

C 316BEE

**STEREO
AMPLIFIER**

SERVICE MANUAL

C 316BEE

**STEREO
AMPLIFIER**

NAD

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PRODUCT SAFETY SERVICING GUIDELINES

CAUTION : DO NOT ATTEMPT TO MODIFY THIS PRODUCT IN ANY WAY. NEVER PERFORM CUSTOMIZED INSTALLATIONS WITHOUT MANUFACTURER'S APPROVAL. UNAUTHORIZED MODIFICATIONS WILL NOT ONLY VOID THE WARRANTY, BUT MAY LEAD TO YOUR BEING LIABLE FOR ANY RESULTING PROPERTY DAMAGE OR USER INJURY.

SERVICE WORK SHOULD BE PERFORMED ONLY AFTER YOU ARE THOROUGHLY FAMILIAR WITH ALL OF THE FOLLOWING SAFETY CHECKS AND SERVICING GUIDELINES. TO DO OTHERWISE, INCREASES THE RISK OF POTENTIAL HAZARDS AND INJURY TO THE USER.

WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM AC LINE SHOCK.

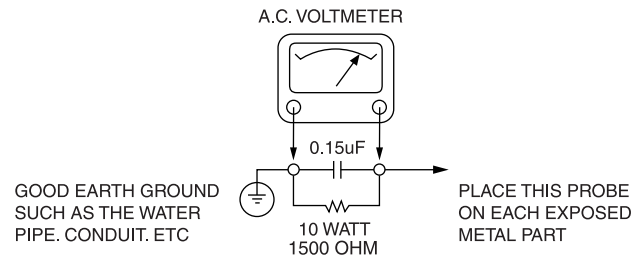
SAFETY CHECKS

AFTER THE ORIGINAL SERVICE PROBLEM HAS BEEN CORRECTED. A CHECK SHOULD BE MADE OF THE FOLLOWING.

SUBJECT : FIRE & SHOCK HAZARD

1. BE SURE THAT ALL COMPONENTS ARE POSITIONED IN SUCH A WAY AS TO AVOID POSSIBILITY OF ADJACENT COMPONENT SHORTS. THIS IS ESPECIALLY IMPORTANT ON THOSE MODULES WHICH ARE TRANSPORTED TO AND FROM THE REPAIR SHOP.
2. NEVER RELEASE A REPAIR UNLESS ALL PROTECTIVE DEVICES SUCH AS INSULATORS, BARRIERS, COVERS, SHIELDS, STRAIN RELIEFS, POWER SUPPLY CORDS, AND OTHER HARDWARE HAVE BEEN REINSTALLED PER ORIGINAL DESIGN. BE SURE THAT THE SAFETY PURPOSE OF THE POLARIZED LINE PLUG HAS NOT BEEN DEFEATED.
3. SOLDERING MUST BE INSPECTED TO DISCOVER POSSIBLE COLD SOLDER JOINTS, SOLDER SPLASHES OR SHARP SOLDER POINTS. BE CERTAIN TO REMOVE ALL LOOSE FOREIGN PARTICLES.
4. CHECK FOR PHYSICAL EVIDENCE OF DAMAGE OR DETERIORATION TO PARTS AND COMPONENTS. FOR FRAYED LEADS, DAMAGED INSULATION (INCLUDING AC CORD). AND REPLACE IF NECESSARY FOLLOW ORIGINAL LAYOUT, LEAD LENGTH AND DRESS.
5. NO LEAD OR COMPONENT SHOULD TOUCH A RECEIVING TUBE OR A RESISTOR RATED AT 1 WATT OR MORE. LEAD TENSION AROUND PROTRUDING METAL SURFACES MUST BE AVOIDED.
6. ALL CRITICAL COMPONENTS SUCH AS FUSES, FLAMEPROOF RESISTORS, CAPACITORS, ETC. MUST BE REPLACED WITH EXACT FACTORY TYPES, DO NOT USE REPLACEMENT COMPONENTS OTHER THAN THOSE SPECIFIED OR MAKE UNRECOMMENDED CIRCUIT MODIFICATIONS.
7. AFTER RE-ASSEMBLY OF THE SET ALWAYS PERFORM AN AC LEAKAGE TEST ON ALL EXPOSED METALLIC PARTS OF THE CABINET, (THE CHANNEL SELECTOR KNOB, ANTENNA TERMINALS. HANDLE AND SCREWS) TO BE SURE THE SET IS SAFET TO OPERATE WITHOUT DANGER OF ELECTRICAL SHOCK. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST USE AN AC VOLTMETER, HAVING 5000 OHMS PER VOLT OR MORE SENSITIVITY, IN THE FOLLOWING MANNER; CONNECT A 1500 OHM 10 WATT RESISTOR, PARALLELED BY A .15 MFD, 150V AC TYPE CAPACITOR BETWEEN A KNOWN GOOD EARTH GROUND (WATER PIPE, CONDUIT, ETC.) AND THE EXPOSED METALLIC PARTS, ONE AT A TIME.
MEASURE THE AC VOLTAGE ACROSS THE COMBINATION OF 1500 OHM RESISTOR AND .15 MFD CAPACITOR.
REVERSE THE AC PLUG AND REPEAT AC VOLTAGE MEASUREMENTS FOR EACH EXPOSED METALLIC PART.

VOLTAGE MEASURE MUST NOT EXCEED 75 VOLTS R.M.S. THIS CORRESPONDS TO 0.5 MILLIAMPS AC ANY VALUE EXCEEDING THIS LIMIT CONSTITUTES A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED IMMEDIATELY.



SUBJECT : GRAPHIC SYMBOLS



THE LIGHTNING FLASH WITH ARROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.



THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE.

SUBJECT : TIPS ON PROPER INSTALLATION

1. NEVER INSTALL ANY PRODUCT IN A CLOSED-IN RECESS, CUBBYHOLE OR CLOSELY FITTING SHELF SPACE. OVER OR CLOSE TO HEAT DUCT, OR IN THE PATH OF HEATED AIR FLOW.
2. AVOID CONDITIONS OF HIGH HUMIDITY SUCH AS: OUTDOOR PATIO INSTALLATIONS WHERE DEW IS A FACTOR, NEAR STEAM RADIATORS WHERE STEAM LEAKAGE IS A FACTOR, ETC.
3. AVOID PLACEMENT WHERE DRAPERIES MAY OBSTRUCT REAR VENTING. THE CUSTOMER SHOULD ALSO AVOID THE USE OF DECORATIVE SCARVES OR OTHER COVERINGS WHICH MIGHT OBSTRUCT VENTILATION.
4. WALL AND SHELF MOUNTED INSTALLATIONS USING A COMMERCIAL MOUNTING KIT MUST FOLLOW THE FACTORY APPROVED MOUNTING INSTRUCTIONS A PRODUCT MOUNTED TO A SHELF OR PLATFORM MUST RETAIN ITS ORIGINAL FEET (OR THE EQUIVALENT THICKNESS IN SPACERS) TO PROVIDE ADEQUATE AIR FLOW ACROSS THE BOTTOM, BOLTS OR SCREWS USED FOR FASTENERS MUST NOT TOUCH ANY PARTS OR WIRING. PERFORM LEAKAGE TEST ON CUSTOMIZED INSTALLATIONS.
5. CAUTION CUSTOMERS AGAINST THE MOUNTING OF A PRODUCT ON SLOPING SHELF OR A TILTED POSITION, UNLESS THE PRODUCT IS PROPERLY SECURED.
6. A PRODUCT ON A ROLL-ABOUT CART SHOULD BE STABLE ON ITS MOUNTING TO THE CART. CAUTION THE CUSTOMER ON THE HAZARDS OF TRYING TO ROLL A CART WITH SMALL CASTERS ACROSS THRESHOLDS OR DEEP PILE CARPETS.
7. CAUTION CUSTOMERS AGAINST THE USE OF A CART OR STAND WHICH HAS NOT BEEN LISTED BY UNDERWRITERS LABORATORIES, INC. FOR USE WITH THEIR SPECIFIC MODEL OF TELEVISION RECEIVER OR GENERICALLY APPROVED FOR USE WITH T.V.'S OF THE SAME OR LARGER SCREEN SIZE.
8. CAUTION CUSTOMERS AGAINST THE USE OF EXTENSION CORDS, EXPLAIN THAT A FOREST OF EXTENSIONS SPROUTING FROM A SINGLE OUTLET CAN LEAD TO DISASTROUS CONSEQUENCES TO HOME AND FAMILY.

SERVICING PRECAUTIONS

CAUTION : Before servicing the A/V Receiver covered by this service data and its supplements and addends, read and follow the **SAFETY PRECAUTIONS**. **NOTE** : if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publication, always follow the safety precautions.

Remember Safety First:

General Servicing Precautions

1. Always unplug the A/V Receiver AC power cord from the AC power source before:
 - (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
 - (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
 - (3) Connecting a test substitute in parallel with an electrolytic capacitor.

Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Do not spray chemicals on or near this A/V Receiver or any of its assemblies.
3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cottontipped swab, or comparable soft applicator.
Unless specified otherwise in this service data, lubrication of contacts is not required.
4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
5. Do not apply AC power to this A/V Receiver and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
6. Always connect test instrument ground lead to the appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter(500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

Note 1 : Accessible Conductive Parts including Metal panels, Input terminals, Earphone jacks, etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical Es devices are integrated circuits and some field effect transistors and semiconductor chip components.

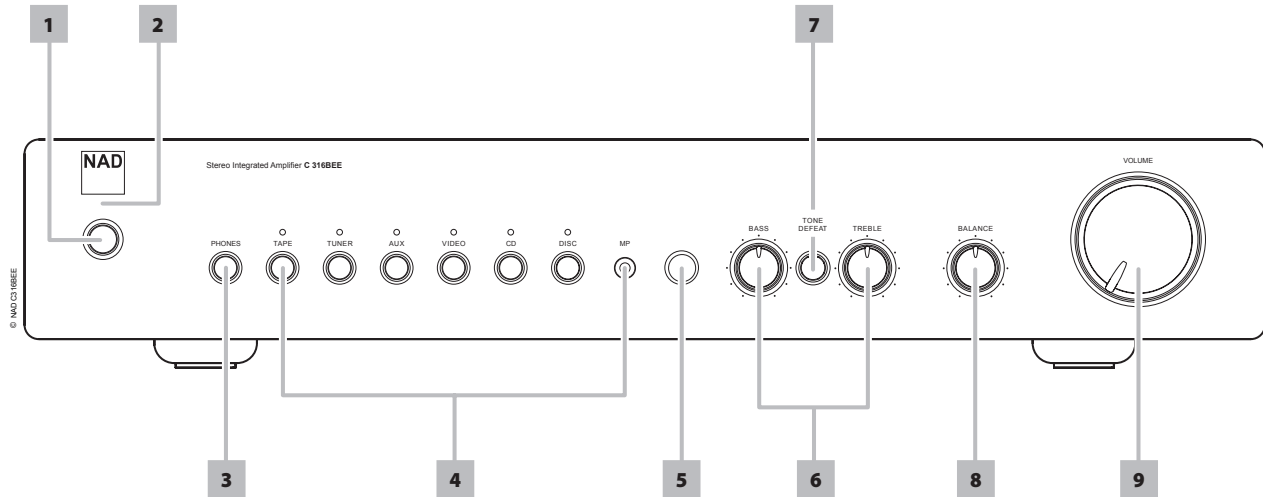
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified a "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freonpropelled chemicals. These can generate electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

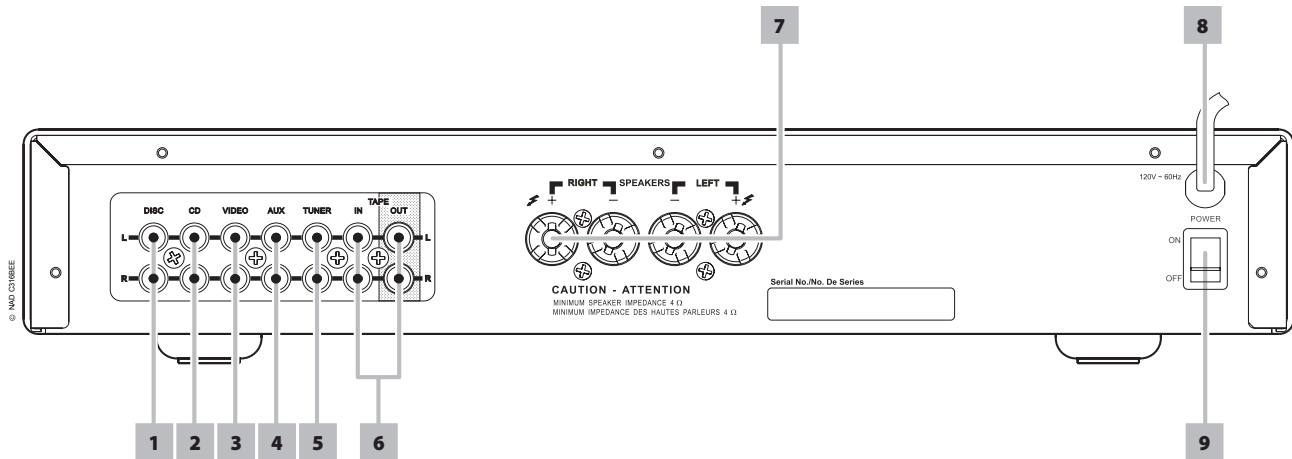
8. Minimize bodily motions when handing unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

FRONT PANEL CONTROLS (FIGURE 1)



