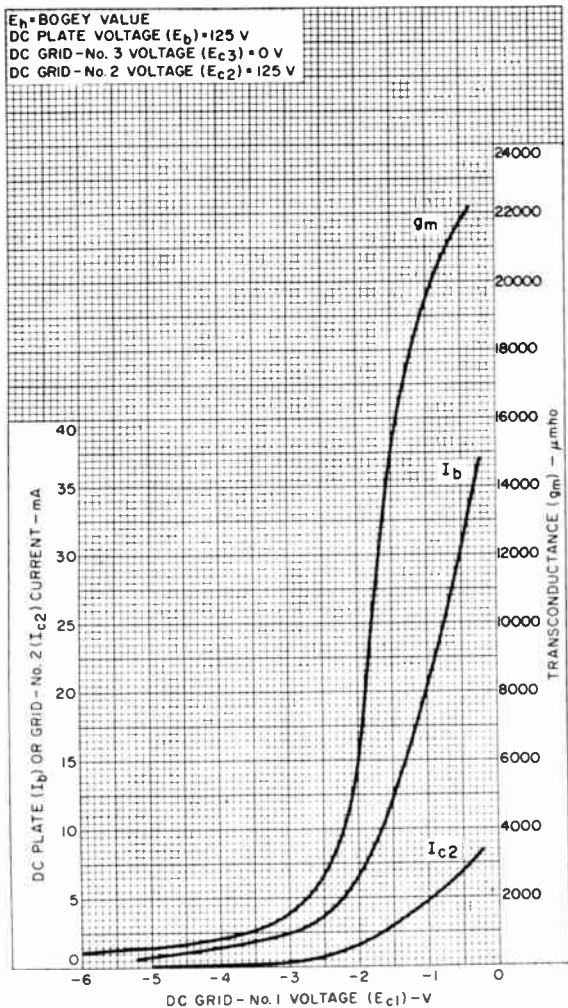
^a Unless otherwise specified.



Typical Characteristics



Typical Characteristics



92CM-14005



High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Color-Killer, Sound IF Amplifier, and Band-pass-Amplifier Applications in TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (W or F)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.600	amp
Peak heater-cathode voltage:		

Unit: Triode Pentode^a

Heater negative with respect to cathode	200 max.	20 max.	volts
Heater positive with respect to cathode	200 ^b max.	20 max.	volts

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield ^c	
<i>Triode Unit:</i>			
G _T to P _T	3.0	3.0	pf
Input: G _T to (H+G _{3p} +1S, K _T)	3.2	3.2	pf
Output: P _T to (H+G _{3p} +1S, K _T)	1.6	2.4	pf

Pentode Unit:

G _{1p} to P _p	0.046 max.	0.030 max.	pf
Input: G _{1p} to (H+G _{3p} +1S, G _{2p} , K _p)	7.5	7.5	pf
Output: P _p to (H+G _{3p} +1S, G _{2p} , K _p)	2.2	2.8	pf
G _T to P _p	0.018 max.	0.003 max.	pf
G _{1p} to P _T	0.006 max.	0.002 max.	pf

Characteristics, Class A₁ Amplifier:

	Unit:	Triode	Pentode	
Plate Voltage		250	125	volts
Grid-No.2 Voltage		-	125	volts
Grid-No.1 Voltage		-2	-1	volts
Amplification Factor		100	-	
Plate Resistance (Approx.)		31500	150000	ohms
Transconductance		3200	10000	μmhos
Plate Current		1.8	12	ma
Grid-No.2 Current		-	4.5	ma
Grid-No.1 Voltage (Approx.) for plate μ = 20		-3.5	-7	volts

Mechanical:

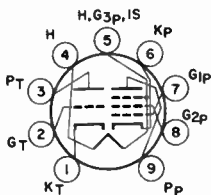
Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"



6KT8

Length, Base Seat to Bulb Top
 (Excluding Tip) 1-9/16" \pm 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 9QP

Pin 1 - Triode Cathode
 Pin 2 - Triode Grid
 Pin 3 - Triode Plate
 Pin 4 - Heater
 Pin 5 - See Footnote ^a
 (Heater, Pentode
 Grid No.3,
 Internal Shield)
 Pin 6 - Pentode Cathode
 Pin 7 - Pentode Grid No.1
 Pin 8 - Pentode Grid No.2
 Pin 9 - Pentode Plate



AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Unit:	Triode	Pentode	
Plate Voltage.		330 max.	330 max.	volts
Grid-No.2 Supply Voltage		-	330 max.	volts
Grid-No.2 Voltage.	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section			
Grid-No.1 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 <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section			
Plate Dissipation.		1 max.	2.5 max.	watts

Maximum Circuit Values:

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

^a Pin No.5 (Pentode Grid No.3, Internal Shield, and Heater) should be operated at or near ground potential. If the peak cathode-to-grid-No.3 voltage exceeds +20 volts, undesirable changes in the tube characteristics may result.

^b The dc component must not exceed 100 volts.

^c With external shield JEDEC No.315 connected to pins 4 and 5.

Beam Power Tube

NOVAR TYPE

DARK HEATER

For High-Voltage-Pulse Shunt-Regulator
Applications in Color-TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage	E_h	6.3	V
Heater Current	I_h	1.600	A
Direct Interelectrode Capacitances Without external shunts:			
Grid-No.2 to plate	C_{g1-p}	1.2	pF
Input: G1 to (K, G2, G3, H)	C_i	22	pF
Output: P to (K, G2, G3, H)	C_o	9.0	pF

For the following characteristics, see Conditions

Amplification Factor (Triode Connection) ^a			
	μ	- 4 -	
Plate Resistance (Approx.)	r_p	- - 6000	Ω
Transconductance	g_m	- - 9500	μmho
DC Plate Current	I_b	580 ^b - 80	mA
DC Grid-No.2 Current	I_{c2}	24 ^b - 2.4	mA
Cutoff DC Grid-No.1 Voltage	$E_{c1}(co)$	- - -42	V
Plate mA = :			

Conditions

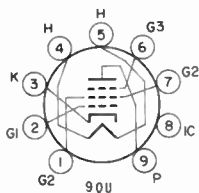
Heater Voltage	E_h	Bogey Value	V
DC Plate Voltage	E_b	100 140	V
DC Grid-No.3 Voltage	E_{c3}	0 0	V
DC Grid-No.2 Voltage	E_{c2}	140 140	V
DC Grid-No.1 Voltage	E_{c1}	0 -24.5	V

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathode	Coated Unipotential
Dimensional Outline (JEDEC 12-96)	See General Section
Maximum Overall Length	3.130 in
Maximum Seated Length	2.750 in
Maximum Diameter	1.562 in
Envelope	JEDEC Designation T12
Base ^c	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC Designation E9-88)

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Grid No.2
- Pin 2 - Grid No.1
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.3
- Pin 7 - Grid No.2
- Pin 8 - Do Not Use
- Pin 9 - Plate



6KV6

DESIGN-MAXIMUM RATINGS

For operation as a High-Voltage-Pulse Shunt-Regulator Tube in Color-Television Receivers in a 525-line, 30-frame system

DC Plate Supply Voltage ($I_b = 0 \text{ mA}$)	E _{bb}	770	V
Peak Positive-Pulse Plate Voltage ^c	e _{bm}	6500	V
Peak Negative-Pulse Plate Voltage	-e _{bm}	1500	V
DC Grid-No.3 Voltage	E _{c3}	75	V
DC Grid-No.2 (Screen-Grid) Voltage	E _{c2}	220	V
Grid No.1 (Control-Grid) Voltage			
Peak positive-pulse value	-e _{c1m}	330	V
Negative-pulse value (bias)	-E _{c1}	75	V
Heater-Cathode Voltage			
Peak	e _{hkm}	+200 -500	V
Average ^d	E _{hk(av)}	100	V
Heater Voltage (AC or DC)	E _h	5.7 to 6.9	V
Cathode Current			
Peak	i _{km}	950	mA
Average ^d	I _{k(av)}	275	mA
Grid-No.2 Input	P _{g2}	3.5	W
Plate Dissipation ^e	P _b	20 ^f	W
Envelope Temperature (at hottest point on envelope surface)	T _E	240	°C

MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance	R _{g1(ckt)}		
For grid-No.2-rectifier-bias operation	-	1	MΩ

- ^a With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.
- ^b This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- ^c This rating is applicable where the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 μs.
- ^d Measured with a dc meter.
- ^e Adequate circuit precautions must be taken to protect the tube in the absence of grid-No.1 bias.
- ^f Plate dissipations up to 24 W maximum are permissible for short periods of time (up to 10 s maximum) provided the maximum envelope-temperature rating is not exceeded.



Beam Power Tube

NOVAR TYPE

For High-Voltage-Pulse Shunt-Regulator
Applications in Color-TV Receivers

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc. E_h	6.3	V
Heater Current I_h	1.6	A
Direct Interelectrode Capacitances: ^a		
Grid No.1 to plate. c_{g1-p}	0.6	pF
Input: G1 to (K,G3,G2,H) . . . c_i	22	pF
Output: P to (K,G3,G2,H) . . . c_o	9.0	pF

For the following characteristics, see Conditions below.

Amplification Factor (Triode Connection) ^b μ	-	4	-	
Plate Resistance (Approx.) . . . r_p	-	-	10000	Ω
Transconductance g_m	-	-	6000	μmho
DC Plate Current I_b	440 ^c	-	40	mA
DC Grid-No.2 Current I_{c2}	30 ^c	-	2.4	mA
Cutoff DC Grid-No.1 Voltage for $I_b = 1 \text{ mA}$ $E_{c1(\text{co})}$	-	-	-42	V

Conditions:

Heater Voltage E_h	Bogey Value			V
DC Plate Voltage E_b	100	140	140	V
DC Grid-No.3 Voltage E_{c3}	0	0	0	V
DC Grid-No.2 Voltage E_{c2}	140	140	140	V
DC Grid-No.1 Voltage E_{c1}	0	-24.5	-24.5	V

MECHANICAL CHARACTERISTICS

Dimensional Outline	JEDEC No.12-97
Maximum Overall Length . . . . .	.3.380in. (85.85 mm)
Maximum Seated Length	3.000in. (76.2 mm)
Maximum Diameter	1.562in. (39.6 mm)
Envelope	JEDEC Designation T12
Base ^d	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC Designation E9-88)

6KV6A

Terminal-Connections Designation JEDEC 9QU
 Type of Cathode Coated Unipotential
 Operating Position Any

MAXIMUM RATINGS – Design-Maximum Values^g

For operation as a High-Voltage-Pulse Shunt-Regulator Tube in Color Television Receivers in a 525-line, 30-frame system.

DC Plate Supply Voltage ($I_b = 0$ mA)	E_{bb}	900	V
Peak Positive-Pulse Plate Voltage . . .	e_{bm}	6500	V
Peak Negative-Pulse Plate Voltage . . .	$-e_{bm}$	1500	V
DC Grid-No.3 Voltage	E_{c3}	75	V
DC Grid-No.2 (Screen-Grid) Voltage . . .	E_{c2}	220	V
Peak Positive-Pulse Grid-No.2 Voltage .	e_{c2m}	600	V
Grid No.1 (Control-Grid) Voltage:			
Peak negative-pulse value	$-e_{c1m}$	330	V
Negative dc value (bias).	$-E_{c1}$	250	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	{ +200 -500	V
Average ^g	$E_{hk(av)}$	100	V
Heater Voltage	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	950	mA
Average ^g	$I_{k(av)}$	275	mA
Grid-No.2 Input	P_{g2}	2.0	W
Plate Dissipation ^h	P_b	28 ^k	W
Envelope Temperature (at hottest point on envelope surface)	T_E	240	°C

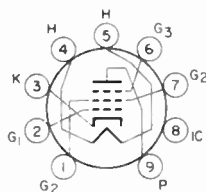
MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance:	$R_{g1(ckt)}$	
For grid-No.1-resistor-bias operation		1 M Ω

- ^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- ^b With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.
- ^c This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- ^d Designed to mate with "Novar 9-Contact" Socket generally available from your local RCA Distributor.
- ^e As defined in the current issue of EIA Standard RS-239.
- ^f This rating is applicable where the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is $10\mu\text{s}$.
- ^g Measured with a dc meter.
- ^h Adequate circuit precautions must be taken to protect the tube in the absence of grid-No.1 bias.
- ^k Plate dissipations up to 32W maximum are permissible for short periods of time provided the maximum envelope-temperature rating is not exceeded. This condition may exist under high-line voltage, zero picture tube beam current.

TERMINAL DIAGRAM — Bottom View

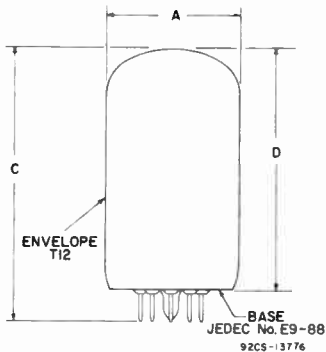
- Pin 1 - Grid No.2
 Pin 2 - Grid No.1
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Grid No.3
 Pin 7 - Grid No.2
 Pin 8 - Do Not Use
 Pin 9 - Plate



JEDEC 9QU

6KV6A

DIMENSIONAL OUTLINE — JEDEC No. 12-97



DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.438*	1.562	36.6*	39.6
C	—	3.380	—	85.85
D	2.750	3.000	69.9	76.2
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

FRAME-GRID CONSTRUCTION

For Use as a Combined Voltage Amplifier
and Video Output Tube in TV Receivers

ELECTRICAL

Heater Characteristics and Ratings

Voltage (A or B)	6.3 ± 0.6	V
Current at heater voltage	0.775	A
Peak heater-cathode voltage (100°C):		
Heater negative with respect to cathode	200	V
Heater positive with respect to cathode	200 ^a	V

Direct Interelectrode Capacitances^b

Triode Unit:

Grid-to-plate	3.7	pF
Grid-to-cathode, pentode with plate to cathode, No. 1 internal shield, and heater	2.5	pF
Grid-to-cathode, pentode with plate to cathode, grid No. 2 internal shield, and heater	2.4	pF
Triode-grid-to-pentode-plate	0.015 max	pF

Pentode Unit:

Grid No. 1 to plate	0.12 max	pF ←
Grid No. 1 to control-grid No. 2, and heater		
Grid No. 2, grid No. 1, and heater	13.0	pF
Plate to control-grid No. 2, grid No. 1, and heater	4.8	pF
Control-plate to triode-plate	0.17 max	pF

Characteristics, Class A₁ Amplifier

	Triode Unit	Pentode Unit		
Plate Supply Voltage	-	125	200	V
Plate Voltage	200	-	-	V
Grid-No. 2 Supply Voltage	-	125	125	V
Grid-No. 1 Supply Voltage	-2	-	-	V
Cathode Resistor	-	82	68	Ω
Amplification Factor	70	-	-	
Plate Resistance (Approx.)	17500	55000	75000	Ω
Transconductance	4000	21000	23000	μmho
Plate Current	4	16.5	20	mA ←
Grid-No. 2 Current	-	3.1	3.5	mA ←
Grid-No. 1 Voltage (Approx.) for plate current = 100 μA	-4.5	-4.2	-4.2	V

← Indicates a change.

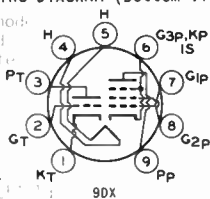


MECHANICAL

Operating Position	Any
Maximum Overall Length	2-5/8 in
Maximum Seated Length	2-3/8 in
Length, Base Seat to Bulb Top (Excluding tip)	$2 \pm \frac{3}{32}$ in
Diameter	0.750 to 0.875 in
Dimensional Outline	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)

BASING DIAGRAM (Bottom View)

- Pin 1 - Triode Cathode
- Pin 2 - Triode Grid
- Pin 3 - Triode Plate
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Pentode



- Pin 7 - Pentode Grid No. 1
- Pin 8 - Pentode Grid No. 2
- Pin 9 - Pentode Plate

AMPLIFIER — Class A₁ Design-Maximum Ratings

	Triode Unit	Pentode Unit	
Plate Voltage	300	300 max	V
Grid-No.2 (Screen-Grid) Supply Voltage	-	300 max	V
Grid-No.2 Voltage	-	See <i>Grid-No.2</i>	
<i>Input Rating Chart at front of Receiving Tube Section</i>			
Grid-No.1 (Control-Grid) Voltage Positive-bias value	0	0 max	V
Grid-No.2 Input Grid-No.2 voltage with 100% modulation	-	1 max	W
Grid-No.2 Input Grid-No.2 voltage with 100% modulation	-	See <i>Grid-No.2</i>	
<i>Input Rating Chart at front of Receiving Tube Section</i>			
Plate Dissipation	1	5 max	W

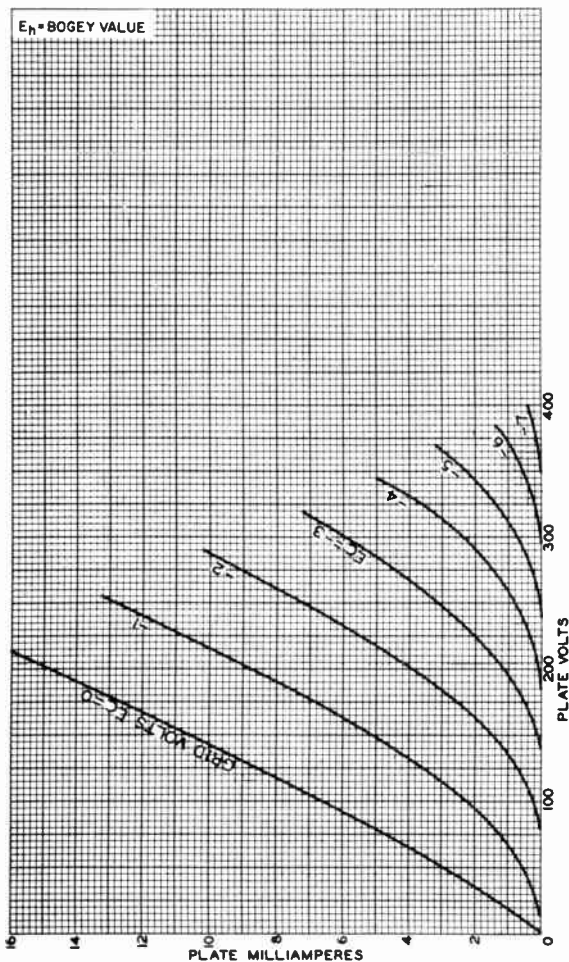
Maximum Circuit Values

	Triode Unit	Pentode Unit
Grid-No.1-Circuit Resistance Grid-No.1-bias with 100% modulation	0.5	0.1 max M Ω
Grid-No.1-bias with 100% modulation	1	0.25 max M Ω

^a The dc component must not exceed 100 volts.

^b Without external shield.



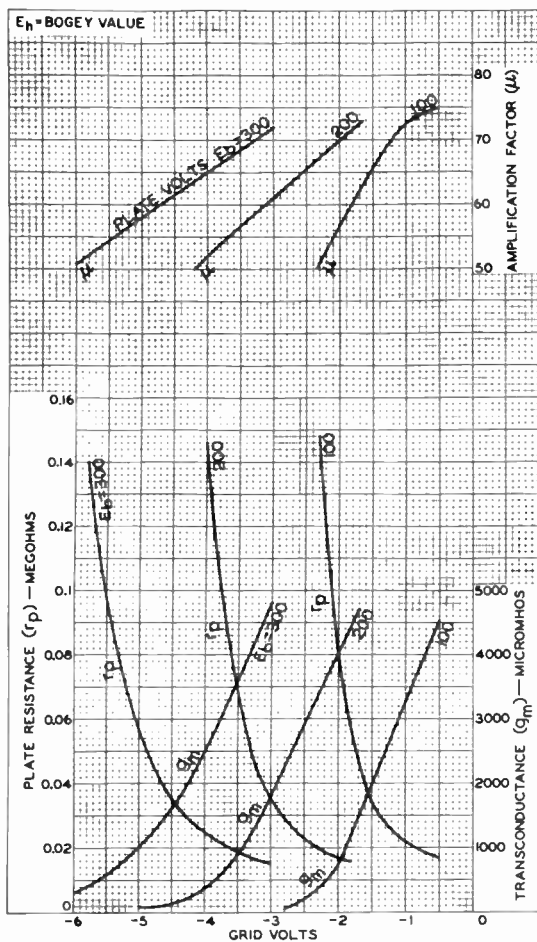
Average Plate Characteristics
Triode Unit

92CM-8644RI



6KV8

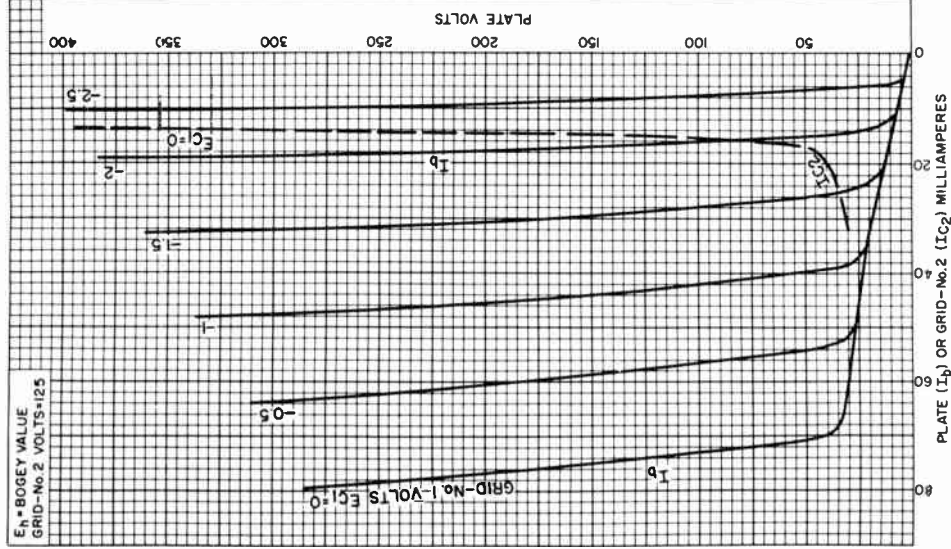
Average Characteristics Triode Unit



92CM-10874R1

6KV8

Average Characteristics Pentode Unit

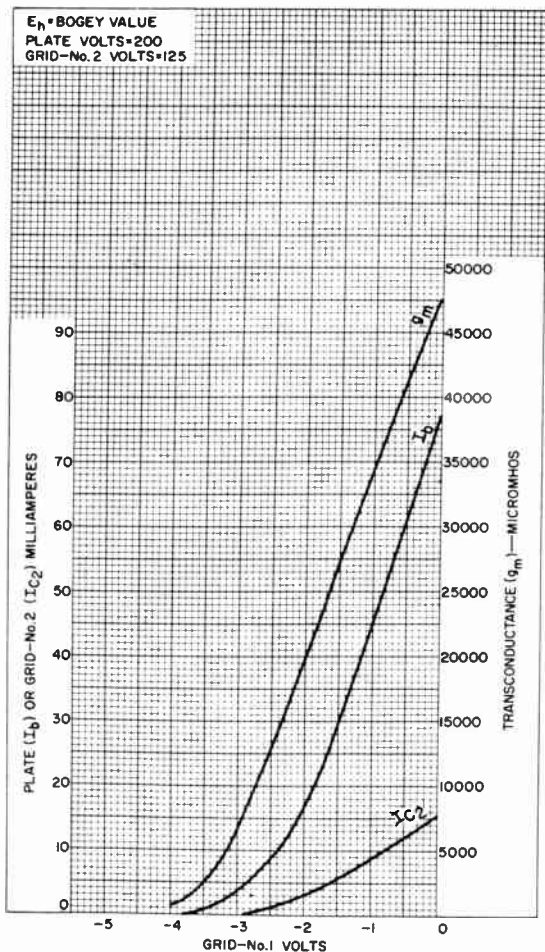


92CM-11946R2



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Electronic Components and Devices
Harrison, N. J.

DATA 3
6-66

Average Characteristics
Pentode Unit

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

FRAME-GRID CONSTRUCTION

DARK HEATER

For Video-Output-Amplifier Service in Color-TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values^a

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	0.520	A
Direct Interelectrode Capacitances			
<i>Without external shields</i>			
Grid No.1 to plate	C_{g1-p}	0.16 max	pF
Input: G1 to (K, G3 + IS, G2, H)	C_{ci}	14	pF
Output: P to (K, G3 + IS, G2, H).	C_o	6.0	pF

For the following characteristics, see Conditions

Plate Resistance (Approx.)	r_p	40	k Ω
Transconductance	g_m	30000	μ mho
DC Plate Current	I_b	30	mA
DC Grid-No.2 Current	I_{c2}	5.2	mA
Cutoff DC Grid-No.1 Voltage	$E_{c1}(co)$	-4.5	V

Plate $\mu A = 100$

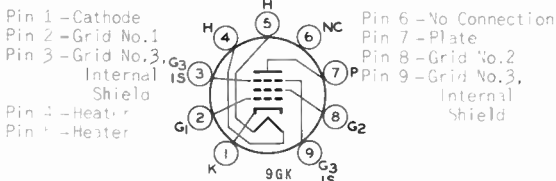
Conditions

Heater Voltage	E_h	Bogey Value	V
Plate Supply Voltage	E_{bb}	200	V
Grid-No.3		connected to cathode at socket	
Grid-No.2 Supply Voltage	E_{cc2}	135	V
Grid-No.1 Supply Voltage	E_{cc1}	0	V
Cathode Resistor	R_k	47	Ω

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.625 in
Maximum Seated Length	2.375 in
Length, Base Seat to Bulb Top	
Excluding tip	1.906 to 2.094 in
Maximum Diameter	0.875 in
Dimensional Outline (JEDEC 6-3)	See <i>General Section</i>
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)

TERMINAL DIAGRAM (Bottom View)



6KY6

DESIGN-MAXIMUM RATINGS

For operation as a Class A₁ Amplifier

Plate Voltage.	E_b	330	V
Grid-No.2 (Screen-Grid) Supply Voltage.	E_{c2}	330	V
Grid-No.2 Voltage.	E_{c2}		See Grid-No.2 Input Rating Chart at front of Receiving Tube Section
Grid-No.1 (Control-Grid) Voltage			
Positive-bias value.	E_{c1}	0	V
Heater-Cathode Voltage			
Peak	e_{hkm}	±200	V
DC	E_{hk}	100	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9	V
Grid-No.2 Input	P_{g2}		
For $E_{c2} \leq 165$ V.		1	W
For $E_{c2} > 165$ V and ≤ 330 V.	-		See Grid-No.2-Input Rating Chart at front of Receiving Tube Section
Plate Dissipation.	P_b	9	W

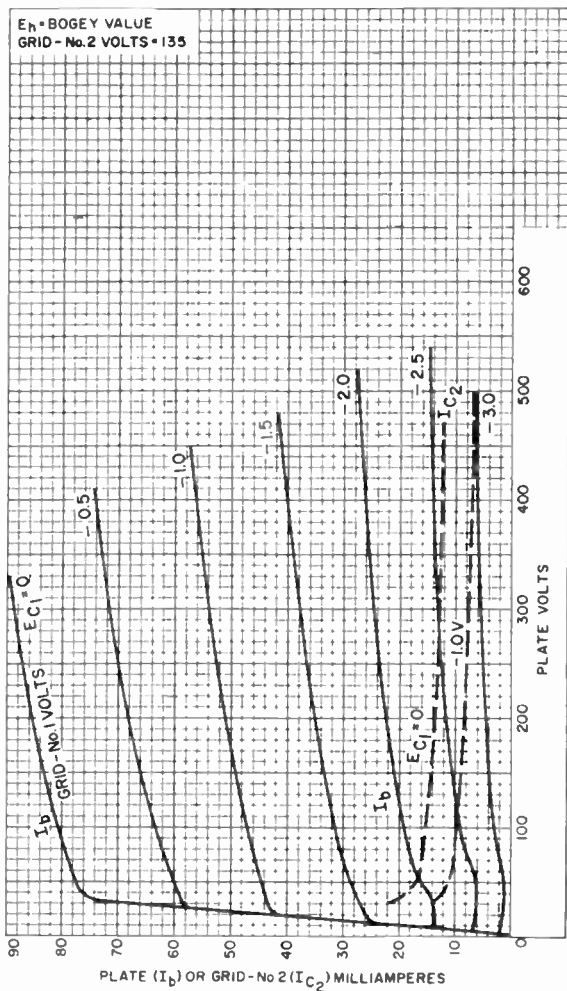
MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	$R_{g1(ckt)}$		
For fixed-bias operation.		0.1	M.
For cathode-bias operation.	-	0.25	M.

