DENON

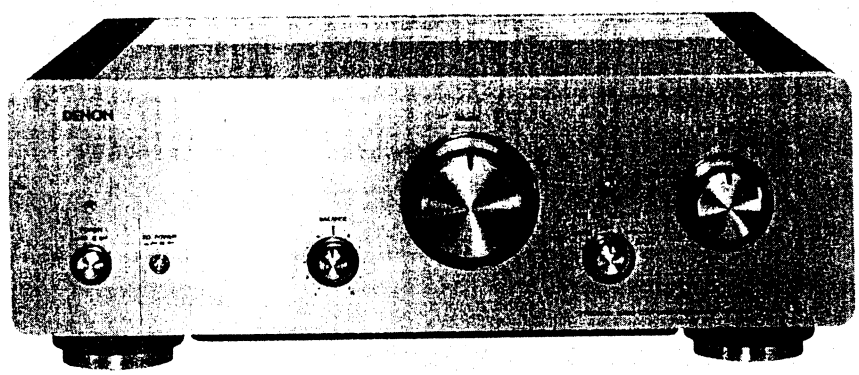
Hi-Fi Pre-Main Amplifier

For Multi-Voltage Model

SERVICE MANUAL

MODEL PMA-S1

PRE-MAIN AMPLIFIER



— TABLE OF CONTENTS —

NIPPON COLUMBIA CO., LTD.

CAUTION

RISK OF ELECTRIC SHOCK

DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

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 to persons.

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.

WARNING: - TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

• FOR U.S.A. & CANADA MODEL ONLY

CAUTION

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

• POUR LE MODELE CANADIEN UNIQUEMENT

ATTENTION

POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

SAFETY INSTRUCTIONS

1. Read Instructions – All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions – The safety and operating instructions should be retained for future reference.
3. Heed Warnings – All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions – All operating and use instructions should be followed.
5. Water and Moisture – The appliance should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands – The appliance should be used only with a cart or stand that is recommended by the manufacturer.

6A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

7. Wall or Ceiling Mounting – The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation – The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat – The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. Power Sources – The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization – Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

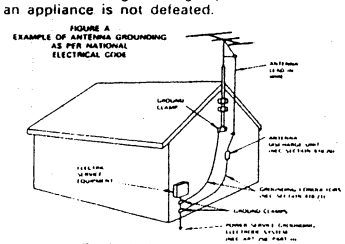


FIGURE A
EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE

12. Power-Cord Protection – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
14. Cleaning – The appliance should be cleaned only as recommended by the manufacturer.
15. Power Lines – An outdoor antenna should be located away from power lines.
16. Outdoor Antenna Grounding – If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna-discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.
17. Nonuse Periods – The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
18. Object and Liquid Entry – Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
19. Damage Requiring Service – The appliance should be serviced by qualified service personnel when:
    A. The power-supply cord or the plug has been damaged; or
    B. Objects have fallen, or liquid has been spilled into the appliance; or
    C. The appliance has been exposed to rain; or
    D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
    E. The appliance has been dropped, or the enclosure damaged.
20. Servicing – The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

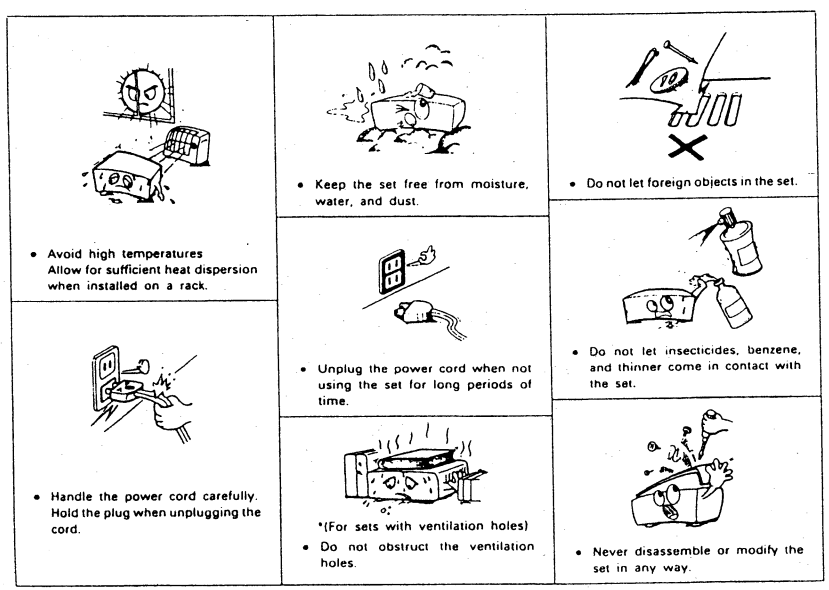
We greatly appreciate your purchase of this DENON product.
To be sure you take maximum advantage of all the features the PMA-S1 has to offer, read these instructions carefully and use the unit properly.
Be sure to keep this manual for future reference should any questions or problems arise.

– TABLE OF CONTENTS –

Please check to make sure the following items are included with the main unit in the carton:

(1) Operating Instructions 1
(2) Hexagon Socket Screw Keys 1

NOTE ON USE



1 FEATURES

(1) Newly developed power amplifier circuit

1. The UHC single push-pull circuit using a UHC-MOS (Ultra High Current MOS FET) provides both an ultra high current and excellent low-signal linearity.
2. The use of high performance amplification stages makes for a simple configuration (one voltage amplification stage and one current amplification stage) and provides natural sound reproduction.

(2) Line amplifier using a new inverted Σ (sigma) balance circuit

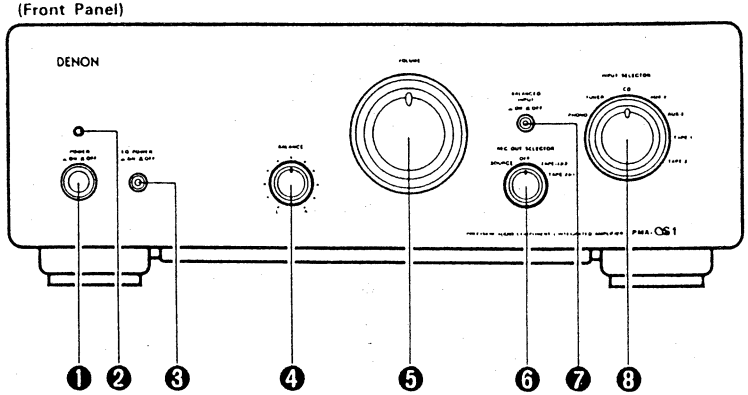
1. The use of a new inverted Σ (sigma) balance circuit allowing both balanced and unbalanced input eliminates the need for a conversion amplifier and makes for simple, pure signal transfer.
2. The pre-amplifier section has been given a simple function and thorough care has been taken in designing the parts, circuits and structure with the aim of creating a high sound quality pre-main amplifier providing both faithful signal transfer and rich musical expression.

(3) Structure designed for a clear mechanical ground

1. The large power transformer, which because of its weight can become a source of vibration, is mounted directly on a heavyweight cast aluminum chassis base with bolts piercing the EI core, suppressing mutual interference due to vibration and reducing the effect on nearby circuitry.
2. The use of a cast aluminum chassis base incorporating the power radiator reduces mutual interference due to vibration.

2 NAMES AND FUNCTIONS OF PARTS

(Front Panel)



❶ POWER switch
When set to the ON (⏝) position, the power turns on and the muting circuit is activated for several seconds.
When set to the OFF (⏻) position, the power turns off.

❷ POWER indicator
This indicates the set's operating status.
The indicator flashes red for several seconds when the power is turned on and when the position of the EQ POWER switch ❸ and BALANCED INPUT switch ❼ is changed, indicating that the muting circuit is activated (interrupting the speaker output). In the normal operating mode, the indicator is orange when the EQ POWER switch ❸ is set to the OFF (⏻) position, green when it is set to the ON (⏝) position.
Also, if the protective circuit is activated (due to a short-circuit in the speaker output, DC output to speakers, abnormal temperature rise, etc.), the indicator flashes red and the speaker output is interrupted. If this happens, turn the power off immediately, then check the connections, etc.

❸ EQ POWER switch
(phono equalizer power switch)
When set to the ON (⏝) position, the power of the phono equalizer circuit turns on, and when set to the OFF (⏻) position, the power of the phono equalizer circuit turns off. When this switch is operated, the muting circuit is activated for several seconds, interrupting the speaker output. The power indicator ❷ is green when this switch is turned on, orange when it is off.
Set this switch to the ON (⏝) position when playing records (analog discs). (Also set the INPUT SELECTOR ❽ to the PHONO position.)
For sources other than records, we recommend setting this switch to the OFF (⏻) position for higher sound quality.

❹ BALANCE control
Use this to adjust the balance between the left and right speakers. When set to the center position, the amplification is the same for the left and right speakers.
If there seems to be a difference in the output voltage of the input component for the left and right channels, turn this control clockwise (↷) to increase the volume of the right channel, counterclockwise (↶) to increase the volume of the left channel.

❺ VOLUME control
Use this to adjust the volume.
Turn clockwise (↷) to increase the volume, counterclockwise (↶) to decrease it.

❻ REC OUT SELECTOR
(recording output selector)
Use this to select the output source for recording onto a tape deck, etc.

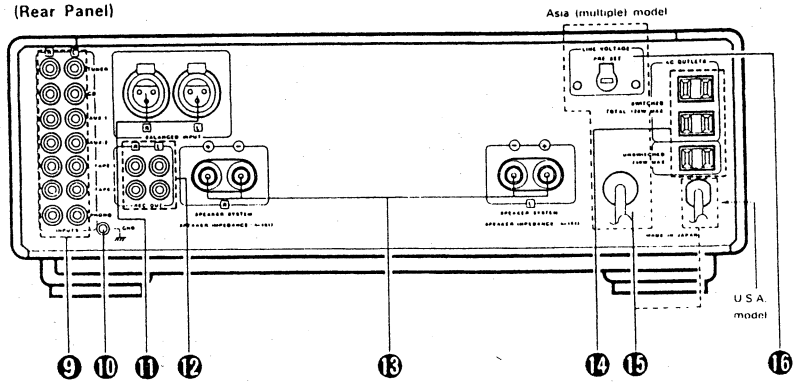
- SOURCE
  Set to this position when recording. The recording output is the source selected with the BALANCED INPUT switch ❼ and the INPUT SELECTOR ❽.
- OFF
  In this position, the recording output is turned off. For higher quality playback sound, we recommend keeping the selector at this position when not recording.
- TAPE-1 ▶ 2
  Use this position when making copies of tapes using two tape decks. The input signal from the deck connected to the TAPE-1 input jacks is fed to the TAPE-2 REC-OUT jacks, regardless of the position of the BALANCED INPUT switch ❼ and the INPUT SELECTOR ❽.
- TAPE-2 ▶ 1
  Use this position when making copies of tapes using two tape decks. The input signal from the deck connected to the TAPE-2 input jacks is fed to the TAPE-1 REC-OUT jacks, regardless of the position of the BALANCED INPUT switch ❼ and the INPUT SELECTOR ❽.

❼ BALANCED INPUT switch
When set to the ON (⏝) position, the source connected to the BALANCED INPUT terminals on the rear panel is selected, regardless of the position of the INPUT SELECTOR ❽. When set to the OFF (⏻) position, the source is set to the source selected with the INPUT SELECTOR ❽. When this switch is operated, the muting circuit is activated for several seconds, interrupting the speaker output.

❽ INPUT SELECTOR
Use this to select the playback source.

- PHONO
  Set to this position to play the turntable connected to the PHONO jacks on the rear panel. Also set the EQ POWER switch ❸ to the ON (⏝) position.
  The PMA-S1's PHONO input is for MM cartridges. When using an MC cartridge, input the signals via an MC cartridge step-up transformer, etc.
- TUNER
  Set to this position to play the AM/FM tuner connected to the TUNER jacks on the rear panel.
- CD
  Set to this position to play the CD player connected to the CD jacks on the rear panel.
- AUX-1
  Set to this position to play the component connected to the AUX-1 jacks on the rear panel.
- AUX-2
  Set to this position to play the component connected to the AUX-2 jacks on the rear panel.
- TAPE-1
  Set to this position to play the tape deck connected to the TAPE-1 jacks on the rear panel.
- TAPE-2
  Set to this position to play the tape deck connected to the TAPE-2 jacks on the rear panel.

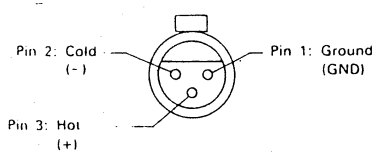
(Rear Panel)



⑨ INPUTS jacks
These are input jacks for CD players, turntables, AM/FM tuners, tape decks or other playback components.

⑩ GND (ground) terminal
Connect the turntable's ground wire here.

⑪ BALANCED INPUT terminals
These are cannon input terminals for connecting a CD player or other playback component equipped with balanced outputs.
The polarities of the pins are as follows:



⑫ REC OUT (recording output) jacks
These are recording output jacks for connection to tape decks.

⑬ SPEAKER SYSTEM terminals
Connect the speaker systems here.
These terminals can also be used for banana plugs.

