

MANUAL

SERVICE

317
STEREO INTEGRATED
AMPLIFIER

NAD

SERVICE SAFETY PRECAUTIONS (UL)

1. Use exact replacement parts for critical locations marked “”
2. Return lead dress to original position and re-install protective covers.
3. Before returning to customer, test for shock hazard; use either method A or B:
 - A. Leakage test “cold”:
 1. Unplug the AC cord; turn power switch ON.
 2. Connect one lead of High Voltage Insulation Tester to both prongs of the AC plug.
 3. Touch other lead to all exposed metal parts.
 4. Impedance measurement must be 0.3-5.0 Megohms.
 - B. Leakage test, “live”:
 1. Plug unit directly into the AC outlet; do not use isolation transformer.
 2. Connect one lead of the Leakage Current Tester to earth ground.
 3. Touch other lead to all exposed metal parts.
 4. Leakage measurement must be less than 0.5 millamps.

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1. Replacing the fuses



This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.

| Reference No | Part Number | Description |
|--------------|--------------|--|
| F501*AH | N51007030-1A | Fuse 7A 125V Time Lag LBC (UL/CSA) |
| F501*B,C | N51002530-1B | Fuse 2.5A 250V Time Lag LBC (SEMKO/VDE) |
| F502*AH | 5120-0036-0 | Fuse 100mA 250V Medium Time Lag LBC (UL/CSA) |
| F502*B,C | 5120-0035-0 | Fuse 100mA 250V Time Lag LBC (SEMKO/VDE) |

NOTE :

- ***AH** : USA, CANADIAN MODEL ONLY.
- <***B**> : UK MODEL ONLY.
- <***C**> : EUROPEAN MODEL ONLY.

2. Safety-check out

(Only U.S.A. model)

After correcting the original service problem perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and the screw on the back panel.

Specifications : 3.3 Mohm \pm 10% at 500V.

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SPECIFICATIONS**POWER AMPLIFIER SECTION**

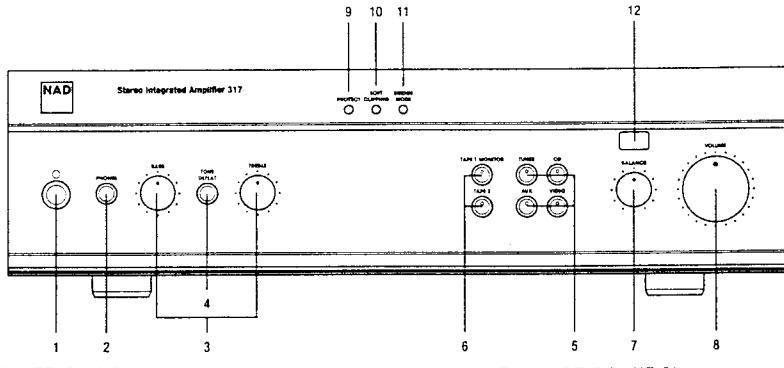
| | |
|--|--|
| CONTINUOUS AVERAGE POWER OUTPUT INTO 8 OHMS (Min. power per channel, 20 Hz - 20 kHz, both channels driven, with no more than rated distortion) | 80 W (19 dBW) |
| Rated Distortion THD (20 Hz - 20 kHz) | 0.03% |
| Clipping power at 8 ohms (Maximum continuous power per channel). | 95 W |
| IHF dynamic headroom at 8 ohms | +1.4 dB |
| IHF dynamic power (Maximum short term power per channel) | |
| 8 ohms: | 110 W (20.4 dBW) |
| 4 ohms: | 180 W (22.6 dBW) |
| 2 ohms: | 250 W (24 dBW) |
| Slew rate | > 60 V / μsec |
| Damping factor at 50 Hz | 8 ohms: 200 |
| Input Impedance | 60 kohms + 500 pF |
| Input sensitivity (for rated output into 8 ohms) | 0.9 V |
| Voltage gain | $\times 28.3$ (29 dB) |
| Frequency response 20 Hz - 20 kHz | ± 0.2 dB - 3 dB at 2 Hz / 100 kHz |
| Signal / Noise ratio, A-weighted | 96 dB ref. 1 W 115 dB ref. rated power |
| <u>BRIDGED (MONOPHONIC) MODE</u> | |
| CONTINUOUS AVERAGE POWER OUTPUT INTO 8 OHMS (Min. power per channel, with no more than rated distortion) | 240 W (23.8 dB) |
| IHF dynamic headroom at 8 ohms | + 1.8 dB |
| IHF dynamic power | 8 ohms: 360 W (25.6 dBW) 4 ohms: 500 W (27 dBW) |
| Input sensitivity (for rated output into 8 ohms) | 775 mV |

PREAMPLIFIER SECTION

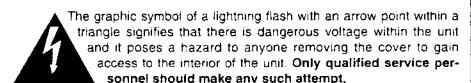
| | |
|--|--|
| LINE LEVEL INPUTS (CD, Video, Auxiliary, Tuner, Tape1, Tape2) | 20 kohms + 450 pF |
| Input impedance (R and C) | 80 mV |
| Input sensitivity (ref. 0.5 V) | 80 dB ref. 1 W |
| Signal/ Noise ratio, A-weighted | ± 0.2 dB |
| Frequency response, 20 Hz - 20 kHz | 16 dB |
| Voltage gain | 0.01% |
| THD + SMPTE + IHF I.M. | |
| LINE LEVEL OUTPUTS | 220 ohms |
| Preamp output impedance | Source Z + 2 kohms |
| Tape output impedance | 120 ohms |
| Headphones output impedance | |
| Maximum output level | preamp-out: tape-out: headphones-out: |
| | > 12 V >10 V > 8 V into 600 ohms > 250 mV into 8 ohms |
| CONTROLS | ± 7 dB at 10 kHz |
| Treble | |
| Bass | ± 10 dB at 50 Hz |
| <u>DIMENSIONS AND WEIGHTS</u> | |
| Net Weight | 12 kg (26.4 lb) |
| Shipping Weight | 13.6 kg (29.92 lb) |
| Dimensions (Width x Height x Depth) | 435mm x 130mm x 380mm |

REAR PANEL / FRONT PANEL VIEW

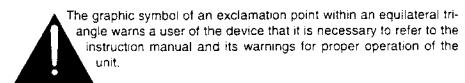
FRONT PANEL



1. POWER SWITCH
2. HEADPHONE SOCKET
3. BASS & TREBLE CONTROLS
4. TONE DEFEAT SWITCH
5. INPUT SELECTORS
6. TAPE 1 MONITOR/ TAPE 2
7. BALANCE CONTROL
8. VOLUME CONTROL
9. PROTECT INDICATOR
10. SOFT CLIPPING INDICATOR
11. BRIDGE MODE INDICATOR
12. INFRA-RED SENSOR

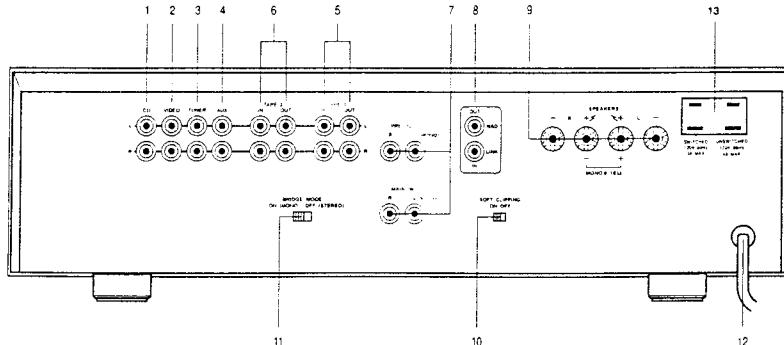


The graphic symbol of a lightning flash with an arrow point within a triangle signifies that there is dangerous voltage within the unit and it poses a hazard to anyone removing the cover to gain access to the interior of the unit. Only qualified service personnel should make any such attempt.



The graphic symbol of an exclamation point within an equilateral triangle warns a user of the device that it is necessary to refer to the instruction manual and its warnings for proper operation of the unit.

REAR PANEL



1. CD INPUT
2. VIDEO SOUND INPUT
3. TUNER INPUT
4. AUXILIARY INPUT
5. TAPE 1 INPUT/OUTPUT
6. TAPE 2 INPUT/OUTPUT
7. PREAMP OUT, MAIN IN
8. NAD LINK INPUT/OUTPUT
9. SPEAKER TERMINALS
10. SOFT CLIPPING SWITCH
11. BRIDGE MODE SWITCH
12. AC LINE CORD
13. AC OUTLETS (ONLY IN 120 V MODEL)

DISASSEMBLY INSTRUCTIONS

1. Remove machine screws M4.0 x 6.0 (1 to 6) from the side panels. Remove tapping screw 3.0 x 8.0 (7 to 8) from the back panel. Refer to **Figure No. 1**.

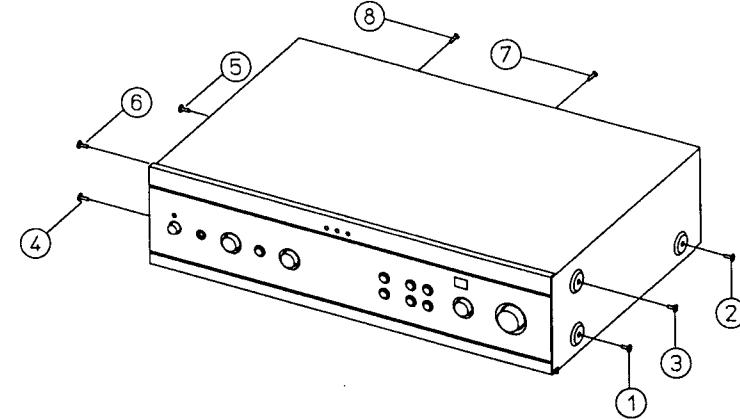


Figure No. 1.

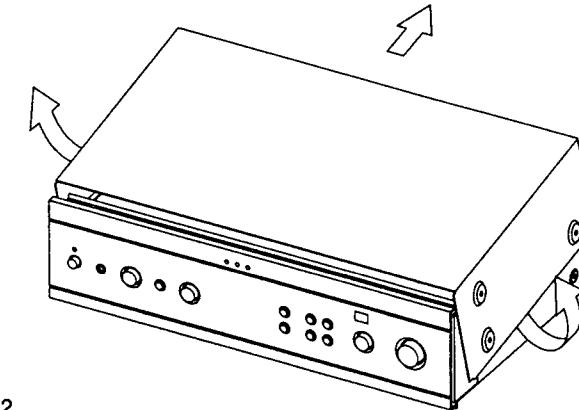
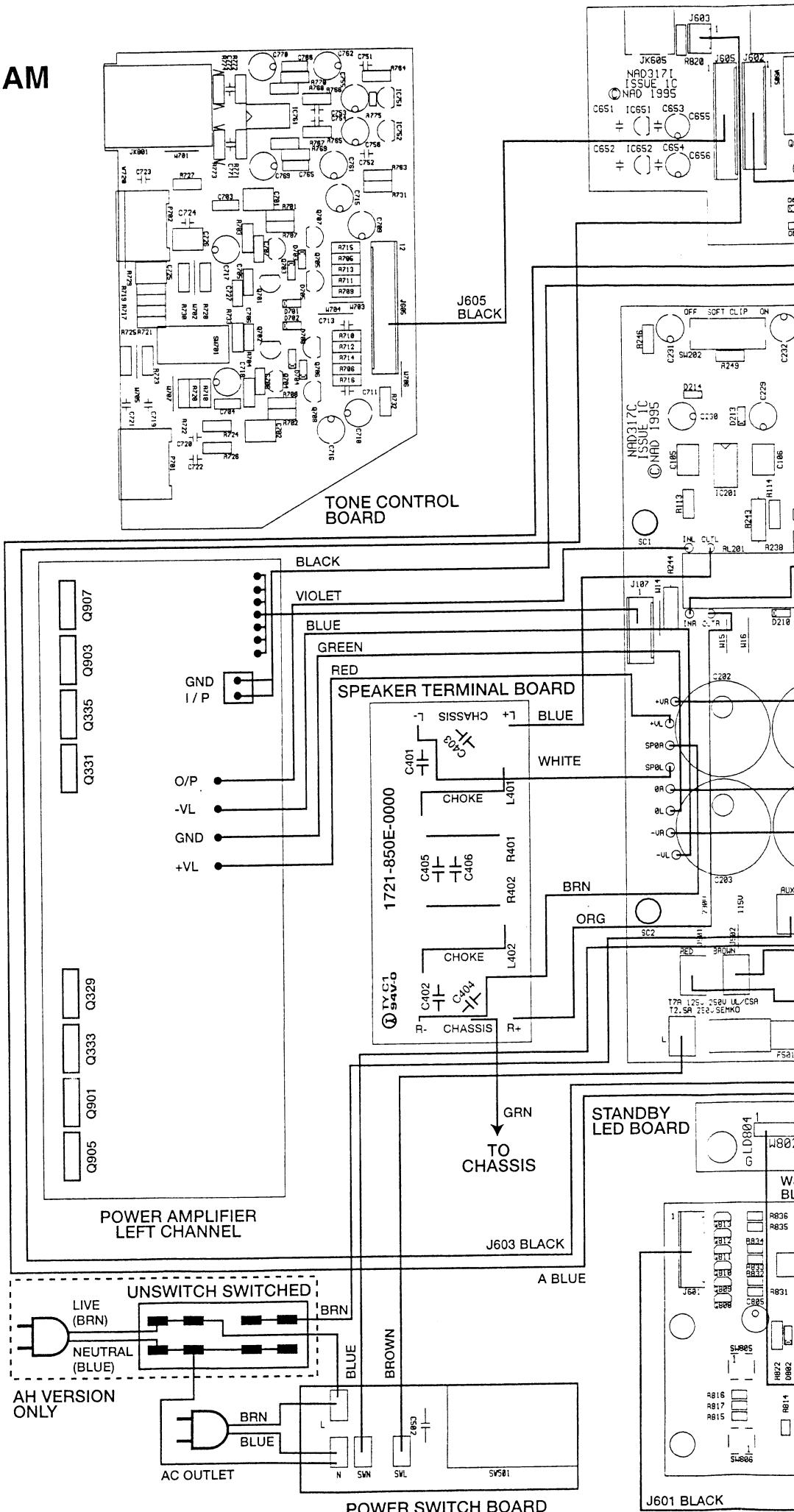
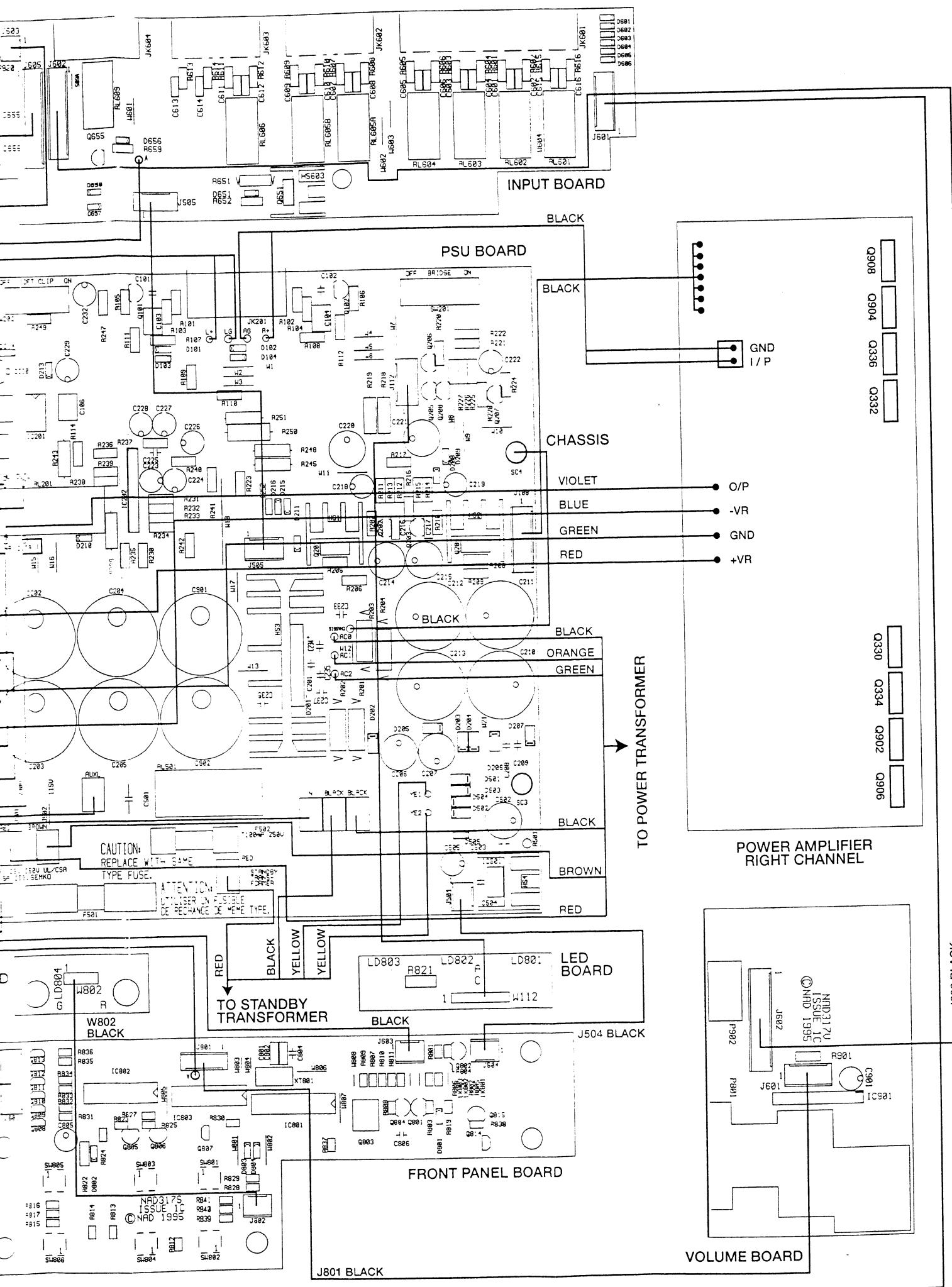


Figure No. 2.

