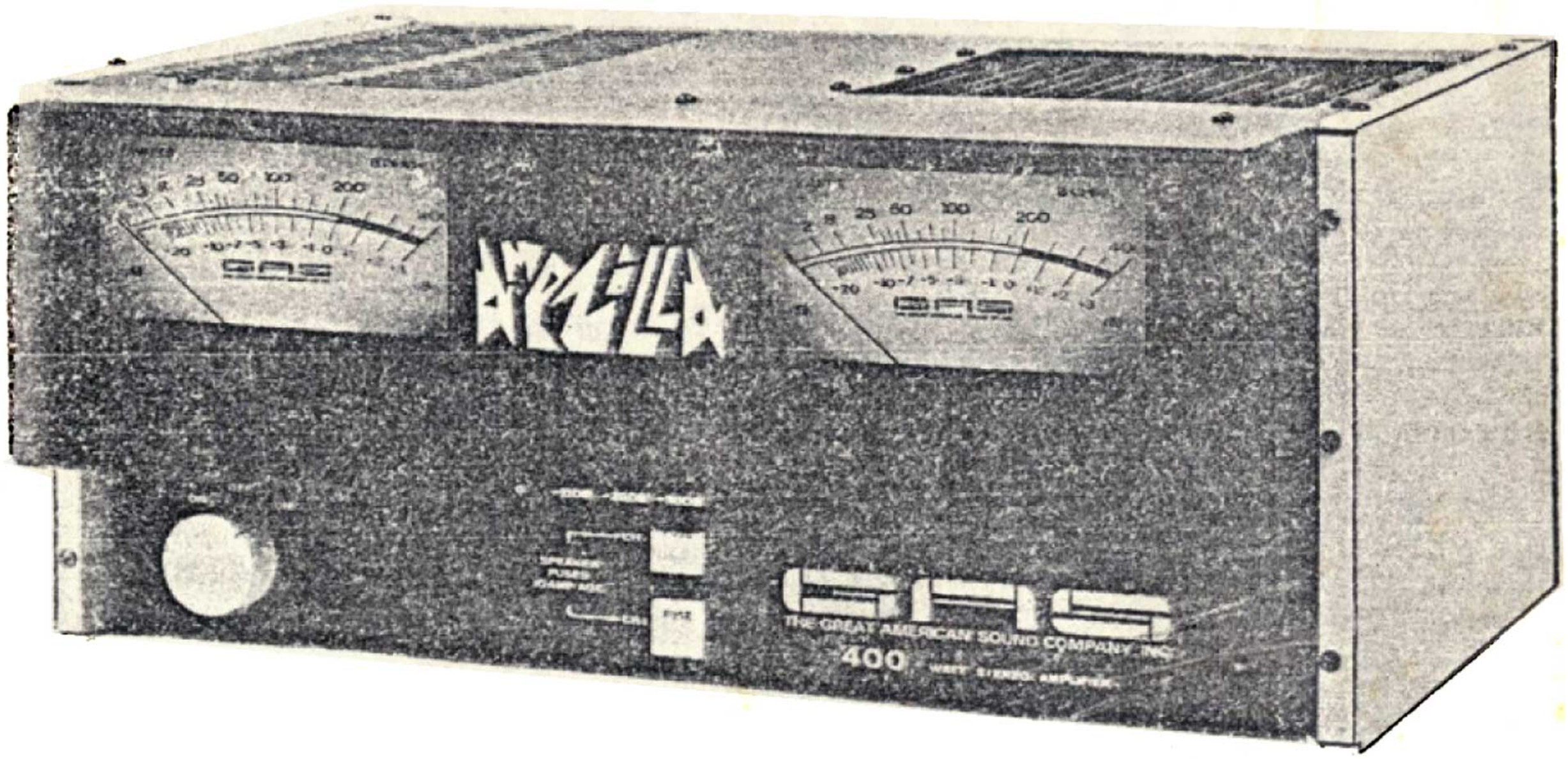


# ASSEMBLY MANUAL

## AMPZILLA MODEL GAS 101

THE GREAT AMERICAN SOUND COMPANY, INC.
8780 SHOREHAM DRIVE
WEST HOLLYWOOD, CALIFORNIA 90069

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# INTRODUCTION

Welcome to Great American Sound, your friendly G.A.S. Company, where we dare to be different and truthful. The Great American Sound Company, Inc., was formed by audiophiles and engineers who are dedicated to furthering the advancement of the state of the art and who have come together to bring you products that have no compromises -- period.

Ampzilla was created because of dissatisfaction with all previous efforts in achieving the ultimate sound. Needless to say, great efforts were made in its circuit design in order to provide good, clean, low distortion measurements. But this amplifier goes much further beyond measurements. Extensive direct listening comparisons were made against all known standards including some very exotic, specially-designed tube amplifiers. Proudly we present AMPZILLA, which not only passed the listening tests with flying colors, but also performed effortlessly with known problem loads such as a variety of electrostatic speaker combinations.

In kit form Ampzilla is a breeze to build. Ease at mechanical assembly is assured through the use at pre-installed nuts, a fan has been included as an integral part of the chassis to keep the amplifier cool for greatly extending operating life and enable its meeting the stringent F.T.C. operating rules. A massive 1.5 kilowatt transformer of very unique design has been provided which almost approaches a power supply with electronic regulation. The construction of the amplifier is like the proverbial battleship and is well suited for the most rugged environmental conditions.

Trust us as we are a quality house. Our products will only utilize top quality parts and components. Furthemore, we pre-test all active components.

We listen. Do you have a gripe? Don't remain silent -- tell us. Communication is a great commodity. We do not believe in keeping our customers in the dark. Any problems you may have or encounter will be analyzed, and we will do all we can to make your HI-FIDELITY life happy.

A few words about our founder and President, JAMES BONGIORNO.

The man who heads the G.A.S. Co. is very well known in the audio field.

Before founding the G.A.S. Co. he was the Director of Engineering at SAE, Inc. Previous to that he was Director of Research and Development for Dynaco, Inc. and before that he was Director of Research and Development at Rectilinear Research Corporation. Previous to that he was on the engineering staff at both Marantz Company and Hadley Laboratories and Audio Workshop. In addition, Jim has been on staff as contributing editor for Popular Electronics, Audio and Radio-Electronics Magazines for over six years.

## ABOUT THE CIRCUIT

The circuit design of AMPZILLA is the result of many years of development. We feel it represents the ultimate that today's technology can produce. The AMPZILLA circuit is direct coupled from input to output and more important, it is fully push-pull from input to output. Utilizing full complementary differential inputs, complementary drivers, and full complementary push-pull outputs, AMPZILLA is flawless in its sonic performance as well as its measurements. All of the circuit topographies in AMPZILLA were conceived and invented by G.A.S. Co. engineers, and while some of the circuitry concepts have been used by other manufacturers in AMPZILLA, innumerable refinements have been combined to achieve a new excellence in amplifiers.

Previous designs exhibited temperature drift problems plus overload "sticking" problems. There are no such problems with AMPZILLA. While in other amplifier designs the cross-over notch distortion problem has been reduced to a great degree, it is practically zero in AMPZILLA. A floating-bias regulator scheme used in previous designs has been improved with a time constant of many seconds so that an on-off time-delay relay is no longer necessary. This also prevents blowing the line fuse should AMPZILLA be plugged into the wall with the power switch on.

The protection circuit in AMPZILLA is of the floating type, again conceived by G.A.S. Co. engineers. This protection circuit is not a conventional volt-amp limiter; instead, it senses the impedance characteristic of the load. This results in eliminating any annoying circuit triggering which is common to protection circuits used by other manufacturers. Also included are four B+ and B- fuses which are set slightly higher than the average load current drawn by a four Ohm load. This means that AMPZILLA can be continuously overdriven with four Ohm loads without blowing the B supply fuses.

Due to the absolute control and lack of overload "sticking" that is present in all other amplifiers, AMPZILLA exhibits absolutely no strain whatsoever, even when driven constantly into overload. This is possible because one

channel of AMPZILLA is really two amplifiers in one. There is a separate amplifier for the positive half cycle of the signal and an entirely separate amplifier for the negative half cycle. Our unique circuit topography achieves this where others fail.

All the transistors in AMPZILLA up to the power output semiconductor devices themselves are operated in pure class A operation. They are run conservatively at less than 10% of their rated specifications. This conservative approach extends reliability so that in over five years of constant use and abuse, we have never lost (blown) a single transistor up to the power output transistors.

**In short -- AMPZILLA IS HERE.**

## PRECAUTIONARY NOTES

A few notes of caution are stated here regarding AMPZILLA'S operation which also apply in general to all high-power high fidelity amplifiers.

1. Ampzilla's warranty is voided if the 3rd (grounding) pin on the AC line-cord plug is removed or not connected to a true electrical ground. Under no circumstances should a 3-to-2 pin AC plug adapter be used to avoid connection of the 3rd (ground) pin on Ampzilla's line-cord plug.

2. Because of the power limitations of most hi-fi preamplifiers' AC convenience outlets and AC power off-on switches, do not connect Ampzilla's power cord into your preamplifier AC convenience outlets (unless you are fully certain that their power ratings are capable of 15 Amp. @ 120 V continuous duty and 100 Amp. @ 120 V surge and that 3-wire outlets are provided with the 3rd wire connected to the preamp line-cord plug 3rd blade and not to preamplifier chassis). Great American Sound Co. will not be responsible for damage incurred to an underrated preamplifier AC power switch or outlet.

3. NEVER plug an input cable into the amplifier while the power is on. This may cause R-F burn-out of the output transistors and is not covered under the warranty.

4. Never apply the "thumb test" (touching with your finger) to the input of any amplifier, especially this or any other high power amplifier. Speaker damage and/or amplifier damage is a strong possibility due to R-F rectification and hum. The Great American Sound Company, Inc. is not liable for speaker damage caused by improper use of its equipment.

5. Never connect a load of less than 4 Ohms impedance to the amplifier. Although no damage should result, the power is restricted below 2 Ohms and overt fuse blowing may occur.

6. Never restrict the airflow around the amplifier.Even though AMP-ZILLA is fan cooled, air circulation around the amplifier is necessary for proper operation.

7. Do not recycle Ampzilla's AC power switch from off-to-on frequently within a three minute time period. As a result of frequent AC power cycling, Ampzilla's turn-on-time-constant circuitry will be circumvented and turn-on "thumps" will be heard. Turn-on of Ampzilla should also be avoided when its inputs are not connected to a preamplifier output or equivalent load source. In addition, it is recommended to have a speaker or equivalent load connected to the Ampzilla output whenever Ampzilla's power switch is activated.

8. Note that some meter movement when Ampzilla is turned on is normal. In the most sensitive position of the meter sensitivity switch (-30 dB), the meter turn-on deflection might approach full scale.

9. In case of difficulties, please contact the factory immediately and we will do our utmost to solve any problems you may encounter.

## VERY IMPORTANT - DO NOT OVERLOOK

99% of all malfunctions, errors and failures are due solely to the excitement of the kitbuilder in anticipation of his results and result from his failure to read and follow explicit directions. There are no shortcuts. Therefore, please build this very expensive kit in accordance with the directions. All parts have been checked before packing, especially all of the solid-state components which are 100% pretested. Due to the price and overhead we do not warranty semiconductors. (Neither do our competitors.)

Follow the directions step-by-step. In addition, check off each step as they are completed. Furthermore, re-check all steps after you have reached the end of a construction page. We have persevered to make this kit as easy to build as possible. If you encounter any difficulties, go back and recheck your work thoroughly. The best recommendation that we can make is to have a friend recheck your work for you. Surprisingly, a great many details can be overlooked when working alone.

## WARRANTY AND SERVICE INFORMATION

The Ampzilla power amplifier kit is warranted against defective materials and workmanship for a period of one year from date of purchase. The warranty, however, does not cover semiconductors. Our competitors do not warranty semiconductor devices either. All semiconductors are 100% tested. It must be noted that 99% of all failures in kit building are due to poor soldering and failure to follow directions.

If you have difficulty, DO NOT SHIP THE ENTIRE AMPZILLA TO THE FACTORY. Because Ampzilla's entire amplifier circuitry is contained on the heat-sink chimney, only this chimney need be returned. We will repair it free if found to be our fault. Otherwise, a minimal labor charge plus parts will be charged.

PREPAY SHIPPING TO THE FACTORY. SORRY, WE WILL NOT ACCEPT C. O. D. SHIPPING. We will return the repaired module C. O. D. for the shipping charges.

The Great American Sound Company, Inc.

## TOOLS

Below is a list of the tools and supplies needed to build this kit:

Soldering Iron - Medium Wattage 30 to 40 w
" " High Wattage 50 to 70 w
Solder 60-40 Rosin or Resin core
Wire Cutters
Needle Nose Pliers
Combination Pliers
#2 Phillips Screw Driver
Spin Tights or Nut Drivers 1/4", 3/8", 5/16" and 11/32"
Wire Strippers
Razor Blade, Single Edged
Toothpicks
Scratch Awl
Hex Wrench (Allen) 1/16"
Good Quality Volt Ohmmeter - Meter must be accurate to 2%
(20,000 to 30,000 ohms per volt)

Test leads for meter with alligator clips

## Construction Suggestions

The assembly of your AMPZILLA power amplifier will take approximately two days to one week depending on your ability and time devoted to its assembly. Cleanliness and neatness are of utmost importance, as poor workmanship will cause problems. Do Not skip steps, an extra hour or two devoted to careful assembly and check out will reward you with a fine piece of profesional equipment.

Although this kit is relativly easy to assemble, a certain amount of experience in kit building is helpful. If this is your first kit and you have no electronic experience we suggest you have a friend knowledgeable in electronics check your work. The most important things to remember are; follow the instructions step by step checking them off as you proceed. Be sure all tests are performed and readings are within specifications.