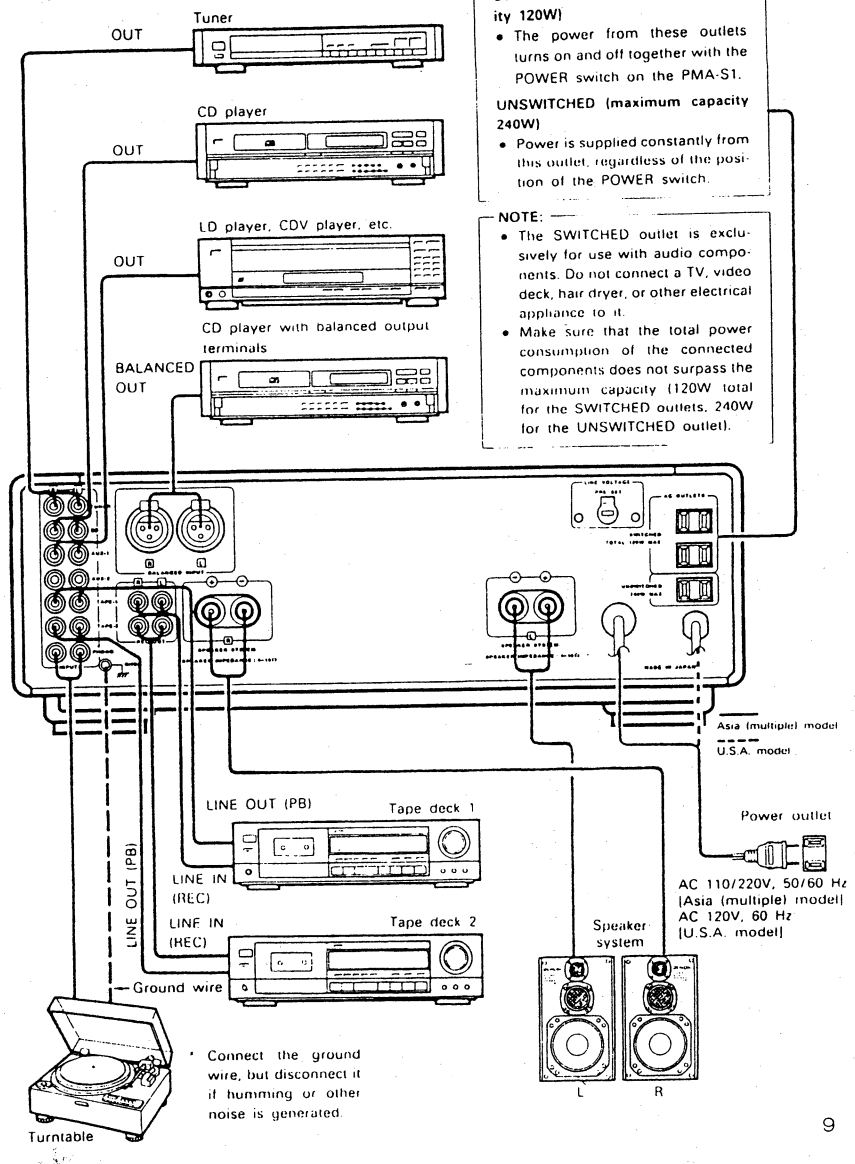
NOTE:
- The PMA-S1's speaker output has a BTL configuration, so inverted phase signal is fed to the ⊖ terminal same as noninverted phase signal is fed to the ⊕ terminal. Do not use these terminals to connect a device (such as an audio channel selector) for switching between multiple amplifiers or speakers or for any type of connection (speaker matrix connection, etc.) other than the normal speaker connections (see page 10). Such connections may result in damage.

⑭ AC OUTLETS
Use these as power outlets for other audio components.
- SWITCHED outlets (total maximum capacity 120W)
  The power from these outlets turns on and off together with the POWER switch on the PMA-S1.
- UNSWITCHED (maximum capacity 240W)
  Power is supplied constantly from this outlet, regardless of the position of the POWER switch.

⑮ AC power cord
Plug this cord into a wall power outlet.

⑯ LINE VOLTAGE selection switch
For Asia (multiple) models only
- Use a screwdriver to set this switch to the proper position.
- Do not turn this switch with excessive force, as this may cause damage.
- If the switch does not turn smoothly, please contact a qualified service person.
- Be sure that the AC power cord is unplugged when changing the setting.

3 CONNECTIONS



AC OUTLETS
SWITCHED (Total maximum capacity 120W)
- The power from these outlets turns on and off together with the POWER switch on the PMA-S1.

UNSWITCHED (maximum capacity 240W)
- Power is supplied constantly from this outlet, regardless of the position of the POWER switch.

NOTE:
- The SWITCHED outlet is exclusively for use with audio components. Do not connect a TV, video deck, hair dryer, or other electrical appliance to it.
- Make sure that the total power consumption of the connected components does not surpass the maximum capacity (120W total for the SWITCHED outlets, 240W for the UNSWITCHED outlet).

* Connect the ground wire, but disconnect it if humming or other noise is generated.

Cautions on Connections

- Do not plug in the power cord until all connections are completed.
- Be sure to connect the left and right channels properly.
- Insert the plugs securely. Incomplete connections can result in noise.
- Use the SWITCHED AC outlets to plug in audio components. Do not use them for hair dryers or other appliances.
- The PMA-S1's speaker output has a BTL configuration, so inverted phase signal is fed to the ⊖ terminal same as noninverted phase signal is fed to the ⊕ terminal.
  Do not use these terminals to connect a device (such as an audio channel selector) for switching between multiple amplifiers or speakers or for any type of connection (speaker matrix connection, etc.) other than the normal speaker connections (see page 10). Such connections may result in damage.
- Note that placing the pin plug cords next to power cords or near power transformers may result in humming or other noise.
- The PHONO input jacks have an extremely high sensitivity, so avoid turning up the volume when no pin plug cords are connected. Doing so may result in induction humming (booming) from the speakers. When pin plug cords are not connected, insert the included short-circuit pin plug.

Connecting the Speakers

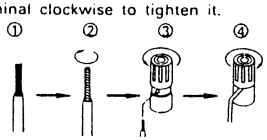
- Speaker impedance
  - Use speakers with an impedance of 4 to 16 ohms.
  - The protective circuit may be activated if speakers with other impedances are connected.

Protective circuit

- The PMA-S1 is equipped with a high-speed protective circuit.
  This circuit protects internal circuitry from damage should a strong current be generated inside the set if an output is emitted when the speaker terminals are improperly connected or short-circuited.
  If this protective circuit is activated, the speaker output is automatically interrupted. If this happens, turn off the power, recheck the speaker connections, then turn the power back on. The set will operate normally in a few seconds after the muting circuit turns off.

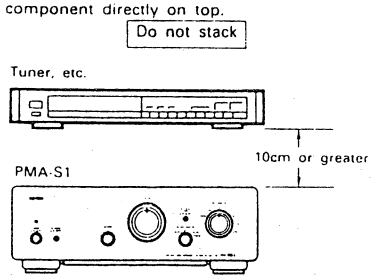
- Be sure to connect the cords between the speaker terminals and speaker systems with the same polarities (⊕ to ⊕, ⊖ to ⊖). If not, the central sound will be weak and the position of the different instruments will not be clear, diminishing the stereo effect.
- When connecting the speakers, be sure that the core wires of the speaker cords do not stick out from the terminals and touch other terminals, each other or the rear panel.

- Connecting the speaker cords
  ①Peel off the sheathing from the end of the cord.
  ②Twist the core wires.
  ③Turn the speaker terminal counterclockwise to loosen it.
  ④Insert the core wires entirely, then turn the terminal clockwise to tighten it.



Cautions on Installation

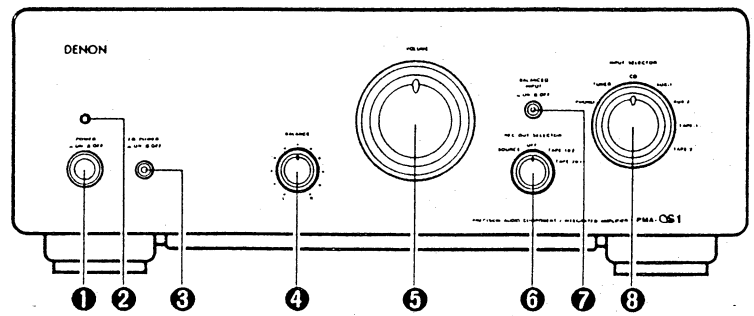
- The PMA-S1 generates heat, so leave at least 10cm above it. Do not place another audio component directly on top.



- When installing in a rack, be sure the shelf is sufficiently thick and strong enough to support the set's weight.

4 OPERATIONS

- Make sure that all connections are proper.
- Turn the VOLUME control ❺ fully counterclockwise (∩) to the minimum position.
- Set the BALANCE control ❹ to the center position.
- Set the POWER switch ❶ to the ON (⁀) position.



Playing records

1. Set the INPUT SELECTOR ❽ to the PHONO position.
2. Set the EQ POWER switch ❸ to the ON (⁀) position.
3. Set the record on the turntable and start playback.
4. Adjust the VOLUME ❺ and BALANCE ❹ controls to the desired levels.

Playing CDs
(when the CD player is connected to the CD jacks)

1. Set the INPUT SELECTOR ❽ to the CD position.
2. Set the CD in the CD player and start playback.
3. Adjust the VOLUME ❺ and BALANCE ❹ controls to the desired levels.

Listening to the radio on the tuner
(when the tuner is connected to the TUNER jacks)

1. Set the INPUT SELECTOR ❽ to the TUNER position.
2. Tune the radio to the desired station.
3. Adjust the VOLUME ❺ and BALANCE ❹ controls to the desired levels.

Listening to the component connected to the AUX-1 or AUX-2 jacks

1. Set the INPUT SELECTOR ❽ to the AUX-1 or AUX-2 position.
2. Set the component connected to the AUX-1 or AUX-2 jacks to the play mode.
3. Adjust the VOLUME ❺ and BALANCE ❹ controls to the desired levels.

Playing the component connected to the BALANCED INPUT terminals

1. Set the BALANCED INPUT switch ❼ to the ON (⁀) position.
2. Set the component connected to the BALANCED INPUT terminals to the play mode.
3. Adjust the VOLUME ❺ and BALANCE ❹ controls to the desired levels.

Playing a tape deck

1. Set the INPUT SELECTOR ❽ to the TAPE-1 or TAPE-2 position.
2. Set the tape in the tape deck and start playback.
3. Adjust the VOLUME ❺ and BALANCE ❹ controls to the desired levels.

Copying tapes

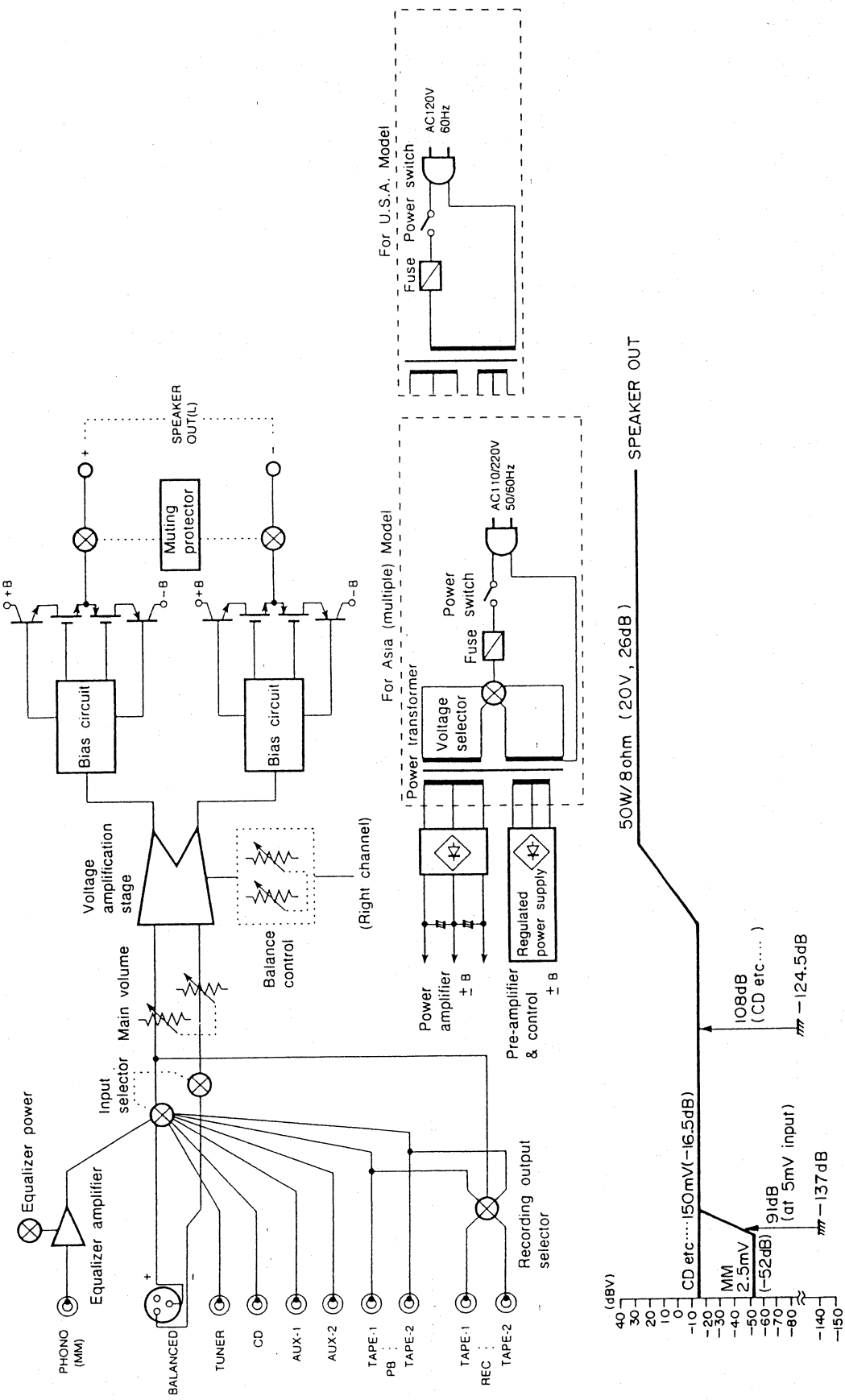
(Refer to the tape decks' instructions.)

1. Select the tape deck using the REC OUT SELECTOR ❻.
   - To record from the deck connected to the TAPE-1 jacks, set to the TAPE-1▶2 position.
   - To record from the deck connected to the TAPE-2 jacks, set to the TAPE-2▶1 position.
2. Set the tape deck onto which you want to record to the recording mode.
3. Set the tape deck from which you want copy to the play mode.

Recording onto a tape deck
(other than for copying tapes)

1. Select the source to be recorded using the INPUT SELECTOR ❽ and the BALANCED INPUT switch ❼.
2. Set the REC OUT SELECTOR ❻ to the SOURCE position.
3. Set the tape deck onto which you want to record to the recording mode.
   (Refer to the tape deck's instructions.)
4. Play the source to be recorded.