2. Pull both sides of the TOP COVER slightly outwards, tilt approximately 35° and then move in the direction shown in **Figure No. 2**.

WIRING DIAGRAM

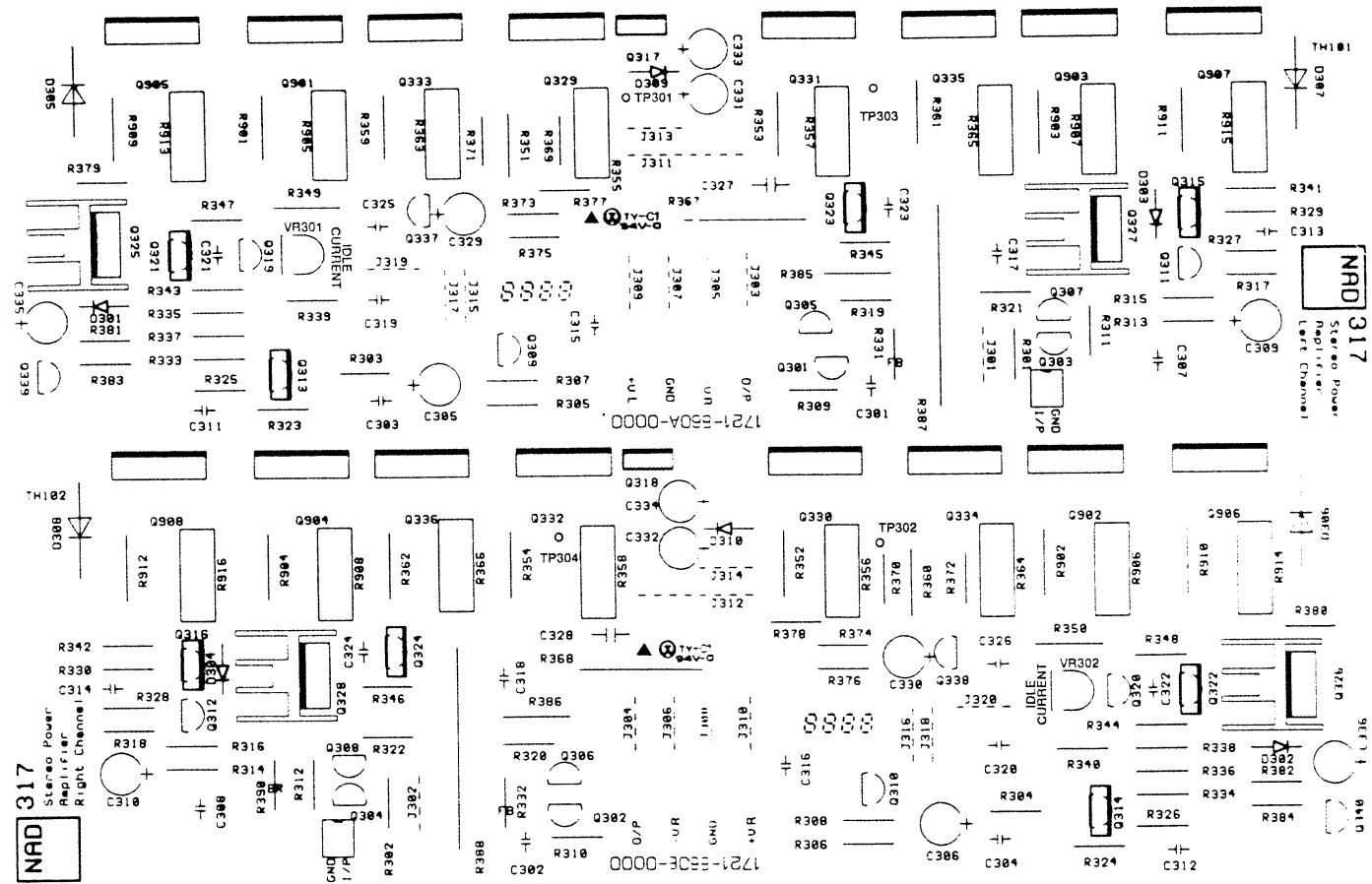




ALIGNMENT POINTS DIAGRAM / PROCEDURES

A. ALIGNMENT POINTS

PC

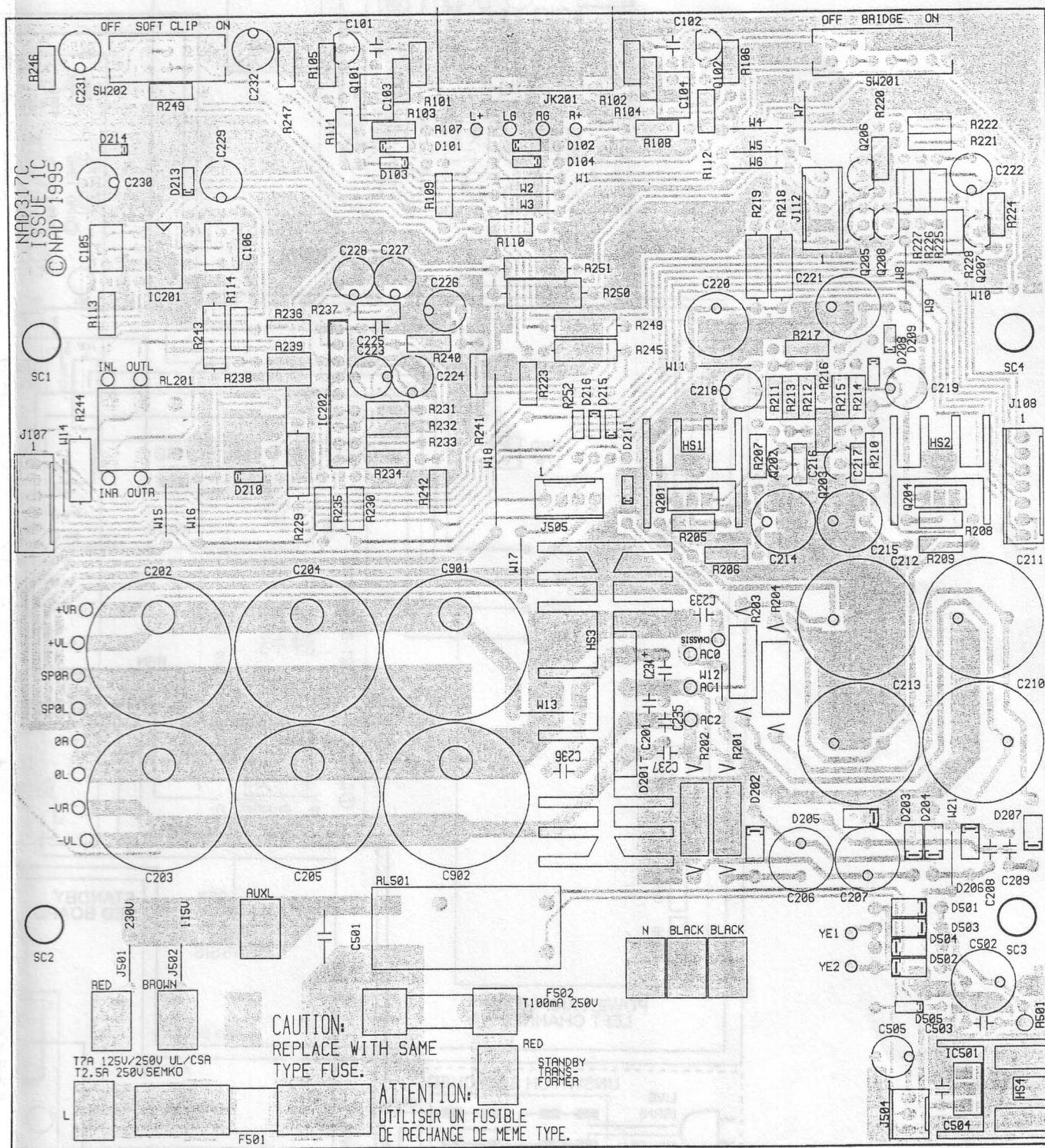


B. IDLE CURRENT ALIGNMENT (NO SIGNAL, NO LOAD)

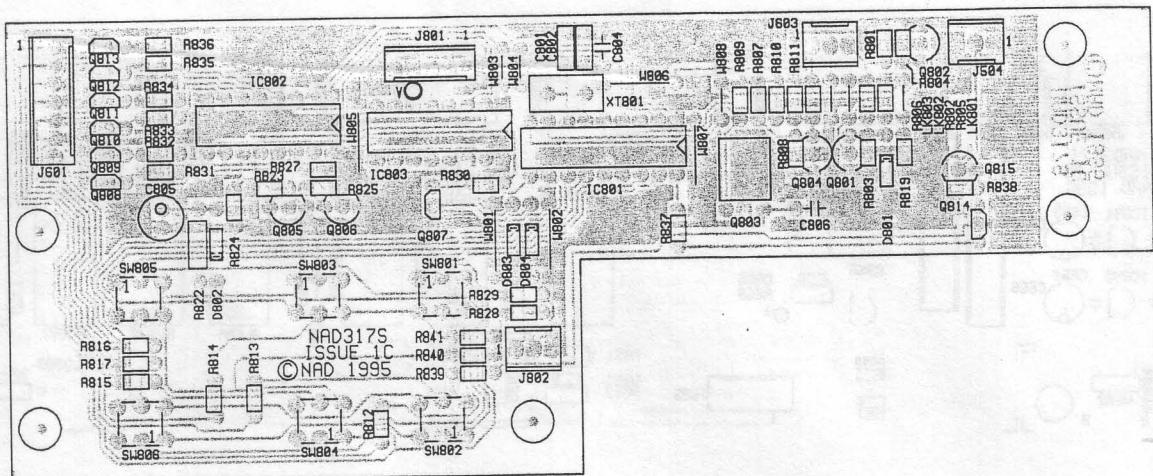
1. Connect a DC millivoltmeter to TP301 and TP303, and adjust VR301 for 20 ± 1.5 mV reading on meter.
2. Connect a DC millivoltmeter to TP302 and TP304, and adjust VR302 for 20 ± 1.5 mV reading on meter.
3. Leave power “ on ” for a minimum of 5 minutes, and check 1 and 2 for correct reading.