## MECHANICAL ASSEMBLY OF CHASSIS

Check steps Here

1. Unpack and layout all parts, count and verify the quantities against the parts list. ( )

2. Locate the four bumper feet (PN780006) and install them on the bottom of the chassis with four 6-32 x 3/8" nickel-plated screws (PN750204) and four #6 lock-washers (PN770003). Tighten until screw threads are flush with top of pre-installed nuts. ( )

3. Locate two red binding posts (PN630001) and two black binding posts (PN630002). (Discard solder lugs supplied with binding posts.) Install each with one of the #8 nuts supplied with binding posts and tighten. (See figure 1) ( )

4. On each red binding post install a #8 lockwasher, one orange wire (PN810103), one quarter inch quick disconnect terminal (PN740002), and the other #8 nut. (See figure 1) ( )

5. On each black binding post install one #8 lockwasher (PN770004), one short black wire (PN810100), one quarter inch Q.D.T. and the other #8 nut. (See figure 1) ( )

6. Locate the single A/C fuseholder (PN640001), and with the fiber washer on the outside of the chassis, install as shown in figure 1. ( )

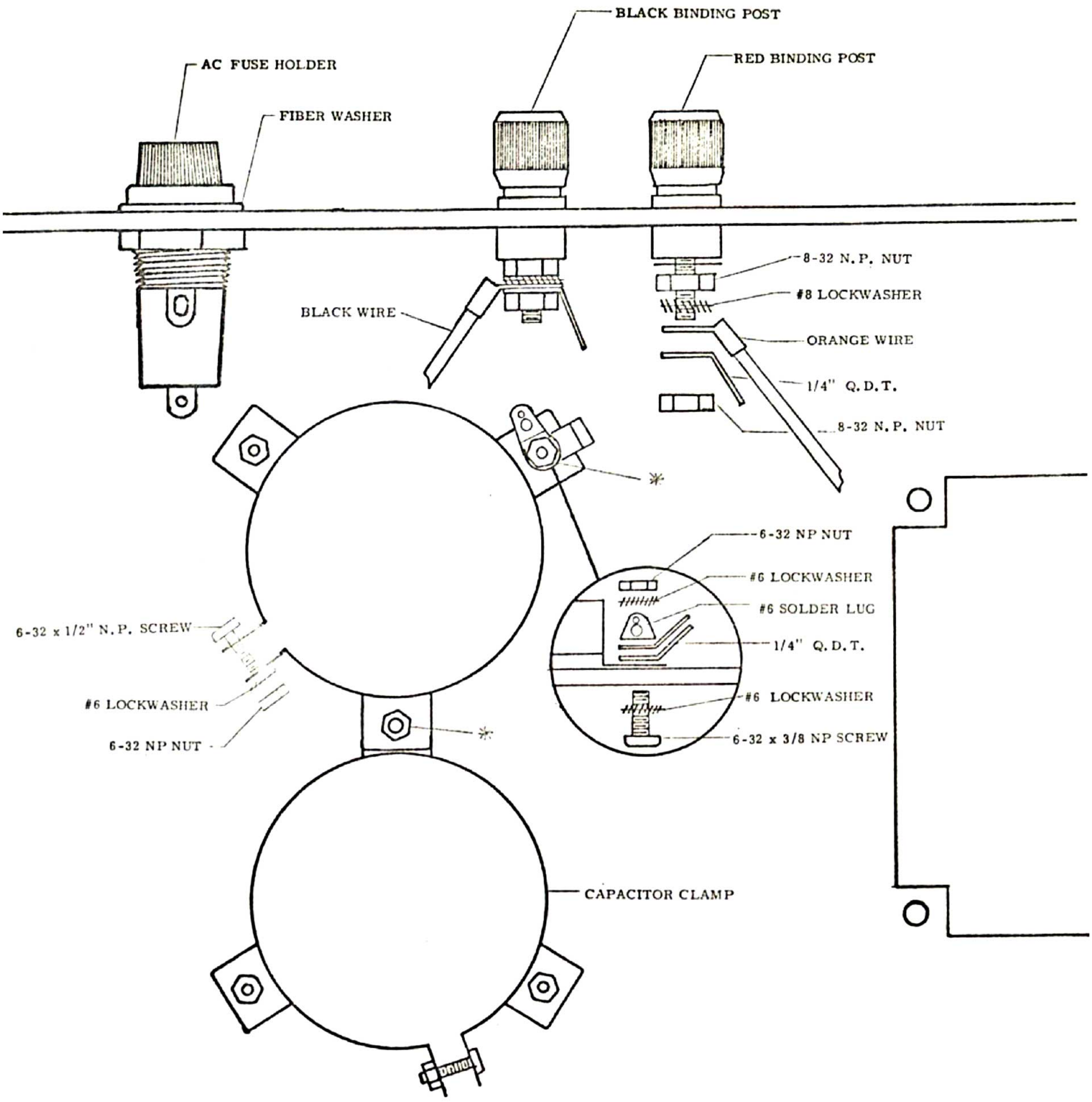
7. Locate the two capacitor clamps (PN710005). Install on clamping ears (as shown in figure 1) two 6-32 x 1/2" NP screws (PN750206), two #6 lockwashers, and two 6-32 nuts (PN760003). DO NOT TIGHTEN NOW.

8. Install capacitor clamps as shown in figure 1 using five 6-32 x 3/8 N.P. screws, SIX #6 lockwashers, five 6-32 x 1/4" nuts, one solder lug (PN740001), and two quarter inch Q.D.T's. Tighten only screws indicated by * in figure 1. Note position of solder lug and Q.D.T's. in figure 1 ( )

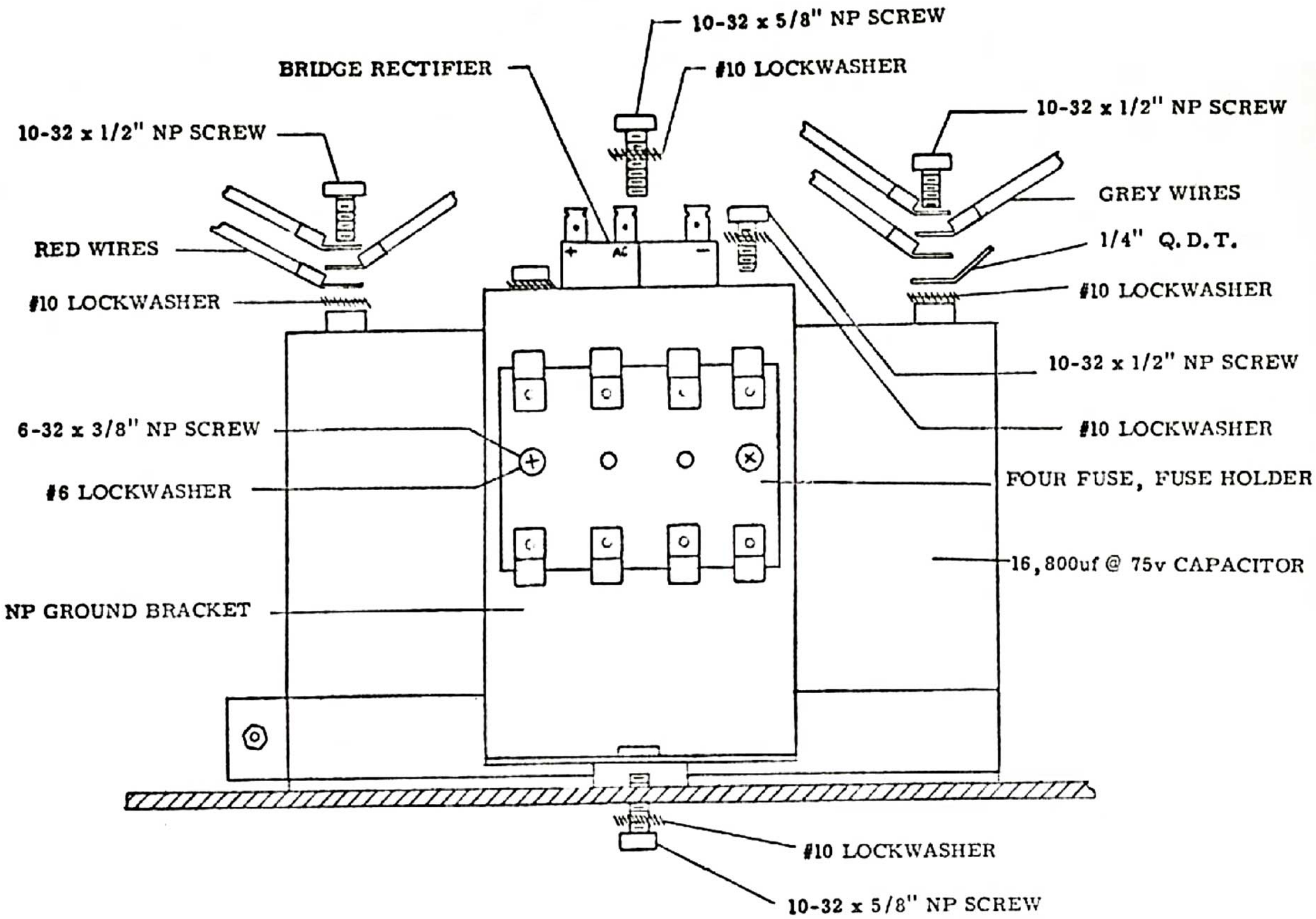
9. Locate the two 16,800 uf at 75v electrolytic capacitors (PN350001) and position inside capacitor clamps as shown in color pictorial. DO NOT TIGHTEN NOW. (CAUTION: Note polarity and position of the capacitors.) ( )

10. Locate the four fuse, fuse holder (PN640002) and install on the nickel-plated ground bracket (PN710001), using two 6-32 x 3/8" NP screws and two #6 lock-washers. (See figure 2) ( )

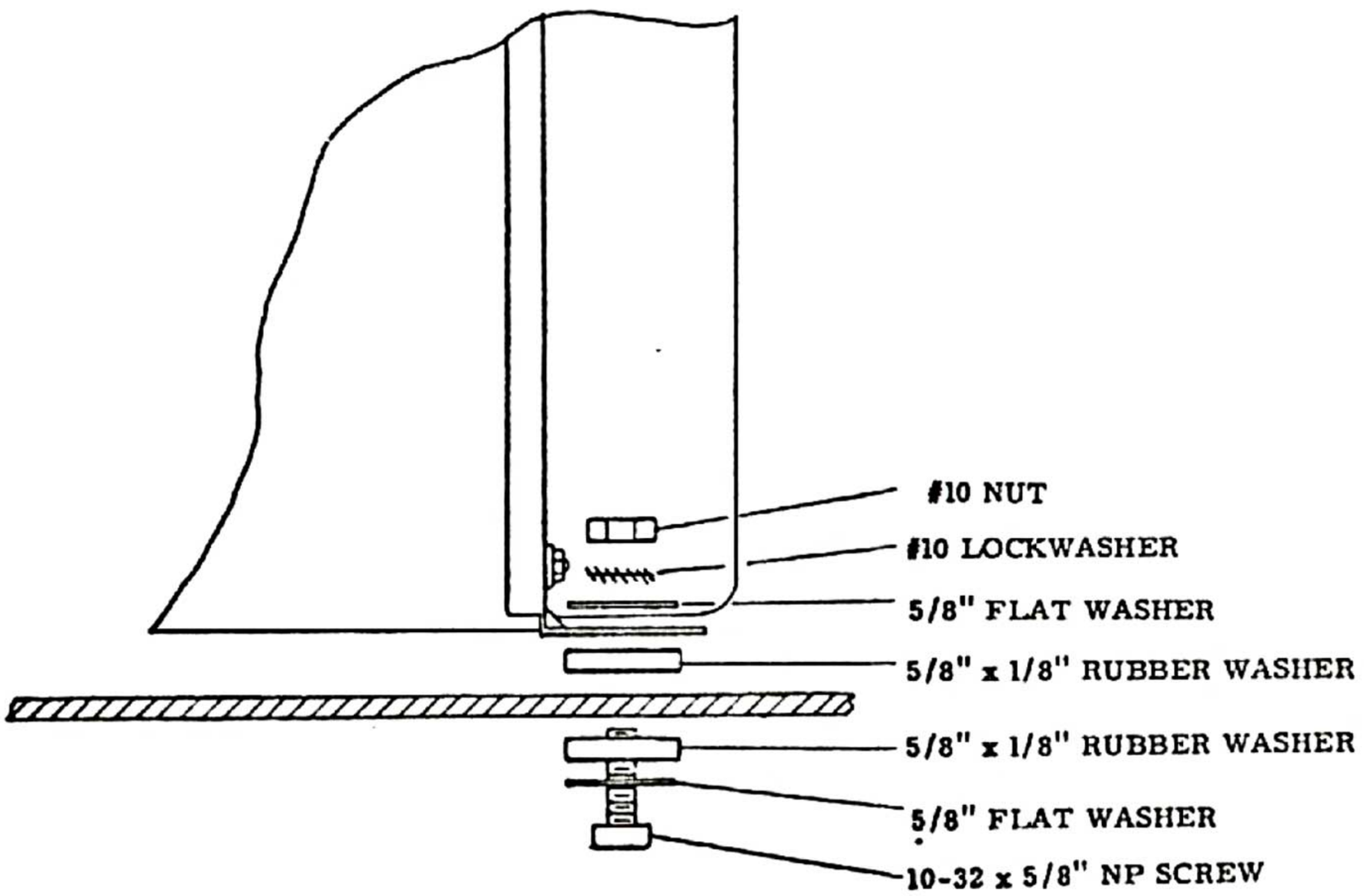
# FIGURE 1



# FIGURE 2




# FIGURE 3



11. Install ground bracket in chassis using one 10-32 x 5/8" NP screws (PN750405), two 10-32 x 1/2" NP screws (PN750404) (on capacitor), and three#10 lockwashers (PN770005) as shown in figure 2. Align capacitor as shown in color pictorial, and tighten capacitor clamping ears first, then tighten capacitor clamps to chassis, and then tighten ground bracket screws. ( )

12. Locate the bridge rectifier (PN141001) and install on top of ground bracket using one 10-32 x 5/8" NP screws and one #10 lockwasher. Caution! Note position of the rectifier. (See figure 2) ( )

13. Locate three short red wires (PN810112). Install wires as shown in color pictorial using one 10-32 x 1/2" NP screw and one #10 lockwasher. Connect wires to capacitor, fuseholder, and bridge rectifier as shown in color pictorial& Fig. 2. ( )

14. Locate three short grey wires (PN810108). Connect wires to capacitor, (using one 10-32 x 1/2" NP screw*) fuseholder, and bridge rectifier as shown in color pictorial. NOTE the quarter inch QDT installed with grey wires on the negative terminal of the capacitor. (Not shown on color pictorial) (See figure 2) ( )

15. Install the two speaker fuse holders (PN640003), with the word "top" facing up, as shown in the color pictorial. Push orange wire on the bottom lug of each fuse holder. (See color pictorial.) ( )

16. Install the A.C. power switch (PN500001) as shown in color pictorial, using one 3/8" - 32 pal nut (PN760010) and one 3/8" lockwasher (PN770006). (Install lockwasher BETWEEN switch and chassis.) ( )

17. Mount the power transformer (PN430001) as shown in color pictorial. Use four 10-32 x 5/8" NP screws, four #10 nuts (PN760005), four #10 lockwashers, eight 5/8" x 1/8" rubber washers (PN772001), and eight 5/8" flat washers (PN770010). (Note position of transformer in figure 3 and in color pictorial.) ( )

18. Mount the two input jacks (PN610001) using two 1/4" fiber sholder washers (PN771002), two fiber flat washers (PN780003), two input solder lugs (PN740006), and two 1/4 x 28 input nuts (PN760006) as shown in figure 4. ( )

19. Install a #6 solder lug between the two input jacks using one 6-32 x 3/8" black oxide screw (PN750205) and one 6-32 x 1/4" nut. Solder one end of each 2.2 ohm 1/3 watt 5% resistor (PN211922) to this solder lug. Run the other two ends through the input jack solder lugs in #18, but do not solder. (See color pictorial.) ( )