BLOCK AND LEVEL DIAGRAM



SPECIFICATIONS

■ Power amplifier

- **Rated output**: Both channel driven (CD → SP OUT)
  50W + 50W (8 ohms load, 20Hz to 20kHz), T.H.D. 0.07%
  100W + 100W (4 ohms load), T.H.D. 0.7%
- **Total harmonic distortion rate**:
  0.007% (–3dB rated output), 8 ohms load, 1kHz
- **Output terminals**: Speaker load 4 to 16 ohms

■ Pre-amplifier

Equalizer amplifier output (REC OUT jacks): Rated output 150mV

Input sensitivity/impedance:

PHONO (MM):	2.5mV/47kohms
CD, TUNER, AUX-1, AUX-2, TAPE-1 and TAPE-2:	150mV/47kohms
BALANCED:	150mV/100kohms

RIAA deviation: PHONO 20Hz to 20kHz, ±0.3dB

■ Overall performance

S/N ratio (A network):

PHONO (MM):	91dB (input terminals short-circuited, 5mV input signal)
CD, TUNER, AUX-1, AUX-2, TAPE-1 and TAPE-2:	108dB (input terminals short-circuited)

■ Power outlets

UNSWITCHED:	1 outlet, maximum capacity 240W
SWITCHED:	2 outlets, total maximum capacity 120W

■ Power supply

AC 110/220V, 50/60Hz [Asia (multiple) model]
AC 120V, 60Hz [U.S.A. model]

■ Power consumption

230W [Asia (multiple) model]
4A [U.S.A. model]

■ Maximum external dimensions:

434 (width) × 155 (height) × 493 (depth) mm
(including feet, controls and jacks)

■ Weight:

25.0kg

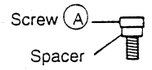
DISASSEMBLY

(For reassembling , do reverse manner as to disassemble.)

● TOP COVER A ND SIDE PANEL

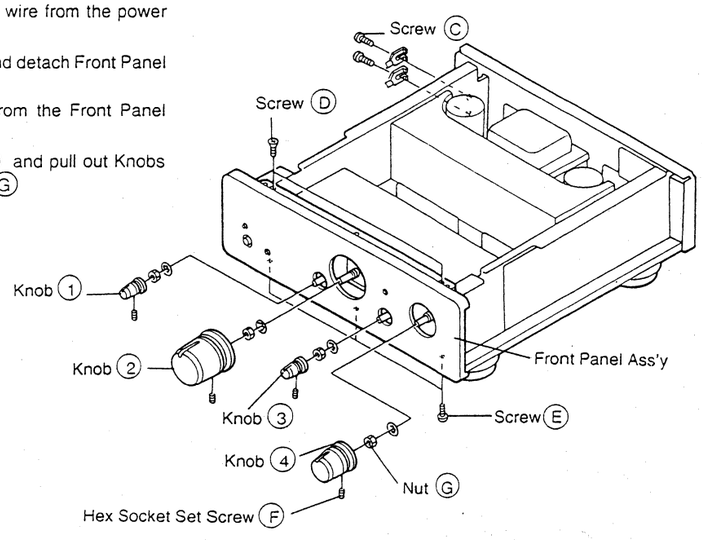
1. Remove 8 screws (A) and detach Top Covers (A) and (B).
2. Remove 6 screws (B), 6 screws (C) and detach Side Panels.

Note: Spacer should be inserted to screw (A) as shown in the illustration.



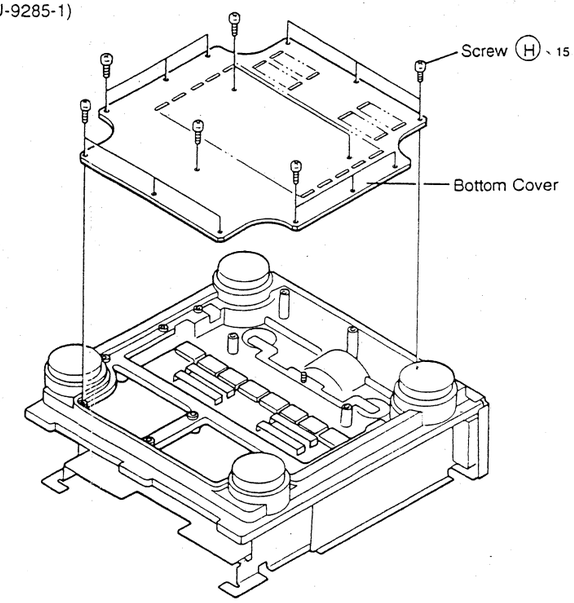
● FRONT PANEL ASS'Y

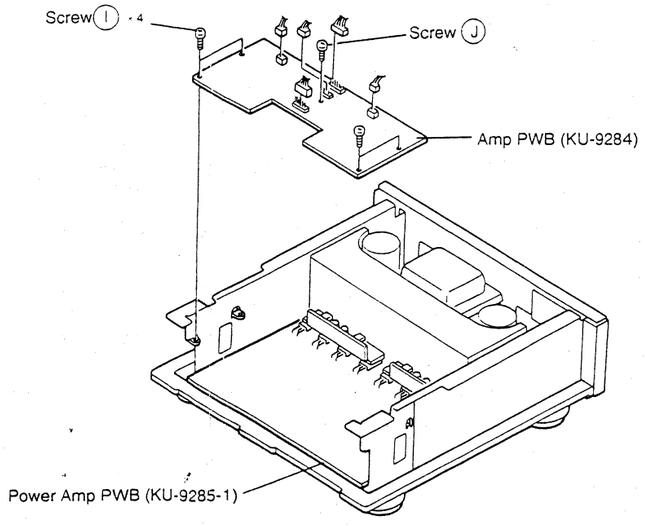
1. Unfasten screw (C) and remove lug wire from the power switch.
2. Remove 2 screws (D) 3 screws (E) and detach Front Panel Ass'y.
   (Be sure to unplug connector cord from the Front Panel Ass'y.)
3. Remove 4 hex socket set screws (F) and pull out Knobs (1) ~ (4), then untighten 4 hex nuts (G)



● BOTTOM COVER AND AMP PWB

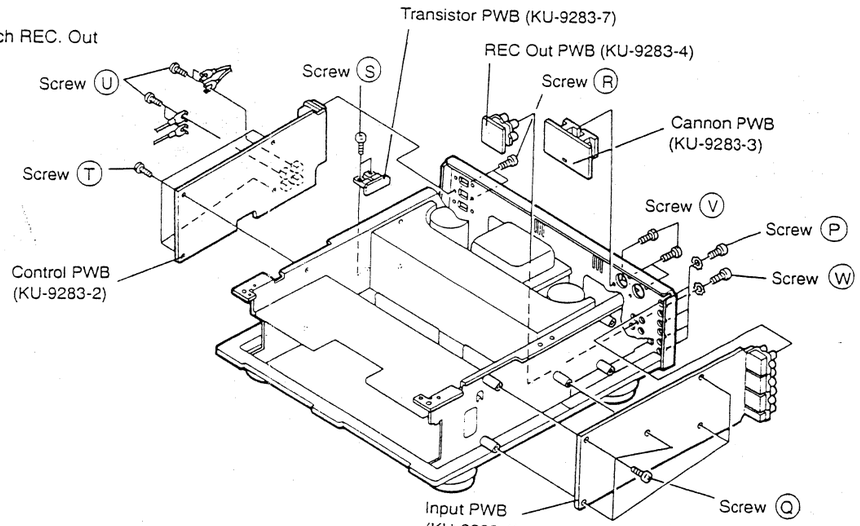
1. Unsecure 15 screws (H) from the bottom side and detach Bottom Cover.
2. Unfasten 4 screws (I), screw (J), unplug 5 respective connectors from the top side and take out Amp PWB (KU-9284).
   In this state, the checking of power Amp PWB (KU-9285-1) is feasible.



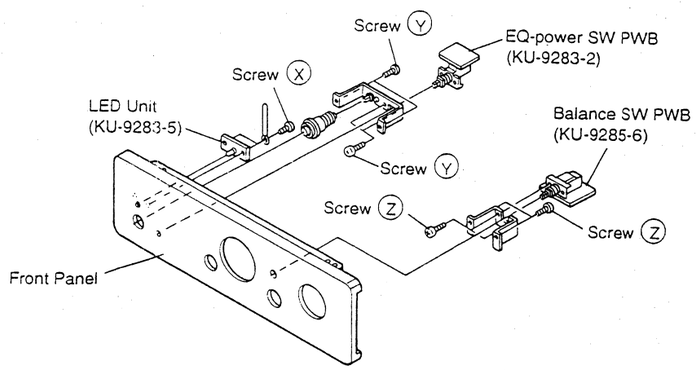


● EACH PWB

1. Remove 4 screws (P), 5 screws (Q) and detach Input PWB (KU-9283-1).
2. Unfasten 2 screws (S) and detach Transistor PWB (KU-9283-7).
3. Unscrew 4 screws (T), 6 screws (U) and detach Control PWB (KU-9283-2).
   (Unplug each connector of PWB.)
4. Untighten 4 screws (V) and detach Cannon PWB (KU-9283-3).
5. Remove 1 screw (W) and detach REC. Out PWB (KU-9283-4).

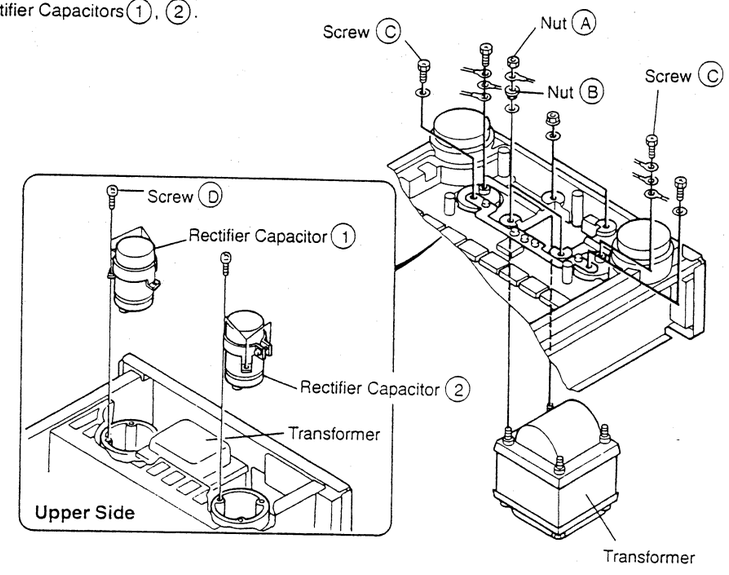


6. Unsecure 2 screws (X) and detach LED PWB (KU-9283-5).
7. Unfasten 4 screws (Y) and detach EQ-power SW PWB (KU-9285-5).
8. Remove 4 screws (Z) and detach Balance SW PWB (KU-9285-6).



● TRANSFORMER AND RECTIFIER CAPACITOR

1. Remove 2 nuts (A), 4 nuts (B) from the bottom side and take out Transformer. (Disconnect each wire from the Transformer.)
2. Unfasten 2 each screws (C), 3 each screws (D) from the bottom side and detach 2 Rectifier Capacitors (1), (2).



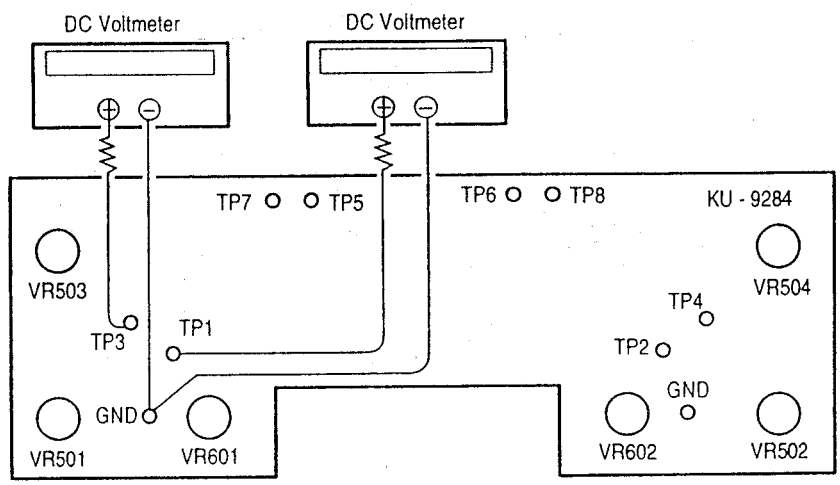
ADJUSTMENT

● VOLTAGE AMPLIFIER STAGE

1. Output Offset Voltage Adjustment for Distortion Eliminating Circuit

Connect 2 DC Voltmeters across TP1 and TP3 to GND with the Balanced Input set at ON, turn the Master Volume minimum (extremely left), and rotate VR601 so as to obtain absolute value difference of TP1 and TP3 DC voltage becomes no greater than 100mV.

Perform the same manner as per the above and rotate VR602 by means of connecting DC Voltmeters to TP2 and TP4 to make adjustment for Rch.

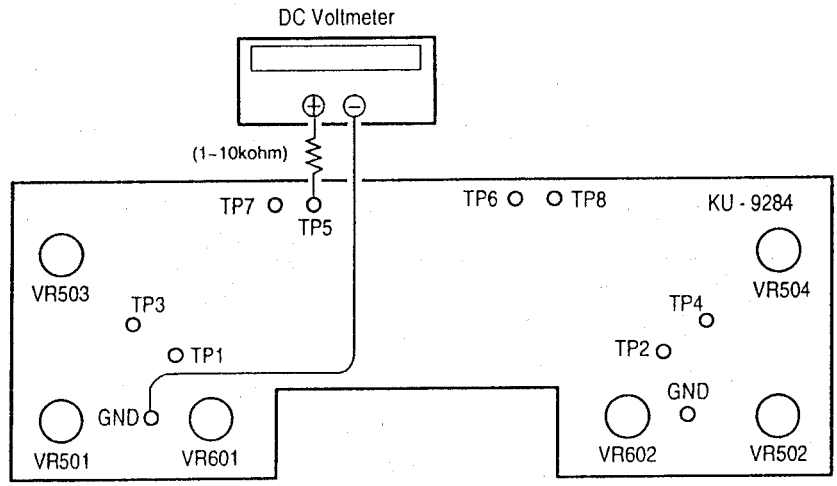


2. Output Offset Voltage Adjustment for Voltage Amplifier Stage

Connect a DC Voltmeter across TP5 and GND with the Balanced Input set at ON, turn the master Volume minimum (extremely left) so as to obtain TP5 DC Voltmeter within ±5mV when rotating VR501.

