

# ELECTRONICS SERVICE MANUAL

## A-03 Amplifier

### TABLE OF CONTENTS

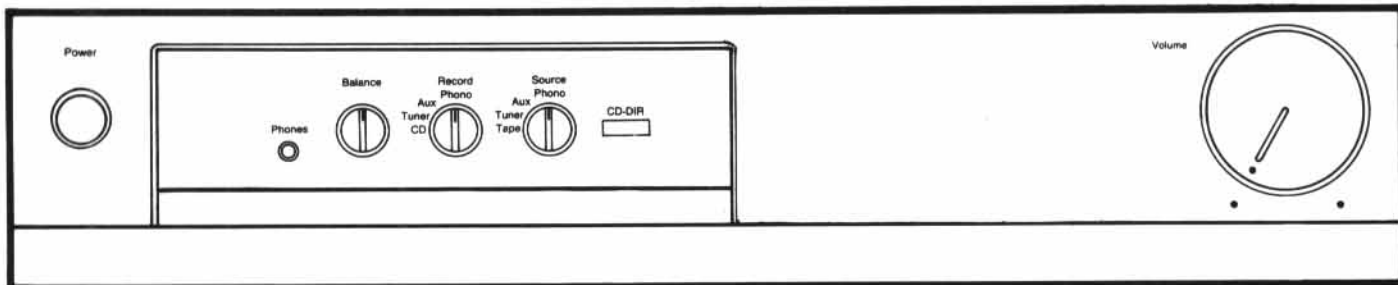
|                                      |   |
|--------------------------------------|---|
| Specifications.....                  | 1 |
| Bias Adjustment.....                 | 1 |
| Hints For Removing The PC Board..... | 2 |
| Schematic Diagram.....               | 3 |
| Wiring Diagram.....                  | 5 |
| Printed Circuit Boards.....          | 6 |
| Disassembly Diagram.....             | 7 |
| PC Board Ass'y Parts List.....       | 9 |

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## Specification

Rated Continuous Power Output 20Hz-20kHz  
 8 ohms.....30W  
 4 ohms.....40W  
 Maximum Continuous Power Output:  
 8 ohms.....35W  
 4 ohms.....45W  
 IHF Dynamic Power Output:  
 8 ohms.....50W  
 4 ohms.....70W  
 Maximum Output Current:.....12A  
 THD 20Hz-20kHz rated power:  
 8 ohms.....0.07%  
 IMD rated power:  
 8 ohms.....0.05%  
 Damping factory:  
 1kHz.....120  
 Input sensitivities for rated output 8 ohms 1kHz:  
 CD, Tuner, Aux, Tape .....150mV  
 Phono MM.....2.5mV  
 Input Impedance:  
 CD, Tuner, Aux, Tape (minimum).....10k ohms  
 Phono MM .....47k ohms/100pf  
 Signal-to-noise ratio IHF A  
 Weighted, (refracted input)  
 CD, Aux, Tape .....96dB

Signal-to-noise ratio A weighted:  
 Phono MM (ref 5mV).....80dB  
 Frequency response 15Hz-20kHz.....0 to - 0.3dB  
 Phono RIAA error 20Hz-20kHz.....- 0.3dB  
 Maximum input 1kHz:  
 CD, Tuner, Aux, Tape.....> 30V  
 Phono MM.....160mV  
 Crosstalk between sources  
 CD, Tuner, Aux, Tape.....75dB  
 Separation 1kHz:  
 Tuner, Aux, Tape.....75dB  
 CD.....85dB  
 Power Requirement.....120V/60Hz, 220, 240V/  
 50Hz or 120, 220, 240V/  
 50-60Hz (depending on  
 destination  
 Power Consumption.....150W  
 Dimensions (overall).....430W x 93H x 354D  
 16<sup>15/16</sup>" x 3<sup>13/16</sup>" x 13<sup>15/16</sup>"  
 Weight (net).....6.6 kg/14.52 lbs

- Specifications and design subject to possible modification without notice.