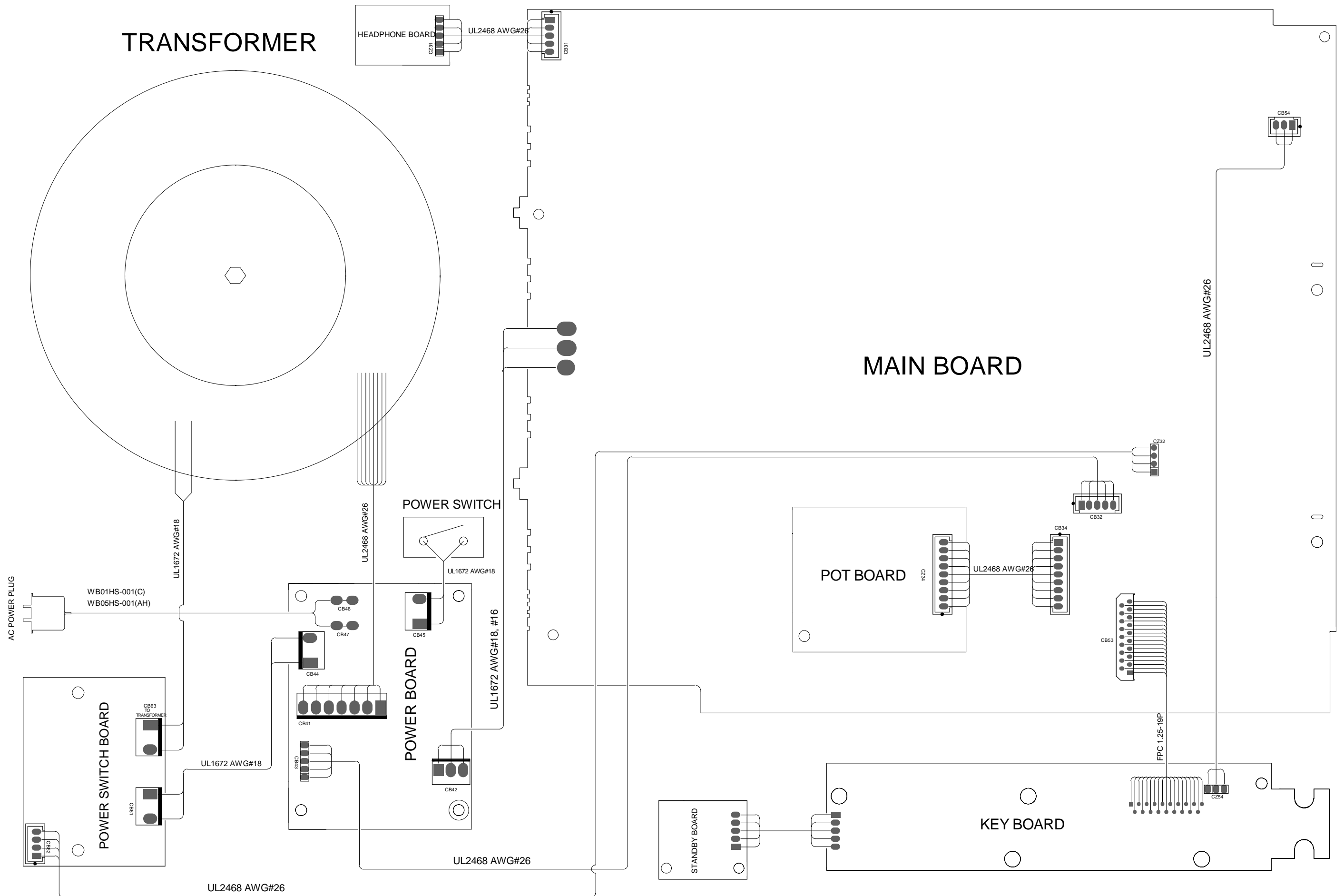
- | | |
|--------------------------------------|--------------------|
| 1. POWER | 5. IR RECEIVER |
| 2. POWER/STAND BY/
PROTECTION LED | 6. TONE CONTROLS |
| 3. HEADPHONE | 7. TONE DEFEAT |
| 4. INPUT SELECTOR | 8. BALANCE CONTROL |
| | 9. VOLUME CONTROL |

REAR PANEL CONNECTIONS (FIGURE 2)

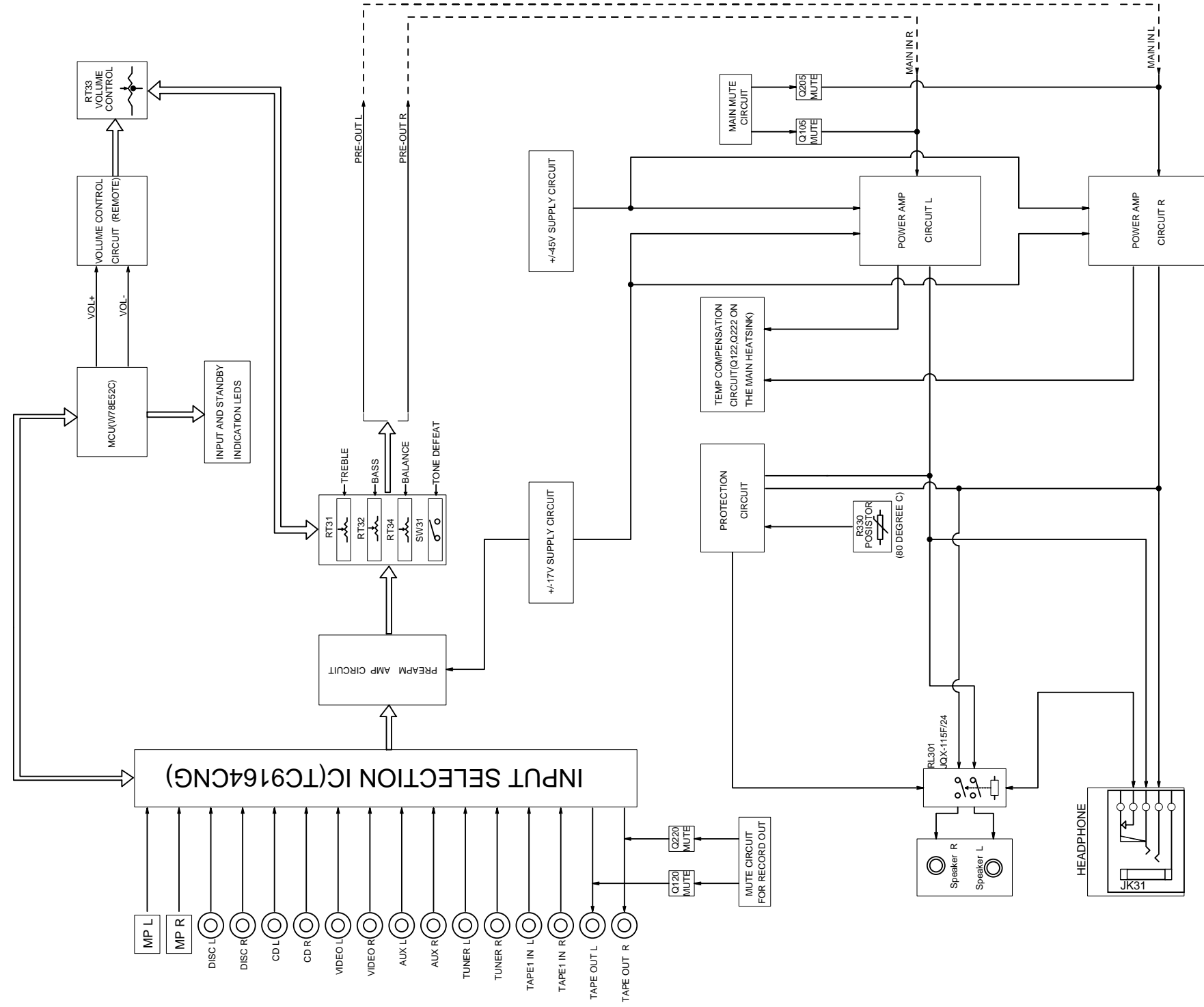


- | | |
|----------------|-----------------|
| 1. DISC INPUT | 6. TAPE IN/OUT |
| 2. CD INPUT | 7. SPEAKERS OUT |
| 3. VIDEO INPUT | 8. AC LINE CORD |
| 4. AUX INPUT | 9. POWER SWITCH |
| 5. TUNER INPUT | |