Next, connect a DC Voltmeter to TP7 and obtain the DC voltage within ±5mV with the adjustment of VR503.

Perform the same manner as per the above and rotate VR502, VR504 by means of connecting DC Voltmeters to TP6 and TP8 to make adjustment for Rch.



Note 1: Be sure to connect a oscillation preventive resistor (1kohm ~ 10kohm) on the tip of DC Voltmeter probe.

Note 2: An aging of more than 5 minutes is essential prior to perform the above adjustment.

● POWER AMPLIFIER STAGE

1. Idle Current Adjustment

Turn VR701~VR704 fully counterclockwise.

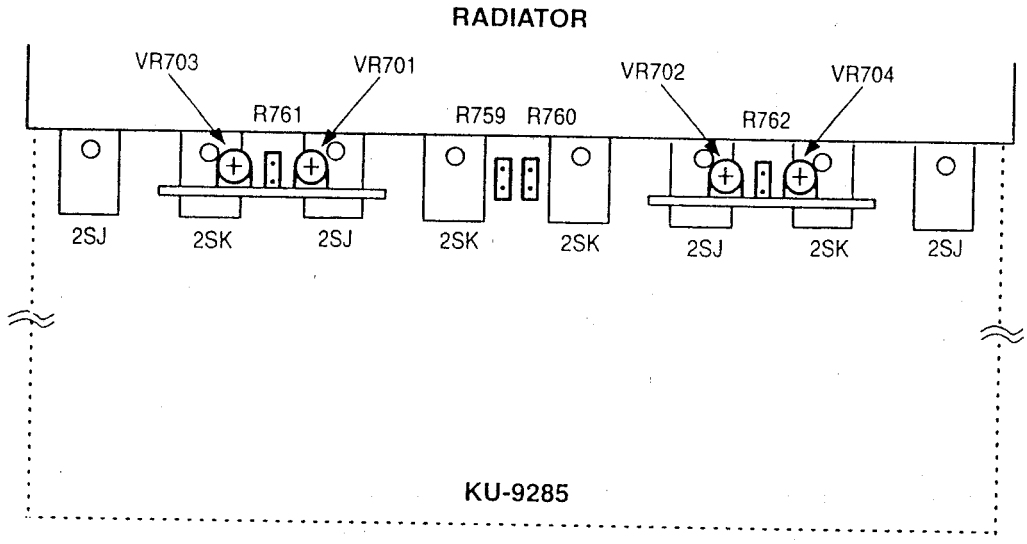
Set the Master Volume to minimum (extremely left) and turn the power switch ON.

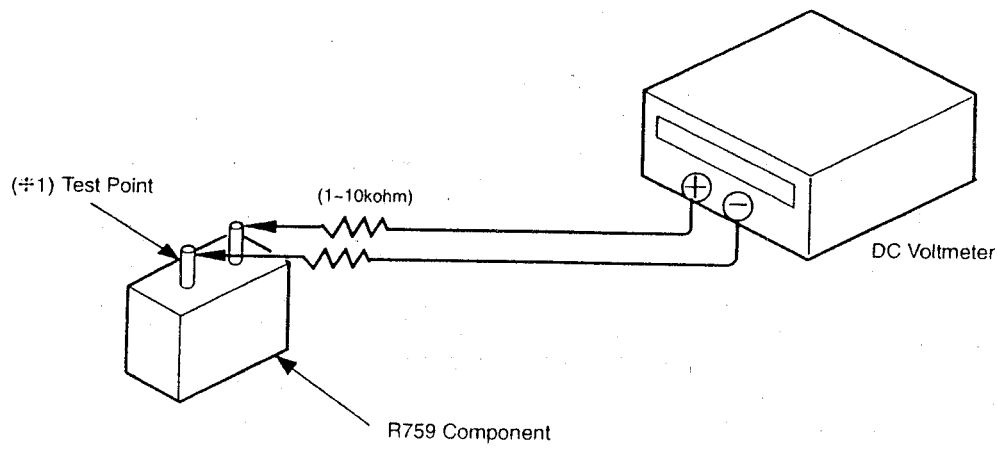
(※1) Connect a DC voltmeter to Test Point upper portion of R759 and obtain a DC voltage at the same Test Point as follows.

Turn VR701 clockwise and adjust the voltage to 25mV ±5mV.

Keep warm up 10 minutes, adjust the above voltage to 45mV ±5mV.

Adjust the idle current with R761 and VR703, R760 and VR702, R762 and VR704 the same procedure as to the above for Lch Reversal Amplifier, Rch Non-reversal Amplifier and Reversal Amplifier.



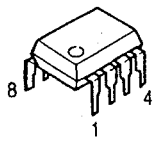


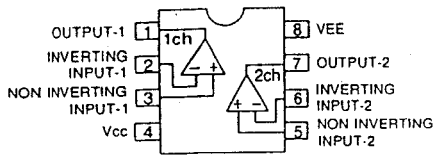
Note 1: Be sure to connect a oscillation preventive resistor (1kohm ~ 10kohm) on the tip of DC Voltmeter probe.

SEMICONDUCTORS

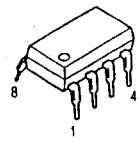
● IC

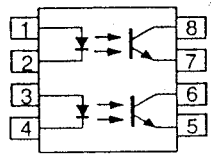
NJM082D
M5219P



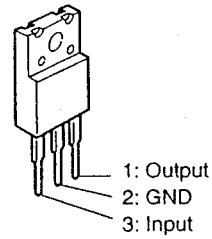


TLP512-2(BL)

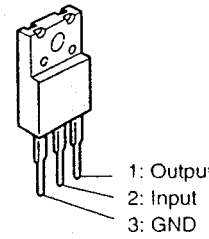




NJM78M18FA

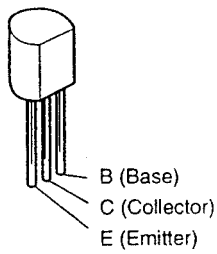


NJM7918FA

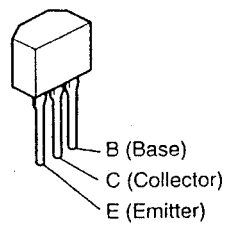


● Transistor

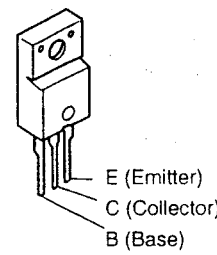
2SA1015(GR)
2SB647A
2SC3792
2SC1815(GR)
2SD667A
2SD1111



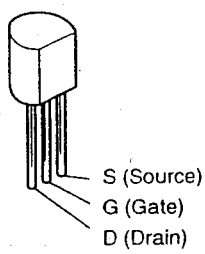
2SC2458(BL)



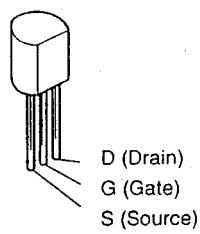
2SD1944



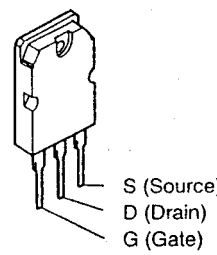
2SK369(BL)/(GR)-C



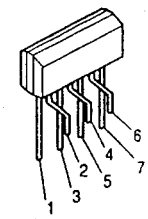
2SK373(Y)



2SK1303

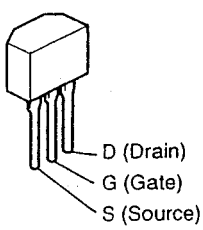


2SK389(GR)/(BL)/(V)

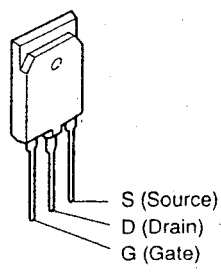


1: Drain 1
2: Gate 1
3: Source 1
4: Sub Straight
5: Source 2
6: Gate 2
7: Drain 2

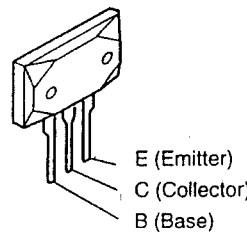
2SK381(B)(C)



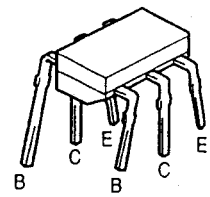
2SJ216



2SB1570
2SD2401

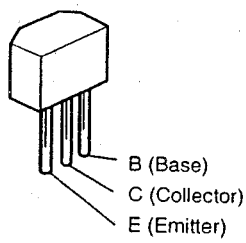


2SA1240
2SC3067

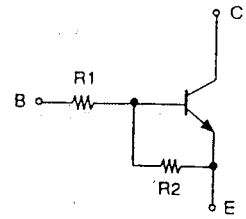


E (Emitter)
C (Collector)
B (Base)

RN1202 (10k-10k)
RN2202 (10k-10k)
RN2204 (47k-47k)

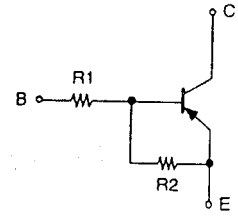


RN1202 (10k-10k)



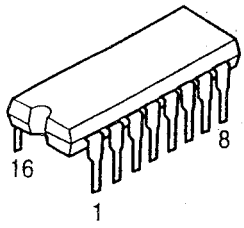
	R1	R2
RN1202	10 kohm	10 kohm

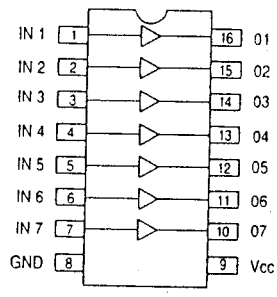
RN2202 (10k-10k)
RN2204 (47k-47k)



	R1	R2
RN2202	10 kohm	10 kohm
RN2204	47 kohm	47 kohm

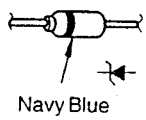
LB1701(Transistor Array)



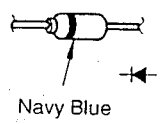


● Diode (Include LED)

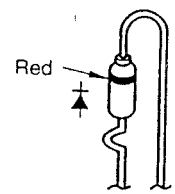
HZS2B-1
HZS7C-1
HZS9C-1
HZS24-1
HZ9LA-2
HZ20L-2
HZ4B-1
HZ5C-1
MTZJ2.0A



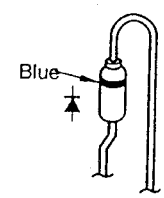
1SS270A
1S2076A



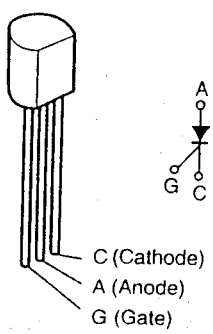
S2K20F



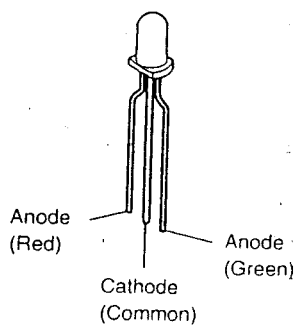
1SR35-200A



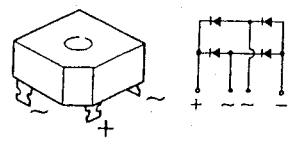
SFOR1A42
(Thyristor)



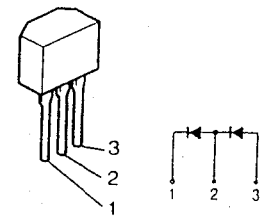
SWL1216W (LED)



