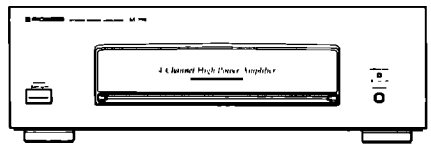
PIONEER
*The Art of Entertainment*

# Service Manual



ORDER NO.
**RRV1465**

## STEREO POWER AMPLIFIER

# M-790

**THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).**

| Type | Model | Power Requirement | Remarks |
|---|---|---|---|
| | M-790 | | |
| KUXJ | O | AC120V | |
| KCXJ | O | AC120V | |

- **This product is a system(s) component.**
  **This product does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component(s), otherwise damage may result.**

## CONTENTS

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# 1. SAFETY INFORMATION

**This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.**
**Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.**

WARNING

**Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).**
**When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.**

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

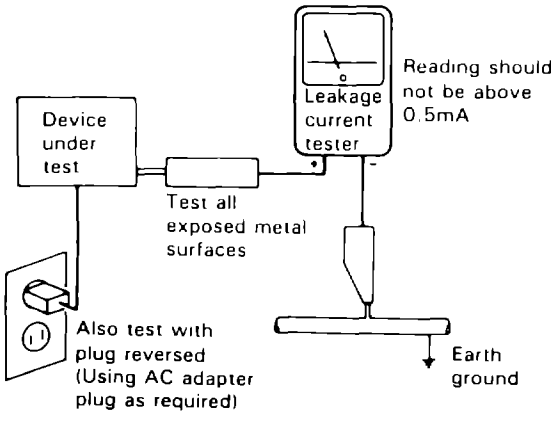
(FOR USA MODEL ONLY)

## 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

**LEAKAGE CURRENT CHECK**

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.




AC Leakage Test

**ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

## 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

# 2. PACKING, EXPLODED VIEWS AND PARTS LIST

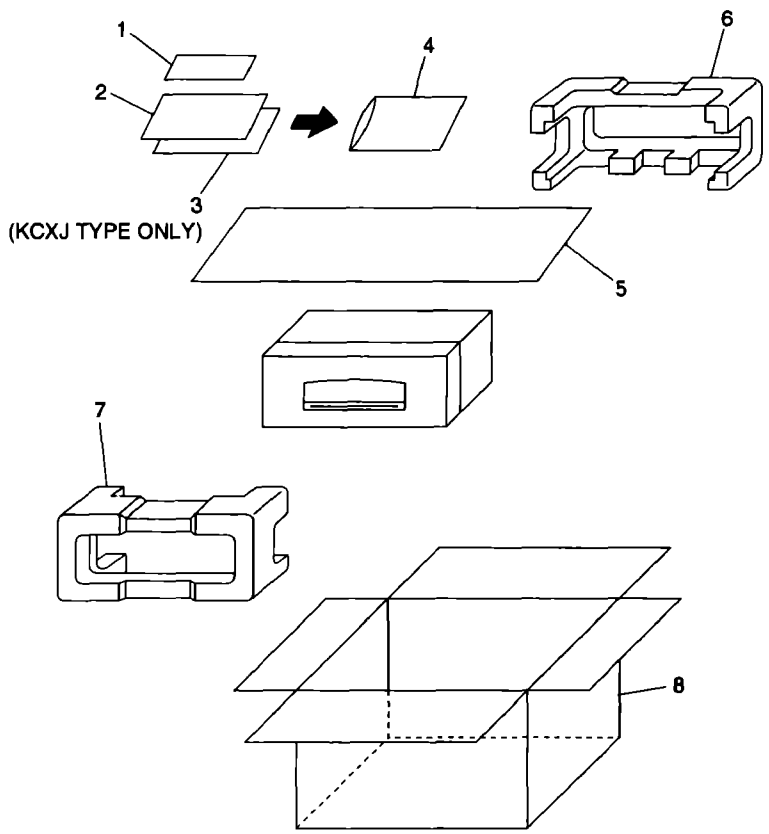
*NOTES:*

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

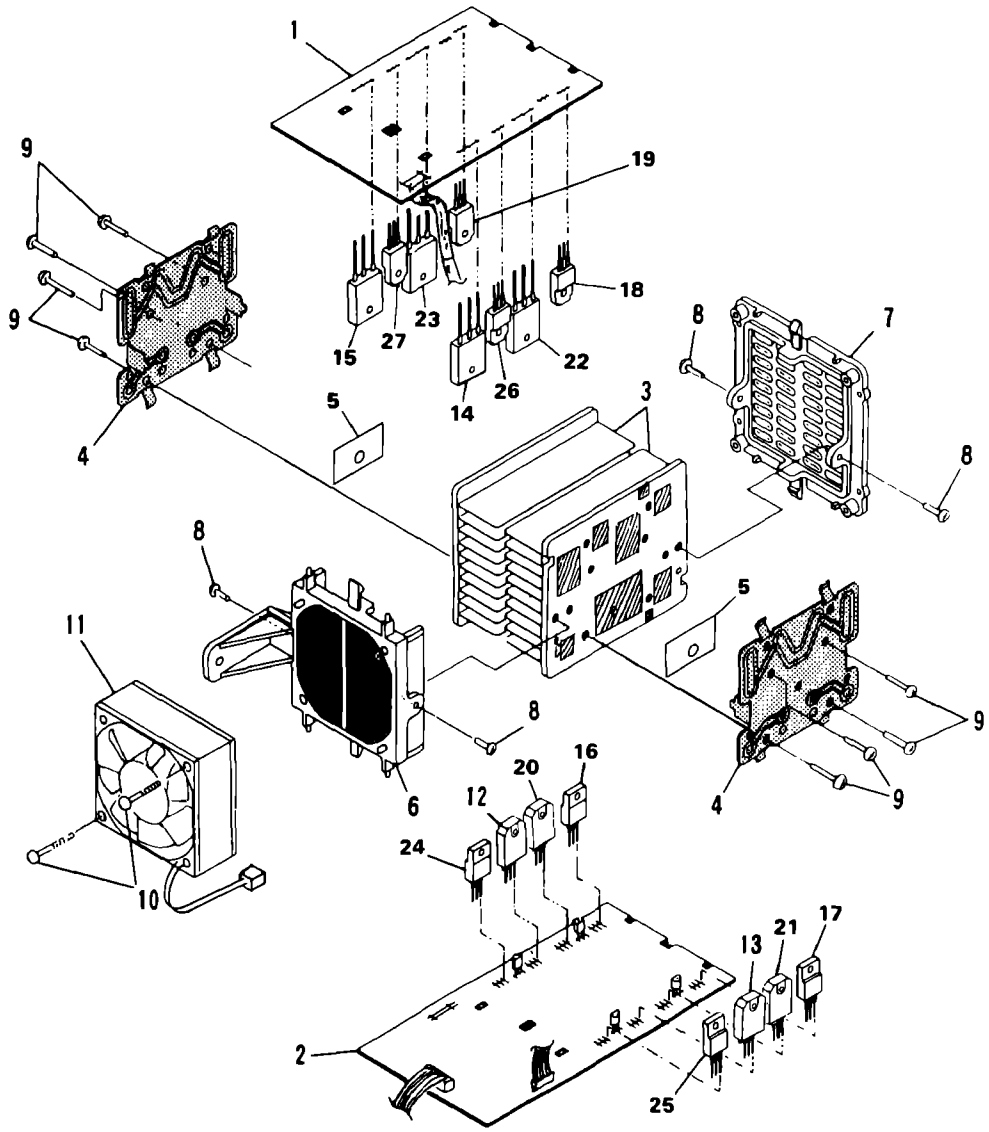
## 2.1 PACKING

**Parts List**

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| NSP | 1 | WARRANTY CARD (KUXJ TYPE ONLY) | ARY1051 |
| NSP | 1 | WARRANTY CARD (KCXJ TYPE ONLY) | ARY1075 |
| | 2 | OPERATING INSTRUCTIONS (ENGLISH) | RRB1167 |
| | 3 | OPERATING INSTRUCTIONS (FRENCH)(KCXJ TYPE ONLY) | RRC1005 |
| NSP | 4 | POLYETHYLENE BAG | AHG1202 |
| | 5 | PACKING SHEET | AHG7008 |
| | 6 | REAR PAD | AHA1666 |
| | 7 | FRONT PAD | AHA1665 |
| | 8 | PACKING CASE | RHG1708 |



## 2.2 POWER AMP. UNIT SECTION




**NOTE : Screws adjacent to ▼ mark on product are used for disassembly.**

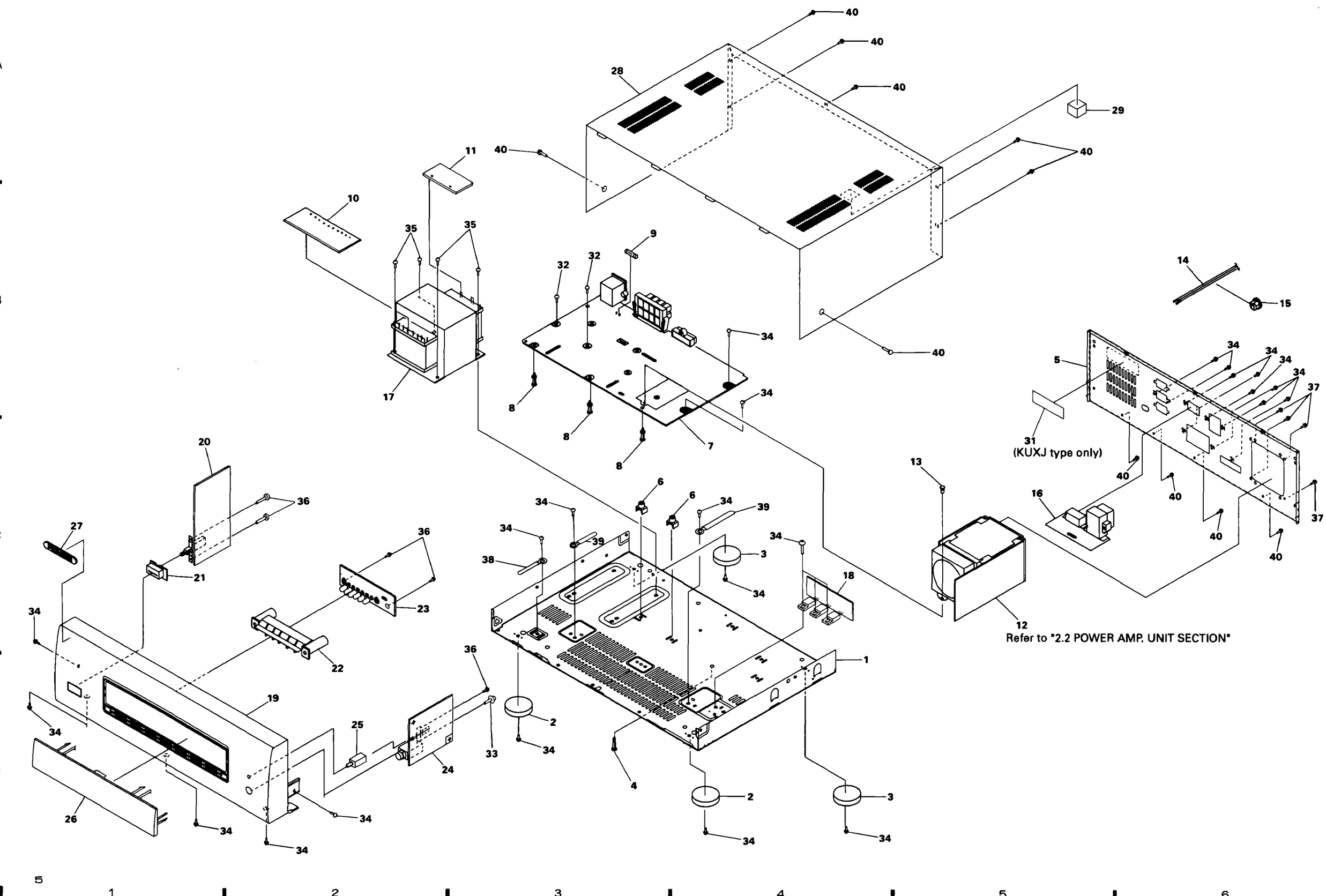
*Notes*

- *Ensure that silicon grease does not adhere to the MOLD A (No. 6) and MOLD B (No. 7).*