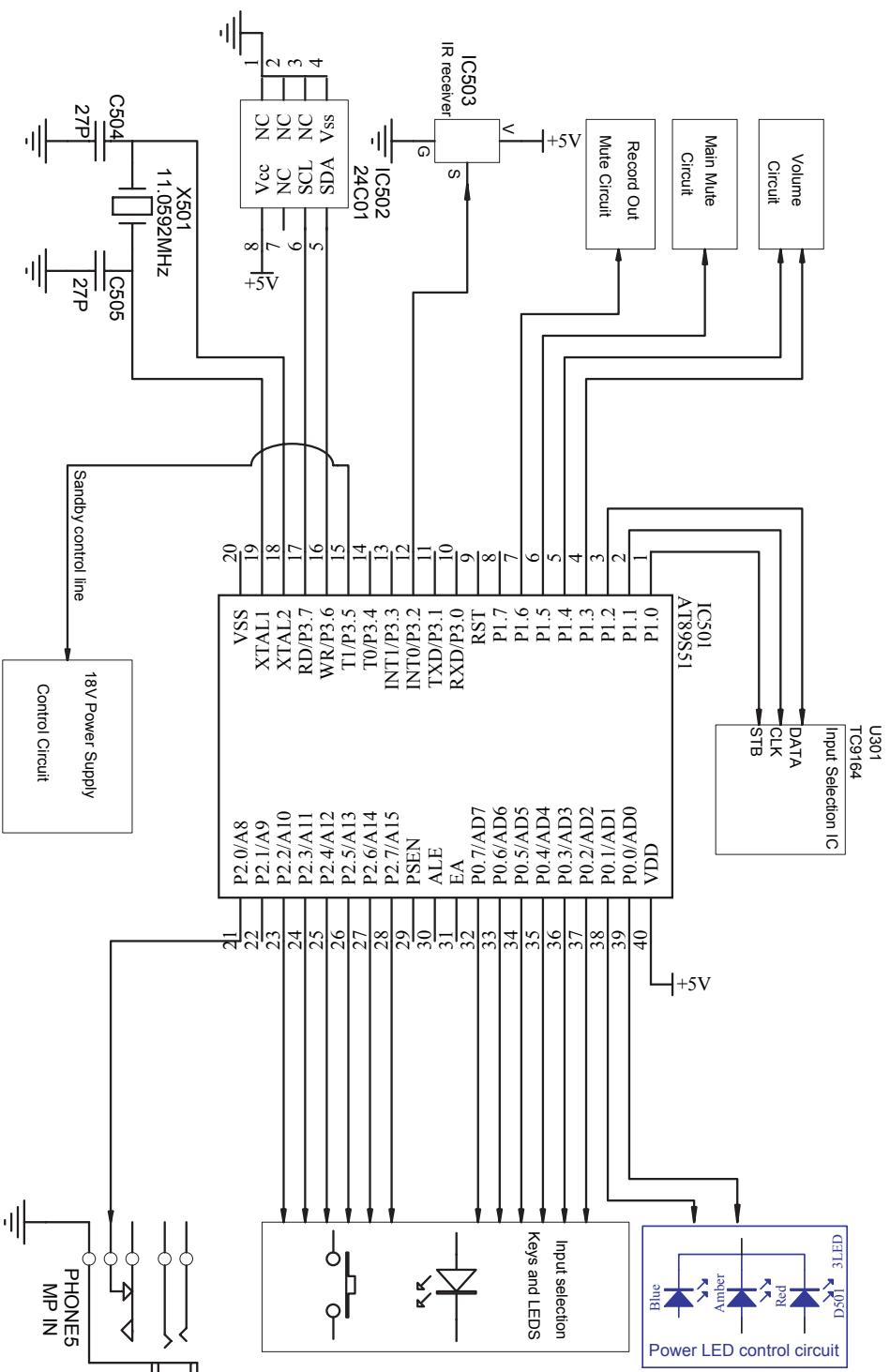
WIRING DIAGRAM



BLOCK DIAGRAM



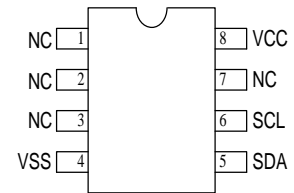
MICROPROCESSOR CONNECTION DIAGRAM



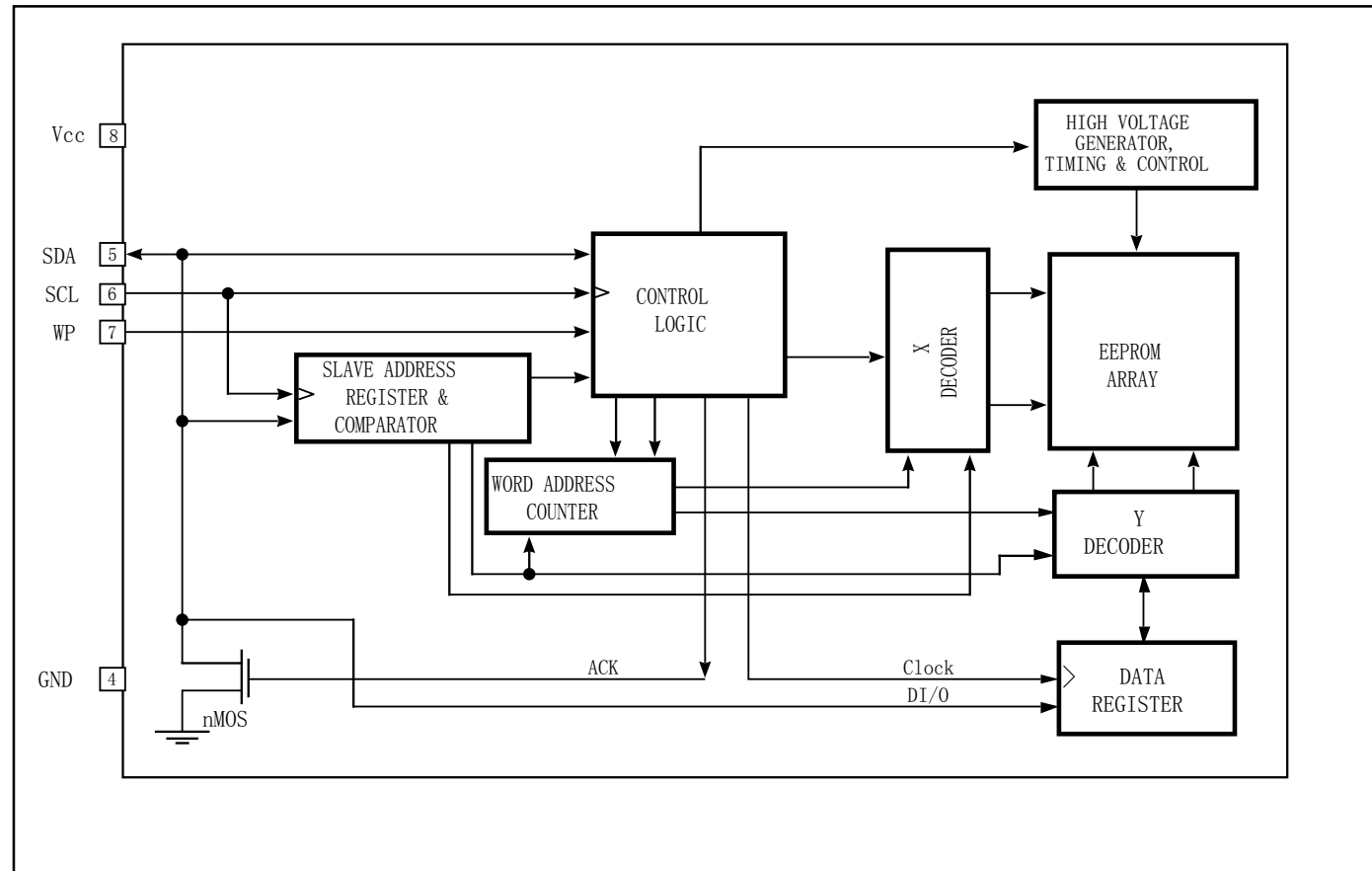
24C01

KEY BOARD: IC71

PIN CONFIGURATION

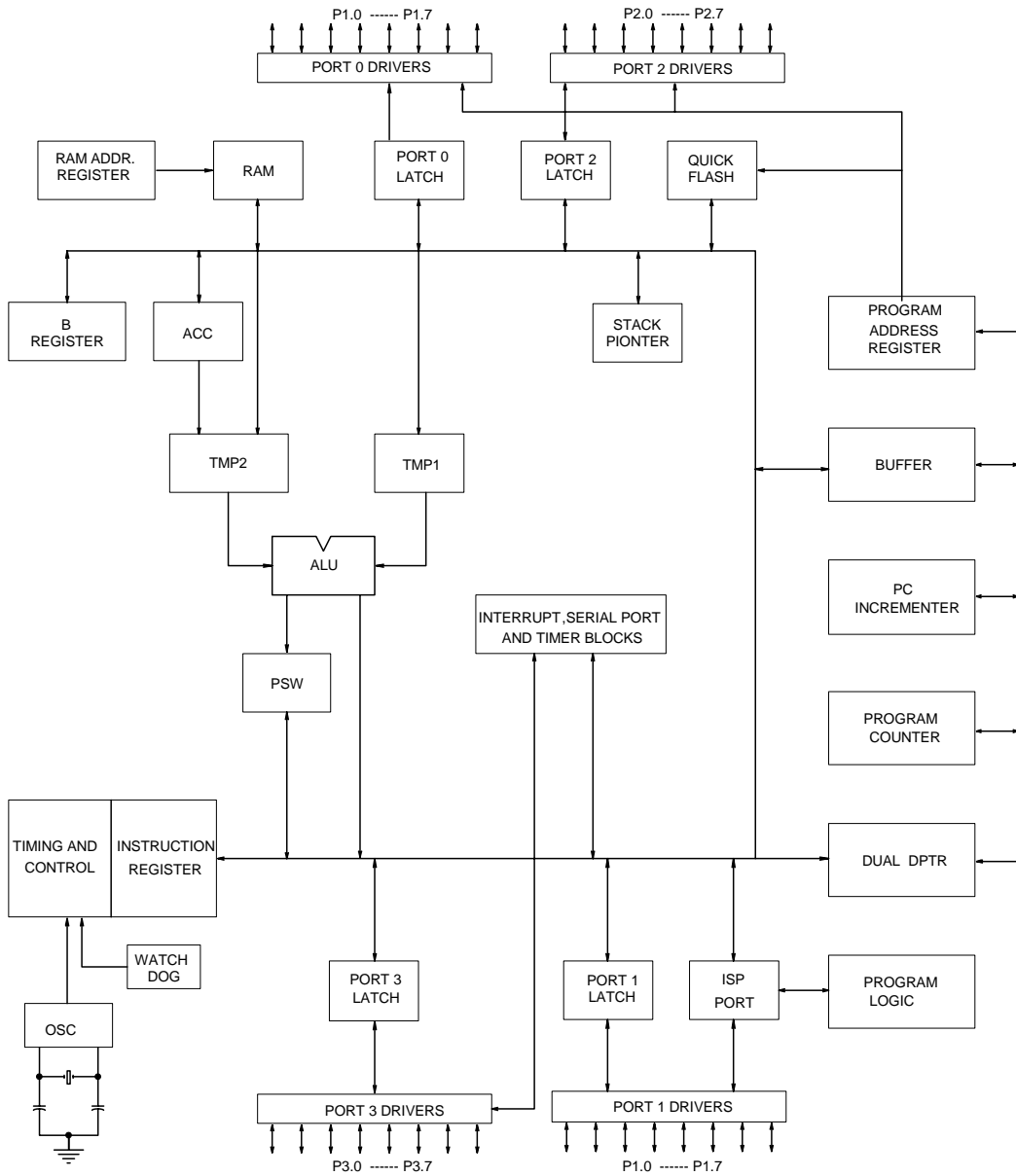
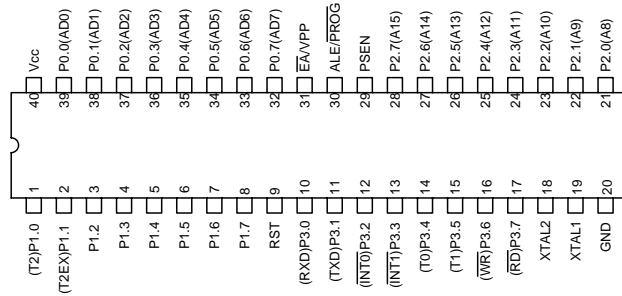


FUNCTIONAL BLOCK DIAGRAM



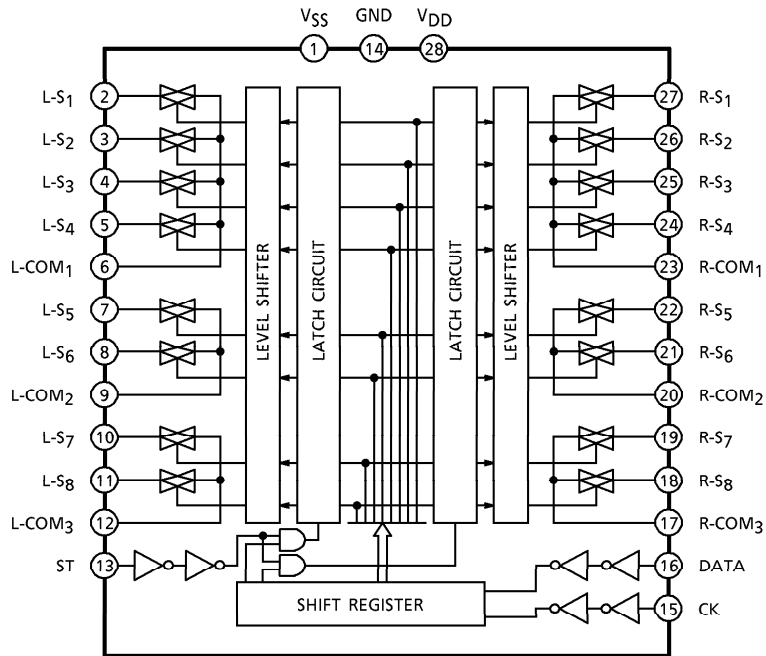
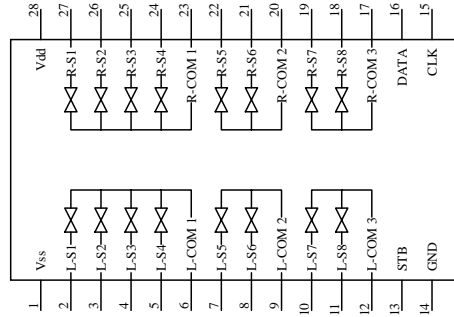
AT89S51/W78E052DDG
 MAIN BOARD : IC501

PIN CONFIGURATION

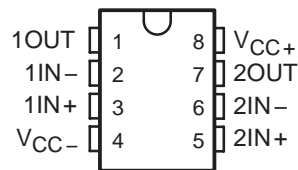


TC9164CNG
MAIN BOARD:U301

PIN CONFIGURATION



TL082, TL082A, TL082B
D, JG, P, PS, OR PW PACKAGE
(TOP VIEW)



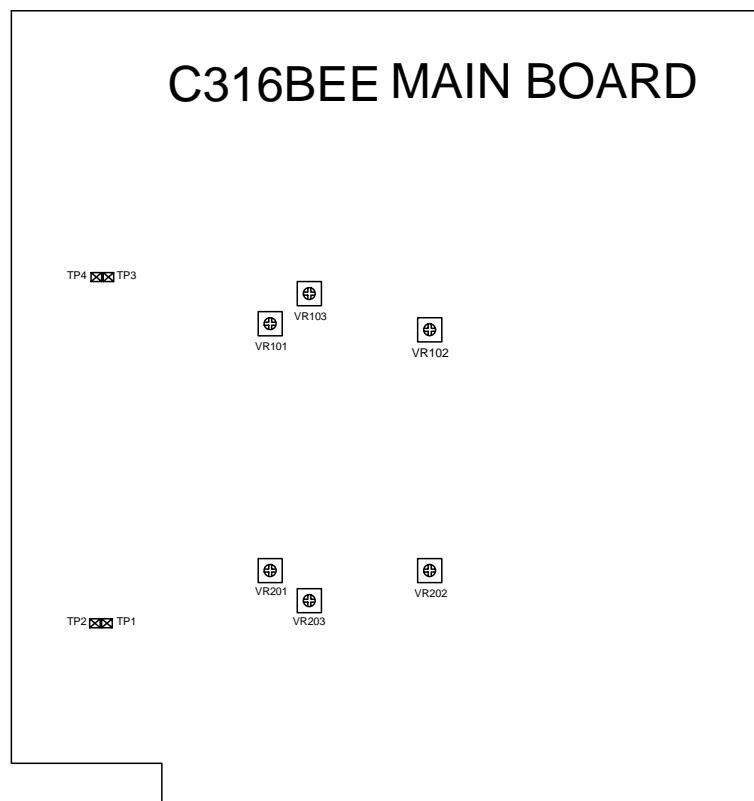
ALIGNMENT PROCEDURES

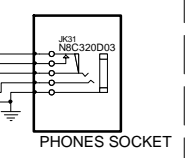
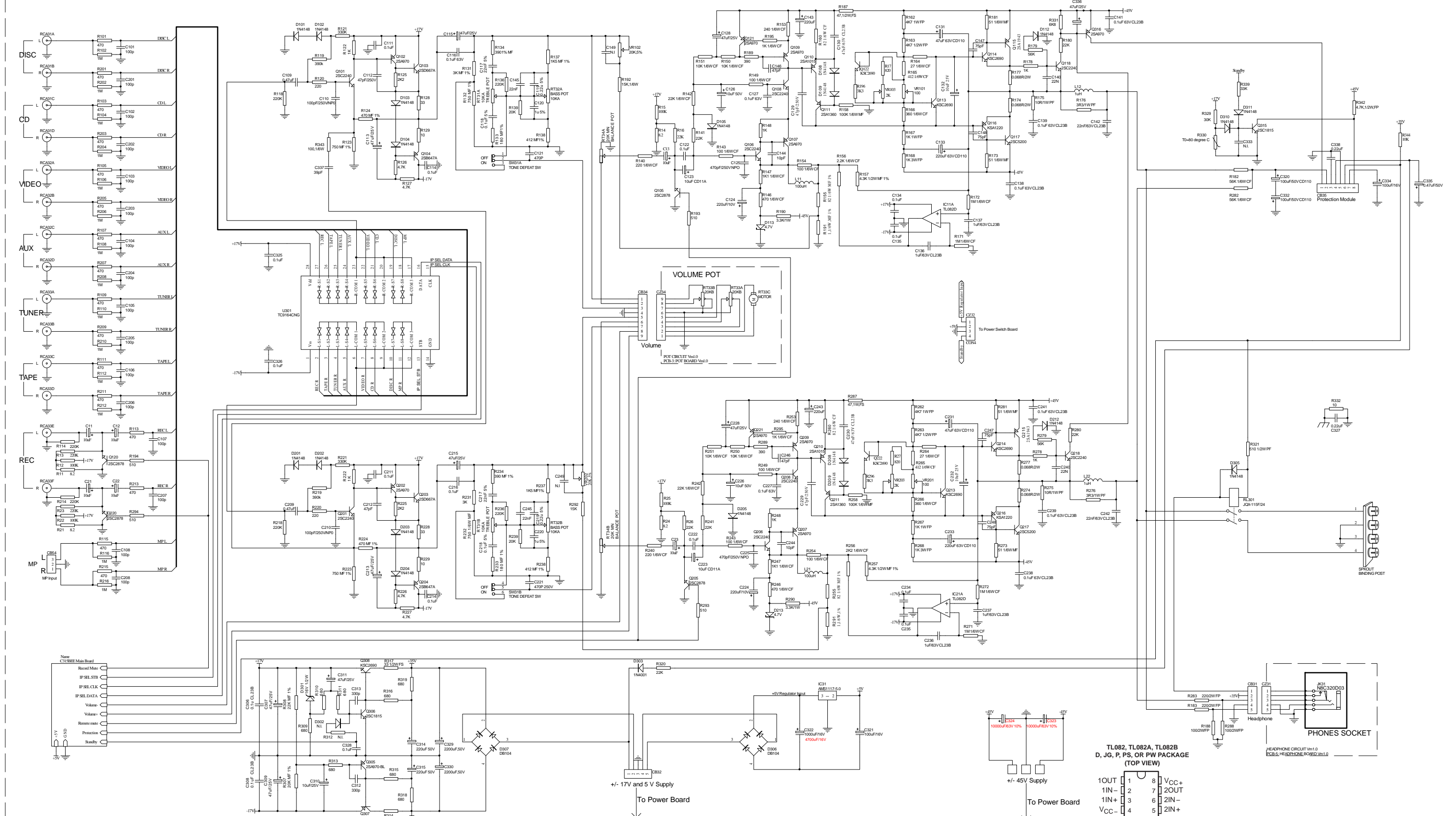
A. LOWEST VOLUME ADJUSTMENT

1. Tune the volume pot to lowest state.
2. Input a high voltage signal such as 5V from CD input.
3. Connect a oscilloscope to L channel binding posts.
4. Observing the oscilloscope,adjust VR102,make the output of speakers become to the lowest level.
5. Adjusting VR202,make R channel output become to the lowest level by same way.