15D4B41



DA210S

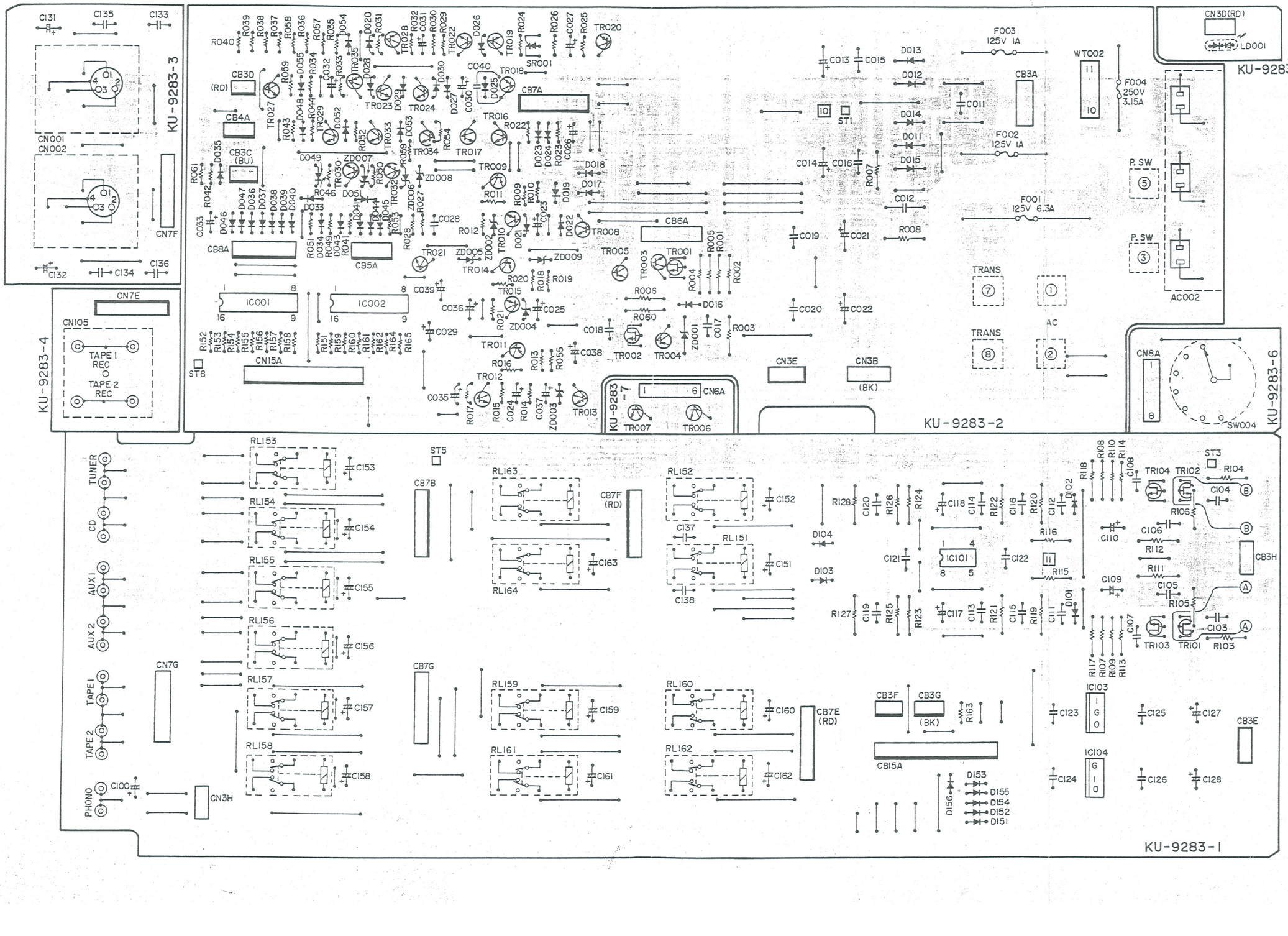


PRINTED WIRING BOARD (Pattern side)

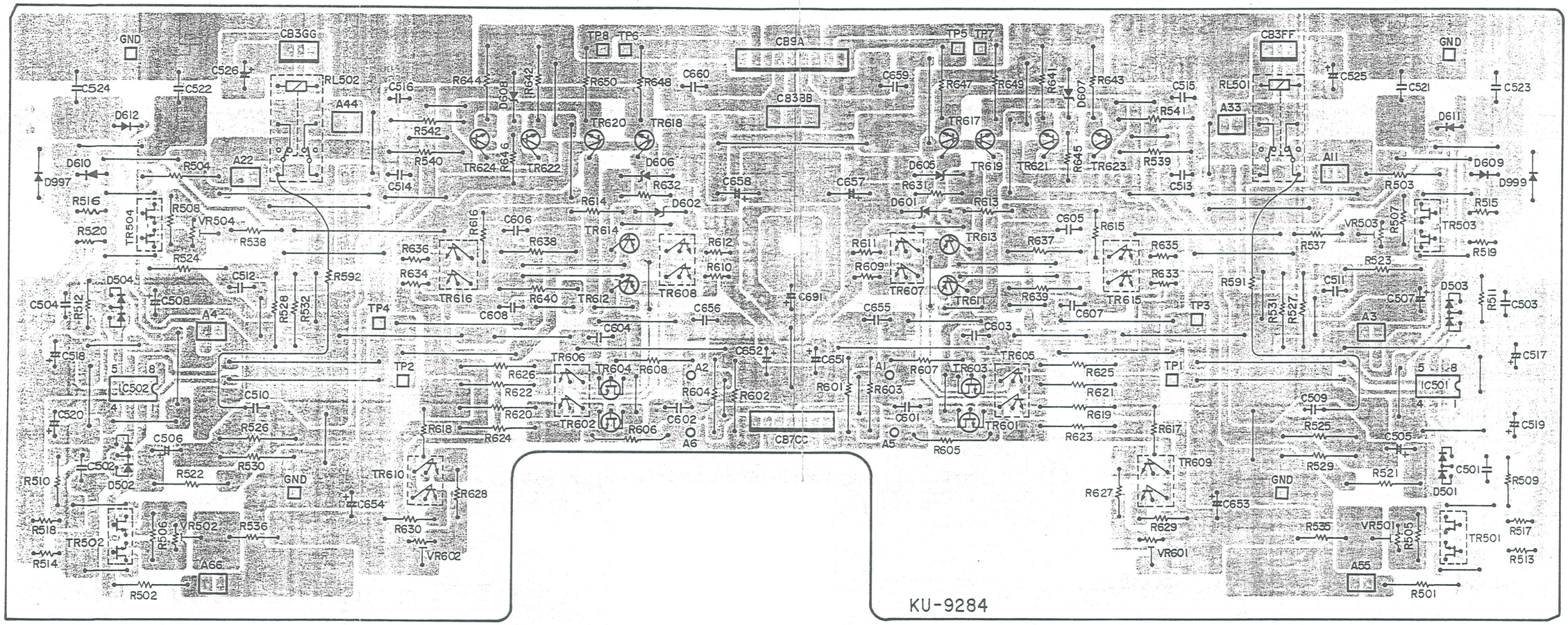
1 2 3 4 5 6 7 8

A B C D E

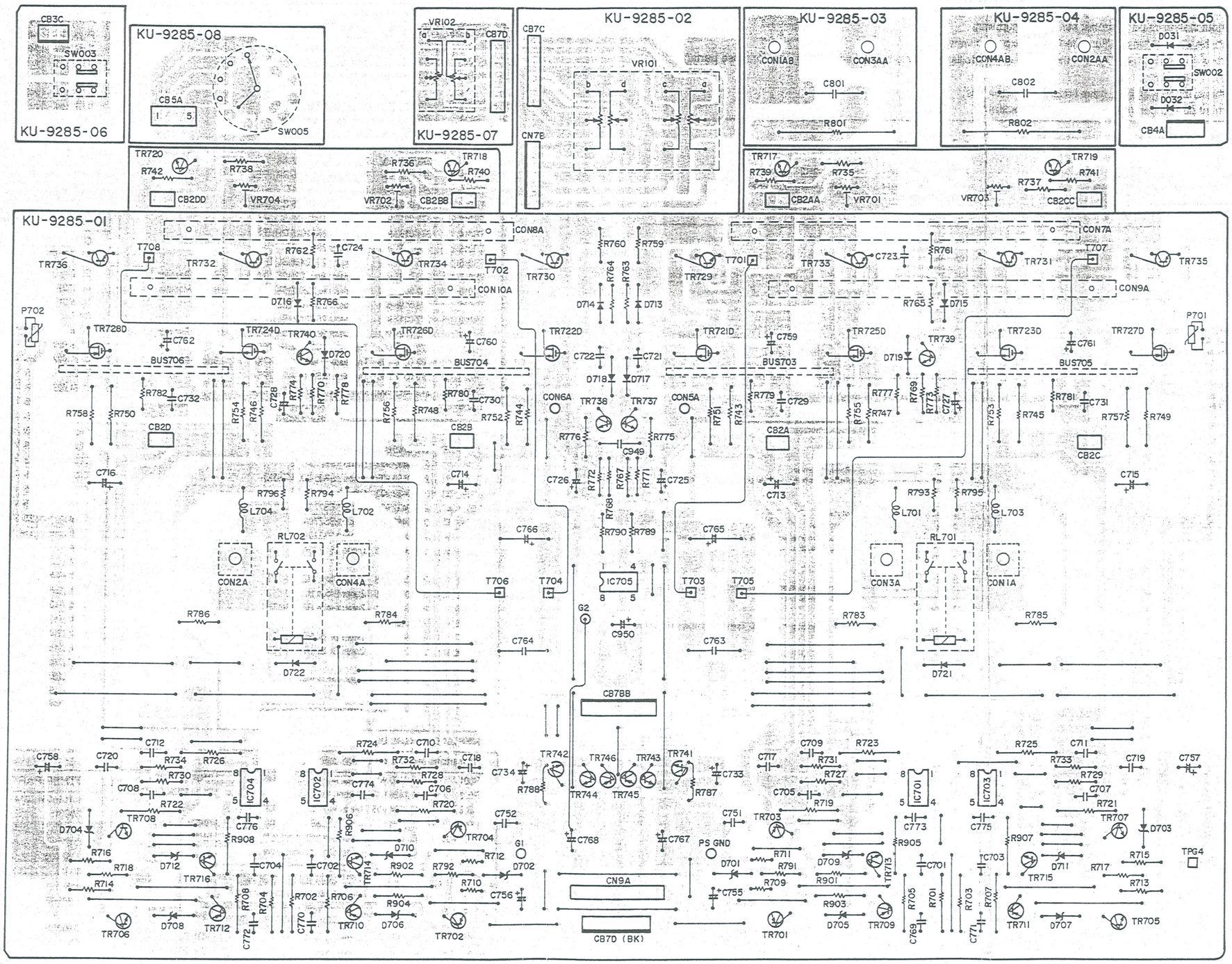
KU-9283-D INPUT & CONTROL UNIT ASS'Y



KU-9284 DISTORTION REJECT UNIT ASS'Y



KU-9285 POWER UNIT ASS'Y



NOTE FOR PARTS LIST
- Part indicated with the mark " ◉ " are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:
Parts marked with this symbol ⚠ ▒▒ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

● Resistors

Ex.: RN (Type) 14K (Shape and performance) 2E (Power) 182 (Resistance) G (Allowable error) FR (Others)

RD : Carbon RC : Composition RS : Metal oxide film RW : Winding RN : Metal film RK : Metal mixture	2B : 1/8W 2E : 1/4W 2H : 1/2W 3A : 1W 3D : 2W 3F : 3W 3H : 5W	F : ±1% G : ±2% J : ±5% K : ±10% M : ±20%	P : Pulse-resistant type NL : Low noise type NB : Non-burning type FR : Fuse-resistor F : Lead wire forming

• Resistance

1 8 2 ⇒ 1800 ohm = 1.8 kohm
Indicates number of zeros after effective number.
2-digit effective number.

• Units: ohm

1 R 2 ⇒ 1.2 ohm
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: ohm

● Capacitors

Ex.: CE (Type) 04W (Shape and performance) 1H (Dielectric strength) 2R2 (Capacity) M (Allowable error) BP (Others)

CE : Aluminum foil electrolytic CA : Aluminum solid electrolytic CS : Tantalum electrolytic CQ : Film CK : Ceramic CC : Ceramic CP : Oil CM : Mica CF : Metallized CH : Metallized	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V 2A : 100V 2B : 125V 2C : 160V 2D : 200V 2E : 250V 2H : 500V 2J : 630V	F : ±1% G : ±2% J : ±5% K : ±10% M : ±20% Z : +80% −20% P : +100% −0% C : ±0.25pF D : ±0.5pF * : Others	HS : High stability type BP : Non-polar type HR : Ripple-resistant type DL : For charge and discharge HF : For assuring high frequency U : UL part C : CSA part W : UL-CSA type F : Lead wire forming

• Capacity (electrolyte only)

2 2 2 ⇒ 2200μF
Indicates number of zeros after effective number.
2-digit effective number.

• Units: μF.

2 R 2 ⇒ 2.2μF
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: μF.

• Capacity (except electrolyte)

2 2 2 ⇒ 2200pF = 0.0022μF
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: μF.

2 2 1 ⇒ 220pF
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: pF.

• When the dielectric strength is indicated in AC, "AC" is included after the dieelectric strength value.

PARTS LIST OF PRINTED WIRING BOARD
KU-9283-D INPUT & CONTROL UNIT

Ref No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC001,002	263 0917 008	Tr.Aray LB1710	
IC101	263 0244 014	IC NJM082DT/BD	
IC103	263 0820 001	IC NJM78M18FA(S)	
IC104	263 0592 009	IC NJM79M18FA	
TR001,002	275 0048 912	Transistor 2SK381(B)/(C)-T	
TR003	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR004,005	271 0102 924	Transistor 2SA1015(GR)TPE2	
TR006,007	274 0138 007	Transistor 2SD1944	
TR008	273 0379 902	Transistor 2SC3792-AA	
TR009	271 0102 924	Transistor 2SA1015(GR)TPE2	
TR010	274 0111 901	Transistor 2SD1111T	
TR011	271 0102 924	Transistor 2SA1015(GR)TPE2	
TR012,013	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR014	271 0102 924	Transistor 2SA1015(GR)TPE2	
TR015	274 0111 901	Transistor 2SD1111T	
TR016	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR017	269 0025 901	Transistor RN1202(10K-10K)T	Built in Resistor
TR018–020	269 0026 900	Transistor RN2202(10K-10K)T	Built in Resistor
TR021	273 0198 934	Transistor 2SC1815(BL/GR)TPE2	
TR022,023	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR024	269 0025 901	Transistor RN1202(10K-10K)T	Built in Resistor
TR027	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR028	269 0030 909	Transistor RN2204(47K-47K)T	Built in Resistor
TR029,030	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR032–034	273 0317 906	Transistor 2SC2458(BL)TPE4	
TR035	269 0030 909	Transistor RN2204(47K-47K)T	Built in Resistor
TR101–104	275 0038 029	Transistor 2SK369(GR)-C	
D011–015	276 0348 000	Diode S2K20F	
D016	276 0432 903	Diode 1SS270A TE	
D017,018	276 0553 905	Diode 1SR35-200A(T93X)	
D019–030	276 0432 903	Diode 1SS270A TE	
D033–041	276 0432 903	Diode 1SS270A TE	
D043–055	276 0432 903	Diode 1SS270A TE	
D101–104	276 0432 903	Diode 1SS270A TE	
D151–156	276 0432 903	Diode 1SS270A TE	
ZD001	276 0355 938	Zener Diode HZ9LA-2TD	
ZD002–004	276 0469 905	Zener Diode HZS9C-1TD	
ZD005	276 0450 901	Zener Diode HZS2B-1TD	
ZD006	276 0466 908	Zener Diode HZS7C-1TD	
ZD007	276 0450 901	Zener Diode HZS2B-1TD	
ZD008,009	276 0481 909	Zener Diode HZS24-1TD	
LD001	393 3491 004	LED SML1216W	
SR001	279 0016 904	Thyristor SF0R1A42(TPE2)	
RESISTORS GROUP			
(not included Carbon Film ±5% 1/4W type)			
R001	245 2100 909	Metal film 22k ohm 1/4W	RN14K2E223GT
R002	241 2429 963	Carbon 1M ohm 1/4W	RD14B2E105JT PSNB
R003	245 2094 905	Metal film 12k ohm 1/4W	RN14K2E123GT
R004	245 2104 905	Metal film 33k ohm 1/4W	RN14K2E333GT
R005,006	245 2101 908	Metal film 24k ohm 1/4W	RN14K2E243GT
R007	245 2108 901	Metal film 47k ohm 1/4W	RN14K2E473GT
R008	245 2106 903	Metal film 39k ohm 1/4W	RN14K2E393GT
⚠ R035–040	244 2051 932	Metal oxide film 3.3k ohm 1W (Non-burning type)	RS14B3A332JNBST
⚠ R057,058	244 2051 932	Metal oxide film 3.3k ohm 1W (Non-burning type)	RS14B3A332JNBST
R060	241 2429 963	Carbon 1M ohm 1/4W	RD14B2E105JT PSNB
R103,104	241 2420 988	Carbon 220 ohm 1/4W	RD14B2E221JT PSNB
R105,106	245 2108 901	Metal film 47k ohm 1/4W	RN14K2E473GT