**Parts List**

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| | 1 | FRONT ASSY | RWZ3697 |
| | 2 | REAR ASSY | RWZ3698 |
| | 3 | HEAT SINK | ANH7008 |
| | 4 | BRACKET | RNE1881 |
| | 5 | MICA SHEET | REE1029 |
| | 6 | MOLD A | AMR7005 |
| | 7 | MOLD B | AMR7006 |
| | 8 | SCREW (3×10) | ABA1021 |
| | 9 | SCREW | BBZ30P140FZK |
| | 10 | SCREW | BPZ30P350FZK |
| | 11 | DC FAN MOTOR | AXM7003 |
| ⚠ | 12 | TRANSISTOR (Q15) | 2SA1264N |
| ⚠ | 13 | TRANSISTOR (Q16) | 2SA1264N |
| ⚠ | 14 | TRANSISTOR (Q55) | 2SA1264N |
| ⚠ | 15 | TRANSISTOR (Q56) | 2SA1264N |
| ⚠ | 16 | TRANSISTOR (Q13) | 2SA1837 |
| ⚠ | 17 | TRANSISTOR (Q14) | 2SA1837 |
| ⚠ | 18 | TRANSISTOR (Q53) | 2SA1837 |
| ⚠ | 19 | TRANSISTOR (Q54) | 2SA1837 |
| ⚠ | 20 | TRANSISTOR (Q17) | 2SC3181N |
| ⚠ | 21 | TRANSISTOR (Q18) | 2SC3181N |
| ⚠ | 22 | TRANSISTOR (Q57) | 2SC3181N |
| ⚠ | 23 | TRANSISTOR (Q58) | 2SC3181N |
| ⚠ | 24 | TRANSISTOR (Q11) | 2SC4793 |
| ⚠ | 25 | TRANSISTOR (Q12) | 2SC4793 |
| ⚠ | 26 | TRANSISTOR (Q51) | 2SC4793 |
| ⚠ | 27 | TRANSISTOR (Q52) | 2SC4793 |

## 2.3 EXTERIOR




Refer to "2.2 POWER AMP. UNIT SECTION"

**Parts List**

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| NSP | 1 | CHASSIS | RNE1874 |
| | 2 | INSULATOR ASSY | PNW1912 |
| | 3 | INSULATOR ASSY | DXA1490 |
| NSP | 4 | PCB HOLDER | AEC1583 |
| | 5 | REAR PANEL | RNA2037 |
| | 6 | PCB MOLD | AMR2533 |
| | 7 | AF ASSY | RWZ3686 |
| | 8 | PCB SUPPORT | AEC1581 |
| ⚠ | 9 | FUSE (FU151, 8.0A) | REK1086 |
| | 10 | SECONDARY ASSY | RWZ3692 |
| | 11 | PRIMARY ASSY | RWZ3772 |
| | 12 | POWER AMP. UNIT | RXQ7024 |
| | 13 | PUSH RIVET | AEC7010 |
| ⚠ | 14 | AC POWER CORD | PDG1015 |
| | 15 | CORD STOPPER | AEP – 113 |
| | 16 | SP ASSY | RWZ3690 |
| ⚠ | 17 | POWER TRANSFORMER (T1) | RTT1307 |
| | 18 | REGURATOR ASSY | RWZ3687 |
| | 19 | FRONT PANEL | RAH2692 |
| | 20 | POWER SW ASSY | RWZ3691 |
| | 21 | POWER BUTTON | AAD7064 |
| | 22 | INDI. LENS | AAK7075 |
| | 23 | LED ASSY | RWZ3689 |
| | 24 | H.P. ASSY | RWZ3688 |
| | 25 | SPEAKER BUTTON | AAD2416 |
| | 26 | ILLUMI. PANEL | RAH2696 |
| | 27 | NAME PLATE | PAM1608 |
| | 28 | BONNET CASE | ANE1528 |
| | 29 | SPACER | REB1300 |
| | 30 | ..... | |
| | 31 | 65 LABEL (KUXJ TYPE ONLY) | ORW1069 |
| | 32 | SCREW (3×18) | ABA1018 |
| | 33 | SCREW (2.6×8) | ABA1095 |
| | 34 | SCREW | BBZ30P080FZK |
| | 35 | SCREW | BBZ40P080FZK |
| | 36 | SCREW | BPZ26P080FMC |
| | 37 | SCREW | VPZ30P080FZK |
| | 38 | BINDER | AEC – 826 |
| | 39 | BINDER | AEP – 215 |
| | 40 | SCREW | BBT30P080FZK |

# 3. SCHEMATIC AND PCB CONNTCTION DIAGRAMS

## NOTE FOR SCHEMATIC DIAGRAMS (Type 1A)

**1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**

**2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**

**3. RESISTORS:**
Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.

**4. CAPACITORS:**
Unit: p:pF or μF unless otherwise noted.
Ratings: capacitor (μF)/voltage(V) unless othrewise noted.
Rated voltage: 50V except for electrolytic capacitors.

**5. COILS:**
Unit: m:mH or μH unless otherwise noted.

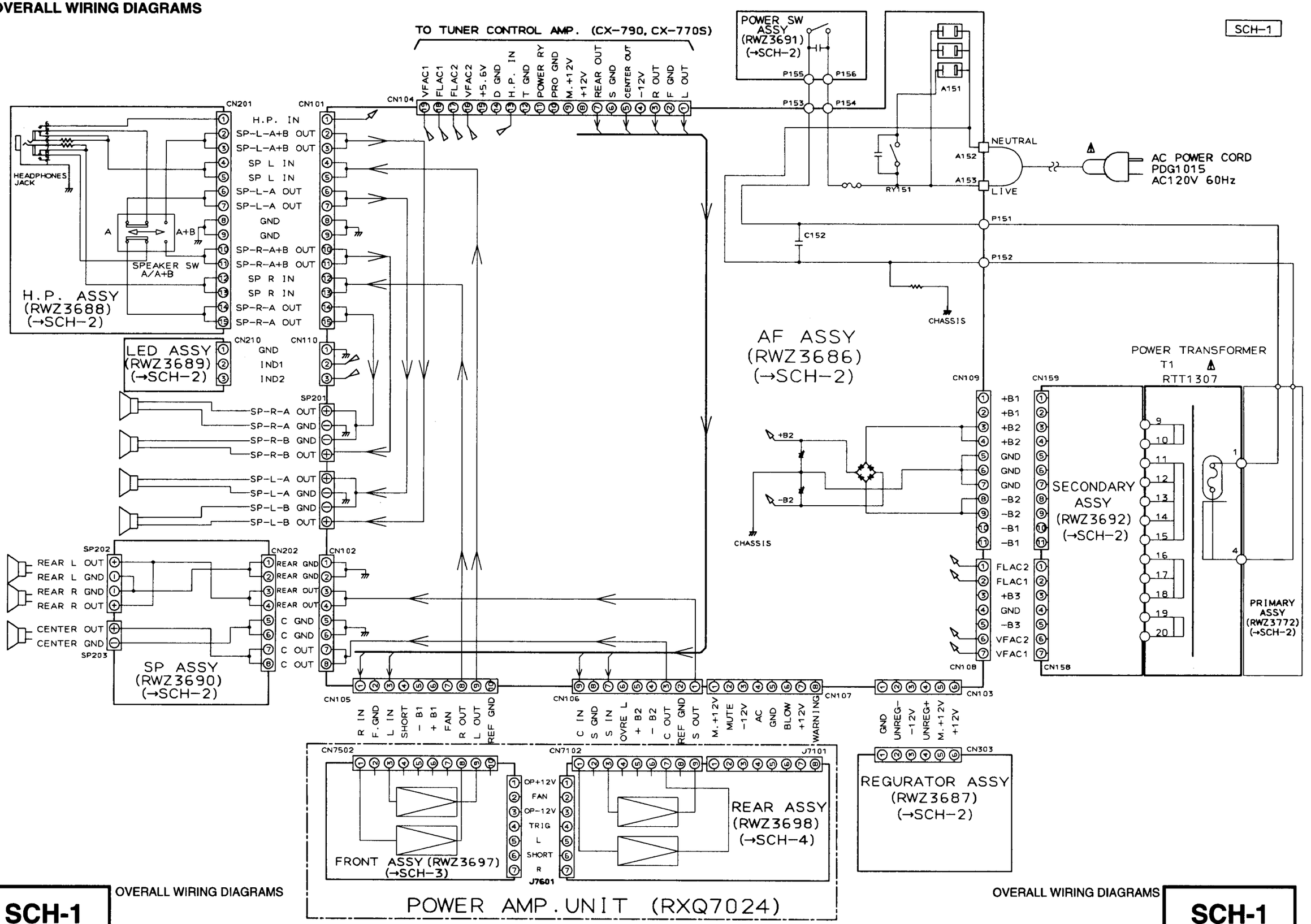
**6. VOLTAGE AND CURRENT:**
V : Signal voltage at rated output.
or ← V:
DC voltage (V) at no input signal unless otherwise noted.
Value in ( ) is DC voltage at rated power.
⇦ mA or ← mA:
DC current at no input signal unless otherwise noted.

**7. OTHERS:**
- ⊘ or ⊘ : Adjusting point.
- ◄ : Measurement point.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

**8. SCH-□ ON THE SCHEMATIC DIAGRAM:**
- SCH-□ indicates the drawing number of the schematic dia gram. (SCH stands for schematic diagram.)