B. IDLING CURRENT

1. Adjust 25mV initial idling current for L/R channels,dismount top cover.
2. Let unit run for 10 minutes.
3. Connect a DC voltmeter toTP1 and TP2 ,adjust VR201/VR203 for 12.5mV reading on voltmeter.
4. Connect a DC voltmeter toTP3 and TP4 ,adjust VR101/VR103 for 12.5mV reading on voltmeter.
5. Cover the top cover.



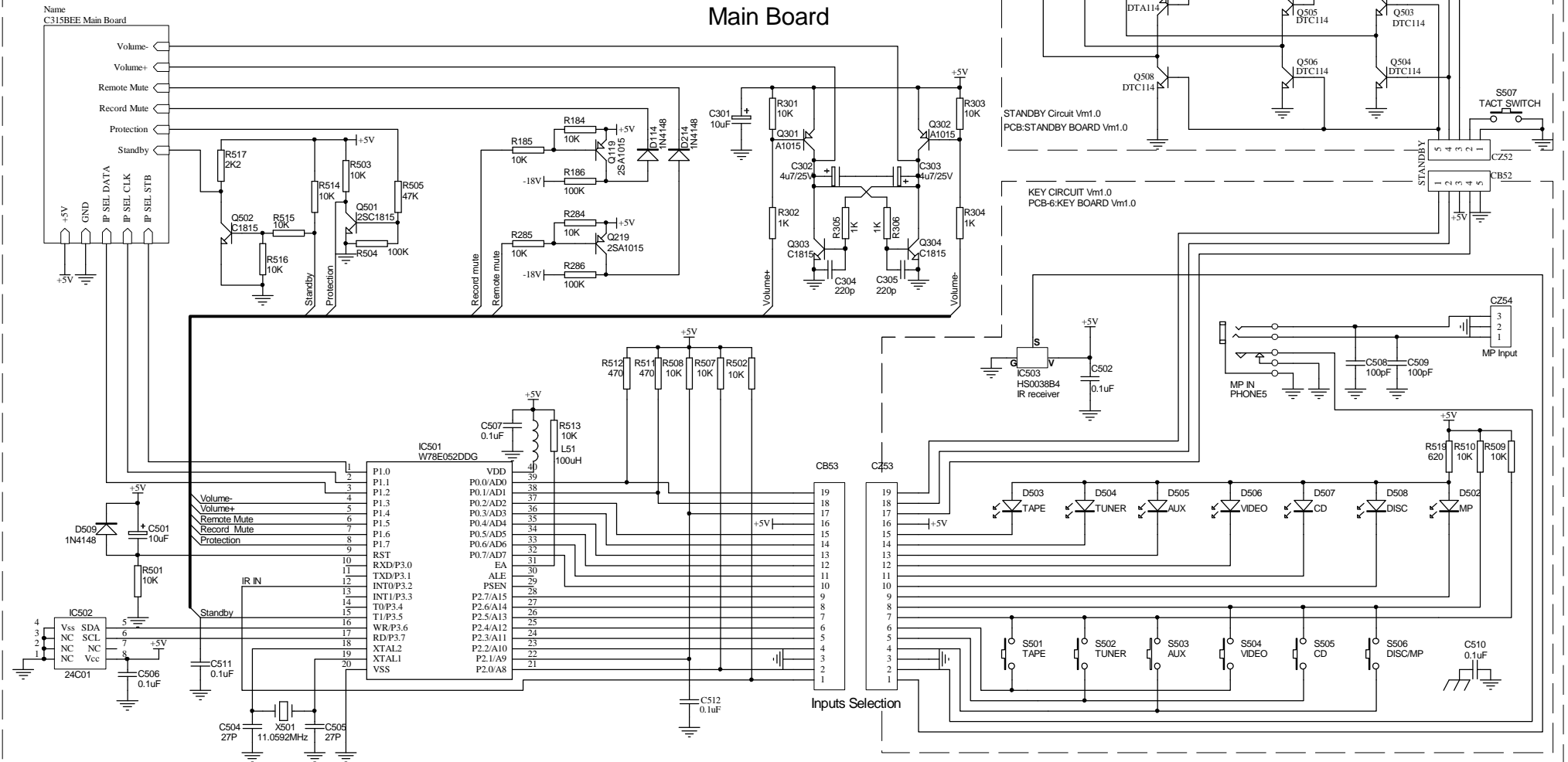


+/- 17V and 5V Supply
To Power Board

+/- 45V Supply
To Power Board

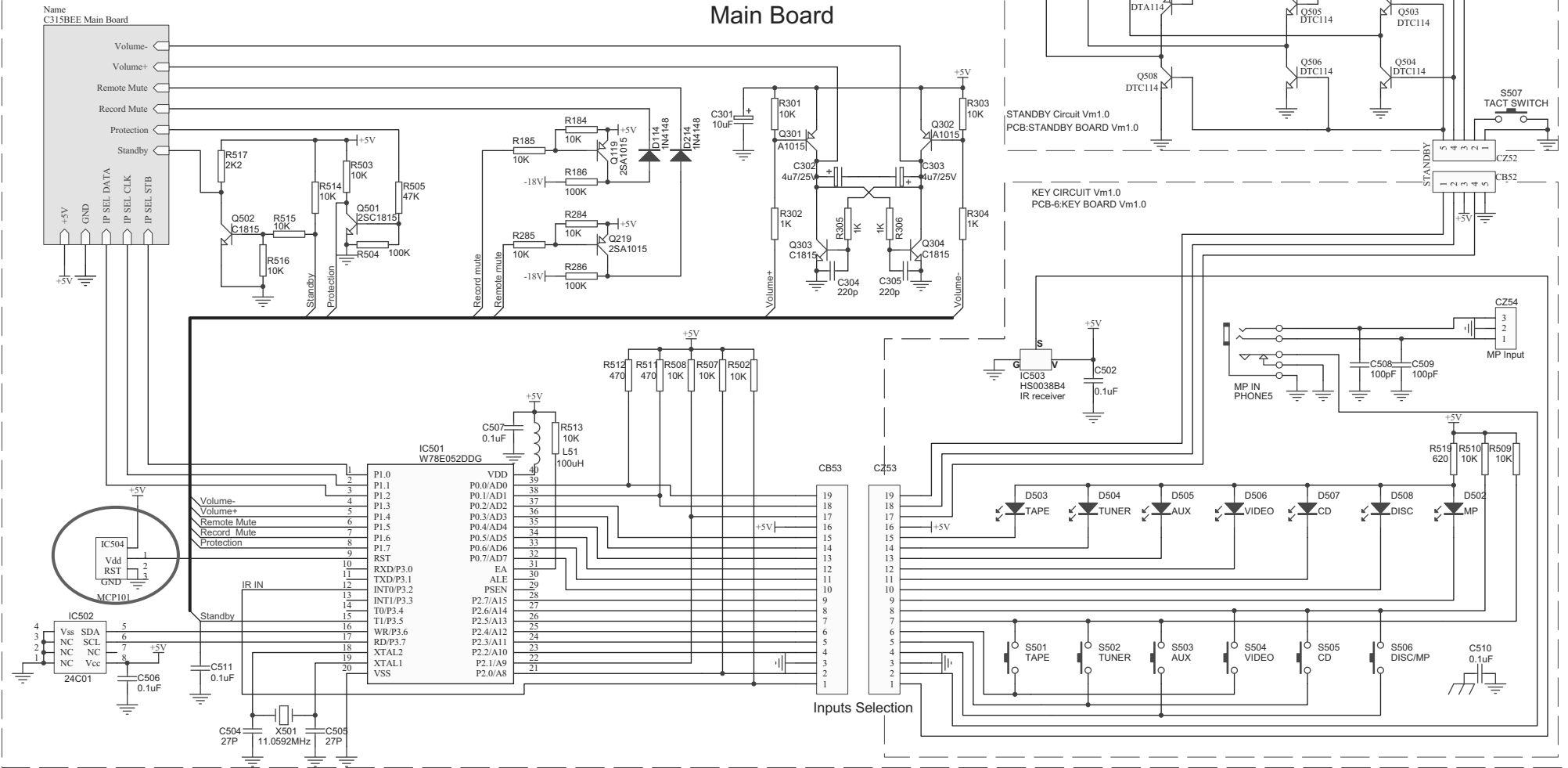
SCHEMATICS DIAGRAM

MCU CONTROL CIRCUIT Vm1.0
PCB-1:MAIN BOARD Vm1.0



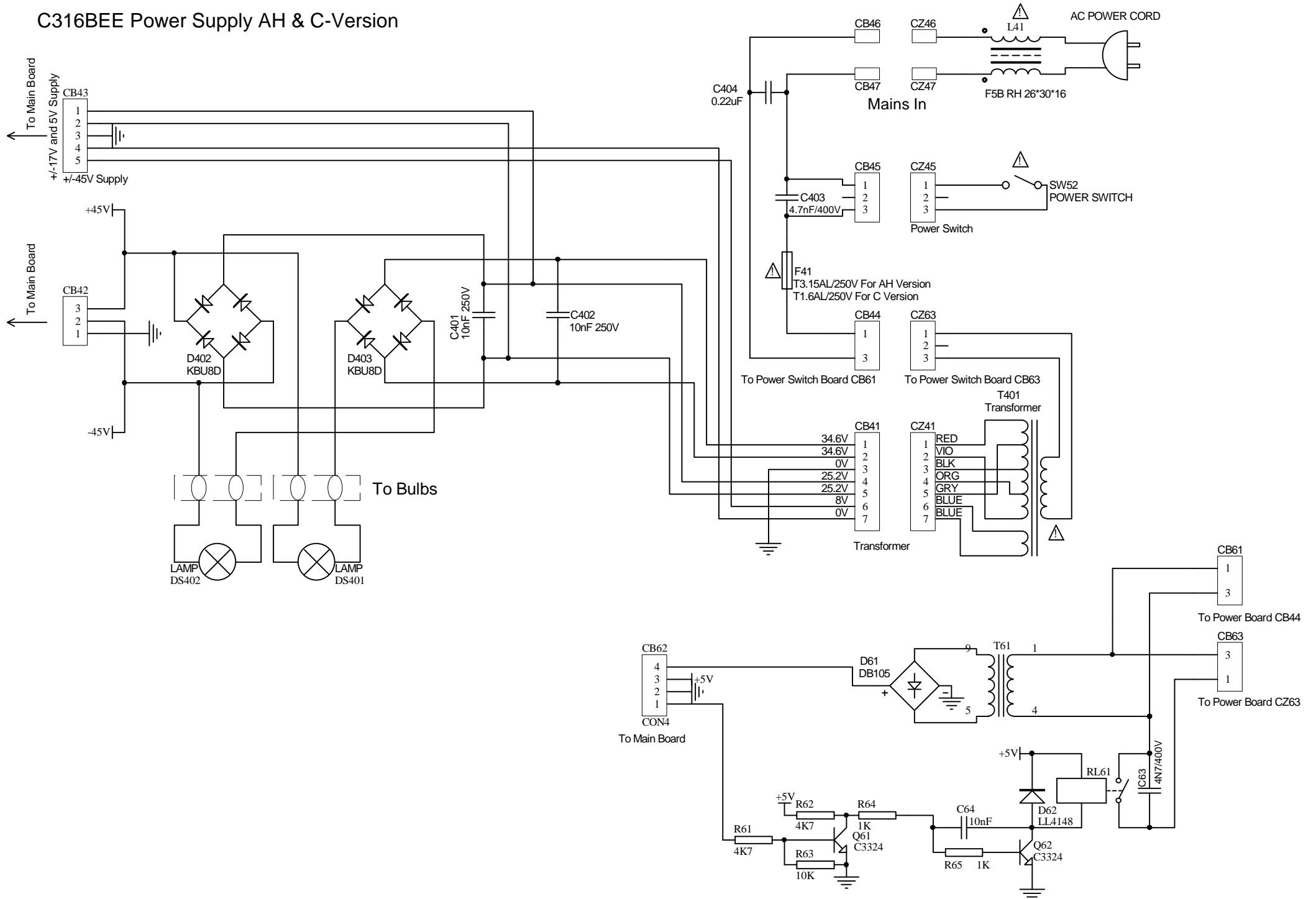
SCHEMATICS DIAGRAM

MCU CONTROL CIRCUIT Vm1.1
PCB-1:MAIN BOARD Vm1.0