PCB LAYOUT

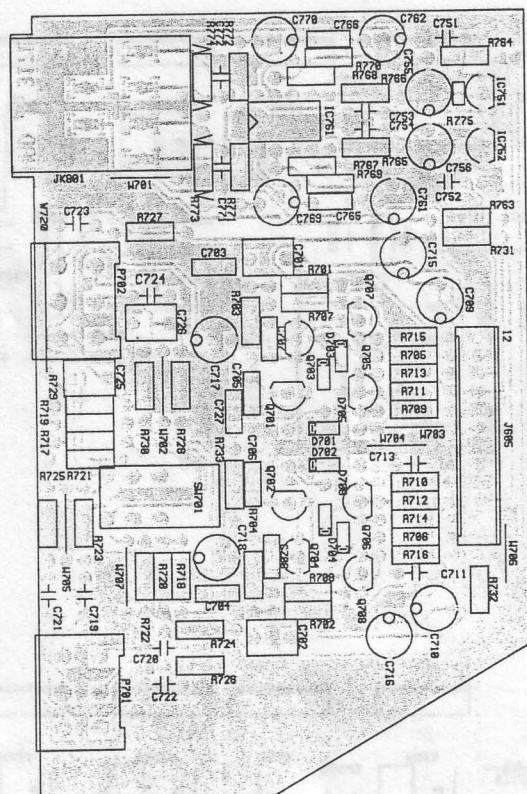
PSU PCB



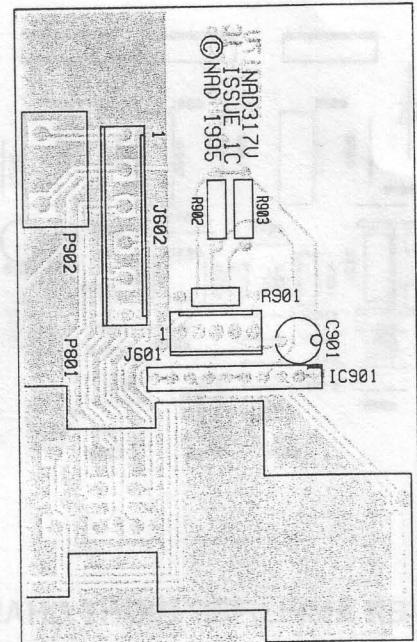
FRONT PANEL PCB



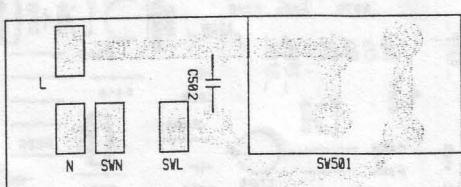
TONE CONTROL PCB



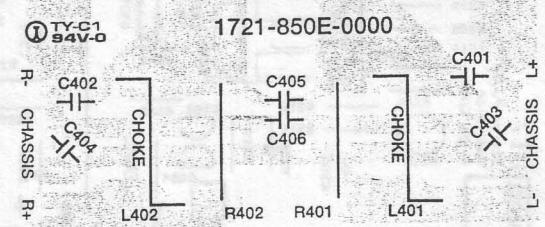
VOLUME PCB



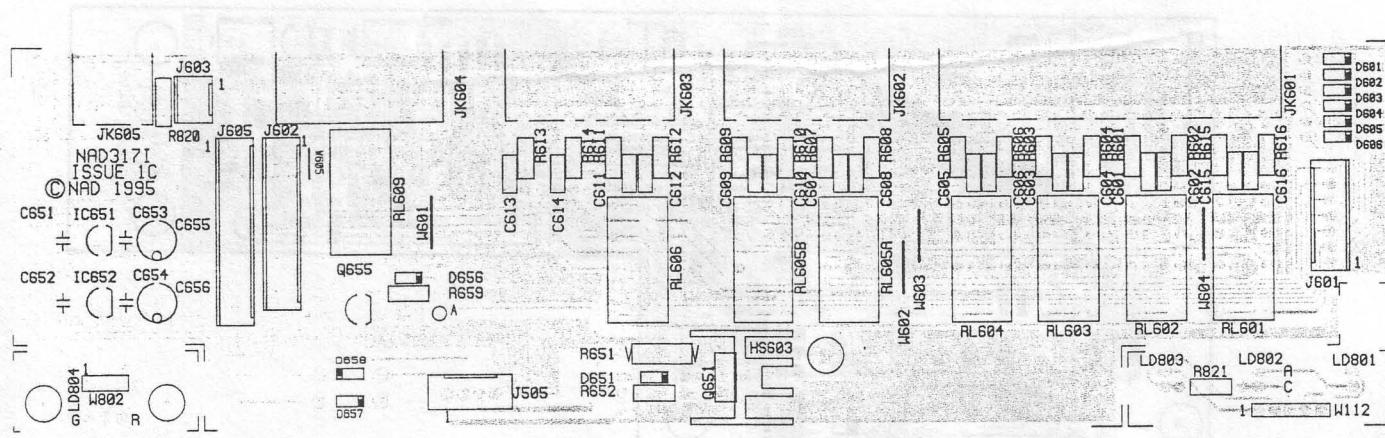
POWER SWITCH PCB



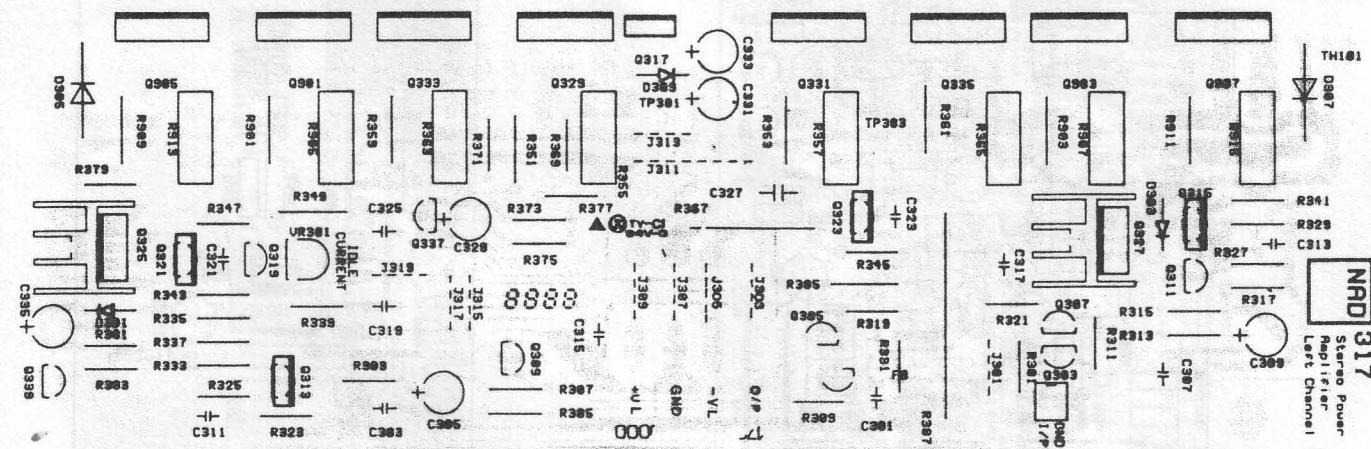
SPEAKER TERMINAL PCB



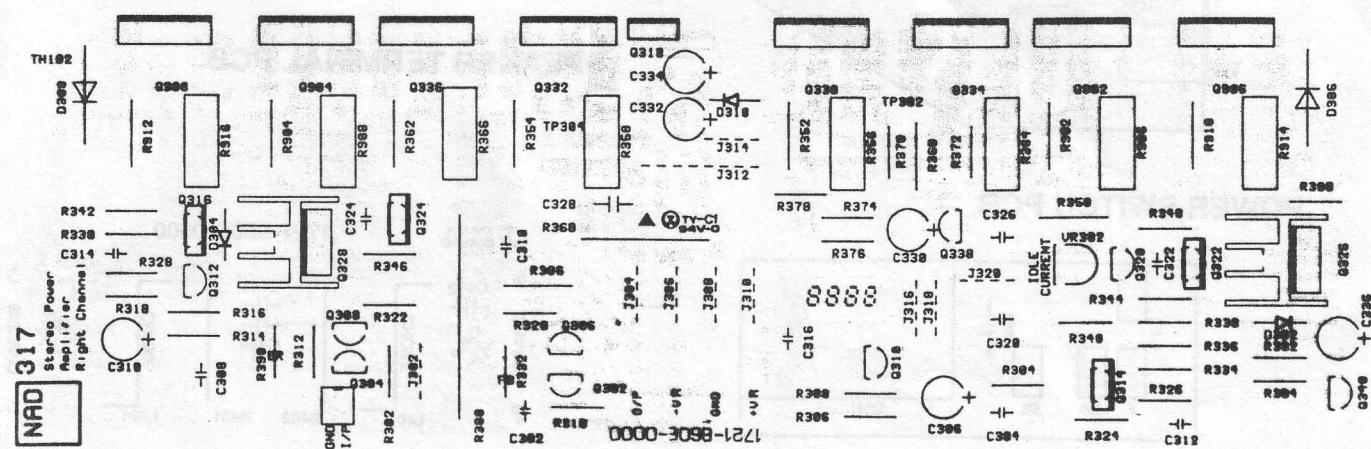
INPUT, STANDBY LED & LED PCBs

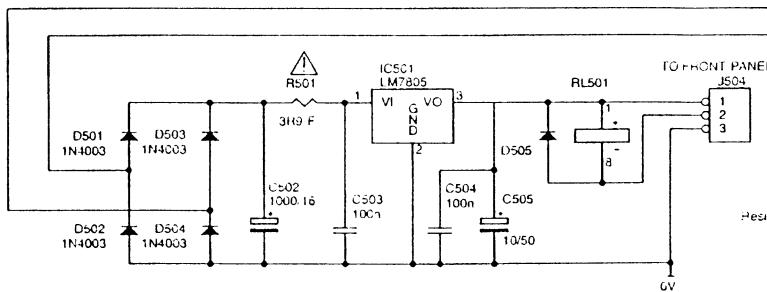
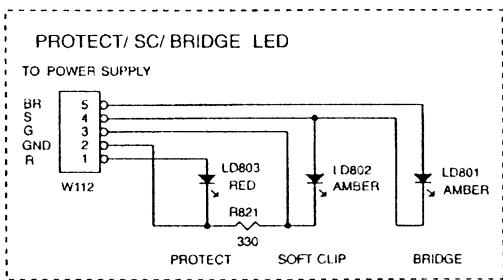
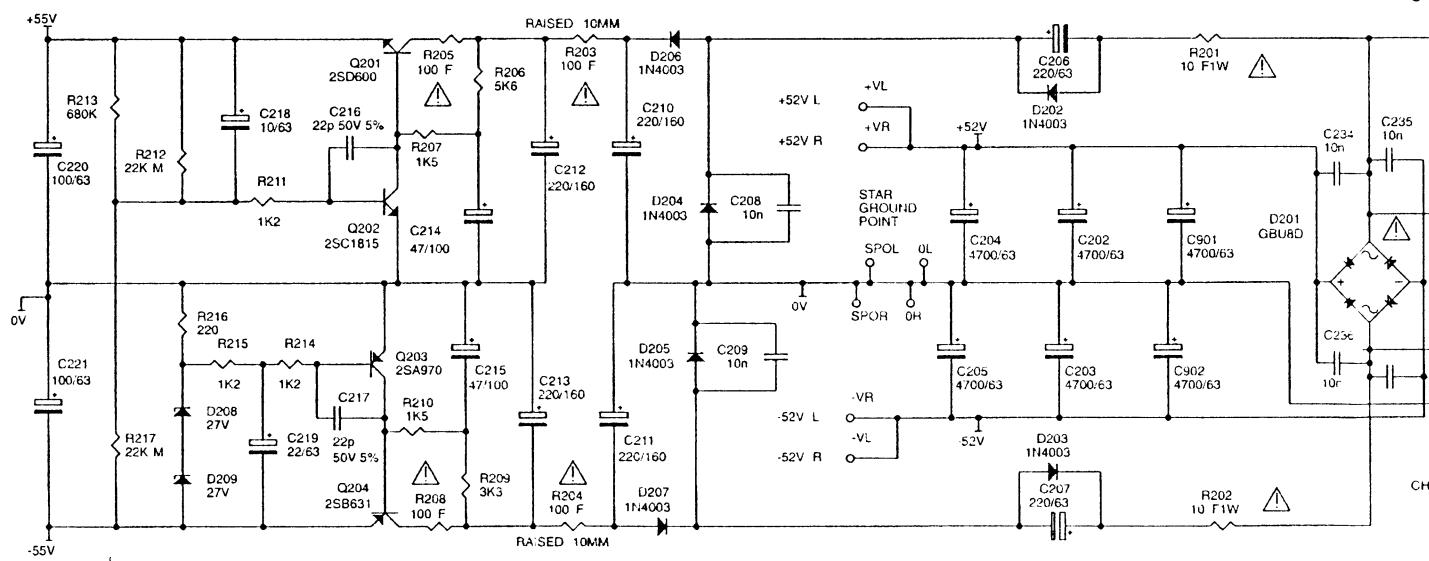
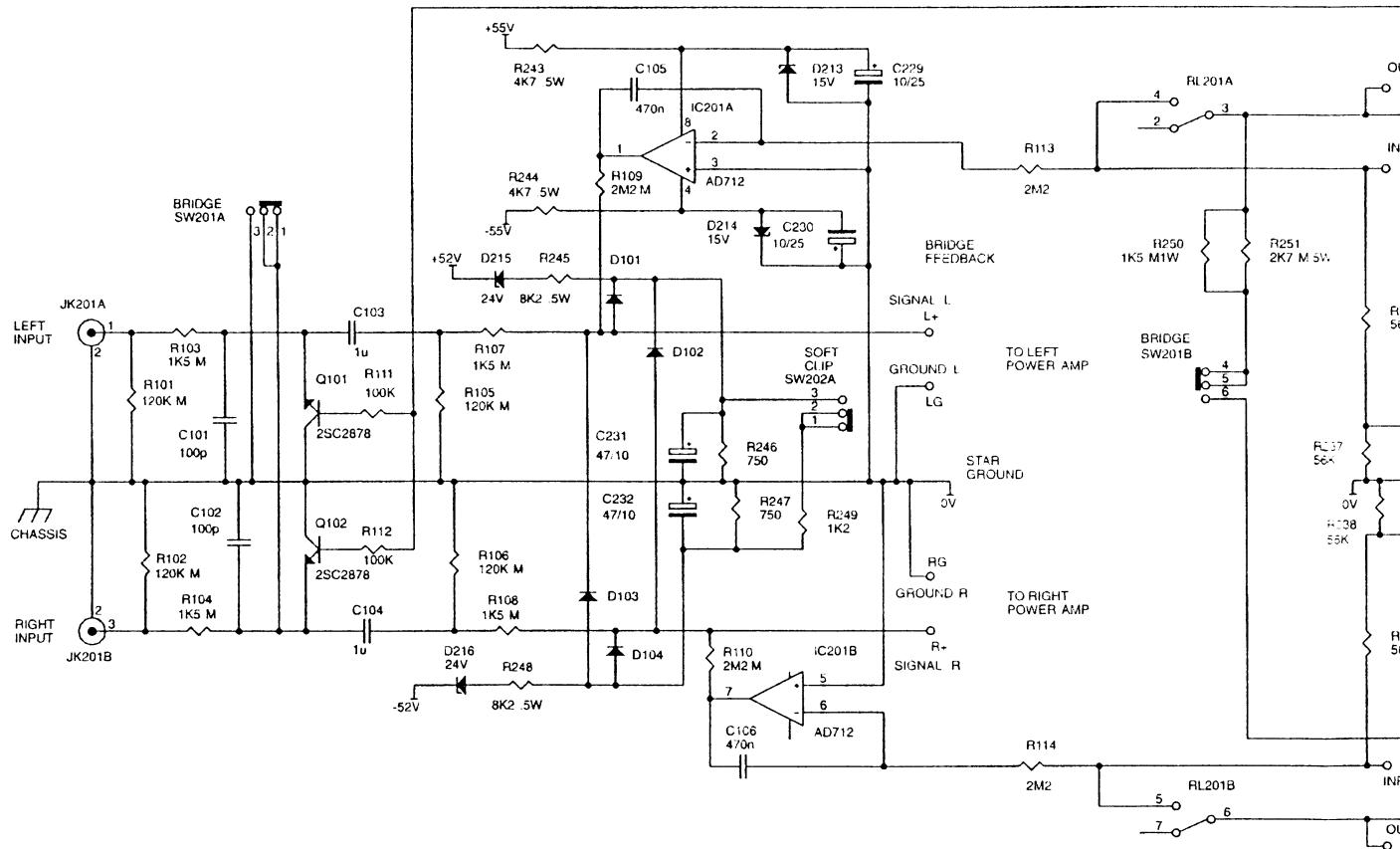