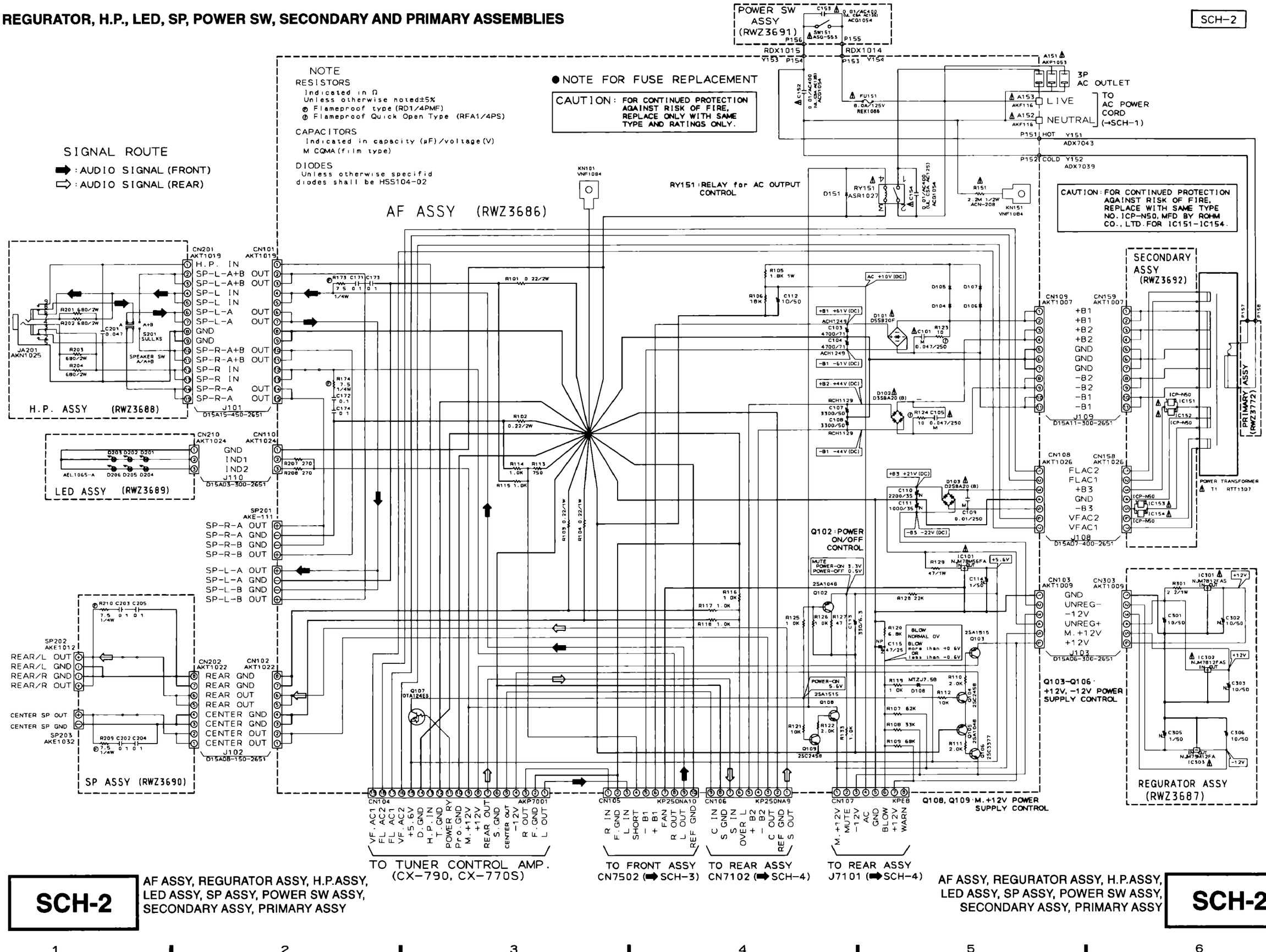
**9. SWITCHES** (Underline indicates switch position):
H.P ASSY
S201 : SPEAKERS(A / A+B)

## 3.1 OVERALL WIRING DIAGRAMS



## 3.2 AF, REGURATOR, H.P., LED, SP, POWER SW, SECONDARY AND PRIMARY ASSEMBLIES

SCH-2

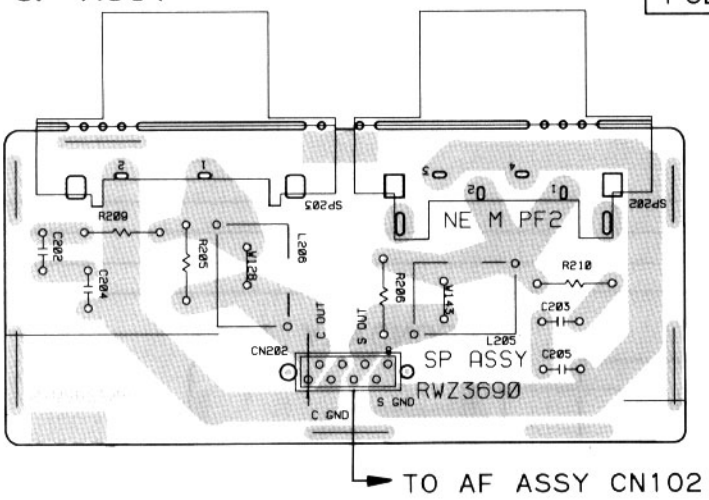



**SCH-2** AF ASSY, REGURATOR ASSY, H.P.ASSY, LED ASSY, SP ASSY, POWER SW ASSY, SECONDARY ASSY, PRIMARY ASSY

AF ASSY, REGURATOR ASSY, H.P.ASSY, LED ASSY, SP ASSY, POWER SW ASSY, SECONDARY ASSY, PRIMARY ASSY **SCH-2**

## SP ASSY

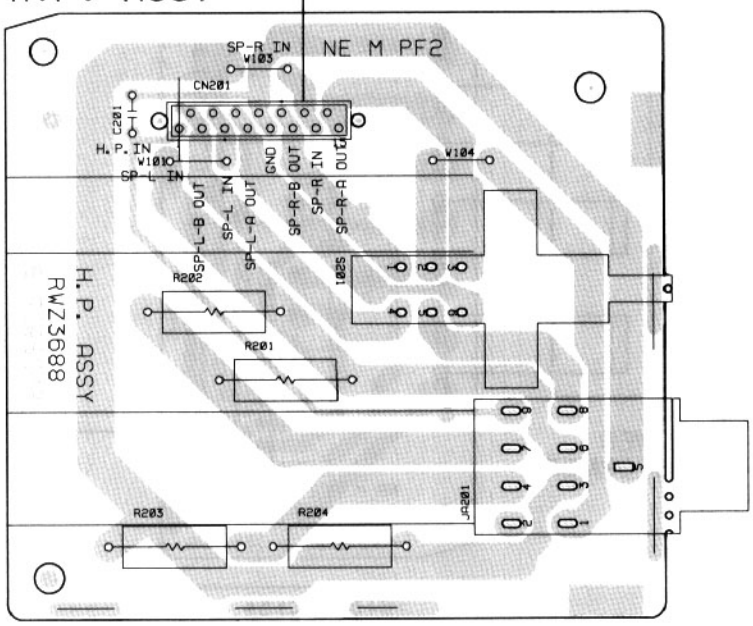
PCB-1



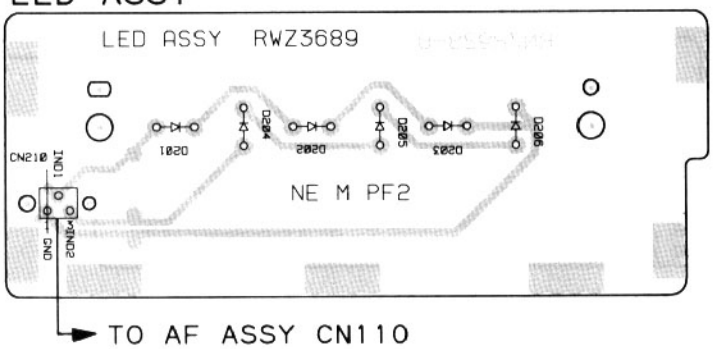

NOTE FOR PCB DIAGRAMS:
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

| Symbol in PCB Diagrams | Symbol in Schematic Diagrams | Part Name |
|---|---|---|
| B C E | B C E B C E | Transistor |
| B C E | B C E B C E | Transistor with resistor |
| D G S | D G S D G S | Field effect transistor |
| | | Resistor array |
| | | 3-terminal regulator |