^a Unless otherwise specified.



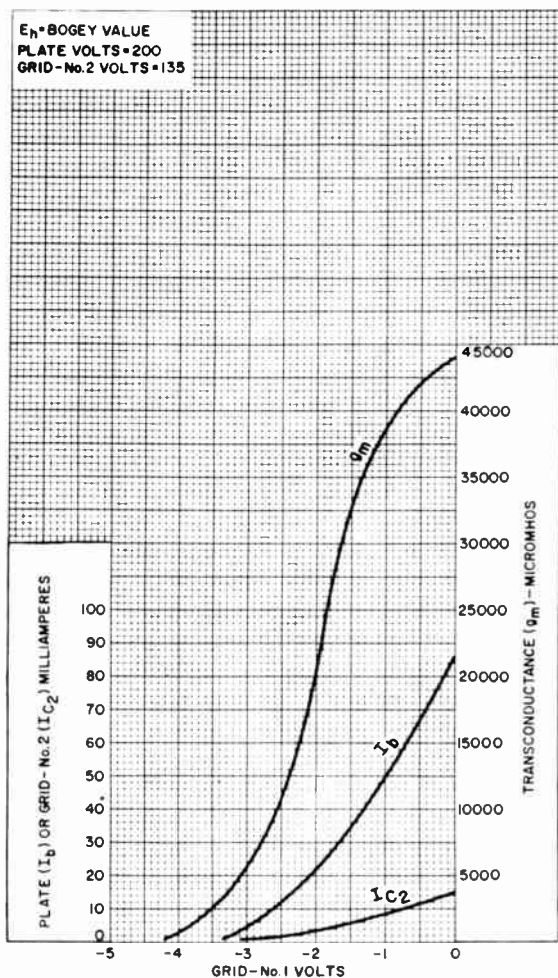
Typical Characteristics



92CM-13833R1



Typical Characteristics



High-Mu Triode-Beam Power Tube

NOVAR TYPE

For Combined Vertical-Deflection Oscillator
and Amplifier Service in TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.100	amp

Peak heater-cathode voltage (Each unit):

Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 ^a	max. volts

Direct Interelectrode Capacitances (Approx.):^b

Triode Unit:

Grid to plate	0.44	pf
G _T to (K _T , H)	15.0	pf
P _T to (K _T , H)	7.0	pf

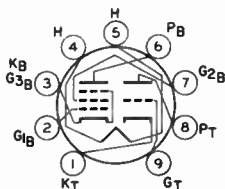
Beam Power Unit:

Grid No.1 to plate	0.048	pf
G _{1P} to (K _B +G _{3B} , G _{2B} , H)	2.6	pf
P _P to (K _B +G _{3B} , G _{2B} , H)	0.28	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	3.110"
Maximum Seated Length	2.730"
Length, Base Seat to Bulb Top (Excluding tip)	2.210" to 2.390"
Diameter	1.062" to 1.188"
Bulb . . . . .	.T9
Socket	Cinch Mfg. Co. No.149 19 00 033, Industrial Electronics Hardware Corp. No.S0-0968-SL1, or equivalent
Base	Small Button Novar 9-Pin (JEDEC No.E9-75)
Basing Designation for BOTTOM VIEW	9QT

- Pin 1 - Triode Cathode
Pin 2 - Beam Power Grid No.1
Pin 3 - Beam Power Cathode &
Grid No.3
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Beam Power Plate
Pin 7 - Beam Power Grid No.2
Pin 8 - Triode Plate
Pin 9 - Triode Grid



Characteristics, Class A₁ Amplifier:

	Triode Unit		Beam Power Unit		
Plate Voltage	250	50	135	120	volts
Grid-No.2 Voltage	-	120	120	Connected to plate at socket	volts
Grid-No.1 Voltage	-3	0	-10	-10	volts
Amplification Factor	64	-	-	7	



6KY8

	Triode Unit	Beam Power Unit	
Plate Resistance (Approx.)	40000	-	18000 ohms
Transconductance.	1600	-	8400 μ mhos
Plate Current	1.4	170 ^c	39 ma
Grid-No.2 Current	-	20 ^c	3 ma
Grid-No.1 Voltage (Approx.) for plate ma = 1.	-	-	- 24 volts

VERTICAL-DEFLECTION OSCILLATOR (Triode Unit)

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC Plate Voltage.	330 max.	volts
Peak Negative-Pulse Grid Voltage.	400 max.	volts
Peak Cathode Current.	77 max.	ma
Average Cathode Current	22 max.	ma
Plate Dissipation	1.5 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias operation. 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER (Beam Power Unit)

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC Plate Voltage.	300 max.	volts
Peak Positive-Pulse Plate Voltage ^e	2000 abs.max.	volts
DC Grid-No.2 (Screen-Grid) Voltage.	150 max.	volts
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage.	250 max.	volts
Peak Cathode Current.	200 max.	ma
Average Cathode Current	70 max.	ma
Plate Dissipation	12 max.	watts
Grid-No.2 Input	1.9 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation. 2.2 max. megohms

^a The dc component must not exceed 100 volts.

^b without external shield.

^c This value can be measured by a method involving a recurrent wave form such that the plate dissipation and grid-no.2 input will be kept within ratings in order to prevent damage to the tube.

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

^e This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

DIMENSIONAL OUTLINE & CURVES

shown under Type 15KY8 also apply to the 6KY8



High-Mu Triode-Beam Power Tube

NOVAR TYPE

For Combined Vertical-Deflection Oscillator
and Amplifier Service in TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.100	amp
Peak heater-cathode voltage (Each unit): ^a		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^a max.	volts

Direct Interelectrode Capacitances (Approx.):^b

Triode Unit:

Grid to plate	0.44	pf
G _T to (K _T , H)	15.0	pf
P _T to (K _T , H)	7.0	pf

Beam Power Unit:

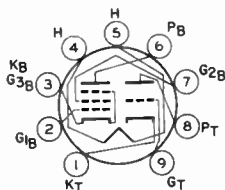
Grid No.1 to plate	0.048	pf
G _{1B} to (K _B +G _{3B} , G _{2B} , H)	2.6	pf
P _B to (K _B +G _{3B} , G _{2B} , H)	0.28	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.380"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See General Section
Bulb	T9
Base	Small Button Novar 9-Pin with Exhaust Tip (JFDEC No. E9-B9)

Basing Designation for BOTTOM VIEW 9QT

- Pin 1—Triode Cathode
- Pin 2—Beam Power Grid No.1
- Pin 3—Beam Power Cathode & Grid No.3
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Beam Power Plate
- Pin 7—Beam Power Grid No.2
- Pin 8—Triode Plate
- Pin 9—Triode Grid



Characteristics, Class A₁ Amplifier:

	Triode Unit		Beam Power Unit		
Plate Voltage	250	50	135	120	volts
Grid-No.2 Voltage	-	120	120	Connected volts to plate at socket	
Grid-No.1 Voltage	-3	0	-10	-10	volts
Amplification Factor	64	-	-	7	



6KY8A

	Triode Unit		Beam Power Unit		
Plate Resistance (Approx.).	40000	-	18000	-	ohms
Transconductance.	1600	-	8400	-	μ mhos
Plate Current	1.4	170 ^c	39	-	ma
Grid-No.2 Current	-	20 ^c	3	-	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	-	-	-24	-	volts

VERTICAL-DEFLECTION OSCILLATOR (Triode Unit)

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC Plate Voltage.	330 max.	volts
Peak Negative-Pulse Grid Voltage.	400 max.	volts
Peak Cathode Current.	77 max.	ma
Average Cathode Current	22 max.	ma
Plate Dissipation	1.5 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias operation. . . . 2.2 max. megohms

VERTICAL-DEFLECTION AMPLIFIER (Beam Power Unit)

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system^d

DC Plate Voltage.	300 max.	volts
Peak Positive-Pulse Plate Voltage ^e	2000 abs.max.	volts
DC Grid-No.2 (Screen-Grid) Voltage.	150 max.	volts
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage.	250 max.	volts
Peak Cathode Current.	200 max.	ma
Average Cathode Current	70 max.	ma
Plate Dissipation	12 max.	watts
Grid-No.2 Input	1.9 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation. . . . 2.2 max. megohms

^a The dc component must not exceed 100 volts.

^b without external shield.

^c This value can be measured by a method involving a recurrent wave form such that the plate dissipation and grid-No.2 input will be kept within ratings in order to prevent damage to the tube.

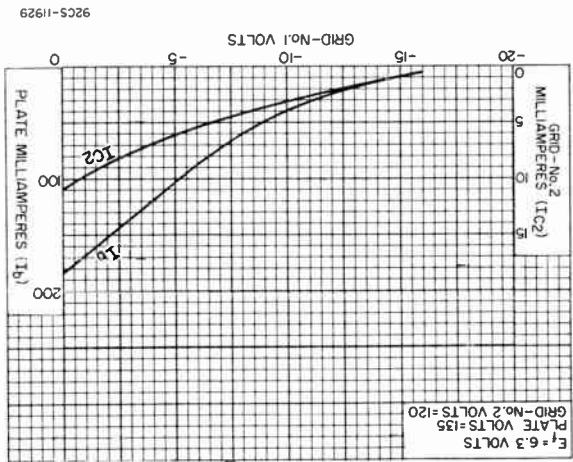
^d As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

^e This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



6KY8A

AVERAGE CHARACTERISTICS Beam Power Unit



92CS-11929

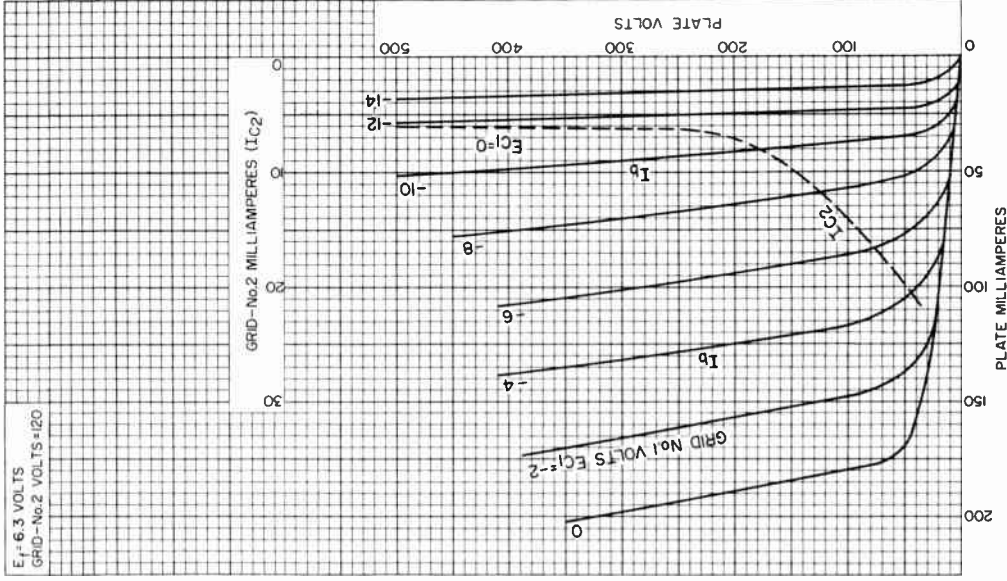


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Harrison, N. J.

DATA 2
10-64

6KY8A

AVERAGE CHARACTERISTICS Beam Power Unit

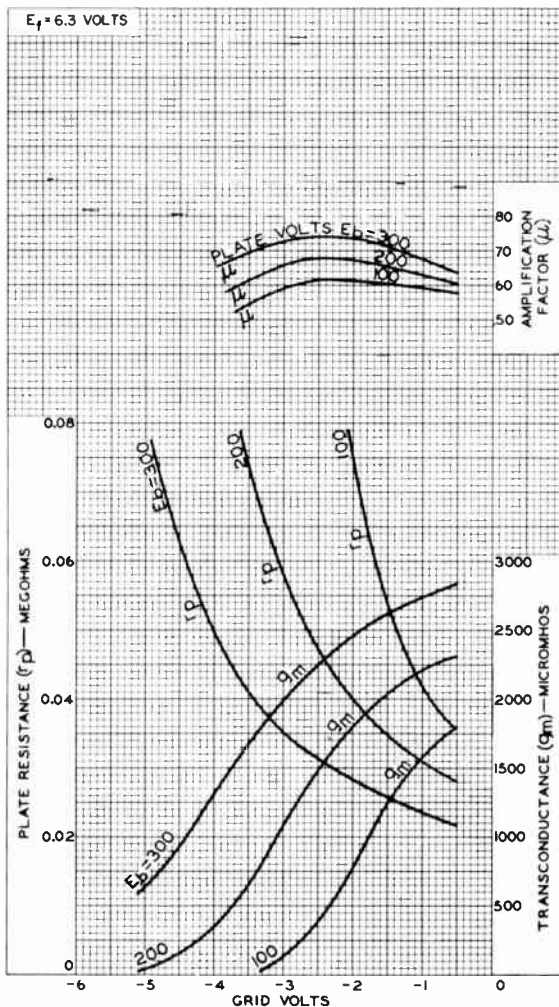


92CM-11942

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.



AVERAGE CHARACTERISTICS Triode Unit

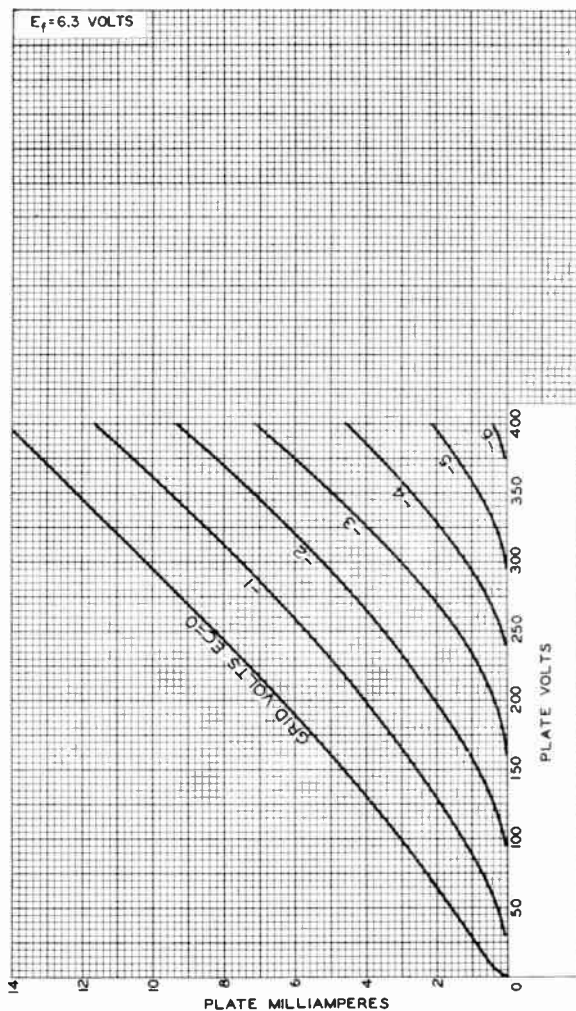


92CM-11945



6KY8A

AVERAGE CHARACTERISTICS Triode Unit



92CM-11944



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Oscillator-Mixer Service in VHF TV-Tuner Applications

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ^a	6.3 ± 0.6 volt ^c
Current	0.450 ± 0.030	0.450 ^b amp
Warm-up time (Average)	11	— sec

Peak heater-cathode voltage^c (Each Unit).

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^c max.	volt ^c

Direct Interelectrode Capacitances:^d

Triode Unit:

G _T to P _T	1.0	pf
Input: G _T to (K _T , G _{3P} + K _P + IS, H)	3.2	pf
Output: P _T to (K _T , G _{3P} + K _P + IS, H)	1.8	pf

Pentode Unit:

G _{1P} to P _P	0.01 max.	pf
Input: G _{1P} to (K _P + G _{3P} + IS, G _{2P} , H)	5.5	pf
Output: P _P to (K _P + G _{3P} + IS, G _{2P} , H)	3.4	pf
Heater to cathode (Each Unit)	3.2	pf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	—	125	volts
Grid-No.1 Voltage	-1	-1	volt
Amplification Factor	46	—	
Plate Resistance (Approx.)	5400	200000	ohms
Transconductance	8500	7500	μmhos
Plate Current	13.5	12	ma
Grid-No.2 Current	—	4	ma
Grid-No.1 Voltage (Approx.) for plate μA = 10	-8	-8	volts

Mechanical:

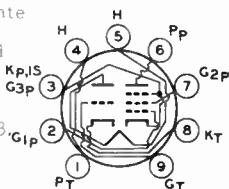
Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)



6KZ8

Basing Designation for BOTTOM VIEW. 9F7

- Pin 1 - Triode Plate
- Pin 2 - Pentode
Grid No. 1
- Pin 3 - Pentode
Cathode,
Pentode
Grid No. 3,
Internal
Shield
- Pin 4 - Heater



- Pin 5 - Heater
- Pin 6 - Pentode
Plate
- Pin 7 - Pentode
Grid No. 2
- Pin 8 - Triode
Cathode
- Pin 9 - Triode
Grid

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
Plate Voltage.	330 max.	330 max.	volts
Grid-No. 2 (Screen-Grid) Supply Voltage	-	330 max.	volts
Grid-No. 2 Voltage.	See <i>Grid-No. 2 Input Rating Chart</i> at front of Receiving Tube Section		
Grid-No. 1 (Control-Grid) Voltage:			
Positive-bias value.	0 max.	0 max.	volts
Plate Dissipation.	2.5 max.	2.5 max.	watts
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 <i>Grid-No. 2 Input Rating Chart</i> at front of Receiving Tube Section		

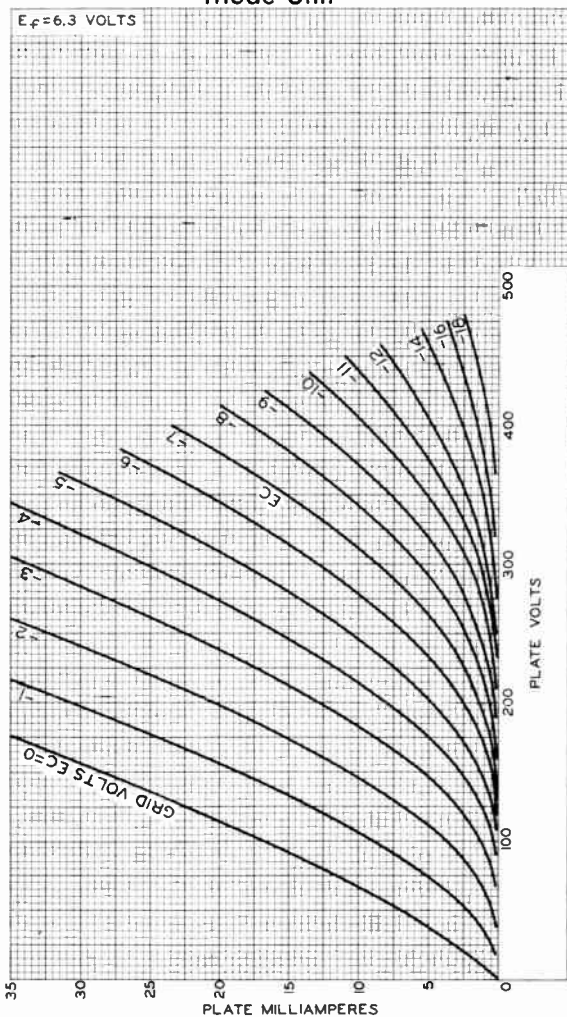
Maximum Circuit Values:

Grid-No. 1-Circuit Resistance:			
For fixed-bias operation.	0.25 max.	0.25 max.	megohm
For cathode-bias operation.	0.5 max.	0.5 max.	megohm

- ^a At heater amperes = 0.450.
- ^b At heater volts = 6.3.
- ^c The dc component must not exceed 100 volts.
- ^d With external shield JEDEC No. 315 connected to cathode of unit under test.



AVERAGE PLATE CHARACTERISTICS Triode Unit

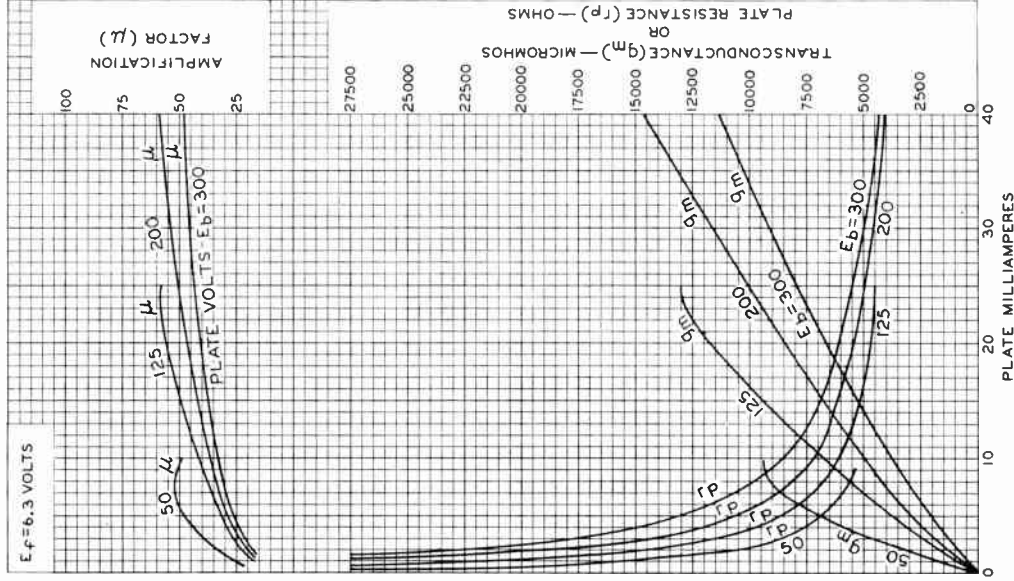


92CM-10421R1



6KZ8

AVERAGE CHARACTERISTICS Triode Unit



ELECTRON TUBE DIVISION

92CM-10428

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

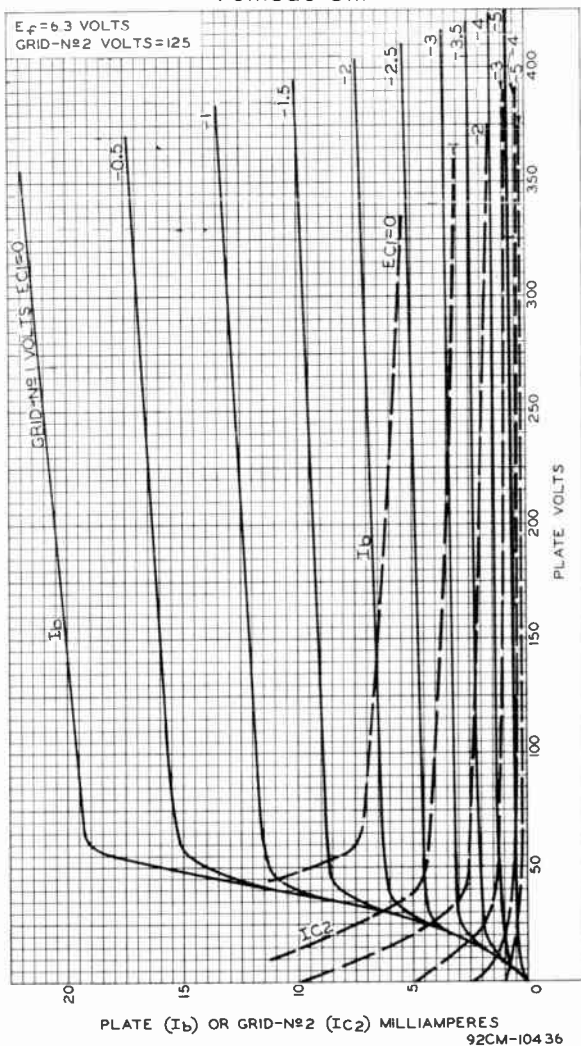
RADIO CORPORATION OF AMERICA
Electronic Components and Devices

Harrison, N. J.



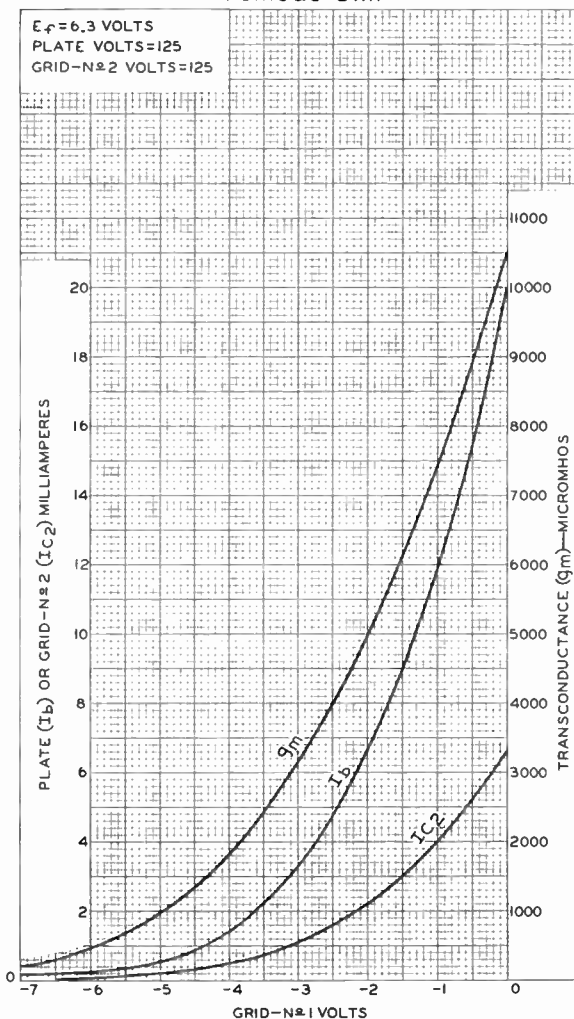
AVERAGE CHARACTERISTICS

Pentode Unit



6KZ8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-10417

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.





6L5-G

6L5-G

DETECTOR AMPLIFIER TRIODE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances: [ⓐ]		
Grid to Plate	2.7	μmf
Grid to Cathode	3.0	μmf
Plate to Cathode	5.0	μmf
Maximum Overall Length		4-1/8"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small Shell Octal 6-Pin
Pin 1-No Connection		Pin 5-Grid
Pin 2-Heater		Pin 7-Heater
Pin 3-Plate		Pin 8-Cathode



BOTTOM VIEW

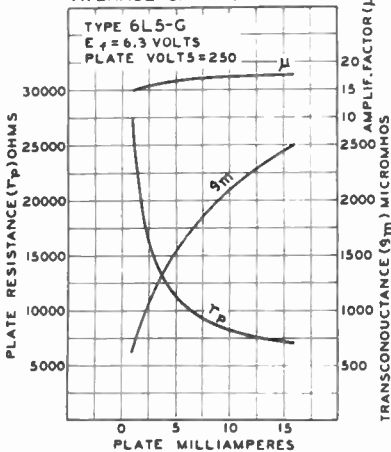
AMPLIFIER - Class A

Operating Conditions and Characteristics:

Heater	6.3	6.3	volts
Plate	135	250 max.	volts
Grid	-5	-9	volts
Amp. Fact.	17	17	
Plate Res.	11200	9000	ohms
Transcond.	1500	1900	μmhos
Plate Cur.	3.5	8	ma.
Grid Bias **	-11	-20	approx.volts

- ** For cathode current cut-off.
- * 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 tight-fitting shield.