## Bias Adjustment

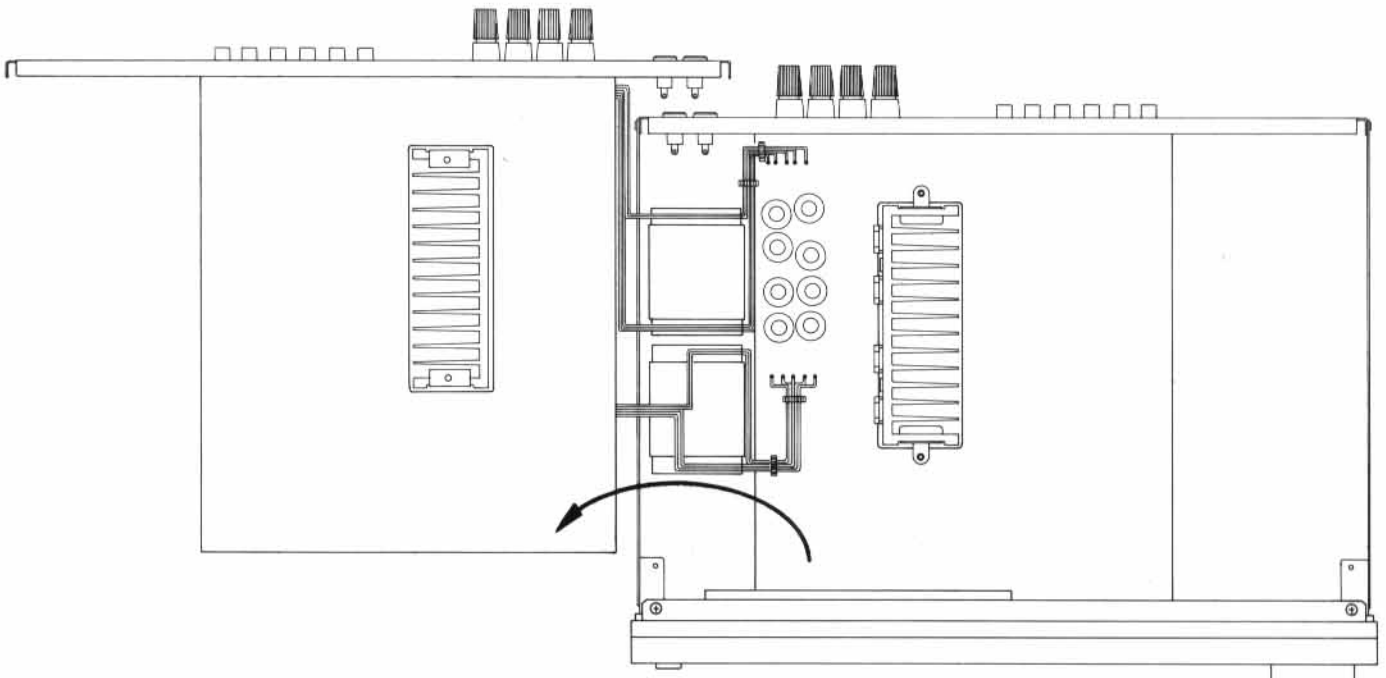
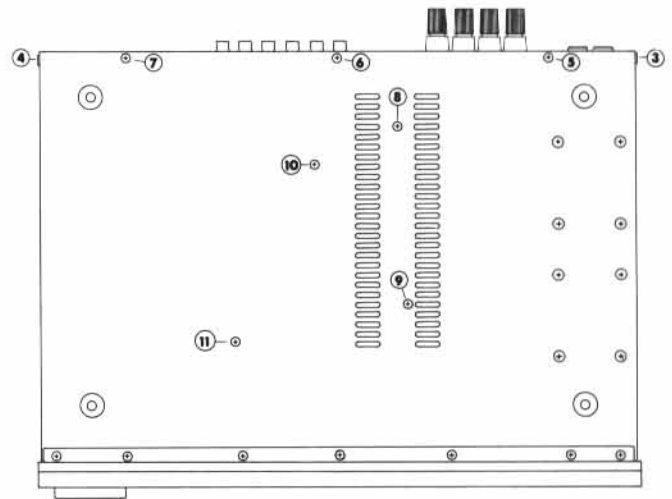
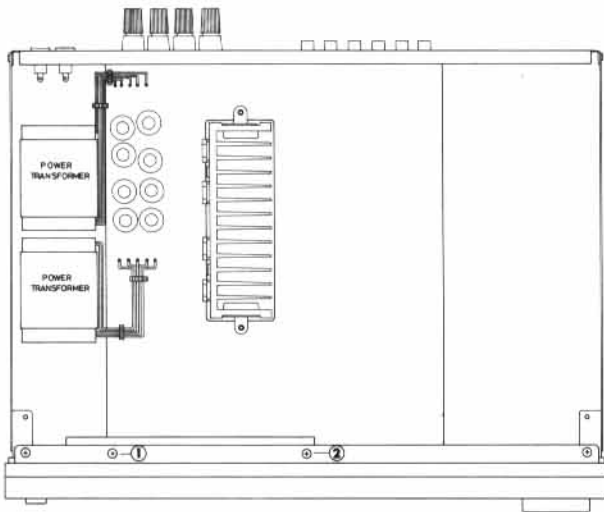
**Instruments:** DC milli-voltmeter

**Notes:** Prior to Bias Adjustment, run about 5 minutes with rated output (8 ohm) and warm up Power Transistor and Heat Sink.  
 Set Volume Control to Minimum.

| Step | Coupling  |            | Adjust | Adjust for                      |
|------|-----------|------------|--------|---------------------------------|
|      | Plus Lead | Minus Lead |        |                                 |
| 1    | TP1       | TP3        | VR601  | DC milli-voltmeter<br>reads 4mV |
| 2    | TP2       | TP4        | VR602  |                                 |