## H.P. ASSY



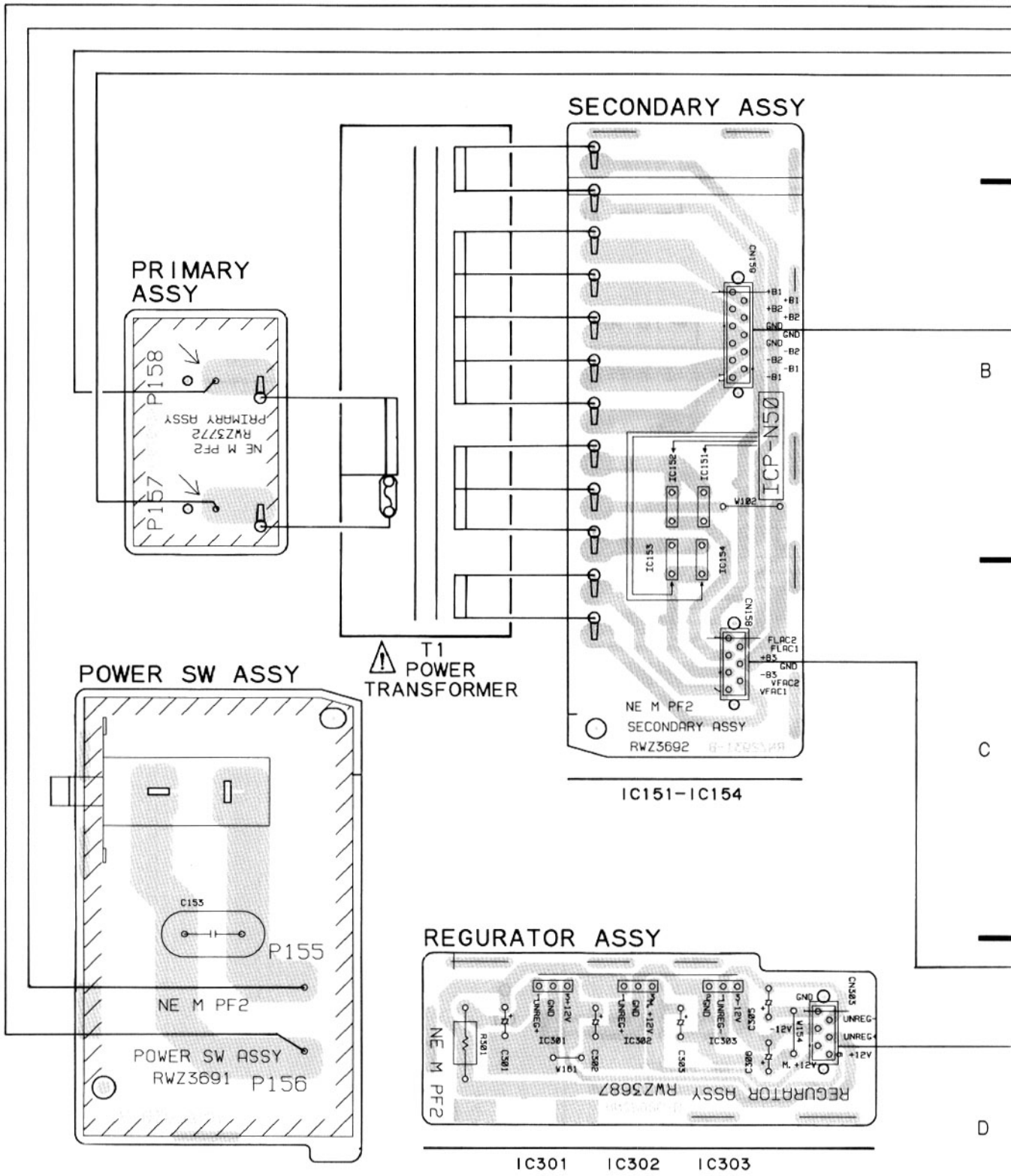

## LED ASSY




RNP1644-B

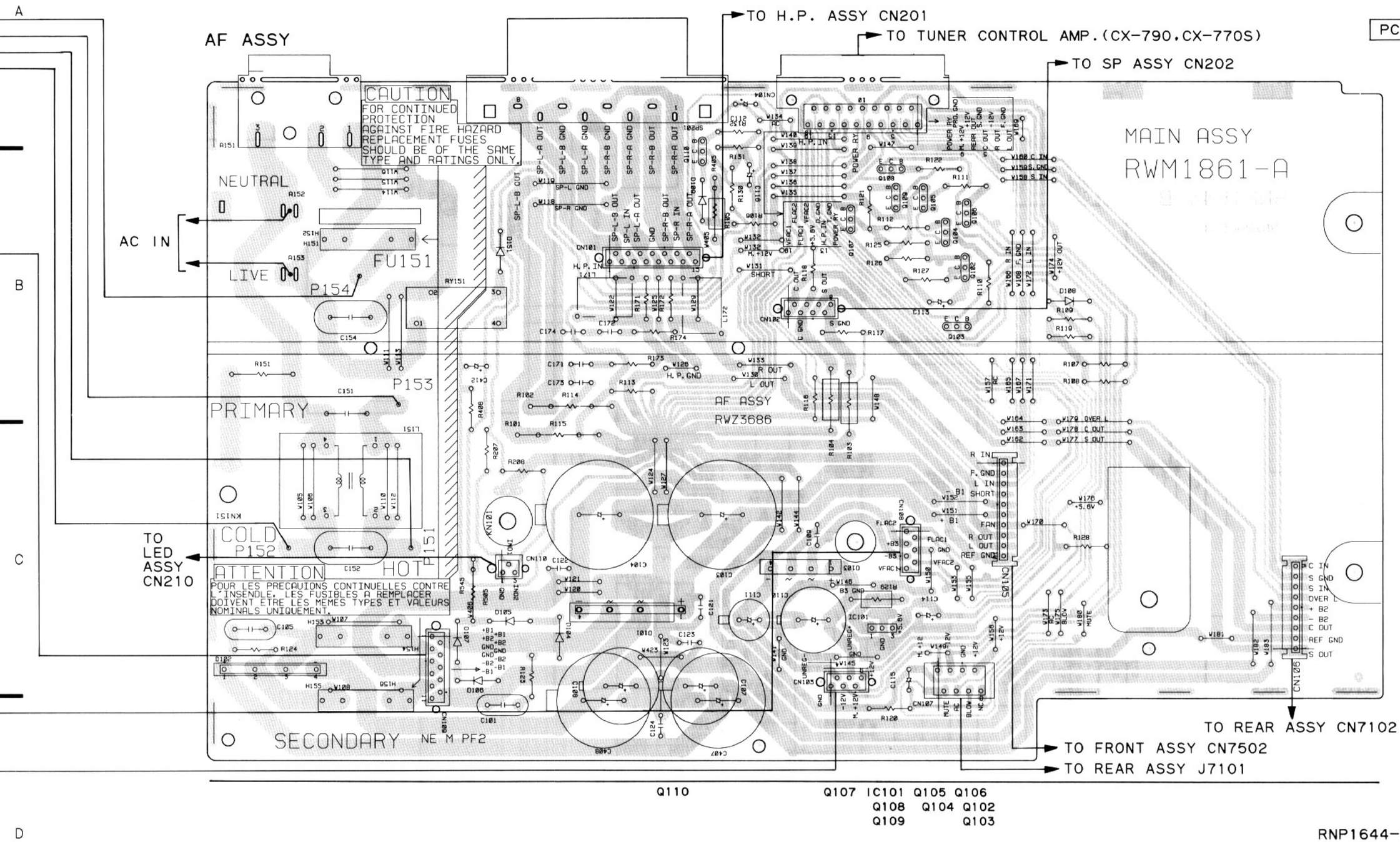
- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations. For further information for respective destinations, be sure to check with the schematic diagram.

PCB-2




RNP1644-B

- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations. For further information for respective destinations, be sure to check with the schematic diagram.




- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

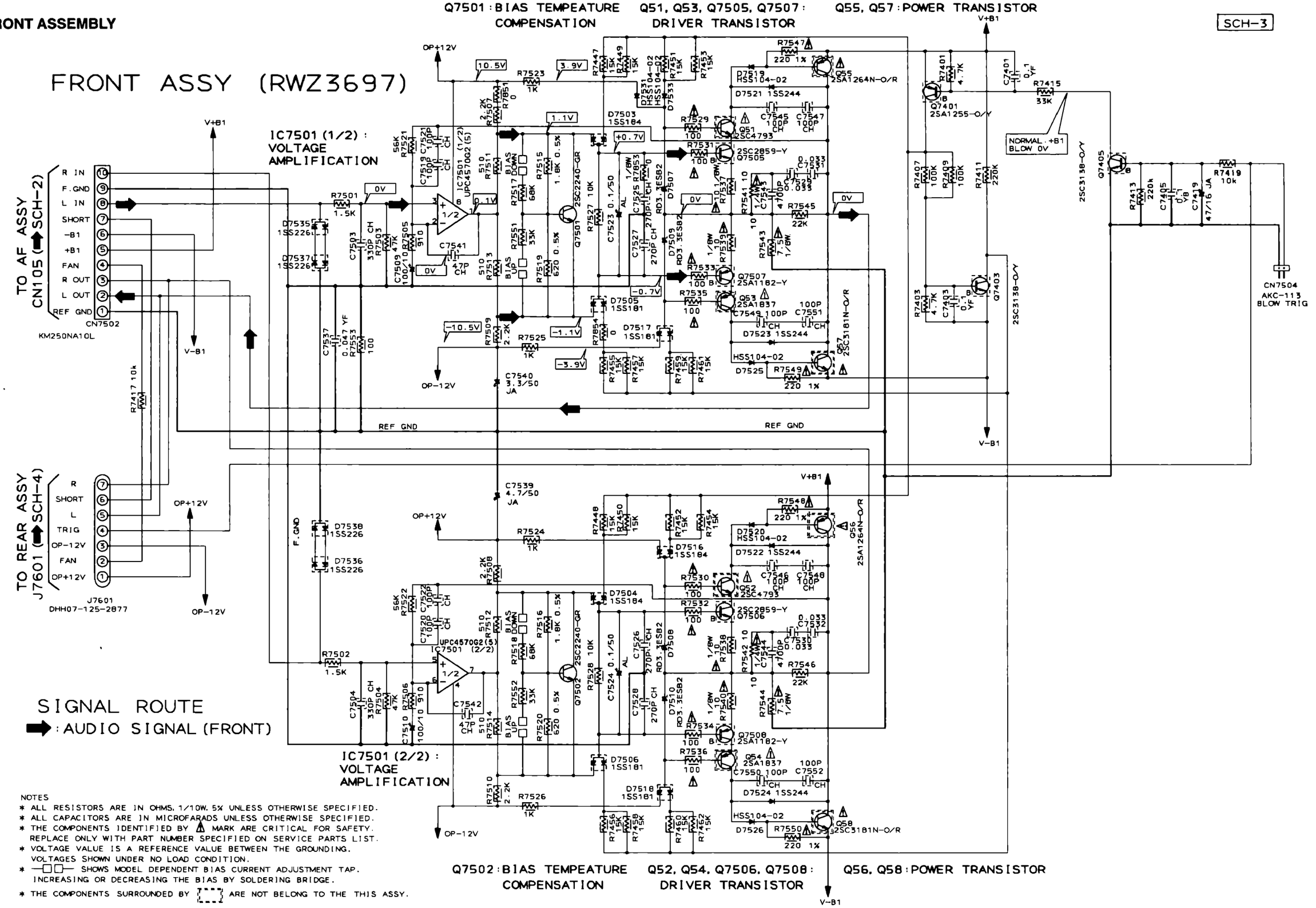
# FRONT ASSY (RWZ3697)

Q7501 : BIAS TEMPEATURE COMPENSATION

Q51, Q53, Q7505, Q7507 : DRIVER TRANSISTOR

Q55, Q57 : POWER TRANSISTOR

SCH-3




NOTES

* ALL RESISTORS ARE IN OHMS, 1/10W, 5% UNLESS OTHERWISE SPECIFIED.
* ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
* THE COMPONENTS IDENTIFIED BY ⚠ MARK ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED ON SERVICE PARTS LIST.
* VOLTAGE VALUE IS A REFERENCE VALUE BETWEEN THE GROUNDING. VOLTAGES SHOWN UNDER NO LOAD CONDITION.
* —□□— SHOWS MODEL DEPENDENT BIAS CURRENT ADJUSTMENT TAP. INCREASING OR DECREASING THE BIAS BY SOLDERING BRIDGE.
* THE COMPONENTS SURROUNDED BY [ ] ARE NOT BELONG TO THE THIS ASSY.