Ref No.	Part No.	Part Name	Remarks
R107–110	245 2076 907	Metal film 2.2k ohm 1/4W	RN14K2E222GT
R111,112	245 2082 904	Metal film 3.9k ohm 1/4W	RN14K2E392GT
R113,114	245 2060 900	Metal film 470 ohm 1/4W	RN14K2E471GT
R115,116	245 2036 905	Metal film 47 ohm 1/4W	RN14K2E470GT
R119,120	241 2425 983	Carbon 27K ohm 1/4W	RD14B2E273JT PSNB
R121,122	241 2423 927	Carbon 2.2K ohm 1/4W	RD14B2E222JT PSNB
R123,124	245 2128 907	Metal film 330k ohm 1/4W	RN14K2E334GT
R125,126	241 2420 988	Carbon 220 ohm 1/4W	RD14B2E221JT PSNB
R127,128	241 2421 961	Carbon 470 ohm 1/4W	RD14B2E471JT PSNB
⚠ R151–162	244 2051 932	Metal oxide film 3.3k ohm 1W (Non-burning type)	RS14B3A332JNBST
⚠ R164,165	244 2051 932	Metal oxide film 3.3k ohm 1W (Non-burning type)	RS14B3A332JNBST
⚠ R240	244 2051 932	Metal oxide film 3.3k ohm 1W (Non-burning type)	RS14B3A332JNBST
CAPACITORS GROUP			
C011	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C012	256 1033 006	Metallized 2.2μF/100V	CF93B2A225K GU
C013,014	254 4356 069	Electrolytic 2200μF/50V	CE04W1H222M ARS
C015,016	255 6167 000	Film 0.01μF/125V	CQ09S2B103K B
C017	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C018	255 4217 907	Film 100pF/50V	CQ09P1H101JT PDH
C019,020	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C021,022	254 4445 705	Electrolytic 470μF/50V	CE04W1H471MC ARSG
C023	254 1033 000	Tantalm electrolytic 4.7μF/35V	CS45E1V4R7M
C024,025	254 4260 980	Electrolytic 10μF/50V	CE04W1H100MT SME
C026	254 4254 909	Electrolytic 10μF/16V	CE04W1C100MT SME
C027	254 4254 938	Electrolytic 47μF/16V	CE04W1C470MT SME
C028	255 1265 936	Film 0.01μF/50V	CQ09M1H103JT B
C029	254 4260 948	Electrolytic 1μF/50V	CE04W1H010MT SME
C030,031	254 4260 951	Electrolytic 2.2μF/50V	CE04W1H2R2MT SME
C032	254 4260 948	Electrolytic 1μF/50V	CE04W1H010MT SME
C033	254 4260 951	Electrolytic 2.2μF/50V	CE04W1H2R2MT SME
C035,036	254 4260 948	Electrolytic 1μF/50V	CE04W1H010MT SME
C037	254 4260 980	Electrolytic 10μF/50V	CE04W1H100MT SME
C038,039	254 4432 718	Electrolytic 100μF/50V	CE04W1H101MC ARE
C040	256 1035 091	Metallized 1μF/50V	CF93A1H105J
C100	254 4432 734	Electrolytic 22μF/50V	CE04W1H220MC ARE
C103–106	255 4217 907	Film 100pF/50V	CQ09P1H101JT PDH
C107,108	255 4232 953	Film 0.0047μF/100V	CQ09P2A472JT NH
C109,110	254 4432 718	Electrolytic 100μF/50V	CE04W1H101MC ARE
C111,112	256 1034 982	Metallized 0.12μF/50V	CF93A1H124JT
C113,114	255 4235 785	Film 0.033μF/100V	CQ93P2A333JC NH
C115,116	255 4235 992	Film 680pF/100V	CQ09P2A681JT NH
C117,118	254 4356 797	Electrolytic 10μF/50V	CE04W1H100MC ARS
C119,120	255 4232 953	Film 0.0047μF/100V	CQ09P2A472JT NH
C121–126	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C127,128	254 4347 735	Electrolytic 4.7μF/50V	CE04W1H4R7MC ARSA
C131,132	254 4432 734	Electrolytic 22μF/50V	CE04W1H220MC ARE
C133–136	255 4217 907	Film 100pF/50V	CQ09P1H101JT PDH
C137,138	255 1265 936	Film 0.01μF/50V	CQ09M1H103JT B
C151–163	254 4260 918	Electrolytic 47μF/50V	CE04W1H470MT SME
OTHER PARTS			
RL151–164	214 0174 001	Relay (RY-12W-OH-K)	
SW004	212 0357 000	Rotary Switch (1–7)	INPUT SELECT
⚠ AC002	203 3946 003	AC OUTLET (POLARIZED)	
⚠ F001	206 1017 001	Fuse (6.3A) 125V	
⚠ F002,003	206 1053 007	Fuse (1.0A) 125V	
⚠ F004	206 1061 028	Fuse (3.15A) 250V	
(F001)	EP- 5870	Fuse Holder	FOR F001
(F002–004)	202 0022 008	Fuse Holder	FOR F002–004
CN001,002	205 0634 000	3P Cannon Connector	
CN101	204 8458 007	2P Pin Jack(G)	PHONO
CN102–104	204 8459 006	4P Pin Jack(G)	
CN105	204 8460 008	4P Pin Jack(G)	REC OUT

KU-9284-D DISTORTION REJECT UNIT

Ref No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC501,502	263 0284 003	IC M5219P	
TR501~504	275 0045 012	Transistor 2SK389(GR)/(BL)/(V)	
TR601~604	275 0042 905	Transistor 2SK373(Y)TPE2	
TR605,606	273 0431 002	Transistor 2SC3067	
TR607,608	271 0253 006	Transistor 2SA1240F/G	
TR609,610	273 0431 002	Transistor 2SC3067	
TR611~614	271 0102 924	Transistor 2SA1015(GR)TPE2	
TR615,616	273 0431 002	Transistor 2SC3067	
TR617~624	274 0060 900	Transistor 2SD667A	
D501~504	276 0630 909	Diode DA210S TP	
D601,602	276 0624 902	Diode MTZJ2.0A T77	
D605,606	276 0313 938	Zener Diode HZ20L-2TD	
D607,608	276 0185 933	Zener Diode HZ4B-1TE	
D609~612	276 0553 905	Diode 1SR35-200A(T93X)	
D997~999	276 0049 914	Diode 1S2076ATE	
RESISTORS GROUP			
(not included Carbon Film ±5% 1/4W type)			
VR501~504	211 6075 011	Adjust 100 ohm (CERMET)	VO6PB101
VR601,602	211 6075 011	Adjust 100 ohm (CERMET)	VO6PB101
R501~504	241 2438 006	Carbon 300 ohm 1/2W	RD05A2H301J RMG
R505~508	241 2417 988	Carbon 12 ohm 1/4W	RD14B2E120JT PSNB
R509~512	241 2421 961	Carbon 470 ohm 1/4W	RD14B2E471JT PSNB
⚠ R513~520	244 2043 953	Carbon Fuse 470 ohm 1/4W	RD14B2E471FRT
R521~524	241 2448 067	Carbon 100k ohm 1/2W	RD05A2H104J RMG
R525~528	241 2425 954	Carbon 20K ohm 1/4W	RD14B2E203JT PSNB
R529,530	241 2438 006	Carbon 300 ohm 1/2W	RD05A2H301J RMG
R531,532	241 2434 013	Carbon 150 ohm 1/2W	RD05A2H151J RMG
R535~538	241 2424 926	Carbon 5.6K ohm 1/4W	RD14B2E562JT PSNB
R539~542	241 2424 900	Carbon 4.7K ohm 1/4W	RD14B2E472JT PSNB
R591,592	241 2438 006	Carbon 300 ohm 1/2W	RD05A2H301J RMG
R601~604	241 2448 067	Carbon 100k ohm 1/2W	RD05A2H104J RMG
R605~608	241 2434 068	Carbon 1k ohm 1/2W	RD05A2H102J RMG
⚠ R609~612	244 2050 920	Metal oxide film 120 ohm 1W (Non-burning type)	RS14B3A121JNBST(S)
R613,614	241 2422 944	Carbon 1K ohm 1/4W	RD14B2E102JT PSNB
R615,616	241 2425 925	Carbon 15K ohm 1/4W	RD14B2E153JT PSNB
R617,618	241 2423 928	Carbon 2.2K ohm 1/4W	RD14B2E222JT PSNB
R619~622	241 2438 006	Carbon 300 ohm 1/2W	RD05A2H301J RMG
R623~626	241 2448 067	Carbon 100k ohm 1/2W	RD05A2H104J RMG
R627,628	241 2415 919	Carbon 47 ohm 1/4W	RD14B2E470JT PSNB
R629,630	241 2422 944	Carbon 1K ohm 1/4W	RD14B2E102JT PSNB
R631,632	241 2423 928	Carbon 2.2K ohm 1/4W	RD14B2E222JT PSNB
⚠ R633~636	244 2050 946	Metal oxide film 240 ohm 1W (Non-burning type)	RS14B3A241JNBST(S)
R637~640	241 2425 996	Carbon 30K ohm 1/4W	RD14B2E303JT PSNB
⚠ R641~644	244 0033 020	Metal oxide film 220 ohm 1W (Non-burning type)	RS14B3A221JNBF
R645,646	241 2426 940	Carbon 47K ohm 1/4W	RD14B2E473JT PSNB
R647~650	241 2438 022	Carbon 2.2k ohm 1/2W	RD05A2H222J RMG
CAPACITORS GROUP			
C501~504	255 4218 964	Film 470pF/50V	CQ09P1H471JT PDH
C505~508	254 4356 027	Electrolytic 22μF/50V	CE04W1H220MC ARS
C505~508	254 4417 018	Electrolytic 4.7μF/50V	CE04W1H4R7M ARSA
⚠ C509~512	255 6181 028	Film 33pF/400V	CQ09S2G330KF B
⚠ C513~516	255 6181 015	Film 22pF/400V	CQ09S2G220KF B
C517~520	254 4347 735	Electrolytic 4.7μF/50V	CE04W1H4R7MC ARSA
C521~524	255 6167 000	Film 0.01μF/125V	CQ09S2B103K B
C525,526	254 4356 739	Electrolytic 47μF/50V	CE04W1H470MC ARS

Ref No.	Part No.	Part Name	Remarks
C601,602	255 6175 034	Film 100pF/125V	CQ09S2B101KF B
C601~604	255 4235 918	Film 100pF/100V	CQ93P2A101JT NH
⚠ C605,606	255 6181 002	Film 10pF/400V	CQ09S2G100KF B
⚠ C607,608	255 6181 015	Film 22pF/400V	CQ09S2G220KF B
C651,652	254 4356 797	Electrolytic 10μF/50V	CE04W1H100MC ARS
C653,654	254 4347 735	Electrolytic 4.7μF/50V	CE04W1H4R7MC ARSA
C655,656	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C657,658	254 4445 721	Electrolytic 330μF/50V	CE04W1H331MC ARSG
C659,660	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C691	254 4356 797	Electrolytic 10μF/50V	CE04W1H100MC ARS
OTHER PARTS			
RL501,502	214 0174 001	Relay (RY-12W-OH-K)	