20. Solder long black wire from transformer to AC fuse as shown in color pictorial. ( )

21. Push on short black wire from transformer to power switch as shown in color pictorial. ( )

* and one #10 lockwasher

FIGURE 4

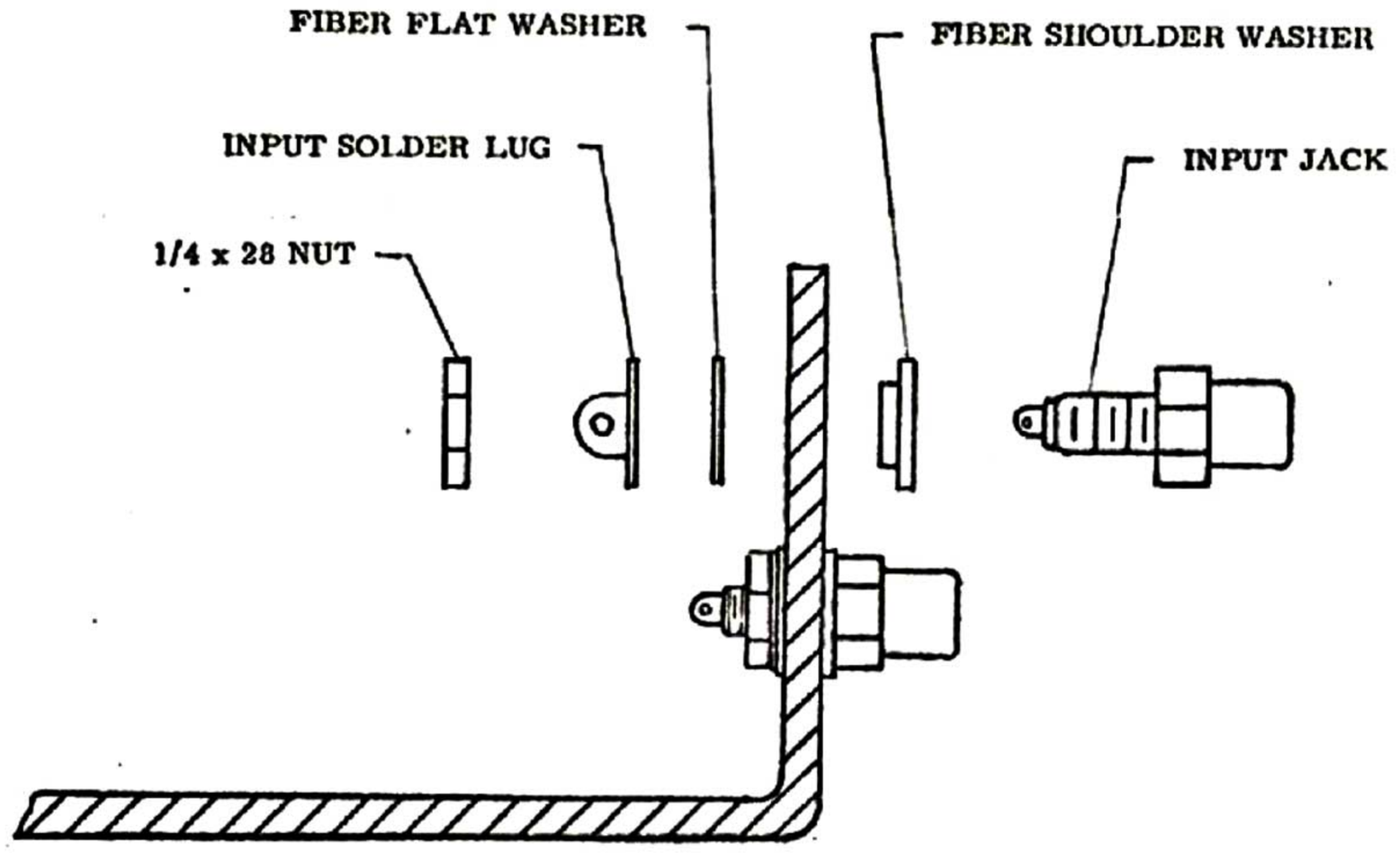
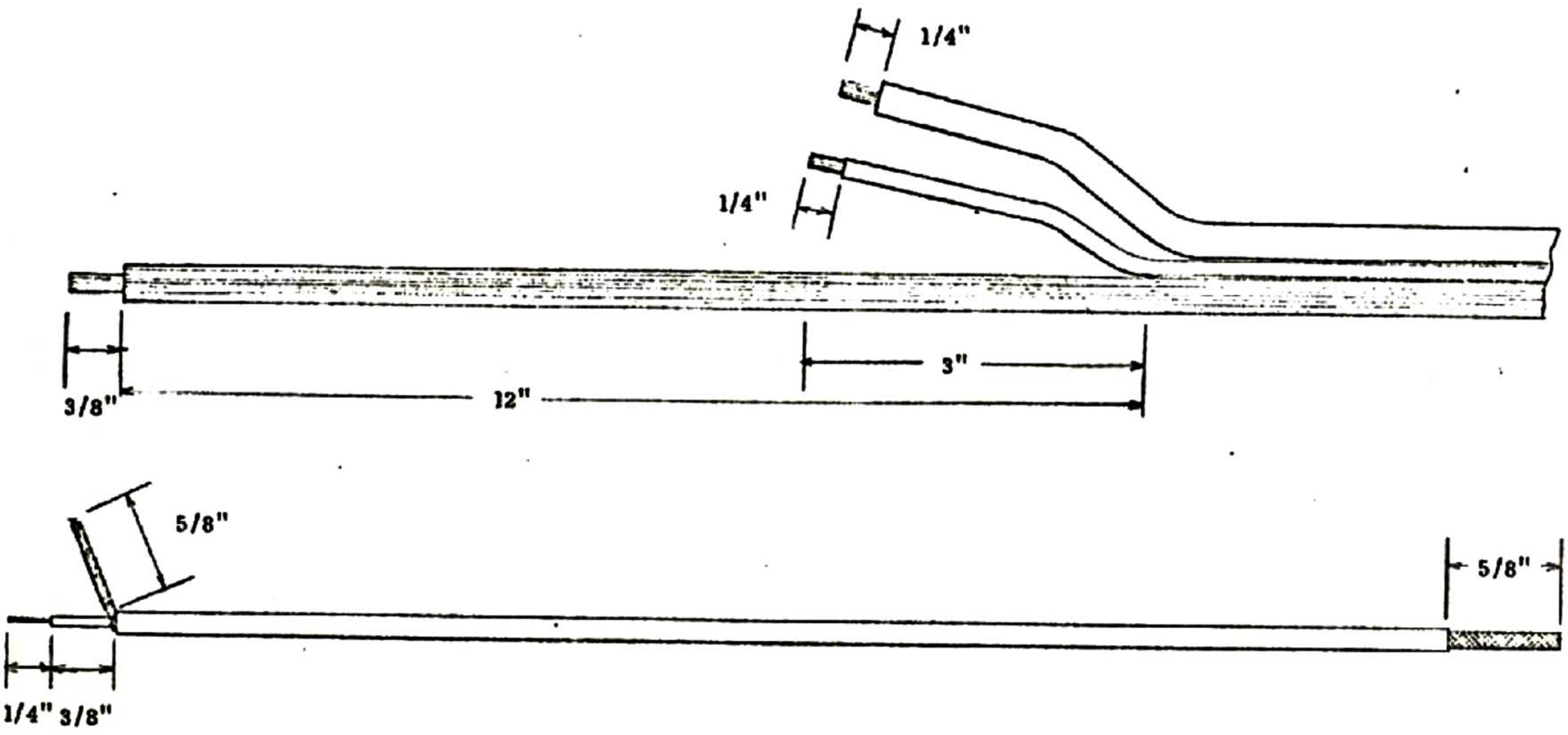



FIGURE 5



22. Place a #10 lockwasher, followed by the yellow wire from transformer, followed by the two black wire from speaker binding post on the ground bracket mounting screw followed by a 10-32 nut. Tighten. Note color pictorial. ( )

23. Push on two red wires from transformer to A.C. terminals of bridge rectifier as shown in color pictorial. ( )

24. NOTE: The fan cord has been pre-installed at the factory to insure proper fan operation. PLEASE DISREGARD FAN-SWITCH WIRING AND ALTERNATE FAN SPEED WIRING AS SHOWN IN COLOR PICTORIAL. ( )

25. Route the fan cord neatly along the four fuse fuseholder to the bottom of chassis tray. ( )

26. Install power switch jumper (PN810199) to terminals on power switch as shown in color pictorial. ( )

27. Prepare A.C. line cord as shown in figure 5. Note ribbed conductor. ( )

28. Install A.C. line cord through chassis using strain relief (PN780005) as shown in color pictorial. ( )

29. Solder the long grey A.C. line cord wire to power switch jumper. Solder short green wire from A.C. line cord to solder lug as shown in color pictorial. ( )
Solder short gray wire to AC fuse holder.

30. Locate short shielded wire (PN820110) and long shielded wire (PN820210). Carefully separate the inner conductor from the shell with a scratch awl or a toothpick at both ends of each shielded cable as shown in figure 5. ( )

31. Solder short shielded cable to bottom input jack and long shielded cable to top input jack as shown in color pictorial. Caution: Do not overheat cable during soldering as the shield will short to the inner conductor. ( )

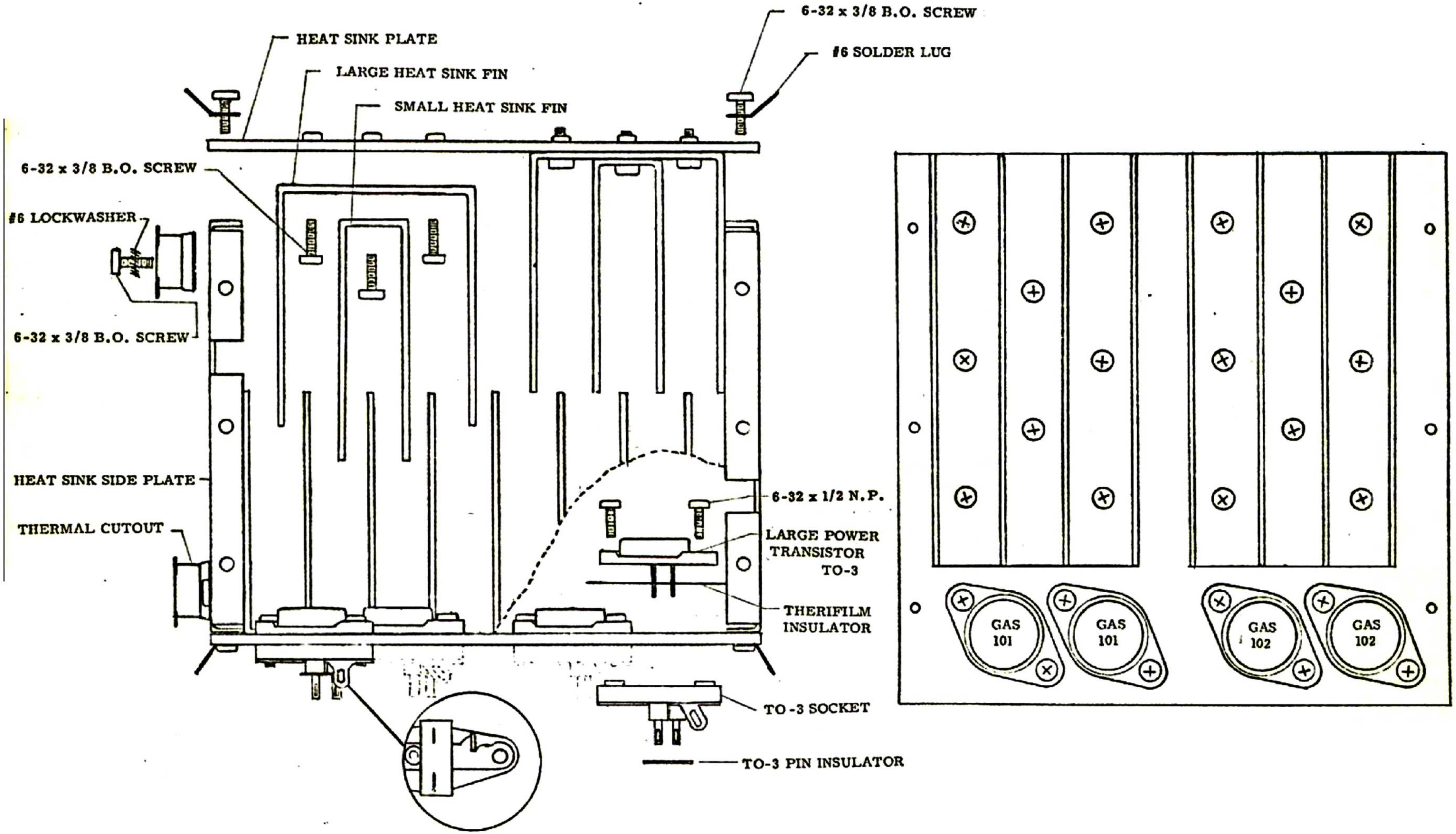
32. Locate fan (PN440001) and place fan over opening in chassis with printed label down and power terminal positioned closest to capacitors. Install with four 6-32 x 1-5/8" cap screws (PN750212). Tighten very carefully so as not to distort fan frame. Push fan cord on to fan terminals. ( )

## MECHANICAL ASSEMBLY OF HEAT SINK

33. Locate flat heat sink plates (2) (PN700004) and place on table with pre-installed nuts down. ( )

34. Locate four large U shape heat sink fins (PN710002) and four small U shape heat sink fins (PN710003). Apply thermal compound (white grease in plastic tube) to bottom mating surface of U fins and mount to heat sink plates using thirty two 6-32 x 3/8" black oxide screws (PN750205) as shown in figure 6. ( )

FIGURE 6



35. Locate large TO-3 power output transistors, GAS 101 (PN100101 and four GAS 102 (100102). Apply thermal compound to mounting surfaces of each transistor. Now place a TO-3 therefilm insulator (PN780001) on each mounting. surface of each transistor and apply thermal compound again. ( )

36. Locate eight transistor sockets (PN600001) and install eight output transistors using SIXTEEN 6-32 x 1/2" N.P. screws as shown in figure 6. Note location of transistors in figure 6. ( )

37. Using an ohmmeter, connect it between one of the preinstalled nuts on the heat sink plate and successively to each of the power transistor cases to make sure that there are no shorts between the transistor cases and the heat sink plate. ( )

38. Locate two heat sink sides (PN700005) and assemble with heat sink plates, as shown in figure 6 using TWELVE 6-32 x 3/8" Black Oxide screws, four #6 solder lugs and eight #6 lockwashers. Note notch on bottoms sides and position nearest output transistors (bottom of heat sink assembly) and the four solder lugs nearest the bottom of the heat sink. See figure 6. ( )

39. Locate two thermal cutout switches (PN510001). Coat mounting surfaces with thermal compound and install using four 6-32 x 3/8" B. O. screws and four #6 lockwashers as shown in figure 6. ( )

## DRIVE BOARD ASSEMBLY

40. Locate the four "L" shaped heat sinks. (PN710004) and the sixteen plastic transistor insulators (PN780007). Carefully press four insulators into the inside of each heat sink. See Fig 7. ( )

41. Locate the sixteen small power transistors, four each, GAS 103 (PN100103), GAS 104 (PN100104), GAS 105 (PN100105), GAS 106 (PN100106). Apply thermal compound to the mounting surface of each transistor. Place a therafilm insulator (PN780002) on the coated surface of each transistor and apply thermal compound to each therafilm insulator. See Fig 7. ( )

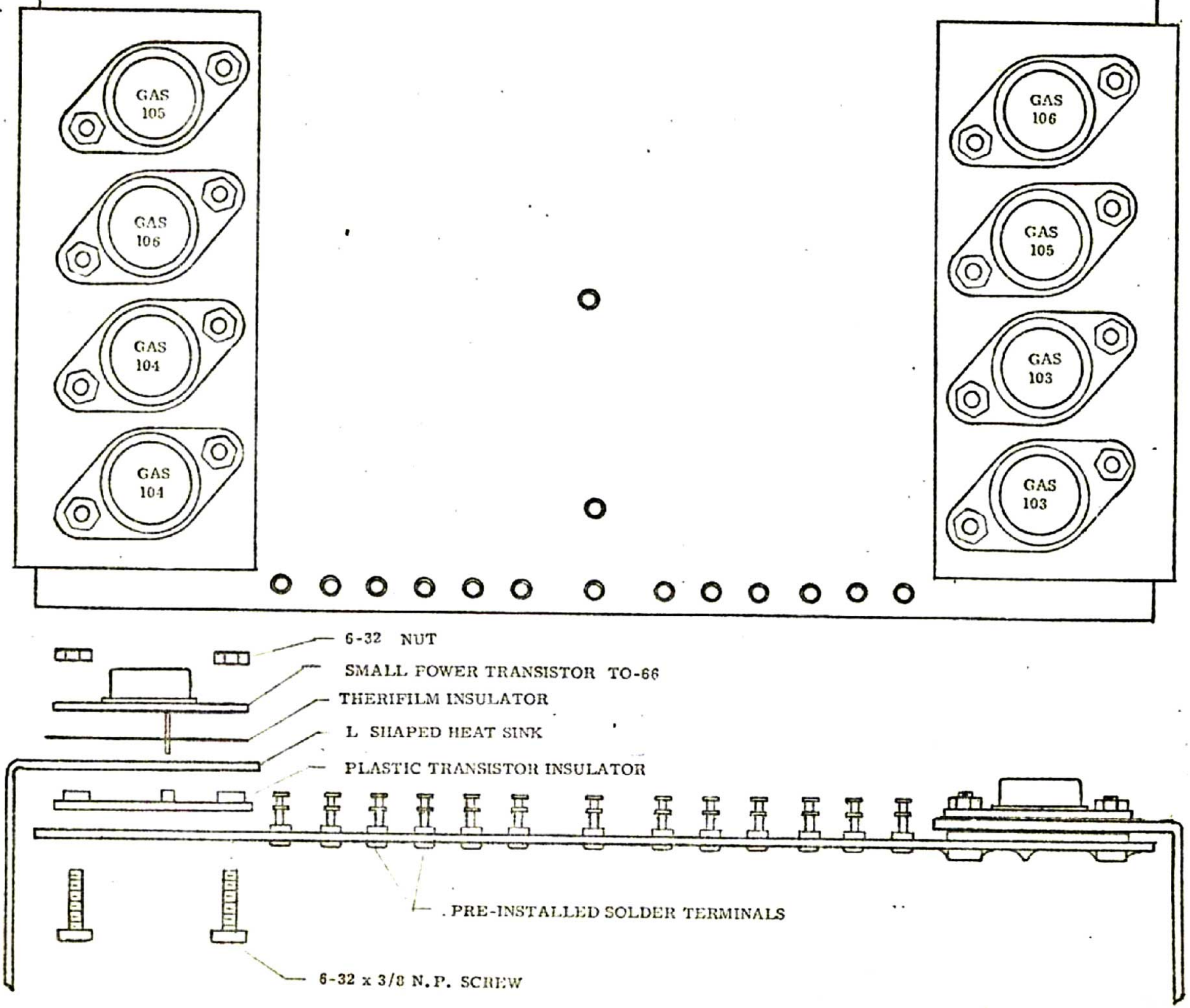
42. Locate the two large printed circuit boards (PN790001), thirty two 6-32 x 3/8 NICKEL PLATED screws, and thirty two 6-32 x 1/4 nuts. Referring to figure 7, install each transistor using two 6-32 x 3/8 N. P. screws and two 6-32 x 1/4 nuts. Check placement and tighten nuts securely. ( )