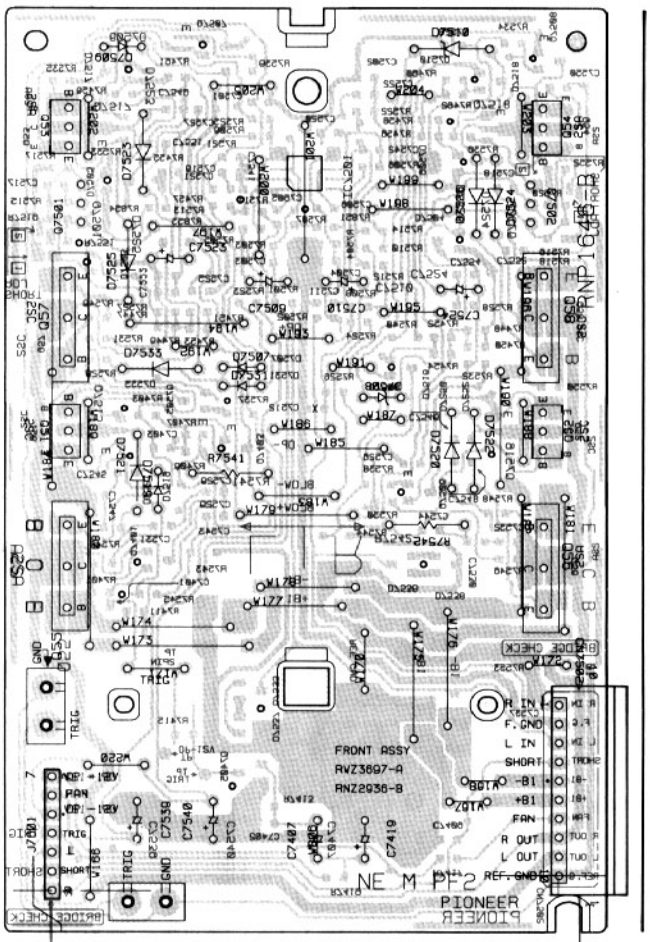
Q7502 : BIAS TEMPEATURE COMPENSATION

Q52, Q54, Q7506, Q7508 : DRIVER TRANSISTOR

Q56, Q58 : POWER TRANSISTOR

PCB-4

## FRONT ASSY




TO REAR ASSY J7601

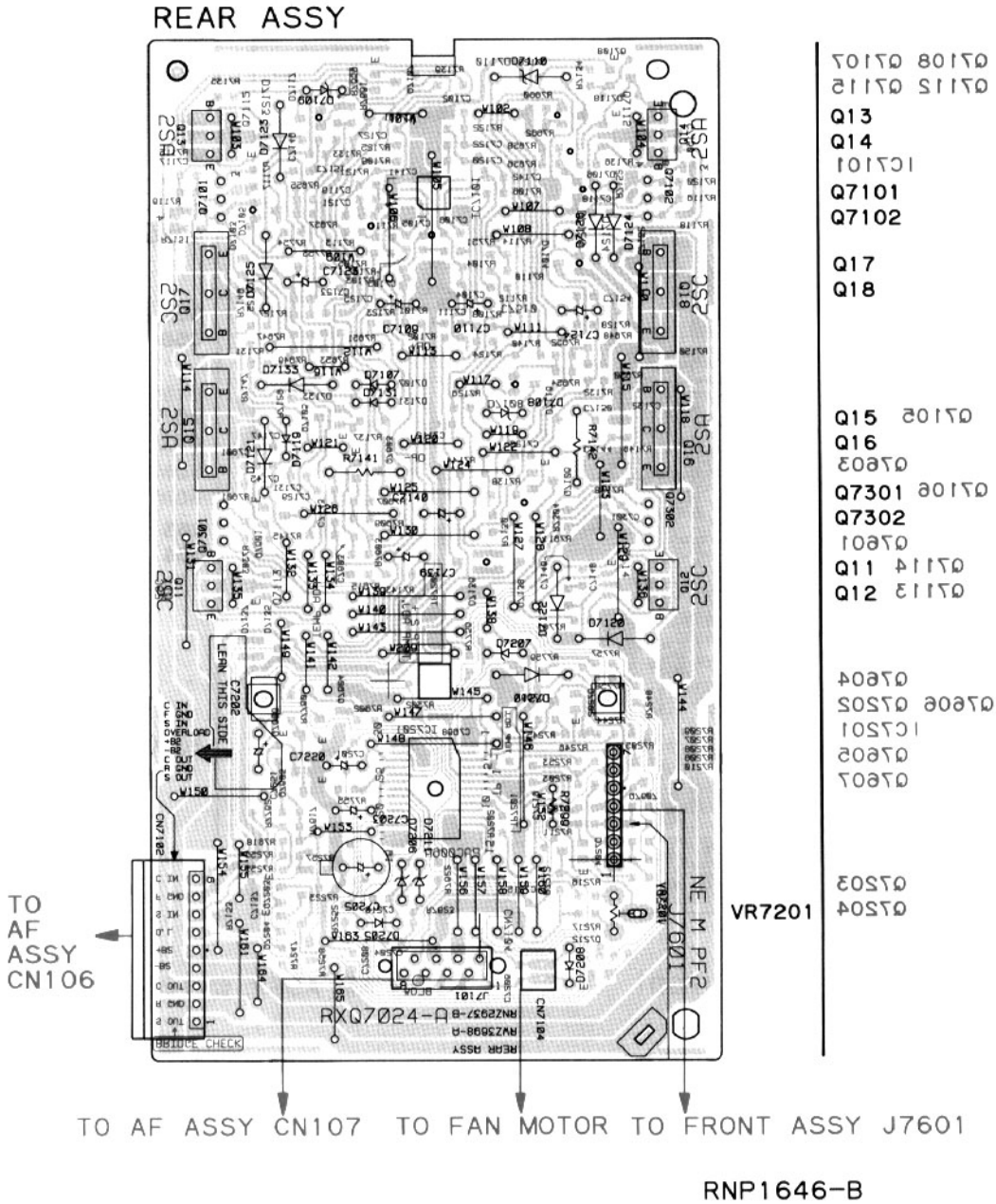
TO AF ASSY CN105

RNP1646-B

- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

### 3.4 REAR ASSEMBLY

PCB-5




RNP1646-B

- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

# REAR ASSY (RWZ3698)

SIGNAL ROUTE

⇨ : AUDIO SIGNAL (REAR)

TO AF ASSY CN106 (➡SCH-2)

Q7101 : BIAS TEMPERATURE COMPENSATION

Q11, Q13, Q7105, Q7107 : DRIVER TRANSISTOR

Q15, Q17 : POWER TRANSISTOR

IC7101 (1/2) : VOLTAGE AMPLIFICATION

IC7101 (2/2) : VOLTAGE AMPLIFICATION

IC7201 : PROTECTION IC

SCH-4

TO FRONT ASSY J7601 (➡SCH-3)

TO AF ASSY CN107 (➡SCH-2)

NOTES
* ALL RESISTORS ARE IN OHMS, 1/10W, 5% UNLESS OTHERWISE SPECIFIED.
* ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED
* THE COMPONENTS IDENTIFIED BY ⚠ MARK ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED ON SERVICE PARTS LIST.
* VOLTAGE VALUE IS A REFERENCE VALUE BETWEEN THE GROUNDING. VOLTAGES SHOWN UNDER NO LOAD CONDITION.
* —□□— SHOWS MODEL DEPENDENT BIAS CURRENT ADJUSTMENT TAP. INCREASING OR DECREASING THE BIAS BY SOLDERING BRIDGE
* THE COMPONENTS SURROUNDED BY [ ] ARE NOT BELONG TO THE THIS ASSY.

Q7102 : BIAS TEMPERATURE COMPENSATION

Q12, Q14, Q7106, Q7108 : DRIVER TRANSISTOR

Q16, Q18 : POWER TRANSISTOR

# 4. PCB PARTS LIST

*NOTES:*

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

*Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

| | | | | |
|---|---|---|---|---|
| *560Ω* | → | *56 × 10¹* | → *561* ..... | *RD1/4PU561J* |
| *47kΩ* | → | *47 × 10³* | → *473* ..... | *RD1/4PU473J* |
| *0.5Ω* | → | *0R5* | ..... | *RN2H0R5K* |
| *1Ω* | → | *1R0* | ..... | *RS1P1R0K* |

*Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).*

| | | | | |
|---|---|---|---|---|
| *5.62kΩ* | → | *562 × 10¹* | → *5621* ..... | *RN1/4PC5621F* |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| **LIST OF ASSEMBLIES** | | | |
| NSP | MAIN ASSY | | RWM1861 |
| | ├ AF ASSY | | RWZ3686 |
| | ├ REGURATOR ASSY | | RWZ3687 |
| | ├ H.P. ASSY | | RWZ3688 |
| | ├ LED ASSY | | RWZ3689 |
| | ├ SP ASSY | | RWZ3690 |
| | ├ POWER SW ASSY | | RWZ3691 |
| | ├ SECONDARY ASSY | | RWZ3692 |
| | └ PRIMARY ASSY | | RWZ3772 |
| | POWER AMP. UNIT | | RXQ7024 |
| | ├ FRONT ASSY | | RWZ3697 |
| | └ REAR ASSY | | RWZ3698 |
| **MAIN ASSY** | | | |
| **OTHERS** | | | |
| | Y154 | BOARDIN READ WIRE | RDX1014 |
| | Y153 | BOARDIN READ WIRE | RDX1015 |
| **AF ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| ⚠ | IC101 | | NJM78M56FA |
| | Q102, Q105 | | 2SA1048 |
| | Q103, Q108 | | 2SA1515 |
| | Q104, Q109 | | 2SC2458 |
| | Q106 | | 2SC3377 |
| | Q107 | | DTA124ES |
| ⚠ | D103 | | D2SBA20(B) |
| ⚠ | D102 | | D3SBA20(B) |
| ⚠ | D101 | | D5SB20F |
| | D104 – D107, D151 | | HSS104 – 02 |
| | D108 | | MTZJ7.5B |
| **RELAY** | | | |
| ⚠ | RY151 | | ASR1027 |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| **CAPACITORS** | | | |
| ⚠ | C152, C154 | (0.01μF/AC400V) | ACG1054 |
| | C103, C104 | (4700pF/DC63V) | ACH1249 |
| | C115 | | CEANP470M25 |
| | C114 | | CEAS010M50 |
| | C112 | | CEAS100M50 |
| | C111 | | CEAS102M35 |
| | C110 | | CEAS222M35 |
| | C113 | | CEAS331M6R3 |
| | C171 – C174 | | CFTXA104J50 |
| | C109 | | CQMA103K250 |
| ⚠ | C101, C105 | | CQMA473K250 |
| | C107, C108 | (3300pF/DC50V) | RCH1129 |
| **RESISTORS** | | | |
| ⚠ | R151 | (2.2MΩ, 1/2W) | ACN – 208 |
| | R173, R174 | | RD1/4PMF7R5J |
| ⚠ | R123, R124 | | RFA1/4PS100J |
| | R105 | | RS1LMF182J |
| | R129 | | RS1LMF470J |
| | R103, R104 | | RS2LMFR22J |
| | R101, R102 | | RS3LMFR22J |
| | | Other Resistors | RD1/4PU□□□J |
| **OTHERS** | | | |
| | | SPEAKER TERMINAL 8 – P | AKE – 111 |
| ⚠ | | AC OUTLET 3P | AKP1053 |
| | | SOCKET(19P) | AKP7001 |
| | | CABLE HOLDER | AKT1007 |
| | CN105 | 10P SOCKET | KP250NA10 |
| | CN106 | 9P SOCKET | KP250NA9 |
| | CN107 | CONNECTOR(8P) | KPE8 |
| | | PCB BINDER | VEF1040 |
| | KN101, KN151 | EARTH METAL FITTING | VNF1084 |
| **REGURATOR ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| ⚠ | IC301, IC302 | | NJM7812FAS |
| ⚠ | IC303 | | NJM79M12FA |