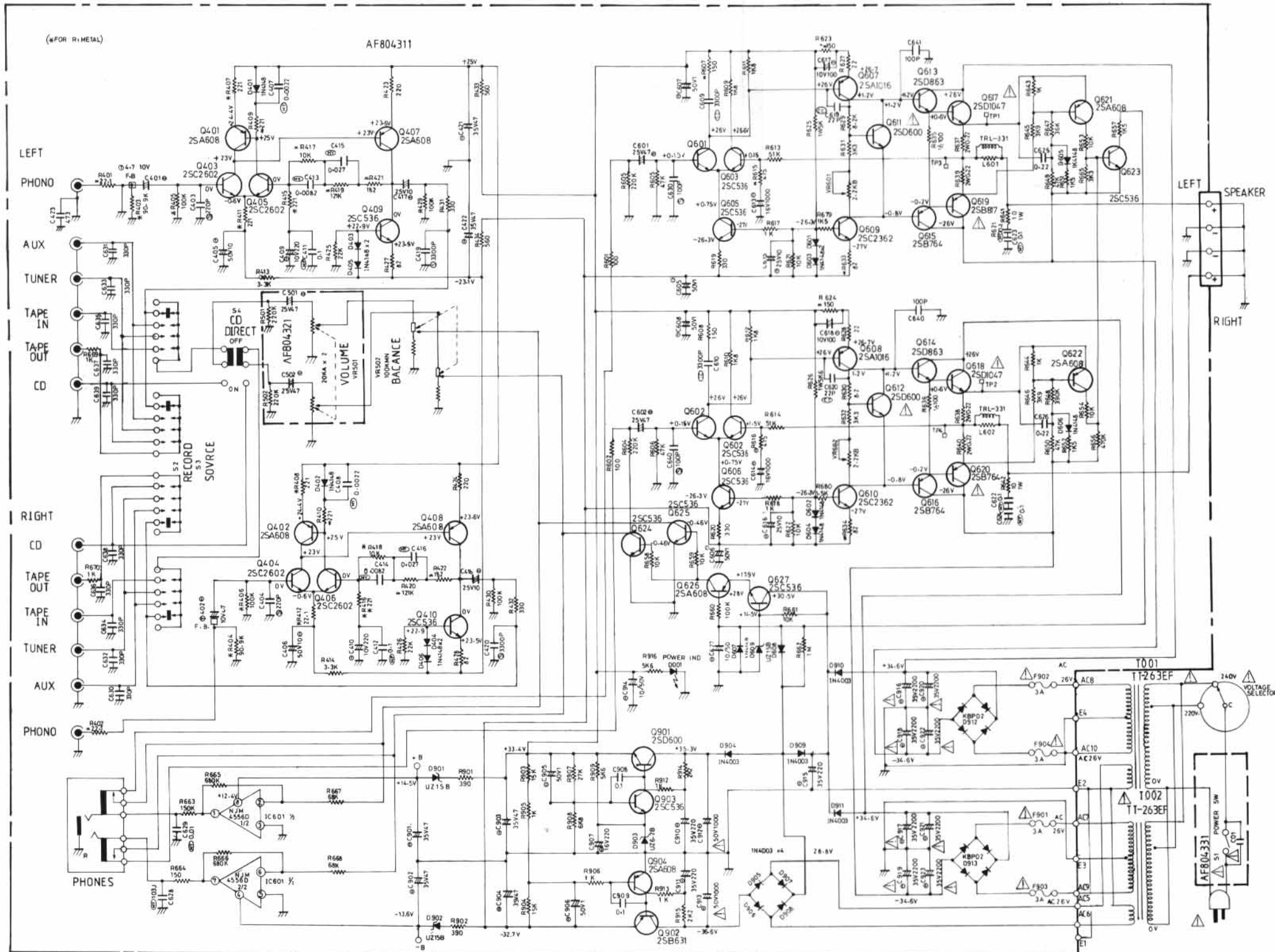
## HINTS FOR REMOVING THE PC BOARD

1. To remove the main PC board, first remove screws ① and ②.
2. Then turn the unit upside down, remove screws from ③ to ⑪.
3. Pull the back plate and the PC board assembly toward the back, then lift and flip the PC board to the Transformer side would allow one to reach the soldering side of the PC board.  
(Note: When removing the PC board, not separate the Heatsink from PC board).