KU-9285-D POWER UNIT

Ref No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC701~704	263 0244 014	IC NJM082DT/BD	
IC705	262 0989 004	Photo Coupler TLP521-2 (BL)	
TR701~704	272 0053 908	Transistor 2SB647A(C)TZ	
TR705~708	274 0060 900	Transistor 2SD667A(C)TZ	
TR709~712	271 0102 924	Transistor 2SA1015(GR)TPE2	
TR713~176	273 0198 921	Transistor 2SC1815(GR)TPE2	
TR717~720	274 0138 007	Transistor 2SD1944	
TR737~744	273 0198 921	Transistor 2SC1815(GR)TPE2	
TR745,746	271 0102 924	Transistor 2SA1015(GR)TPE2	
D031,032	276 0049 914	Diode 1S2076A TE	
D701~704	276 0624 902	Diode MTZJ2.0A T77	
D705~712	276 0236 934	Zener Diode HZ5C-1TE	
D713~722	276 0432 903	Diode 1S2076A TE	
D949	276 0432 903	Diode 1S2076A TE	
RESISTORS GROUP			
(not included Carbon Film ±5% 1/4W type)			
VR101	211 9090 006	Variable 100k ohm	V4040V30SA104-(MASTER VOL.)
VR102	211 9125 007	Variable 50k ohm	V1820V25RS503T (BALANCE VOL.)
VR701~704	211 6098 001	Adjust 3.3k ohm	VO9PB332
R701~704	241 2450 097	Carbon 1M ohm 1/2W	RD05A2H105J RMG
R705~708	241 2438 006	Carbon 300 ohm 1/2W	RD05A2H301J RMG
⚠ R709~712	241 2313 901	Carbon Fuse 100 ohm 1/4W	RD14B2E101GFRT
⚠ R713~716	241 2313 008	Carbon Fuse 100 ohm 1/4W	RD14B2E101GFR
R717,718	241 2425 967	Carbon 22K ohm 1/4W	RD14B2E223JT PSNB
R719~726	241 2438 022	Carbon 2.2k ohm 1/2W	RD05A2H222J RMG
R727~734	241 2423 927	Carbon 2.2K ohm 1/4W	RD14B2E222JT PSNB
R735	241 2422 944	Carbon 1K ohm 1/4W	RD14B2E102JT PSNB
R736~739	241 2423 985	Carbon 3.9K ohm 1/4W	RD14B2E392JT PSNB
R740~742	241 2422 944	Carbon 1K ohm 1/4W	RD14B2E102JT PSNB
R743~758	241 2453 081	Carbon 10 ohm 1/2W	RD05A2H100J RFA
R759~762	243 2085 002	Winding 0.1 ohm 3W	RW99=3F0R1K
R763~766	241 2423 985	Carbon 3.9K ohm 1/4W	RD14B2E392JT PSNB
R767~770	241 2424 968	Carbon 8.2K ohm 1/4W	RD14B2E822JT PSNB
R771~774	241 2426 937	Carbon 43K ohm 1/4W	RD14B2E433JT PSNB
R775~778	241 2424 948	Carbon 10K ohm 1/4W	RD14B2E103JT PSNB
⚠ R779~782	244 2058 061	Metal oxide film 10 ohm 1W (Non-burning type)	RS14B3A100JNBS (RSFSV)
R783~786	241 2426 908	Carbon 33K ohm 1/4W	RD14B2E333JT PSNB
R787,788	241 2429 963	Carbon 1M ohm 1/4W	RD14B2E105JT PSNB
R789	241 2425 967	Carbon 22K ohm 1/4W	RD14B2E223JT PSNB
R790~792	241 2422 944	Carbon 1K ohm 1/4W	RD14B2E102JT PSNB
⚠ R793~796	244 2058 045	Metal oxide film 4.7 ohm 1W (Non-burning type)	RS14B3A7R7JNBS (RSFSV)
⚠ R801,802	244 2059 031	Metal oxide film 22 ohm 2W (Non-burning type)	RS14B3D220JNBF (RSFN)
R901~904	241 2453 081	Carbon 10 ohm 1/2W	RD05A2H100J RFA
R905~908	241 2434 000	Carbon 100 ohm 1/2W	RD05A2H101J RMG
CAPACITORS GROUP			
C701~704	255 4232 924	Film 39pF/100V	CQ93P2A390JT NH
C705~712	255 4217 965	Film 180pF/50V	CQ09P1H181JT PDH
C713~716	254 4445 721	Electrolytic 330μF/50V	CE04W1H331MC ARSG
C717~720	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C721~724	255 4237 903	Film 0.0027μF/100V	CQ93P2A272JT NH
C725~728	254 4356 797	Electrolytic 10μF/50V	CE04W1H100MC ARS
C729~732	255 4079 048	Film 0.01μF/100V	CQ93P2A103JC NH
C733,734	254 4288 001	Electrolytic 100μF/25V	CE04W1E101M AWF

Ref No.	Part No.	Part Name	Remarks
C751,752	255 4235 057	Film 0.1μF/100V	CQ93P2A104J NH
C755,756	254 4356 713	Electrolytic 100μF/50V	CE04W1H101MC ARS
C757,758	254 4347 735	Electrolytic 4.7μF/50V	CE04W1H4R7MC ARSA
C759~762	254 4356 797	Electrolytic 10μF/50V	CE04W1H100MC ARS
C763,764	255 6167 000	Film 0.01μF/125V	CQ09S2B103K B
C765,766	254 4373 013	Electrolytic 1000μF/100V	CE04W2A102M ARS
C767,768	254 4356 713	Electrolytic 100μF/50V	CE04W1H101MC ARS
C769~772	255 4232 953	Film 0.0047μF/100V	CQ93P2A472JT NH
C773~776	255 6181 028	Film 33pF/400V	CQ09S2G330KF B
C801,802	256 4081 049	Metalized 0.068μF/100V	CF93B2A683K UA
C851~858	255 6175 034	Film 100pF/125V	CQ09S2B101KF B
C949	255 4079 048	Film 0.01μF/100V	CQ93P2A103J
C950	254 4356 797	Electrolytic 10μF/50V	CE04W1H100MC ARS
OTHER PARTS			
RL701,702	214 0037 009	Relay (JC-48V)	
SW002,003	212 9250 016	1P Push Switch	
SW005	212 0358 009	Rotary Switch (2~4)	
P701,702	279 0034 041	Posistor(PTH9M04BD222TS2F333)	
L701~704	235 0053 006	Inductor (1mH)	

PARTS LIST OF EXPLODED VIEW

Ref No.	Part No.	Part Name	Remarks	Q'ty
1	411 9123 104	Base Chassis (KK)		
2	254 6183 007	Electrolytic Capacitor	(C003,004)	
	—	1000μF/50V(CE37W1H103M)		
3	276 0257 007	Diode 15D4B41	(D001)	
4	414 9148 308	Shield Chassis (R)		
5	414 9149 200	Shield Chassis (L)		
6	443 0900 145	P.W.B. Support		
7	KU-9285 D	Power Unit Ass'y		
7-1	—	Power Amp. Unit		
7-2	—	Main VOL. Unit		
7-3	—	SP-L Unit		
7-4	—	SP-R Unit		
7-5	—	EQ-PO-SW Unit		
7-6	—	BAL-SW Unit		
7-7	—	BAL-VR Unit		
7-8	—	REC Control SW Unit		
7-9	—	Bias TR-L Unit		
7-10	—	Bias TR-R Unit		
8	443 9029 001	P.W.B. Support		
9	KU-9284 D	Distortion Reject Unit Ass'y		
10	415 0234 007	Insulating Sheet		
11	275 0081 005	Transistor 2SK1303	(TR721~724)	
12	275 0080 006	Transistor 2SJ216	(TR725~728)	
13	417 9079 007	CU Plate (B)		
16	144 9190 208	Side Cover		
17	205 0438 028	1P Terminal(Red)		
18	205 0438 031	1P Terminal(Black)		
21	105 9240 315	Rear Panel		
⚠ 22	206 2116 008	AC Plug Cord		
⚠ 23	445 0104 002	Cord Bush		
⚠ 24	125 9004 089	UL Tube(L=60)		
⚠ 25	212 3634 005	Voltage Selector Switch		
26	205 0879 001	GND Terminal		
27	KU-9283 D	Input & Control Unit Ass'y		
27-1	—	Input Unit		
27-2	—	Control & P.Supply Unit		
27-3	—	Cannon Connector Unit		
27-4	—	REC Out Terminal Unit		
27-5	—	LED Unit		
27-6	—	Input Switch Unit		
31	412 2814 028	Card Spacer(L=10)		
32	445 0048 003	Cord Holder(L76)		
33	144 9193 205	Front Panel Ass'y		
34	113 1625 007	Power Button Ass'y		
35	463 9071 008	Spring		
36	113 9284 107	Push Button Ass'y		
37	114 0121 000	LED Ring		
38	143 9107 007	Lens (INPUT)		
39	412 9387 008	LED Bracket		
40	412 9383 109	Power Switch Bracket		
⚠ 41	212 9534 002	Power Switch TV-8	(SW001)	
47	114 9010 002	Knob Guide (M)		
48	445 0048 016	Cord Holder(L50)		
49	114 9011 001	Knob Guide (F)		
50	114 9012 000	Knob Guide (B)		
51	114 9015 007	Knob Guide (R)		
52	412 9384 108	Push Switch Bracket		
⚠ 56	233 9663 103	Power Transformer	(PT001)	
57	412 9386 106	Earth Plate(A)		
58	417 9078 105	CU Plate(A)		
59	255 6167 000	Film Capacitor	(C811,812)	
		0.01μF/125V(CQ09S2B103K-B)		
60	415 9044 007	Insulating Sheet		
61	274 0170 007	Transistor 2SD2401	(TR729~732)	
62	272 0134 005	Transistor 2SB1570	(TR733~736)	
63	412 9388 007	Earth Bracket		
64	105 9241 107	Bottom Cover		

Ref No.	Part No.	Part Name	Remarks	Q'ty
65	104 0267 006	Foot Ass'y		
66	144 9191 100	Top Plate(A)		
67	144 9192 206	Top Plate(B)		
68	112 9101 106	Knob (M)		
69	112 9102 105	Knob (F)		
70	112 9103 104	Knob (B)		
71	462 0036 007	Terminal Cap		
72	462 0036 010	Terminal Cap		
73	414 9078 009	Dust Cap -SDC		
74	209 0012 006	Short Pin		
75	125 9004 076	UL Tube		
76	414 9095 040	CU Danper		
77	414 9155 003	DAMP Plate		
78	412 9404 004	TR Plate		
79	—	—		
80	—	—		
81	461 9034 049	Rubber Sheet		
82	125 0075 020	Chukoh Tape		
83	122 0183 007	Spacer		
101	471 3840 003	Screw 4 x 6 CBS-CU		
102	473 7007 026	Screw 4 x 16 CBTS(S)-B		
103	471 3832 008	Screw 3 x 8 CBS-CU		
104	471 3830 000	Screw 3 x 6 CBS-CU		
105	475 3005 002	TWA 8 ϕ		
106	473 7003 017	Screw 3 x 8 CFTS(S)-B		
106	470 0012 022	Screw 3 x 12 CPS SW W		
107	475 3003 004	TWA 5 ϕ		
108	475 6010 007	Nut 5 ϕ		
109	473 8034 001	Screw 3 x 8 CBTS(B)-CU		
110	475 3201 000	TWB 3 ϕ		
111	476 1003 009	3 ϕ E Ring		
112	471 3302 017	Screw 3 x 5 CBS		
113	475 3800 003	TWA 9 ϕ		
114	471 3306 013	Screw 3 x 12 CBS-Z		
115	475 1005 004	Washer 4 ϕ		
116	475 3202 009	TWB 4 ϕ		
117	475 6009 005	Nut 4 ϕ		
118	205 0003 107	3T LUG		
119	—	—		
120	473 8007 025	Cup Screw 3 x 8		
121	470 0014 020	Screw 3 x 16 CPS SW W		
122	471 3840 016	Screw 4 x 14 CBS-CU		
123	475 3004 003	6 TWA		
124	476 3802 004	Socket Screw (4 x 10)		
125	205 8008 007	4T LUG		

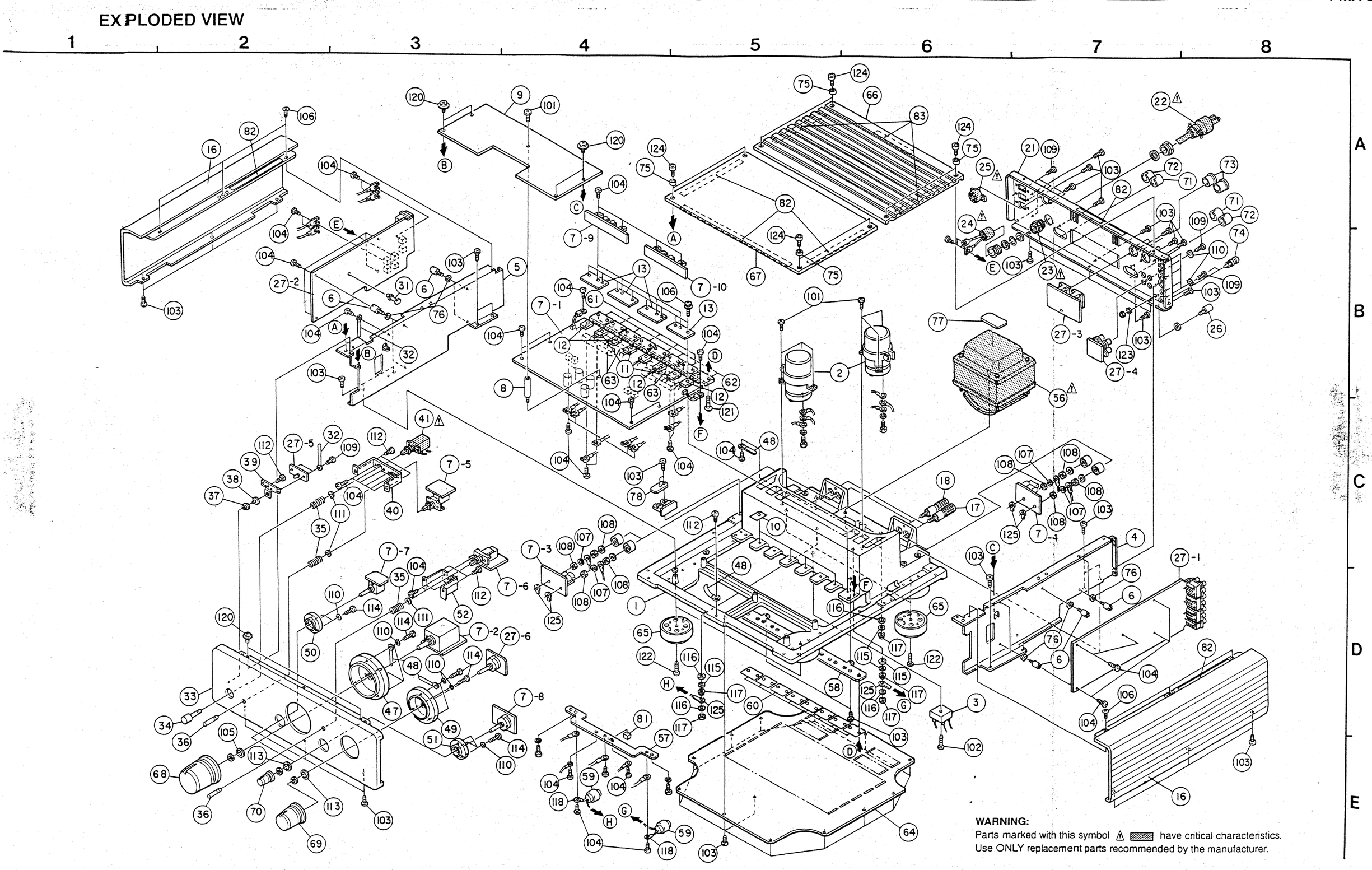
PACKING & ACCESSORIES

Ref No.	Part No.	Part Name	Remarks	Q'ty
	504 9102 003	Stylene Paper	FOR SET	1
	504 9102 003	Stylene Paper	FOR AC CORD	1
	505 0177 014	Poly Cover		1
	503 9254 000	Cushion		2
	501 9249 116	Carton Case		1
	505 8023 076	Envelope		1
	529 0049 012	HS Screw Key		1
	505 0076 115	Poly Cover		1
	511 9365 000	Operating Instructions	ENGLISH	1
	511 9366 009	Operating Instructions	CHINESE	1
	502 9131 007	Pad (F)		1
	502 9132 006	Pad (B)		1