| Mark | No. | Description | Parts No. |
|---|---|---|---|
| **CAPACITORS** | | | |
| | C305 | | CEAS010M50 |
| | C301 – C303, C306 | | CEAS100M50 |
| **RESISTOR** | | | |
| | R301 | | RS1LMF2R2J |
| **H.P. ASSY** | | | |
| **SWITCH** | | | |
| | S201 | PUSH SWITCH | SULLXS |
| **CAPACITOR** | | | |
| | C201 | | CKCYF473Z50 |
| **RESISTORS** | | | |
| | R201 – R204 | | RS2LMF681J |
| **OTHERS** | | | |
| | | JACK | AKN1025 |
| **LED ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | D201 – D206 | | AEL1065 |
| **SP ASSY** | | | |
| **CAPACITORS** | | | |
| | C202 – C205 | | CQMA104J50 |
| **RESISTORS** | | | |
| | R209, R210 | | RD1/4PMF7R5J |
| **OTHERS** | | | |
| | | SPEAKER TERMINAL 4 – P | AKE1012 |
| | | SPEAKER TERMINAL 2 – P | AKE1032 |
| **POWER SW ASSY** | | | |
| **SWITCH** | | | |
| ⚠ | S151 | PUSH SWITCH | ASG – 553 |
| **CAPACITOR** | | | |
| ⚠ | C153 | (0.01μF/AC400V) | ACG1054 |
| **SECONDARY ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| ⚠ | IC151 – IC154 | | ICP – N50 |
| **OTHERS** | | | |
| | | CABLE HOLDER | AKT1007 |
| **PRIMARY ASSY** | | | |
| **OTHERS** | | | |
| | Y152 | BOARDIN READ WIRE | ADX7039 |
| | Y151 | BOARDIN READ WIRE | ADX7043 |
| **FRONT ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | IC7501 | | UPC4570G2(5) |
| | Q7507, Q7508 | | 2SA1182 |
| | Q7401 | | 2SA1255 |
| | Q7501, Q7502 | | 2SC2240 |
| | Q7505, Q7506 | | 2SC2859 |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| | Q7403, Q7405 | | 2SC3138 |
| | D7505, D7506, D7517, D7518 | | 1SS181 |
| | D7503, D7504, D7516 | | 1SS184 |
| | D7535 – D7538 | | 1SS226 |
| | D7521 – D7524 | | 1SS244 |
| | D7519, D7520, D7525, D7526, D7531 | | HSS104 – 02 |
| | D7533 | | HSS104 – 02 |
| | D7507 – D7510 | | RD3.3ESB2 |
| **CAPACITORS** | | | |
| | C7519 – C7522, C7545 – C7552 | | CCSQCH101J50 |
| | C7525 – C7528 | | CCSQCH271J50 |
| | C7503, C7504 | | CCSQCH331J50 |
| | C7541, C7542 | | CCSQCH470J50 |
| | C7523, C7524 | | CEALR10M50 |
| | C7509, C7510 | | CEAS101M10 |
| | C7540 | | CEJA3R3M50 |
| | C7419 | | CEJA470M16 |
| | C7539 | | CEJA4R7M50 |
| | C7405 | | CKSQYB104K25 |
| | C7529 – C7532 | | CKSQYB333K50 |
| | C7543, C7544 | | CKSQYB472K50 |
| | C7401, C7403 | | CKSQYF104Z50 |
| | C7537 | | CKSQYF473Z50 |
| **RESISTORS** | | | |
| | R7515, R7516 | (1.8kΩ, 1/10W) | ACN1107 |
| ⚠ | R7541, R7542 | | RD1/4PMF100J |
| | R7519, R7520 | | RN1/10SE621D |
| ⚠ | R7529 – R7536 | | RS1/10S101J |
| ⚠ | R7547 – R7550 | | RS1/10S2200F |
| | R7853 | | RS1/8S000J |
| ⚠ | R7537 – R7540 | | RS1/8S100J |
| | R7553 | | RS1/8S101J |
| ⚠ | R7543, R7544 | | RS1/8S7R5J |
| | | Other Resistors | RS1/10S□□□J |
| **OTHERS** | | | |
| | CN7502 | 10P PLUG | KM250NA10L |
| **REAR ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | IC7201 | | PAC006C |
| | IC7101 | | UPC4570G2 |
| | Q7605, Q7606 | | 2PD601A |
| | Q7204 | | 2SA1162 |
| | Q7107, Q7108 | | 2SA1182 |
| | Q7601 | | 2SA1255 |
| | Q7301, Q7302 | | 2SC1815 |
| | Q7101, Q7102 | | 2SC2240 |
| | Q7202, Q7203 | | 2SC2712 |
| | Q7105, Q7106 | | 2SC2859 |
| | Q7603, Q7604 | | 2SC3138 |
| | Q7607 | | DTA124EK |
| | D7105, D7106, D7117, D7118 | | 1SS181 |
| | D7103, D7104, D7116, D7204, D7212 | | 1SS184 |
| | D7135 – D7138 | | 1SS226 |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| | D7121 – D7124 | | 1SS244 |
| | D7119, D7120, D7125, D7126, D7131 | | HSS104 – 02 |
| | D7133, D7205, D7208 | | HSS104 – 02 |
| | D7210 | | RB441Q – 40 |
| | D7107 – D7110 | | RD3.3ESB2 |
| | D7206, D7211 | | RD4.7ESB |
| | D7207 | | RD5.6ESB2 |
| **CAPACITORS** | | | |
| | C7204 | (1μF/DC16V) | ACG1051 |
| | C7119 – C7122, C7145 – C7152 | | CCSQCH101J50 |
| | C7125 – C7128 | | CCSQCH271J50 |
| | C7103, C7104 | | CCSQCH331J50 |
| | C7141, C7142 | | CCSQCH470J50 |
| | C7220 | | CEAL010M50 |
| | C7123, C7124 | | CEALR10M50 |
| | C7202 | | CEANL4R7M50 |
| | C7109, C7110 | | CEAS101M10 |
| | C7205 | | CEJA221M10 |
| | C7140 | | CEJA3R3M50 |
| | C7139 | | CEJA4R7M50 |
| | C7203 | | CEJAR33M50 |
| | C7201, C7208, C7219, C7697 | | CKSQYB103K50 |
| | C7301 | | CKSQYB332K50 |
| | C7129 – C7132 | | CKSQYB333K50 |
| | C7143, C7144 | | CKSQYB472K50 |
| | C7206, C7215, C7216, C7601, C7603 | | CKSQYF104Z50 |
| | C7698 | | CKSQYF104Z50 |
| | C7137 | | CKSQYF473Z50 |
| **RESISTORS** | | | |
| | R7115, R7116 | (1.8kΩ, 1/10W) | ACN1107 |
| ⚠ | R7141, R7142 | | RD1/4PMF100J |
| | R7119, R7120 | | RN1/10SE621D |
| ⚠ | R7129 – R7136 | | RS1/10S101J |
| ⚠ | R7147 – R7150 | | RS1/10S2200F |
| | R7623, R7753, R7759, R7760 | | RS1/8S000J |
| ⚠ | R7137 – R7140 | | RS1/8S100J |
| | R7153 | | RS1/8S101J |
| | R7145 | | RS1/8S223J |
| ⚠ | R7143, R7144 | | RS1/8S7R5J |
| | VR7201 | (22kΩ, 0.1W) | RCP1103 |
| | | Other Resistors | RS1/10S□□□J |
| **OTHERS** | | | |
| | CN7102 | 9P PLUG | KM250NA9L |
| | | PCB BINDER | VEF1040 |

# 5. ADJUSTMENTS

## POWER AMP. UNIT SECTION (Refer to Fig. 1.)

### 5.1 Handling Precautions

- Since the heat sink and transistor metallic parts are connected to the Front Amp output, make sure they do not contact the GND (chassis) or other circuits.
- Since there is residual high voltage in the Power Amp Module Assy ±B1 (FRONT ASSY) and ±B2 (REAR ASSY) even when the power is OFF, caution should be exercised. (If necessary, the voltage should be discharged).
- When handling the Power Amp. UNIT, make sure you do not touch the fan motor blade.

### 5.2 Adjustment and Confirmation of Idle Current

- Basically, the idle current needs to be confirmed when replacing a power transistor, driver transistor, or bias transistor, or when the entire split board Assy of the Power Amp. UNIT has been replaced.
- Make sure the heat sink has cooled sufficiently before measuring the idle current. (Temperature should be the same as room temperature; 25°C is ideal, if possible.)
- Idle current stipulated value: 3 – 50mA.

CAUTION :
Before performing this adjustment, short the blow trigger shorting pin (shown in Fig. 2) of the FRONT ASSY to prevent the protection IC from malfunction. After adjustment is completed, remove the short-circuit.

**■ Front Amp Side (FRONT ASSY)**

| Step | Measurement | Item | Remarks |
|---|---|---|---|
| 1 | Lch side | Short both sides of C7123 and C7124 on the Rear Amp side. | Do not operate the Rear Amp side. |
| 2 | | Insert a resistor (0.22Ω, 3W or more) in series in the connector CN7502 +B1 (or –B1) line (terminal No.5 or 6). (Refer to Fig.3) | For measuring voltage at both sides of resistor. |
| 3 | | Short both sides of C7524. | Do not operate Rch side. |
| 4 | | Turn the power ON, wait 6 seconds, and then measure the resistance voltage in Step 2. | Lch Idle current I=V/0.22 (Ω) |
| 5 | Rch side | • Same as Steps 1 and 2 above.<br>• Short both sides of C7523. | Do not operate Lch side. |
| 6 | | Turn the power ON under the above conditions, and after 6 seconds measure the resistance voltage in Step 2. | |
| 7 | — | If the measured idle current is greater than 50mA, perform the following procedure. | |
| 8 | Lch side | Short between the Point Ⓐ pattern in Fig.4 using solder. | Connect R7517 to R7515 in a parallel circuit. |
| 9 | Rch side | Short between the Point Ⓑ pattern in Fig.4 using solder. | Connect R7518 to R7516 in a parallel circuit. |
| 10 | — | After performing Steps 8 and 9, remeasure the idle current and confirm that it is below 50mA. | |
| 11 | — | If the idle current is below 3mA, perform the following procedure. | |
| 12 | Lch side | Short between the Point Ⓒ pattern in Fig.4 using solder. | Connect R7551 to R7519 in a parallel circuit. |
| 13 | Rch side | Short between the Point Ⓓ pattern in Fig.4 using solder. | Connect R7552 to R7520 in a parallel circuit. |
| 14 | — | After performing Steps 12 and 13, remeasure the idle current and confirm that it is greater than 3mA (within 3 – 50mA). | |

