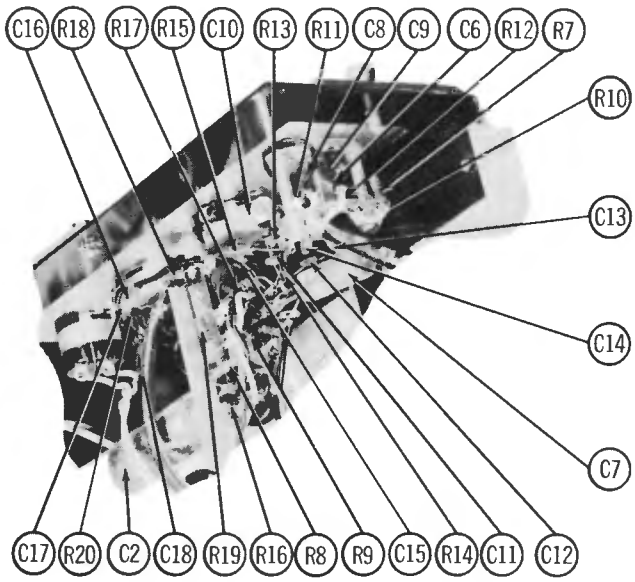



NATIONAL
MODEL Horizon 10

| | |
|---|---|
| TRADE NAME | National Model "Horizon 10" |
| MANUFACTURER | National Co., Inc., 61 Sherman St., Malden 48, Mass. |
| TYPE SET | AC Operated 4 Channel 10 Watt Audio Amplifier |
| TUBES (Five) | Types 12AX7 Pre-Amp., 12AX7 AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier |
| POWER SUPPLY | 110-120 Volts AC-50/60 Cycles RATING .66 Amp. @ 117 Volts AC |

NATIONAL
MODEL Horizon 10




FRONT DECK—PARTIAL REAR VIEW

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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# PARTS LIST AND DESCRIPTIONS

NATIONAL
MODEL "Horizon 10"

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | NATIONAL PART No. | STANDARD REPLACEMENT | | |
| V1 | Pre-Amplifier | 12AX7 | 12AX7 | 9A | |
| V2 | AF Amplifier-Phase Inverter | 12AX7 | 12AX7 | 9A | |
| V3 | Output | 6V6GT | 6V5GT | 7S | |
| V4 | Output | 6V6GT | 6V6GT | 7S | |
| V5 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