AVERAGE CHARACTERISTICS



92C-4894

APRIL 20, 1938

RCA RADIODRON DIVISION
RCA MANUFACTURING COMPANY INC

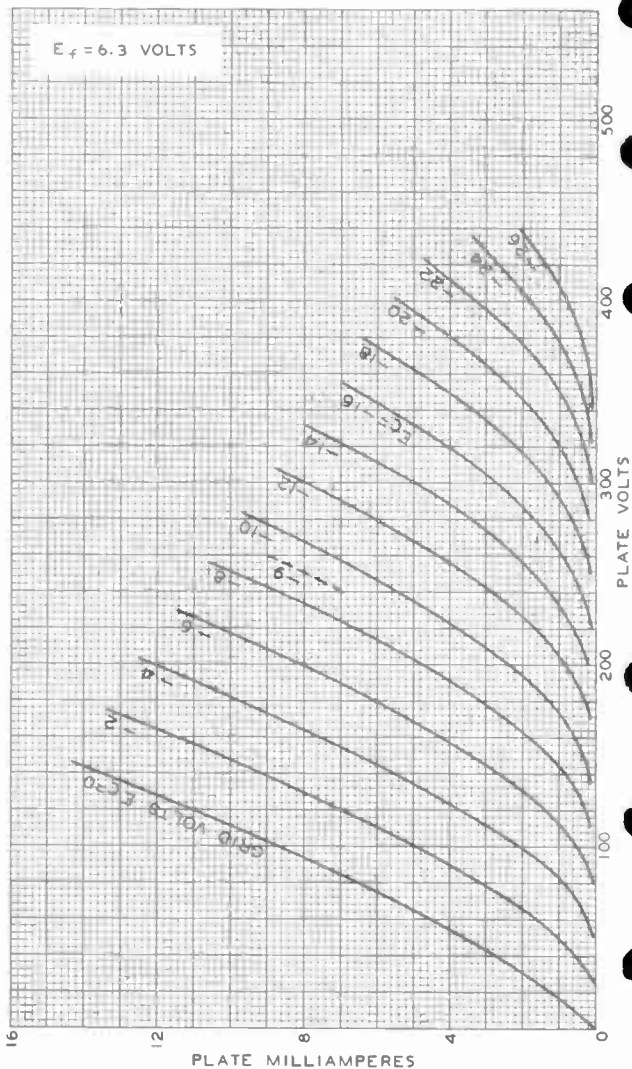
DATA

6L5-G



6L5-G

AVERAGE PLATE CHARACTERISTICS



MARCH 8, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.
World Radio History

92C-4893



6L6
6L6-G

6L6, 6L6-G

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.9	amp

Direct Interelectrode Capacitances (Approx.):

	6L6 ^o	6L6-G ^{oo}	
Grid No.1 to plate . .	0.4	0.9	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater	10	11.5	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater	12	9.5	$\mu\mu\text{f}$

Mechanical:

	6L6	6L6-G
Mounting Position	Any	Any
Maximum Overall Length . .	4-5/16"	5-5/16"
Maximum Seated Length . .	3-3/4"	4-3/4"
Maximum Diameter	1-5/8"	2-1/16"
Bulb	Metal Shell MT-10	ST-16
Base	Small-Wafer	Medium-Shell
	Octal 7-Pin (JETEC No. B7-22)	Octal 7-Pin (JETEC No. B7-12)
Basing Designation	7AC	G-7AC

Pin 1 { 6L6, Shell
6L6-G, No Conn.
Pin 2 - Heater
Pin 3 - Plate



Pin 4 - Grid No.2
Pin 5 - Grid No.1
Pin 7 - Heater
Pin 8 - Cathode,
Grid No.3

AF POWER AMPLIFIER - Class A₁ †

Triode Connection - Grid No.2 Connected to Plate

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	275 max.	volts
PLATE DISSIPATION	19 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . .	180 max.	volts
Heater positive with respect to cathode . .	180 max.	volts

Typical Operation and Characteristics:

	Fixed Bias	Cathode Bias	
Plate Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	-20	-	volts
Cathode-Bias Resistor	-	490	ohms

^o, ^{oo}, †: See next page.

→ Indicates a change.

6L6
6L6-G



6L6, 6L6-G

BEAM POWER TUBE

	Fixed Bias	Cathode Bias	
Peak AF Grid-No.1 Voltage . . .	20	20	volts
Zero-Signal Plate Current . . .	40	40	ma
Max.-Signal Plate Current . . .	44	42	ma
Amplification Factor	8	-	
Plate Resistance (Approx.) . . .	1700	-	ohms
Transconductance	4700	-	μmhos
Load Resistance	5000	6000	ohms
Total Harmonic Distortion . . .	5	6	%
Max.-Signal Power Output . . .	1.4	1.3	watts

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:

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

AF POWER AMPLIFIER - Class A₁†

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	360 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	270 max.	volts
PLATE DISSIPATION	19 max.	watts
GRID-No.2 INPUT	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

→ **Typical Operation and Characteristics:**

Fixed-Bias Operation

Plate Voltage	200	250	300	350	volts
Grid-No.2 Voltage	200	250	200	250	volts
Grid-No.1 Voltage	-11.5	-14	-12.5	-18	volts
Peak AF Grid-No.1 Voltage	11.5	14	12.5	18	volts
Zero-Signal Plate Current	52	72	48	54	ma
Max.-Signal Plate Current	57	79	55	66	ma
Zero-Signal Grid-No.2 Current	3.5	5.0	2.5	2.5	ma
Max.-Signal Grid-No.2 Current	5.7	7.3	4.7	7.0	ma
Plate Resistance (Approx.)	35000	22500	35000	33000	ohms
Transconductance	5300	6000	5300	5200	μmhos
Load Resistance	3000	2500	4500	4200	ohms
Total Harmonic Distortion	9	10	11	15	%
Max.-Signal Power Output	4	6.5	6.5	10.8	watts

Cathode-Bias Operation

Plate Voltage	200	250	300	volts
Grid-No.2 Voltage	200	250	200	volts

° With shell connected to cathode.

∞∞ With no external shield.

†: See next page.

→ indicates a change.

NOV. 5, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA 1



6L6, 6L6-G

6L6
6L6-G

BEAM POWER TUBE

Cathode-Bias Resistor	186	167	218	ohms
Peak AF Grid-No.1 Voltage	11.5	14	12.7	volts
Zero-Signal Plate Current	55	75	51	ma
Max.-Signal Plate Current	56	78	54.5	ma
Zero-Signal Grid-No.2 Current	4.2	5.4	3.0	ma
Max.-Signal Grid-No.2 Current	5.6	7.2	4.6	ma
Load Resistance	3000	2500	4500	ohms
Total Harmonic Distortion	9	10	11	%
Max.-Signal Power Output	4	6.5	6.5	watts

Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance:

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

PUSH-PULL AF POWER AMPLIFIER - Class A₁†

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE	360 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	270 max.	volts
PLATE DISSIPATION	19 max.	watts
GRID-No.2 INPUT	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

	Fixed Bias		Cathode Bias		
Plate Voltage	250	270	250	270	volts
Grid-No.2 Voltage	250	270	250	270	volts
Grid-No.1 Voltage	-16	-17.5	-	-	volts
Cathode-Bias Resistor	-	-	124	124	ohms
Peak AF Grid-No.1-to-					
Grid-No.1 Voltage	32	35	35.6	28.2	volts
Zero-Signal Plate Current	120	134	120	134	ma
Max.-Signal Plate Current	140	155	130	145	ma
Zero-Signal Grid-No.2					
Current	10	11	10	11	ma
Max.-Signal Grid-No.2					
Current	16	17	15	17	ma
Plate Resistance (Per tube)					
(Approx.)	24500	23500	-	-	ohms
Transconductance (Per tube)	5500	5700	-	-	μmhos
Effective Load Resistance					
(Plate to plate)	5000	5000	5000	5000	ohms
Total Harmonic Distortion	2	2	2	2	%
Max.-Signal Power Output.	14.5	17.5	13.8	18.5	watts

†: See next page.

← indicates a change

6L6
6L6-G



6L6, 6L6-G BEAM POWER TUBE

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:
 For fixed-bias operation 0.1 max. megohm
 For cathode-bias operation 0.5 max. megohm

PUSH-PULL AF POWER AMPLIFIER - Class AB₁†

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE 360 max. volts
 GRID-No.2 (SCREEN) VOLTAGE 270 max. volts
 PLATE DISSIPATION 19 max. watts
 GRID-No.2 INPUT 2.5 max. watts

→ **PEAK HEATER-CATHODE VOLTAGE:**

Heater negative with respect to cathode . 180 max. volts
 Heater positive with respect to cathode . 180 max. volts

→ **Typical Operation:**

Values are for 2 tubes

	Fixed Bias		Cathode Bias	
Plate Voltage	360	360	360	volts
Grid-No.2 Voltage	270	270	270	volts
Grid-No.1 Voltage	-22.5	-22.5	-	volts
Cathode-Bias Resistor	-	-	248	ohms
Peak AF Grid-No.1-to-				
Grid-No.1 Voltage	45	45	40.6	volts
Zero-Signal Plate Current	88	88	88	ma
Max.-Signal Plate Current	132	140	100	ma
Zero-Signal Grid-No.2				
Current	5	5	5	ma
Max.-Signal Grid-No.2				
Current	15	11	17	ma
Effective Load Resistance				
(Plate to plate)	6600	3800	9000	ohms
Total Harmonic Distortion	2	2	4	%
Max.-Signal Power Output	26.5	18	24.5	watts

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:▲
 For fixed-bias operation 0.1 max. megohm
 For cathode-bias operation 0.5 max. megohm

PUSH-PULL AF POWER AMPLIFIER - Class AB₂♦

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE 360 max. volts
 GRID-No.2 (SCREEN) VOLTAGE 270 max. volts
 PLATE DISSIPATION 19 max. watts
 GRID-No.2 INPUT 2.5 max. watts

▲, †, ♦: see next page.

→ indicates a change.



6L6
6L6-G

6L6, 6L6-G BEAM POWER TUBE

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . 180 max. volts
 Heater positive with respect to cathode. . . 180 max. volts

Typical Operation:

Values are for 2 tubes

	<i>Fixed Bias</i>		
Plate Voltage.	360	360	volts
Grid No.2 Voltage.	225	270	volts
Grid-No.1 Voltage.	-18	-22.5	volts
Peak AF Grid-No.1-to Grid-No.1 Voltage	52	72	volts
Zero-Signal Plate Current.	78	88	ma
Max.-Signal Plate Current.	142	205	ma
Zero-Signal Grid-No.2 Current.	3.5	5	ma
Max.-Signal Grid-No.2 Current.	11	16	ma
Effective Load Resistance (Plate to plate).	6000	3800	ohms
Peak Grid-Input Power.	140	270	mw
Total Harmonic Distortion.	2	2	%
Max.-Signal Power Output	31	47	watts

Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance†:

For fixed-bias operation 0.1 max. megohm
 For cathode-bias operation Not recommended

† Subscript 1 indicates that grid-No.1 current does not flow during any part of input cycle.

♦ Subscript 2 indicates that grid-No.1 current flows during some part of input cycle.

‡ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB₂ stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB₂ stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

▲ The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

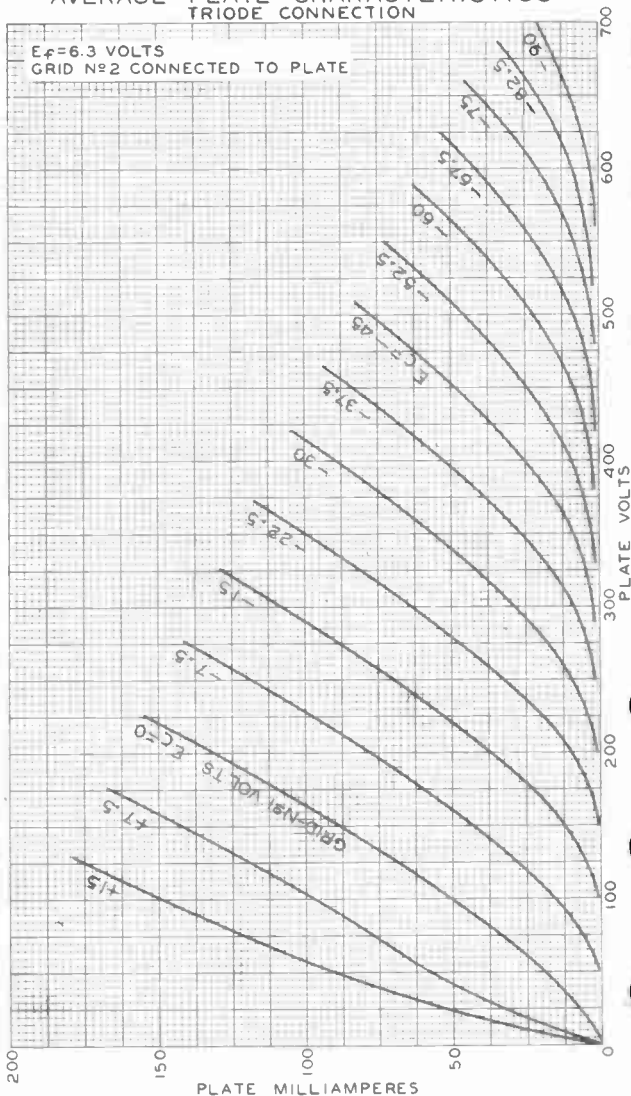
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6L6



6L6

AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



SEPT. 6 1938

PLATE MILLIAMPERES
TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-4966RI



6L6

6L6

AVERAGE PLATE CHARACTERISTICS WITH E_{C1} AS VARIABLE

$E_f = 6.3$ VOLTS

SCREEN VOLTS = 250

LOAD LINE CORRECTED TO COMPENSATE FOR EFFECTS OF RECTIFICATION WITH LARGE SIGNALS

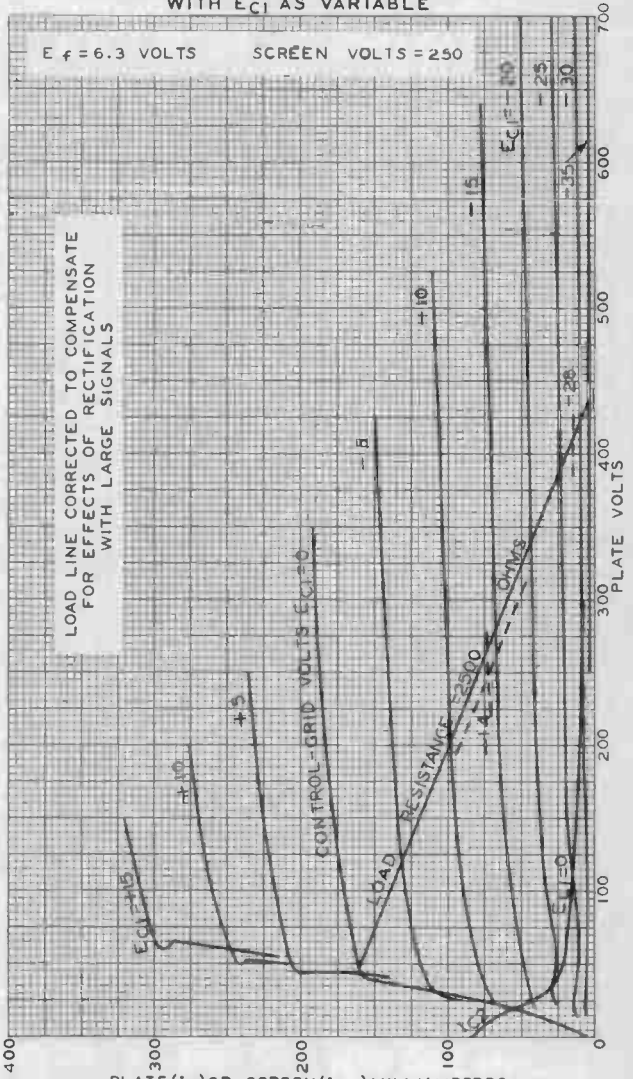


PLATE (I_b) OR SCREEN (I_{C2}) MILLIAMPERES

MAY 6, 1936

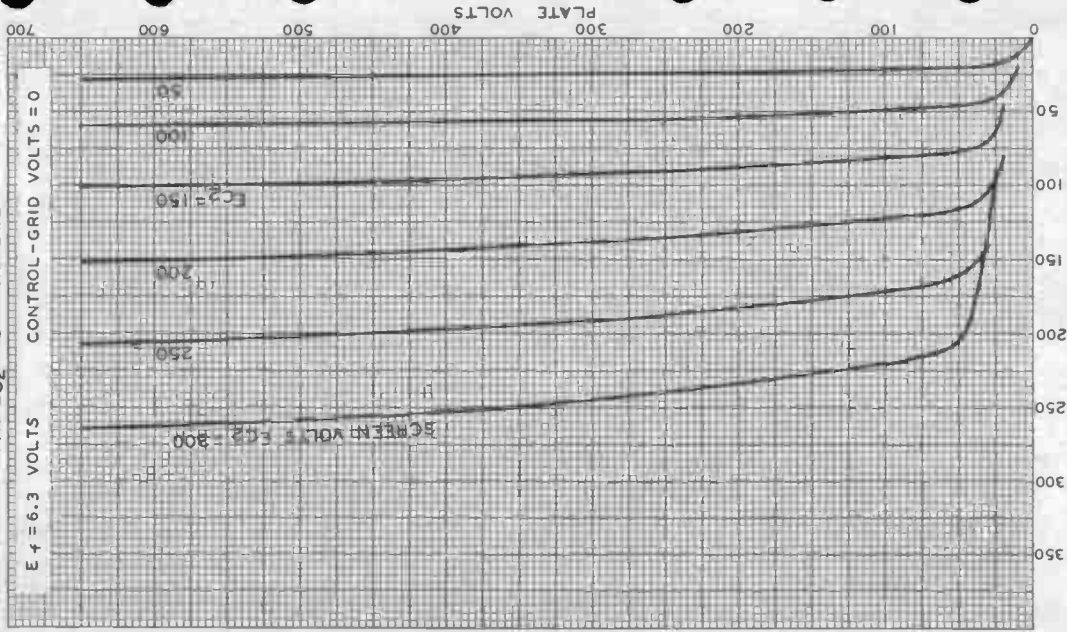
RCA RADIONRON DIVISION
RCA MANUFACTURING COMPANY INC.

92C-4581R1



6L6

AVERAGE PLATE CHARACTERISTICS WITH EC2 AS VARIABLE



92C-4580R1

PLATE MILLIAMPERES

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

MAY 8, 1936

6L6

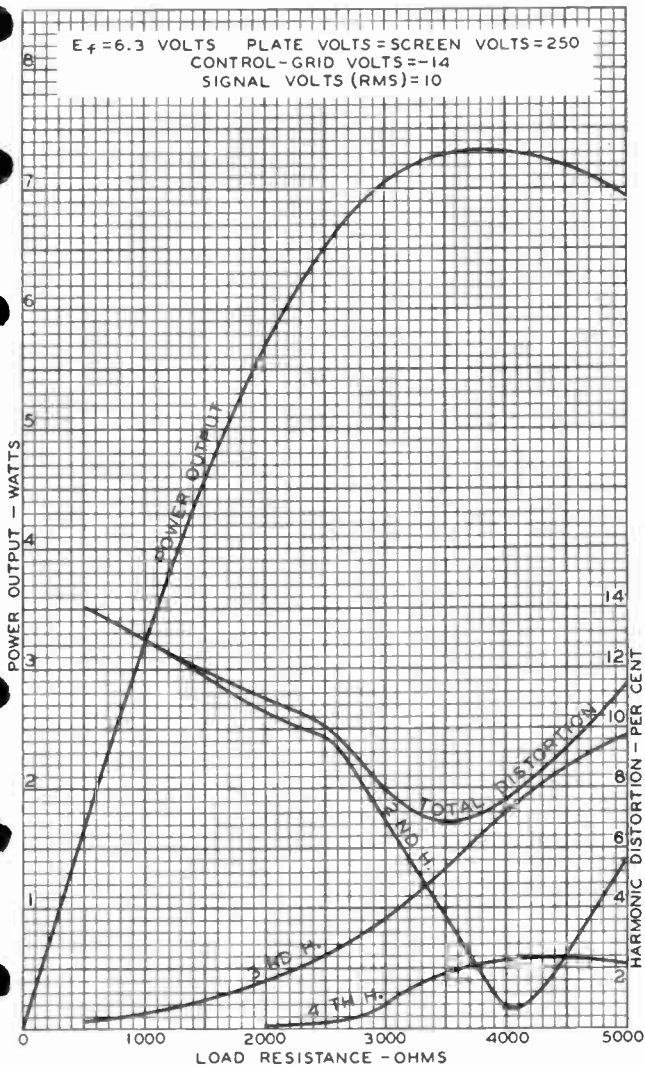


6L6

6L6

OPERATION CHARACTERISTICS

$E_f = 6.3$ VOLTS PLATE VOLTS = SCREEN VOLTS = 250
CONTROL-GRID VOLTS = -14
SIGNAL VOLTS (RMS) = 10



MAY 7, 1936

RCA RADOTRON DIVISION
RCA MANUFACTURING COMPANY INC

92C-4608

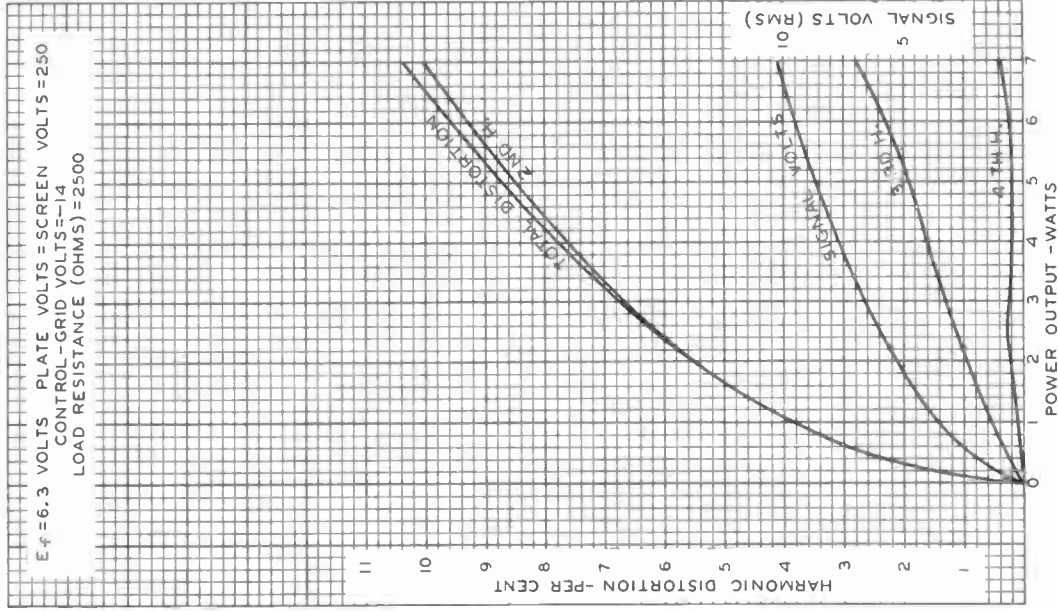
6L6



6L6

OPERATION CHARACTERISTICS

$E_f = 6.3$ VOLTS PLATE VOLTS = SCREEN VOLTS = 250
 CONTROL-GRID VOLTS = -14
 LOAD RESISTANCE (OHMS) = 2500



MAY 7, 1936

 RCA RADIOTRON DIVISION
 RCA MANUFACTURING COMPANY INC.

92C-4609

Beam Power Tube

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.9	amp

Direct Interelectrode Capacitances

(Approx.):[▲]

Grid-No.1 to plate	0.6	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	10	μf
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μf

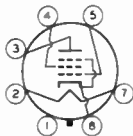
Characteristics, Class A₁ Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	-14	volts
Plate Resistance (Approx.)	22500	ohms
Transconductance	6000	μmhos
Plate Current	72	ma
Grid-No.2 Current	5	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	4-1/4"
Maximum Seated Length	3-11/16"
Diameter	1.438" to 1.562"
Bulb	T-12
Base	Medium-Shell Octal 7-Pin (JEDEC Group 1, No.B7-12), Short Medium-Shell Octal 7-Pin with External Barriers Style A (JEDEC Group 1, No.B7-111) or Style B (JEDEC Group 1, No.B7-119), or Short Medium-Shell Octal 6-Pin with External Barriers Style A (JEDEC Group 1, No.B6-148) or Style B (JEDEC Group 1, No.B6-122)
Basing Designation for BOTTOM VIEW	7AC

- Pin 1 • - no Connection
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode,
Grid No.3

AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	500	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	450	max.	volts
GRID-No.2 INPUT	5	max.	watts
PLATE DISSIPATION	30	max.	watts



6L6-GC

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts
 Heater positive with respect to cathode. 200★ max. volts

Typical Operation and Characteristics:

Fixed-Bias Operation

Plate Voltage.	200	250	300	350	volts
Grid-No.2 Voltage.	200	250	200	250	volts
Grid-No.1 (Control-Grid) Voltage.	-11.5	-14	-12.5	-18	volts
Peak AF Grid-No.1 Voltage.	11.5	14	12.5	18	volts
Zero-Signal Plate Current.	52	72	48	54	ma
Max.-Signal Plate Current.	57	79	55	66	ma
Zero-Signal Grid-No.2 Current.	3.5	5	2.5	2.5	ma
Max.-Signal Grid-No.2 Current.	5.7	7.3	4.7	7	ma
Plate Resistance (Approx.).	35000	22500	35000	33000	ohms
Transconductance	5300	6000	5300	5200	μmhos
Load Resistance.	3000	2500	4500	4200	ohms
Total Harmonic Distortion.	9	10	11	15	%
Max.-Signal Power Output	4	6.5	6.5	10.8	watts

Cathode-Bias Operation

Plate Supply Voltage	200	250	300	volts
Grid-No.2 Supply Voltage	200	250	200	volts
Cathode Resistor	186	167	218	ohms
Peak AF Grid-No.1 Voltage.	11.5	14	12.7	volts
Zero-Signal Plate Current.	55	75	51	ma
Max.-Signal Plate Current.	56	78	54.5	ma
Zero-Signal Grid-No.2 Current.	4.2	5.4	3	ma
Max.-Signal Grid-No.2 Current.	5.6	7.2	4.6	ma
Load Resistance.	3000	2500	4500	ohms
Total Harmonic Distortion.	9	10	11	%
Max.-Signal Power Output	4	6.5	6.5	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

AF POWER AMPLIFIER — Class A₁

Triode Connection — Grid No.2 Connected to Plate

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	450	max.	volts
PLATE DISSIPATION.	30	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200★	max.	volts



Typical Operation and Characteristics:

	Fixed Bias	Cathode Bias	
Plate Supply Voltage.	250	250	volts
Grid-No.1 (Control-Grid) Voltage. . .	-20	-	volts
Cathode Resistor.	-	490	ohms
Peak AF Grid-No.1 Voltage	20	20	volts
Zero-Signal Plate Current	40	40	ma
Maximum-Signal Plate Current.	44	42	ma
Plate Resistance (Approx.).	1700	-	ohms
Amplification Factor,	8	-	
Transconductance.	4700	-	μ hos
Load Resistance	5000	6000	ohms
Total Harmonic Distortion	5	6	%
Maximum-Signal Power Output	1.4	1.3	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

PUSH-PULL AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	500 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	450 max.	volts
GRID-No.2 INPUT.	5 max.	watts
PLATE DISSIPATION.	30 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	200 max.	volts
Heater positive with respect to cathode. .	200* max.	volts

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

	Fixed Bias		Cathode Bias		
Plate Supply Voltage.	250	270	250	270	volts
Grid-No.2 Supply Voltage.	250	270	250	270	volts
Grid-No.1 Voltage	-16	-17.5	-	-	volts
Cathode Resistor.	-	-	124	124	ohms
Peak AF Grid-No.1-to-					
Grid-No.1 Voltage	32	35	35.6	28.2	volts
Zero-Signal Plate Current.	120	134	120	134	ma
Max.-Signal Plate Current	140	155	130	145	ma
Zero-Signal Grid-No.2					
Current	10	11	10	11	ma
Max.-Signal Grid-No.2					
Current	16	17	15	17	ma
Plate Resistance (Approx., per tube)	24500	23500	-	-	ohms
Transconductance (Per tube).	5500	5700	-	-	μ hos
Effective Load Resistance (Plate to plate).	5000	5000	5000	5000	ohms
Total Harmonic Distortion	2	2	2	2	%
Max.-Signal Power Output.	14.5	17.5	13.8	18.5	watts



6L6-GC

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

PUSH-PULL AF POWER AMPLIFIER — Class AB₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE 500 max. volts
 GRID-No.2 VOLTAGE 450 max. volts
 GRID-No.2 INPUT 5 max. watts
 PLATE DISSIPATION 30 max. watts
 PEAK HEATER-CATHODE VOLTAGE:
 Heater negative with respect to cathode . 200 max. volts
 Heater positive with respect to cathode . 200* max. volts

Typical Operation:

Values are for 2 tubes

	Fixed Bias			Cathode	
				Bias	
Plate Supply Voltage.	360	450	450	360	volts
Grid-No.2 Supply Voltage.	270	350	400	270	volts
Grid-No.1 (Control-Grid) Voltage.	-22.5	-30	-37	-	volts
Cathode Resistor.	-	-	-	248	ohms
Peak Af Grid-No.1-to-					
Grid-No.1 Voltage	45	60	70	40.6	volts
Zero-Signal Plate Current.	88	95	116	88	ma
Max.-Signal Plate Current	132	194	210	100	ma
Zero-Signal Grid-No.2 Current	5	3.4	5.6	5	ma
Max.-Signal Grid-No.2 Current	15	19.2	22	17	ma
Effective Load Resistance (Plate to plate).	6600	6000	5600	9000	ohms
Total Harmonic Distortion	2	1.5	1.8	4	%
Max.-Signal Power Output.	26.5	50	55	24.5	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

PUSH-PULL AF AMPLIFIER — Class AB₂

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. 500 max. volts
 GRID-No.2 (SCREEN-GRID) VOLTAGE. 450 max. volts
 GRID-No.2 INPUT 5 max. watts
 PLATE DISSIPATION. 30 max. watts
 PEAK HEATER-CATHODE VOLTAGE:
 Heater negative with respect to cathode. . 200 max. volts
 Heater positive with respect to cathode. . 200* max. volts



Typical Operation:

Values are for 2 tubes

	Fixed Bias		
Plate Voltage.	360	360	volts
Grid-No.2 Voltage.	225	270	volts
Grid-No.1 (Control-Grid) Voltage [▲]	-18	-22.5	volts
Peak AF Grid-No.1 to Grid-No.1 Voltage.	52	72	volts
Zero-Signal Plate Current.	78	88	ma
Max.-Signal Plate Current.	142	205	ma
Zero-Signal Grid-No.2 Current.	3.5	5	ma
Max.-Signal Grid-No.2 Current.	11	16	ma
Effective Load Resistance (Plate to plate).	6000	3800	ohms
Peak Grid-Input Power [▲]	140	270	mw
Total Harmonic Distortion.	2	2	%
Max.-Signal Power Output	31	47	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:[▲]

- For fixed-bias operation 0.1 max. megohm
- For cathode-bias operation Not recommended

[▲] Without external shield.