43. Using a high wattage soldering iron, solder the screw heads to the printed circuit boards by heating the screw heads until solder flows completely around the screw head. ( )

44. Check and retighten the transistor hold down nuts. ( )

45. Using an ohm meter, make sure there are NO SHORTS between the heat sinks and the transistor cases. (Be sure you have a good connection between the heat sink "L" and the ohm meter by scraping away the anodize.) ( )

FIGURE 7



46. After insuring there are no shorts between the heat sinks and the transistor cases, solder the transistor leads to the circuit board and trim the excess leads. ( )

47. Using a medium heat soldering iron (30-40 watt), solder the following parts to the circuit boards with enough heat and solder to produce good connections without overheating the boards or components.
Referring to the Stuffing list and the printed circuit board layout (Fig8), begin by installing and soldering the diodes (noting polarity bands), the resistors, (Do not install R-5, the black trim pot, at this time.) the capacitors (observe polarity where applicable), and the four 1 mh chokes. (The four 1 mh chokes are separately packaged to identify them) (Note that R-74 and R-75 are not used. ( )

48. Referring to the printed circuit board and parts list, fabricate and install the jumpers, noting the longer jumper is insulated. Use Buss Bar(PN810299) for non insulated jumpers, and 4" 22 AWG yellow wire (PN810204) for insulated jumpers. ( )

49. Install the small plastic transistors (uni-watts), carefully noting their placement and lead position. (Note: On some boards, Q5 is not marked, its placement is between D5 and R18.) (See figure 8.) ( )

50. Locate the two output coils (PN400001) and scrape or sand the insulation varnish from the leads. Install them on the printed circuit boards and fold the leads over against the foil and solder. ( )

51. Locate the black 1 k ohm trim pots (R-5) (PN280210) and install and solder them to the printed circuit boards. ( )

52. Solder the pre-installed solder terminals to the foil. ( )

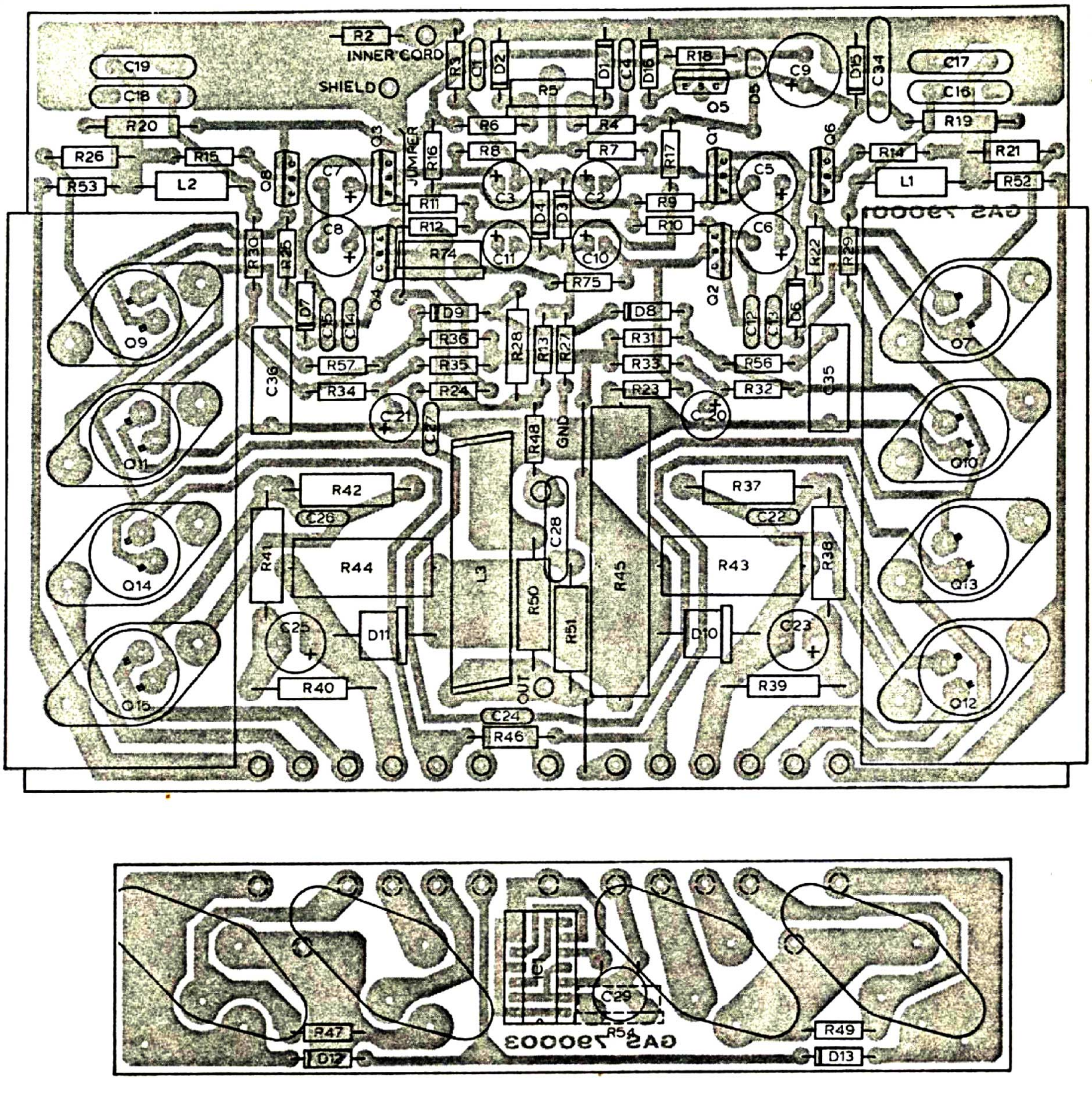
53. At this point, recheck all printed circuit board work. Carefully check all solder connections and parts placement. Check for "solder bridges". (Solder that "bridges" or "runs" between the foil patterns). Using a toothpick, carefully remove any flux between the foil patterns. (Flux can become conductive and cause failures.) ( )

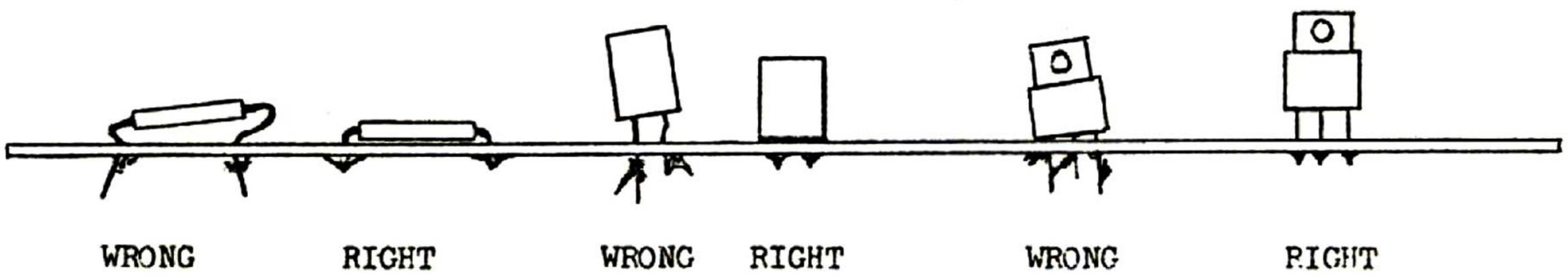
## DRIVE BOARD TESTS

The next section pertains to checking the large drive boards to see that they are functioning properly. These boards will be checked first with an ohmmeter, and then connected to the power supply and voltage measurements will be made. Please do not overlook the importance of this section as a faulty drive board will cause complete failure of the amplifier.

54. The purpose of this procedure is to determine the polarity of your ohmmeter. To accomplish this, we will use one of the four remaining 1N4004 diodes not yet used.

FIGURE 8



# CIRCUIT BOARDS STUFFING LIST

| | Key No. | Description | Body Markings and Special Codes |
|---|---|---|---|
| Diodes | D1 | 1N4148 | Silicon Diode (small glass diodes) |
| | D2 | 1N4148 | Silicon Diode (small glass diodes) |
| | D3 | 1N4148 | Silicon Diode (small glass diodes) |
| | D4 | 1N4148 | Silicon Diode (small glass diodes) |
| | D5 | 1N5878 C | Zener Diode (plastic radial diodes) |
| | D6 | UG-2101 | Silicon Diode (large glass diodes) |
| | D7 | UG-2101 | Silicon Diode (large glass diodes) |
| | D8 | 1N4148 | Silicon Diode (small glass diodes) |
| | D9 | 1N4148 | Silicon Diode (small glass diodes) |
| | D10 | GAS 109 | Schottkey Diode (large metal diodes) |
| | D11 | GAS 109 | Schottkey Diode (large metal diodes) |
| | * D12 | 1N4003 | Silicon Diode (small plastic diodes) |
| | * D13 | 1N4003 | Silicon Diode (small plastic diodes) |
| | D14 | ------- | (not on circuit boards, indicator light) |
| | D15 | 1N4148 | Silicon Diode (small glass diodes) |
| | D16 | 1N4148 | Silicon Diode (small glass diodes) |
| Resistors | R1 | -------- | (not on circuit boards, input jacks) |
| | R2 | 1 Meg 1/4w 5% | Brown, black, green, gold |
| | R3 | 1000 1/4w 5% | Brown, black, red, gold |
| | R4 | 7500 1/4w 5% | Violet, green, red, gold |
| | R5 | 1000 Trimmer | Black |
| | R6 | 7500 1/6w 5% | Violet, green, red, gold |
| | R7 | 150K 1/4w 5% | Brown, green, yellow, gold |
| | R8 | 150K 1/4w 5% | Brown, green, yellow, gold |
| | R9 | 150 1/4w 5% | Brown, green, brown, gold |
| | R10 | 150 1/4w 5% | Brown, green, brown, gold |
| | R11 | 150 1/4w 5% | Brown, green, brown, gold |
| | R12 | 150 1/4w 5% | Brown, green, brown, gold |
| | R13 | 200 1/2w 2% | Red, black, brown, red |
| | R14 | 1800 1/4w 5% | Brown, grey, red, gold |
| | R15 | 1800 1/4w 5% | Brown, grey, red, gold |

* Denotes components on "output" board

| | Key No. | Description | Body Markings and Special Codes |
|---|---|---|---|
| Resistors (cont.) | R16 | 7500 1/4w 5% | Violet, green, red, gold |
| | R17 | 7500 1/4w 5% | Violet, green, red, gold |
| | R18 | 620 1/4w 5% | Blue, red, brown, gold |
| | R19 | 3900 1w 5% | 3.9K J-Y on resistor body |
| | R20 | 3900 1w 5% | 3.9K J-Y on resistor body |
| | R21 | 62 1/2w 5% | Blue, red, black, gold |
| | R22 | 20 1/4w 5% | Blue, red, brown, gold |
| | R23 | 150K 1/4w 5% | Brown, green, yellow, gold |
| | R24 | 150K 1/4w 5% | Brown, green, yellow, gold |
| | R25 | 620 1/4w 5% | Blue, red, brown, gold |
| | R26 | 62 1/2w 5% | Blue, red, black, gold |
| | R27 | 4991 1/2w 1% | 4991- RN55 on resistor body |
| | R28 | 3900 1w 5% | 3.9K J-Y on resistor body |
| | R29 | 36K 1/4w 5% | Orange, blue, orange, gold |
| | R30 | 36K 1/4w 5% | Orange, blue, orange, gold |
| | R31 | 100 1/4w 5% | Brown, black, brown, gold |
| | R32 | 390 1/4w 5% | Orange, white, brown, gold |
| | R33 | 100 1/4w 5% | Brown, black, brown, gold |
| | R34 | 470 1/4w 5% | Yellow, violet, brown, gold |
| | R35 | 100 1/4w 5% | Brown, black, brown, gold |
| | R36 | 100 1/4w 5% | Brown, black, brown, gold |
| | R37 | 1000 2w 2% | 2W 2% 1.0K on resistor body |
| | R38 | 750 2w 2% | 2W 2% 750 on resistor body |
| | R39 | 300 1w 2% | 16J4 300 on resistor body |
| | R40 | 300 1w 2% | 16J4 300 on resistor body |
| | R41 | 750 2w 2% | 2W 2% 750 on resistor body |
| | R42 | 1000 2w 2% | 2W 2% 1.0K on resistor body |
| | R43 | .39 5w 10% | 5W 39 ± 10% |
| | R44 | .39 5w 10% | 5W 39 ± 10% |
| | R45 | .125 10w 3% | 10W .125 ± 3% |
| | R46 | 62 1/2w 5% | Blue, red, black, gold |
| * | R47 | 100 1/4w 5% | Brown, black, brown, gold |
| | R48 | 1.2 1/4w 5% | Brown, red, gold, gold |
| * | R49 | 100 1/4w 5% | Brown, black, brown, gold |

* Denotes components on "output" board

| | Key No. | Description | Body Markings and Special Codes |
|---|---|---|---|
| | R50 | 2.2 2w 5% | 2BJ 2.2 -Y on resistor body |
| | R51 | 10 2w 5% | 2BJ 10 -Y on resistor body |
| | R52 | 10 1/4w 5% | Brown, black, black, gold |
| | R53 | 10 1/4w 5% | Brown, black, black, gold |
| * | R54 | 250 Trimmer | Green |
| | R55 | ---------- | Not on boards (indicator light) |
| | R56 | 150 1/4w 5% | Brown, green, brown, gold |
| | R57 | 150 1/4w 5% | Brown, green, brown, gold |
| **Capacitors** | | | |
| | C1 | 200pf. 100 Volt | Ceramic Disc 200 pf |
| | C2 | 100uf. 10 Volt | Radial Electrolitic 100 MFD 10 Volt |
| | C3 | 100uf. 10 Volt | Radial Electrolitic 100 MFD 10 Volt |
| | C4 | 1 uf. 50 Volt | Ceramic Disc. .1 uf 50 Volt |
| | C5 | 330 uf. 10 Volt | Radial Electrolitic 330 MFD 10 Volt |
| | C6 | 330 uf. 10 Volt | Radial Electrolitic 330 MFD 10 Volt |
| | C7 | 330 uf. 10 Volt | Radial Electrolitic 330 MFD 10 Volt |
| | C8 | 330 uf. 10 Volt | Radial Electrolitic 330 MFD 10 Volt |
| | C9 | 100 uf. 50 Volt | Radial Electrolitic 100 MFD 50 Volt |
| | C10 | 100 uf. 10 Volt | Radial Electrolitic 100 MFD 10 Volt |
| | C11 | 100 uf. 10 Volt | Radial Electrolitic 100 MFD 10 Volt |
| | C12 | 22 pf 500 Volt 10% | Ceramic Disc 22PF |
| | C13 | 47 pf 500 Volt 10% | Ceramic Disc 47PF |
| | C14 | 22 pf 500 Volt 10% | Ceramic Disc 22PF |
| | C15 | 47 pf 500 Volt 10% | Ceramic Disc 47PF |
| | C16 | .1 uf 100 Volt | Ceramic Disc 20% .1 100V |
| | C17 | .1 uf 100 Volt | Ceramic Disc 20% .1 100V |
| | C18 | .1 uf 100 Volt | Ceramic Disc 20% .1 100V |
| | C19 | .1 uf 100 Volt | Ceramic Disc 20% .1 100V |
| | C20 | 100 uf. 10 Volt | Radial Electrolitic 100 MFD 10 Volt |
| | C21 | 100 uf. 10 Volt | Radial Electrolitic 100 MFD 10 Volt |
| | C22 | .001 uf. 500 Volt | Ceramic Disc B 102 |
| | C23 | 220 uf. 16 Volt | Radial Electrolitic 220 MFD 16V |
| | C24 | .1 uf. 50 Volt | Ceramic Disc .1 uf 50 Volt |