POWER AMPLIFIER LEFT CHANNEL PCB



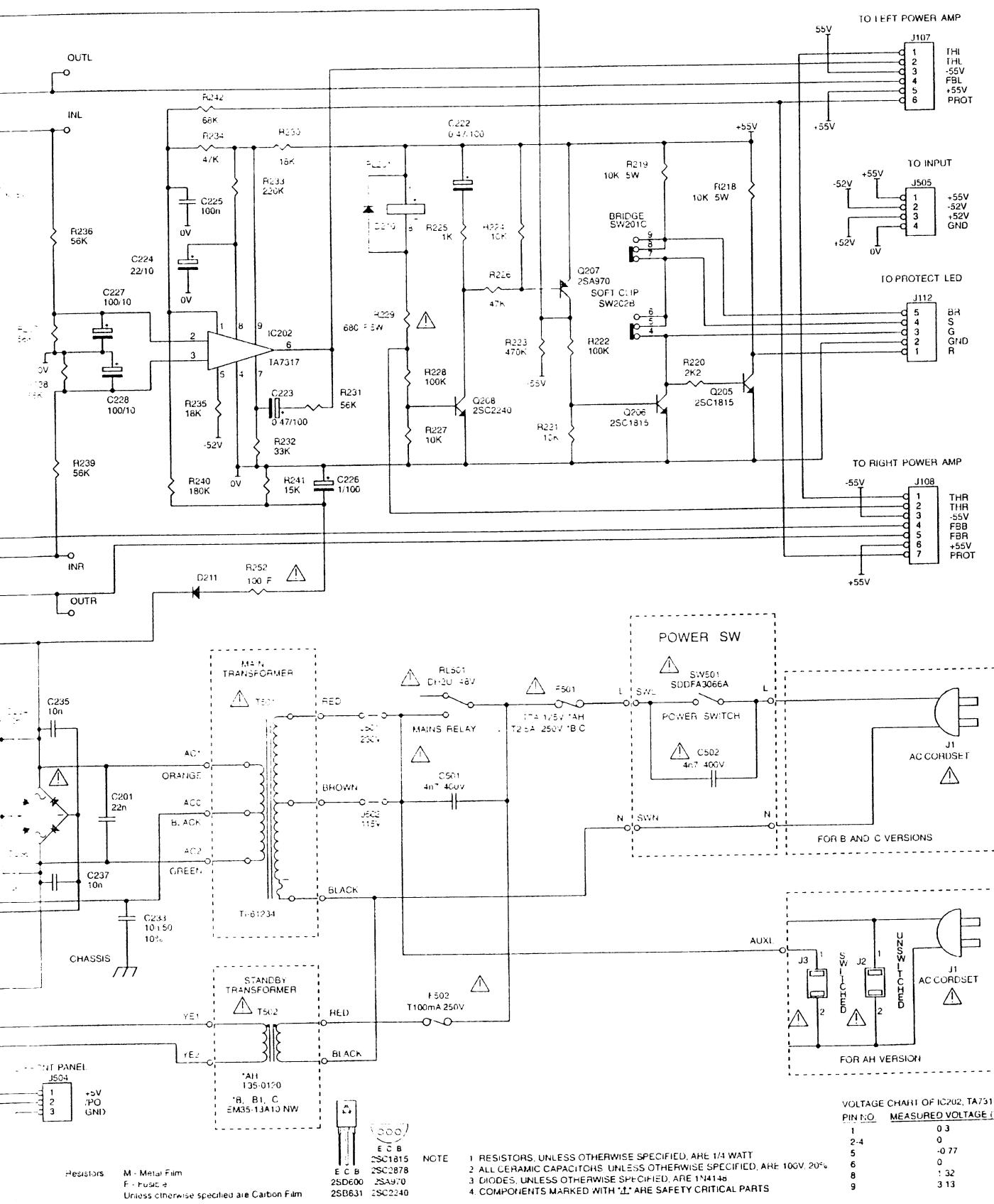
POWER AMPLIFIER RIGHT CHANNEL PCB

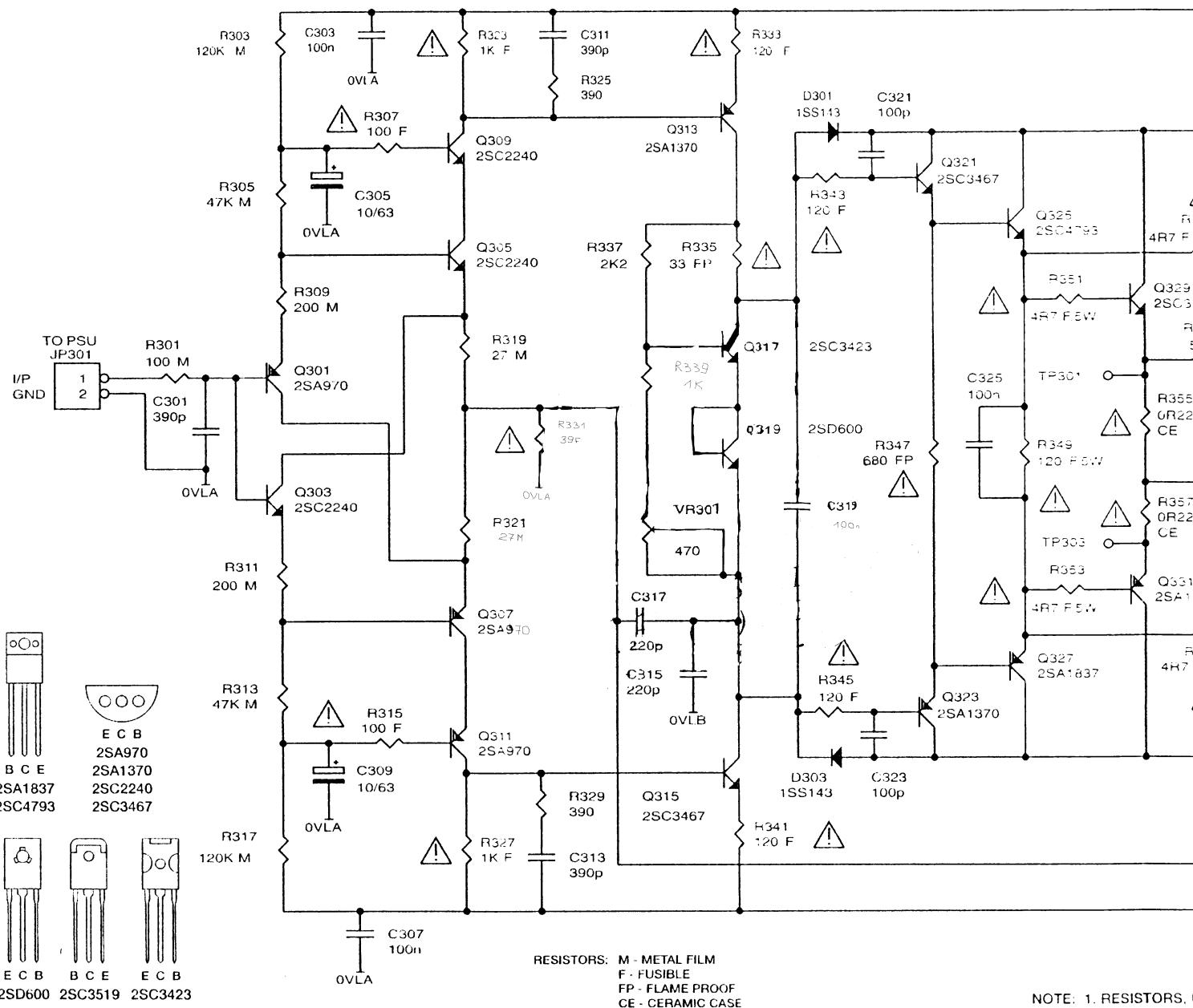




SCHEMATIC DIAGRAM

PSU

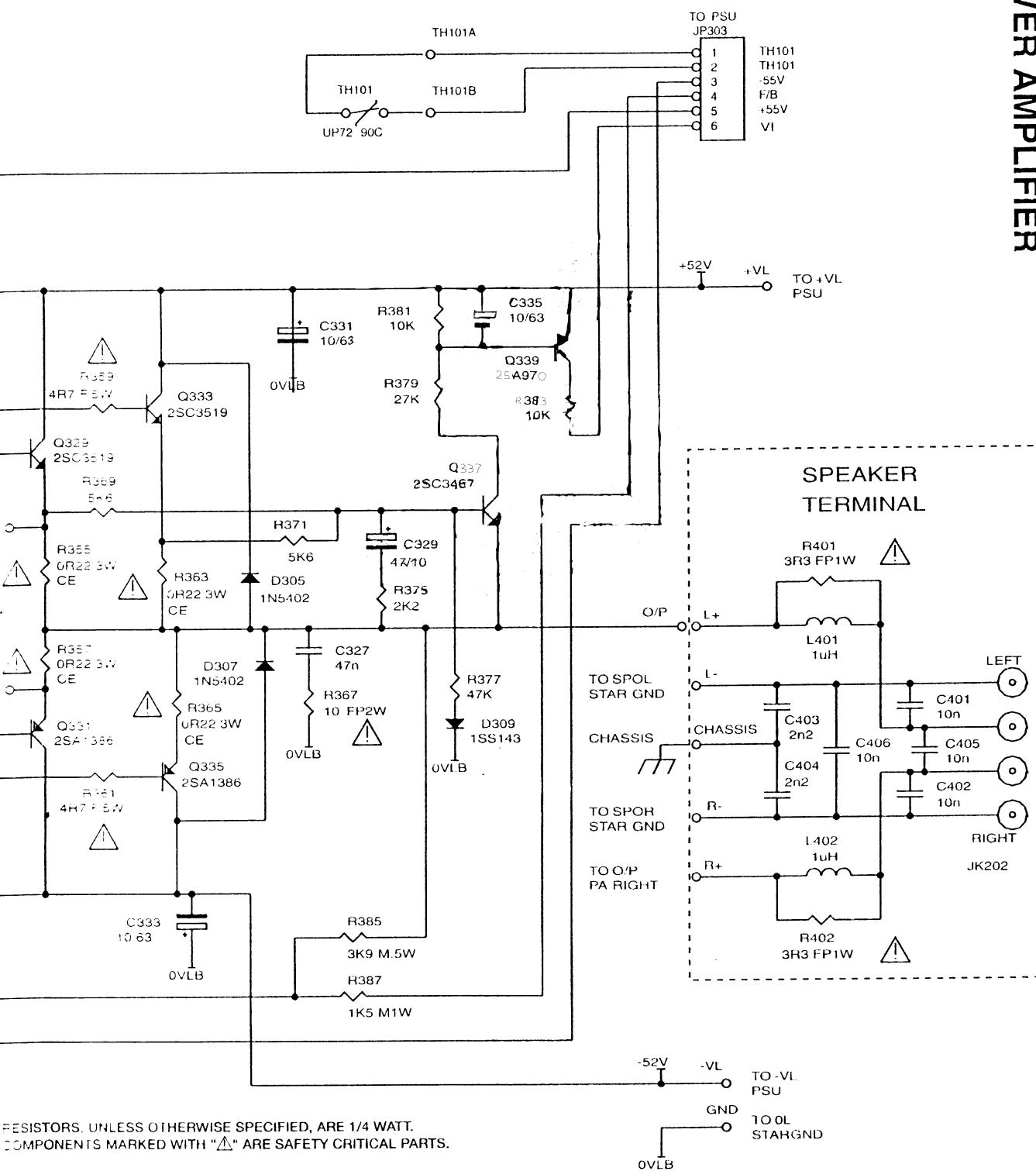


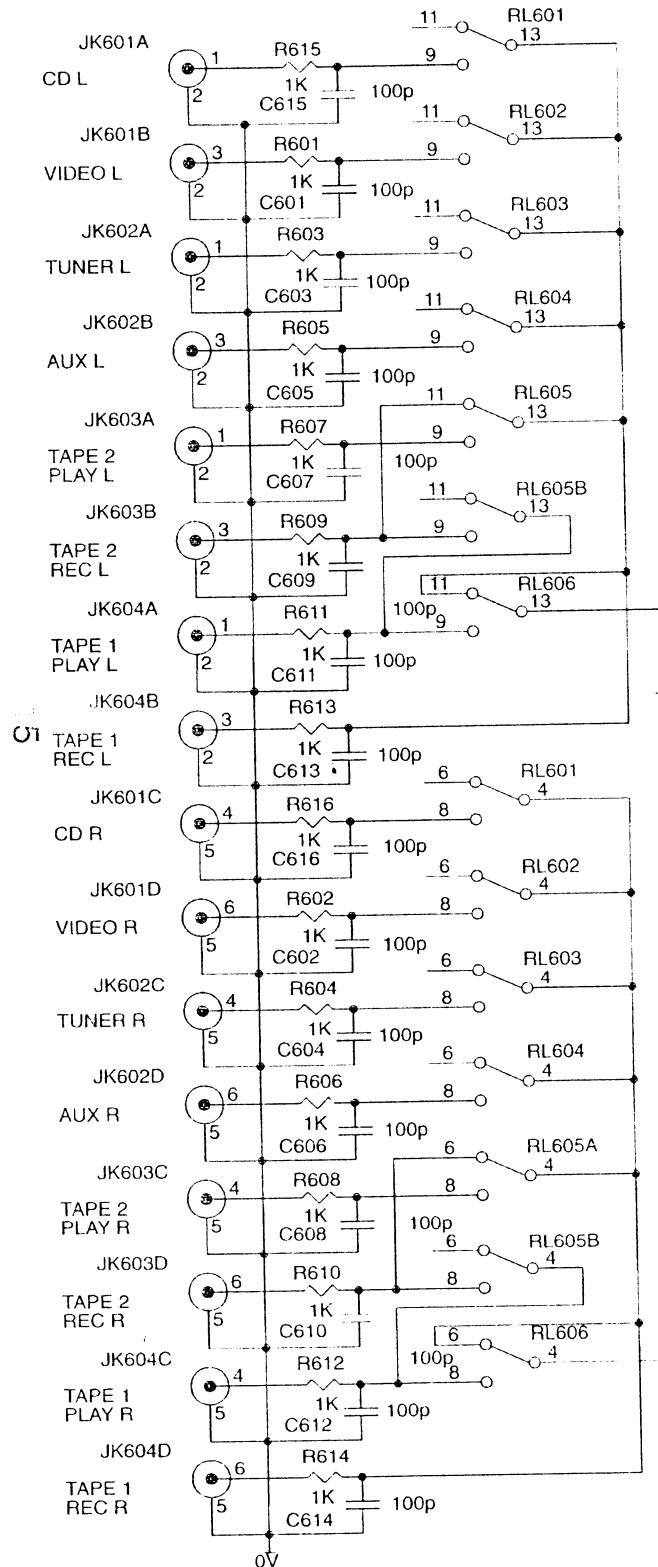


RESISTORS: M - METAL FILM
F - FUSIBLE
FP - FLAME PROOF
CE - CERAMIC CASE
UNLESS OTHERWISE SPECIFIED ARE CARBON FILM

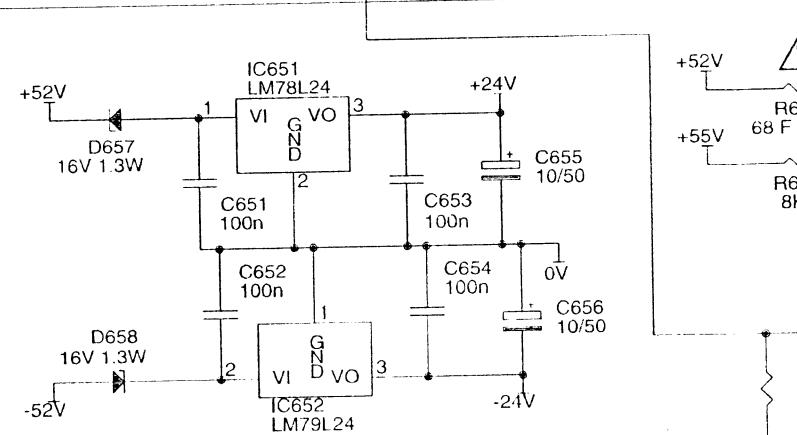
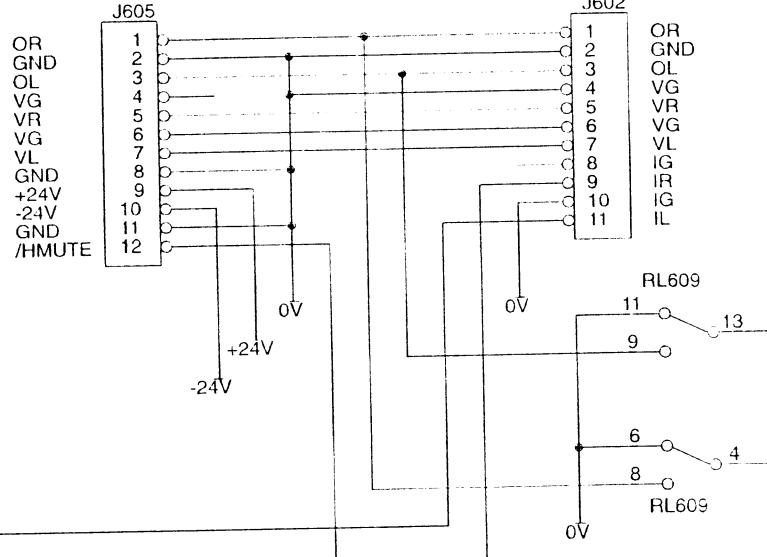
NOTE: 1. RESISTORS, 100Ω
2. COMPONENTS