● On the 6-pin bases, pin 1 as well as pin 6 is omitted.

★ The dc component must not exceed 100 volts.

◆ In push-pull circuits where grid No.2 of each tube is connected to a tap on the plate winding of the output transformer, it is permissible for this voltage to be as high as 500 volts.

♣ The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

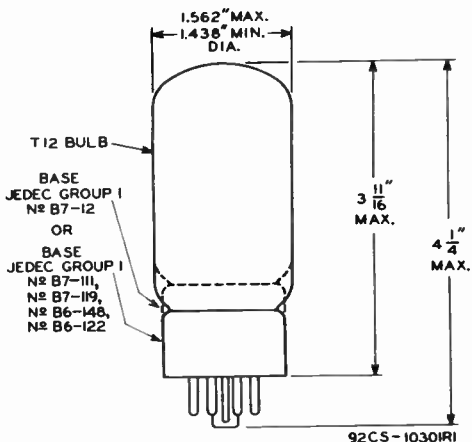
◆ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB₂ stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB₂ stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

OPERATING CONSIDERATIONS

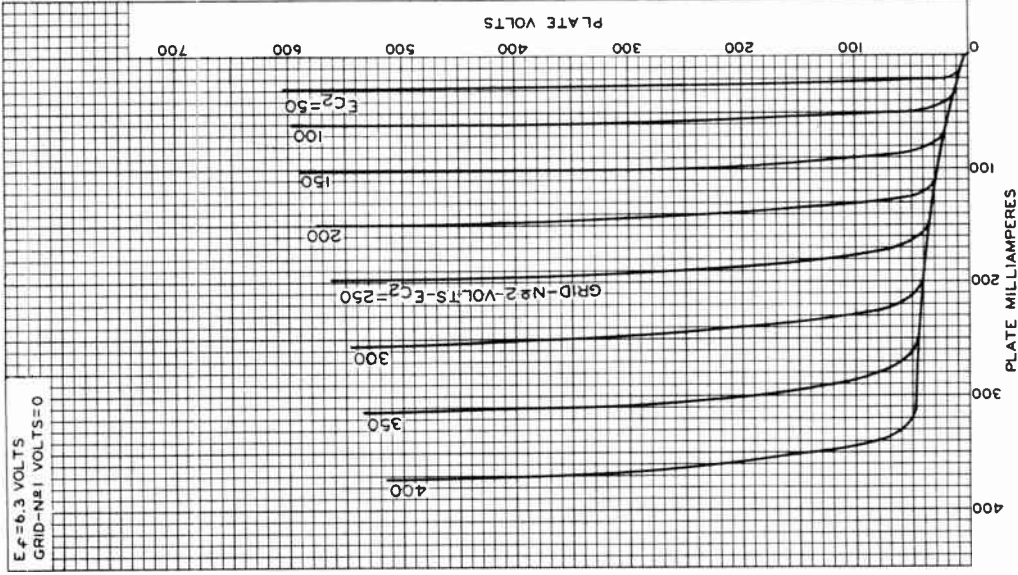
The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided.



6L6-GC



AVERAGE PLATE CHARACTERISTICS



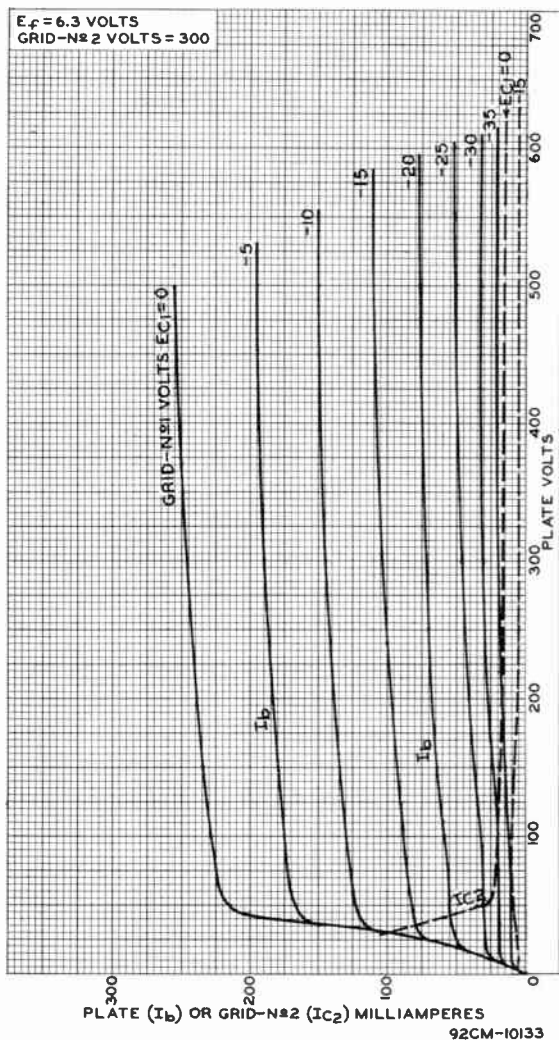
RADIO CORPORATION OF AMERICA
 Electron Tube Division

Harrison, N. J.

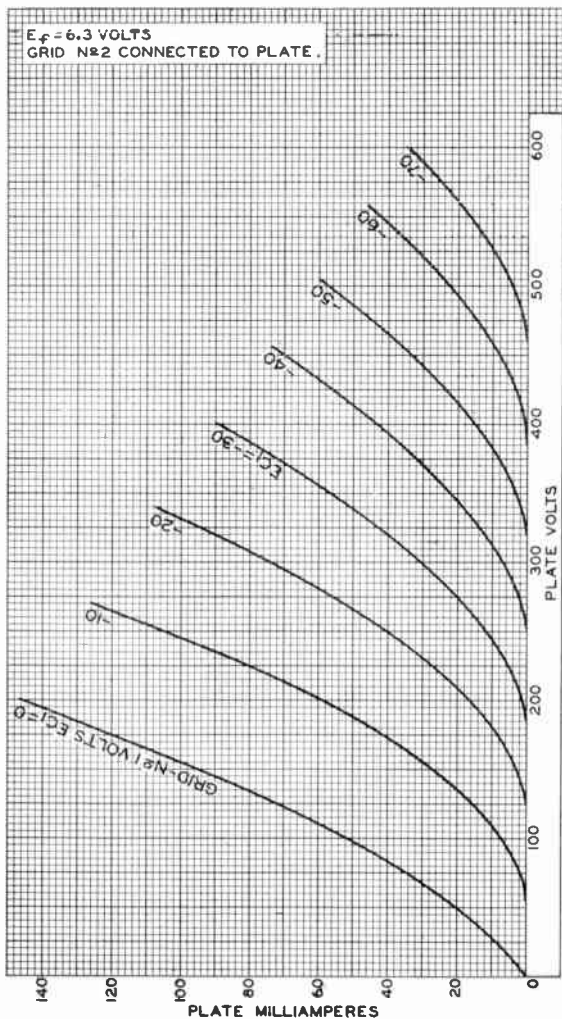
DATA 4
 8-60

6L6-GC

AVERAGE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS Triode Connection

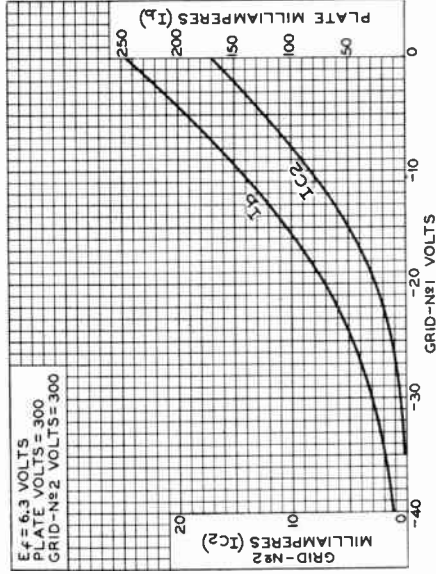


92CM-9568



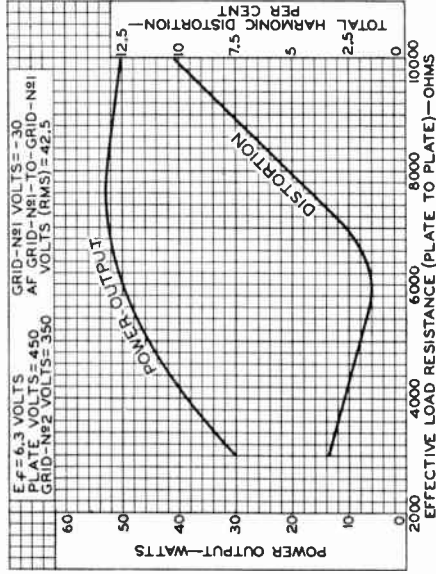
6L6-GC

AVERAGE CHARACTERISTICS



92CS-10126

OPERATION CHARACTERISTICS Push-Pull Class AB₁



92CS-9575



Beam Power Tube

Duodecar Type

For Color-TV Horizontal-Deflection Amplifier
Circuits Using 240 V to over 400 V "B" Supplies

ELECTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc . . .	E_h	6.3	V
Heater Current	I_{h1}	2.25	A
Direct Interelectrode Capacitances: ^a			
Grid No.1 to plate	c_{g1-p}	0.44	pF
Input: G1 to (K, G3, G2, H) . . .	c_i	33	pF
Output: P to (K, G3, G2, H). . .	c_o	18	pF

For the following characteristics, see Conditions below:

Amplification Factor

(Triode Connection) ^b . . .	μ	—	—	—	4 ^c
Plate Resistance (approx.)	r_p	—	—	—	6600 Ω
Transconductance	g_m	—	—	—	13400 μmho
DC Plate Current	I_b	—	900 ^d	560 ^d	105 mA
DC Grid-No.2 Current	I_{c2}	—	110 ^d	46 ^d	2.0 mA
Cutoff DC Grid-No.1 Volt- age for $I_b = 1$ mA	$E_{c1(co)}$	-125	—	—	-40 V

Conditions:

Heater Voltage	E_h	← 6.3 →			V
Peak Positive-Pulse Plate Voltage ^e	e_{bm}	5000	—	—	V
DC Plate Voltage	E_b	—	45	50	150 V
Grid No.3		Connected to cathode at socket			
DC Grid-No.2 Voltage	E_{c2}	110	160	110	110 V
DC Grid-No.1 Voltage	E_{c1}	—	0	—	-20 V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	4.375 in (111.12 mm)
Maximum Seated Length	4.000 in (101.6 mm)
Maximum Diameter	1.563 in (39.7 mm)
Dimensional Outline	JEDEC No.12-90
Envelope	JEDEC T12
Top Cap ^f	Small (JEDEC C1-1 or C1-34)

6LB6

Base Large-Button Duodecar 12-Pin (JEDEC E12-74)
 Terminal Diagram JEDEC 12GJ
 Type of Cathode Coated Unipotential
 Operating Position Any

MAXIMUM RATINGS – Design-Maximum Values⁹

*For operation as a Horizontal-Deflection-Amplifier Tube
 in a 525-line, 30-frame system*

DC Plate Supply Voltage	E_{bb}	990	V
Peak Positive-Pulse Plate Voltage ^h	e_{bm}	7000 ^k	V
Peak Negative-Pulse Plate Voltage	$-e_{bm}$	100	V
DC Grid-No.3 Voltage	E_{c3}	0	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	200	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	$-e_{c1m}$	300	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	±200	V
Average ^m	E_{hk}	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	1100	mA
Average ^m	$I_{k(av)}$	315	mA
Grid-No.2 Input	P_{g2}	5.0	W
Plate Dissipation ⁿ	P_b	30	W
Envelope Temperature	T_E	200 ^p	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	R_{g1}	1.2	M Ω
With Feedback-Type High Voltage Regulation			
Grid-No.1-Circuit Resistance	R_{g1}	10	M Ω
With Shunt-Type High Voltage Regulation			
Grid-No.3-Circuit Resistance	R_{g3}	0	Ω

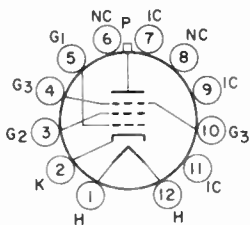
^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.

- ^c Conditions: $E_b = E_{c2} = 125 \text{ V}$, $E_{c1} = -25 \text{ V}$.
- ^d This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- ^e Under pulse-duration condition specified in Footnote h.
- ^f Designed to mate with connector of 0.250-inch cap, generally available from your local RCA distributor.
- ^g As defined in the current issue of EIA Standard RS-239, unless otherwise specified.
- ^h This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is $10 \mu\text{s}$.
- ^k Absolute-Maximum Value.
- ^m Measured with a DC meter.
- ⁿ An adequate bias resistor or other means is required to protect the tube in the absence of excitation.
- ^p This rating is applicable when measurement is made using a thermocouple attached to a 0.1-inch wide phosphor-bronze ring placed at the hottest location on the envelope. A maximum rating of 220°C is applicable to direct thermocouple measurements taken at the hottest point on the envelope surface.

TERMINAL DIAGRAM (Bottom View)

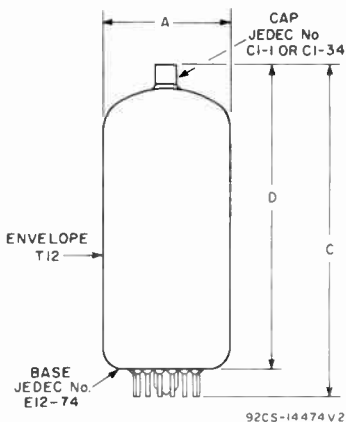
- Pin 1 – Heater
 Pin 2 – Cathode
 Pin 3 – Grid No.2
 Pin 4 – Grid No.3
 Pin 5 – Grid No.1
 Pin 6 – No Internal Connection
 Pin 7 – Do Not Use
 Pin 8 – No Internal Connection
 Pin 9 – Do Not Use
 Pin 10 – Grid No.3
 Pin 11 – Do Not Use
 Pin 12 – Heater
 Cap – Plate



JEDEC 12GJ

6LB6

DIMENSIONAL OUTLINE (JEDEC No.12-90)



DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.437*	1.563	36.5*	39.7
C	—	4.375	—	111.12
D	3.750	4.000	95.3	101.6
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Sync-Separator and Noise-Immune
Gated-AGC-Amplifier Applications in
Color and Black-and White TV Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

voltage (AC or DC)	0.5 ^a	0.3 ± 0.8	volts
Current	1.00 ± 0.010	0.000 ^b	amp
Warm-up time (Average)	11	—	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200 ^c max.		volts

Direct Internal Electrode

Capacitance:^d

Triode Unit:

Grid to plate	2.2	pf
Grid to cathode & pentode grid No.3 & internal shield, and heater	2.8	pf
Plate to cathode & pentode grid No.3 & internal shield, and heater	2.2	pf

Pentode Unit:

Grid No.1 to plate	0.1 max.	pf
Grid No.1 to cathode, triode cathode & grid No.3 & internal shield, grid No.2, and heater	10.0	pf
Grid No.3 & triode cathode & internal shield to plate	3.4	pf
Grid No.1 to grid No.3 & triode cathode & internal shield	0.36	pf
Grid No.3 & triode cathode & internal shield to plate, cathode, grid No.2, grid No.1, and heater	12.5	pf

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage	200	150	volts
Grid No.3	—	e	



6LC8

	Triode Unit	Pentode Unit	
Grid-No.2 Supply Voltage	-	100	volts
Grid-No.1 Voltage.	-2	-	volts
Grid No.1.	-	e	
Cathode Resistor	-	180	ohms
Amplification Factor	70	-	
Plate Resistance (Approx.)	17500	10000	ohms
Transconductance, Grid No.1 to Plate	4000	4400	μ hos
Transconductance, Grid No.3 to Plate ^f	-	600	μ hos
Plate Current.	4	4	ma
Grid-No.2 Current.	-	2.8	ma
Grid-No.1 Supply Voltage (Approx.) for plate μ 3 =			
10	-5	-	volts
20	-	-4	volts
Grid-No.3 Supply Voltage (Approx.) for plate μ 3 = 20 ^f	-	-7	volts

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length.	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip).	2" \pm 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline.	See <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Base Designation for BOTTOM VIEW	9QY

Pin 1 - Triode Plate

Pin 2 - Triode Grid

Pin 3 - Triode

Cathode,

Pentode Grid

No.3, Inter-

nal Shield

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Pentode

Grid No.1

Pin 7 - Pentode

Cathode

Pin 8 - Pentode

Grid No.2

Pin 9 - Pentode

Plate

GATED AGC AMPLIFIER & NOISE INVERTER

Pentode Unit

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system

DC PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE ^h	600 max.	volts

GRID-No.3 (CONTROL-GRID) VOLTAGE:

Negative-bias value. 100 max. volts
 Positive-bias value. 0 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:

Negative-bias value. 50 max. volts
 Positive-bias value. 0 max. volts

GRID-No.2 INPUT:

For grid-No.2 voltages
 up to 150 volts. 1.1 max. watts

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 max. watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation 0.5 max. megohm
 For cathode-bias operation 1 max. megohm

AMPLIFIER — Class A₁

Triode Unit

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. 300 max. volts

GRID VOLTAGE:

Negative-bias value. 50 max. volts
 Positive-bias value. 0 max. volts

PLATE DISSIPATION. 1.1 max. watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation 0.25 max. megohm
 For cathode-bias operation 1 max. megohm

a At heater amperes = 0.600.

b At heater volts = 6.3.

c The dc component must not exceed 100 volts.

d without external shield.

e Connected to negative end of cathode resistor.

f with no external connection to triode plate and triode grid.

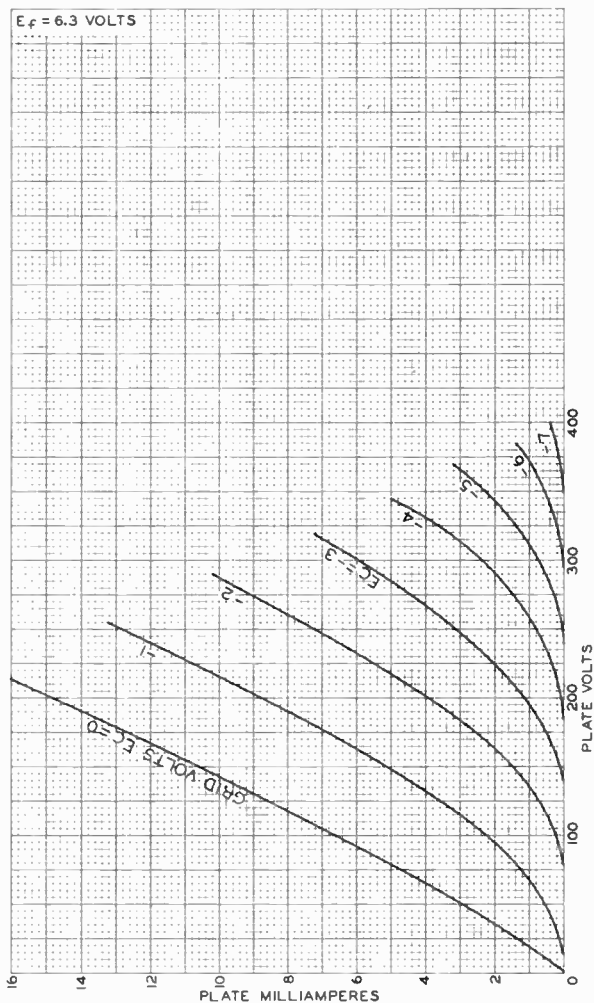
g As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

h This rating is applicable when the duration of the voltage pulse does 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.



6LC8

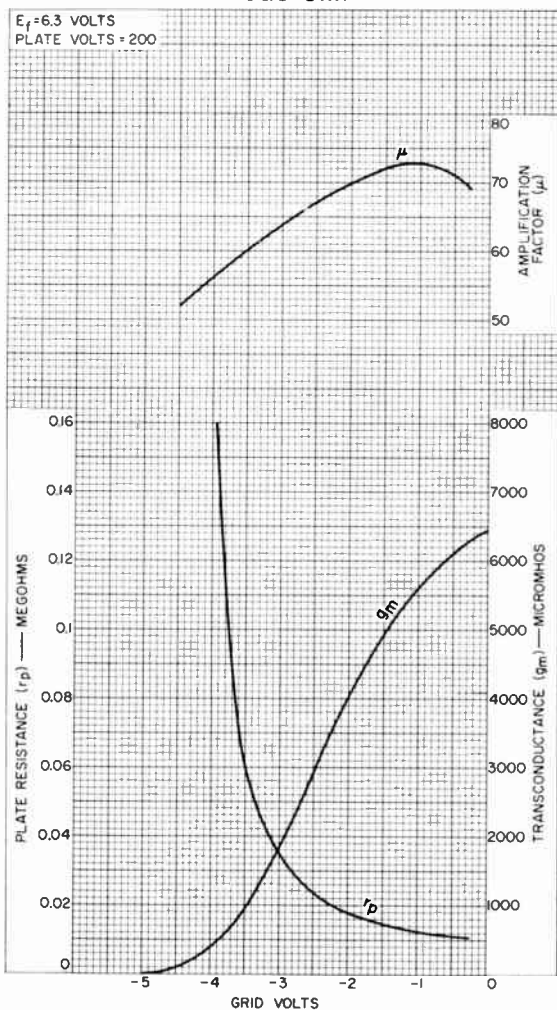
AVERAGE PLATE CHARACTERISTICS Triode Unit



92CM-8644



AVERAGE CHARACTERISTICS Triode Unit

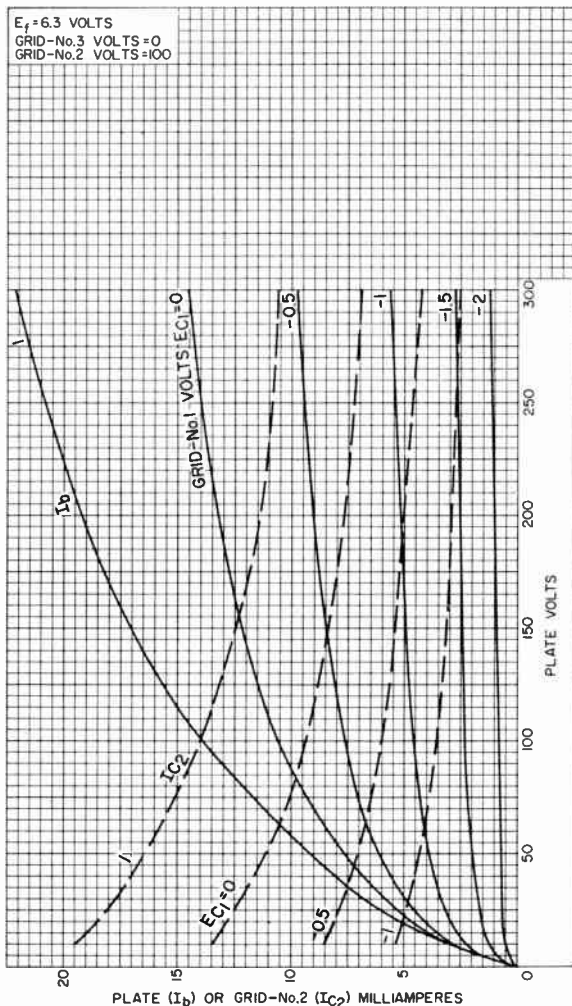


92CM-8647



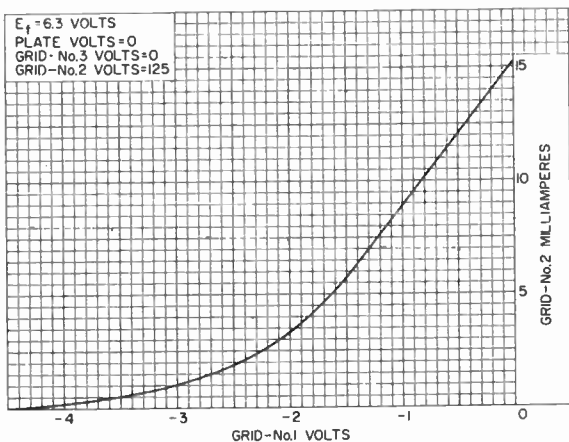
6LC8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-11594



AVERAGE CHARACTERISTICS
Pentode Unit

92CS-11603





Twin Dual-Control Pentodes

9-PIN MINIATURE TYPE

COMMON-CATHODE, GRID No.1 & GRID No.2

DARK HEATER

For Combined Color Demodulator and Matrix
Amplifier Applications in Color TV Receivers
Having High-Level Demodulation Systems

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage, AC or DC	E_f	6.3	V
Heater Current	I_f	760	mA

Direct Interelectrode Capacitances

Without external shields

G2 to P (each unit, with other unit connected to ground)	C_{g3-p}	2.7	pF
G1 to G ₁ , P ₁ , P ₂ , P _{F1} , G _{3p1} , G _{3p2} , G ₂ , H)	C_{g1-all}	15.5	pF
G _{3p1} to G _{3p2} , P ₁ , P ₂ , P _{F1} , G _{3p1} , G ₂ , G ₂ , H)	C_{g3-all}	6.0	pF
P ₁ to G _{3p1} , P ₂ , G _{3p2} , G _{3p1} , G ₂ , G ₂ , H)	C_{p-all}	3.7	pF
P ₂ to G _{3p2} , P ₁ , G _{3p2} , G _{3p1} , G ₂ , G ₂ , H)	C_{g3-g3}	0.10	pF

For the following characteristics, with both units operating,
see Conditions

Plate Resistance	r_p	50000	Ω
Approx., each unit			
Grid-No.1-to-Plate Transconductance	$g_m(g1p)$	5800	μ mhos
Each unit			
Grid-No.3-to-Plate Transconductance	$g_m(g3p)$	350	μ mhos
Each unit			
DC Plate Current	I_b	7.6	mA
Each unit			
DC Grid-No.2 Current ^a	I_{c2}	14.5	mA
Cutoff DC Grid-No.1 Voltage			
Approx., each unit			
For $I_b = 100 \mu A$	$E_{c1(co)}$	-6.3	V
Cutoff DC Grid-No.3 Voltage ^b			
Approx., each unit			
For $I_b = 100 \mu A$	$E_{c3(co)}$	-16.5	V

Conditions

Heater Voltage	E_f	6.3	V
DC Plate Voltage	E_b	100	V
Each unit			
DC Grid-No.3 (Control-Grid) Voltage	E_{c3}	0	V
Each unit			
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	100	V
DC Grid-No.1 (Control-Grid) Voltage	E_{c1}	-2.5	V

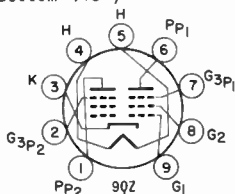


MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-1/16 in
Maximum Seated Length	3-13/16 in
Length, Base Seat to Bulb Top	2-7/16 + 3/32 in Excluding tip
Diameter	0.750 to 0.875 in
Envelope	JEDEC T6-1/2
Dimensional Outline (JEDEC 6-4)	See <i>General Section</i>
Base	Small-Button Noval 9-Pin (JEDEC E9-1)

TERMINAL DIAGRAM (Bottom View)

Pin 1 - Plate
Pin 2 - Grid-No.2
Pin 3 - Cathode
Pin 4 - Heater
Pin 5 - Filament
Pin 6 - Grid-No.1
Pin 7 - Grid-No.2
Pin 8 - Grid-No.1
Pin 9 - Grid-No.2



DESIGN MAXIMUM RATINGS

DC Plate Voltage (Each unit)	E_b	300	V
DC Grid-No.2 Voltage	E_{c2}	150	V
Heater-Cathode Voltage			
Each	e_{hkm}	+200	V
Average ^c	$E_{hk(av)}$	-300	V
Average ^c	$E_{hk(av)}$	100	V
Heater Voltage, AC or DC	E_f	5.7 to 6.9	V
Grid-No.2 Input	P_{g2}	2	W
Plate Dissipation (Each unit)	P_b	2	W

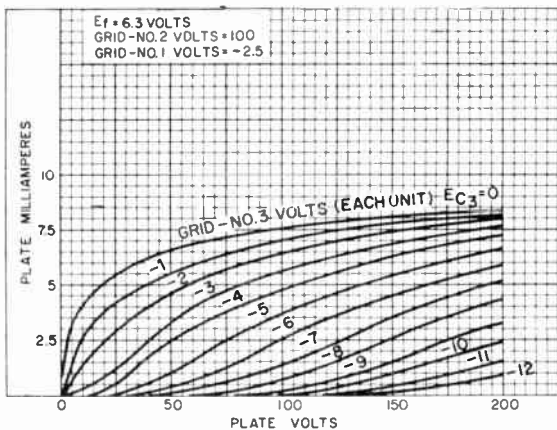
^a Units in parallel (P_{p1} connected to P_{p2} ; G_{3p1} connected to G_{3p2}).