■ **Rear Amp Side (REAR ASSY)**

| Step | Measurement | Item | Remarks |
|---|---|---|---|
| 1 | Center amp side | Short both sides of C7523 and C7524 on the Front Amp side. | Do not operate the Front Amp side. |
| 2 | | Insert a resistor (0.22Ω, 3W or more) in series in the connector CN7102 +B2 (or −B2) line (terminal No.4 or 5). (Refer to Fig.5) | For measuring voltage at both sides of resistor. |
| 3 | | Short both sides of C7124 on the Surround Amp side. | Do not operate the Surround Amp. |
| 4 | | Turn the power ON, wait 6 seconds, and then measure the resistance voltage in Step 2. | Idle current : I=V/0.22 (Ω) |
| 5 | Surround amp side | ● Same as Steps 1 and 2 above.<br>● Short both sides of C7123 on Surround Amp side. | Do not operate the Surround Amp. |
| 6 | | Turn the power ON under the conditions in Steps 1 and 2, and after 6 seconds measure the resistance voltage in Step 2. | |
| 7 | —— | If the measured idle current is greater than 50mA, perform the following procedure. | |
| 8 | Center amp side | Short between the Point Ⓔ pattern in Fig.6 using solder. | Connect R7117 to R7115 in a parallel circuit. |
| 9 | Surround amp side | Short between the Point Ⓕ pattern in Fig.6 using solder. | Connect R7118 to R7116 in a parallel circuit. |
| 10 | —— | After performing Steps 8 and 9, remeasure the idle current and confirm that it is below 50mA. | |
| 11 | —— | If the idle current is below 3mA, perform the following procedure. | |
| 12 | Center amp side | Short between the Point Ⓖ pattern in Fig.6 using solder. | Connect R7151 to R7119 in a parallel circuit. |
| 13 | Surround amp side | Short between the Point Ⓗ pattern in Fig.6 using solder. | Connect R7152 to R7120 in a parallel circuit. |
| 14 | —— | After performing Steps 12 and 13, remeasure the idle current and confirm that it is greater than 3mA (within 3 – 50mA). | |

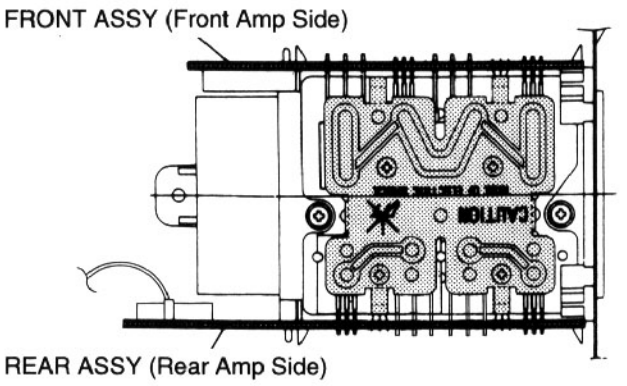



Fig. 1 POWER AMP. UNIT(RXQ7024)

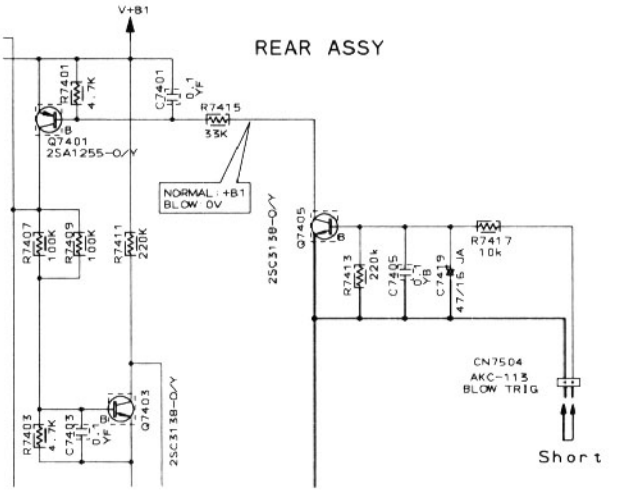



Fig. 2 BLOW TRIGGER CIRCUIT

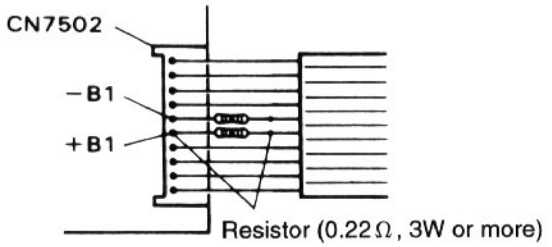



Fig. 3 FRONT ASSY

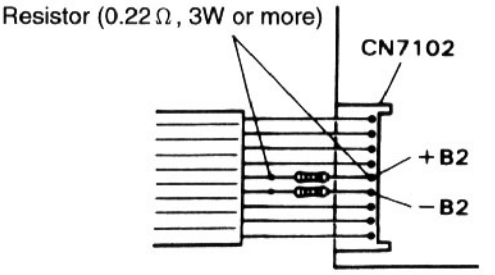
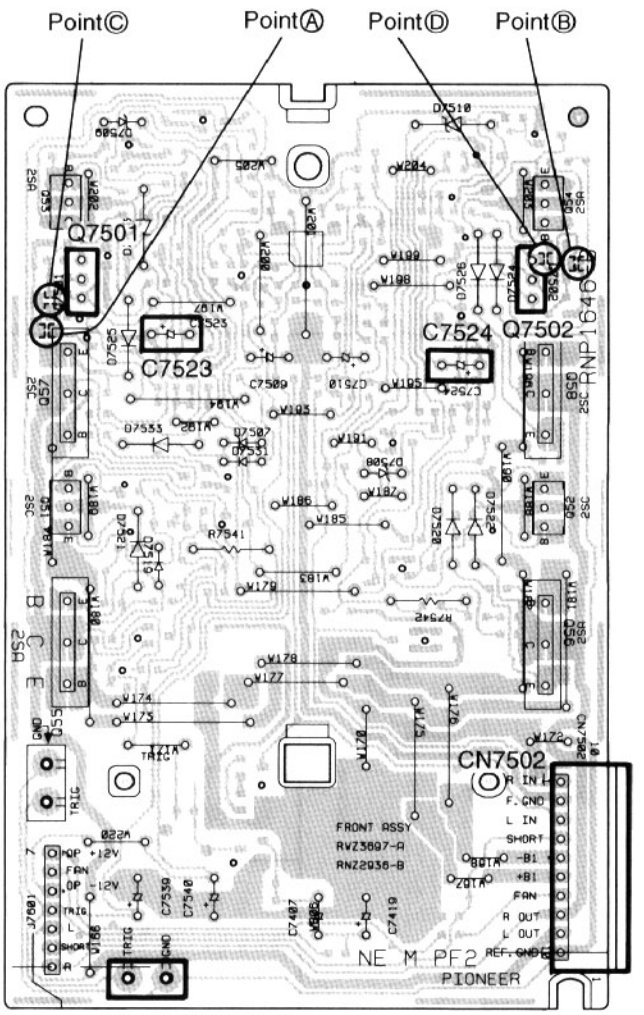



Fig. 5 REAR ASSY




BLOW TRIGGER
SHORT PIN

Fig. 4 FRONT ASSY

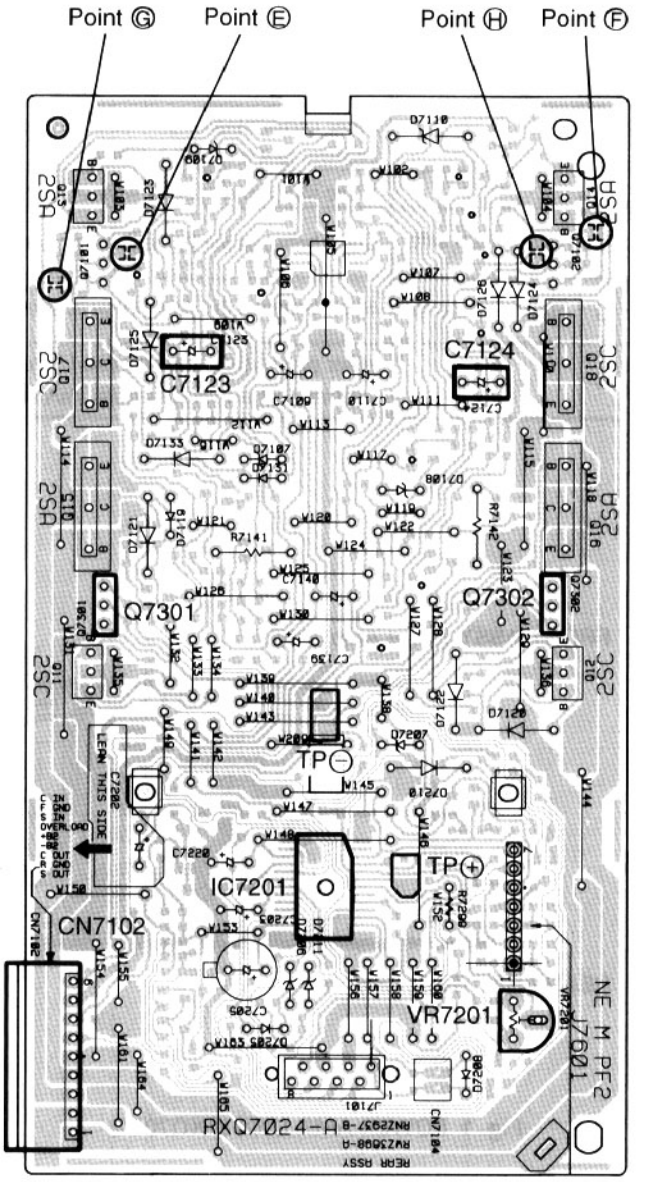



Fig. 6 REAR ASSY

## 5.3 Adjusting the Operating Temperature Setting of the Fan Motor (VR7201)

This adjustment is necessary when IC301 (+12V regulator), Q7301 and Q7302 (temperature sensors), or VR7201 has been replaced, or when the entire split board Assy of the Power Amp. UNIT has been replaced.

CAUTION :
Before performing this adjustment, short the blow trigger shorting pin (shown in Fig. 2) of the FRONT ASSY to prevent the protection IC from malfunction. After adjustment is completed, remove the short-circuit.

### ■ Adjustment-Related Cautions

- Make sure the heat sink has sufficiently cooled (is the same as room temperature Ta.)
- Once the power has been turned ON, make measurements and adjustments as quickly as possible. (If too much time is taken, the heat sink temperature will rise, and the measurements will deviate from the Ta measurement point.)

### ■ Adjustment

1. Connect a voltmeter between TEMP and TP (or between IC7201 terminals No.7 and 9). (Refer to Figs.6 and 7.)
2. Determine the fan motor operating temperature setting by means of the following formula. (Tolerance is within ±30mV.)
   Formula : (75°C – Ta) × 19 (mV)
   Ta : ambient temperature (°C)
3. Adjust VR7201 so that the voltage between TEMP and TP is the value obtaind from the above formula.
   For example :
   when the room temperature is 25°C,
   set value = (75 – 25) × 19 (mV)
   = 950mV (tolerance within ±30mV).