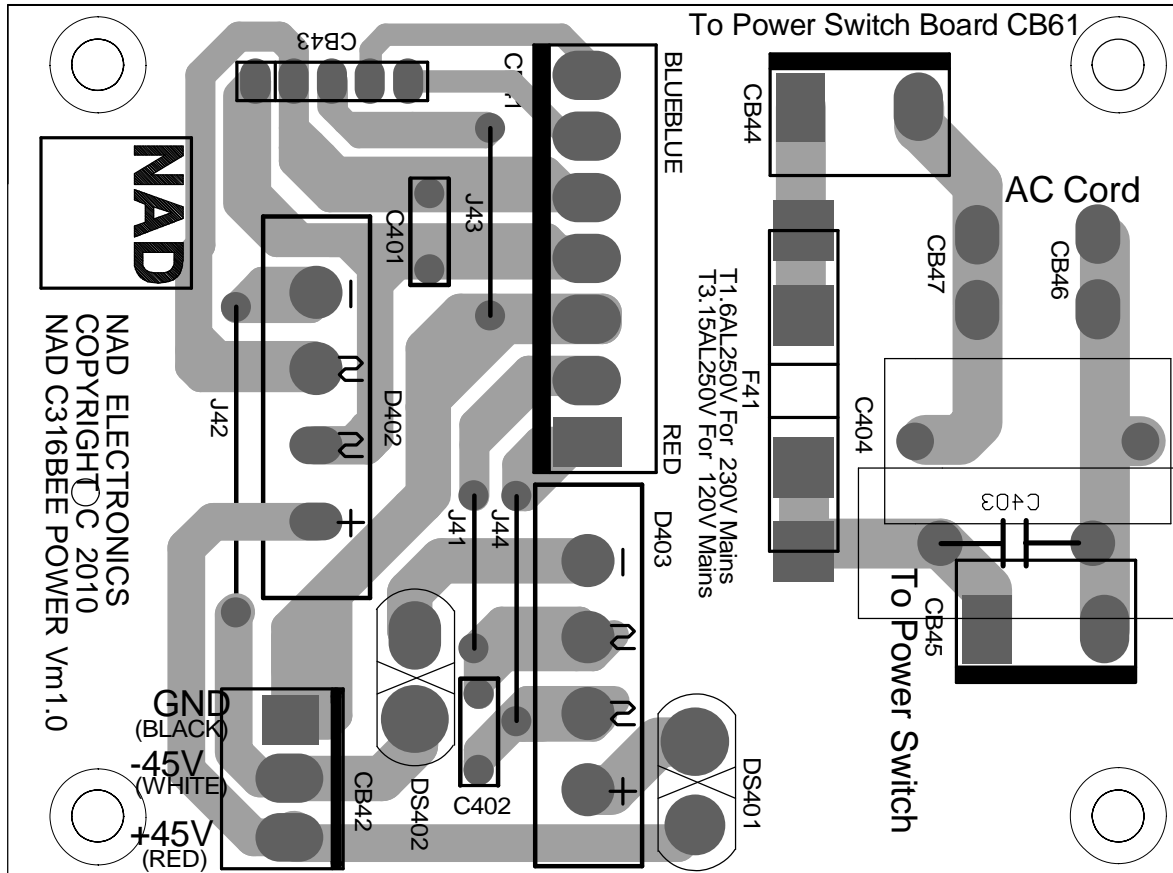


REV.	ECN NO.	DESCRIPTION	Date	APPRO
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Document Number:				Sheet:
Project:				State:
by:	by:	Checked:	Approved:	
Date:	Date:	Date:	Date:	

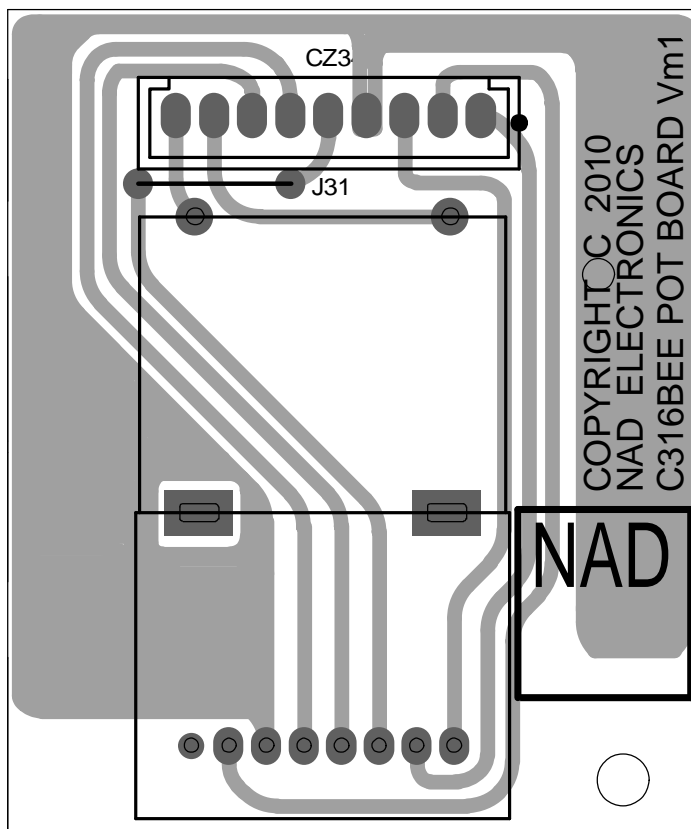
C316BEE Power Supply AH & C-Version



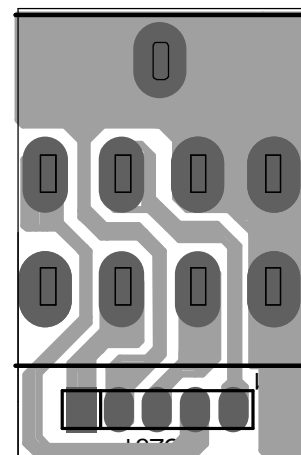
PCB-2: POWER BOARD AH & C-VERSION



PCB-3: POT BOARD

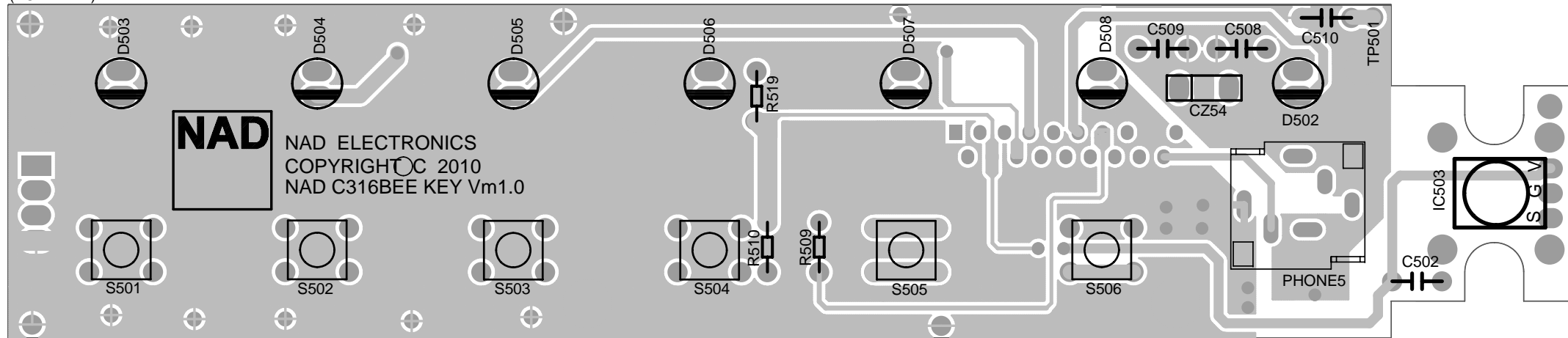


PCB-5: HEADPHONE BOARD



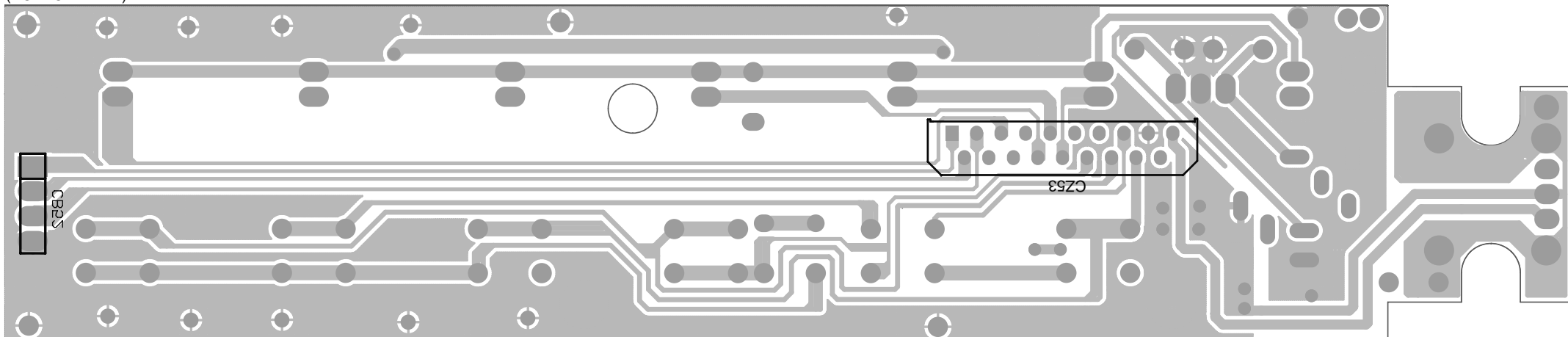
PCB-6: KEY BOARD Vm1.0

(TOP VIEW)

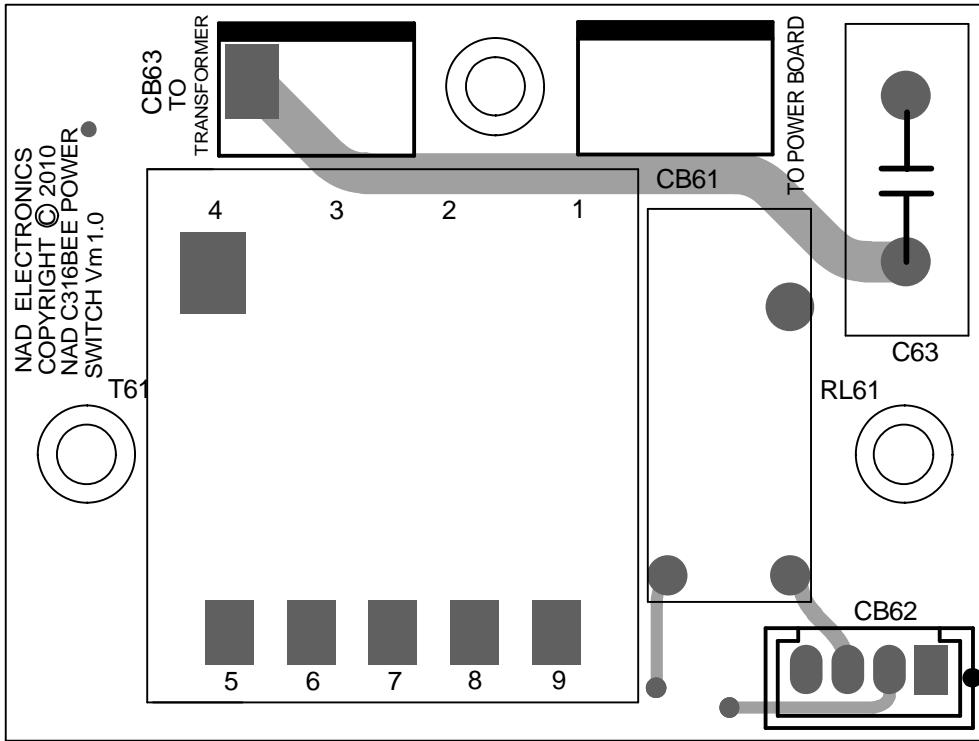


PCB-6: KEY BOARD Vm1.0

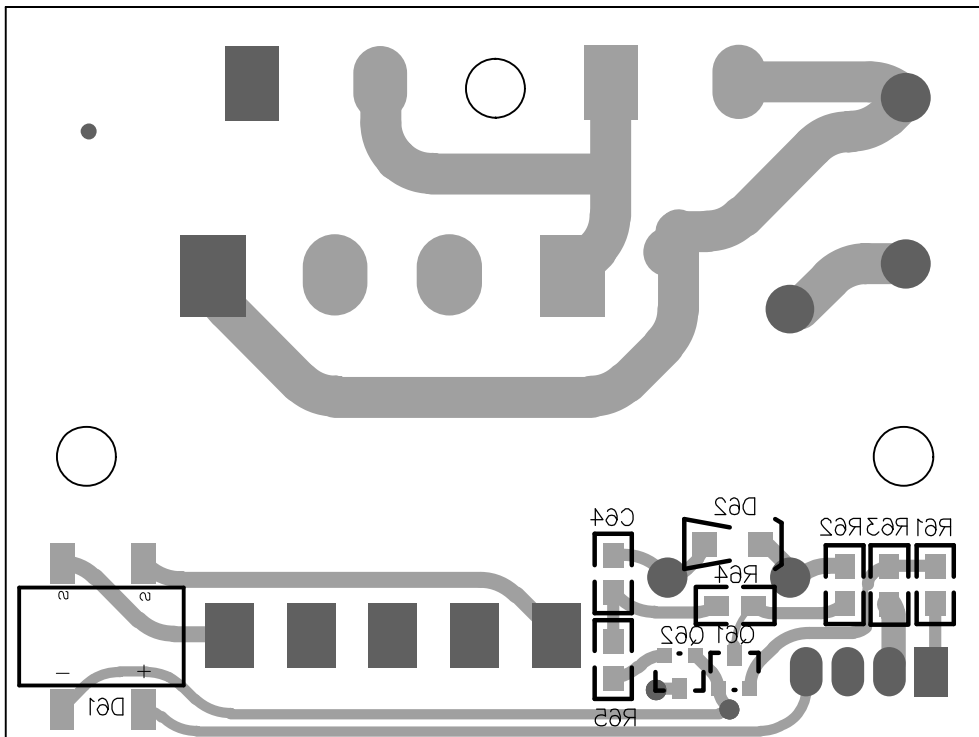
(BOTTOM VIEW)