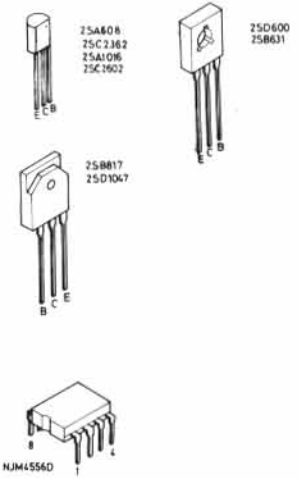


# Schematic Diagram

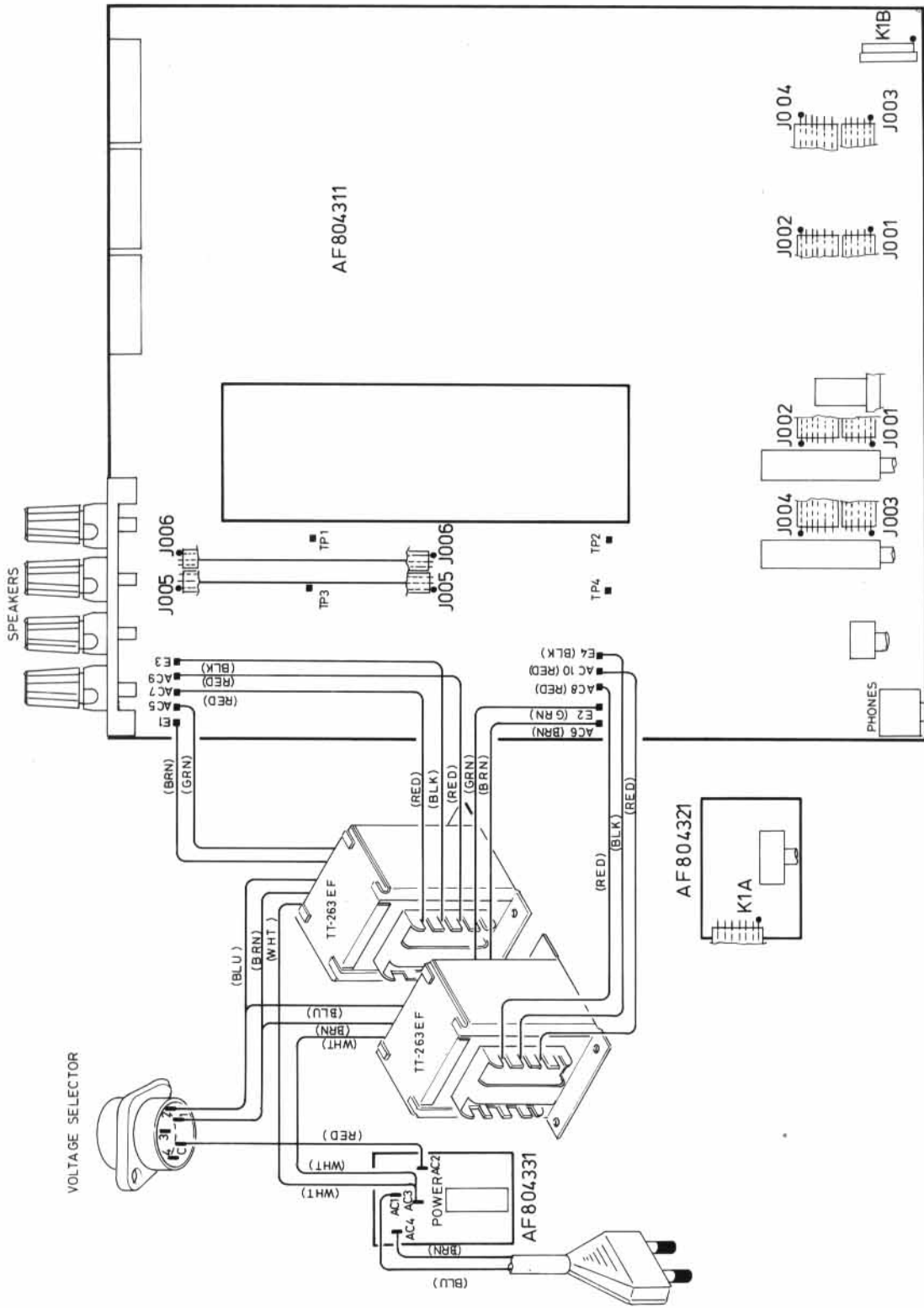
NOTE: PARTS AND CIRCUIT SUBJECT TO CHANGES FOR IMPROVEMENTS WITHOUT PRIOR NOTICE