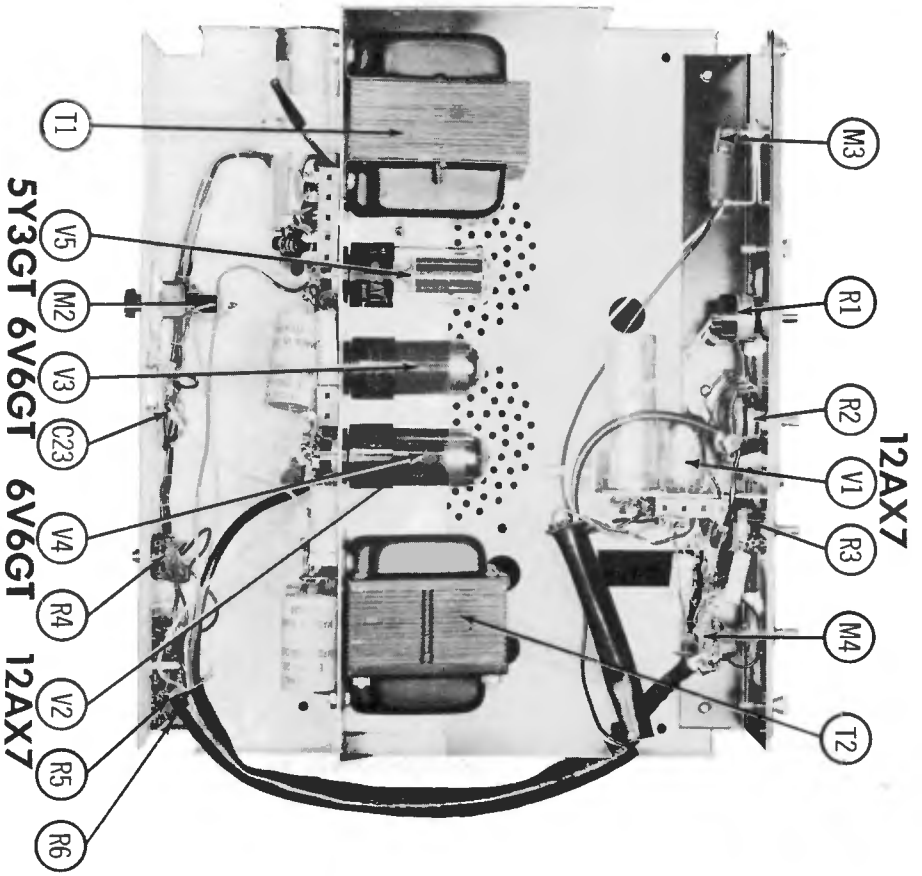
**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | NATIONAL PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C1A | ■40 | 450 | | AFH3-46 | | | | FP378 | TVL-3787 |
| B | ▲80 | 450 | | | | | | | TVA-1709 |
| C | 20 | 450 | | | | | | | |
| C2A | ■40 | 300 | | AFH1-34 | | A038 | | | |
| B | ▲50 | 6 | | PRS150/50-50 | | BBR50-6 | | | |
| C | 50 | 6 | | | | BBR50-6 | | | |
| C3 | 20 | 450 | | PRS450/20 | | BR2045 | | TC75 | TVA-1709 |
| C4 | 20 | 450 | | PRS450/20 | | BR2045 | | TC75 | TVA-1709 |
| C5 | 4 | 450 | | PRS450/4 | | BR445 | | TC70 | TVA-1702 |
| C6 | 1500 | | | BPD-0015 | DD-152 | K071 | 801-0015 | DC-5215 | 5HK-D15 |
| C7 | .1 | 200 | | | | | | | |
| C8 | 56 | | | BPD-000058 | DD-560 | G036 | GP1K-560 | UC-5456 | 5GA-Q56 |
| C9 | 56 | | | BPD-000056 | DD-580 | G036 | GP1K-560 | UC-5456 | 5GA-Q56 |
| C10 | .015 | 200 | | | | | | | |
| C11 | 270 | | | BPD-00027 | DD-271 | G054 | GP2K-271 | UC-5327 | 5GA-T27 |
| C12 | 680 | | | BPD-00068 | DD-681 | G065 | GP2K-681 | UC-5368 | 5GA-T68 |
| C13 | 1200 | | | BPD-0012 | DD-122 | G070 | 801-0012 | DC-5212 | 5HK-D12 |
| C14 | 15 | | | BPD-000056 | DD-560 | G036 | GP1K-560 | UC-5456 | 5GA-Q56 |
| C15 | 10000 | | | BPD-01 | DD-103 | K082 | 801-01 | DC-511 | 5HK-S1 |
| C16 | 220 | | | BPD-00022 | DD-221 | G051 | GP1K-221 | UC-5322 | 5GA-T22 |
| C17 | 330 | | | BPD-00033 | DD-331 | G056 | GP1K-331 | UC-5333 | 5GA-T33 |
| C18 | 2000 | | | BPD-002 | DD-202 | K072 | 801-002 | DC-522 | 5HK-D2 |
| C19 | 10000 | | | BPD-01 | DD-103 | K082 | 811-01 | DC-511 | 5HK-S1 |
| C20 | .1 | 400 | | | | | | | |
| C21 | .1 | 400 | | | | | | | |
| C22 | 10000 | | | BPD-01 | DD-103 | K082 | 811-01 | DC-511 | 5HK-S1 |
| C23 | 10000 | | | BPD-01 | DD-103 | K082 | 811-01 | DC-511 | 5HK-S1 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | NATIONAL PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 2Meg | ½ | T888-1 | Q13-139 | A47-2Meg-Z | AB-76 | U-55 | Bass |
| B | Shaft | | Not Req. | Not Req. | FS-3 | AK-24 | Not Req. | Attach to R1A |
| C | Switch | | Not Req. | 76-1 | SWE-12 | KB-1 | US-26 | Attach to R1A |
| R2A | 2Meg | ½ | T013-6 | Q17-139 | | AB-76 | | Treble |
| B | Shaft | | Not Req. | Not Req. | | AK-24 | | Attach to R2A |
| R3 | 2Meg | ½ | T748-1 | Q17-139X | | BT-81 | UT-450 | Loudness - tapped @ 112KΩ |
| R4A | 1000Ω | ½ | T013-5 | Q11-108 | A47-1000-S | AB-5 | U-4 | Hum Balance |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | AK-1 | Not Req. | Attach to R4A |

# CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING OHMS | RATING WATT | REPLACEMENT DATA NATIONAL PART No. | REPLACEMENT DATA IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R5 | 56KΩ | ½ | | BTS-56KΩ | |
| R6 | 27KΩ | ½ | | BTS-27K | |
| R7 | 39KΩ | ½ | | BTS-39K | |
| R8 | 1800Ω | ½ | | BTS-k800 | |
| R9 | 220KΩ | ½ | | BTS-220K | |
| R10 | 56KΩ | ½ | | BTS-58K | Note 3 |
| R11 | 330KΩ | ½ | | BTS-330K | |
| R12 | 330KΩ | ½ | | BTS-330K | |
| R13 | 15KΩ | ½ | | BTS-15K | |
| R14 | 1Meg | ½ | | BTS-1Meg | |
| R15 | 8.2Meg | ½ | | BTS-8.2Meg | |
| R16 | 2700Ω | ½ | | BTS-2700 | Note 1 |
| R17 | 270KΩ | ½ | | BTS-270K | |
| R18 | 1Meg | ½ | | BTS-1Meg | |
| R19 | 33KΩ | ½ | | BTS-33K | |
| R20 | 120KΩ | ½ | | BTS-120K | |
| R21 | 470Ω | ½ | | BTS-470 | Note 2 |
| R22 | 470KΩ | ½ | | BTS-470K | |
| R23 | 68KΩ | 2 | | BTB-68K | |

| ITEM No. | RATING OHMS | RATING WATT | REPLACEMENT DATA NATIONAL PART No. | REPLACEMENT DATA IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R24 | 5600Ω | 1 | | BTA-5600 | |
| R25 | 1Meg | ½ | | BTS-1Meg | |
| R26 | 1200Ω | ½ | | BTS-1200 | |
| R27 | 33KΩ 5% | ½ | | BTS-33K 5% | |
| R28 | 33KΩ 5% | ½ | | BTS-33K 5% | |
| R29 | 4.7Meg 5% | ½ | | BTS-4.7Meg 5% | |
| R30 | 4.7Meg 5% | ½ | | BTS-4.7Meg 5% | |
| R31 | 4700Ω | ½ | | BTS-4700 | |
| R32 | 470Ω | ½ | | BTS-470Ω | |
| R33 | 270KΩ 5% | ½ | | BTS-270K 5% | |
| R34 | 470Ω | ½ | | BTS-470 | |
| R35 | 270KΩ 5% | ½ | | BTS-270K 5% | |
| R36 | 22KΩ | ½ | | BTS-22K | |
| R37 | 470Ω | 2 | | BTB-470 | |
| R38 | 470Ω | 2 | | BTB-470 | |
| R39 | 100KΩ | 1 | | BTA-100K | |
| R40 | 10KΩ | ½ | | BTS-10K | |

Note 1: Some versions may use a 3300Ω in this application.
Note 2: Some versions may use a 330Ω in this application.
Note 3. Not used in some versions.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA NATIONAL PART No. | Stancor PART No. | Merit PART No. | Triad PART No. | Halldorson PART No. | Thordarson PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC @.66A | 860VCT .080A | 5VAC @2A | 6.3VAC @1.7A | T861-1 | PC-8409 ① ② | | R-11A ① ② | P9310 ① ② | 24R04U ① ② |

① Drill new mounting holes.
② Tape 6.3V center tap.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. 1 | IMPEDANCE SEC. | REPLACEMENT DATA NATIONAL PART No. | Stancor PART No. | Merit PART No. | Triad PART No. | Halldorson PART No. | Thordarson PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T2 | 2.35KΩ | 16Ω | T659-1 | | | | | | |
| | PRI. 2 | tap @ | | | | | | | |
| | 2.35KΩ | 8Ω | | | | | | | |