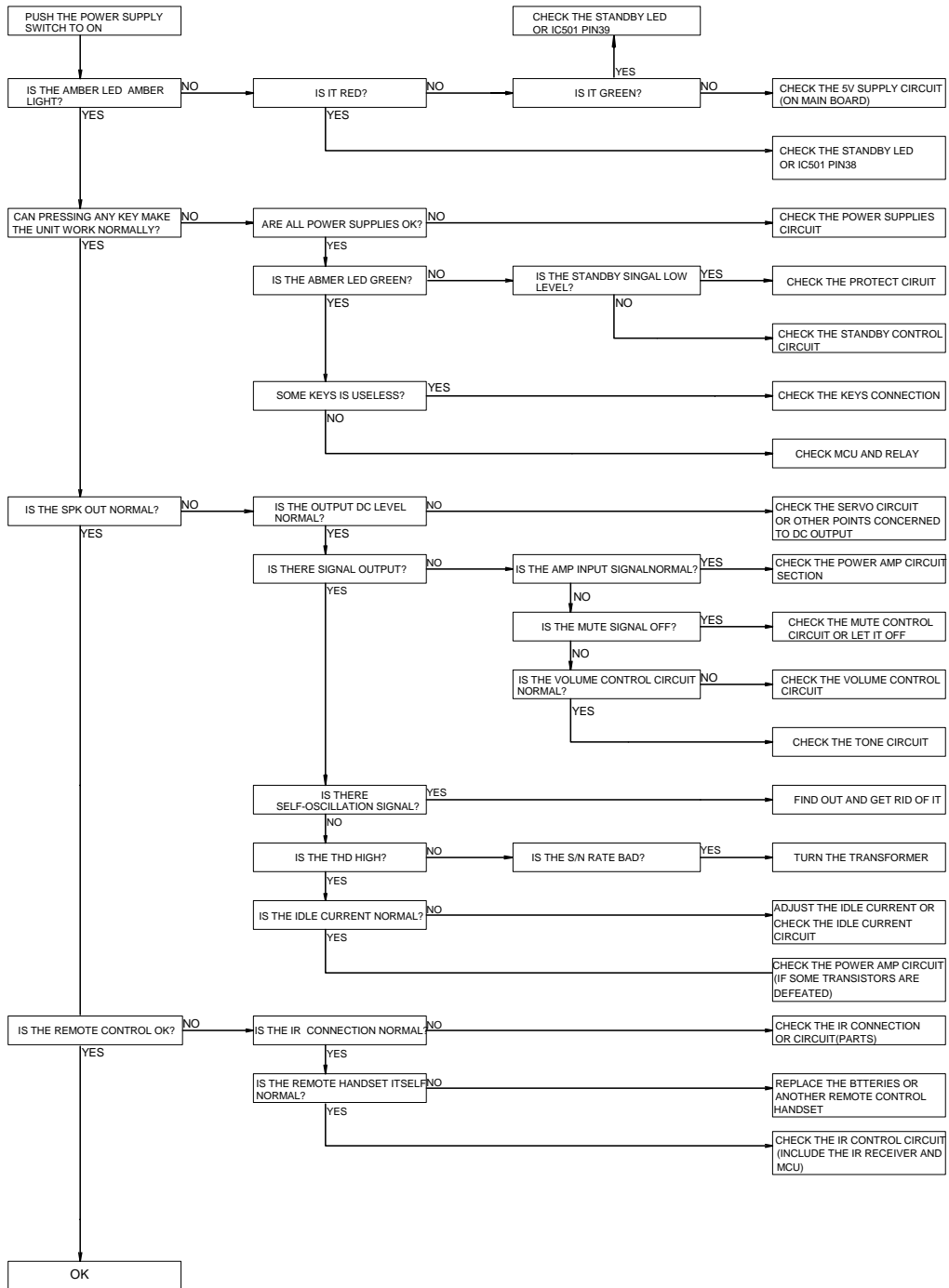
PCB-7: POWER SWITCH BOARD (TOP VIEW)



PCB-7: POWER SWITCH BOARD (BOTTOM VIEW)



TROUBLESHOOTING GUIDE



ELECTRIAL PARTS LIST

PCB-1: MAIN BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
ICS		
IC11, IC21	03-00082-00	TL082CP/CN/D
IC31	03-01117-01	AMS1117-5.0 / LM1117MPX-5.0
IC502	03-02402-00	24C01A/24C02(A)/24C04(A)/AT24C02B-10PU
U301	J03-09164-00	TC9164CNG
IC501	03-08951-23	AT89S51-24PI / W78E052C40DL
IC501	03-08951-03	AT89S51-24PI / W78E052C40DL
CB35	02-01237-00	upc1237 Module
DIODES		
D101, D102, D103, D104, D105, D108, D109, D112, D114, D201, D202, D203, D204, D205, D208, D209, D212, D214, D305, D310, D311, D509	33-44148-00	1N4148
D113, D213	33-14709-00	4.7V, 0.5W
D301	33-11600-00	16V, 0.5W
D303	33-24001-00	IN4001
D306, D307	33-30142-00	DB104
TRANSISTORS		
Q110, Q119, Q210, Q219, Q301, Q302	31-01015-00	2SA1015 GR
Q303, Q304, Q306, Q315, Q501, Q502	31-01815-00	2SC1815 GR
Q102, Q107, Q109, Q121, Q202, Q207, Q209, Q221, Q316	J31-00970-00	2SA970 GR
Q305	J31-00970-10	2SA970 BL
Q101, Q106, Q108, Q118, Q201, Q206, Q208, Q218	J31-02240-00	2SC2240 GR
Q105, Q120, Q205, Q220	J31-02878-00	2SC2878A
Q103, Q203	31-00667-00	2SD667A
Q104, Q204	31-00647-00	2SB647A
Q113, Q114, Q213, Q214, Q308	31-02690-00	KSC2690AYSTU
Q116, Q216, Q307	31-01220-00	KSA1220AYSTU
Q111, Q211	J31-01360-00	2SA1360-0(Q)
CAPACITORS		
C144, C244	05-10013-00	10p, 1KV, ±10%
C504, C505	05-27013-00	27p, 1KV, ±10%
C337	05-39013-00	39p, 1KV, ±5%
C112, C129, C146, C212, C229, C246	05-47013-00	47p, 1KV, ±10%
C147, C148, C247, C248	05-75013-00	75p, 1KV, ±10%
C101, C102, C103, C104, C105, C106, C107, C108, C110, C201, C202, C203, C204, C205, C206, C207, C208, C210	05-10113-01	100p, 1KV, ±10%
C304, C305	05-22113-01	220p, 1KV, ±10%
C312	05-33113-00	330p, 1KV, ±10%
C121, C125, C221, C225	05-47113-00	470p, 1KV, ±10%
C140, C240	24-22312-04	22n, 100V, ±10%
C134, C135, C234, C235, C325, C326, C328, C506, C507, C511, C512	24-10412-01	0.1uF, 100V, ±20%
C327, C338	24-22412-00	0.22uF, 100V, ±20%
C117, C142, C145, C217, C242, C245	25-22361-05	22n, 63V, ±5%
C130, C230	25-47361-01	47n, 63V, ±5%
C114, C116, C118, C122, C127, C138, C139, C141, C214, C216, C218, C222, C227, C239, C241, C306, C308	25-10461-07	0.1uF, 63V, ±5%
C119, C219	25-22461-02	0.22uF, 63V, ±5%
C109, C209	25-47461-00	0.47uF, 63V, ±5%
C120, C220, C136, C137, C236, C237	25-10561-02	1u, 63V ±5%

ELECTRIAL PARTS LIST

C335	06-47851-02	0.47uF, 50V, ±20%
C302, C303	06-47951-00	4.7uF, 50V, ±20%
C126, C132, C226, C232	06-10051-00	10uF, 50V, ±20%
C12, C13, C21, C22, C23, C301, C310	06-10051-01	10uF, 50V, ±20%
C128, C228, C336, C307, C309, C311	06-47051-02	47uF, 50V, ±20%
C113, C213	06-47021-06	47uF, 25V, ±20%
C131, C231	06-47061-00	47uF, 63V, ±20%
C321, C334	06-10111-00	100uF, 16V, ±20%
C320, C332	06-10151-00	100uF, 50V, ±20%
C124, C224	06-22111-00	220uF, 10V, ±20%
C143, C243, C314, C315	06-22161-01	220uF, 63V, ±20%
C313	05-33113-00	330p, 1KV, ±10%
C111, C211, C238	25-10461-07	0.1uF, 63V, ±5%
C123, C223	06-10051-08	10uF, 50V, ±20%
C11, C501	06-10051-01	10uF, 50V, ±20%
C115, C215	06-47021-06	47uF, 25V, ±20%
C133, C233	06-22161-01	220uF, 63V, ±20%
C322	06-10211-04	1000u, 16V, ±20% (change to 4700uF at 16V 06-47211-00)
C329, C330	06-22251-00	2200u/50V 20%
C323, C324	06-10361-00	10000uF/63V,+20%-10%
RESISTORS		
R14, R24	07-10829-50	8.2Ω, 1/6W, ±5%
R129, R229, R332	07-10100-50	10Ω, 1/6W, ±5%
R164, R264	07-10270-51	27Ω, 1/4W, ±5%
R128, R228	07-10330-50	33Ω, 1/6W, ±5%
R173, R181, R273, R281	07-10510-51	51Ω, 1/4W, ±5%
R160, R260	07-10820-50	82Ω, 1/6W, ±5%
R143, R149, R154, R243, R249, R254, R343	07-10101-50	100Ω, 1/6W, ±5%
R120, R140, R220, R240	07-10221-50	220Ω, 1/6W, ±5%
R153, R253	07-10241-50	240Ω, 1/6W, ±5%
R166, R266	07-10361-50	360Ω, 1/6W, ±5%
R189, R289	07-10391-50	390Ω, 1/6W, ±5%
R101, R103, R105, R107, R109, R111, R113, R115, R146, R201, R203, R205, R207, R209, R211, R213, R215, R246, R511, R512	07-10471-50	470Ω, 1/6W, ±5%
R193, R194, R293, R294	07-10511-50	510Ω, 1/6W, ±5%
R309, R310, R311, R313	07-10681-50	680Ω, 1/6W, ±5%
R17, R27	07-10821-50	820Ω, 1/6W, ±5%
R122, R148, R178, R195, R222, R248, R278, R295, R302, R304, R305, R306	07-10102-50	1KΩ, 1/6W, ±5%
R147, R247	07-10112-50	1K1Ω, 1/6W, ±5%
R125, R156, R225, R256, R517	07-10222-50	2K2Ω, 1/6W, ±5%
R196, R296	07-10332-50	3K3Ω, 1/6W, ±5%
R126, R127, R226, R227	07-10472-50	4K7Ω, 1/6W, ±5%
R331	07-10682-50	6K8Ω, 1/6W, ±5%
R150, R151, R184, R185, R250, R251, R284, R285, R301, R303, R501, R502, R503, R507, R508, R513, R514, R515, R516	07-10103-50	10KΩ, 1/6W, ±5%
R505	07-10473-50	47KΩ, 1/6W, ±5%
R192, R292	07-10153-50	15KΩ, 1/6W, ±5%
R139, R239(RT31, RT32:15%~18%)	07-10682-50	6.8KΩ, 1/6W, ±5%
R139, R239(RT31, RT32:18%~24%)	07-10472-50	4.7KΩ, 1/6W, ±5%
R16, R26, R141, R142, R180, R241, R242, R280, R320	07-10223-50	22KΩ, 1/6W, ±5%
R329	07-10303-50	30KΩ, 1/6W, ±5%
R339	07-10333-50	33KΩ, 1/6W, ±5%
R179, R182, R279, R282	07-10563-50	56KΩ, 1/6W, ±5%
R15, R158, R186, R25, R258, R286, R504	07-10104-50	100KΩ, 1/6W, ±5%

ELECTRIAL PARTS LIST

R114, R118, R136, R214, R218, R236	07-10224-50	220KΩ, 1/6W, ±5%
R121, R221	07-10334-50	330KΩ, 1/6W, ±5%
R119, R219	07-10394-50	390KΩ, 1/6W, ±5%
R102, R104, R106, R108, R110, R112, R116, R171, R172, R202, R204, R206, R208, R210, R212, R216, R271, R272	07-10105-50	1MegΩ, 1/6W, ±5%
R191, R291	07-21008-50	1Ω, 1/6W, ±1%
R155, R255	07-28209-50	82Ω, 1/6W, ±1%
R133, R233	07-21800-51	180Ω, 1/4W, ±1%
R138, R165, R238, R265	07-24120-50	412Ω, 1/6W, ±1%
R134, R234	07-23900-51	390Ω, 1/4W, ±1%
R124, R224	07-24700-50	470Ω, 1/6W, ±1%
R123, R132, R223, R232	07-27500-50	750Ω, 1/6W, ±1%
R137, R237	07-21501-50	1K5Ω, 1/6W, ±1%
R131, R231	07-23001-50	3KΩ, 1/6W, ±1%
R307	07-22002-50	20KΩ, 1/6W, ±1%
R308	07-22202-50	22KΩ, 1/6W, ±1%
R11, R21	07-98208-01	8.2Ω, ±1%
R12, R22	07-91003-01	100KΩ, ±1%
R13, R23	07-92203-01	220KΩ, ±1%
R157, R257	07-24301-20	4K3Ω, 1/2W, ±1%
R176, R276	07-30339-01	3.3Ω, 1W, ±5%
R188, R288	07-30101-04	100Ω, 2W, ±5%
R183, R283	07-30221-03	220Ω, 2W, ±5%
R321	07-30511-00	510Ω, 1/2W, ±5%
R167, R267	07-30102-05	1KΩ, 1W, FP, ±5%
R168, R268	07-30102-06	1KΩ, 3W, FP, ±5%
R190, R290	07-30332-03	3K3Ω, 1W, FP, ±5%
R163, R263, R342	07-30472-00	4K7Ω, 1/2W, FP, ±5%
R162, R262	07-30472-01	4K7Ω, 1W, FP, ±5%
R175, R275	07-50100-01	10Ω, 1W, FS, ±5%
R314, R317	07-50330-00	33Ω, 1/2W, ±5%, FS
R187, R287	07-50470-00	47Ω, 1/2W, FS, ±5%
R315, R316, R318, R319	07-50681-10	680Ω, 1/2W, FS, ±5%
R174, R177, R274, R277	07-40687-03	0.068Ω, 3W, CE, ±5%
R344	07-10103-50	10kΩ, 1/6W, ±5%
INDUCTORS		
L12, L22	08-01010-00	1uH
L11, L21, L51	A08-01101-01	100uH, ±20%
CRYSTAL		
X501	04-11102-00	11.0592MHz
POTS		
VR101, VR201	09-02101-00	100Ω
VR103, VR203	09-02202-01	2KΩ
VR102, VR202	09-02203-00	20KΩ
RT31, RT32	J09-01103-13	RD163121A175 10KAX2
RT34	J09-01203-30	RK163121A104-20KMN
SWITCHES		
SW31	11-02202-02	SPUN190700
RELAYS		
RL301	A12-03102-05	JQX-115F/024-2HS4AF(144)(555)
CONNECTERS		
CB35→upc1237 module J10	13-12508-02	2.54 8pin
CB54	13-22503-00	XHB2.5A-3A
CB31, CB32	13-22505-00	XHB2.5A-5A
CB34	13-22509-00	XHB2.5A-9A
CB53	13-21219-00	FPC1.25 19PIN
4RCA	17-01004-00	AV4-8.4-13
6RCA	17-01006-00	AV6-8.4-13
Binding Post(Red)	73-001003-0	HS4-C320-B009V1-P003
BDP CAP(Red)	73-001005-0	HS4-C320-B009V1-P007
Shaft	69-001001-0	HS4-C320-B009V1-M024
Binding Post	69-001002-0	HS4-C320-B009V1-M025
Binding Post(Black)	73-001004-0	HS4-C320-B009V1-P004
BDP Cap(Black)	73-001006-0	HS4-C320-B009V1-P008
Shaft	69-001001-0	HS4-C320-B009V1-M024
Binding Post	69-001002-0	HS4-C320-B009V1-M025
PIN	69-010003-0	HS4-T972-B009V1-M017