* Denotes components on "output" board

| Key No. | | Description | Body Markings and Special Codes |
|---|---|---|---|
| | C25 | 220 uf. 16 Volt | Radial Electrolitic 220 MFD 16V |
| | C26 | .001uf. 100Volt | Ceramic Disc B102 |
| | C27 | .001uf. 100Volt | Ceramic Disc B102 |
| | C28 | .1uf. 100 Volt | Ceramic Disc 20% .1 100 Volt |
| * | C29 | .1uf. 50 Volt | Ceramic Disc .1 vf 50 Volt |
| | C30 | ---------- | Not used on boards (used on heat sink assembly) |
| | C31 | ---------- | Not used on boards (used on heat sink assembly) |
| | C32 | ---------- | Not used on boards (power supply) |
| | C33 | ---------- | Not used on boards (power supply) |
| | C34 | .1uf. 100 Volt | Ceramic Disc 20% 1 vf 100 Volt |
| | C35 | 1uf. 100 Volt | Mylar 1.0 10% 100 - |
| | C36 | 1uf. 100 Volt | Mylar 1.0 10% 100 - |
| Semiconductors | | | |
| | Q1 | GAS 107, MPS U06 | Uniwatt plastic transistor MPS U06 |
| | Q2 | GAS 107, MPS U06 | Uniwatt plastic transistor MPS U06 |
| | Q3 | GAS 108, MPS U56 | Uniwatt plastic transistor MPS U56 |
| | Q4 | GAS 108, MPS U56 | Uniwatt plastic transistor MPS U56 |
| | Q5 | GAS 107, MPS U06 | Uniwatt plastic transistor MPS U06 |
| | Q6 | GAS 108, MPS U56 | Uniwatt plastic transistor MPS U56 |
| | Q7 | GAS 107, MPS U06 | Uniwatt plastic transistor MPS U06 |
| Inductors | | | |
| | L1 | 1 mh choke | (Bagged separately) Silver, brown, black, red, gold |
| | L2 | 1 mh choke | (Bagged separately) Silver, brown, black, red, gold |
| | L3 | 2.5 h choke | Output coil (32 turns, #16 AWG) (Copper Wire) |
| Jumpers | | | |
| | | Two 1/2" | Jumper 1/2" Non-Insulated (Fabricate from Buss Bar) |
| | | One 1 1/8" | Jumper 1 1/8" Insulated (Fabricate from 4" yellow wire) |

* Denotes components on "output" board

Connect the ohmmeter leads, black to the lead nearest the stripe on the diode body and the red lead to the other side of the diode. If your ohmmeter has standard polarity, the meter should deflect. When the leads are reversed on the diode, the meter should not deflect. If your meter shows results opposite from these, reverse the test leads on your ohmmeter for the following tests. (Note: All measurements made with a Simpson 260 V. O. M.) ( )

55. Using figure 9 as a guide, connect only the jumpers as shown between the solder terminals on the drive boards. Use "buss bar" (Stiff silver colored wire) provided, for the jumpers (PN810299). ( )

56. Locate the terminal marked ground on drive board, and connect black lead of ohmmeter to this point. Using the table below, make the following measurements with the red lead. ( )

All Readings + or - 20% (X 1,000 ohms)

| Q12 | R | Q13 | R | Q14 | R | Q15 | R |
|---|---|---|---|---|---|---|---|
| Collector | 4.2 | Collector | INF | Collector | 5.5 | Collector | 3.6 |
| Base | 3.6 | Base | 5.4 | Base | 5.4 | Base | 3.4 |
| Emitter | INF | Emitter | 2.8 | Emitter | 2.8 | Emitter | 5.6 |

If results are not right recheck your work.

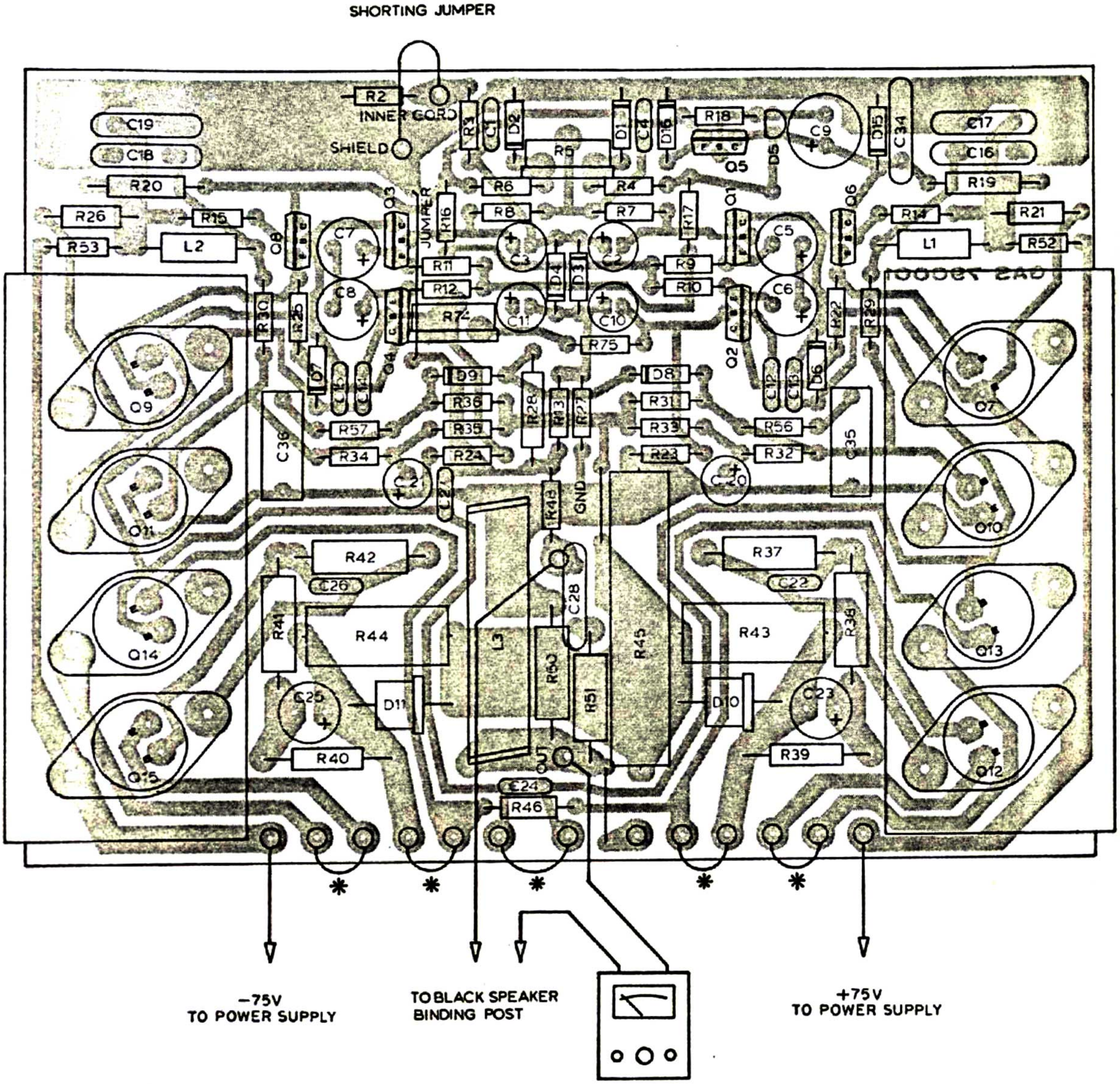
57. If all tests are O. K. in previous step, then connect the red lead to ground terminal on board and make the following measurements with the black lead. ( )

| Q12 | R | Q13 | R | Q14 | R | Q15 | R |
|---|---|---|---|---|---|---|---|
| Collector | 3.4 | Collector | 5.4 | Collector | INF | Collector | 4.3 |
| Base | 3.4 | Base | 5.8 | Base | 5.8 | Base | 3.8 |
| Emitter | 5.4 | Emitter | 3.0 | Emitter | 3.0 | Emitter | INF |

If results are not right recheck your work.

58. If all tests are O. K. in previous step, then connect the black lead to the terminal marked "OUT", and using the red lead make the following tests. ( )

FIGURE 9




* SHORTING JUMPERS

| Q12 | R | Q13 | R | Q14 | R | Q15 | R |
|---|---|---|---|---|---|---|---|
| Collector | 1.8 | Collector | INF | Collector | 2.6 | Collector | 1.4 |
| Base | 1.0 | Base | 1.6 | Base | 1.6 | Base | 1.0 |
| Emitter | INF | Emitter | 0.0 | Emitter | 0.0 | Emitter | 2.6 |

If results are not right recheck your work.

59. If all tests are O. K. in previous step, then connect the red lead to the terminal marked "OUT", and using the black lead make the following tests. ( )

| Q12 | R | Q13 | R | Q14 | R | Q15 | R |
|---|---|---|---|---|---|---|---|
| Collector | 1.4 | Collector | 2.6 | Collector | INF | Collector | 1.8 |
| Base | 1.0 | Base | 1.9 | Base | 1.9 | Base | 1.0 |
| Emitter | 2.5 | Emitter | 0.0 | Emitter | 0.0 | Emitter | INF |

If results are not right recheck your work.

60. Now apply all previous tests to other drive board. If all previous ohmmeter measurements check O. K. on both drive boards, proceed to next series of tests. ( )

61. Two 1/4 amp fuses have been supplied to check the drive boards and they should be installed in one positive (+) and one negative (-) fuse position of the four fuse fuse holders. Locate and install the AC switch knob (PN720001) using a 1/16" hex wrench (not supplied). ( )

## POWER SUPPLY CHECKOUT

62. Install the 10 amp MDA fuse in the AC fuseholder. Connect a D. C. voltmeter, switched to the 300 volt range, to the + and - of the power supply (across both filters). Plug in AC line cord, turn on power switch and watch voltmeter. Voltage should rise immediately to 140 to 155 volts. If not, TURN OFF POWER SWITCH IMMEDIATELY!! Locate the source of the problem. The most likely source is either the rectifier bridge is installed backwards or one or both of the filter capacitors are reversed. If everything is O. K., measure between each filter and the ground bracket. You should measure ± 70 to 75 volts.
NOTE: After turning off the power switch, discharge the filter capacitors, one at a time, using the 1500 ohm 5 watt resistor between each filter and the ground bracket for at least 3 minutes. DO NOT overlook discharging the filter capacitors as a potentially LETHAL charge is contained in the filter capacitors for a long period of time after power is turned off. ( )

## DRIVE BOARD ELECTRICAL TESTS

The next series of tests will involve applying power to the drive boards to make voltage measurements.

63. Locate one long grey wire with push on terminal (PN810128) and one long red wire with push on terminal (PN810132). Referring to figure 9, solder the red wire to the positive power supply terminal of the drive board, and the grey wire to the negative power supply terminal of the drive board. Locate the white wire with push on terminal (PN810119) and solder it to the terminal marked "GND" on the drive board. Connect a jumper between the input terminals marked "shield" and "inner cord" on the drive board. ( )

64. After insuring the filter capacitors are fully discharged, push on the red wire from the drive board to the positive terminal of the 4 fuse fuseholder with the 1/4 amp fuse installed. Now push on the grey wire from the drive board to the minus terminal of the 4 fuse fuseholder with the 1/4 amp fuse installed. Push on the white wire from the drive board to a 1/4" Q. D. T. on either of the black speaker binding posts. ( )

65. Connect the black lead of your voltmeter to either of the black speaker binding posts, and the red lead of your voltmeter to the terminal marked "OUT" on the drive board. ( )

66. Before applying power to the drive board, double check all jumpers and connections. ( )

67. Switch the voltmeter to the 50 volt range (D. C.). Turn on the power and watch the meter. If there is a large voltage indication, TURN OFF THE POWER IMMEDIATELY!! (A very slight deflection followed by a return to zero is permissible.) ( )

68. If everything is O. K., then turn the voltmeter to the 2. 5 volt D. C. scale. Slowly rotate the offset trimmer (1000 ohm) R5 and note that the D. C. offset at the output of the board shifts above and below zero volts. Set the trimmer for zero volts D. C. If you cannot zero the voltage, check to see that D1 and D2 are installed correctly. If everything checks O. K., leave the power on and proceed to the next step. ( )

69. Switch the voltmeter to the 250 volt D. C. scale. Move the red lead of the voltmeter to the collector of Q6 (Metal tab on the top of the transistor) and observe the voltage. It should be between 25 and 27 volts. Now check the voltage at Q12 by moving the voltmeter red lead to the collector (metal case) of Q12. It should be between 67 and 82 volts. Repeat this procedure for Q13 collector. The voltage should be between 32 and 41 volts. Now reverse the voltmeter leads (Red lead to either of the black speaker binding posts) and the black lead to the collector of Q8. The meter should read

between 25 and 27 volts. Now move the black voltmeter lead to the collector of Q15. It should be between 67 and 82 volts. Repeat this procedure for Q14 collector. The voltage should be between 32 and 41 volts. If all measurements are O. K., proceed to the next step. ( )

70. Connect the black lead of your voltmeter to the collector of Q10 (metal case) and the red lead of your voltmeter to the collector of Q12. Select the 10 volt D. C. scale and observe the voltage. It should be between 1. 7 volts and 2. 75 volts. Move the black lead of your voltmeter to the collector (metal case) of Q 15 and move the red lead to the collector of Q11. The voltage should be between 1. 7 volts and 2. 75 volts. Repeat steps 63 through 70 on the other drive board. If all checks good, proceed to the next section. (Be sure to turn off the power. )

## OUTPUT BOARD ASSEMBLY

71. Locate the two output printed circuit boards (PN790003), the two 250 ohm trim pots (PN280125), two 14 pin 1. C. socket (PN600002) four 100 ohm resistors (PN211110), two . 1 U. F. disc capacitors (PN300015) and four 1N4004 diodes (PN140002). Referring to figure 8, install and solder the four 100 ohm resistors, the diodes, and the disc capacitors. Insert the 1C socket into printed circuit board, noting position of "notch" on socket. Be sure socket is seated as close to the board as possible and solder, using care to prevent "solder bridges" between pins. ( )

72. Turn the printed circuit board over so that the foil side faces you. Insert the 250 ohm trim pot and solder carefully. Note that this is the only component you will install on this (the foil)side of the printed circuit board. Now trim off the excess leads of the 250 ohm trim pot as close to the board as possible. ( )

73. Fold the disc capacitors over so that it covers its outline on the printed circuit board. Make sure that the disc capacitor does not touch the trim pots' leads. ( )

74. Locate the two integrated circuits (PN150100). With the "notch" in the integrated circuit facing the same direction as the "notch" in the 1. C. socket, VERY CAREFULLY press the integrated circuit into the 1. C. socket. Be sure all the integrated circuit "pins" are firmly seated into the 1. C. socket. ( )

## FINAL HEAT SINK ASSEMBLY

75. Locate assembled heat sink and place on work area with transistor socket pins facing up. CAUTION!!! The transistor socket pins are VERY FRAGILE, so DO NOT damage them by setting the heat sink assembly down on the socket pins. ( )

76. Very carefully, using a pair of pliers, twist and straighten the collector tab of the TO-3 power transistor socket so that the tab faces straight up. (Refer to figure 6.) Do not twist the tab too far as the tab will break off. Now locate the eight TO-3 pin insulators (PN780004). Carefully straighten any bent transistor socket pins and slide one insulator on each socket until it seats fully against the base of the socket. (See figure 6.)