## SELENIUM RECTIFIER

| ITEM No. | RATING CURRENT | REPLACEMENT DATA NATIONAL PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | MALLORY PART No. | SARKES TARZIAN PART No. | SELETRON PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| M1 | .005A | T657-1 | 323D8490 | | | 026-25H-Q | V17HP | |

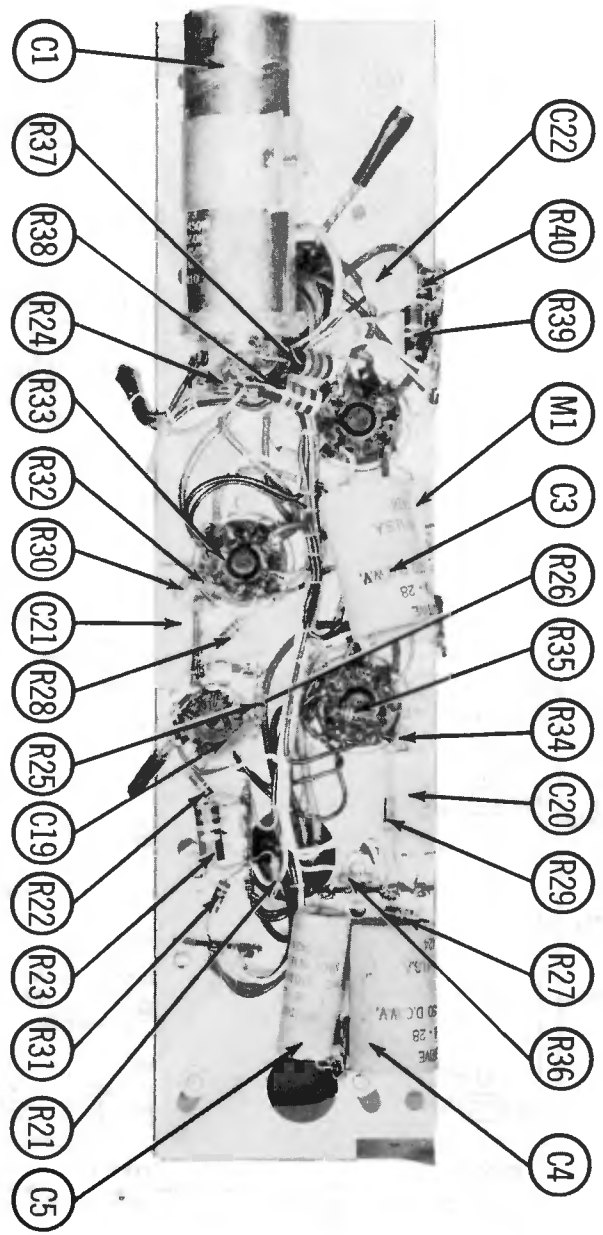
## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA NATIONAL PART No. FUSE | NATIONAL PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M2 | 3AG | 1A-250V | | E510-1 | 312001 (3AG-1A) | 342001 | AGC 1 | HKP |

## MISCELLANEOUS

| ITEM No. | PART NAME | NATIONAL PART No. | NOTES |
|---|---|---|---|
| M3 | Panel Light | | #47 Bayonet |
| M4 | Switch Knob | T663-1 SB:2819 | Selector 4 used |