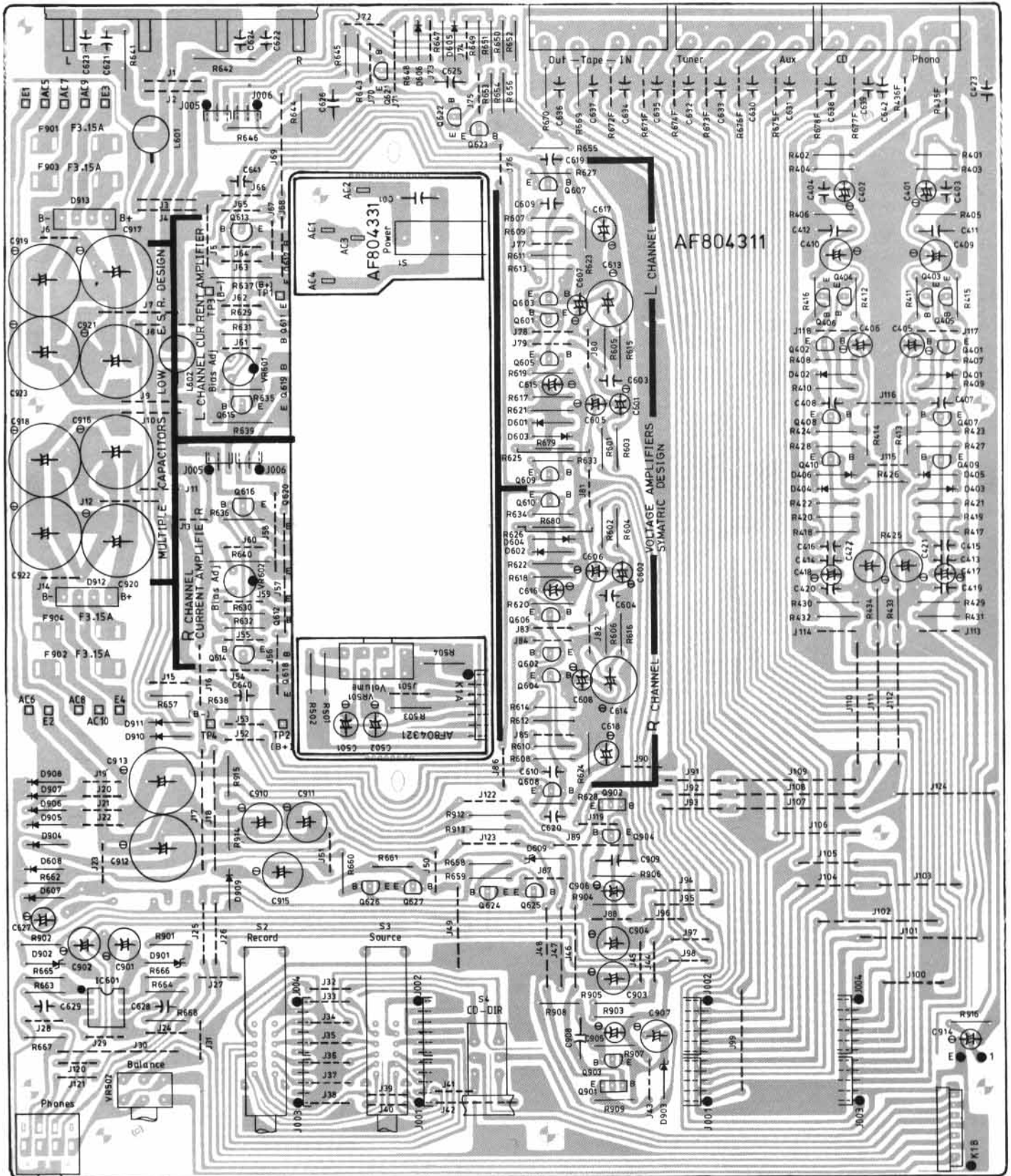
INSTRUCTIONS FOR SERVICE PERSONNEL  
 1) TO USE ONLY REPLACEMENT PARTS THAT HAVE THE CRITICAL CHARACTERISTICS RECOMMENDED BY MANUFACTURER.  
 2) TO MAKE LEAKAGE CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.