^b For this test, $E_{c1} = -3$ V so that the Grid-No.2 Input rating will not be exceeded.

^c Measured with a dc meter.

Typical Plate Characteristics

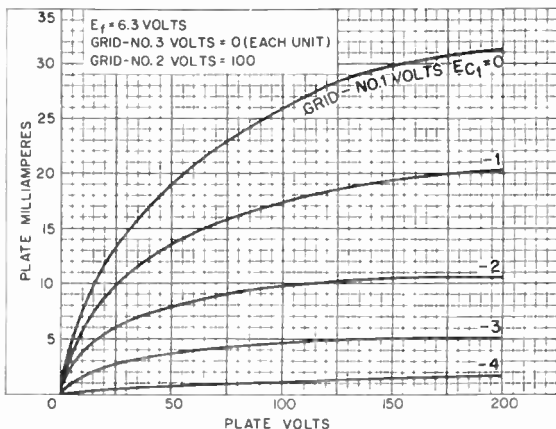
Each Unit, with Both Units Operating



92CS-13459

Typical Plate Characteristics

Each Unit, with Both Units Operating



92CS-13460



High-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Video-Amplifier Service in Color-TV Receivers and
Other Applications Using Positive Triode-Grid Operation

Electrical:

Heater Characteristics and Ratings:

Voltage (A* or DC)	6.3 ± 0.6 ^a	volts
Current at heater volts = 6.3.	0.600 ^b	amp
Warm-up time (Average)	11	sec

Peak heater-cathode voltage (Each unit):

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 ^c max.	volts

Direct Interelectrode Capacitances:^d

Triode Unit:

G _T to P _T	2.2	pf
Input: G _T to (K _T , K _p +G _{3p} +I _S , H)	3.2	pf
Output: P _T to (K _T , K _p +G _{3p} +I _S , H)	1.8	pf

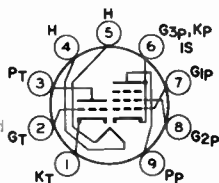
Pentode Unit:

G _{1p} to P _p	0.060 max.	pf
Input: G _{1p} to (K _p +G _{3p} +I _S , G _{2p} , H)	10	pf
Output: P _p to (K _p +G _{3p} +I _S , G _{2p} , H)	3.6	pf
G _{1p} to P _T	0.008 max.	pf
P _p to P _T	0.15 max.	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
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 <i>General Section</i>
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. F9-1)
Basing Designation for BOTTOM VIEW	9DX

- Pin 1—Triode Cathode
- Pin 2—Triode Grid
- Pin 3—Triode Plate
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Pentode Cathode,
Grid No.3, Internal Shield
- Pin 7—Pentode Grid No.1
- Pin 8—Pentode Grid No.2
- Pin 9—Pentode Plate



6LF8

Characteristics, Class A Amplifier:

	Triode Unit		Pentode Unit		
Plate Voltage.	200	40	7 ^f	100	volts
Grid-No.2 Voltage.	-	-	150	150	volts
Grid-No.1 Voltage.	-2	+3	0	-2.5	volts
Amplification Factor	70	40	-	-	
Plate Resistance (Approx.)	17500	10000	-	200000	ohms
Transconductance	4000	4000	-	11000	μ mhos
Plate Current.	4	11	50 ^e	20	ma
Grid-No.2 Current.	-	-	12 ^e	5	ma
Grid-No.1 Current.	0	2.7	0	0	ma
Grid-No.1 Voltage (Approx.) for plate μ a = 20.	-5	-	-	-8	volts

AMPLIFIER — Class A^f

Maximum Ratings, Design-Maximum Values:

	Triode Unit as Class A ₁ or A ₂ Amplifier	Pentode Unit as Class A ₁ Amplifier	
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:

Negative-bias value.	55 max.	55 max.	volts
Positive-bias value.	4 max.	0 max.	volts
Grid-No.1 Current.	8 max.	0 max.	ma

Grid-No.2 Input:

For grid-No.2 voltages up to 165 volts	-	1.1 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	

Plate Dissipation.	1.1 max.	3.75 max.	watts
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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

^a For parallel heater operation.

^b For series heater operation current must be limited to 0.600 \pm 0.040 amperes.

^c The dc component must not exceed 100 volts.

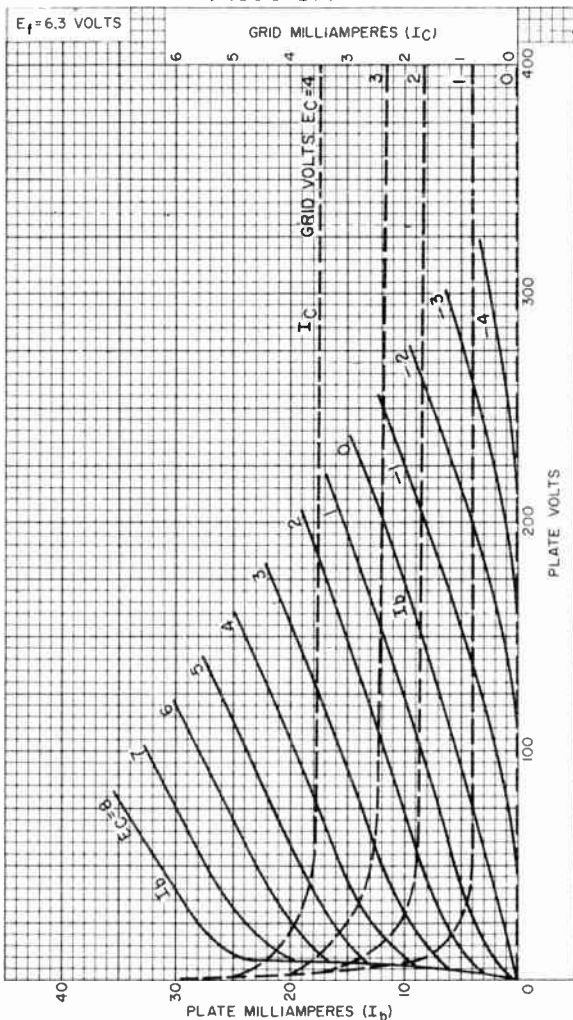
^d Without external shield.

^e This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

^f A Class A Amplifier is an amplifier in which the grid bias and varying grid voltages are such that plate current flows at all times. The subscript 1 added to the class letter denotes that grid current does not flow during any part of the input cycle. The subscript 2 denotes that grid current flows during some part of the cycle.



AVERAGE CHARACTERISTICS Triode Unit

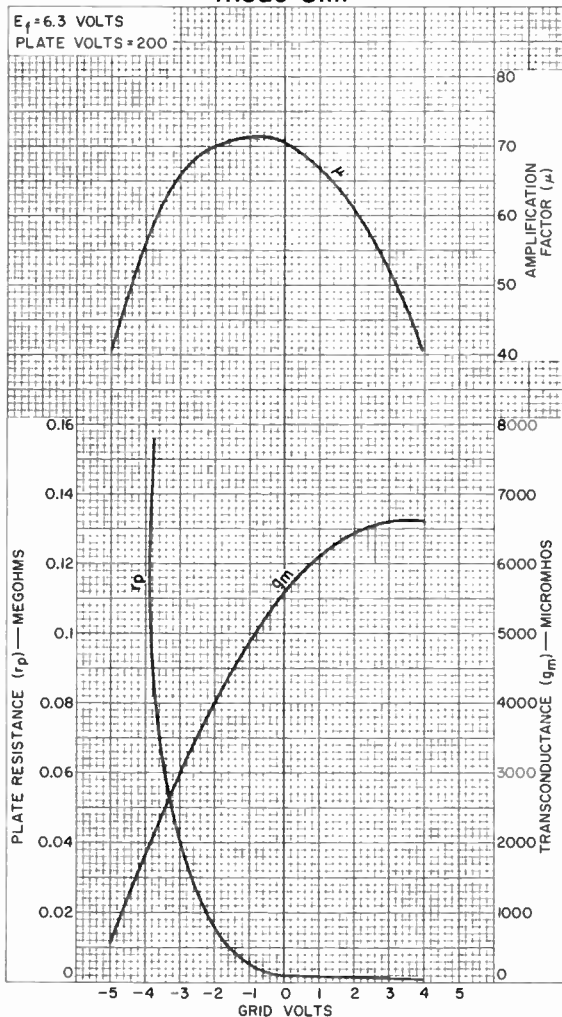


92CM-12384



6LF8

AVERAGE CHARACTERISTICS Triode Unit

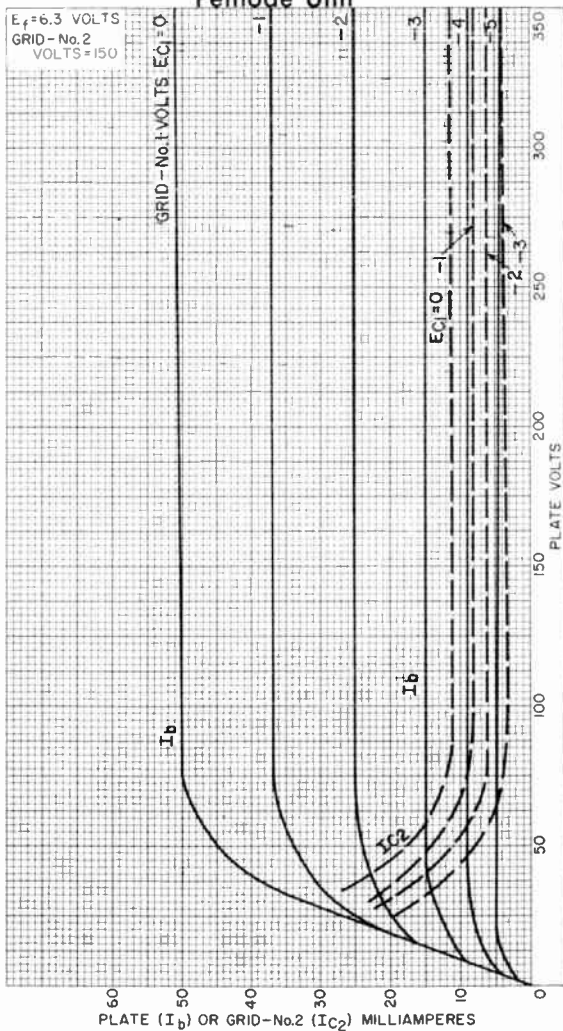


92CM-12388

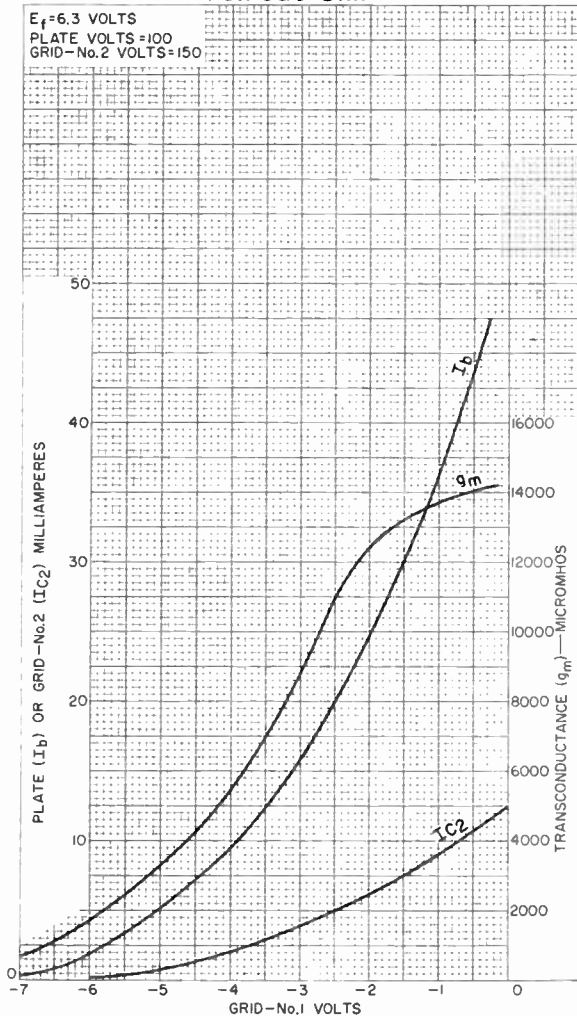


AVERAGE CHARACTERISTICS

Pentode Unit



AVERAGE CHARACTERISTICS Pentode Unit



92CM-12403



Medium-Mu Triode— Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

SEPARATE CATHODE BASE-PIN CONNECTIONS

For Color and Black-and-White TV Receivers. Pentode Unit is Particularly Suited for Burst-Amplifier Circuit in Color TV. Triode Unit is Useful as a General-Purpose Amplifier.

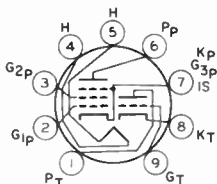
Electrical:

Heater voltage (w/100 ohm resistance):	6.3 ± 0.6	volt
Current at heater voltage (T ₁₀₀):	0.10	amp
Peak heater-cathode voltage (Each Unit):		
Triode Unit: Heater to cathode:	20 max.	volt
Pentode Unit: Heater to pentode cathode:	20 max.	volt
Direct Inter-electrode spacings: ^b		
<i>Triode Unit:</i>		
Grids to plate:	1.2	pt
Grids to G ₁ to (K _T , P ₁ , P ₂ , P ₃ , P ₄):	3.0	pt
Grids to P ₅ to (K _T , P ₁ , P ₂):	1.2	pt
<i>Pentode Unit:</i>		
Grid No. 1 to plate:	0.015 max.	pt
Grids: G ₁ to (K _T , P ₁ , P ₂ , P ₃ , P ₄):	5.5	pt
Output: P ₅ to (K _T , P ₁ , P ₂):	2.3	pt
Heater to cathode (each unit):	2.2	pt

Mechanical:

Pin 1 Position:	Any
Pin 5 Cutoff:	Control Potential
Maximum Overall Length:	2-3/16"
Maximum Case Width:	1-5/16"
Length from Base Pin to Bulk Top Filament Pin:	1-3/16" ± 3/32"
Diameter:	0.750" to 0.875"
General Outline:	See General Section
Part No.:	6-172
Reference:	Standard-Notched 9-Pin (JEDEC No. EP-1)
Ordering Designation for FORMER:	9AE

- Pin 1—Triode Plate
- Pin 2—Pentode Grid No. 1
- Pin 3—Pentode Grid No.
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Pentode Plate
- Pin 7—Pentode Cathode
- Pin 8—Pentode Grid No. 2
- Pin 9—Internal Shield
- Pin 10—Triode Cathode
- Pin 11—Triode Grid



6LM8

AMPLIFIER — Class A₁

	Triode Unit	Pentode Unit	
Characteristics:			
Plate Voltage	125	125	volts
Grid-No.2 Voltage	-	125	volts
Grid-No.1 Voltage	-1	-2	volts
Amplification Factor	46	-	
Plate Resistance (Approx.)	5400	15000	ohms
Transconductance	8500	6000	μmhos
Plate Current	13.5	12	ma
Grid-No.2 Current	-	1	ma
Grid-No.1 Voltage (Approx.) for plate μ i = 10	-8	-14	volts

Maximum Ratings, Design-Maximum Values:

Plate Voltage	330 max.	-50 max.	volt
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	2.5 max.	2.5 max.	watts

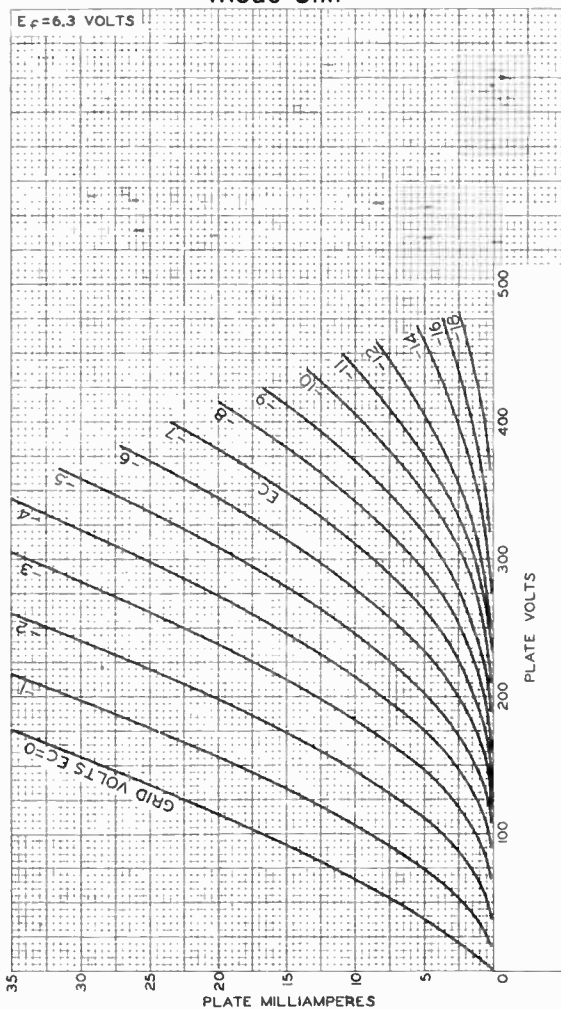
Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.5 max.	0.25 max.	megohm
For cathode-bias operation	1 max.	0.5 max.	megohm

^a The dc component must not exceed 100 volts.

^b with external shield JEDEC No.315 measured in accordance with EIA Standard RS-191-A.

AVERAGE PLATE CHARACTERISTICS Triode Unit

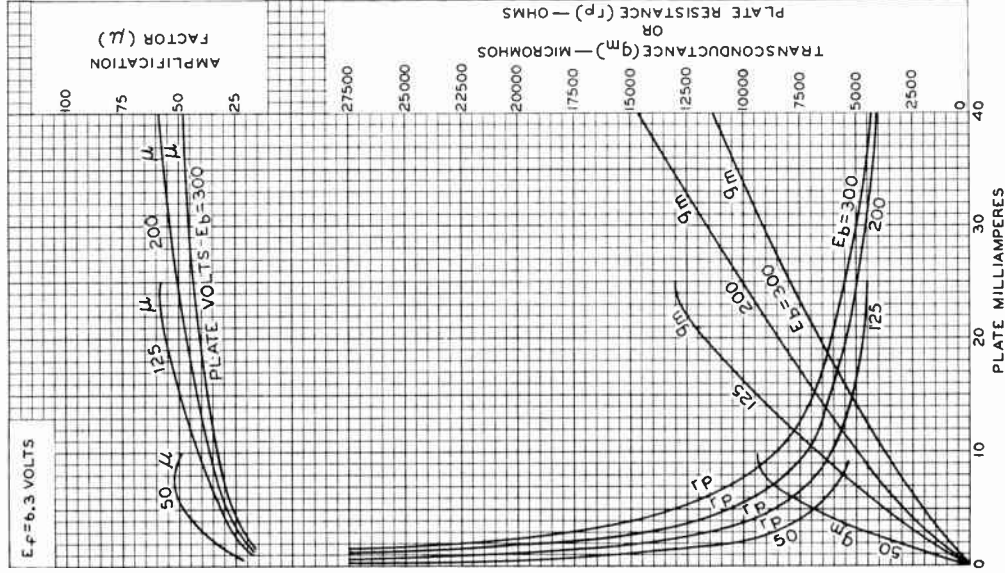


92CM-1042IR1



6LM8

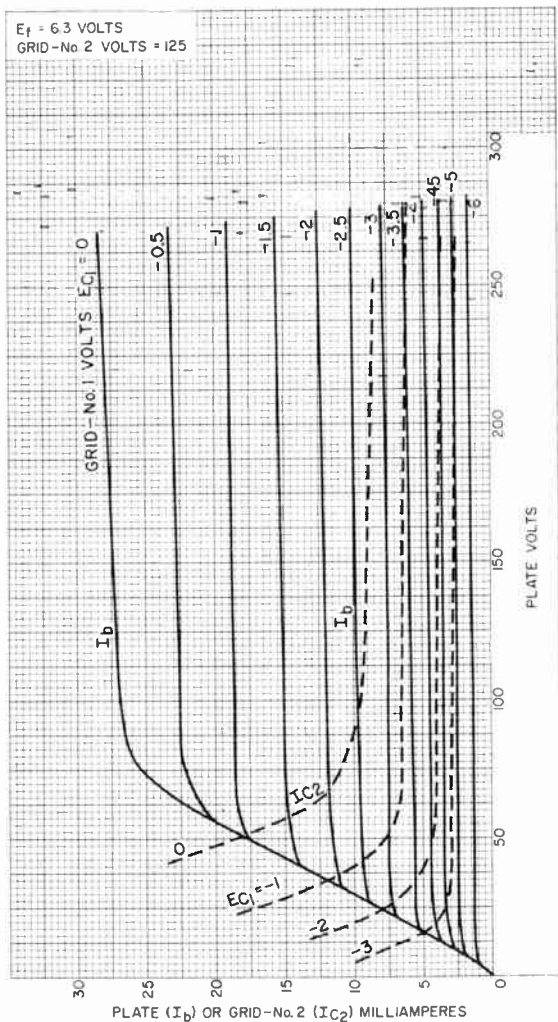
AVERAGE CHARACTERISTICS Triode Unit



92CM-10428

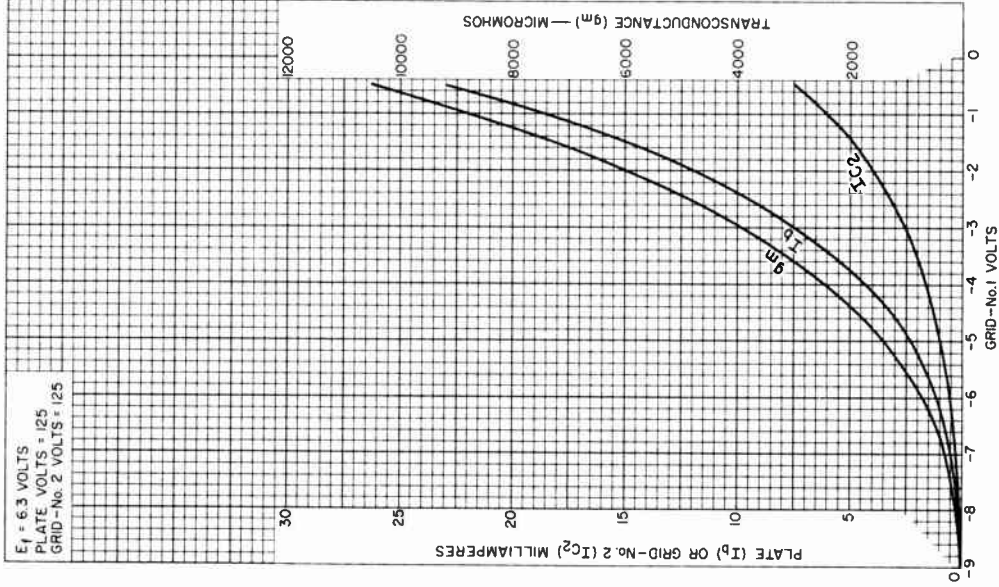
AVERAGE CHARACTERISTICS

Pentode Unit



6LM8

AVERAGE CHARACTERISTICS Pentode Unit



92CM-12558

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.