WARNING:

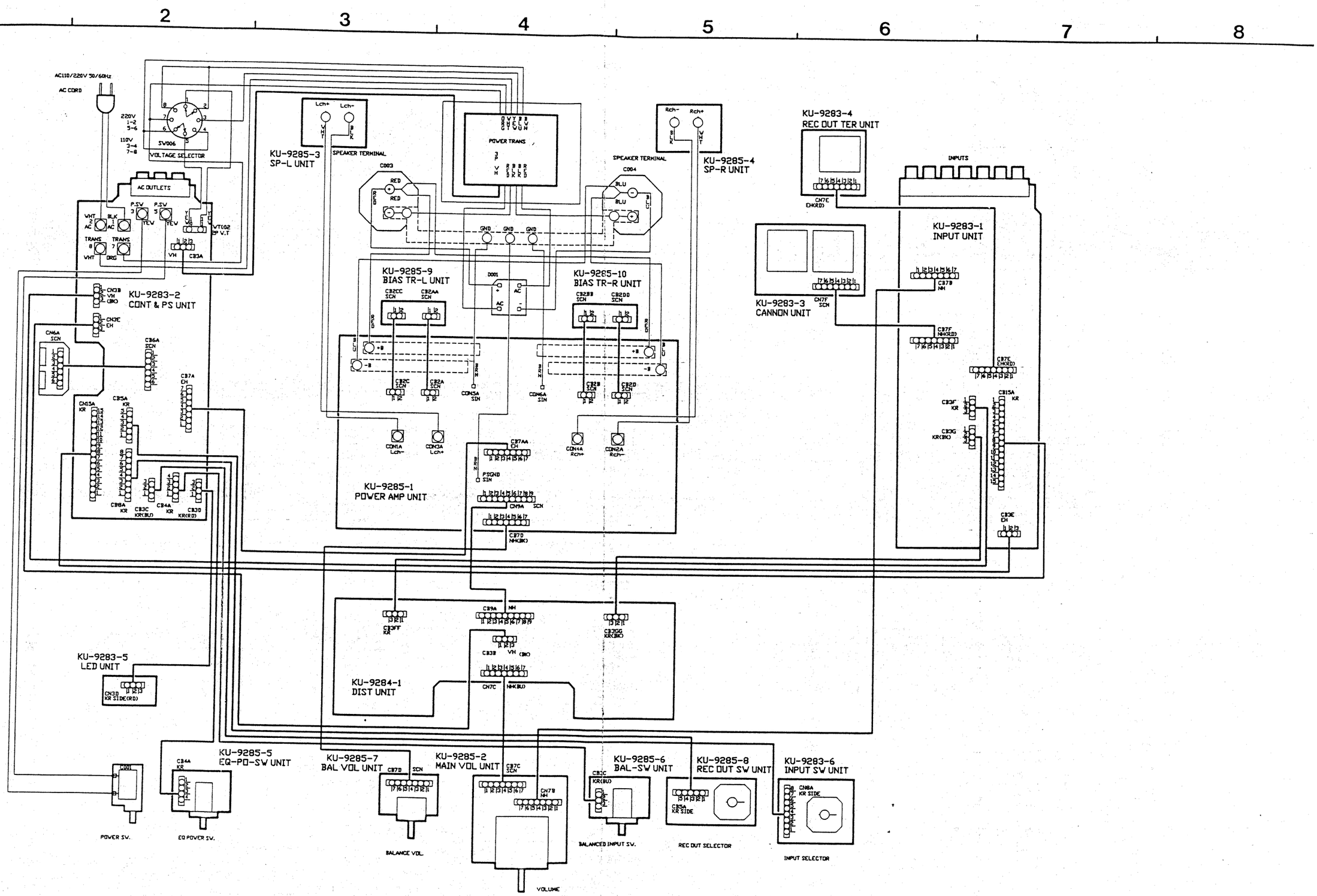
- Parts indicated with " ⚠ " and/shading have special characteristics important to safety.
  Be sure to use the specified parts for replacement.
- Part indicated with the mark " ◉ " are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.

EXPLODED VIEW



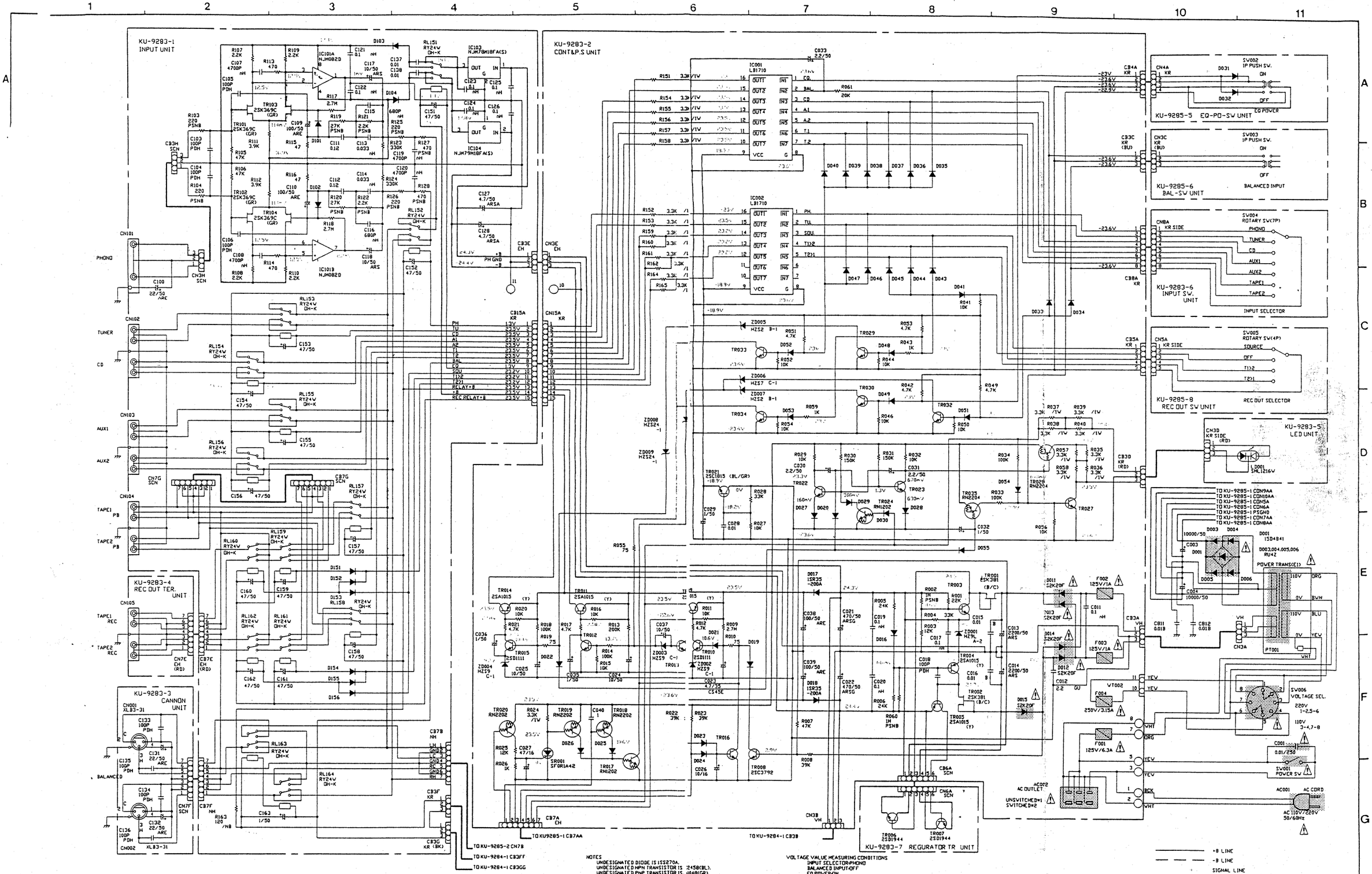
WARNING:
Parts marked with this symbol ⚠ ▨ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

WIRING DIAGRAM



SC

SCHEMATIC DIAGRAM (1/2)



NOTES
UNDESIGNATED DIODE IS 1SS270A.
UNDESIGNATED NPN TRANSISTOR IS 2458(BL).
UNDESIGNATED PNP TRANSISTOR IS 4048(GR).

VOLTAGE VALUE MEASURING CONDITIONS
INPUT SELECTOR=PHOND
BALANCED INPUT=OFF
EQ POWER=ON
REC OUT SELECTOR=OFF

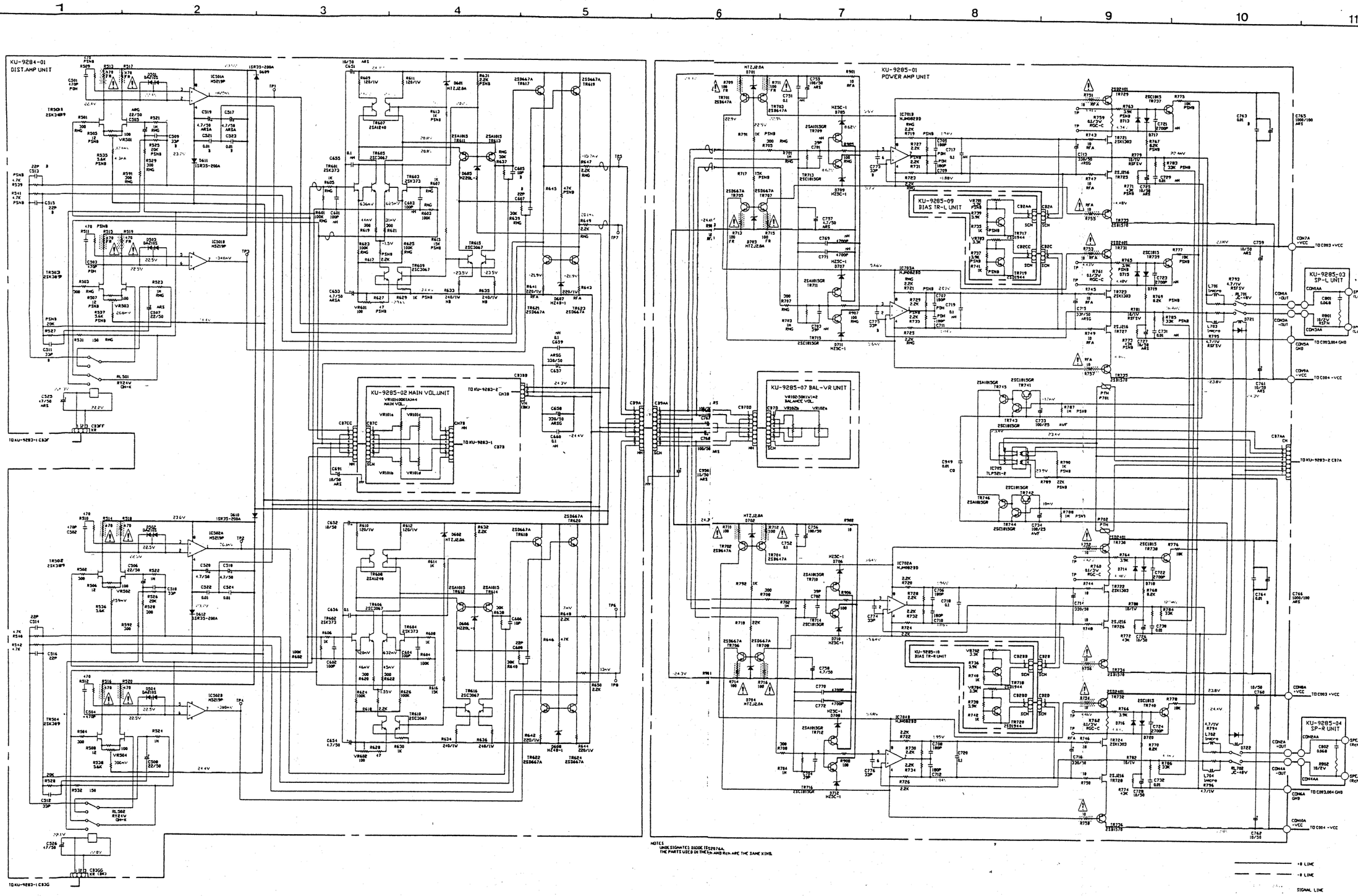
NOTES
ALL RESISTANCE VALUES IN OHM, k=1,000 OHM, M=1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD, P=MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT NOTICE FOR IMPROVEMENT.

WARNING:
Parts marked with this symbol ⚠ 🔒 have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 kohms, the unit is defective.

WARNING:
DO NOT return the unit to the customer until the problem is located and corrected.

SCHEMATIC DIAGRAM (2/2)



WARNING:
Parts marked with this symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 kohms, the unit is defective.

WARNING:
DO NOT return the unit to the customer until the problem is located and corrected.

NOTES
ALL RESISTANCE VALUES IN OHM. k=1,000 OHM, M=1000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD. P=MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.