# Wiring Diagram

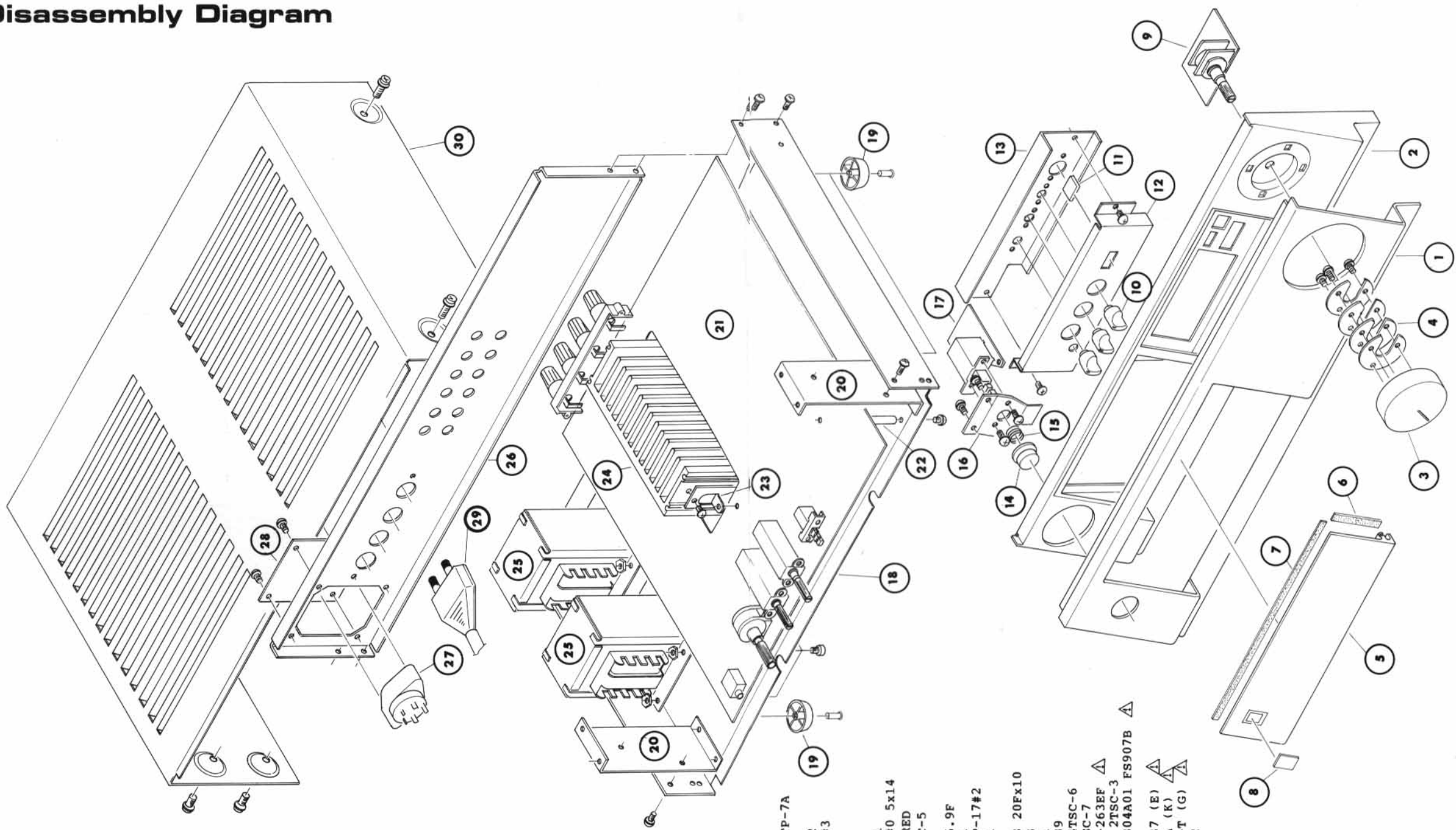


# PRINTED CIRCUIT BOARDS





# Disassembly Diagram



| SYMBOL | PART NO.   | DESCRIPTION                       |
|--------|------------|-----------------------------------|
| 1      | AA80001254 | FRONT PANEL 2TSC-1A               |
| 2      | AA80001102 | PLAS. FRONT PANEL 2TTP-7A         |
| 3      | KB10001620 | KNOB 4TTX-14 50F                  |
| 4      | SR00000985 | KNOB SPACER 4TQU-65#2             |
| 5      | OM10000759 | ALUMINUM DOOR 4TTX-8#3            |
| 6      | SG00000742 | SPONGE 4TSC-8                     |
| 7      | SG00000717 | DOOR SPONGE 4TTX-21               |
| 8      | OM00002224 | AR BADGE C-4347A01                |
| 9      | -----      | P.C.B. ASS'Y AF804321             |
| 10     | KB20002140 | PUSH BUTTON 4TR-1515#0 5x14       |
| 11     | KB10000961 | KNOB C-3187#2-T 13F RED           |
| 12     | OM10000747 | ORNAMENTAL PLATE 4TSC-5           |
| 13     | AF80000408 | FRONT CHASSIS 4TSC-2              |
| 14     | KB20001652 | PUSH BUTTON 4TUQ-4 16.9F          |
| 15     | SN00000271 | BUTTON SPRING 4TTP-21             |
| 16     | SP10005656 | POWER SW SUPPORT 4TTP-17#2        |
| 17     | -----      | P.C.B. ASS'Y AF804331             |
| 18     | AM00001665 | CHASSIS BODY 2TSC-4A              |
| 19     | PT00000175 | PLASTIC FOOT 4TR-2593 20Fx10      |
| 20     | SP10005528 | PANEL SUPPORT 4TTY-13             |
| 21     | -----      | P.C.B. ASS'Y AF804311             |
| 22     | BC00000192 | CYLINDER BUSH 4TR-1989            |
| 23     | SP10005772 | HEAT SINKER SUPPORT 4TSC-6        |
| 24     | AH20000631 | HEAT SINKER BOARD 4TSC-7          |
| 25     | PT26305101 | POWER TRANSFORMER TT-263EF        |
| 26     | AR80000958 | PRINTED REAR CHASSIS 2TSC-3       |
| 27     | VC00000048 | VOLTAGE SELECTOR C-4304A01 FS907B |
| 28     | SP10005309 | V.S MASK 4TTP-24                  |
| 29     | CD00000048 | AC POWER CORD 4TR-1037 (E)        |
|        | CD00000085 | AC POWER CORD C-2504A (K)         |
|        | CD00000115 | AC POWER CORD C-3763-T (G)        |
| 30     | AU00000889 | UPPER COVER 2TTP-6A#2             |

# Parts List

NOTE: THE COMPONENTS INDENTIFIED BY  $\Delta$  MARK ARE FOR SAFETY. REPLACE ONLY WITH ORIGINAL PARTS. DO NOT SUBSTITUTE.