77. Locate the assembled output boards (the small ones) and the two integrated circuit aluminum wafers (PN770001). Apply thermal compound to both sides of the integrated circuit aluminum wafer and place it squarely on top of the integrated circuit. NOTE: if I. C. sockets are Black color do not use aluminum wafers, use thermal compound on the integrated circuit mating surface.

78. Carefully slide the output board onto the heat sink assembly with all the transistor socket leads going through the output board. This is a very tight fit, so be careful not to damage any components. Be sure that the output board is fully seated on the transistor sockets. Make sure that the integrated circuit aluminum wafer is touching the heat sink assembly with NO GAPS between the integrated circuit, the aluminum wafer, or the heat sink. This is vitally important, as an error at this point can cause destruction of the amplifier.

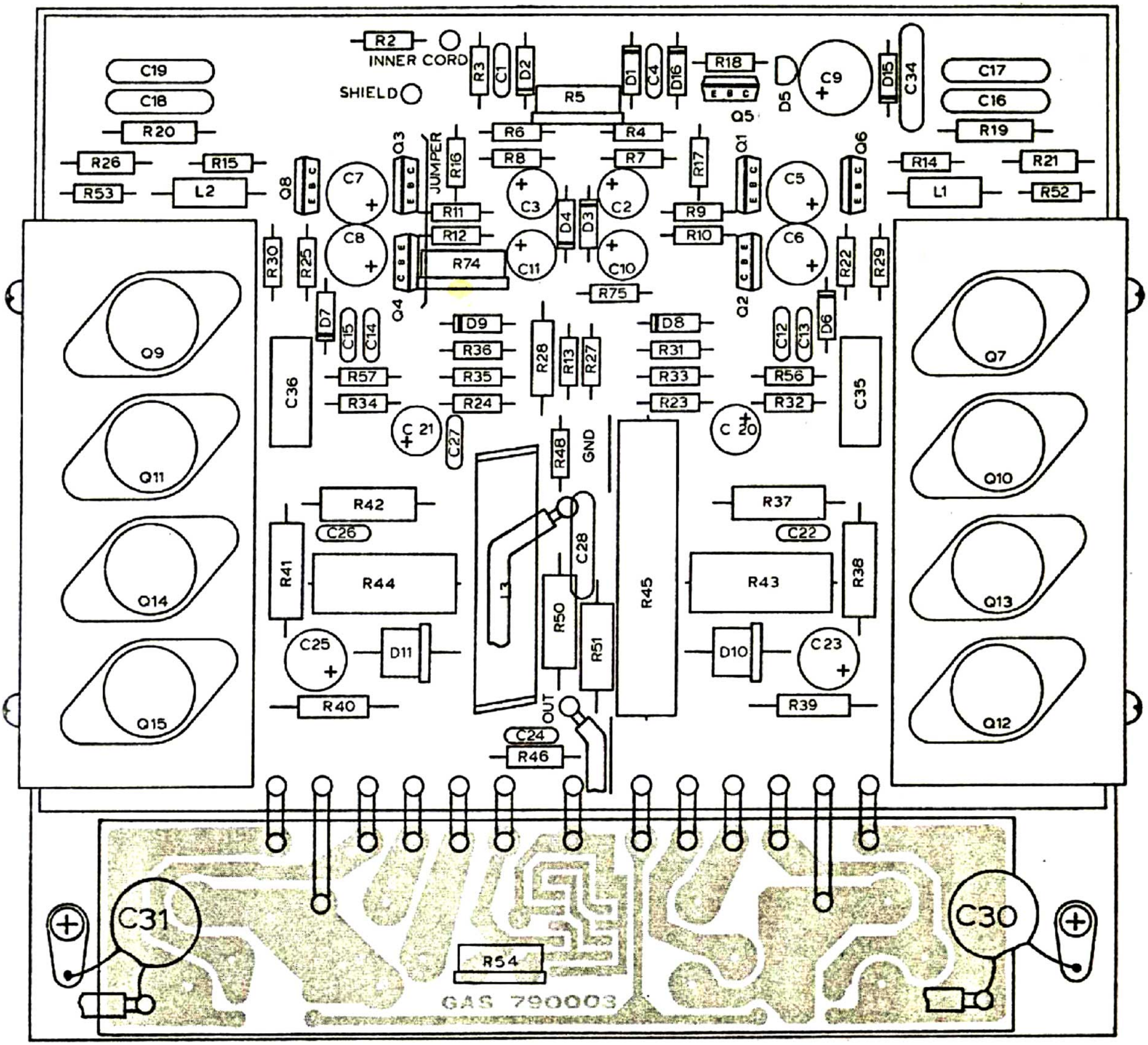
79. Making sure the board stays fully seated, trim the transistor socket base and emitter leads (the small ones), so that 1/8" protrudes above the circuit board. Carefully bend over the base and emitter leads so that they contact the printed circuit board foil. Be sure that the transistor socket leads do not contact adjacent foil patterns ("Bridging").

80. Using a high wattage soldering iron, solder the transistor socket leads to the foil making sure that the solder flows smoothly and completely around the socket leads and that the board stays fully seated. Now, solder the pre-installed solder terminals to the circuit board foil. Check your work. Repeat steps 77 through 80 for other output circuit board.

81. Locate complete and tested drive boards (the large ones). Remove all jumpers EXCEPT input shorting jumper (shield & inner cord). Carefully remove the red, grey, and white wires with push on terminals from the drive board. (These wires will be used later.)

82. Sparingly coat the inside of the heat sink "L's" on the drive boards with thermal compound.

83. Carefully slide the drive boards assembly onto the heat sink assembly. (See figure 10.) Secure them to heat sink with eight 6-32 x 3/8 black oxide screws and eight #6 lockwashers. Now, look between the drive boards and the heat sink assembly and be sure there are no leads from the drive board touching the heat sink plates.




−75V
TO POWER SUPPLY

+75V
TO POWER SUPPLY

84. Using figure 10 as a guide, interconnect the drive board and the output board using "buss bar" between the preinstalled solder terminals on the boards. After "wiring" the boards together, carefully solder the "buss bar jumpers" to the pre-installed solder terminals using a medium wattage soldering iron. ( )

Check your work

85. Locate the four .1 mfd, 100 volt, disc capacitors and referring to figure 10, solder them to the solder lugs on the heat sink assembly and the pre-installed solder terminals on the output circuit board. ( )

86. Place the heat sink assembly in front of you with the thermal cutouts facing left and up. Locate the short red wire with push on terminal (PN810122), the long grey wire with push on terminal (PN810128) one blue wire without connectors (PN810116), the long blue wire with push on terminal (PN810126), and the short white wire with push on terminal (PN810109). Using a high wattage soldering iron, solder the blue wire without connectors, from the preinstalled solder terminal on the drive board marked "OUT", (See figure 10) to the thermal cutout terminal closest to the drive board. Solder the long blue wire with push on terminal to the other terminal of the thermal cutout. ( )

87. Before soldering the red, grey, and white wire, note that they will be routed from their respective solder terminals, towards the thermal cutouts. Solder the short red wire with push on terminal to the pre-installed solder terminal of the output board marked "+ 75V" (See figure 10). Solder the long grey wire with push on terminal to the pre-installed solder terminal of the output board marked "- 75V" (See figure 10). Solder the short white wire with push on terminal to the pre-installed solder terminal of the drive board marked "GND". ( )

88. Place the heat sink assembly in front of you with the thermal cutouts facing up and right.
Locate the long red wire with push on terminal (PN810132), the short grey wire with push on terminal (PN810118), the other blue wire without connectors (PN810116), the short blue wire with push on terminal (PN810106) and the long white wire with push on terminal (PN810119). Using figure 10 as a guide, solder the blue wire without connectors, from the pre-installed solder terminal on the drive board marked "OUT", to the thermal cutout terminal closest to the drive board. Solder the short blue wire with push on terminal to the other terminal of the thermal cutout. ( )

89. Before soldering the red, grey, and white wires, note that they will be routed from their respective solder terminals, towards the thermal cutouts. Solder the long red wire with push on terminal to the pre-installed terminal of the output board marked "+75V" (See figure 10). Solder the short grey wire with push on terminal to the pre- installed solder terminal of the output board marked "-75V" (See figure 10). Solder the long white wire with push on terminal to the pre-installed solder terminal of the drive board marked "GND". ( )

90. Carefully inspect all of the solder connections at the pre-installed solder terminals and the thermal cutouts. Good solder connections are especially important at these points. Be sure the solder flows smoothly and enough heat is applied to prevent "cold" connections. ( )

## FINAL ASSEMBLY & CHECKOUT

91. The following ohmmeter resistance checks will insure that the completed heat sink assembly is in operating order. With your ohmmeter on the Rx1 scale, connect the black lead of the ohmmeter to the long blue wire with push on terminal. (Channel B) Hook up the red lead of the ohmmeter to the red wire with push on terminal of the same channel. Your meter should read between 1500 and 2000 ohms.(NOTE: Be sure to "set up" your ohmmeter polarity the same way as in the drive board checkout.) Now move the red lead of the ohmmeter to the blue wire with push on terminal and black lead of the ohmmeter to the grey wire with push on terminal of the same channel. Your meter should read between 1500 and 2000 ohms. Repeat this test on the other channel If your readings are much lower (less than 1000 ohms) make sure that the output transistors (TO-3) are installed correctly. If all tests check O. K., proceed to the next step. ( )

92. Now turn the 250 ohm trim pots on the output board completely off. With the heat sink assembly sitting so the output boards are at the top, the pot should be turned completely clockwise. Check to be sure that they are turned off by connecting an ohmmeter across the trim pots and verify that they are turned to the lowest reading. ( )

93. Remove the 1/4 amp fuses from the 4 fuse fuseholder. Carefully place the completed and tested heat sink assembly in the bottom tray of the chassis over the fan, being careful not to disturb the fan cord plug, or damage the 250 ohm trim pots on the output boards. DO NOT fasten heat sink assembly to chassis at this time. ( )

94. Referring to the color pictorial hook up all wires from the completed heat sink assembly to their respective terminals. Make sure that none of the push on terminals touch the chassis or short to one another. Be sure the amplifier power switch is off (It would be wise to unplug the unit.) and the filter capacitors are fully discharged. Install two 6 amp AGC fuses, (PN530001), one in channel "A" positive position, and one in channel "A" negative position of the four fuse fuseholder. (Red & grey wires from one board) ( )

95. Locate six, 6-32 x 3/8 N. P. screws and six #6 lockwashers. These screws will be used to fasten the heat sink assembly to the chassis. BEFORE fastening the heat sink to the chassis, BE SURE that the wires from the heat sink assembly are not pinched or routed under the heat sink. BE SURE that

the fan cord is routed <u>through</u> the notch in the bottom of the heat sink and the fan cord is still plugged into the fan. Install two of the screws through the bottom of the chassis tray and lightly tighten (finger tight). Double check all the wires to make sure that none are pinched or under the heat sink. If everything is O. K., install the four remaining screws and lock-washers and tighten all six screws securely. ( )

IMPORTANT

96. Before continuing, recheck the 250 ohm trim pot on the output boards to make sure they haven't moved from the off position. Recheck all the wiring to make sure that it's hooked up correctly, and there are no shorts or pinched wires. <u>Make sure the input jumpers are in place</u> (Between "shield" and "inner cord") <u>on both drive boards</u>. ( )

97. Locate the two 10 amp AGC fuses (PN530002) and install them in the speaker fuseholder. ( )

98. Connect a voltmeter between the red and black speaker binding post of channel "A". Switch the voltmeter to the 50 volt D. C. range. Make sure the power switch is in the "off" position. Plug in the amplifier power cord. ( )

99. Watch the meter and turn the power switch to the "on" position. If there is a large steady voltage indication, <u>TURN OFF THE POWER IMMEDIATELY</u> and start trouble shooting. (A deflection followed by a return to zero is normal.) ( )

100. Switch the meter to the 2. 5 volt DC scale and adjust the D. C. offset by turning the 1 k ohm trim pot, R5, on the channel "A" drive board until the voltmeter reads zero. ( )

101. Move the voltmeter leads from the speaker binding posts to the collectors (metal case) of transistors Q7 and Q9 on the drive board of channel "A". Red lead to Q7 and black lead to Q9. Very <u>slowly</u> and carefully turn the 250 ohm trim pot on the output board of channel "A", until the meter reads 2. 2 volts. If equipment is available see alternate bias setup. ( )

102. Turn off the amplifier, unplug the line cord, and <u>discharge the filter capacitors</u> with the 1500 ohm 5 watt resistor. ( )

103. Install the other two 6 amp AGC fuses in the four fuse fuseholder. Repeat steps 98 through 101 for channel "B".

104. Turn off the power switch, unplug the line cord, and discharge the filter capacitors with the 1500 ohm 5 watt resistor. Remove the input jumper from the drive boards and solder the shielded cable to the pre-installed solder terminals on the drive boards marked "shield" and "inner cord". <u>DO NOT</u> overheat the cable as the shield will "short" to the inner cord. (Long shielded

cable to channel "A" and short shielded cable to channel "B".) ( )

105. OPERATING MUSTS!! Before hooking up your amplifier to your system, be sure all other components are OFF!! Once the amplifier is hooked up, ALWAYS turn on your pre amp first. It is very important that you allow the pre-amp to warm up before turning on the amplifier. Do not use switched outlets of your pre-amp for the amplifier. ( )

106. To insure proper operation of your amplifier, we suggest you install it in your "system" and perform a listening test before completing construction. DO THIS ONLY FOR A SHORT PERIOD OF TIME AND BE CAREFUL. Do not allow children or people who "look with their fingers" get close to the amplifier, as voltages at points in the amplifier can be LETHAL. ( )

107. After the listening test, turn off the power switch, unplug the line cord, and discharge the filter capacitors with the 1500 ohm 5 watt resistor. ( )

108. Locate the green LED (PN 160001) and the 1500 ohm 5 watt resistor. Gently press the LED into the hole in the front of the chassis. As shown in the color pictorial, solder one lead of the 1500 ohm resistor to the large lead of the LED. Solder a short piece of jumper wire between the small thin lead of the LED and pre-installed solder terminal on the output board with the large red wire (+ 75V). Solder the other lead of the 1500 ohm resistor to the ground solder lug on the heat sink assembly. ( )

109. Locate the pre-assembled meter top cover (PN700001). Connect the black wire with push on terminal to the QDT terminal at the base of the capacitors (GND). Connect the violet wire with push on terminal to the QDT on the red speaker binding post of channel "B". Connect the red wire with push on terminal to the QDT on the red speaker binding post of channel "A". Connect the white wire with push on terminal to the QDT on the top of the negative filter capacitor. Make sure none of the top cover wires are touching the chassis or any other terminal. Fasten the top cover to the heat sink assembly using six 6-32 x 3/8 B. O. screws. ( )

110. Locate the two white end covers (PN700003). Carefully push the end covers onto the chassis and secure with twenty 6-32 x 3/8 B. O. screws. The end covers are a very tight fit. It may be necessary to force them on by striking them with the open palm of your hand. ( )

111. This completes construction of your amplifier. May it fulfill your wildest sonic dreams.

# OPERATION

## INSTALLATION

1. Make sure the rest of your music system is turned off. Locate your AMPZILLA so there is adequate ventilation for cooling. (Do not place AMPZILLA on shag carpeting, as this will block air to the fan.)