LEFT POWER AMPLIFIER

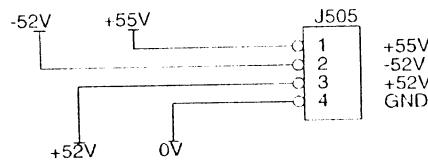




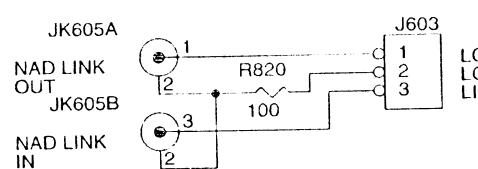
TO TONE CONTROLS



TO POWER SUPPLY

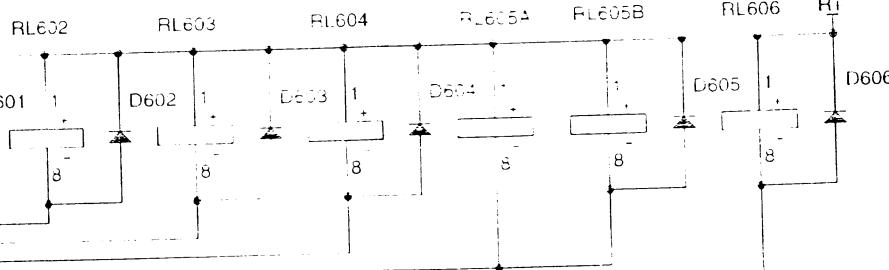
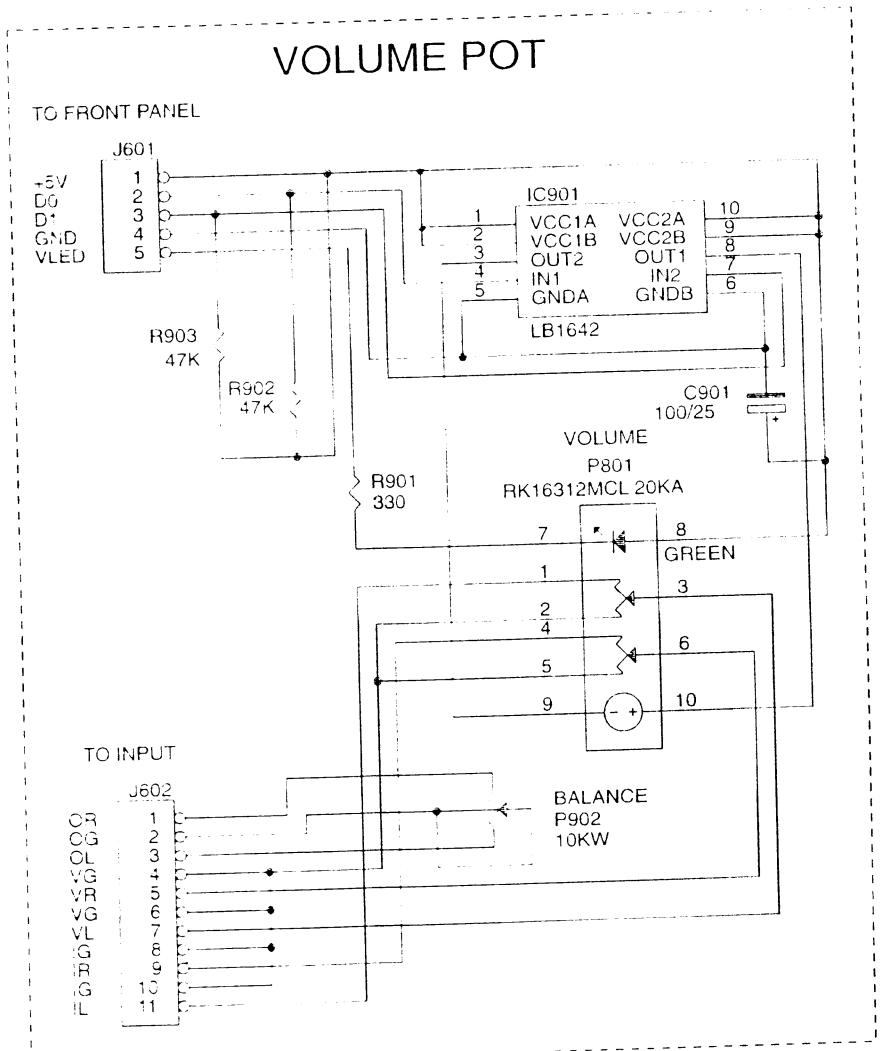
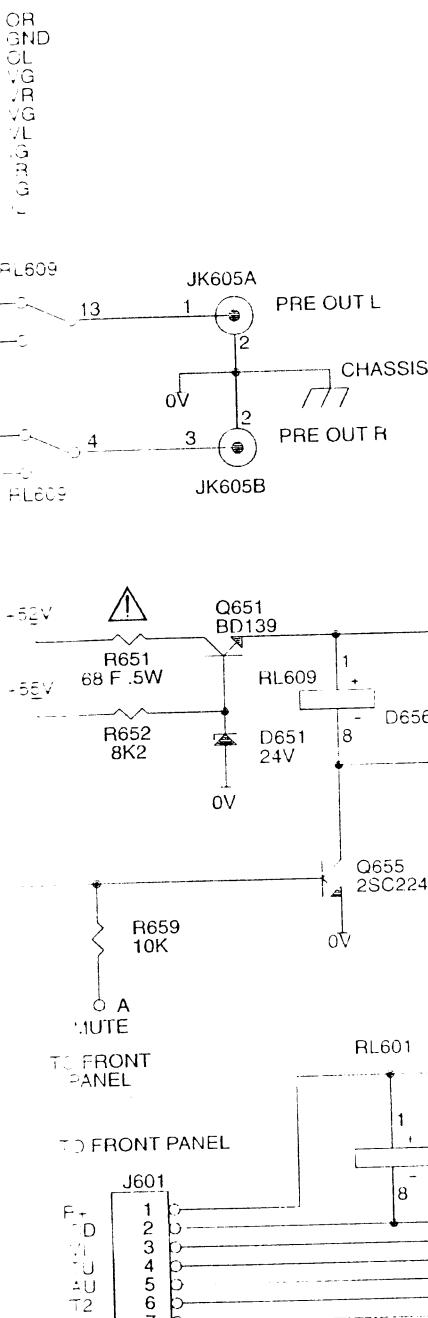


TO FRONT PANEL



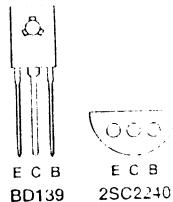
INPUT

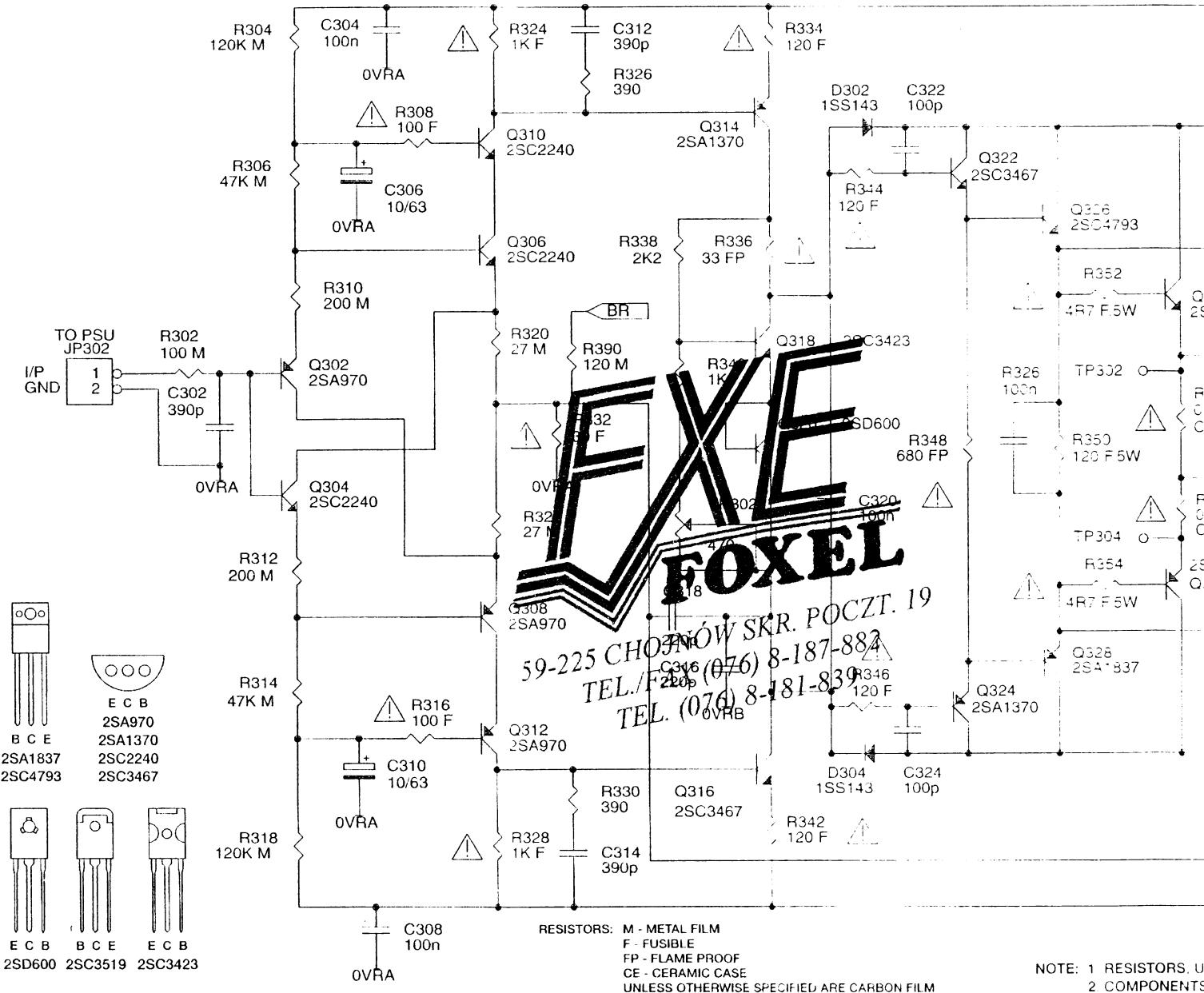
TIME CONTROL



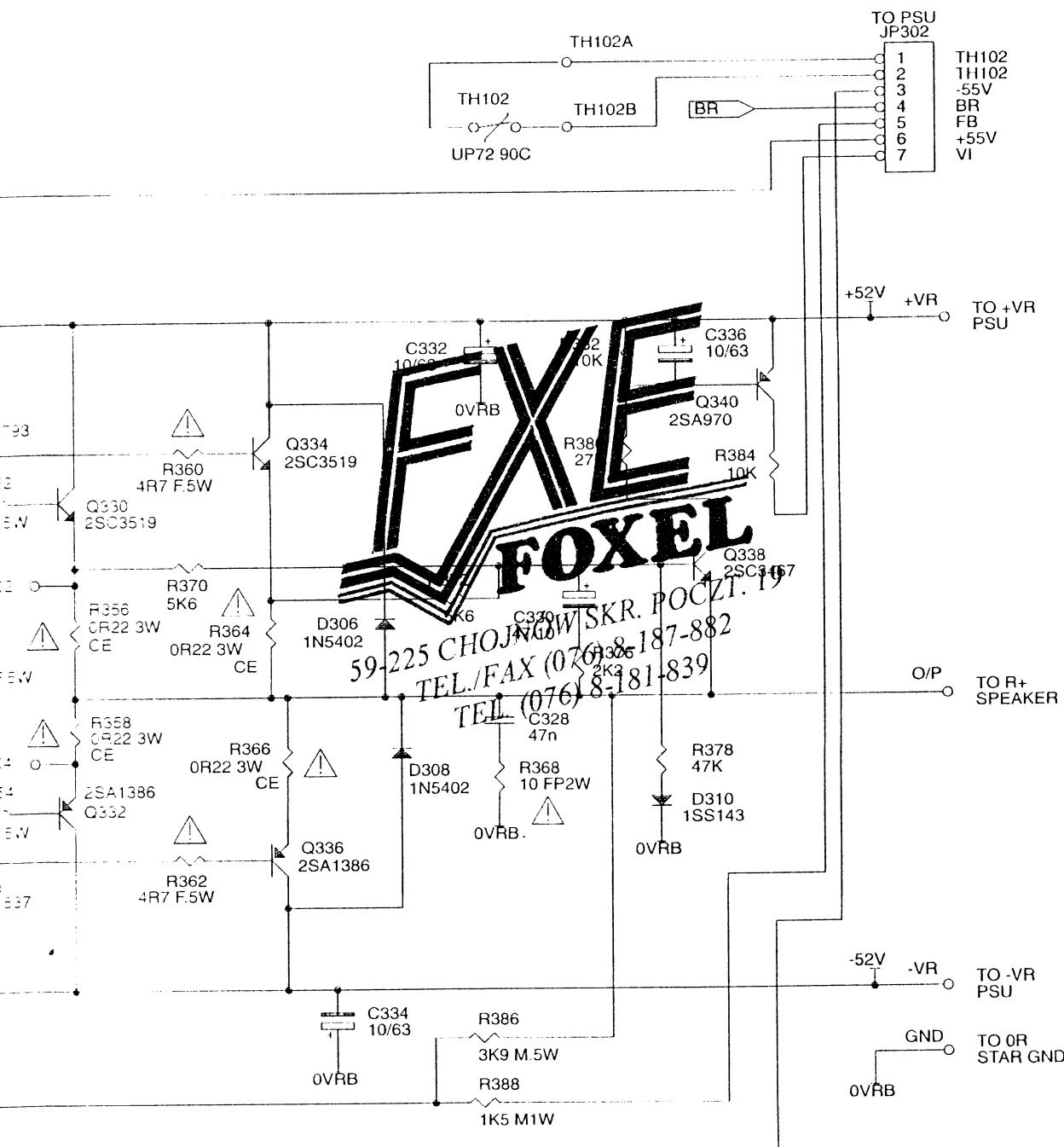
RESISTORS: F - FUSIBLE
UNLESS OTHERWISE SPECIFIED ARE CARBON FILM

NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.
3. DIODES, UNLESS OTHERWISE SPECIFIED, ARE 1N4148.
4. RELAYS, UNLESS OTHERWISE SPECIFIED, ARE GY-24W-K.
5. COMPONENTS MARKED WITH "▲" ARE SAFETY CRITICAL PARTS.