| SYMBOL                | PARTS NO.  | DESCRIPTION                |
|-----------------------|------------|----------------------------|
| AF804311 PCB ASSEMBLY |            |                            |
| R401,402              | RM52212811 | R,METAL 22.1 F 1/4W        |
| R403,404              | RM59092811 | R,METAL 90.9K F 1/4W       |
| R405,406              | RM51003813 | R,METAL 100K F 1/4W        |
| R407-410              | RM52210814 | R,METAL 221 F 1/4W         |
| R411,412              | RM52212811 | R,METAL 22.1K F 1/4W       |
| R413,414              | RD53301822 | R,CARBON 3.3K J 1/4W       |
| R415,416              | RM52210814 | R,METAL 221 F 1/4W         |
| R417,418              | RM51002810 | R,METAL 10K F 1/4W         |
| R419,420              | RM51213819 | R,METAL 121K F 1/4W        |
| R421,422              | RM21820810 | R,METAL 182 F 1/4W         |
| R423,424              | RD52200827 | R,CARBON 220 J 1/4W        |
| R425,426              | RD52202824 | R,CARBON 22K J 1/4W        |
| R427,428              | RD28209826 | R,CARBON 82 J 1/4W         |
| R429,430              | RD51003820 | R,CARBON 100K J 1/4W       |
| R431,432              | RD53300829 | R,CARBON 330 J 1/4W        |
| C401,402              | CT04707840 | CAP,TANTALUM 4.7uF 10V     |
| C403,404              | CS42211420 | CAP,STYROL 220P 50V        |
| C405,406              | CE01006500 | CAP,ELEC 10uF 50V          |
| C407,408              | CM02210428 | CAP,MYLAR 222 J 50V        |
| C409,410              | CE02205103 | CAP,ELEC 220uF 10V         |
| C411,412              | CP11008330 | CAP,M.P. 0.1uF 100V        |
| C413,414              | CM08210426 | CAP,MYLAR 822 J 50V        |
| C415,416              | CM02709423 | CAP,MYLAR 273 J 50V        |
| C417,418              | CE01006251 | CAP,ELEC 10uF 25V          |
| C419,420              | CS43310428 | CAP,STYROL 3300P 50V       |
| C421,422              | CE04706351 | CAP,ELEC 47uF 35V          |
| C423                  | CC05009457 | CAP,CERAMIC 0.047 50V      |
| D401-406              | DD80000021 | DIODE 1N4148-86            |
| Q401,402              | TR10000126 | TRANSISTOR 2SA608K         |
| Q403-406              | TR30000467 | TRANSISTOR 2SC2602G        |
| Q407,408              | TR10000126 | TRANSISTOR 2SA608K         |
| Q409,410              | TR30000327 | TRANSISTOR 2SC536          |
| VR502                 | RV10001231 | R,VARIABLE 4TR-2537 100KMN |
| R601,602              | RD51000820 | R,CARBON 100 J 1/4W        |
| R603,604              | RD52203828 | R,CARBON 220K J 1/4W       |
| R605,606              | RD54702824 | R,CARBON 47K J 1/4W        |
| R607,608              | RD51500827 | R,CARBON 150 J 1/4W        |
| R609-612              | RD51801827 | R,CARBON 1.8K J 1/4W       |
| R613,614              | RM25112813 | R,METAL 51.1K F 1/4W       |
| R615,616              | RM54750812 | R,METAL 475 F 1/4W         |
| R617,618              | RD51001823 | R,CARBON 1K J 1/4W         |
| R619,620              | RD53300829 | R,CARBON 330 J 1/4W        |
| R621,622              | RD51002827 | R,CARBON 10K J 1/4W        |
| R623,624              | RM21500815 | R,METAL 150 F 1/4W         |
| R625,626              | RM15601128 | R,METAL 5.6K J 1W          |
| R627,628              | RD52209820 | R,CARBON 22 J 1/4W         |
| R629,630              | RD58201829 | R,CARBON 8.2K J 1/4W       |
| R631,632              | RD53301822 | R,CARBON 3.3K J 1/4W       |
| R633,634              | RM28259811 | R,METAL 82.5 F 1/4W        |
| R635,636              | RM91000926 | R,METAL 100 J 1/2W         |
| R637-640              | RM10228226 | R,METAL 0.22 2W            |
| R641,642              | RM11009120 | R,METAL 10 J 1W            |
| R643,644              | RD51001823 | R,CARBON 1K J 1/4W         |
| R645,646              | RD53901825 | R,CARBON 3.9K J 1/4W       |
| R647,648              | RD53903822 | R,CARBON 390K J 1/4W       |
| R649,650              | RD54702824 | R,CARBON 47K J 1/4W        |
| R651,652              | RD51501820 | R,CARBON 1.5K J 1/4W       |
| R653,654              | RD51002827 | R,CARBON 10K J 1/4W        |
| R655                  | RD53301822 | R,CARBON 3.3K J 1/4W       |
| R656                  | RD54703828 | R,CARBON 470K J 1/4W       |
| R657                  | RD51501820 | R,CARBON 1.5K J 1/4W       |
| R658,659              | RD51002827 | R,CARBON 10K J 1/4W        |
| R660                  | RD51003820 | R,CARBON 100K J 1/4W       |
| R661                  | RD51002827 | R,CARBON 10K J 1/4W        |
| R662                  | RD21004822 | R,CARBON 1M J 1/4W         |
| R663,664              | RD21500825 | R,CARBON 150 J 1/4W        |
| R665,666              | RD26803824 | R,CARBON 680K J 1/4W       |
| R667,668              | RD26802820 | R,CARBON 68K J 1/4W        |