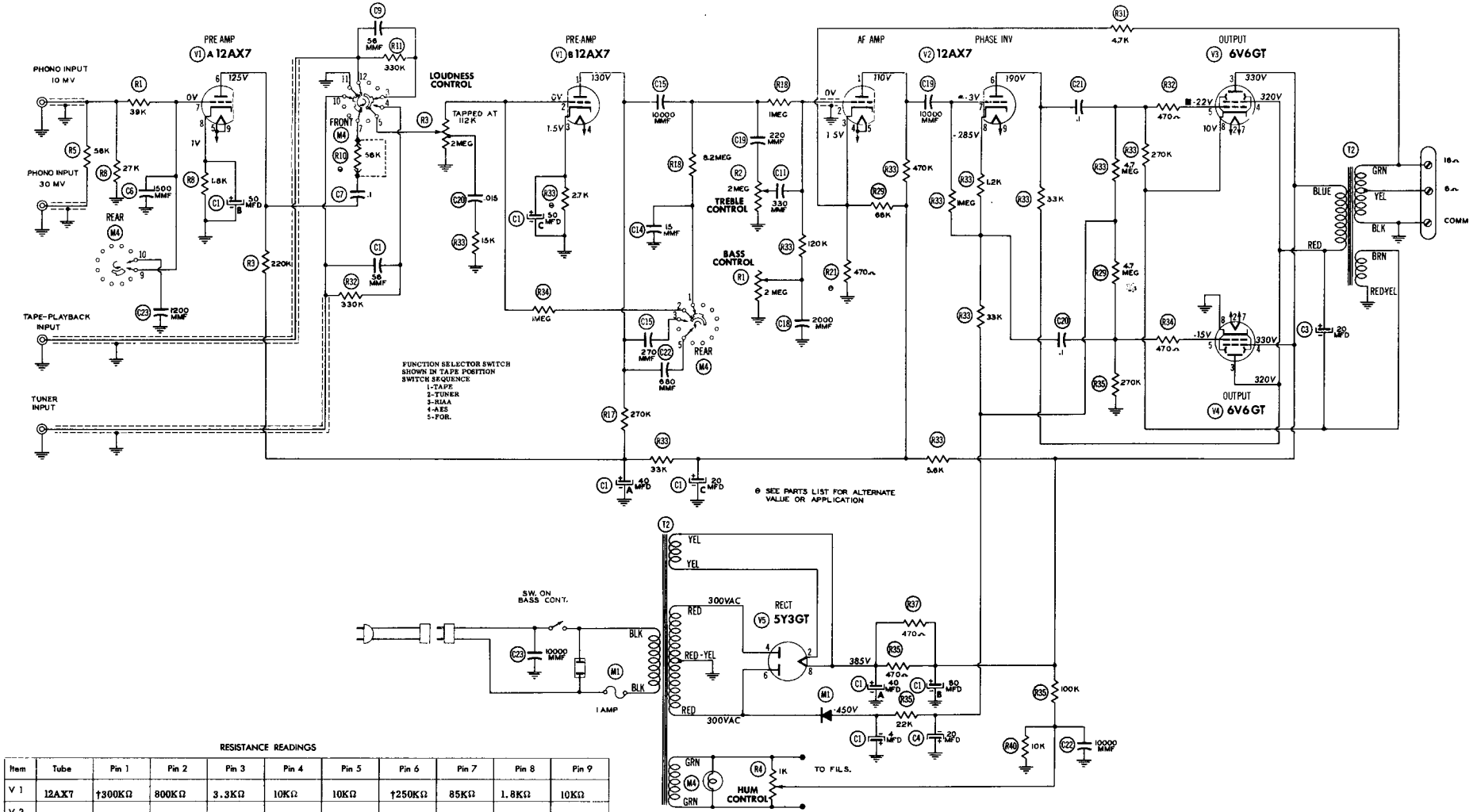
## REAR DECK – REAR VIEW








NATIONAL MODEL "Horizon 10"




RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 12AX7 | †300KΩ | 800KΩ | 3.3KΩ | 10KΩ | 10KΩ | †250KΩ | 85KΩ | 1.8KΩ | 10KΩ |
| V 2 | 12AX7 | †450KΩ | 230KΩ | 330Ω | 10KΩ | 10KΩ | †35KΩ | 1.3Meg | *35KΩ | 10KΩ |
| V 3 | 8V8GT | .8Ω | 10KΩ | †260Ω | †85Ω | 270KΩ | 270KΩ | 10KΩ | 8Ω | |
| V 4 | 6V8GT | INF | 10KΩ | †85Ω | †470Ω | 270KΩ | 270KΩ | 10KΩ | 0Ω | |
| V 5 | 5Y3GT | INF | 25KΩ | 150Ω | 150Ω | INF | 180Ω | 100Ω | 25KΩ | |

▪ MEASURED FROM PIN 8 OF V2
† MEASURED FROM PIN 2 OF V5
* MEASURED FROM OUTPUT OF M1
■ MEASURED FROM PIN 8 OF V3

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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