ELECTRIAL PARTS LIST

LINKS

J1, J3, J11, J46, J47, J48, J55, J56, J58, J73, J86, J102, J112, J113, J117, J120, J131, J132, J133, J134, J137, J140, J145, J149, J150, J155, J156, J157, J159, J167, J172, J174, J177, J182	21-06000-00	L=5
J4, J6, J16, J17, J19, J35, J36, J43, J44, J49, J50, J60, J69, J70, J71, J72, J81, J89, J101, J106, J119, J121, J123, J128, J136, J138, J170, J176, J178, J179, J181	21-06000-00	L=7.5
J2, J8, J12, J15, J21, J22, J23, J32, J34, J42, J45, J54, J57, J75, J76, J80, J98, J108, J122, J124, J139, J141, J160, J166	21-06000-00	L=10
J9, J10, J18, J26, J27, J28, J29, J30, J33, J53, J62, J63, J64, J74, J77, J78, J79, J94, J103, J107, J116, J142, J152, J153, J158 J183	21-06000-00	L=12.5
J67, J88, J105, J109, J110, J118, J126, J144, J165, J168	21-06000-00	L=15
J24, J25, J52, J65, J66, J87, J147	21-06000-00	L=18
J41, J51, J91, J96, J97, J114	21-06000-00	L=20
J13, J90, J95, J169	21-06000-00	L=22.5
J31, J37, J38, J39, J40, J82, J83, J84, J99, J151, J161, J162, J163	21-06000-00	L=25
J173	21-10000-00	L=12.5
J7, J14, J93, J115	21-10000-00	L=15
J5	21-10000-00	L=20
J85, J125	21-10000-00	L=25

ASSY HEATSINK

Hexagon Socket Head Screw	61-354516-0	HS4-C315BEE-B009V1-M011
CLAMPER	66-001009-0	HS4-C320-B009V1-M012
Heatsink	70-076001-0	HS4-315BEE-B009V2-M005
Posistor	07-70471-08	PTH9M04BF471TS2F333
Q115, Q215	31-01943-00	2SA1943-O
Q117, Q217	31-05200-00	2SC5200-O
Heat Conductive Pad	78-001004-0	Berquist Sil-Pad K06-122
Plastic Plug	75-076002-0	HS4-C315BEE-B009V1-P007

PCB-2: POWER BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
DIODES		
D402, D403	33-30822-00	8A/200V
BULBS AND HOLDER		
DS401, DS402	34-31501-00	JC-12V-35W-G4
DS401, DS402	A34-31502-00	K522C
CAPACITORS		
C404	A25-22422-03	MKP62, 275V, 0.22uF 10%
C403	A05-47242-00	4n7p, 400V, ±20%
C403	78-001001-1	811810-23
C401, C402	25-10322-00	10n/250V 10%
FUSES		
F41	A20-12162-01	T1.6AL250V 618 Series For C
F41	A20-12312-02	T3.15AL250V 618 Series For AH
F41	20-20000-00	HF-004
CONNECTERS		
CB47	32-24804-00	KST 187
CB46	32-26304-00	KST 250
CB45	13-23903-01	VH 3.96A-3A

ELECTRIAL PARTS LIST

CB42	13-23903-00	VH 3.96A-3A
CB44	13-23903-01	VH 3.96A-3A
CB44	or13-23903-11	VH 3.96A-3A
CB41	13-23907-00	VH 3.96A-7A
CB41	or13-23907-10	VH 3.96A-7A
CB43-----CB32	14-31505-00	
LINKS		
J41	21-06000-00	L=10
J43	21-06000-00	L=12.5
J44	21-06000-00	L=15
J42	21-06000-00	L=20
PCB-3: POT BOARD		
CIRCUIT NO.	PART NO.	DESCRIPTION
POTS		
RT33	J09-01203-01	RK16812MG 20KBx2
CONNECTER		
CZ34	13-22509-00	XHB2.5A-9A
LINKS		
J31	21-06000-00	L=10
PCB-4: STANDBY BOARD		
CIRCUIT NO.	PART NO.	DESCRIPTION
DIODES		
D501	33-50565-02	Φ5 TRI-COLOR BLUE AMBER RED BL-BUBJFB52C4V-1
TRANSISTORS		
Q503, Q504, Q505, Q506, Q508	31-00114-05	DTC114EKA
Q507	31-00114-01	DTA114EKA
RESISTORS		
R521	07-90471-01	470Ω, 0805, ±5%
R522	07-90221-01	220Ω, 0805, ±5%
R524	07-90331-01	330Ω, 0805, ±5%
SWITCHS		
S507	11-04101-00	IT-1102D-1160
CONNECTER		
CZ52	13-22505-00	XHB2.5A-5A
PCB-5: HEADPHONE BOARD		
CIRCUIT NO.	PART NO.	DESCRIPTION
CONNECTER		
CZ31	14-31505-01	LD2.5A-5DW (JC, XHB 2.5A-5Y,26AWG UL2468#, 380mm
JK31	17-02001-41	CK-6.35-02-9P
PCB-6: KEY BOARD		
CIRCUIT NO.	PART NO.	DESCRIPTION
ICS		
IR RECEIVER	03-00038-40	HS0038B4
DIODES		
D502, D503, D504, D505, D506, D507, D508	33-50360-09 or 33-50360-12	LJR3LBD045
CAPACITORS		
C508, C509	05-10113-01	100p, 1KV, ±10%
C502, C510	24-10412-01	0.1uF, 100V, ±20%
RESISTORS		
R519	07-10621-50	620Ω, 1/6W, ±5%
R509, R510	07-10103-50	10KΩ, 1/6W, ±5%
SWITCHS		
S501, S502, S503, S504, S505, S506	11-04101-05	IT-1102A-1160
CONNECTERS		
PHONE5	17-02001-14	JY-3562-01-350G
CZ53	13-21219-00	FPC1.25 19PIN
	76-076006-0	Tin Plate T=0.5mm
CZ53-----CB53	14-31519-00	1.25-19P-250mm
TP501-----CLASSIS	14-32501-12	1007#, 24AWG,35mm
CZ54——CB54	14-31503-01	SCN 2.5A-3D,XHB 2.5A-3Y。 UL1691, 24AWG/26AWG, 500mm
CB52-----CZ52	14-31505-02	XHB 2.54A-5Y. LD2.5A-5DW (JC) , 26AWG UL2468# , 62mm

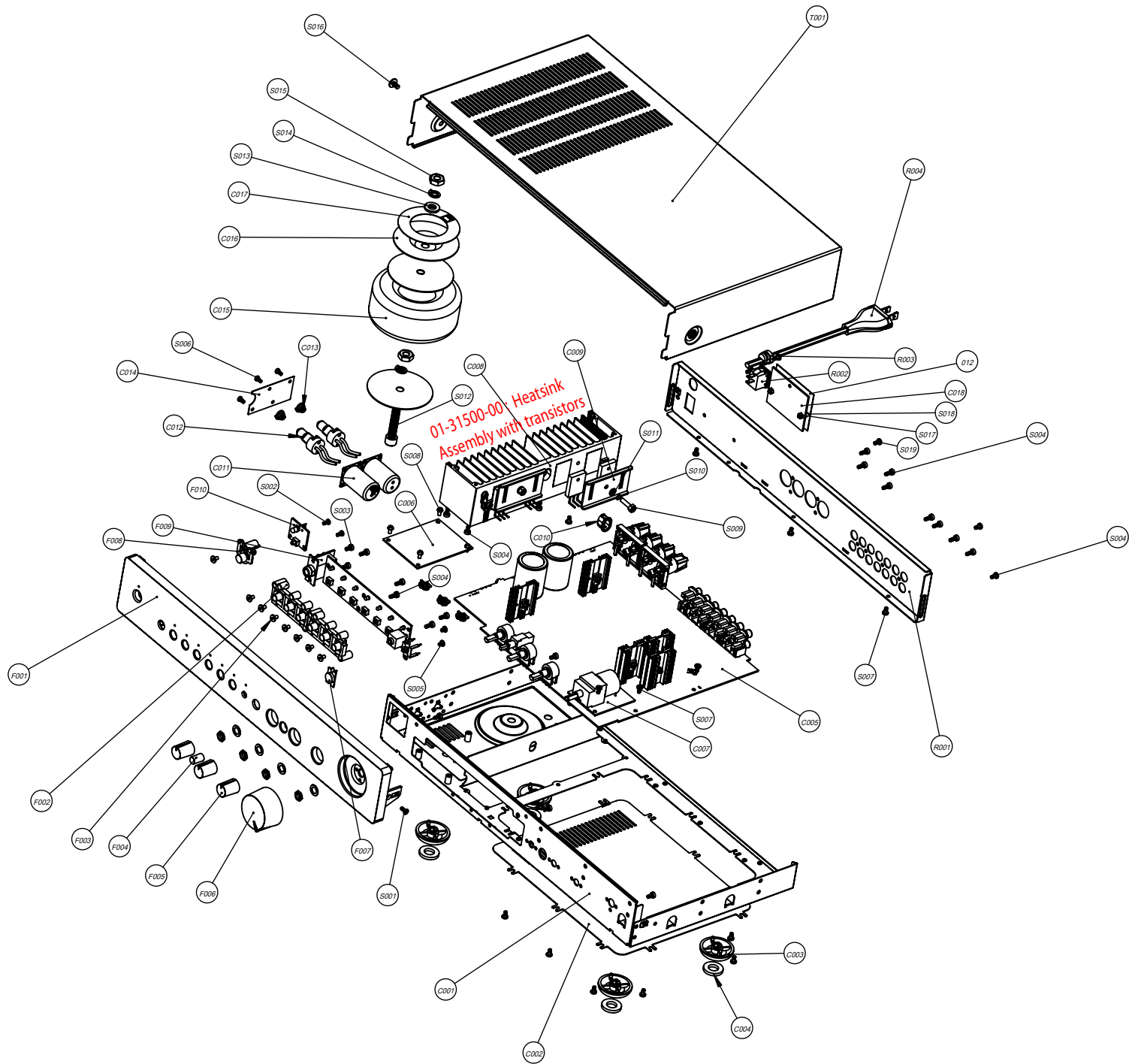
ELECTRIAL PARTS LIST

PCB-7: POWER SWITCH BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
DIODES		
D61	33-30162-02	DB105S, 1A 600V
D62	33-44148-17	1N4148W-NR
TRANSISTORS		
Q61, Q62	31-01815-03	C1815
CAPACITORS		
C64	26-10351-01	10nK, 50V, 0805, X7R
C63	A05-47242-00	4n7p, 400V, ±20%
C63	78-001001-1	Shinagawa 811810-23
RESISTORS		
R61, R62	07-90472-01	4.7K, ±5%, 0805
R63	07-90103-01	10K, ±5%, 0805
R64, R65	07-90102-01	1K, ±5%, 0805
RELAYS		
RL61	A12-03101-11	STD-S-105-LMR2, 5VAC TV-5
RL61	or A12-01101-00	HF36F(JZC-36F)/005-HSLT, TV-5
TRANSFORMER		
Standby Transformer	A18-02801-20	HS-E-02801-230 (C)
Standby Transformer	A18-02801-10	HS-E-02801-120 (AH)
CONNECTERS		
CB61, CB63	13-23903-01	VH 3.96A-3A
CB62	13-22504-00	XHB2.5A-4A
OTHERS		
CIRCUIT NO.	PART NO.	DESCRIPTION
TRANSFORMER		
Transformer	A18-31612-20	HA100C-0543 (C)
Transformer	A18-31612-10	HA100C-0539 (AH)
METAL PARTS		
Chassis	66-076001-1	HS4-C315BEE_B009V1-M001 C
Rear Panel	67-176001-0B	HS40-C316BEE-B12V1-SF01 B HS40-C316BEE-B12V1-M002
Rear Panel	80-176001-0	HS40-C316BEE-B12V1-M002
Rear Panel	65-176001-0	HS40-C316BEE-B12V1-M002
Rear Panel	67-176011-0B	HS40-C316BEE-B12V1-SF02 B HS40-C316BEE-B12V1-M002
Rear Panel	80-176001-0	HS40-C316BEE-B12V1-M002
Rear Panel	65-176001-0	HS40-C316BEE-B12V1-M002
Top Cover	67-076001-1	HS4-C315BEE_B009V1-M003
Top Cover	67-076011-0	HS4-C315BEE_B009V1-M003
Service Cover	66-076004-1	HS4-C315BEE_B009V1-M006 B
Compression Spring	92-076001-0	HS4-C315BEE_B009V1-M007
Lamper Cover	69-076001-2	HS4-C315BEE_B009V1-M004 D
METAL DISC	66-001008-0	HS4-C320-B009V1-M020
Phone holder	66-076005-0	HS4-C315BEE_B009V1-M008
SECC	81-001002-0	SECC-N5 1219×454.8×1
Shield Plate	66-076009-0	HS4-C315BEE-B009V1-M030
PLASTIC PARTS		
Tone Button	74-001001-2	HS4-C320-B009V1-P017
Tone Button	74-020003-1	HS4-C320-B009V1-P017
Trio Buttons	74-076001-1	HS4-C315BEE_B009V1-P001 B
Trio Buttons	74-076011-1	HS4-C315BEE_B009V1-P001 B
Power Button	74-076002-1	HS4-C315BEE_B009V1-P004
Power Button	74-076012-1	HS4-C315BEE_B009V1-P004
Tone Knob	73-014001-2	HS4-C320BEE-B009V1-P002
Tone Knob	73-020001-1	HS4-C320BEE-B009V1-P002
Volume Knob	73-014002-2A	GRAPHTE RETOOLED
Volume Knob	73-020002-1A	TITANIUM RETOOLED
Fascia	77-176001-0A	HS4-C315BEE-B009V1-P002 C HS40-C316BEE-B12V1SF03
Fascia	77-176011-0A	HS4-C315BEE-B009V1-P002 C HS40-C316BEE-B12V1SF03
IR Lens	76-076001-0	HS4-C315Bee_B009V1-P005
LED Lens	76-003011-0	HS4-C160-B009V1-P005
FOOT ASSY	87-076001-0	
FOOT	75-076001-1	HS4-C315BEE_B009V1-P003 B
FOOT Pad	78-076001-0	HS4-C315BEE_B009V1-P006B
Rubber Pad	78-076002-1	HS4-C315BEE_B009V1-P021 B
REMOTE CONTROL	30-13150-02	AMP 2