2. Connect your speaker system to the AMPZILLA, using 14-16 Awg wire, making sure the speakers are phased properly. Connect one speaker to the red and black speaker binding posts marked outputs "CHA" and the other speaker to the binding posts "CHB". (Make sure there are no shorts or loose connections.)

3. Using a pair of good quality shielded audio cables, connect the output of your pre amplifier to the inputs of AMPZILLA marked "CHA" and "CHB".

4. Making sure the AMPZILLA's power switch is turned off, plug the power supply cord into a THREE PRONG GROUNDED OUTLET. (YOUR PRE-AMP SHOULD NOT BE GROUNDED TO YOUR WALL OUTLET.

5. Check all of your wiring, then turn on your preamp first; this is very important, as the preamp will take at least 15 seconds to stabilize. (A tube preamp will take much longer, at least 1 minute.)

6. Turn on AMPZILLA's power switch. Note that some meter movement is normal, when the -30 DB meter switch is depressed.

7. The meter sensitivity switch should be used to select the most usable range of meter movement for the level to be listened to. CAUTION - Do not allow meter needles to constantly "pin" full scale, as this will damage the meters and associated circuits.

## ALTERNATE BIAS SETUP & PROCEDURE

1. Connect the amplifier into the final test set-up diagram as indicated. ( )

2. Increase the oscillator output until the amplifier output voltage is 3 Volts R.M.S. at 2,000 Hz. ( )

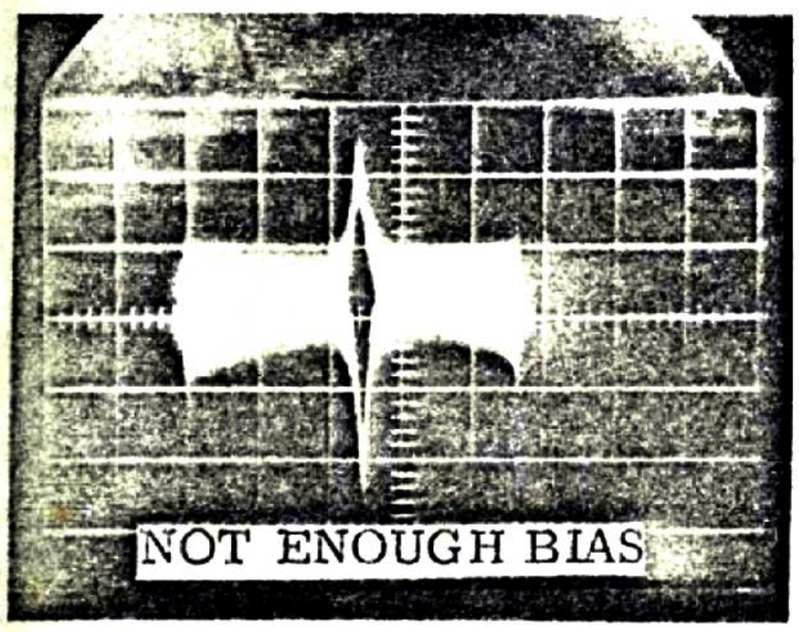
3. Null the distortion analyzer which should produce the waveform #1. ( )

4. Slowly and carefully increase the bias trimmer pot on the bottom P.C. board until the spikes just disappear and no further. This is the correct adjustment point and there are no advantages in increasing the bias beyond this point. As the amplifier gets warmer, the bias will automatically increase to the correct level. ( )

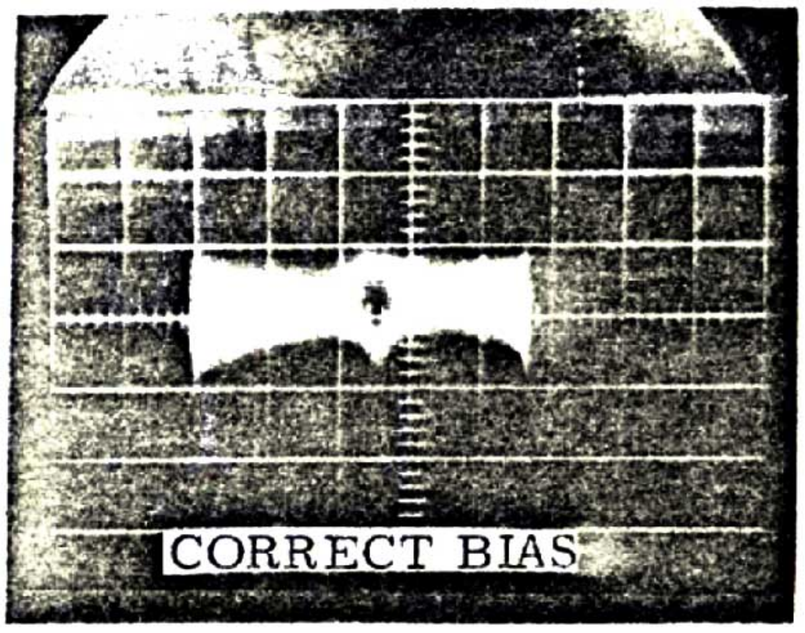
5. Repeat the procedure for the other channel. ( )

6. Now go back and readjust the two D.C. offset pots if needed. ( )

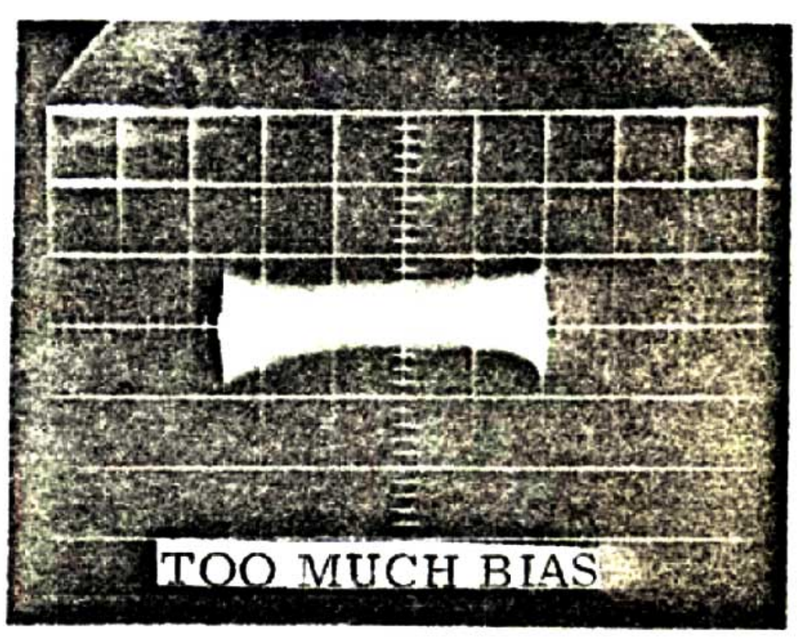
#1

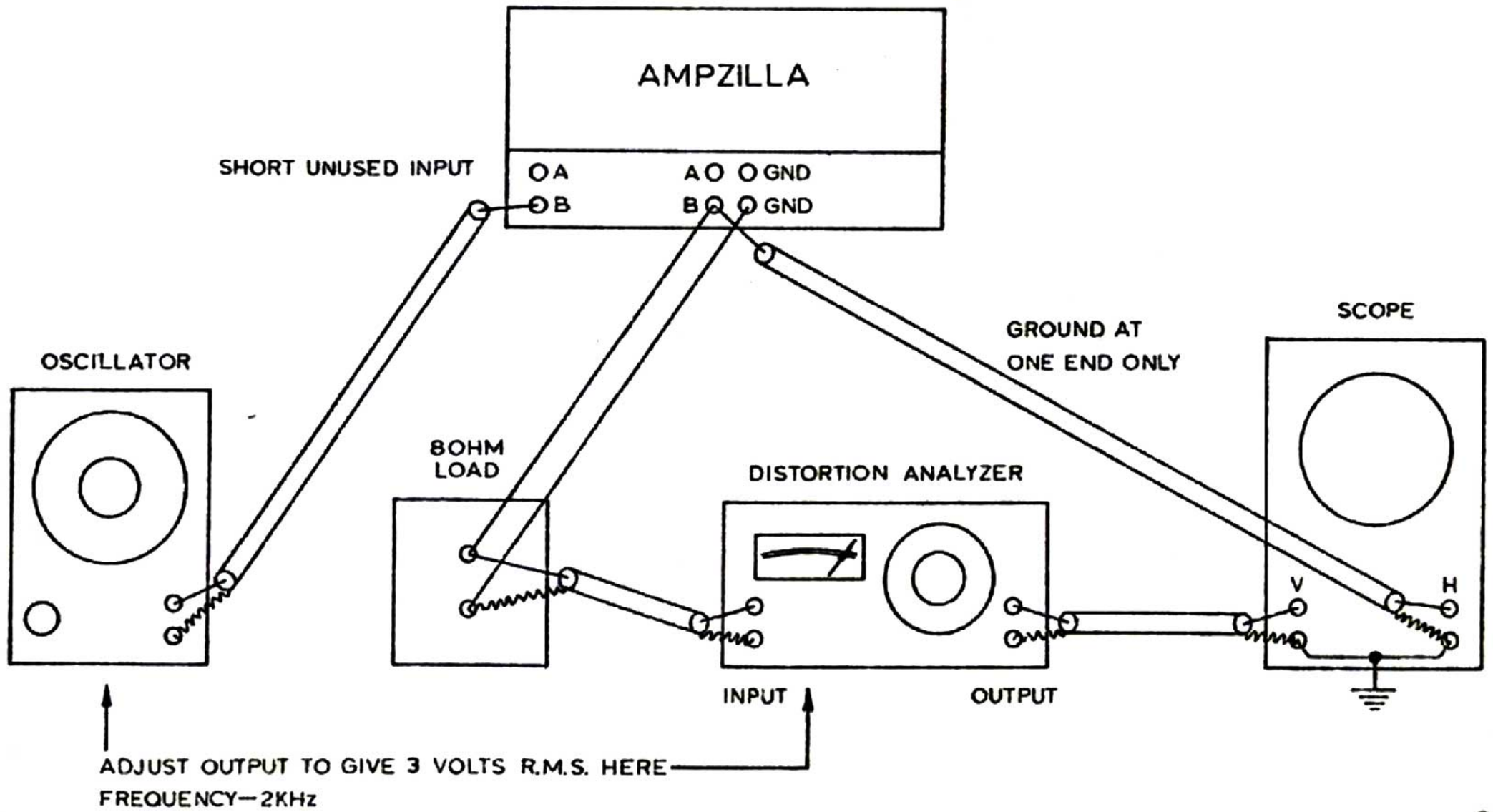


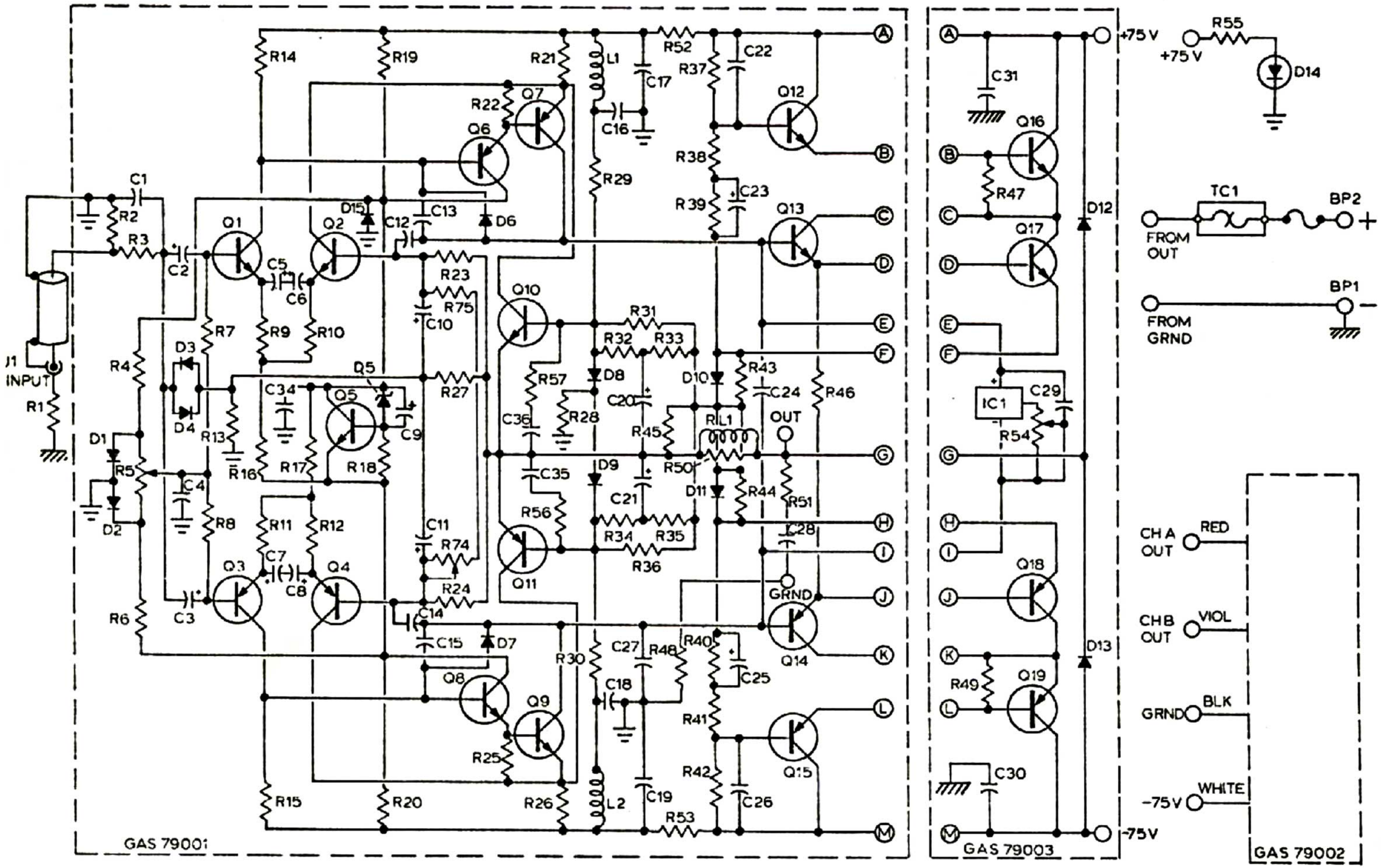

#2




#3






VOLTAGES:

| | | | |
|---|---|---|---|
| COLLECTOR | Q17 | — | +37V |
| —II— | Q18 | | -37V |
| —II— | Q6 | | +25.5V |
| —II— | Q8 | | -25.5V |
| ACROSS | R43 | | .04V |
| —II— | R21 | MIN | 1.2V |
| | | MAX | 1.8V |
| —II— | R26 | MIN | 1.2V |
| | | MAX | 1.8V |

NOTE:

R75, R74 MAY OR MAY NOT BE SUPPLIED WITH THE UNIT. IF R75, R74 ARE SUPPLIED R23, R24 BECOME 270K.


THE GREAT AMERICAN SOUND CO. INC.
8760 SHOREHAM DRIVE WEST HOLLYWOOD, CALIFORNIA 90069

THE GREAT AMERICAN SOUND COMPANY, INC.