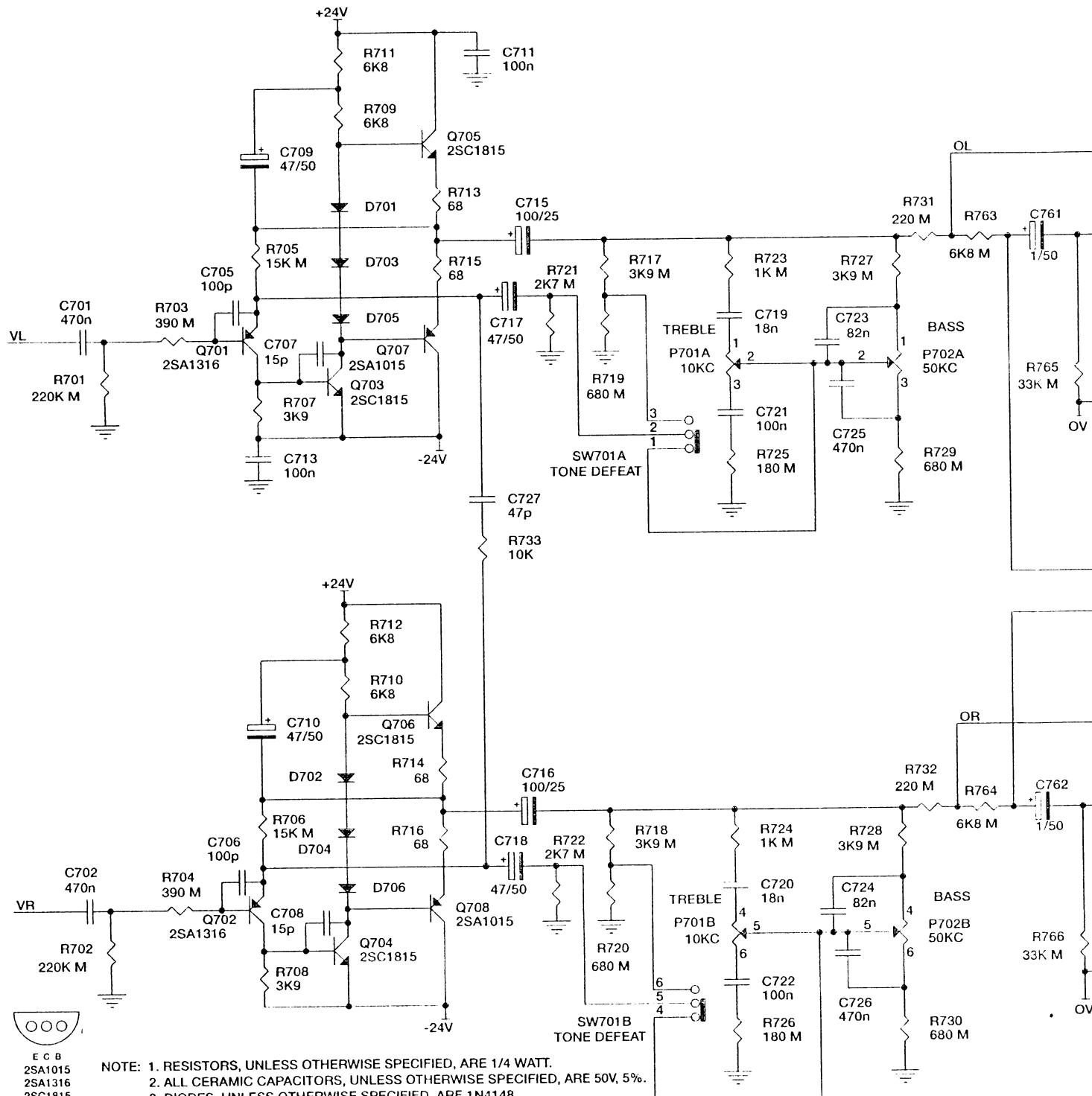




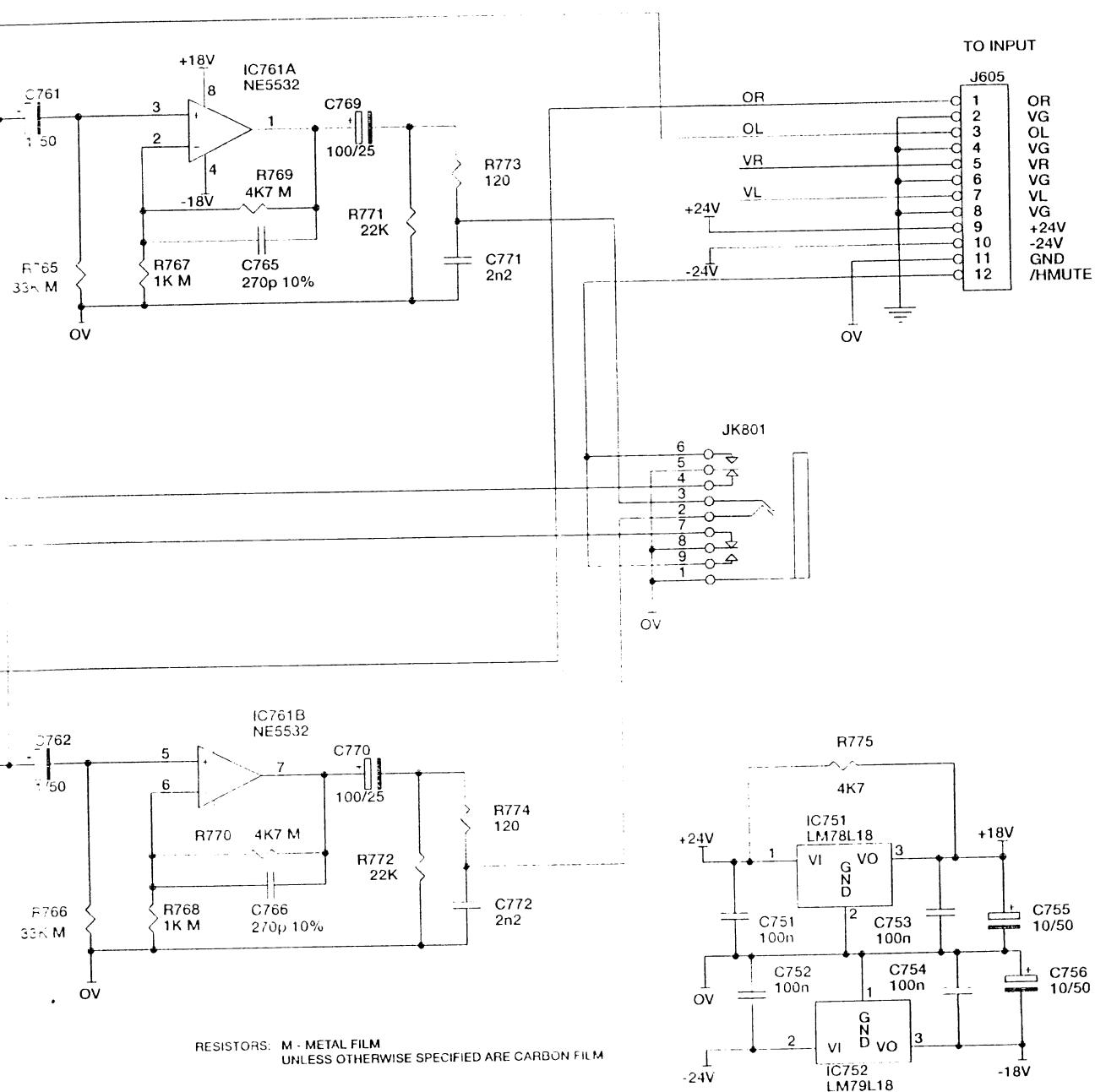
RIGHT POWER AMPLIFIER

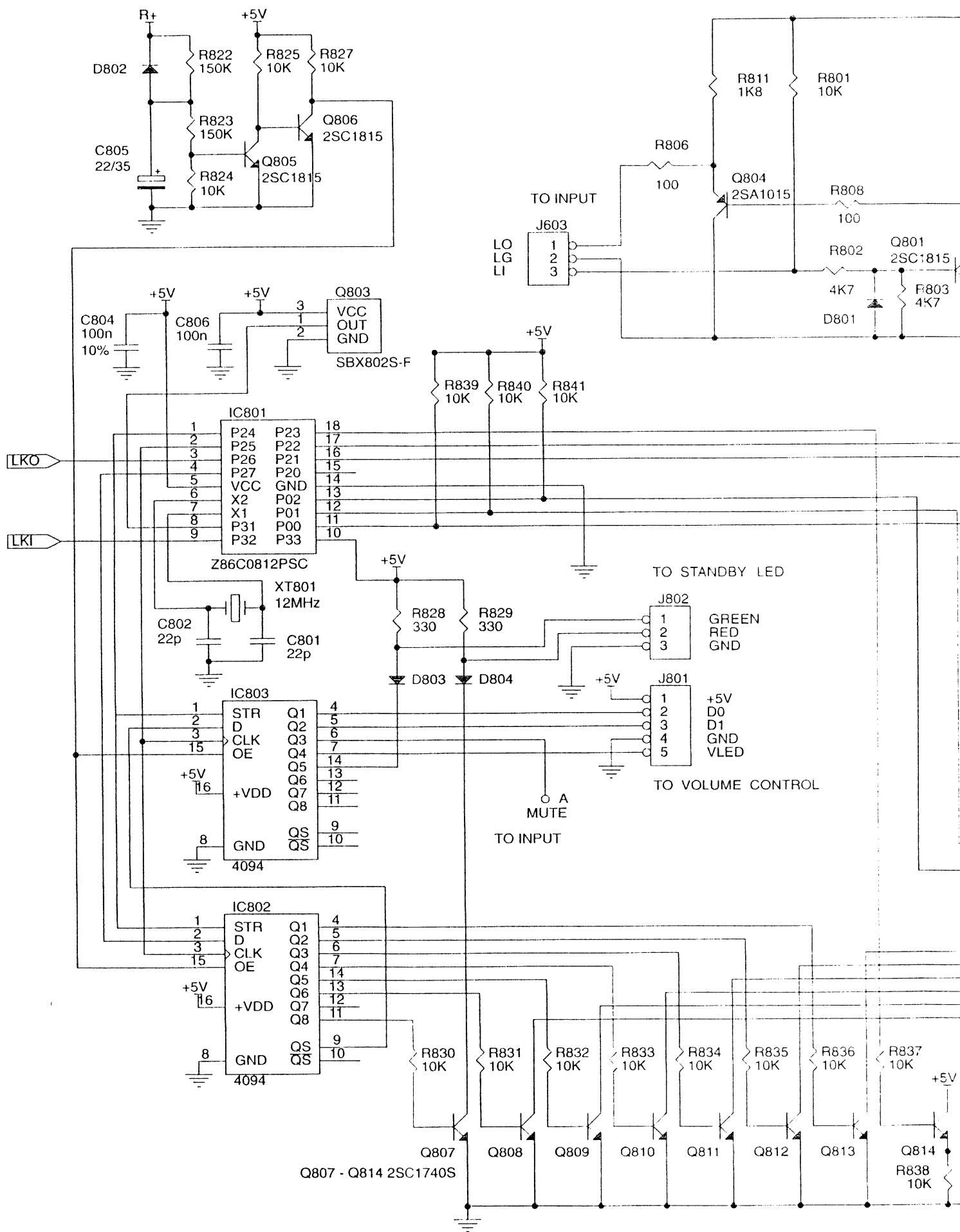


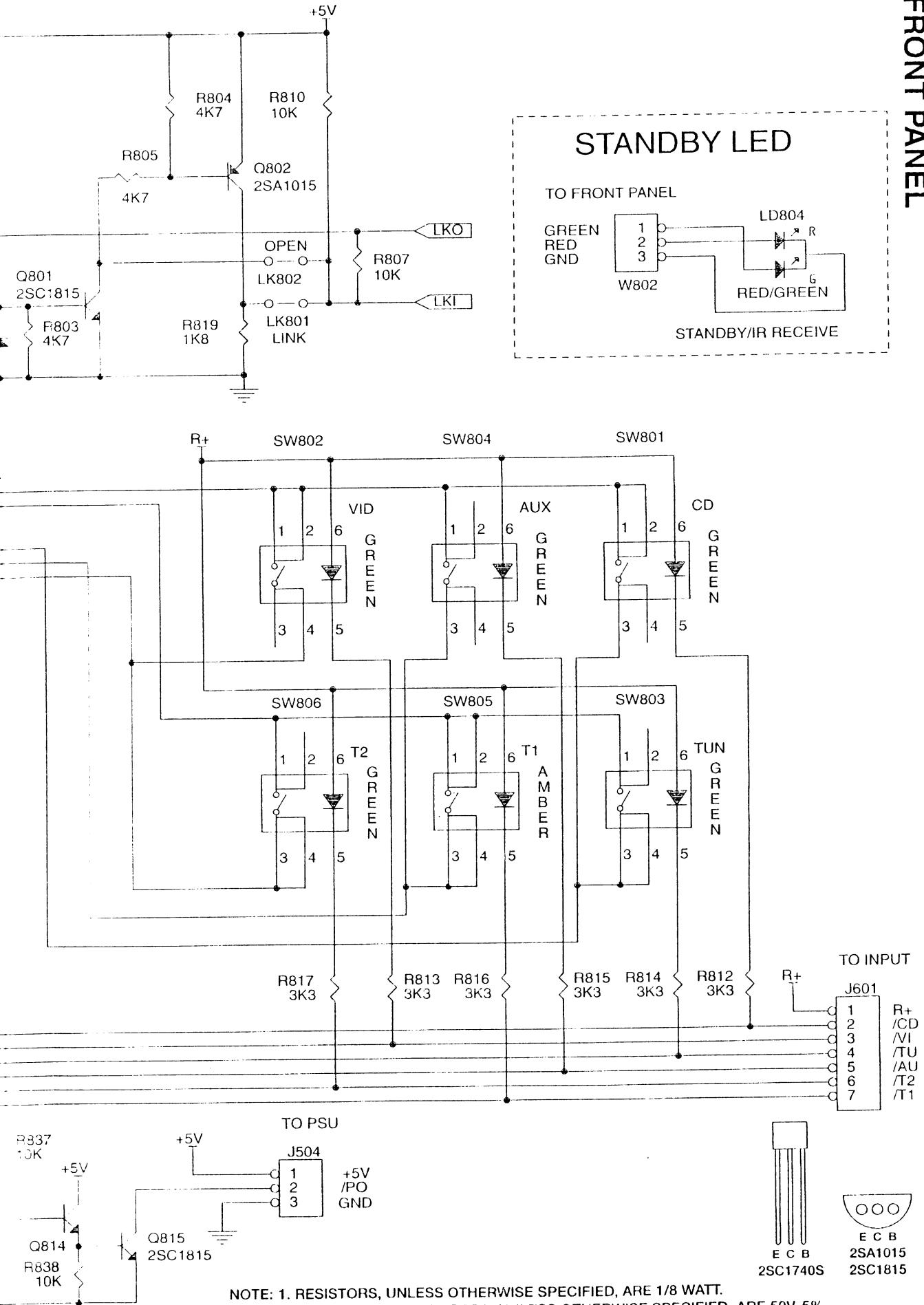
RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT.
COMPONENTS MARKED WITH "▲" ARE SAFETY CRITICAL PARTS.



TONE CONTROL & HEADPHONE AMPLIFIER

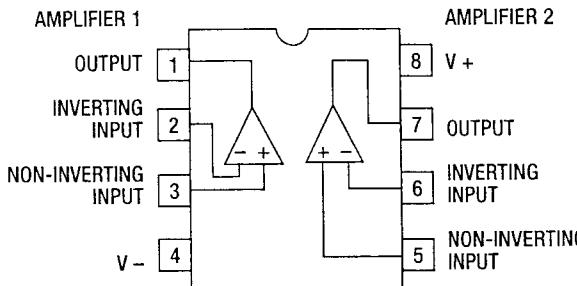
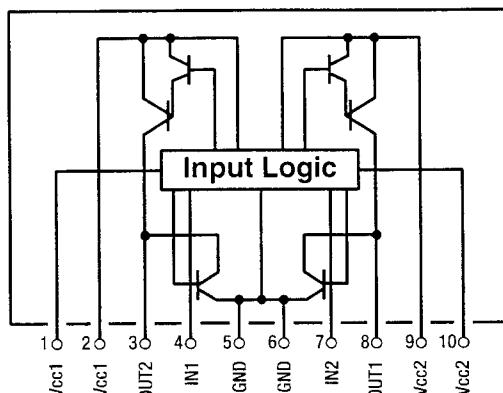
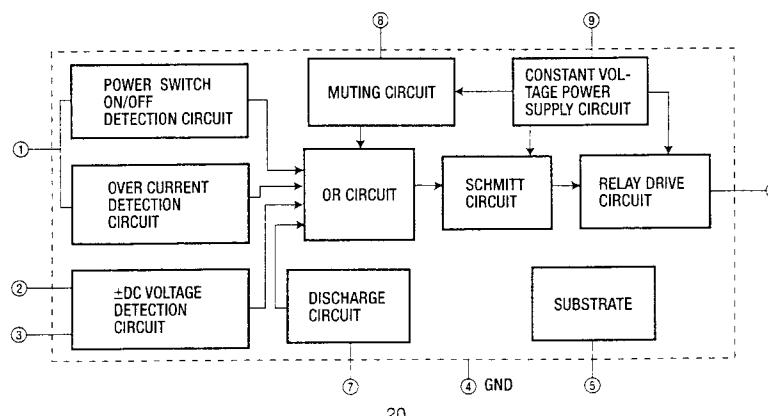
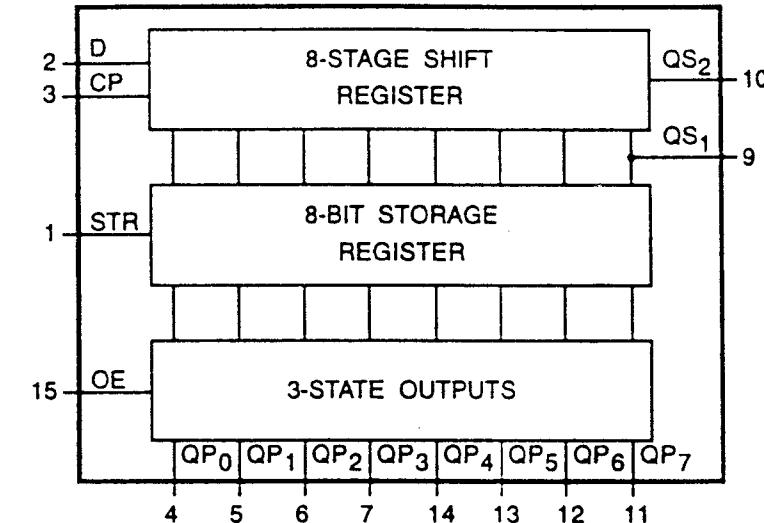




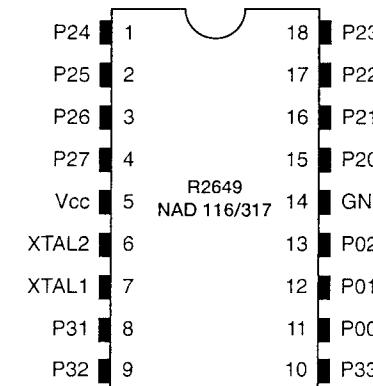


NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/8 WATT.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.
3. DIODES, UNLESS OTHERWISE SPECIFIED, ARE 1N4148.