*Note :*
*Adjustment during service should be ±30mV, but if this value cannot be obtained with the measuring instruments used for adjustment, ±50mV is acceptable.*

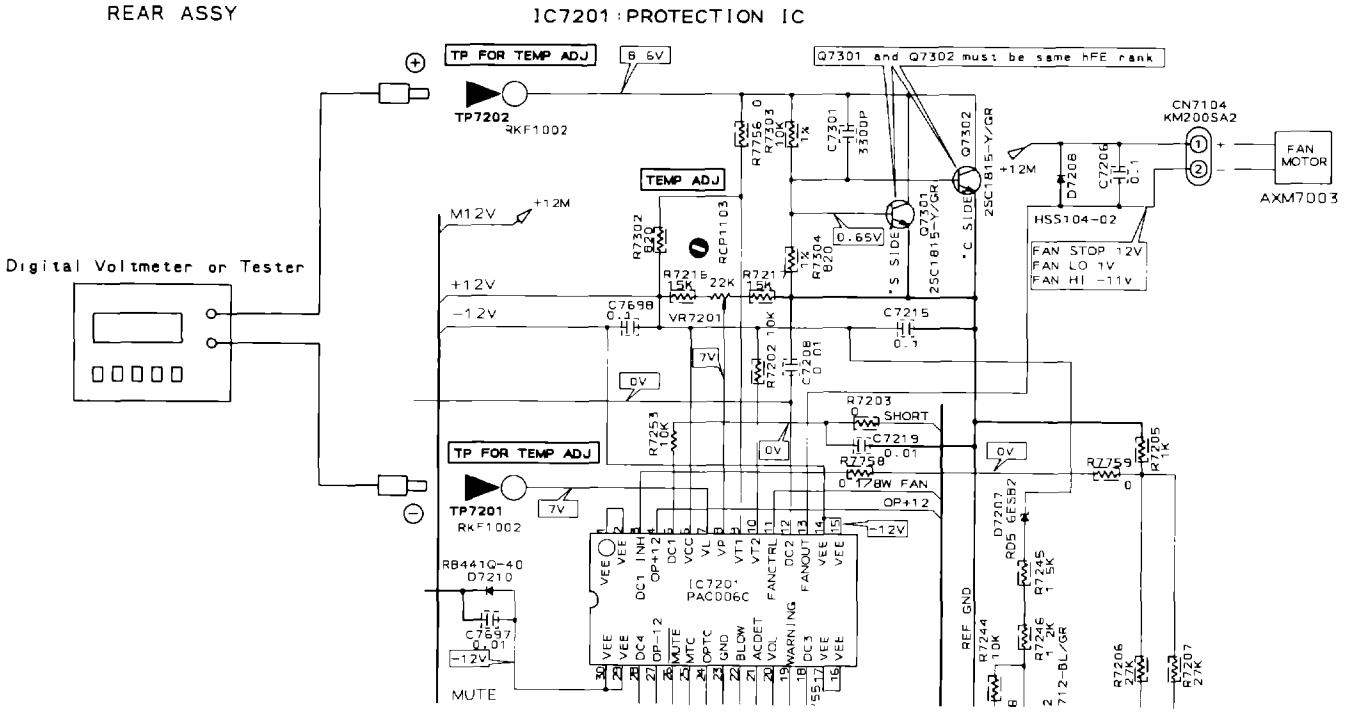



Fig. 7 Adjustment of Operating Temperature Setting of Fan Motor

# 6. HOW TO CHECK M-790

As M-790 is controlled from CX-790 or CX-770S, please carry out check in combination with CX-790 or CX-770S.

**● How to Check M-790 only.**

When checking of the operation of only M-790 is required, the operation can be easily checked according the following procedures.

1. Connect pin 14 (D.GND) and pin 11 (POWER RY) of the CN104 (external connection connector) on AF ASSY (RWZ3686).
2. When pressing the power switch of M-790, the set will enter normal operation status. After this, you can carry out check of the operation.

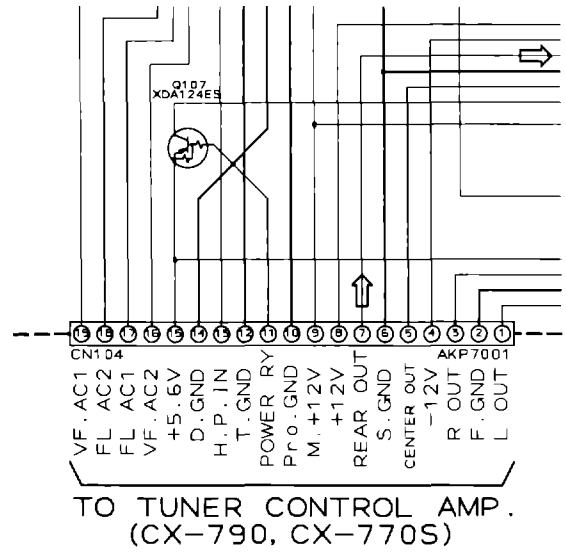
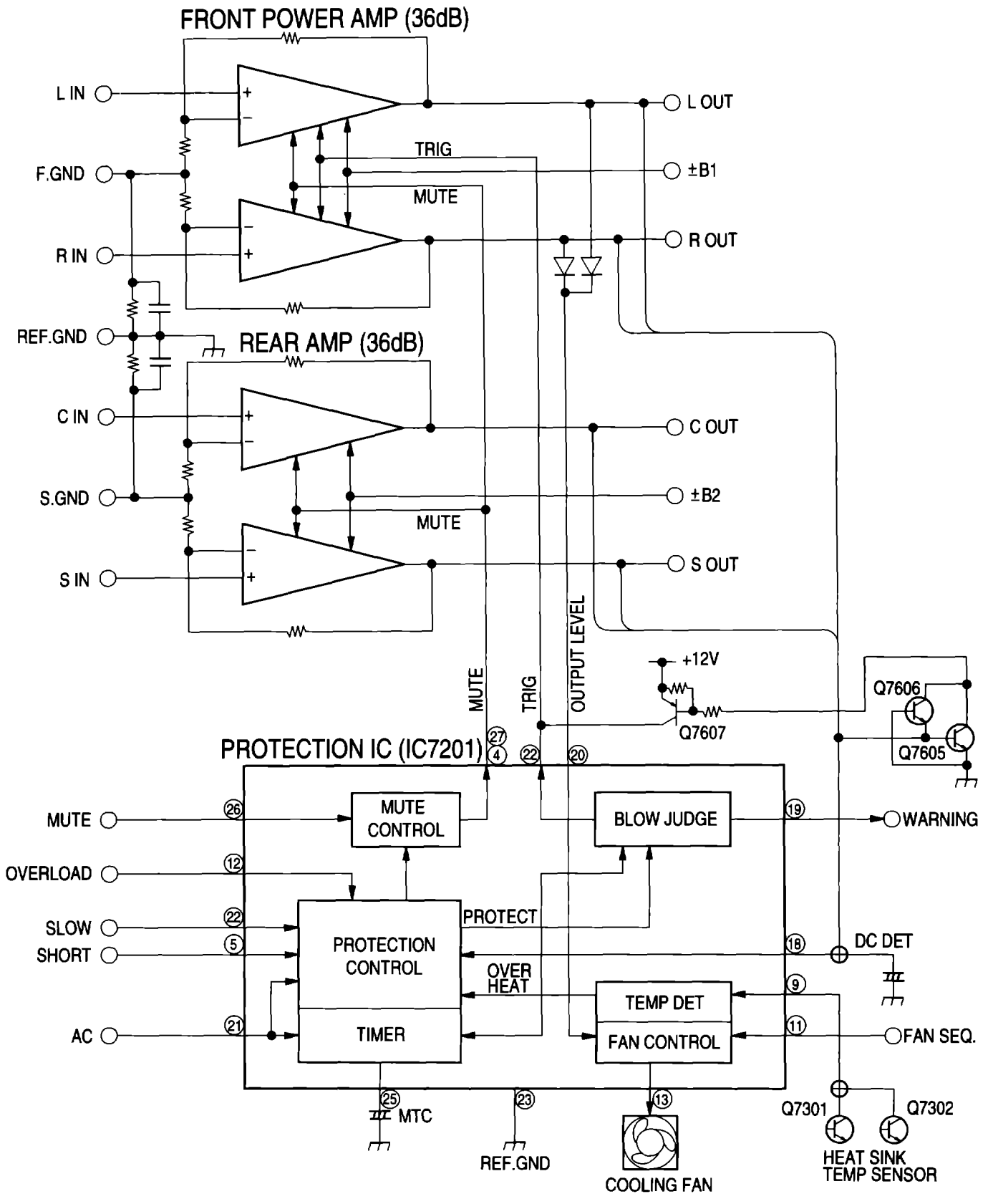


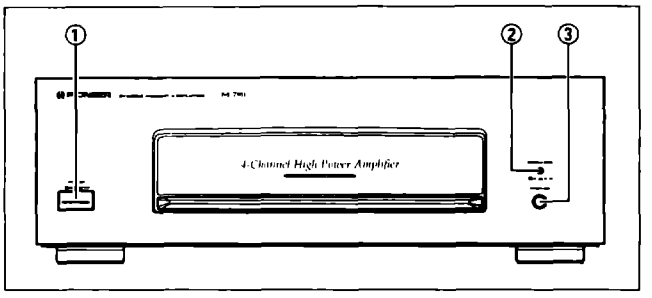

Fig. 8

# 7. BLOCK DIAGRAM

● **POWER AMP. UNIT SECTION**



# 8. PANEL FACILITIES




### ① POWER (OFF/ON) switch

When this switch is OFF, the tuner control amplifier's POWER switch does not function. When this switch is ON, the STANDBY indicator of the tuner control amplifier lights.

### ② SPEAKERS button (▮ A, ▬ A+B)

This is used to select the speaker through which you wish to listen.

▮ A : When the speakers connected to A terminals are in use.

▬ A+B When the speakers connected to A and B terminals are in use.
(There is no sound at this position when speakers are connected only to the A terminals.)

Be sure to use A terminals when you are using one pair of speakers only. No sound will be heard through the speakers when only one pair of speakers are connected to B terminals.

### ③ PHONES jack

This is a "standard plug-type jack" for headphones.

***NOTE:***

*Sound is not heard from the speakers when headphones are in use.*

# 9. SPECIFICATIONS

**[Front], [Center], [Rear]**

Continuous Power Output

Stereo (Front Channels) ..... Continuous Average Power Output is 100 Watts* per channel, min., at 8 ohms from 70 Hertz to 20,000 Hertz, with no more than 0.9 %** total harmonic distortion.

4-Channel

Front Channels ..... 70 W + 70 W (8 Ω , 1 kHz, 0.2 % THD)

Center Channel ..... 70 W (8 Ω , 1 kHz, 1 % THD)

Rear Channels ..... 70 W (8 Ω , 1 kHz, 1 % THD)

* *Measured pursuant to the Federal Trade Commission's Trade Regulation rules on Power Output Claims for Amplifiers.*

** *Measured By Audio Spectrum Analyzer.*

**Miscellaneous**

Power Requirements ..... AC 120 V, 60 Hz

Power Consumption

M-790 ..... 300 W, 400 VA

AC Outlets

Switched x 1 ..... 100 W (0.8 A) MAX

Unswitched x 2 ..... 200 W (1.6 A) MAX

Dimensions

M-790 ..... 420 (W) x 140 (H) x 336 (D) mm
16-9/16 (W) x 5-1/2 (H) x 13-1/4 (D) in

Weight (without package)

M-790 ..... 7.8 kg (17 lb 3 oz)

***NOTE:***

- *Specifications and design are subject to possible modifications without notice due to improvements.*