8780 SHOREHAM DRIVE WEST HOLLYWOOD. CALIFORNIA 90069 PHONE (213) 659-2486

# AMPZILLA SPECIFICATIONS

POWER OUTPUT:

| | |
|---|---|
| 8 Ohms | Minimum 200 Watts RMS channel, both channels driven, 20 Hz to 20 KHz |
| 4 Ohms | Minimum 350 Watts RMS channel, both channels driven, 20 Hz to 20 KHz |
| 16 Ohms | Minimum 125 Watts RMS channel, both channels driven, 20 Hz to 20 KHz |

TOTAL HARMONIC DISTORTION & I.M. DISTORTION:

| | |
|---|---|
| 8 & 16 Ohms | Less than .05% at any frequency or combination of frequencies, and at any power level to clipping |
| 4 Ohms | Less than 0.25% at any frequency or combination of frequencies, and at any power level to clipping |

Input Sensitivity: 1.6 Volts RMS for 200 Watts into 8 Ohms

Input Impedance: 75 K Ohms

Crossover Notch: Non Existent

Frequency Response (Power Bandwidth) at rated power or any level less than rated power:

| | |
|---|---|
| 8 & 16 Ohms | Better than $\pm$ 0.1 dB, 20 Hz to 20 KHz<br>Better than $\pm$ 1 dB, 1 Hz to 100 KHz |
| 4 Ohms | Better than $\pm$ 0.2 dB, 20 Hz to 20 KHz<br>Better than $\pm$ 2 dB, 1 Hz to 100 KHz |

Rise Time at 8 Ohms: Better than 2$\mu$seconds. AT FULL POWER AT 20 KHz
Slew rate equal to 40 $\mu$ Volts per second

Duty Cycle: Low-noise integral fan provides continuous operation at ambient temperatures up to 125° F.

Stability: 100% stable into any load angle 0° to 90° , capacitive or inductive, regardless of waveshape - sine, square, triangular. No oscillations or modulation noise.

Overload Protection: Transistorized dynamic short-circuit protection. Thermal breaker also protects against overheating.

Noise: Better than 100 dB below full power (unweighted, wide band). 112 dB below full power (wide band with R.F. filter).

Size: 17 1/2" (W) x 7" (H) x 9" (D)

Shipping Weight: 50 lbs.

| PART NO. | DESCRIPTION | PRICE EACH | QTY PER KIT | KEY NO. | BODY MARKINGS & SPECIAL CODES |
|---|---|---|---|---|---|
| 100101 | GAS101, 2N5631 | 8.00 | 4 | Q16, 17 | Black |
| 100102 | GAS102, 2N6031 | 8.00 | 4 | Q18, 19 | Violet |
| 100103 | GAS103, 2N6316 | 2.50 | 4 | Q12, 13 | Blue |
| 100104 | GAS104, 2N6318 | 2.50 | 4 | Q14, 15 | Green |
| 100105 | GAS105, 2N3584 | 2.50 | 4 | Q9, 10 | Yellow |
| 100106 | GAS106, 2N6421 | 2.50 | 4 | Q7, 11 | Red |
| 100107 | GAS107, MPSU06 | 1.00 | 8 | Q1, 2, 5, 8 | Plastic transistor |
| 100108 | GAS108, MPSU56 | 1.00 | 6 | Q3, 4, 6 | Plastic transistor |
| 140001 | IN4148 100v | .25 | 16 | D1, 2, 3, 4, 8, 9, 15, 16 | Small glass diode |
| 140002 | IN4003 1A 400v | .25 | 4 | D12, 13 | Bagged separately |
| 140003 | IN3060, IN4938, V62101 | .50 | 4 | D6, 7 | Bagged separately |
| 140004 | GAS109, IN5823 | 3.50 | 4 | D10, 11 | Large metal diode |
| 140010 | 51v 2% Zener diode | .50 | 2 | D5 | Plastic radial |
| 141001 | 525-A20 bridge | 3.00 | 1 | Bridge Rectifier | KBH2502 |
| 150100 | GAS100, CA3086 16 | 1.50 | 2 | IC1 | 14 Pin integrated circuit |
| 160001 | LED MV5222 (green) | 1.00 | 1 | LED | Green |
| 202120 | 200 ohm 1/2w 2% M.F. | .35 | 2 | R13 | Red, black, brown, red |
| 203249 | 4990 ohm 1/2w 1% M.F. | .35 | 2 | R27 | 4991, RN55 |
| 211010 | 10 ohm 1/4w 5% C.F. | .10 | 4 | R52, 53 | Brown, black, black, gold |
| 211110 | 100 ohm 1/4w 5% C.F. | .10 | 12 | R31, 33, 35, 36, 47, | Brown, black, brown, gold |
| 211115 | 150 ohm 1/4w 5% C.F. | .10 | 12 | R9, 10, 11, 12, 56, 57 | Brown, green, brown, gold |
| 211139 | 390 ohm 1/4w 5% C.F. | .10 | 2 | R32 | Orange, white, brown, gold |
| 211147 | 470 ohm 1/4w 5% C.F. | .10 | 2 | R34 | Yellow, violet, brown, gold |
| 211162 | 620 ohm 1/4w 5% C.F. | .10 | 6 | R18, 22, 25 | Blue, red, brown, gold |
| 211210 | 1000 ohm 1/4w 5% C.F. | .10 | 2 | R3 | Brown, black, red, gold |
| 211218 | 1800 ohm 1/4w 5% C.F. | .10 | 4 | R14, 15 | Brown, grey, red, gold |
| 211275 | 7500 ohm 1/4w 5% C.F. | .10 | 8 | R4, 6, 16, 17 | Violet, green, red, gold |
| 211336 | 36K ohm 1/4w 5% C.F. | .10 | 4 | R29, R30 | Orange, blue, orange, gold |
| 211415 | 150K ohm 1/4w 5% C.F. | .10 | 8 | R7, 8, 23, 24 | Brown, green, yellow, gold |
| 211510 | 1M ohm 1/4w 5% C.F. | .10 | 2 | R2 | Brown, black, green, gold |
| 211912 | 1.2 ohm 1/4w 5% C.F. | .10 | 2 | R48 | Brown, red, gold, gold |

| PART NO. | DESCRIPTION | PRICE EACH | QTY PER KIT | KEY NO. | BODY MARKINGS & SPECIAL CODES |
|---|---|---|---|---|---|
| 211922 | 2.2 ohm 1/4w 5% C.F. | .10 | 2 | R1 | Red, red, gold, gold |
| 221062 | 62 ohm 1/2w 5% C.F. | .10 | 6 | R21, 26, 46 | Blue, red, black, gold |
| 231239 | 3900 ohm 1w 5% M.O. | .50 | 6 | R19, 20, 28 | 3.9K J-Y |
| 232130 | 300 ohm 1w 2% M.O. | .50 | 4 | R39, 40 | 1GJ4 300 |
| 241010 | 10 ohm 2w 5% M.O. | .50 | 2 | R51 | 2BJ 10 -Y |
| 241922 | 2.2 ohm 2w 5% M.O. | .50 | 2 | R50 | 2BJ 2.2 -Y |
| 242175 | 750 ohm 2w 2% M.O. | .75 | 4 | R38, 41 | 12w 2% 750 |
| 242210 | 1K ohm 2w 2% M.O. | .75 | 4 | R37, 42 | 2 w 2% 1.0 K |
| 250215 | 1.5K ohm 5w 10% W.W. | 1.00 | 1 | R55 | 5w 1.5K ± 10% |
| 250839 | .39 ohm 5w 10% W.W. | 1.00 | 4 | R43, 44 | 5w .39 ± 10% |
| 262812 | .125 ohm 10w 3% N.H. | 1.50 | 2 | R45 | 10 .125 ± 3% |
| 280125 | 250 ohm P.C. Pot. | .50 | 2 | R54 | Green |
| 280210 | 1000 ohm P.C. Pot. | .50 | 2 | R5 | Black |
| 300005 | 22 pf 10% @ 500v | .25 | 4 | C12, 14 | 22 P.F. |
| 300007 | 47pf 10% @ 500v | .25 | 4 | C13, 15 | 47 P.F. |
| 300010 | 200 pf 10% @ 500v | .25 | 2 | C1 | 200 P.F. |
| 300015 | .001 uf cer. @ 500v | .25 | 6 | C22, 26, 27 | B-102 |
| 300020 | .1 uf cer. @ 50v | .25 | 6 | C4, 24, 29 | .1 UF 50v |
| 300021 | .1 uf cer @ 100v | .50 | 16 | C16, 17, 18, 19, 28, 30, 31, 34 | 20% .1 100v |
| 320020 | 1 uf Myl @ 100v | .75 | 4 | C35, 36 | 1.0 10% 100 |
| 340010 | 100 uf @ 10v | .50 | 12 | C2, 3, 10, 11, 20, 21 | 100MFD 10v |
| 340011 | 100 uf @ 50v | .50 | 2 | C9 | 100MFD 50v |
| 340014 | 220 uf @ 16v | .50 | 4 | C23, 25 | 220MFD 16v |
| 340016 | 330 uf @ 10v | .50 | 8 | C5, 6, 7, 8 | 330MFD 10v |
| 350001 | 16,800 uf @ 75v | 20.00 | 2 | C32, 33 | 16,800 uf 75VDC |
| 400001 | 2.5 uh choke | .10 | 2 | L3 | 32 turns, #16 gauge wire |
| 400002 | 1 mh choke | .25 | 4 | L1, 2 | Silver, brown, black, red, gold |
| 430001 | 120v Pwr xformer | 200.00 | 1 | T1 | 430001 |
| 430002 | 240v Pwr xformer | 225.00 | 1 | Export kit only | 430002 |
| 440001 | Fan | 25.00 | 1 | | White label |
| 500001 | DPDT, CO 15a Sw | 4.00 | 1 | | 15A 250VAC |
| 510001 | Thermal Brk. 70 C | 2.00 | 2 | TC1 | L158 R21-386 |
| 530001 | 6 Amp AGC fuse | .15 | 4 | F1, 2, 3, 4 | Buss AGC 6 |
| 530002 | 10 Amp AGC fuse | .15 | 2 | F6 | Buss AGC 10 |

| PART NO. | DESCRIPTION | PRICE EACH | QTY PER KIT | KEY NO. | BODY MARKINGS & SPECIAL CODES |
|---|---|---|---|---|---|
| 530003 | 10 Amp MDA Slo-Blo | .15 | 1 | F5 | Buss MDA 10 |
| 530004 | 1/4Amp AGC fuse | .25 | 2 | | Buss AGC 1/4 |
| 600001 | TO-3 Socket | .50 | 8 | | MD-3452 |
| 600002 | 1C Socket 14 pin D.I.P. | .75 | 2 | | Excel 14 Pin |
| 610001 | RCA FEMALE JACK | .50 | 2 | | Input Jack |
| 630001 | Binding Post, Red | .50 | 2 | | Red |
| 630002 | Binding Post, Black | .50 | 2 | | Black |
| 640001 | AC fuseholder | .50 | 1 | | 10 A250 VAC |
| 640002 | Four Post fuseholder | .50 | 1 | | Buss 2430 4 |
| 640003 | Fuseholder, Spkr. | .50 | 2 | | 15A 250v |
| 700002 | Ampzilla bottom cover | N.A. | 1 | | Black |
| 700003 | Chassis End cover | N.A. | 2 | | White |
| 700004 | Heat sink plate | N. A. | 2 | | Black |
| 700005 | Heat sink end | N. A. | 2 | | Black |
| 700006 | Top cover, assy. metered | N. A. | 1 | | Black |
| 710001 | GND Bracket | N. A. | 1 | | Nickel-plated |
| 710002 | Sm. Heat sink fin | N. A. | 4 | | Black |
| 710003 | Lg. Heat sink fin | N. A. | 4 | | Black |
| 710004 | PC heat sink L's | N. A. | 4 | | Black |
| 710005 | Capacitor Clamp | 1.00 | 2 | | 2.5" I.D. |
| 720001 | Knob, Ampzilla | 2.00 | 1 | | 1 1/8" white |
| 740001 | #6 solder lug | .10 | 6 | | Self-locking |
| 740002 | Quick disconnect terminal | .10 | 8 | | 1/4" Q.D.T. |
| 740006 | Solder lug | .10 | 2 | | Input jack |
| 750204 | 6-32 x 3/8 Screw | .10 | 50 | | Nickel-plated |
| 750205 | 6-32 x 3/8 Screw | .10 | 90 | | Black Oxide |
| 750206 | 6-32 x 1/2 Screw | .10 | 20 | | Nickel-plated |
| 750212 | 6-32 x 1 5/8 Screw | .10 | 4 | | Cap screw |
| 750404 | 10-32 x 1/2 Screw | .10 | 4 | | Nickel-plated |
| 750405 | 10-32 x 5/8 Screw | .10 | 6 | | Nickel-plated |
| 760003 | 6-32 x 1/4 Nut | .10 | 40 | | Nickel-plated |
| 760005 | 10-32 x 5/16 Nut | .10 | 5 | | Nickel-plated |
| 760010 | PAL 3/1 x 32 Nut | .10 | 1 | | Switch Nut |
| 760006 | 1/4-28 x 11/32 Nut | .10 | 2 | | Input Jack Nut |
| 770001 | 1C Aluminum Wafer | .10 | 2 | | .040 thick |
| 770003 | #6 lock washer | .05 | 50 | | Nickel-plated |

| PART NO. | DESCRIPTION | PRICE EACH | QTY PER KIT | KEY NO. | BODY MARKINGS & SPECIAL CODES |
|---|---|---|---|---|---|
| 770005 | #8 lock washer | .05 | 4 | | Nickel-plated |
| 770006 | 3/8 " lock washer | .10 | 1 | | Cad-plated |
| 770010 | 5/8" O.D. Flat washer | .10 | 8 | | Cad-plated |
| 771002 | Washer, fiber shoulder 1/4" | .10 | 2 | | Black Fiber |
| 772001 | 5/8 x 1/8 Rubber washer | .10 | 8 | | Black Rubber |
| 780001 | TO-3 therifilm insulator | .25 | 8 | | Amber Mylar |
| 780002 | TO-66 therifilm insulator | .25 | 16 | | Amber Mylar |
| 780003 | Washer Fiber Flat 1/4" | .10 | 2 | | Black Fiber |
| 780004 | TO-3 Pin insulator | .05 | 8 | | Black Fiber |
| 780005 | Strain Relief | .25 | 1 | | Heyco |
| 780006 | Bumper feet | .50 | 4 | | Black Plastic |
| 780007 | TO-66 Plastic insulator | .15 | 16 | | Brown Plastic |
| 790001 | Drive PC Board | 10.00 | 2 | | Large Glass Epoxy |
| 790003 | Output PC Board | 3.50 | 2 | | Small Glass Epoxy |
| 810103 | 7.375" 14 awg | .50 | 2 | Ring-Pushon | Orange |
| 810106 | 3.25" 14 awg | .50 | 1 | Pushon- | Blue |
| 810108 | 3.75" 14 awg | .50 | 3 | Ring-Pushon | Grey |
| 810109 | 8" 14 awg | .50 | 1 | Pushon- | White |
| 810110 | 4" 14 awg | .50 | 2 | Ring-Ring | Black |
| 810112 | 3.75" 14 awg | .50 | 3 | Pushon-Ring | Red |
| 810116 | 5.5" 14 awg | .50 | 2 | - | Blue |
| 810118 | 6" 14 awg | .50 | 1 | Pushon- | Grey |
| 810119 | 12.5" 14 awg | .50 | 1 | Pushon- | White |
| 810122 | 6" 14 awg | .50 | 1 | Pushon- | Red |
| 810126 | 6.25" 14 awg | .50 | 1 | Pushon- | Blue |
| 810128 | 10.5" 14 awg | .50 | 1 | Pushon- | Grey |
| 810132 | 10.5" 14 awg | .50 | 1 | Pushon- | Red |
| 810199 | 2" 14 awg | .50 | 1 | Pushon-Pushon | Buss bar |
| 810204 | 4" 22 awg | .10 | 1 | - | Yellow |
| 810299 | 36" 22 awg | .50 | 1 | - | Buss bar |
| 820110 | 11" RG-174U | .75 | 1 | - | Shielded wire |
| 820210 | 21" RG-174U | 1.00 | 1 | - | Shielded wire |
| 830001 | Line Cord | 5.00 | 1 | - | Grey |
| 830002 | Fan Cord | 2.50 | 1 | On Trans. Ass. | Black |