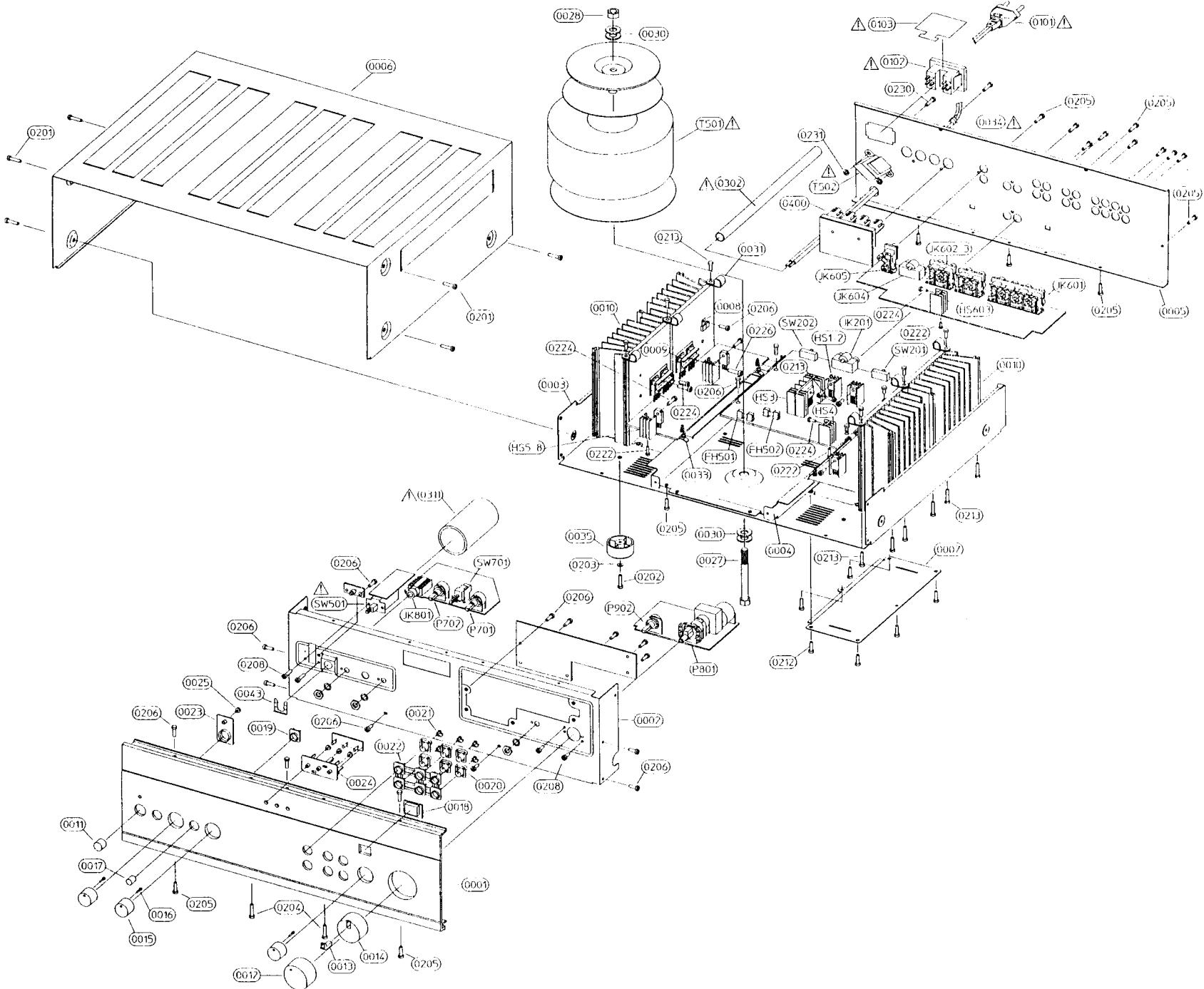
IC BLOCK DIAGRAM

TONE BOARD, PSU & MAIN BOARD
IC761: NE5532, IC201: AD712VOLUME BOARD
IC901: LB1642PSU BOARD
IC202: TA7317PFRONT PANEL BOARD
IC802, IC803: MC14094BCP

IC801: R2649 NAD 116/317



EXPLODED VIEW



EXPLODED VIEW PARTS LIST

| Item | Part No | Description | Qty |
|----------|----------------|-----------------------------------|-----|
| 0001 | 1402-5011-0 | FASCIA | 1 |
| 0002 | 1402-5020-0 | SUBFASCIA | 1 |
| 0003 | 1402-3270-1 | BASE PLATE | 1 |
| 0004 | 1402-3290-2 | CHANNEL | 1 |
| 0005*AH | 1402-5032-0 | REAR PANEL | 1 |
| 0005*B,C | 1402-5082-0 | REAR PANEL | 1 |
| 0006 | 1402-3280-0 | TOP COVER | 1 |
| 0007 | 1402-3300-0 | ACCESS COVER | 2 |
| 0008 | 4132-1661-0 | THERMAL SWITCH MOUNTING CLIP | 2 |
| 0009 | 4132-1671-0 | TRANSISTOR CLAMP | 4 |
| 0010 | 5400-0841-0 | MAIN HEATSINK | 2 |
| 0011 | 2437-640B-0 | POWER BUTTON DIA 11.5 GREEN | 1 |
| 0012 | 1402-3460-0 | 35MM KNOB SKIN | 1 |
| 0013 | 2437-7706-0 | 35MM KNOB LENS | 1 |
| 0014 | 2437-7601-0 | 35MM KNOB CORE | 1 |
| 0015 | 2437-5701-1 | KNOB 18.5MM (BASS,TREBLE,BALANCE) | 3 |
| 0016 | 4152-0041-0 | POINTER | 3 |
| 0017 | 2437-6001-0 | LONG BUTTON 8.0MM | 1 |
| 0018 | 3714-910B-0 | IRS WINDOW LENS | 1 |
| 0019 | 4152-1871-0 | BEZEL | 1 |
| 0020 | 2439-9701-0 | SINGLE LENS BUTTON | 6 |
| 0021 | 3714-9206-1 | BUTTON LENS | 6 |
| 0022 | 4152-1871-0 | BEZEL CLUSTER | 1 |
| 0023 | 4152-1881-0 | POWER BEZEL | 1 |
| 0024 | 4152-1891-0 | LED BEZEL | 1 |
| 0025 | 4152-0011-0 | LED LENS | 4 |
| 0027 | 2907-8070-2000 | M8X1.25P HEX HD (WHT.ZN) | 1 |
| 0028 | 2836-8075-0 | NUT M8X1.25P 6.5T (WHT.ZN) | 1 |
| 0030 | 4132-1971-0 | FLAT WASHER M8X22X1.5 | 4 |
| 0031 | 4152-1911-0 | CABLE CLAMP | 6 |
| 0033 | 4151-9951-1 | PCB SUPPORT DSPLS-4 6.4MM HIGH | 4 |
| 0034 | 4151-9461-0 | STRAIN RELIEF BUSHING | 1 |
| 0035 | 4151-9371-1 | RUBBER FOOT 14.8MM HIGH | 4 |
| 0043 | 4132-4121-0 | PHONE JACK CLIP | 1 |
| 0101*AH | 7009-3100-1 | AC CORD | 1 |
| 0101*B | 7009-5100-0 | AC CORD | 1 |
| 0101*C | 7009-3110-0 | AC CORD | 1 |
| 0102*AH | 2103-7701-2 | AC OUTLET | 1 |
| 0103*AH | 4151-9941-0 | AC OUTLET COVER PLATE | 1 |
| 0201 | 2900-4006-3010 | M4X0.5PX6MM W/FLAT WASHER | 6 |
| 0202 | 2904-3008-3000 | SCREW M3X8 (BLK.ZN) | 4 |
| 0203 | 2842-3367-0 | METAL WASHER ID=3.3 OD=6.7 | 4 |
| 0204 | 2954-3010-3000 | TAPPING 3X10MM B-TITE (BLK.ZN) | 2 |
| 0205 | 2954-3008-3000 | TAPPING 3X8MM B-TITE (BLK.ZN) | 23 |
| 0206 | 2954-3006-0000 | TAPPING 3X6MM B-TITE (YEL.ZN) | 21 |
| 0208 | 2904-3006-0000 | SCREW M3X6 (YEL.ZN) | 4 |
| 0212 | 2950-3508-3000 | TAPPING 3.5X8MM B-TITE (BLK.ZN) | 10 |
| 0213 | 2954-3510-3000 | TAPPING 3.5X10MM B-TITE (BLK.ZN) | 19 |
| 0222 | 2954-2606-0000 | TAPPING 2.6X6MM B-TITE (YEL.ZN) | 10 |
| 0224 | 2954-3008-0000 | TAPPING 3X8MM B-TITE (YEL.ZN) | 10 |

ELECTRICAL PARTS LIST

| Item | Part No | Description | Qty |
|-------------|----------------|--------------------------------|-----|
| 0226 | 2908-4012-3400 | HEXAGON SOCKET HEAD 4X12MM | 4 |
| 0230 | 2904-3008-3000 | SCREW M3X8 (BLK.ZN) | 2 |
| 0231 | 2836-3005-0 | M3X0.5P HEX CAP NUT | 2 |
| 0302 | 1660-0710-0 | GLASS-FIBRE SLEEVE TUBE ID=10 | 1 |
| 0311 | 1660-0630-0 | SHRINKABLE TUBE ID=14MM | 1 |
| 0400*AH | N21038104-0 | SPK.TERMINAL W/O PLUG | 1 |
| 0400*B,C | 2113-1133-0 | SPK. TERMINAL W/PLUG | 1 |
| FH501-FH502 | 4131-9131-0 | FUSE HOLDER 6.5MM PITCH RECT | 4 |
| HS1-2,HS603 | 5400-0851-0 | HEATSINK | 3 |
| HS3 | 5400-0821-1 | HEATSINK | 1 |
| HS4-8 | 5400-0831-0 | HEATSINK | 5 |
| JK201,JK604 | 2103-7902-0 | 2P RCA JACK YKC21-3539 | 2 |
| JK601 | 2113-1101-0 | 8P RCA JACK R/W AUHSP-248V | 1 |
| JK602-3 | 2113-0104-0 | 4P RCA R/W AU 14X14 PITCH | 2 |
| JK605 | 2113-1121-0 | 2P RCA JACK Y/Y AU HSP-242V-22 | 1 |
| JK801 | 2113-1081-1 | PHONE-JACK 6.5MM GOLD | 1 |
| P701 | 4750-3646-0 | VR-TRE 2X10KC W/WASHER & NUT | 1 |
| P702 | 4750-3676-0 | VR-BASS 2X50KC W/WASHER & NUT | 1 |
| P801 | 4750-4470-0 | MOTOR POT20KAX2 VOL | 1 |
| P902 | 4750-3656-0 | VR-BAL 1X10KW W/WASHER & NUT | 1 |
| SW201 | 5200-3161-0-01 | 4PDT SLIDE SW.SK-42F28-G6TS | 1 |
| SW202 | 5200-3171-0-01 | DPDT SLIDE SW.SK-22F28-G9TS | 1 |
| SW501 | 5200-3181-0-01 | POWER SWITCH SDDFA3066A | 1 |
| SW701 | 5200-3121-0-01 | DPDT ALPS SPUN W/O FRAME | 1 |
| T501 | 1806-2142-1 | POWER TRANSFORMER W/HUMSHIELD | 1 |
| T502*AH | 1806-2147-0 | TRANS AC 120V DC9V 350MA EI-35 | 1 |
| T502*B,C | 1806-2148-0 | TRANS AC 230V DC9V 350MA EI-35 | 1 |

NOTE : - The components identified by Δ mark are critical for risk of fire and electrical shock.
 Replace only with part number specified.
 - *AH : USA, Canadian model only.
 - *B : UK model only.
 - *C : European model only.

| Reference No | Part Number | Description |
|--------------------------|----------------|--|
| PSU MAIN ASSEMBLY | | |
| PC BOARD | | |
| *AH | MI-21850A-01-S | PSU MAIN ASSEMBLY |
| *B,C | MI-21850A-02-S | PSU MAIN ASSEMBLY |
| CAPACITORS | | |
| C101-C102 | N158R101J-5-IQ | CP 250V 100pF 5% |
| C103-C104 | 153I-105K-9-NL | CM 63V 1 μ F 10% |
| C105-C106 | 153I-474K-9-NL | CM 63V 0.47 μ F 10% |
| C202-C205 | N89100057-0 | CE 63V 4700 μ F 20% |
| C206-C207 | N157I227M-5-S9 | CE 63V 220 μ F 20% |
| C208-C209 | 153R-103M-9-NL | CM 250V 0.01 μ F 20% |
| C210-C213 | N89100056-0 | CE 160V 220 μ F 20% |
| C214-C215 | 157H-476M-5-S5 | CE 100V 47 μ F 20% |
| C216-C217 | 15CG-220J-7-IJ | CC 50V 22pF 5% NPO |
| C218 | 157I-106M-5-IU | CE 63V 10 μ F 20% |
| C219 | 157I-226M-5-IU | CE 63V 22 μ F 20% |
| C220-C221 | 157I-107M-5-SX | CE 63V 100 μ F 20% |
| C222-C223 | N157H474M-5-IU | CE 100V 0.47 μ F 20% |
| C224 | 157C-226M-5-IU | CE 10V 22 μ F 20% |
| C225 | 153H-104M-9-NL | CM 100V 0.1 μ F 20% |
| C226 | N157H105M-5-IU | CE 100V 1 μ F 20% |
| C227-C228 | 157C-107M-5-IU | CE 10V 100 μ F 20% |
| C229-C230 | 157E-106M-5-IU | CE 25V 10 μ F 20% |
| C231-C232 | 157C-476M-5-IU | CE 10V 47 μ F 20% |
| C501 | N89100049-0 | CAP 400V 4700pF DE7150F472MVA1KC |
| C502 | 157D-108M-5-S9 | CE 16V 1000 μ F 20% |
| C503-C504 | 153H-104M-9-NL | CM 100V 0.1 μ F 20% |
| C505 | 157F-106M-5-IU | CE 50V 10 μ F 20% |
| C901-C902 | N89100057-0 | CE 63V 4700 μ F 20% |
| DIODES | | |
| D101-D104 | 4804-1480-2 | DIODE 1N4148 |
| D201 | N48400610-0 | BRIDGE DIODE GBU8D |
| D202-D207 | 4804-0030-2 | DIODE 1N4003 |
| D208-D209 | 4837-27V0-2 | ZENER DIODE 1/2W 27V(26.2-27.6) |
| D210-D211 | 4804-1480-2 | DIODE 1N4148 |
| D213-D214 | 4840-0510-0 | ZENER DIODE 1/2W 15V HZ 15-3 |
| D215-D216 | 4840-0620-0 | ZENER DIODE 1/2W 24V (23.6-24.7) |
| D501-D504 | 4804-0030-2 | DIODE 1N4003 |
| D505 | 4804-1480-2 | DIODE 1N4148 |
| FUSES | | |
| F501*AH | N51007030-1A | FUSE 7A 125V TIME LAG LBC UL/CSA |
| F501*B,C | N51002530-1B | FUSE 2.5A 250V TIME LAG LBC SEMKO/VDE |
| F502*AH | 5120-0036-0 | FUSE 100mA 250V MEDIUM TIME LAG LBC UL/CSA |
| F502*B,C | 5120-0035-0 | FUSE 100mA 250V TIME LAG LBC SEMKO/VDE |

| <u>Reference No</u> | <u>Part Number</u> | <u>Description</u> |
|----------------------|--------------------|------------------------------|
| ICs | | |
| IC201 | N31303830-0 | IC AD712 (JN) ANALOG DEVICES |
| IC202 | N31303550-0 | IC TA7317P |
| IC501 | 3130-2020-3 | IC 7805 REGULATOR |
| TRANSISTORS | | |
| Q101-Q102 | N48600770-5 | TR 2SC2878 (A,B) |
| Q201 | N48600740-5 | TR 2SD600K (E,F) |
| Q202 | N4851815Y-5 | TR 2SC1815-Y HFE 120-240 |
| Q203 | N48600650-5 | TR 2SA970GR |
| Q204 | N48600870-5 | TR 2SB631K (E,F) |
| Q205-Q206 | N4851815Y-5 | TR 2SC1815-Y HFE 120-240 |
| Q207 | N48600650-5 | TR 2SA970GR |
| Q208 | N485240GR-5 | TR 2SC2240GR |
| RESISTORS | | |
| R101-R102 | 4715-124A-2 | RMF 120k Ohm 1/4W 1% |
| R103-R104 | 4715-152A-2 | RMF 1.5k Ohm 1/4W 1% |
| R105-R106 | 4715-124A-2 | RMF 120k Ohm 1/4W 1% |
| R107-R108 | 4715-152A-2 | RMF 1.5k Ohm 1/4W 1% |
| R109-R110 | N4715225A-2 | RMF 2.2M Ohm 1/4W 1% |
| R201-R202 | △ N4718100J-L-F | RFU 10 Ohm 1W 5% |
| R203-R205 | △ 4715-101J-2-F | RFU 100 Ohm 1/4W 5% |
| R208 | △ 4715-101J-2-F | RFU 100 Ohm 1/4W 5% |
| R212 | 4715-223A-2 | RMF 22k Ohm 1/4W 1% |
| R217 | 4715-223A-2 | RMF 22k Ohm 1/4W 1% |
| R229 | △ 4717-681J-2-F | RFU 680 Ohm 1/2W 5% |
| R250 | 4718-152A-1 | RMF 1.5k Ohm 1W 1% |
| R251 | N4717272A-2 | RMF 2.7k Ohm 1/2W 1% |
| R252 | △ 4715-101J-2-F | RFU 100 Ohm 1/4W 5% |
| R501 | △ 4715-3R9J-2-F | RFU 3.9 Ohm 1/4W 5% |
| RELAYS | | |
| RL201 | N45000130-0 | RELAY DEC DH48D2-0 |
| RL501 | △ 4500-0230-0 | RELAY VS-5MB TV810A |
| TONE ASSEMBLY | | |
| PC BOARD | MI-21850B-01-S | TONE ASSEMBLY |
| CAPACITORS | | |
| C701-C702 | 153I-474J-9-NO | CM 63V 0.47µF 5% |
| C709-C710 | 157F-476M-5-IU | CE 50V 47µF 20% |
| C711,C713 | 153I-104K-9-NL | CM 63V 0.1µF 10% |
| C715-C716 | 157F-107M-5-OW | CE 50V 100µF 20% |
| C717-C718 | 157F-476M-5-IU | CE 50V 47µF 20% |
| C719-C720 | 153I-183K-9-NL | CM 63V 0.018µF 10% |
| C721-C722 | 153I-104K-9-NL | CM 63V 0.1µF 10% |
| C723-C724 | 153I-823K-9-NL | CM 63V 0.082µF 10% |
| C725-C726 | 153I-474J-9-NO | CM 63V 0.47µF 5% |
| C751-C754 | 153I-104K-9-NL | CM 63V 0.1µF 10% |
| C755-C756 | 157F-106M-5-IU | CE 50V 10µF 20% |
| C761-C762 | 157F-105M-5-IU | CE 50V 1µF 20% |
| C769-C770 | 157F-107M-5-OW | CE 50V 100µF 20% |
| C771-C772 | 153I-222K-9-NL | CM 63V 2200pF 10% |