Beam Power Tube

$P_b = 30 \text{ W}$ **Novar Type** **Overload $P_b = 200 \text{ W}$**
For Color-TV Horizontal-Deflection Amplifier Circuits
Using 270 V to over 400 V "B" Supplies

ELECTRICAL CHARACTERISTICS—Bogey Values

Heater Voltage, ac or dc.	E_h	6.3	V
Heater Current	I_h	2.5	A
Direct Interelectrode Capacitances: ^a			
Grid No.1 to plate	c_{g1-p}	0.56	pF
Input: G1 to (K,G3,G2,H)	c_i	22	pF
Output: P to (K,G3,G2,H)	c_o	11	pF

For the following characteristics, see Conditions below:

Amplification Factor (Triode Connection) ^b . μ	-	-	3 ^c	-	-	2.8 ^d	
Plate Resistance (Approx.)	r_p	-	5800	-	-	7000	Ω
Transconductance	g_m	-	9600	-	-	7500	μmho
DC Plate Current	I_b	-	580 ^e	130	-	710 ^e	95 mA
DC Grid-No.2 Current	I_{c2}	-	40 ^e	2.8	-	55 ^e	2.4 mA
Cutoff DC Grid-No.1 Voltage for $I_b = 1 \text{ mA}$	$E_{c1(c0)}$	-120	-	-54	-125	-	-60 V

Conditions:

Heater Voltage	E_h	← 6.3 →		V				
Peak Positive-Pulse Plate Voltage ^f	e_{bm}	5000	-	-	5000	-	-	V
DC Plate Voltage	E_b	-	55	175	-	60	175	V
DC Grid-No.3 Voltage	E_{c3}	30	30	30	30	30	30	V
DC Grid-No.2 Voltage	E_{c2}	125	125	125	145	145	145	V
DC Grid-No.1 Voltage	E_{c1}	-	0	-25	-	0	-35	V

MECHANICAL CHARACTERISTICS

Dimensional Outline	JEDEC No.12-117
Envelope	JEDEC Designation T12
Top Cap ^g	Small (JEDEC Designation C1-1)
Base ^h	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC Designation E9-88)

6LQ6

Terminal Connections
 (See *TERMINAL DIAGRAM*) JEDEC Designation 9QL
 Type of Cathode Coated Unipotential

MAXIMUM RATINGS—Design-Maximum Values^k

For operation as a Horizontal-Deflection-Amplifier Tube in a 525-line, 30-frame system

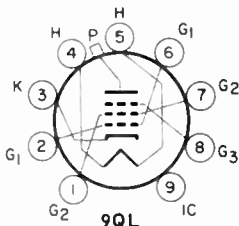
DC Plate Supply Voltage	E_{bb}	990	V
Peak Positive-Pulse Plate Voltage ^m	e_{bm}	7500	V
Peak Negative-Pulse Plate Voltage	$-e_{bm}$	1100	V
DC Grid-No.3 Voltage ⁿ	E_{c3}	75	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	220	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	$-e_{clm}$	330	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	± 200	V
Average	E_{hk}	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	1200	mA
Average	$I_{k(av)}$	350	mA
Grid-No.2 Input.	P_{g2}	5	W
Plate Dissipation ^p	P_b	30	W
Temporary Overload Plate Dissipation ^q	P_b	200	W
Envelope Temperature (at hottest point on envelope surface).	T_E	250	$^{\circ}C$

MAXIMUM CIRCUIT VALUES

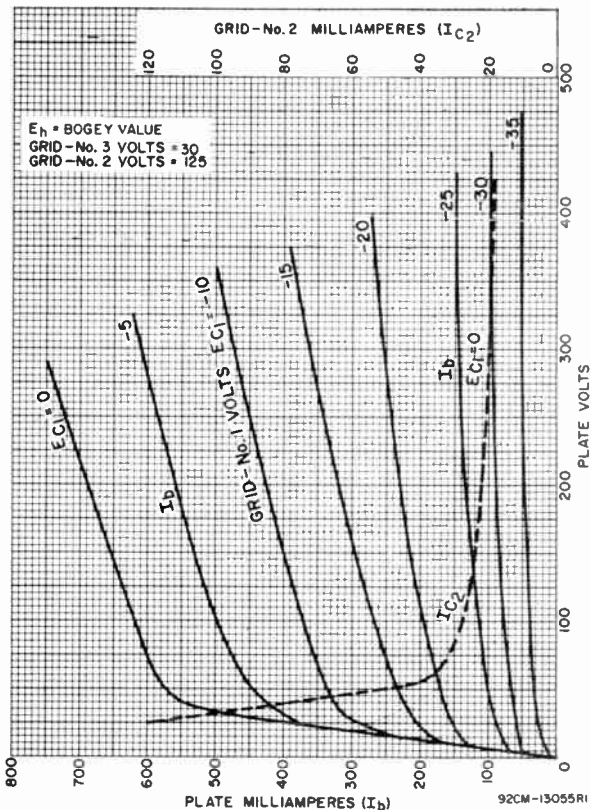
Grid-No.1-Circuit Resistance:	$R_{g1(ckt)}$		
For grid-No.1-resistor-bias operation	-	0.47	$M\Omega$
For plate-pulsed operation (horizontal- deflection circuits only).	-	10	$M\Omega$

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Grid No.2
- Pin 2 - Grid No.1
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.1
- Pin 7 - Grid No.2
- Pin 8 - Grid No.3
- Pin 9 - Do Not Use
- Top Cap - Plate



TYPICAL CHARACTERISTICS

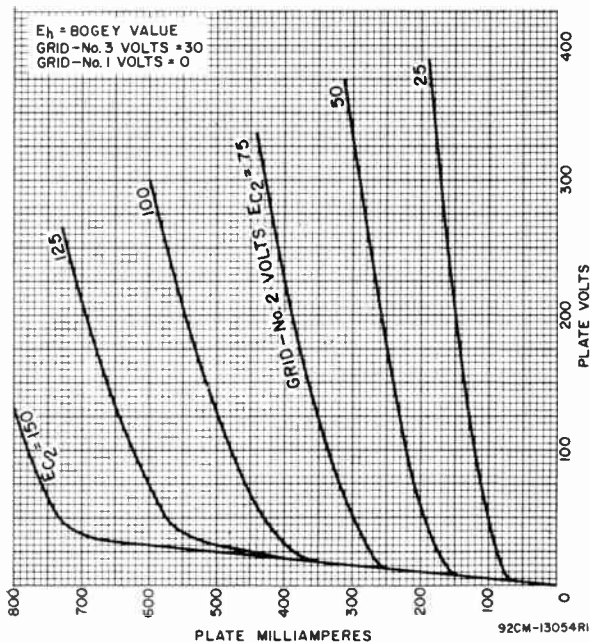


- a Measured without external shield in accordance with the current issue of EIA Standard RS-191.
- b With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.
- c Conditions: $E_b = E_{C2} = 125 \text{ V}$, $E_{C1} = -25 \text{ V}$.
- d Conditions: $E_b = E_{C2} = 145 \text{ V}$, $E_{C1} = -35 \text{ V}$.
- e This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- f Under pulse-duration condition specified in Footnote m.

6LQ6

- g Designed to mate with connector of 0.360-inch cap, generally available from your local RCA Distributor.
- h Designed to mate with "Novar 9-Contact" Socket generally available from your local RCA Distributor.
- k As defined in the current issue of EIA Standard RS-239.
- m This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one scanning cycle is 10 μ s.
- n In horizontal-deflection-amplifier service, a positive voltage should be applied to grid No.3 to reduce interference from "snivets", which may occur in both vhf and uhf television receivers, and to increase power output. A typical value is 30 V.
- P An adequate bias resistor or other means is required to protect the tube in the absence of excitation.
- q Total continuous or accumulated time not to exceed 40 seconds.

TYPICAL CHARACTERISTICS



Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

*For Use in Lou-B+ Black-and-White TV Receivers
Having Low-Voltage Power Supplies*

ELECTRICAL CHARACTERISTICS

Bogey Values^a

Heater voltage (AC or DC)	E _h	6.3	V
Heater Current	I _h	0.775	A
Direct Interelectrode Capacitances Without external shield			
<i>Triode Unit:</i>			
Grid to plate	C _{g-p}	2.8	pF
Input: Grids 1, 2, K, V _p - C _{3p} + I ₅ , H	C _i	4.2	pF
Output: Plate to K, V _p - C _{3p} + I ₅ , H	C _o	2.4	pF
<i>Pentode Unit:</i>			
Grids 1, 2 to plate	C _{gl-p}	0.12 max	pF
Input: G _{1p} to K + C _{3p} + I ₅ , G _{2p} , H	C _i	14	pF
Output: Plate to (K + G _{2p} + I ₅ , G _{2p} , H)	C _o	4.8	pF
Triode grid to cutoff pentode	-	0.015 max	pF
Pentode plate to triode plate	-	0.17 max	pF

For the following characteristics, see Conditions

		Triode Unit	Pentode Unit	
Amplification Factor	μ	46	-	-
Plate Resistance (Approx.)	r _p	4400	55000	75000 Ω
Transconductance	g _m	10400	21000	23000 μmho
DC Plate Current	I _b	15	16.5	20 mA
DC Grid-No.2 Current	I _{c2}	-	3.1	3.5 mA
Cutoff DC Grid-No.1 Voltage	E _{c1(c0)}	-6	-4.2	-4.2 V

^aPlate $\mu = 20$

Conditions

Heater Voltage	E _h	Bogey value		V
DC Plate Supply Voltage	E _{bb}	125	125	200 V
DC Grid-No.2 Supply Voltage	E _{c2}	-	125	125 V
Grid No.1	-	Connected to negative end of R _k		
Cathode Resistor	R _k	68	82	68 Ω

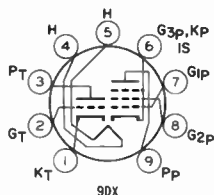
MECHANICAL CHARACTERISTICS

Operating Position	Any		
Type of Cathodes	Coated Unipotential		
Maximum Overall Length	2.625 in		
Maximum Seated Length	2.375 in		
Maximum Diameter	0.875 in		
Dimensional Outline	See <i>General Section</i>		
Envelope	JEDEC T6-1/2		
Base	Small-Button Noval 9-Pin (JEDEC E9-1)		



TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Triode Cathode
- Pin 2 - Triode Grid
- Pin 3 - Triode Plate
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Pentode Grid No. 3,
Pentode Cathode,
Internal Shield
- Pin 7 - Pentode Grid No. 1
- Pin 8 - Pentode Grid No. 2
- Pin 9 - Pentode Plate



DESIGN-MAXIMUM RATINGS

For operation as a Class A₁ Amplifier Tube

		Triode Unit	Pentode Unit	
DC Plate Voltage	E_b	300	300	V
DC Grid-No.2 (Screen-Grid) Supply Voltage	E_{c2}	-	300	V
DC Grid-No.2 Voltage	E_{c2}	-	See Grid-No.2 Input Rating Chart	
at front of Receiving Tube Section				
DC Grid-No.1 (Control-Grid) Voltage				
Positive-bias value	E_{c1}	0	0	V
Heater-Cathode Voltage				
Peak	e_{hkm}		±200	V
Average ^b	$E_{hk(av)}$		100	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9		V
Grid-No.2 Input	P_{g2}			
for $E_{c2} \leq 150$ V	-	-	1	W
for $E_{c2} \geq 150$ V and ≤ 300 V	-	-	See Grid-No.2 Input Rating Chart	
at front of Receiving Tube Section				
Plate Dissipation	P_b	2	5	W

MAXIMUM CIRCUIT VALUES

		Triode Unit	Pentode Unit	
Grid-No.1 Circuit Resistance	$R_{g1(ckt)}$			
for fixed-bias operation	-	0.5	0.1	MΩ
for cathode-bias operation	-	1	0.25	MΩ

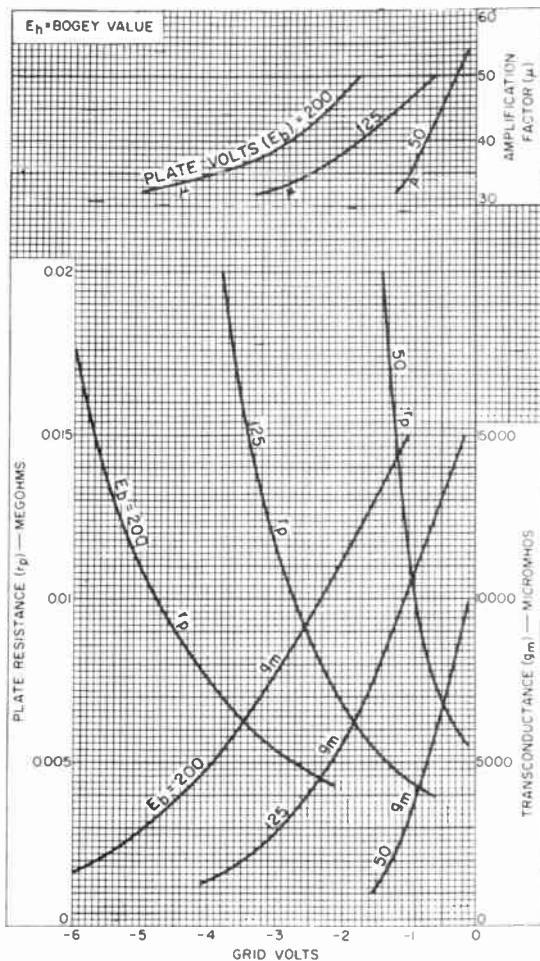
^a Unless otherwise specified.

^b Measured with a dc meter.



Typical Characteristics

Triode Unit



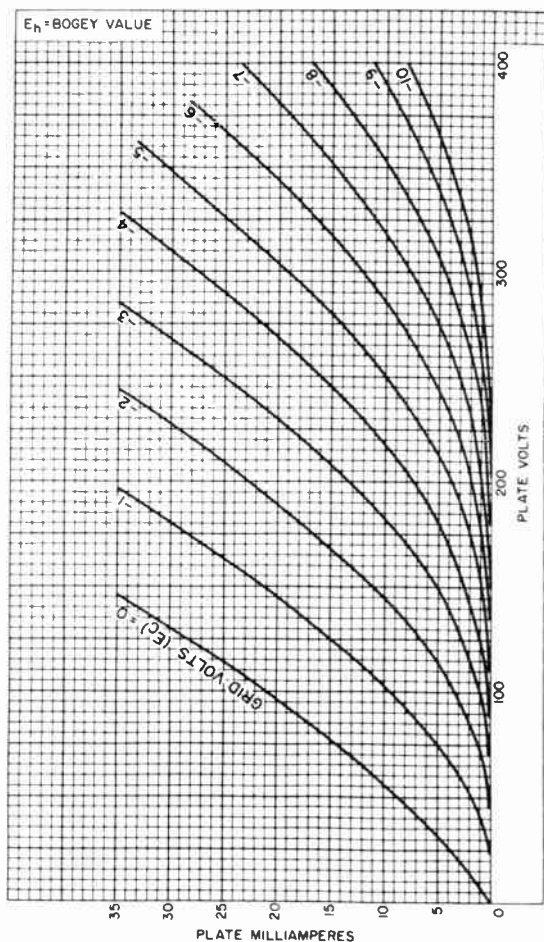
92CM 12623R1



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

Typical Plate Characteristics

Triode Unit

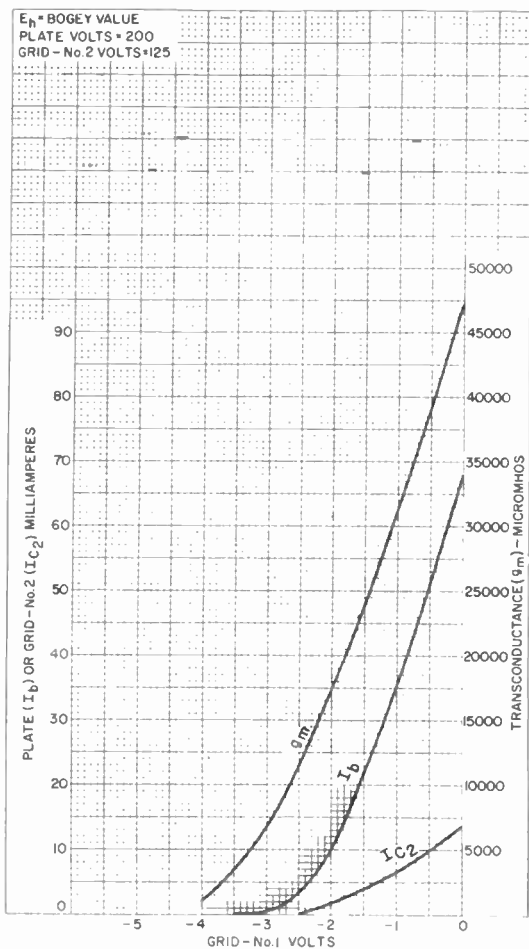


92CM-12616R1



Typical Characteristics

Pentode Unit



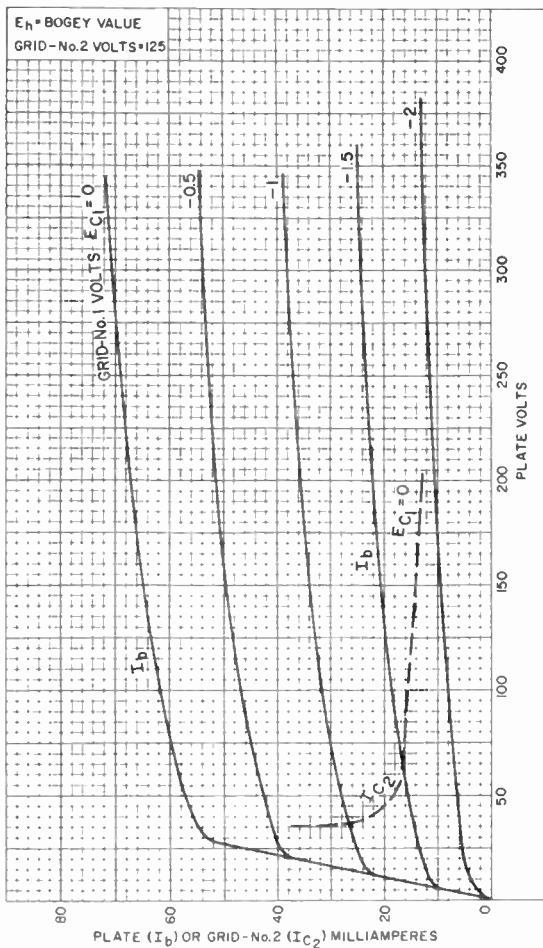
92CM-13750



6LQ8

Typical Plate Characteristics

Pentode Unit



92CM-13751



Beam Power Tube

NOVAR TYPE

ELECTRICAL CHARACTERISTICS — Bogey Values

Heater Voltage, ac or dc E_h	6.3	V
Heater Current I_h	2.3	A

Direct Interelectrode Capacitances:^a

Grid No. 1 to plate c_{g1-p}	0.6	pF
Input: G1 to (K, G3, G2, H) c_i	22	pF
Output: Pto (K, G3, G2, H) c_o	11	pF

For the following characteristics, see Conditions below:

Amplification Factor (Triode Connection) ^b μ	—	—	3 ^c	
Plate Resistance (Approx.) r_p	—	—	6000	Ω
Transconductance g_m	—	—	11000	μmho
DC Plate Current I_b	—	800 ^d	140	mA
DC Grid-No. 2 Current I_{c2}	—	56 ^d	2.0	mA
Cutoff DC Grid-No. 1 Voltage for $I_b = 1 \text{ mA}$ $E_{c1(c0)}$	-125	—	-50	V

Conditions:

Heater Voltage E_h	← Bogey Value →			V
Peak Positive-Pulse Plate Voltage ^a e_{bm}	5000	—	—	V
DC Plate Voltage E_b	—	55	175	V
DC Grid-No. 3 Voltage E_{c3}	30	30	30	V
DC Grid-No. 2 Voltage E_{c2}	130	125	125	V
DC Grid No. 1 Voltage E_{c1}	—	0	-25	V

MECHANICAL CHARACTERISTICS

Dimensional Outline	JEDEC No. 12-117
Envelope	JEDEC T12
Top Cap	Small (JEDEC C1-1)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-88)

Terminal Connections

(See <i>TERMINAL DIAGRAM</i>)	JEDEC 9QL
Type of Cathode	Coated Unipotential
Operating Position	Any

6LZ6

MAXIMUM RATINGS – Design-Maximum Values ^f

For operation as a Horizontal-Deflection-Amplifier Tube in a 525-line, 30-frame system

DC Plate Supply Voltage	E_{bb}	990	V
Peak Positive-Pulse Plate Voltage ^g	e_{bpm}	7500	V
Peak Negative-Pulse Plate Voltage	$-e_{bpm}$	1100	V
DC Grid-No. 3 Voltage ^h	E_{c3}	75	V
DC Grid-No. 2 (Screen-Grid) Voltage	E_{c2}	220	V
Peak Negative-Pulse Grid-No. 1 (Control-Grid) Voltage	$-e_{c1m}$	330	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	+200	V
Average	E_{hk}	100	V
Heater Voltage:	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	1200	mA
Average	$I_{k(av)}$	350	mA
Grid-No. 2 Input	P_{g2}	5	W
Plate Dissipation ^j	P_b	30	W
Temporary Overload Plate Dissipation ^k :	P_b	200	W
Envelope temperature (at hottest point on envelope surface)	T_E	250	°C

MAXIMUM CIRCUIT VALUES

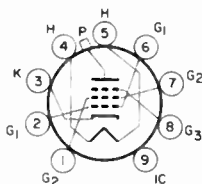
Grid-No. 1-Circuit Resistance: $R_{g(ckt)}$		
Cathode bias		1.0 megohm
(with min. $R_K = 100 \Omega$)		
Grid-leak bias		10.0 megohms
(with signal peak clamped to zero bias)		
Fixed bias		0.47 megohm
(where positive grid current is not drawn)		

- a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.
- b With grid No. 3 and grid No. 2 connected, respectively, to cathode and plate at socket.
- c Conditions: $E_b = E_{c2} = 125V$, $E_{c1} = -25V$.
- d This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- e Under pulse-duration condition specified in *Footnote g*.
- f As defined in the current issue of EIA Standard RS-239A.

- g This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one scanning cycle is $10 \mu\text{s}$.
- h In horizontal-deflection-amplifier service, a positive voltage should be applied to grid No. 3 to reduce interference from "snivets", which may occur in both vhf and uhf television receivers, and to increase power output. A typical value is 30V.
- j An adequate bias resistor or other means is required to protect the tube in the absence of excitation.
- k Total continuous or accumulated time not to exceed 40 seconds.

TERMINAL DIAGRAM – JEDEC 9QL (Bottom View)

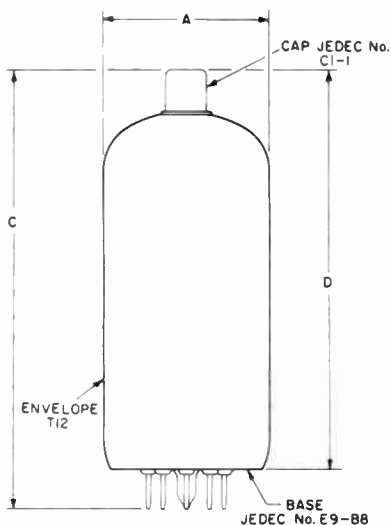
Pin 1 - Grid No. 2
 Pin 2 - Grid No. 1
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater



Pin 6 - Grid No. 1
 Pin 7 - Grid No. 2
 Pin 8 - Grid No. 3
 Pin 9 - Do Not Use
 Top Cap - Plate

6LZ6

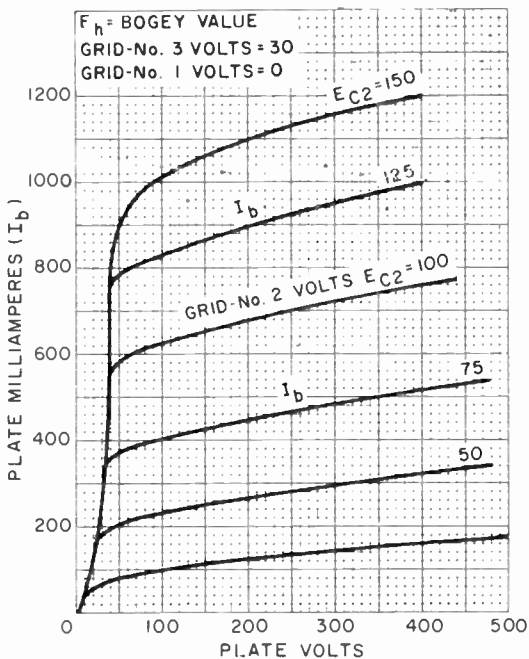
DIMENSIONAL OUTLINE – JEDEC No. 12-117



92CS-17689

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.438*	1.562	36.6*	39.6
C		4.380	95.3	111.25
D	3.750	4.000	95.3	101.6
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
*Applies to the minimum diameter except in the area of the seal.				

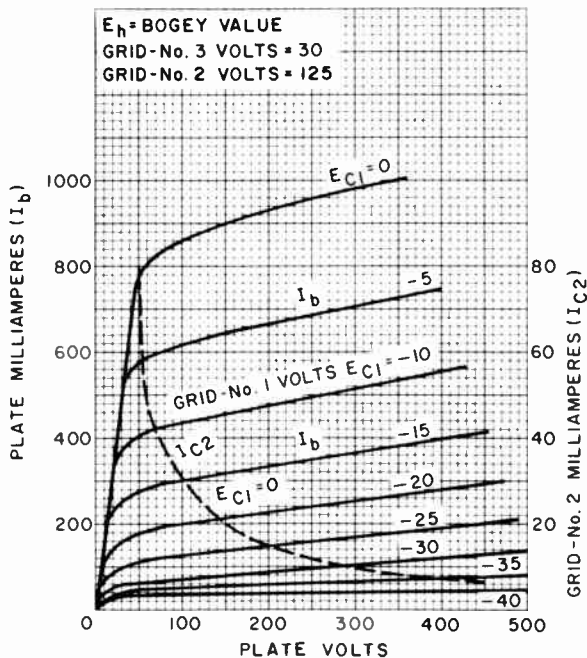
TYPICAL CHARACTERISTICS



92CS-17681

6LZ6

TYPICAL CHARACTERISTICS



92CS-17682

Beam Power Tube

T12 Novar Type

High Perveance Beam Power Tube

For Horizontal-Deflection Amplifier

Service in Low B+ Color-TV Receivers

■ Plate Dissipation = 33 W

■ RCA Dark Heater

■ Peak Cathode Current = 1400 mA

FACTRICAL CHARACTERISTICS – Bogey Values

Heater Voltage, ac or dc	E_h	6.3		V
Heater Current	I_h	2.85		A
Direct Interelectrode Capacitances: ^a				
Grid No. 1 to plate	c_{g1-p}	1.0		pF
Input: G1 to (K, G3, G2, H) . . .	c_i	40		pF
Output: P to (K, G3, G2, H) . . .	c_o	16		pF

For the following characteristics, see Conditions below:

Amplification Factor

(Triode Connection)^b . . . μ — — — 4^c

Plate Resistance

(Approx.) r_p — — — 6000 Ω Transconductance g_m — — — 14000 μmho DC Plate Current I_b — 1100^d 750^d 125 mADC Grid-No. 2 Current . . . I_{c2} — 110^d 42^d 3.3 mA

Cutoff DC Grid-No. 1

Voltage for $I_b = 1 \text{ mA}$. . $E_{c1}(co)$ -125 — 0 -40 V

Conditions:

Heater Voltage E_h ← — 8ogey Value — → V

Peak Positive-Pulse

Plate Voltage^e e_{bm} 5000 — — — VDC Plate Voltage E_b — 45 60 175 VDC Grid-No. 3 Voltage . . E_{c3} 30 30 30 0 VDC Grid-No. 2 Voltage . . E_{c2} 110 160 110 110 VDC Grid-No. 1 Voltage . . E_{c1} — 0 0 -21 V

MECHANICAL CHARACTERISTICS

Envelope JEDEC T-12

Top Cap Small (JEDEC C1-1)

Base Large-Button Novar 9-Pin with Exhaust Tip
(JEDEC E9-88)

Terminal Connections

(See *TERMINAL DIAGRAM*) JEDEC 9QL

Type of Cathode Coated Unipotential

Operating Position Any

6MC6

MAXIMUM RATINGS – Design-Maximum Values ^f

For operation as a Horizontal-Deflection-Amplifier Tube in a 525-line, 30-frame system.