ELECTRIAL PARTS LIST

BATTERIES	30-28601-10	CR2025
FASTENERS		
Self Taping Screw	61-023106-0	STB3×6
Self Taping Screw	61-023106-1	STB3×6-Ni
Self Taping Screw	61-084108-0	STPW4×8
Self Taping Screw	61-084106-2	STPW4×6-2
Self Taping Screw	61-023208-0	BTB3×8
Self Taping Screw	61-023205-0	BTB3×5
Self Taping Screw	61-063108-0	STF3×8
Self Taping Screw	61-022208-6	BTB2.6×8
Self Taping Screw	61-022206-6	BTB2.6×6
Self Taping Screw	61-022204-6	BTB2.6×4
Self Taping Screw	61-023506-0	MB3×6
Bolt	64-108050-0	M8×50
Nut	62-010802-0	M8
Nut	62-010302-0	M3
Spring Washer	63-020820-1	8mm
Pan washer	63-010816-0	8mm
Copper Space	69-176001-0	HS40-C316BEE-B12V1-M003
ACCESSORIES		
LABEL	94-001004-2	
Heat Shrinking Tube	78-000300-0	φ30
Cable Tie	85-070001-0	4N-4
Cable Tie	84-001003-0	YJ-100
Cable Tie	84-001001-1	KL-2 (3M)
LED Lens Gum	86-046001-0	3M Double Side Adhesive
Rubber Washer	86-019002-0	110x25×1.3mm
Rubber Washer	79-176001-0	FORMEX GK-17BK,47×62mm
PACKING		
POLYBAG	90-027001-0	350×600 T=1.0
Non-woven Cloth	90-009002-1	H=80 W=100 L=435
VERSION LABEL(C)	94-176001-0	85×115
VERSION LABEL(AH)	94-176002-0	85×115
VERSION LABEL(CT)	94-176003-0	85×115
VERSION LABEL(AHT)	94-176004-0	85×115
VERSION LABEL(BC)	94-176006-0	85×115
VERSION LABEL(CTBC)	94-176007-0	85×115
SERIAL NO LABEL	94-176005-0	60×10
CCC LABEL	94-014006-0	15mm×11.8mm
Guarantee Card	94-009005-1	AH
SAFETY LABEL	94-076008-0	25mm×20mm,80°C
CONNECTORS		
Connector	A14-31502-12	VH 3.96A-3Y, Lonsid 187, 18AWG UL1672#, 190mm
Connector	14-31602-00	VH 3.96A-3Y, 18AWG UL1672#, 220mm
Connector	14-31509-00	XHB 2.54A-9Y, 26AWG UL2468# 110mm
AC CORD (C)	JA15-02250-04	LP-21&H03VVH2-F 2×0.75mm ² 1830mm BLACK&2T
AC CORD (C)	or A15-02250-00	LP21 & 2T / TQ-C36-P024, 2×0.75 Black L=1.83M AMP Terminal(2-520193-2)
AC CORD (AH)	A15-10120-04	AP-001P & NISPT-2 18AWG×2 Black 2m & AMP 2-520193-2/2-520183-2
AC CORD (AH)	or A15-10120-02	TQ-C36-P023, 18AWG 105°C Black L=2.0M AMP Terminal(2-520193-2/2-520183-2) / SZ03-004-07, 18AWG 105°C Black L=2.0M AMP Terminal(2-520193-2/2-520405-2)
ROCKER SWITCH	A11-01101-03	RF-1003-BB2, 10A 250V, TV-5
Ferrit Ring	19-26030-00	F5B RH 26×30×16mm



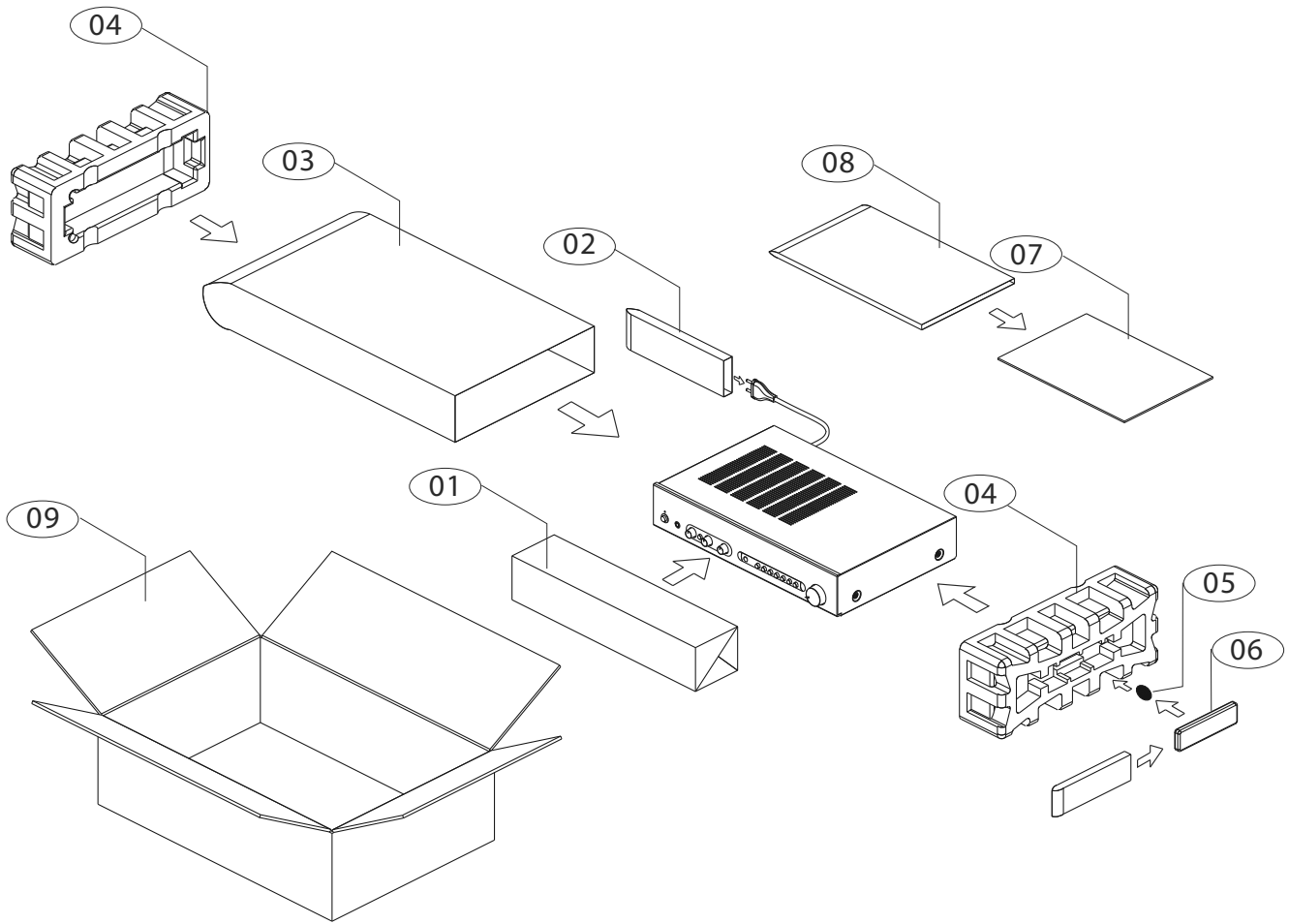
EXPLODED VIEW PARTS LIST

REF.NO	PART NO.	DESCRIPTION	Qty.	REF.NO	PART NO.	DESCRIPTION	Qty.
C001	66-076001-1	Chassis	1		74-076012-1	Power Button (Titanium)	1
C002	66-076004-1	Service Cover	1	F009	01-31606-00	HEADPHONE Board AKA 01-31506-00	1
C003	75-076001-1	Foot Pad	4	F010	01-31605-00	01-31599-01 (sold with F011)	1
C004	78-076001-0	Foot Pad	4	F011	01-31603-00	KeyBoard AKA 01-31599-01	1
C005	01-31601-10	Main Board(AH)	1	F012	79-176001-0	Rubber Washer	1
	01-31601-20	Main Board(C)	1				
C006	01-31602-10	PSU Board(AH) 01-31502-10	1	R001	67-176001-0B	Rear Panel (C,Black)	1
	01-31602-20	PSU Board(C) 01-31502-10 with note and C-fuse	1		67-176011-0B	Rear Panel (AH,Black)	1
	01-31602-30	PSU Board(CCC)	1	R002	11-01101-03	ROCKER SWITCH	1
C007	01-31604-00	Pot Board AKA 01-31504-00	1	R003	85-070001-0	Cable Tie	1
C008	70-076001-0	Heatsink	1	R004	15-02250-00	AC CORD (C)	1
C009	66-001009-0	Clamper	2		15-10120-02	AC CORD (AH)	1
C010	75-076002-0	Plastic Plug	1		JA15-10250-31	AC CORD (CCC)	1
C011	69-076001-1	Lamper Cover	2	T001	67-076001-1	Top Cover(Black)	1
C012	34-31501-00	Light Bulb	2		67-076011-0	Top Cover(Titanium)	1
C013	92-076001-0	Compression Spring	2	S001	61-063108-0	STF3x8 Screw	2
C014	66-076009-0	Sheild Plate	1	S002	61-022208-6	BTB2.6X8 Screw	2
C015	A18-31612-10	Main Transformer AH AKA 18-31512-10	1	S003	61-023206-0	BTB3X6 Screw	2
	A18-31612-20	Main Transformer C AKA 18-31512-21	1	S004	61-063108-0	BTB3x8 Screw	24
C016	66-001008-0	Metal DISC	1	S005	61-022204-6	BTB2.6x4 Screw	2
C017	94-001004-2	LABEL	1	S006	61-022206-6	BTB2.6x6 Screw	4
C018	01-31607-10	POWER SWITCH PCB (AH)	1	S007	61-023106-0	STB3x6 Screw	20
	01-31607-20	POWER SWITCH PCB (C)	1	S008	61-023506-0	MB3x6 Screw	4
F001	77-176001-0A	Fascia (Graphite)*	1	S009	61-354516-0	M4X16 Hexagon Socket Head Screw	2
	77-176011-0A	Fascia (Titanium)*	1	S010	63-020411-0	Spring Washer ϕ 4	2
F002	74-076001-1	Trio Buttons (Black)	2	S011	63-010408-0	Plain Washer ϕ 4	2
	74-076011-1	Trio Buttons (Titanium)	2	S012	64-108050-0	M8X50 Bolt	1
F003	76-003011-0	LED Lens	8	S013	63-010816-0	Plain washer ϕ 8	1
F004	74-001001-2	Tone Button (Black)	1	S014	63-020820-0	Φ 8Spring Washer	2
	74-001003-1	Tone Button (Titanium)	1	S015	62-010802-0	M8 Nut	2
F005	73-014001-2	Tone Knob (Black)	3	S016	61-084108-0	STPW4x8 Screw	2
	73-020001-1	Tone Knob (Titanium)	3	S017	62-010302-0	Nut	2
F006	73-014002-3	Volume Knob (Black) AKA 73-014002-2A	1	S018	69-176001-0	Copper Space	2
	73-020002-2	Volume Knob (Titanium)	1	S019	61-023505-0	Machine Screw	2
F007	76-076001-0	IR Lens	1				
F008	74-076002-1	Power Button (Graphite)	1				

* 02-31698-00C316 Complete Fascia Assembly Graphite

* 02-31699-00C316 Complete Fascia Assembly Titanium

PACKING DIAGRAM



Ref. No.	Part No.	Description	Q'TY
01	90-009002-1	Non Woven Cloth	1
02	90-001013-0	AC Cord Polybag	1
03	90-027001-0	Polybag	1
04	89-076001-1	Polyfoam End Cap	2
05	30-28601-00	Battery CR2025	1
06	30-13150-02	Remote Control Amp2	1
07	30-xxxxxx-xx	IM 1(E nglish)	1
	30-xxxxxx-xx	IM 2(B, C)	1
08	90-001002-	Manual Polybag	1
09	88-076001-0A	Carton Box	1

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