| Reference No | Part Number | Description |
|---|---|---|
| DIODES D701-D706 | 4804-1480-2 | DIODE 1N4148 |
| ICs IC751 IC752 IC761 | 3130-4830-0 3130-4840-0 3130-2430-0 | IC LM78L18 REGULATOR IC LM79L18 REGULATOR IC NE5532 OP AMP |
| TRANSISTORS Q701-Q702 Q703-Q706 Q707-Q708 | N48600670-5 N4851815Y-5 N48600660-5 | TR 2SA1316BL TR 2SC1815-Y HFE 120-240 TR 2SA1015GR |
| RESISTORS R701-R702 R703-R704 R705-R706 R717-R718 R719-R720 R721-R722 R723-R724 R725-R726 R727-R728 R729-R729 R731-R732 R763-R764 R765-R766 R767-R768 R769-R770 | 4715-224C-2 4715-391C-2 4715-153C-2 4715-392C-2 4715-681C-2 4715-272C-2 4715-102C-2 4715-181C-2 4715-392C-2 4715-681C-2 4715-221C-2 4715-682C-2 4715-333C-2 4715-102C-2 4715-472C-2 | RMF 220k Ohm 1/4W 2% RMF 390 Ohm 1/4W 2% RMF 15k Ohm 1/4W 2% RMF 3.9k Ohm 1/4W 2% RMF 680 Ohm 1/4W 2% RMF 2.7k Ohm 1/4W 2% RMF 1k Ohm 1/4W 2% RMF 180 Ohm 1/4W 2% RMF 3.9k Ohm 1/4W 2% RMF 680 Ohm 1/4W 2% RMF 220 Ohm 1/4W 2% RMF 6.8k Ohm 1/4W 2% RMF 33k Ohm 1/4W 2% RMF 1k Ohm 1/4W 2% RMF 4.7k Ohm 1/4W 2% |
| FRONT PANEL ASSEMBLY <i>PC BOARD</i> | MI-21850C-01-S | FRONT PANEL ASSEMBLY |
| CAPACITORS C805 C806 | 157Q-226M-5-OW 153H-104M-9-NL | CE 35V 22μF 20% CM 100V 0.1μF 20% |
| DIODES D801-D804 | 4804-1480-2 | DIODE 1N4148 |
| ICs IC801 IC802-IC803 | 3130-4740-1 N31303600-0 | Z86E0812PSCR2649 MASKED (NAD116/317) MC14094BCP 8-BIT SIPO SR 3S |
| TRANSISTORS Q801 Q802 Q803 Q804 Q805-Q806 Q807-Q814 Q815 | 4860-0700-5 N48600660-5 481X-8025-3 N48600660-5 4860-0700-5 4860-1590-5 4860-0700-5 | TR 2SC1815GR TR 2SA1015GR IR SENSOR SBX8025-F TR 2SA1015GR TR 2SC1815GR TR 2SC1740S HFE 180-390 TR 2SC1815GR |
| SWITCHES SW801-SW804 | N52003201-0-01 | TACT LED GREEN SKWQFG ALPS |

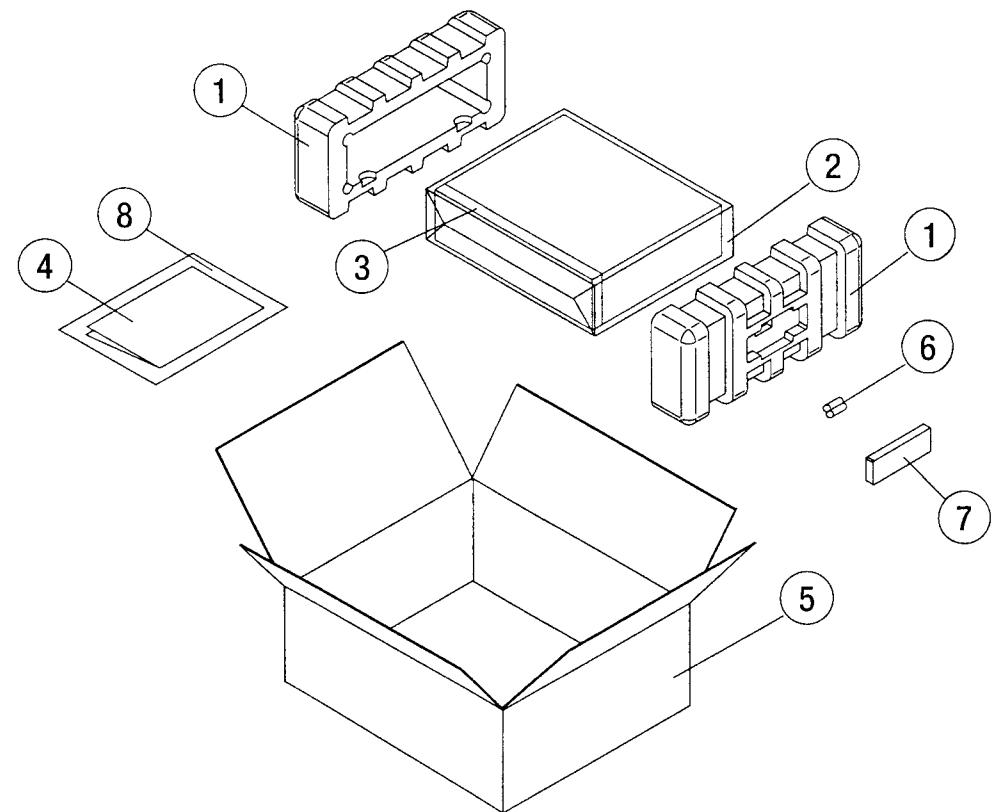
| Reference No | Part Number | Description |
|--|--|---|
| SW805 SW806 | N52003231-0-01 N52003201-0-01 | TACT LED AMBER SKHQFH ALPS TACT LED GREEN SKWQFG ALPS |
| RESONATOR XT801 | 2703-0130-0 | CR RESONATOR CSA 12MHZ |
| VOLUME ASSEMBLY <i>PC BOARD</i> | MI-21850D-01-S | VOLUME ASSEMBLY |
| CAPACITOR C901 | 157E-107M-5-KW | CE 25V 100μF 20% |
| IC IC901 | N31303410-0 | IC LB1642 SANYO MOTOR DRIVER |
| SPEAKER ASSEMBLY <i>PC BOARD</i> | MI-21850E-01-S MI-21850E-02-S | SPEAKER ASSEMBLY SPEAKER ASSEMBLY |
| COILS L401-L402 | N18040490-0 | SPRING COIL 1μH 1/9/16.5 |
| RESISTORS R401-R402 | N47183R3J-2-P | RFP 3.3 Ohm 1W 5% |
| PAL/PAR ASSEMBLY <i>PC BOARD</i> | MI-21860A-01-S | PAL/PAR ASSEMBLY |
| CAPACITORS C301-C302 C303-C304 C305-C306 C307-C308 C309-C310 C311-C314 C315-C318 C319-C320 C321-C324 C325-C326 C327-C328 C329-C330 C331-C336 | N158F391J-5-IQ 153H-104M-9-NL 157I-106M-5-IU 153H-104M-9-NL 157I-106M-5-IU N158F391J-5-IQ N158K221J-5-IQ 153H-104M-9-NL N158R101J-5-IQ 153H-104M-9-NL 153H-473K-9-SW 157C-476M-5-IU 157I-106M-5-IU | CP 50V 390pF 5% CM 100V 0.1μF 20% CE 63V 10μF 20% CM 100V 0.1μF 20% CE 63V 10μF 20% CP 50V 390pF 5% CP 150V 220pF 5% CM 100V 0.1μF 20% CP 250V 100pF 5% CM 100V 0.1μF 20% CM 100V 0.047μF 10% CE 10V 47μF 20% CE 63V 10μF 20% |
| DIODES D302-D304 D305-D308 D309-D310 | 4840-0590-0 N48054020-L 4840-0590-0 | DIODE 1SS143 DIODE 1N5402 DIODE 1SS143 |
| TRANSISTORS Q301-Q302 Q303-Q306 Q307-Q308 | N48600650-5 N485240GR-5 N48600650-5 | TR 2SA970GR TR 2SC2240GR TR 2SA970GR |

| Reference No | Part Number | Description |
|---------------------------|----------------|------------------------|
| Q309-Q310 | N485240GR-5 | TR 2SC2240GR |
| Q311-Q312 | N48600650-5 | TR 2SA970GR |
| Q313-Q314 | N48600680-5 | TR 2SA1370 (E) |
| Q315-Q316 | N48600720-5 | TR 2SC3467 (E) |
| Q317-Q318 | N48600790-5 | TR 2SC3423 (Y) |
| Q319-Q320 | N48600740-5 | TR 2SD600K (E,F) |
| Q321-Q322 | N48600720-5 | TR 2SC3467 (E) |
| Q323-Q324 | N48600680-5 | TR 2SA1370 (E) |
| Q325-Q326 | 4860-1060-5 | TR 2SC4793 HFE 100-320 |
| Q327-Q328 | 4860-1050-5 | TR 2SA1837 HFE 100-320 |
| Q329-Q330 | N48600730-5 | TR 2SC3519 (O,P,Y) |
| Q331-Q332 | N48600690-5 | TR 2SA1386 (O,P,Y) |
| Q333-Q334 | N48600730-5 | TR 2SC3519 (O,P,Y) |
| Q335-Q336 | N48600690-5 | TR 2SA1386 (O,P,Y) |
| Q337-Q338 | N48600720-5 | TR 2SC3467 (E) |
| Q339-Q340 | N48600650-5 | TR 2SA970GR |
| RESISTORS | | |
| R301-R302 | 4715-101A-2 | RMF 100 Ohm 1/4W 1% |
| R303-R304 | 4715-124A-2 | RMF 120k Ohm 1/4W 1% |
| R305-R306 | 4715-473A-2 | RMF 47k Ohm 1/4W 1% |
| R307-R308 | 4715-101J-2-F | RFU 100 Ohm 1/4W 5% |
| R309-R312 | 4715-201A-2 | RMF 200 Ohm 1/4W 1% |
| R313-R314 | 4715-473A-2 | RMF 47k Ohm 1/4W 1% |
| R315-R316 | 4715-101J-2-F | RFU 100 Ohm 1/4W 5% |
| R317-R318 | 4715-124A-2 | RMF 120k Ohm 1/4W 1% |
| R319-R322 | 4715-270A-2 | RMF 27 Ohm 1/4W 1% |
| R323-R324 | 4715-102J-2-F | RFU 1k Ohm 1/4W 5% |
| R327-R328 | 4715-102J-2-F | RFU 1k Ohm 1/4W 5% |
| R331-R332 | 4715-390J-2-F | RFU 39 Ohm 1/4W 5% |
| R333-R334 | 4715-121J-2-F | RFU 120 Ohm 1/4W 5% |
| R335-R336 | N4715330J-2-P | RFP 33 Ohm 1/4W 5% |
| R341-R346 | 4715-121J-2-F | RFU 120 Ohm 1/4W 5% |
| R347-R348 | N4715681J-2-P | RFP 680 Ohm 1/4W 5% |
| R349-R350 | 4717-121J-2-F | RFU 120 Ohm 1/2W 5% |
| R351-R354 | 4717-4R7J-2-F | RFU 4.7 Ohm 1/2W 5% |
| R355-R358 | 471A-022K-5-N | RCE 0.22 Ohm 3W 10% |
| R359-R362 | 4717-4R7J-2-F | RFU 4.7 Ohm 1/2W 5% |
| R363-R366 | 471A-022K-5-N | RCE 0.22 Ohm 3W 10% |
| R367-R368 | 4719-100J-1-P | RFP 10 Ohm 2W 5% |
| R385-R386 | N4717392A-2 | RMF 3.9k Ohm 1/2W 1% |
| R387-R388 | N4718152A-1 | RMF 1.5k Ohm 1W 1% |
| R390 | N4715121A-2 | RMF 120 Ohm 1/4W 1% |
| THERMAL BREAKERS | | |
| TH101-TH102 | N89100055-0 | THERMAL BREAKER 90C |
| VARIABLE RESISTORS | | |
| VR301-VR302 | N47564716-3-06 | SVR 470 H3 7X7.6 |

| Reference No | Part Number | Description |
|------------------------------|----------------|----------------------------------|
| INPUT ASSEMBLY | | |
| PC BOARD | MI-21860B-01-S | INPUT ASSEMBLY |
| CAPACITORS | | |
| C651-C654 | 153I-104K-9-NL | CM 63V 0.1 μ F 10% |
| C655-C656 | 157F-106M-5-IU | CE 50V 10 μ F 20% |
| DIODES | | |
| D601-D606 | 4804-1480-2 | DIODE 1N4148 |
| D651 | 4840-0620-0 | ZENER DIODE 1/2W 24V (23.6-24.7) |
| D656 | 4804-1480-2 | DIODE 1N4148 |
| D657-D658 | 4840-1260-0 | ZENER DIODE 1.3W 16V |
| ICs | | |
| IC651 | 3130-4810-0 | IC LM78L24 REGULATOR |
| IC652 | 3130-4820-0 | IC LM79L24 REGULATOR |
| TRANSISTORS | | |
| Q651 | N485D1390-5 | TR BD139-10 HFE 63-160 |
| Q655 | N485240GR-5 | TR 2SC2240GR |
| RESISTORS | | |
| R651 | 4717-680J-2-F | RFU 68 Ohm 1/2W 5% |
| RELAYS | | |
| RL601-RL606 | 4500-0210-0 | RELAY GY-24W-K (TAKAMISAWA) |
| RL609 | 4500-0210-0 | RELAY GY-24W-K (TAKAMISAWA) |
| LED ASSEMBLY | | |
| PC BOARD | MI-21860C-01-S | LED ASSEMBLY |
| LEDS | | |
| LD801-LD802 | N37003513-Y | LED AMBER (L-424YDT) |
| LD803 | 3700-2522-R | LED RED |
| STANDBY LED ASSEMBLY | | |
| PC BOARD | MI-21860D-01-S | STANDBY LED ASSEMBLY |
| LED | | |
| LD804 | N37003517-RG | LED RED/GREEN (L-469HWG) |
| POWER SWITCH ASSEMBLY | | |
| PC BOARD | MI-21850F-01-S | POWER SWITCH PCB ASSEMBLY |
| CAPACITOR | | |
| C502 | N89100049-0 | CAP 400V 4700pF DE7150F472MVA1KC |

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 - \triangle : USA, Canadian model only.
 - \triangle : UK model only.
 - \triangle : European model only.
 - Capacitors : CP-Polystyrene, CM-Mylar, CE-Electrolytic, CC-Ceramic.
 - Resistors : RMF-Metal Film, RFU-Fusible, RFP-Flame Proof, RCE-Ceramic Case.

PACKING DIAGRAM



PACKING LIST

| <u>Item</u> | <u>Part No</u> | <u>Description</u> | <u>Qty</u> |
|-------------|----------------|--------------------|------------|
| 1 | 1490-2093-1 | POLYFOAM END CAP | 2 |
| 2 | N14971072-3 | UNIT POLYBAG | 1 |
| 3 | N14971252-0 | FASCIA COVER | 1 |
| 4 | 4301-3669-0 | INSTRUCTION MANUAL | 1 |
| 5 | 1476-5201-0 | CARTON BOX | 1 |
| 6 | 4060-0580-0 | BATTERIES | 2 |
| 7 | 8900-1070-0 | REMOTE CONTROL | 1 |
| 8 | N14971062-0 | MANUAL POLYBAG | 1 |