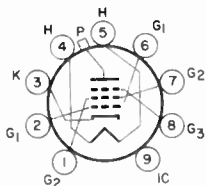
DC Plate Supply Voltage	E_{bb}	990	V
Peak Positive-Pulse Plate Voltage ^g	e_{bm}	7000	V
Peak Negative-Pulse Plate Voltage	$-e_{bm}$	1100	V
DC Grid-No. 3 Voltage ^h	E_{c3}	75	V
DC Grid-No. 2 (Screen-Grid) Voltage	E_{c2}	250	V
Peak Negative-Pulse Grid-No. 1 (Control-Grid) Voltage	$-e_{c1m}$	330	V
Heater-Cathode Voltage:			
Peak	$e_{hk m}$	±200	V
Average	E_{hk}	100	V
Heater Voltage: 6MC6	E_h	5.7 to 6.9	V
Heater Current: 36MC6	I_h	0.42 to 0.48	A
Cathode Current:			
Peak	$I_{k m}$	1400	mA
Average	$I_{k(av)}$	400	mA
Grid-No. 2 Input	P_{g2}	5	W
Plate Dissipation ⁱ	P_b	33	W
Envelope Temperature (at hottest point on envelope surface)	T_E	250	°C

MAXIMUM CIRCUIT VALUES

Grid-No. 1 Circuit Resistance:	$R_{g(ckt)}$	1.0 megohm
Cathode bias		10 megohm (with min. $R_K = 100 \Omega$)
Grid-resistor bias		10.0 megohms (with signal peak clamped to zero bias)
Fixed bias		0.47 megohm (where positive grid current is not drawn)

TERMINAL DIAGRAM – JEDEC 9QL (Bottom View)

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

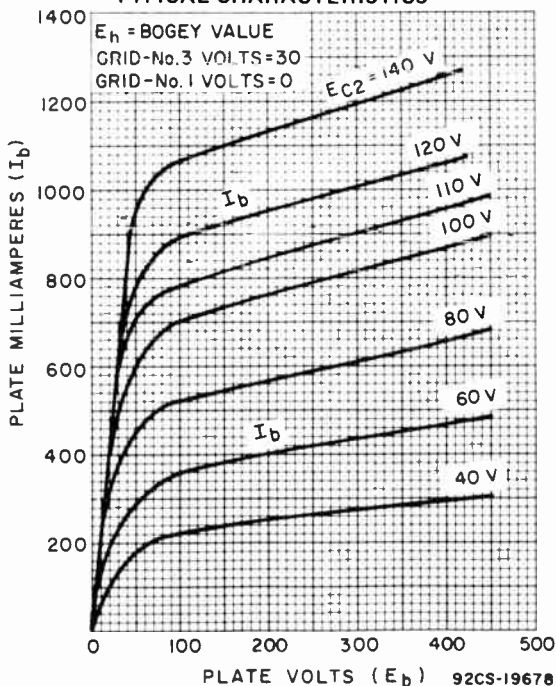


Pin 6 – Grid No. 1
Pin 7 – Grid No. 2
Pin 8 – Grid No. 3
Pin 9 – Do Not Use
Top Cap – Plate

^a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.

^b With grid No. 3 and grid No. 2 connected, respectively, to cathode and plate at socket.

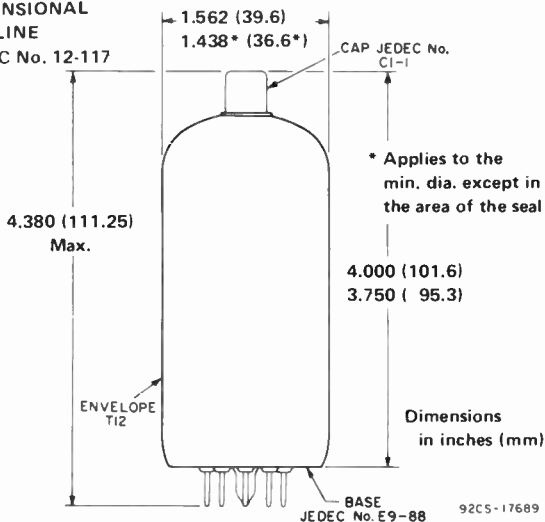
TYPICAL CHARACTERISTICS



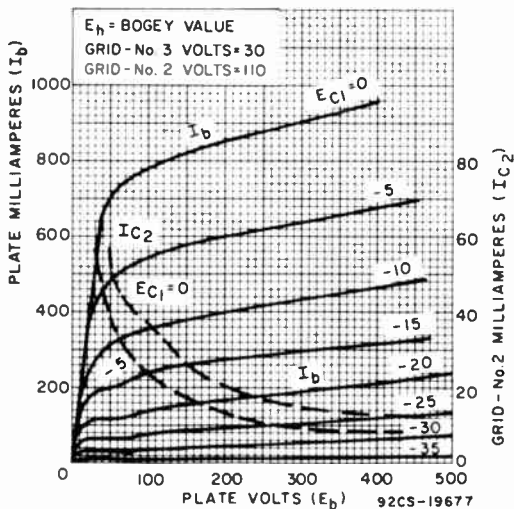
- c Conditions: $E_b = E_{c2} = 175 \text{ V}$, $E_{c1} = -21 \text{ V}$.
- d This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.
- e Under pulse-duration condition specified in Footnote g.
- f As defined in the current issue of EIA Standard RS-239A.
- g This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one scanning cycle is 10 μs .
- h In horizontal-deflection-amplifier service, a positive voltage should be applied to grid No. 3 to reduce interference from "snivets", which may occur in both vhf and uhf television receivers, and to increase power output. A typical value is 30 V.
- j An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

6MC6

DIMENSIONAL OUTLINE JEDEC No. 12-117



TYPICAL PLATE CHARACTERISTICS



Medium-Mu Triple Triode

NOVAR TYPE

For Matrix-Amplifier Applications in Color-TV Receivers

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ± 0.6	V
Current: 1.3 A	0.900	A
Maximum heater-cathode voltage (E _c to unit):		
Heater negative with respect to cathode:		
Peak	200	v
Heater positive with respect to cathode:		
Peak	200	V
Dr. Component	100	V

Direct Interelectrode Capacitances (Approx.)^a

	Unit No. 1	Unit No. 2	Unit No. 3	
Grid to plate	3.0	3.0	3.0	pF
Input: G to (K, H)	3.6	3.6	3.4	pF
Output: P to (K, H)	0.48	0.48	0.36	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.960 in
Maximum Seated Length	2.580 in
Length, Base Seat to Bulb Top (Excluding tip)	2.060 to 2.240 in
Diameter	1.062 to 1.188 in
Bulb	T9

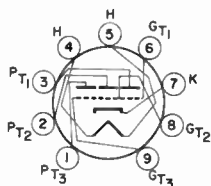
Bases (Alternates)

Small-Button Novar 9-Pin (JEDEC No. E9-7)

Small-Button Novar 9-Pin with Exhaust Tip 9-Pin (JEDEC No. E9-89)

Basing Designation for BOTTOM VIEW 9RQ

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

CHARACTERISTICS, CLASS A₁ AMPLIFIER

Values are for Each Unit

Plate Voltage	250	V
Grid Voltage	-10.5	V
Amplification Factor	17	
Plate Resistance (Approx.)	5500	Ω
Transconductance	3100	μmho



6MD8

Plate Current.	11.5	mA
Plate Current for grid volts = -14	4	mA
Grid Voltage (Approx.) for plate μ A = 50.	-23	V

AMPLIFIER — CLASS A₁

Values are for Each Unit

Maximum Ratings, Design-Maximum Values

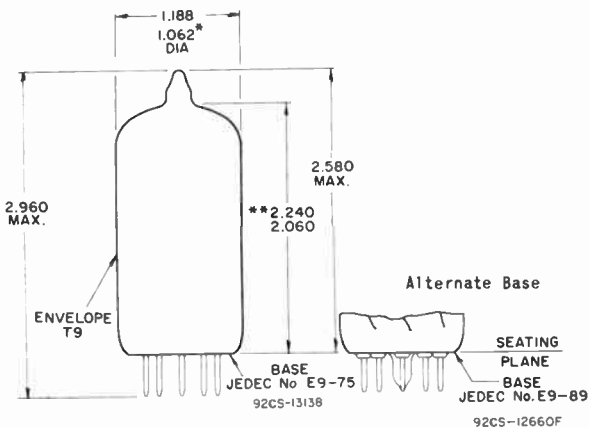
Plate Voltage.	330	V
Grid Voltage		
Positive-bias value.	0	V
Plate Dissipation.	3	W

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance		
For fixed-bias operation	1	MΩ

^a Without external shield.

DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES

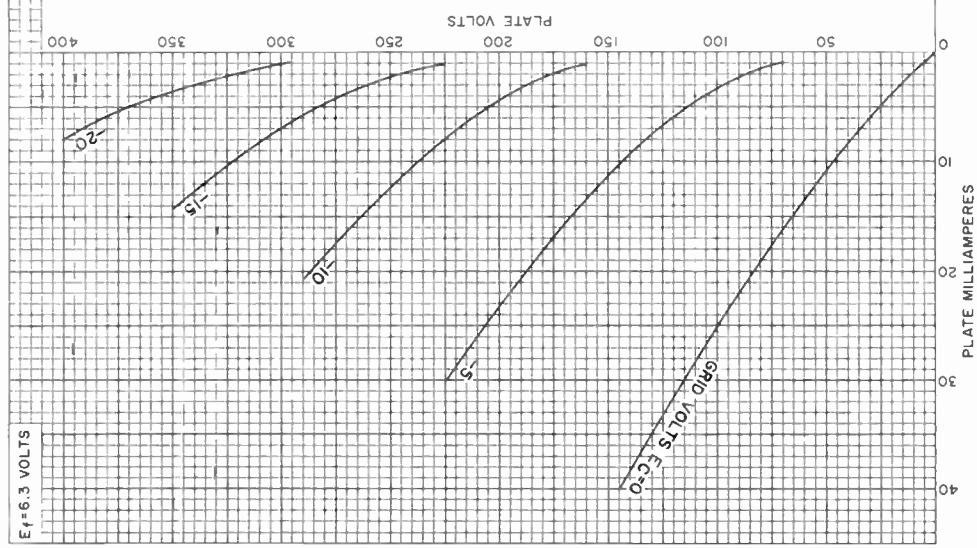
Bottom-exhaust version has the same dimensions for maximum overall length and seated length as the top-exhaust outline shown.

- * Applies to the minimum diameter except in the area of the seal.
- ** Measured from the base seat to bulb-top line as determined by arcing gauge of 0.600" I.D.



6MD8

Average Plate Characteristics EACH UNIT



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

11966
--65



Beam Power Tube

T12 NOVAR TYPE

 $P_b = 30 \text{ W}$ Overload $P_h = 200 \text{ W}$

Electrical Characteristics – Bogey Values

Heater Voltage, ac or dc	E_h	6.3	V
Heater Current	I_h	2.3	A

Direct Interelectrode Capacitances:^a

Grid No. 1 to plate	c_{g1-p}	0.6	pF
Input: G1 to (K, G3, G2, H) . .	c_i	22	pF
Output: P to (K, G3, G2, H) . .	c_o	11	pF

For the following characteristics, see Conditions below:

Amplification Factor

(Triode Connection) ^b . . μ	—	—	3.5 ^c	
Plate Resistance (Approx.). r_p	—	—	5800	Ω
Transconductance gm	—	—	9600	μmho
DC Plate Current I_b	—	580 ^d	130	mA
DC Grid-No. 2 Current . . I_{c2}	—	40 ^d	2.8	mA
Cutoff DC Grid-No. 1				
Voltage for $I_b = 1 \text{ mA}$. . $E_{c1}(co)$	-125	—	-44	V

Conditions:

Heater Voltage E_h	←	6.3	→	V
Peak Positive-Pulse				
Plate Voltage ^e e_{bm}	5000	—	—	V
DC Plate Voltage E_b	—	55	175	V
DC Grid-No. 3 Voltage . . E_{c3}	0	30	30	V
DC Grid-No. 2 Voltage . . E_{c2}	125	125	125	V
DC Grid No. 1 Voltage . . E_{c1}		0	-25	V

Mechanical Characteristics

Dimensional Outline	JEDEC No. 12-117
Envelope	JEDEC T-12
Top Cap	Small (JEDEC C1-1)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-88)

Terminal Connections

(See <i>TERMINAL DIAGRAM</i>)	JEDEC 9QL
Type of Cathode	Coated Unipotential
Operating Position	Any

Maximum Ratings — Design-Maximum Values ^f

For operation as a Horizontal-Deflection-Amplifier Tube in a 525-line, 30-frame system.

DC Plate Supply Voltage E_{bb}	990	V
Peak Positive-Pulse Plate Voltage ^g . . . e_{bm}	7500	V
Peak-Negative-Pulse Plate Voltage . . . $-e_{bm}$	1100	V

6ME6

DC Grid-No. 3 Voltage ^h	E_{c3}	75	V
DC Grid-No. 2 (Screen-Grid) Voltage . .	E_{c2}	220	V
Peak Negative-Pulse Grid-No. 1 (Control-Grid) Voltage	$-e_{c1m}$	330	V
Heater-Cathode Voltage:			
Peak	e_{hkm}	±200	V
Average	E_{hk}	100	V
Heater Voltage	E_h	5.7 to 6.9	V
Cathode Current:			
Peak	i_{km}	1200	mA
Average	$I_{k(av)}$	350	mA
Grid-No. 2 Input	P_{g2}	5	W
Plate Dissipation ^j	P_b	30	W
Temporary Overload Plate Dissipation ^k :	P_b	200	W
Envelope Temperature (at hottest point on envelope surface)	T_E	250	°C

Maximum Circuit Values

Grid-No. 1-Circuit Resistance: $R_{g(ckt)}$

Cathode Bias 1.0 megohm
(with min. $R_K = 100 \Omega$)

Grid-leak Bias 10.0 megohms
(with signal peak clamped to zero bias)

Fixed Bias 0.47 megohm
(where positive grid current is not drawn)

a Measured without external shield in accordance with the current issue of EIA Standard RS-191B.

b With grid No. 3 and grid No. 2 connected, respectively, to cathode and plate at socket.

c Conditions: $E_b = E_{c2} = 125 \text{ V}$, $E_{c1} = -25 \text{ V}$.

This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.

e Under pulse-duration condition specified in *Footnote g*.

f As defined in the current issue of EIA Standard RS-239A.

g This rating is applicable when the duration of the voltage pulse does not exceed 15% of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one scanning cycle is 10 μs .

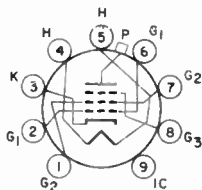
h In horizontal-deflection-amplifier service, a positive voltage should be applied to grid No. 3 to reduce interference from "snivets", which may occur in both vhf and uhf television receivers, and to increase power output. A typical value is 30 V.

j An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

k Total continuous or accumulated time not to exceed 40 seconds.

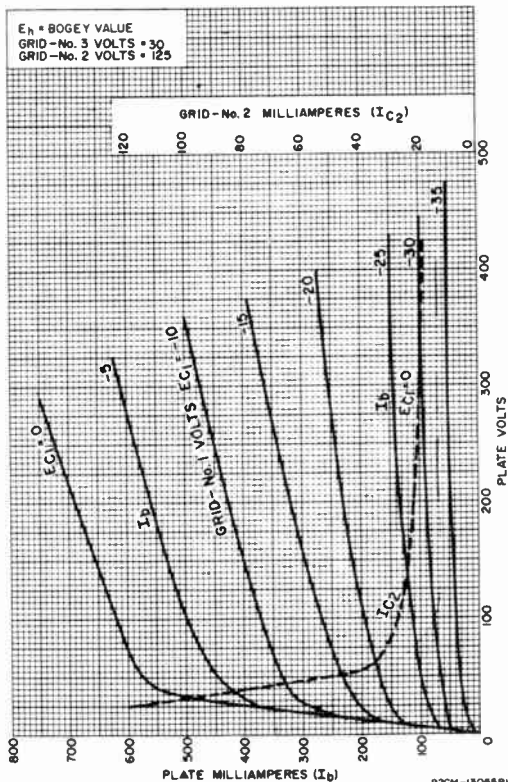
TERMINAL DIAGRAM (BOTTOM VIEW)

- Pin 1 - Grid No. 2
 Pin 2 - Grid No. 1
 Pin 3 - Cathode
 Pin 4 - Heater
 Pin 5 - Heater



- Pin 6 - Grid No. 1
 Pin 7 - Grid No. 2
 Pin 8 - Grid No. 3
 Pin 9 - Do Not Use
 Top Cap - Plate

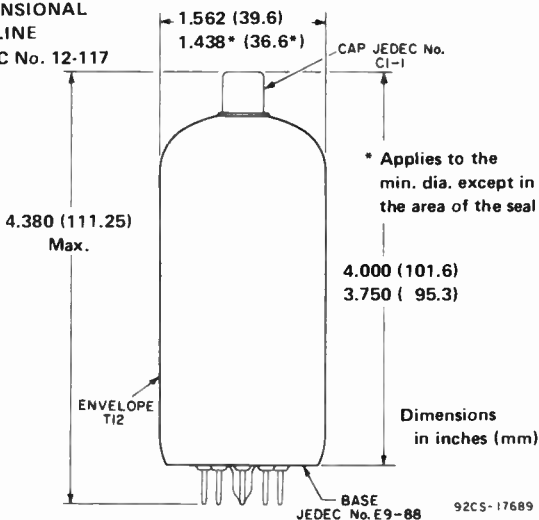
TYPICAL CHARACTERISTICS



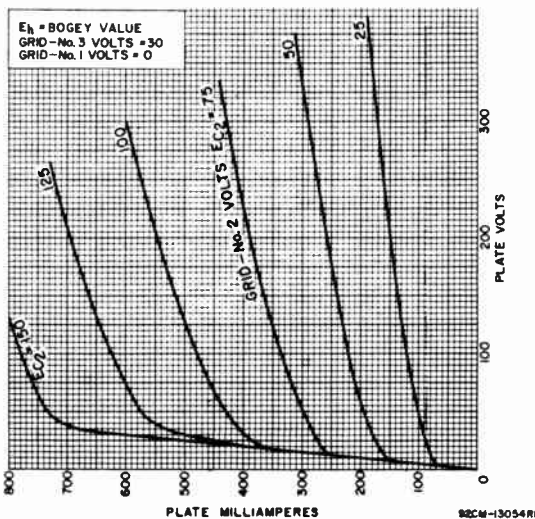
6ME6

DIMENSIONAL OUTLINE

JEDEC No. 12-117



TYPICAL CHARACTERISTICS



Two-Plate Beam-Deflection Tube

BALANCED OUTPUT

9-PIN MINIATURE TYPE

DARK HEATER

For Color-Modulator Applications in Color-TV Receivers
and a Variety of Other Switching and Gating Applications

ELECTRICAL CHARACTERISTICS

Bogey Values^a

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current at E_h - bogey value	I_h	0.300	A
Direct Interelectrode Capacitances			
Grid-No.1 to all other plates			
Grid-No.1 to all other plates	C_{p-all}	7.5	pF
Grid-No.1 to all other plates	C_{p-all}	6.0	pF
Grid-No.1 to all other plates	C_{dj-all}	6.0	pF
Grid-No.1 to all other plates	C_{pl-p2}	0.4	pF
Grid-No.1 to all other plates	$C_{dj1-dj2}$	0.4	pF
Grid-No.1 to all other plates	C_{gl-dj1}	0.07 max	pF
Grid-No.1 to all other plates	C_{gl-dj2}	0.1 max	pF

For the following characteristics see Conditions "A"

Transconductance, grid No.1 to both plates	g_m	4400	μ mho
Total DC Plate Current (plate-No.1 + plate-No.2 current)	$I_b(tot)$	14.5	mA
DC Grid-No.3 Current	I_{c3}	0.7	mA
Cutoff DC Grid-No.1 Voltage for $I_b(tot) = 10 \mu A$	$E_{c1(co)}$	-16	V

Conditions "A"

Heater Voltage	E_h	Bogey Value	V
DC Plate-No.1 Supply Voltage	E_{bb1}	250	V
Plate No.2	-	Connected to plate No.1	
DC Deflecting-Electrode-No.1 Supply Voltage	-	75	V
DC Deflecting-Electrode-No.2 Supply Voltage	-	75	V
DC Grid-No.3 Supply Voltage	E_{cc3}	350	V
DC Grid-No.1 Supply Voltage	E_{cc1}	0	V
Cathode Resistor	R_k	390	Ω

For the following deflecting-electrode characteristics, see Conditions "B"

Deflecting-Electrode Switching Voltage ^b	$E_{dj(switching)}$	30 max	V
Voltage Difference between Deflecting Electrodes for equal plate currents ($I_{b1} = I_{b2}$)	-	0	V



6ME8

Plate-No.1 Current with deflecting electrode-No.1 voltage (E_{dj1}) = 55 V and deflecting-electrode-No.2 voltage (E_{dj2}) 95 V	I_{b1}	1.3 max	mA
Plate-No.2 Current with (E_{dj1}) = 95 V and (E_{dj2}) = 55 V	I_{b2}	1.3 max	mA
Deflecting-Electrode-No.1 Current with E_{dj1} = 125 V and E_{dj2} 25 V	I_{dj1}	0.04 max	mA
Deflecting-Electrode-No.2 Current with E_{dj1} = 25 V and E_{dj2} = 125 V	I_{dj2}	0.04 max	mA

Conditions "B"

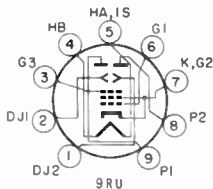
Heater Voltage.	E_h	6.3	V
DC Plate-No.1 Supply Voltage.	E_{bb1}	250	V
DC Plate-No.2 Supply Voltage.	E_{bb2}	250	V
DC Grid-No.3 Supply Voltage	E_{cc3}	350	V
DC Grid-No.1 Supply Voltage	E_{cc1}	0	V
Cathode Resistor.	R_k	390	Ω

MECHANICAL CHARACTERISTICS

Operating Position.	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length.	2.625 in
Maximum Seated Length	2.375 in
Length, Base Seat to Bulb Top Excluding tip	1.906 to 2.094 in
Maximum Diameter.	0.875 in
Dimensional Outline (JEDEC 6-3)	See <i>General Section</i>
Envelope.	JEDEC T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC E9-1)

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Deflecting-Electrode No. 1
- Pin 2 - Deflecting-Electrode No. 2
- Pin 3 - Grid No. 3
- Pin 4 - Heater Grid B
- Pin 5 - Heater Grid A
- Pin 6 - Grid No. 1
- Pin 7 - Grid No. 2
- Pin 8 - Plate No. 1
- Pin 9 - Plate No. 2



▲ Pin No. 5 should be connected directly to ground.

DESIGN-MAXIMUM RATINGS

DC Plate Voltage, each plate.	E_b	400	V
DC Deflecting-Electrode Voltage, each electrode.	E_{dj}	100	V
Peak Deflecting-Electrode Voltage, each electrode.	e_{djm}	±200	V
DC Grid-No.3 (Accelerating-Grid) Voltage	E_{c3}	400	V
DC Grid-No.1 (Control-Grid) Voltage			
Positive bias voltage	E_{c1}	0	V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9	V



DESIGN-MAXIMUM RATINGS (Cont'd)

Average Cathode Current.	$I_{K(av)}$	30	mA
Grid-No.3 Input.	P_{g3}	2	W
Plate Dissipation, each plate.	P_b	2	W

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	$R_{g1(ckt)}$	0.1 M Ω
For cathode bias operation		0.25 M Ω

^a Unless otherwise specified.

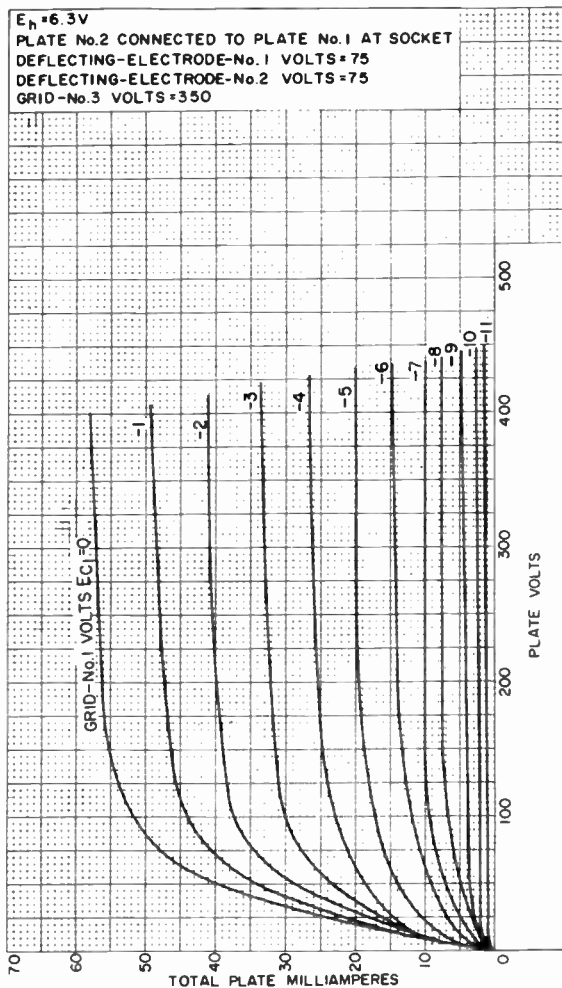
^b Defined as the total voltage change from 75 volts on either deflecting electrode with an equal and opposite change on the other deflecting electrode required to switch the plate current from one plate to the other.

OPERATING CONSIDERATIONS

Magnetic fields adversely affect the intrinsic operating plate-current balance of the 6ME8. To minimize this effect, the tube should be mounted as far as possible from all devices producing extraneous magnetic fields such as transformers, chokes, or similar components. It is recommended that an external shield be used in those applications critical for plate-current balance.



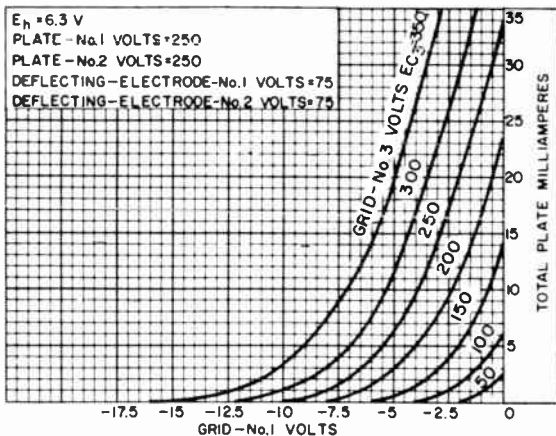
Typical Plate Characteristics



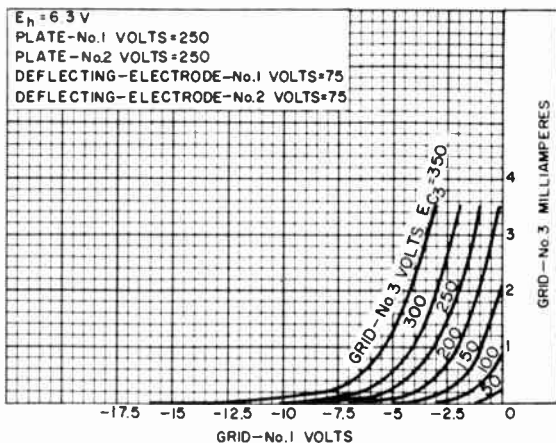
92CM-14470



Transfer Characteristics



92CS-14468



92CS-14469



Transfer Characteristics

 $E_h = 63V$

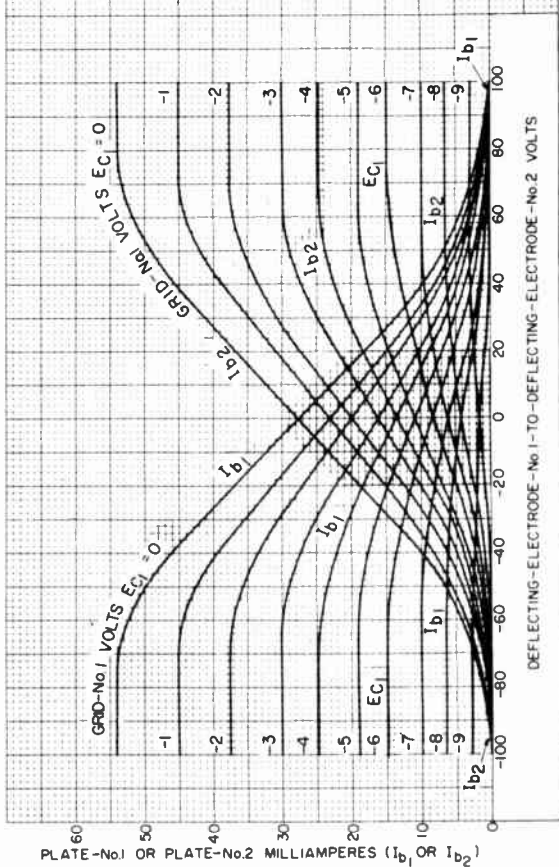
PLATE-NO.1 VOLTS=250

PLATE-NO.2 VOLTS=250

DEFLECTING-ELECTRODE No.1 VOLTS=75

DEFLECTING-ELECTRODE No.2 VOLTS=75

GRID-NO.3 VOLTS=350



Medium-Mu Triple Triode

For Matrix-Amplifier Applications in Color-TV Receivers

ELECTRICAL CHARACTERISTICS

Heater Voltage (ac or dc)	E_h	6.3			V
Heater Current	I_h	0.900			A
Direct Interelectrode Capacitances: ^o		<i>Unit No.1</i>	<i>Unit No.2</i>	<i>Unit No.3</i>	
Grid to plate	C_{gp}	2.8	2.8	2.8	pF'
Input: G to (K, H)	C_{in}	2.9	2.9	3.0	pF'
Output: P to (K, H)	C_{out}	0.36	0.60	0.70	pF'

For the following characteristics, see Conditions below:
Values are for each unit.