| SYMBOL                | PARTS NO.  | DESCRIPTION                  |
|-----------------------|------------|------------------------------|
| R669,670              | RM51001816 | R,METAL 1K F 1/4W            |
| C601,602              | CE04706259 | CAP,ELEC 47uF 25V            |
| C603,604              | CS41011422 | CAP,STYROL 100P 50V          |
| C605-608              | CE01007504 | CAP,ELEC 1uF 50V             |
| C609,610              | CC33310466 | CAP,CERAMIC 0.0033uF 50V     |
| C613,614              | CE01004163 | CAP,ELEC 1000uF 16V          |
| C615,616              | CE01006251 | CAP,ELEC 10uF 25V            |
| C617,618              | CE01005106 | CAP,ELEC 100uF 10V           |
| C619,620              | CC32212436 | CAP,CERAMIC 22P 50V          |
| C621-624              | CM01008423 | CAP,MYLAR 104 J 50V          |
| C625                  | CM02208422 | CAP,MYLAR 224 J 50V          |
| C627                  | CE01006500 | CAP,ELEC 10uF 50V            |
| C628,629              | CM01009427 | CAP,MYLAR 103 J 50V          |
| C630-639              | CC33311434 | CAP,CERAMIC 330P 50V         |
| C640,641              | CC31011435 | CAP,CERAMIC 100P 50V         |
| C642                  | CC05009457 | CAP,CERAMIC 0.047 50V        |
| C643                  | CC31009465 | CAP,CERAMIC 0.01 50V         |
| D601-608              | DD80000021 | DIODE 1N4148                 |
| D609                  | DD20000090 | DIODE RD-15E                 |
| Q601-606              | TR30000327 | TRANSISTOR 2SC536            |
| Q607,608              | TR10000023 | TRANSISTOR 2SA1016           |
| Q609,610              | TR30000212 | TRANSISTOR 2SC2362           |
| Q611,612              | TR40000069 | TRANSISTOR 2SD600K           |
| Q613,614              | TR30000080 | TRANSISTOR 2SD863            |
| Q615,616              | TR10000059 | TRANSISTOR 2SB764            |
| Q617,618              | TR40000045 | TRANSISTOR 2SD1047 $\Delta$  |
| Q619,620              | TR20000040 | TRANSISTOR 2SB817 $\Delta$   |
| Q621,622              | TR10000126 | TRANSISTOR 2SA608K           |
| Q623-625              | TR30000327 | TRANSISTOR 2SC536            |
| Q626                  | TR10000126 | TRANSISTOR 2SA608K           |
| Q627                  | TR30000327 | TRANSISTOR 2SC536            |
| IC601                 | IC00001474 | IC NJM4556D                  |
| L601,602              | LC03550007 | ANTI-PARASITIC TRL-355       |
| VR601,602             | RV40000022 | R,SEMI-FIXED 2.2K            |
| R901,902              | RD23900820 | R,CARBON 390 J 1/4W          |
| R903,904              | RD51502824 | R,CARBON 15K J 1/4W          |
| R905,906              | RD51001823 | R,CARBON 1K J 1/4W           |
| R907                  | RD52702821 | R,CARBON 27K J 1/4W          |
| R908                  | RD56801829 | R,CARBON 6.8K J 1/4W         |
| R909                  | RD55601821 | R,CARBON 5.6K J 1/4W         |
| R912,913              | RD51001823 | R,CARBON 1K J 1/4W           |
| R914,915              | RD52201820 | R,CARBON 2.2K J 1/4W         |
| R916                  | RD55601821 | R,CARBON 5.6K J 1/4W         |
| C901-904              | CE04706351 | CAP,ELEC 47uF 35V            |
| C905,906              | CE01007504 | CAP,ELEC 1uF 50V             |
| C907                  | CE02205164 | CAP,ELEC 220uF 16V           |
| C908,909              | CC01008458 | CAP,CERAMIC 0.1uF 50V        |
| C910,911              | CE02205358 | CAP,ELEC 220uF 35V           |
| C912,913              | CE01004503 | CAP,ELEC 1000uF 50V $\Delta$ |
| C915                  | CE02205358 | CAP,ELEC 220uF 35V           |
| C916-923              | CE02204354 | CAP,ELEC 220uF 35V $\Delta$  |
| D901,902              | DD20000090 | DIODE RD-15E                 |
| D903                  | DD20000181 | DIODE RD-6.2E                |
| D904-911              | DD80000010 | DIODE 1N4003                 |
| D912,913              | DD10000019 | DIODE KBPC02 $\Delta$        |
| Q901                  | TR40000069 | TRANSISTOR 2SD600K           |
| Q902                  | TR10000047 | TRANSISTOR 2SB631            |
| Q903                  | TR30000327 | TRANSISTOR 2SC536            |
| Q904                  | TR10000126 | TRANSISTOR 2SA608K           |
| F901-904              | FU23000049 | FUSE 250V 4A S $\Delta$      |
| S2,S3                 | SH30000390 | FUNCTION SW 4TR-2398         |
| S4                    | SH11000306 | 1 KEY PUSH SUL 4TR-2601      |
| AF804321 PCB ASSEMBLY |            |                              |
| R501,502              | RD22203826 | R,CARBON 220K J 1/4W         |
| C503,504              | CE04706259 | CAP,ELEC 47uF 25V            |
| VR501                 | RV10001383 | R,VARIABLE 4TR-2650 20KAx2   |