Amplification Factor	μ	17			
Plate Resistance (Approx.)	r_p	5600			Ω
Transconductance	G_m	3000			μmho
Plate Current	I_b	10			mA
Plate Current for grid volts = -14		4			mA
Grid Voltage (Approx.) for $I_b = 50\mu\text{A}$		-23			V

Conditions:

Heater Voltage	E_h	6.3			V
Plate Voltage	E_b	250			V
Grid Voltage	E_c	-10.5			V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	2.875 in (73.02 mm)
Maximum Seated Length	2.50 in (63.5 mm)
Maximum Diameter	1.188 in (30.1 mm)
Dimensional Outline	JEDEC E9-60
Envelope	T9
Base	Small-Button Duodecar 12-Pin with Exhaust Tip (JEDEC No.E12-70)
Terminal Diagram	JEDEC 12HG
Type of Cathode	Coated Unipotential
Operating Position	Any

6MJ8

MAXIMUM RATINGS – Design-Maximum Values^b

Values are for Each Unit

Plate Voltage	E_{bb}	330	V
Grid Voltage:			
Positive-bias value	E_{cc}	0	V
Plate Dissipation	P_b	3	W
Heater-cathode voltage (Each unit):			
Peak	e_{hkm}	+200	V
Average ^c	$E_{hk(av)}$	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance:

For fixed-bias operation	R_{g1}	1	$M\Omega$
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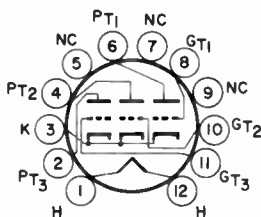
^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239.

^c Measured with a dc meter.

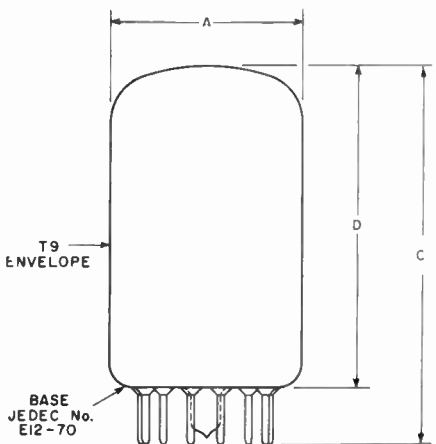
TERMINAL DIAGRAM – Bottom View

- Pin 1 - Heater
- Pin 2 - Plate of Unit No.3
- Pin 3 - Cathode
- Pin 4 - Plate of Unit No.2
- Pin 5 - No Internal Connection
- Pin 6 - Plate of Unit No.1
- Pin 7 - No Internal Connection
- Pin 8 - Grid of Unit No.1
- Pin 9 - No Internal Connection
- Pin 10 - Grid of Unit No.2
- Pin 11 - Grid of Unit No.3
- Pin 12 - Heater



JEDEC 12HG

DIMENSIONAL OUTLINE - JEDEC E9-60



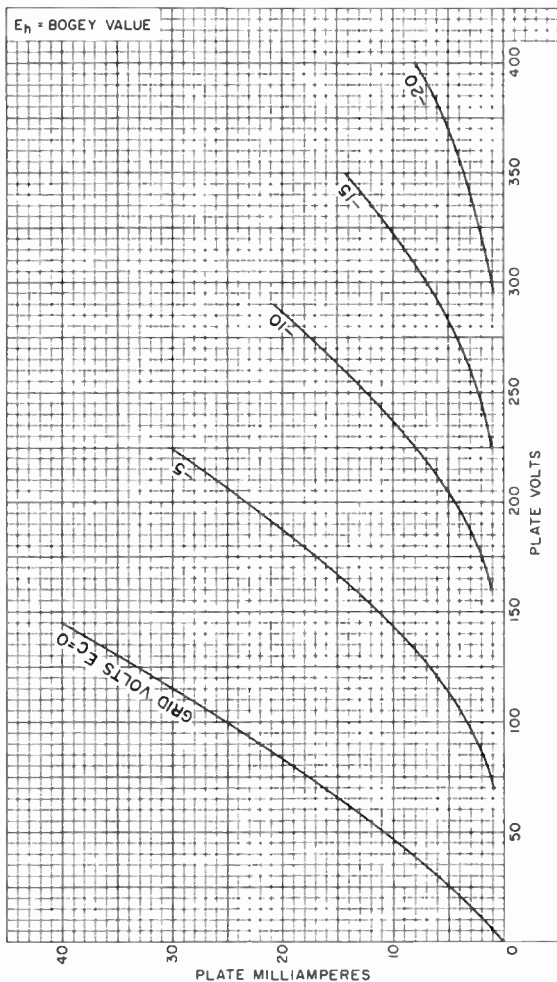
92CS-13200VI

DIMENSION	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	1.062*	1.188	27.0*	30.1
C	—	2.875	—	73.02
D	2.250	2.500	57.2	63.5
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION				
* Applies to the minimum diameter except in the area of the seal.				

6MJ8

AVERAGE PLATE CHARACTERISTICS

Each Unit



92CM-11966R1

High-Mu Triple Triode

Duodecar Type

For Matrix-Amplifier Applications
in Color-TV Receivers

ELECTRICAL CHARACTERISTICS - Bogue Values

Heater Voltage (ac or dc)	E_h	6.3			V
Heater Current	I_h	0.9			A
Direct Interelectrode Capacitances: ^a		<i>Unit No.1</i>	<i>Unit No.2</i>	<i>Unit No.3</i>	
Grid to plate	C_{gp}	2.6	2.6	2.6	pF
Input: G to (K, H)	C_{in}	4.6	4.6	4.6	pF
Output: P to (K, H)	C_{out}	0.33	0.57	0.65	pF

For the following characteristics, see Conditions below:
Values are for each unit.

Amplification Factor	μ	47	40		
Plate Resistance (Approx.)	r_p	6250	10,000		Ω
Transconductance	G_m	7500	4000		μmho
Plate Current	I_b	11	4.8		mA
Grid Voltage (Approx.) for $I_b = 50\mu\text{A}$		-5	-11		V

Conditions:

Heater Voltage	E_h	6.3	6.3		V
Plate Voltage	E_b	125	200		V
Grid Voltage	E_c	-1	-4		V

MECHANICAL CHARACTERISTICS

Maximum Overall Length	2.875 in (73.02 mm)
Maximum Seated Length	2.50 in (63.5 mm)
Maximum Diameter	1.188 in (30.1 mm)
Dimensional Outline	JEDEC E9-60 <i>See Outlines, Glass Tubes in General Section</i>
Envelope	T9
Base	Small-Button Duodecar 12-Pin with Exhaust Tip (JEDEC No.E12-70)
Terminal Diagram	JEDEC 12HU
Type of Cathode	Coated Unipotential
Operating Position	Any

6MN8

MAXIMUM RATINGS – Design-Maximum Values^b

Values are for Each Unit

Plate Voltage	E_{bb}	330	V
Grid Voltage:			
Positive-bias value	E_{cc}	0	V
Plate Dissipation	P_b	3	W
Heater-cathode voltage (Each unit):			
Peak	e_{hkm}	±200	V
Average ^c	$E_{hk(av)}$	100	V
Heater Voltage, ac or dc	E_h	5.7 to 6.9	V

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance:

For fixed-bias operation	R_g	1	$M\Omega$
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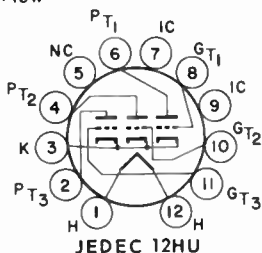
^a Measured without external shield in accordance with the current issue of EIA Standard RS-191.

^b As defined in the current issue of EIA Standard RS-239.

^c Measured with a dc meter.

TERMINAL DIAGRAM – Bottom View

- Pin 1 - Heater
- Pin 2 - Plate of Unit No.3
- Pin 3 - Cathode
- Pin 4 - Plate of Unit No.2
- Pin 5 - No Internal Connection
- Pin 6 - Plate of Unit No.1
- Pin 7 - Do Not Use
- Pin 8 - Grid of Unit No.1
- Pin 9 - Do Not Use
- Pin 10 - Grid of Unit No.2
- Pin 11 - Grid of Unit No.3
- Pin 12 - Heater



Medium-Mu Triode— Sharp-Cutoff Pentode

9-Pin Miniature Type

For Use as a General-Purpose-Amplifier

Tube in Color- and Black-and-White TV Receivers

ELECTRICAL CHARACTERISTICS — Bogey Values^a

Heater Voltage, ac or dc	E_h	6.3 ± 10%	V
Heater Current	I_h	535	mA
Direct Interelectrode Capacitances: ^b (Without External Shield)			
<i>Triode Unit:</i>			
Grid to plate	c_{g-p}	1.7	pF
Input: G_T to (K_T , G_{3P} + K_P + IS, H)	c_i	3.0	pF
Output: P_T to (K_T , G_{3P} + K_P + IS, H).	c_o	1.4	pF
<i>Pentode Unit:</i>			
Grid No.1 to plate	c_{g1-p}	0.045	pF
Input: G_{1P} to (K_P + G_{3P} + IS, G_{2P} , H)	c_i	7.5	pF
Output: P_P to (K_P + G_{3P} + IS, G_{2P} , H).	c_o	2.2	pF

For the following characteristics, see Conditions below:

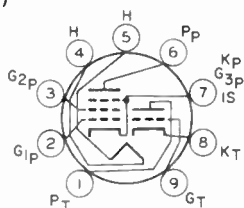
	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Amplification Factor	μ	40	-
Plate Resistance (Approx.)	r_p	5	150 k Ω
Transconductance	g_m	8500	10000 μ mho
DC Plate Current	I_b	18	12 mA
DC Grid-No.2 Current	I_{c2}	-	4.5 mA
Cutoff DC Grid-No.1			
Voltage for $I_b = 20 \mu$ A.	$E_{c1(c0)}$	-12	-7 V

Conditions:

Heater Voltage	E_h	6.3	6.3	V
DC Plate Voltage	E_b	150	125	V
DC Grid-No.2 Voltage	E_{c2}	-	125	V
Cathode Resistance	R_k	56	62	Ω

TERMINAL DIAGRAM (Bottom View)

- 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, Grid No.3 and Internal Shield
- Pin 8 - Triode Cathode
- Pin 9 - Triode Grid



JEDEC 9AE

6MQ8

MECHANICAL CHARACTERISTICS

Maximum Overall Length	2.187 in (55.54 mm)
Maximum Seated Length	1.937 in (49.19 mm)
Maximum Diameter	0.875 in (22.12 mm)
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)
Dimensional Outline	JEDEC 6-2
Terminal Diagram	JEDEC 9AE
Type of Cathodes	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS - Design-Maximum Values^c

		Triode Unit	Pentode Unit	
DC Plate Voltage	E_b	330	330	V
DC Grid-No.2 Supply Voltage	E_{c2}	-	330	V
DC Grid-No.2 Voltage		See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section.		
DC Grid-No.1 Voltage: Positive-bias value	E_{c1}	0	0	V
Heater-Cathode Voltage: Peak	e_{hkm}	±200	±200	V
DC	E_{hk}	100	100	V
Heater Current	I_h	500 to	570	mA
Grid-No.2 Input: For grid-No.2 voltages up to 165 volts	P_{g2}	-	0.55	W
For grid-No.2 voltages between 165 and 330 volts		See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section.		
Plate Dissipation	P_b	2.7	2.5	W

MAXIMUM CIRCUIT VALUES

Grid-No.1 Circuit Resistance:				
For fixed-bias operation	$R_{g1(ckt)}$	0.5	0.25	$M\Omega$
For cathode-bias operation	$R_{g1(ckt)}$	0.5	0.5	$M\Omega$

INTERELECTRODE LEAKAGE

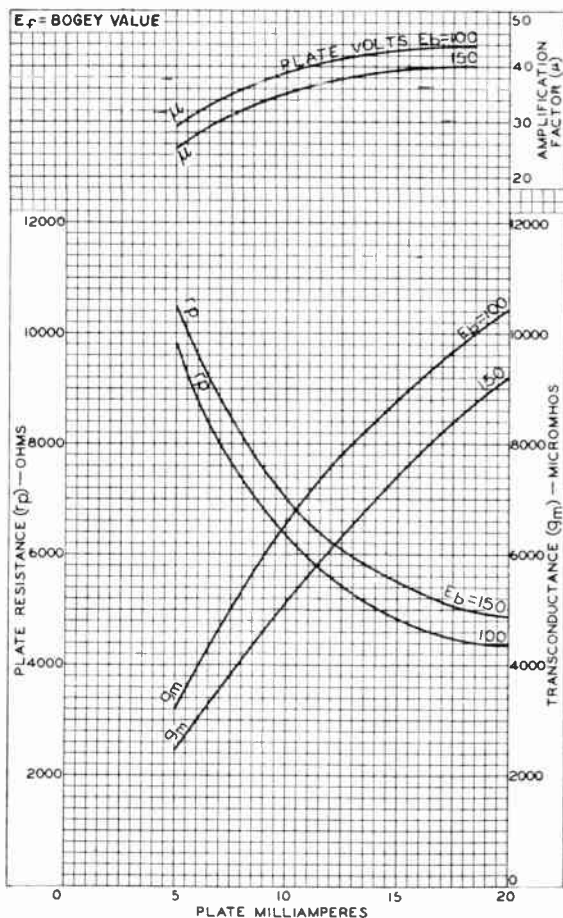
Minimum Leakage Resistance between grid No.1 of each unit and all other electrodes of both units tied together	R_{g1-all}	100	$M\Omega$
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Conditions:

E_h = bogey value, E_{c1} = -100 V with respect to all other electrodes tied together.

- a Unless otherwise specified.
 b Measured in accordance with the current issue of EIA Standard RS-191.
 c As defined in the current issue of EIA Standard RS-239

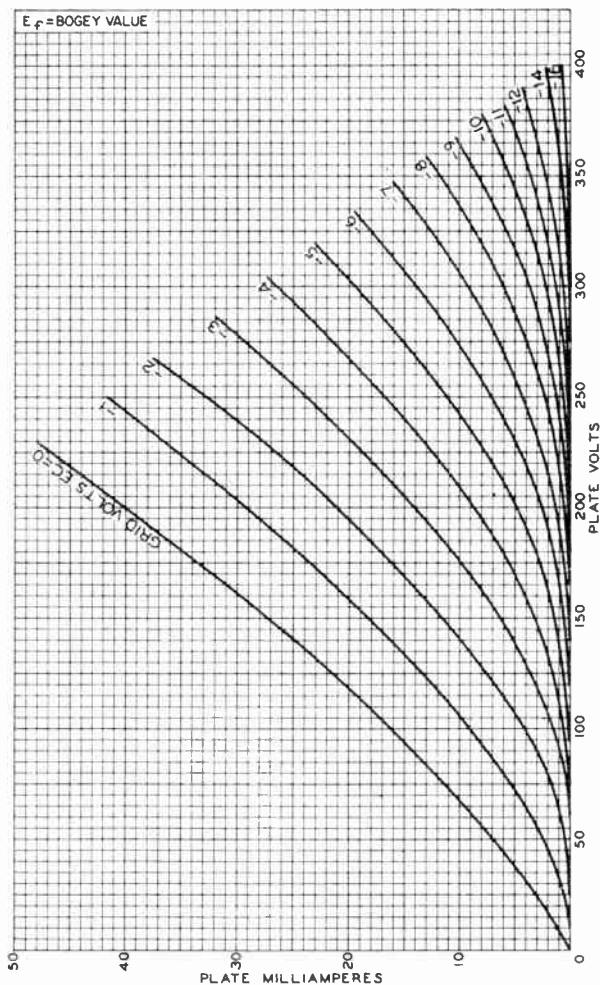
TYPICAL CHARACTERISTICS - Triode Unit



92CM-9882R1

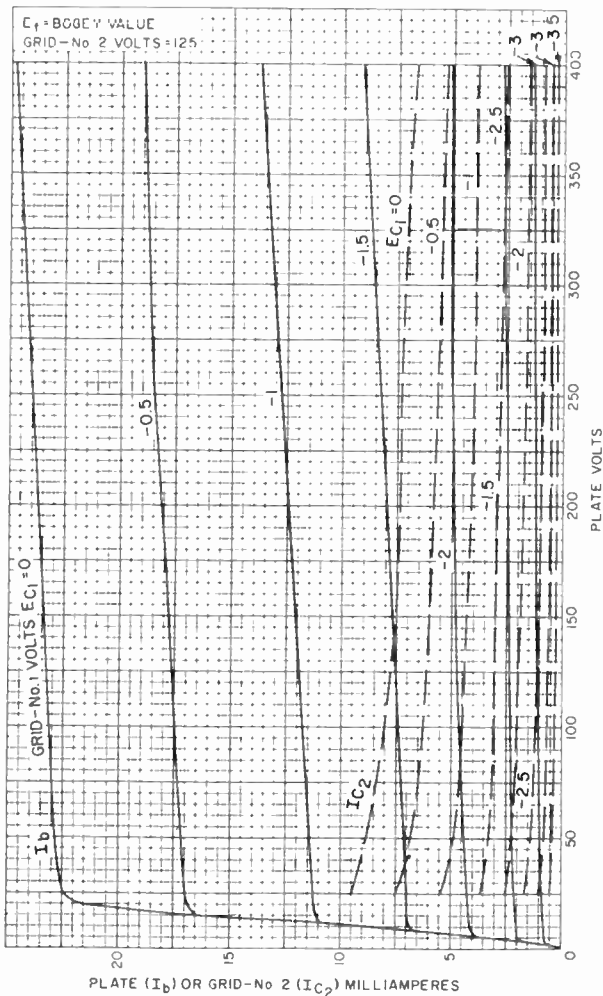
6MQ8

TYPICAL CHARACTERISTICS - Triode Unit



92CM-9866RI

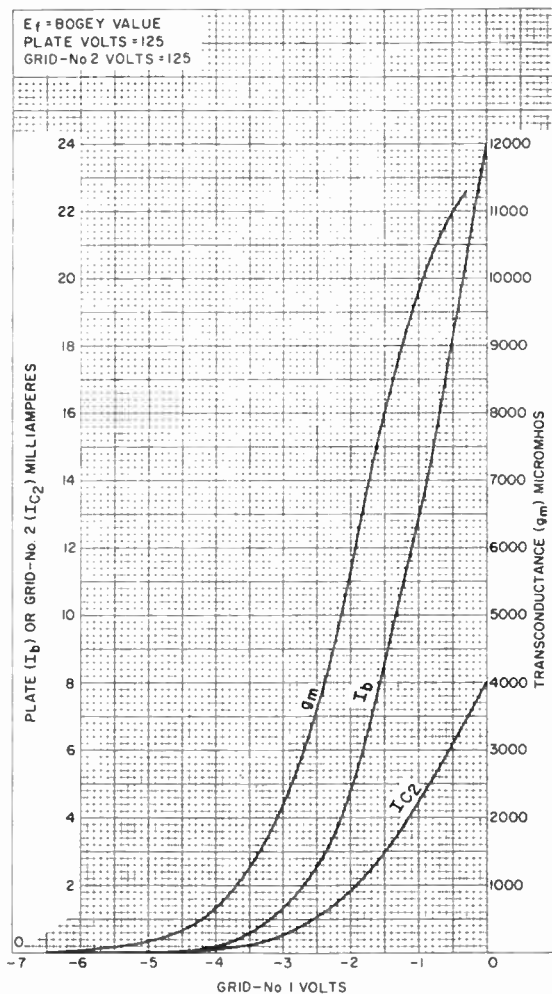
TYPICAL CHARACTERISTICS - Pentode Unit



92CM-15102

6MQ8

TYPICAL CHARACTERISTICS - Pentode Unit



92CM-15107

Medium-Mu Triode— Sharp-Cutoff Pentode

9-Pin Miniature Type

For Use as a Burst Amplifier and General-Purpose-
Amplifier Tube in Color- and Black-and-White TV
Receivers

ELECTRICAL CHARACTERISTICS — Bogey Values ^a

Heater Voltage, ac or dc	E_{h1}	6.3	V
Heater Current	I_h	600	mA
Direct Interelectrode Capacitances: ^b			
<i>Triode Unit:</i>		<i>Without External Shield</i>	<i>With External Shield^c</i>
Grid to plate	c_{g-p}	2.2	2.2 pF
Input: G_T to (K_T , G_{3p} + K_P + IS, H)	c_i	3.0	3.2 pF
Output: P_T to (K_T , G_{3p} + K_P + IS, H)	c_o	2.2	2.4 pF
Heater to cathode	c_{h-k}	4.4	4.8 ^d pF
<i>Pentode Unit:</i>			
Grid No. 1 to plate	c_{gl-p}	0.05	0.05 pF
Input: G_{1p} to (K_P + G_{3p} + IS, G_{2p} , H)	c_i	9.0	9.0 pF
Output: P_P to (K_P + G_{3p} + IS, G_{2p} , H)	c_o	3.6	4.4 pF
Heater to cathode	c_{h-k}	5.5	7.5 ^d pF
Pentode grid No. 1 to triode plate	P_{gl-Tp}	0.17max.	0.2max. pF
Pentode plate to triode plate	P_{p-Tp}	0.09max.	0.008max pF
<i>For the following characteristics, see</i>			
Conditions		<i>Triode Unit</i>	<i>Pentode Unit</i>
Amplification Factor	μ	35	-
Plate Resistance (Approx.)	r_p	5.8	165 k Ω
Transconductance	g_m	6000	9000 μ mho
DC Plate Current	I_b	11.5	19 mA
DC Grid-No.2 Current	I_{c2}	-	4.2 mA
Cutoff DC Grid-No.1 Voltage(Aprox.):			
For $I_b=10\mu A$	$E_{c1(co)}$	-5.8	V
For $I_b=20\mu A$	$E_{c1(co)}$	-	-9.5 V

6MU8

Conditions		Triode Unit	Pentode Unit	
Heater Voltage	E_h	6.3	6.3	V
DC Plate Voltage	E_b	125	150	V
DC Grid-No.2 voltage	E_{c2}	-	150	V
DC Grid-No.1 voltage	E_{c1}	-1	-	V
Cathode Resistance	R_k	-	150	Ω

MECHANICAL CHARACTERISTICS

Maximum Overall Length	2.625 in (66.67 mm)
Maximum Seated Length	2.375 in (60.32 mm)
Maximum Diameter (<i>See Dimensional Outline</i>)	0.875 in (22.12 mm)
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin(JEDEC E9-1)
Dimensional Outline	JEDEC 6-3
Terminal Diagram	JEDEC 9AE
Type of Cathodes	Coated Unipotential
Operating Position	Any

MAXIMUM RATINGS - Design-Maximum Values

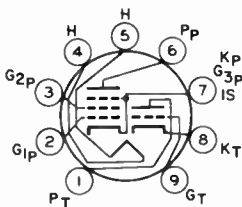
		Triode Unit	Pentode Unit	
DC Plate Voltage	E_b	330	330	V
DC Grid-No.2 Supply Voltage	E_{c2}	-	330	V
DC Grid-No.2 Voltage	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>			
DC Grid-No.1 Voltage:				
Positive-bias value	E_{c1}	0	0	V
Heater-Cathode Voltage:				
Peak	e_{hkm}	± 200	± 200	V
DC	E_{hk}	100	100	V
Heater Voltage, ac or dc	E_h	5.7	to 6.9	V
Grid-No.2 Input: For grid- No.2 voltages up to 165 volts	P_{g2}	-	1.1	W
For grid-No.2 voltages between 165 and 330 volts	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>			
Plate Dissipation	P_b	2.5	3.75	W

MAXIMUM CIRCUIT VALUES

Grid-No.1 Circuit Resistance:				
For fixed-bias operation	R_{g1}	0.5	0.25	$M\Omega$
For cathode-bias operation	R_{g1}	1.0	1.0	$M\Omega$

- a Unless otherwise specified.
 b Measured in accordance with the current issue of EIA Standard RS-191.
 c With external shield JEDEC No. 315 connected to cathode of unit under test except as noted.
 d With external shield JEDEC No. 315 connected to ground.
 e As defined in the current issue of EIA Standard RS-239.

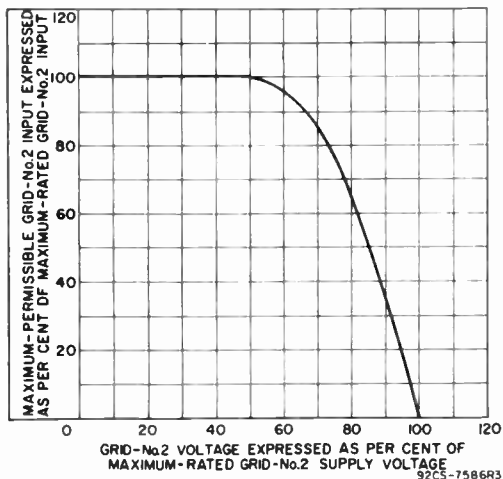
TERMINAL DIAGRAM (Bottom View)



JEDEC 9AE

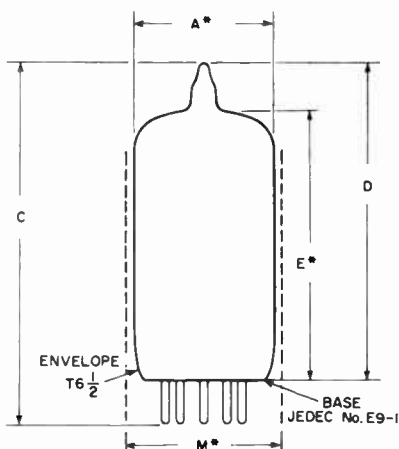
- Pin 1 - Triode Plate
 Pin 2 - Pentode Grid No.1
 Pin 3 - Pentode Grid No.2
 Pin 4 - Heater
 Pin 5 - Heater
 Pin 6 - Pentode Plate
 Pin 7 - Pentode Cathode,
 Grid No.3 and
 Internal Shield
 Pin 8 - Triode Cathode
 Pin 9 - Triode Grid

GRID-NO. 2 INPUT RATING CHART



6MU8

DIMENSIONAL OUTLINE JEDEC 6-3



92CS-11893R2

DIMENSION	INCHES			MILLIMETERS		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A*	0.800	-	0.845	20.32	-	21.46
C	-	-	2.625	-	-	66.67
D	-	-	2.375	-	-	60.32
E*	1.906	2.000	2.094	48.41	50.80	53.19
M*	-	-	0.875	-	-	22.22
MILLIMETER DIMENSION DERIVED FROM INCH DIMENSION						
* As defined in the current issue of EIA standards RS-209-A1						



