ORDER NO. SD82052184C8

Service Manual

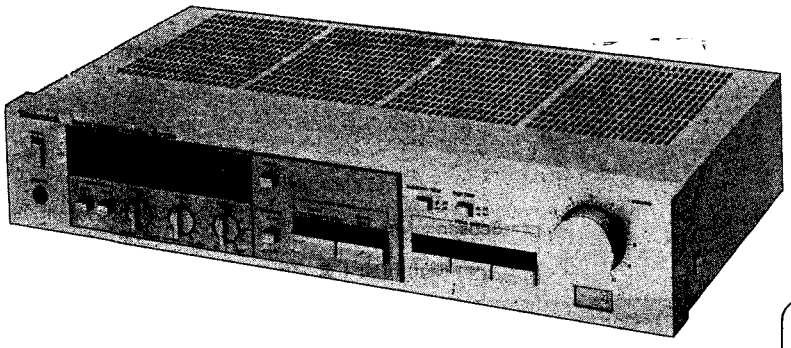
Stereo Integrated Amplifier

SU-Z65

[E], [EK], [EF], [EH], [EB], [Ei], [XA], [XL]

SU-Z65(K)

[E], [EK], [EH], [EB], [Ei], [XA]



* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Areas

* [E] is available in Scandinavia and Switzerland.
* [EK] is available in United Kingdom.
* [EF] is available in France.
* [EH] is available in Holland.
* [EB] is available in Belgium.
* [Ei] is available in Italy.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.

Specifications (Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 50W (4Ω)
	2 × 50W (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	2 × 50W (4Ω)
	2 × 50W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 55W (4Ω)
	2 × 55W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.05% (4Ω)
	0.007% (8Ω)
rated power at 40 Hz~16 kHz	0.05% (4Ω)
	0.007% (8Ω)
rated power at 1 kHz	0.007% (4Ω)
	0.005% (8Ω)
half power at 20 Hz~20 kHz	0.007% (8Ω)
half power at 1 kHz	0.005% (8Ω)
−26 dB power at 1 kHz	0.01% (4Ω)
50 mW power at 1 kHz	0.01% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.05%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.007%
Power bandwidth	
both channels driven, −3 dB	10 Hz~30 kHz (4Ω, 0.03%)
	10 Hz~30 kHz (8Ω, 0.02%)
Residual hum and noise	0.6 mV
Damping factor	20 (4Ω), 40 (8Ω)
S/N	
rated power (4Ω)	
PHONO	75 dB (IHF, A: 81 dB)
TUNER, AUX, TAPE,1, 2	86 dB (IHF, A: 97 dB)
−26 dB power (4Ω)	
PHONO	65 dB
TUNER, AUX, TAPE 1, 2	65 dB
50 mW power (4Ω)	
PHONO	62 dB
TUNER, AUX, TAPE 1,2	62 dB
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
TUNER, AUX	150 mV/22kΩ
TAPE 1	150 mV/22kΩ
TAPE 2	150 mV/22kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
Frequency response	
PHONO	RIAA standard curve
	±0.8 dB (30 Hz~15 kHz)
TUNER, AUX, TAPE 1, 2	5 Hz~100 kHz (−3 dB)
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
High-cut filter	7 kHz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage and impedance	
REC OUT	150 mV
Channel separation, AUX 1 kHz	50 dB
Headphones output level and impedance	470 mV/3 30Ω
Load impedance	
MAIN or REMOTE	4Ω~ 16Ω
MAIN and REMOTE	8Ω~ 16Ω

■ GENERAL

Power consumption	345W
Power supply	AC 50 Hz/60 Hz 220V
	(For continental Europe)
	AC 50 Hz/60 Hz, 110V/120V/220V/240V
	(For others)
Dimensions (W×H×D)	430 × 86 × 288 mm
	(16-15/16" × 3-3/8" × 11-11/32")
Weight	5.3 kg
	(11.9 lb.)

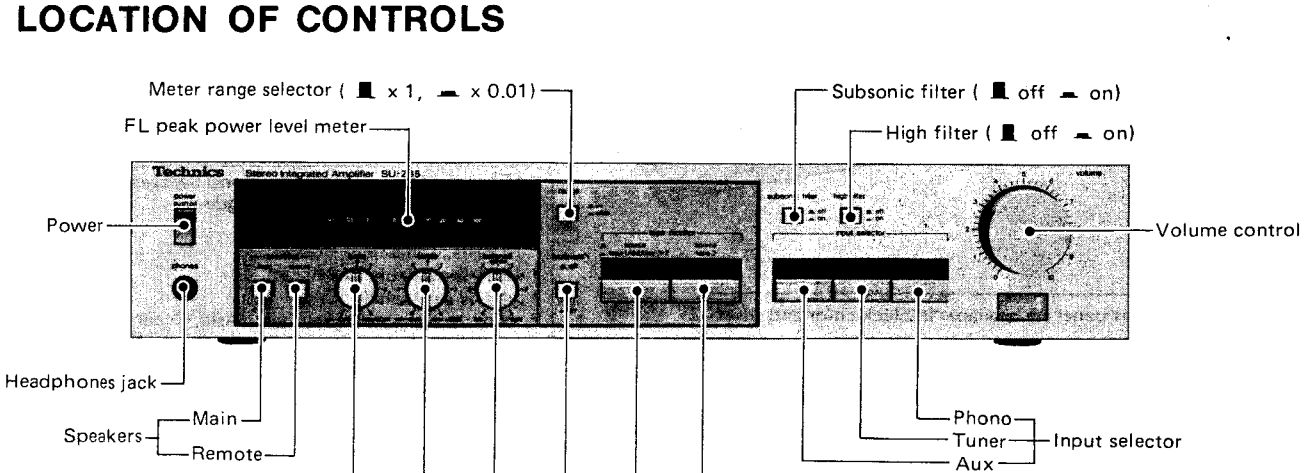
Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

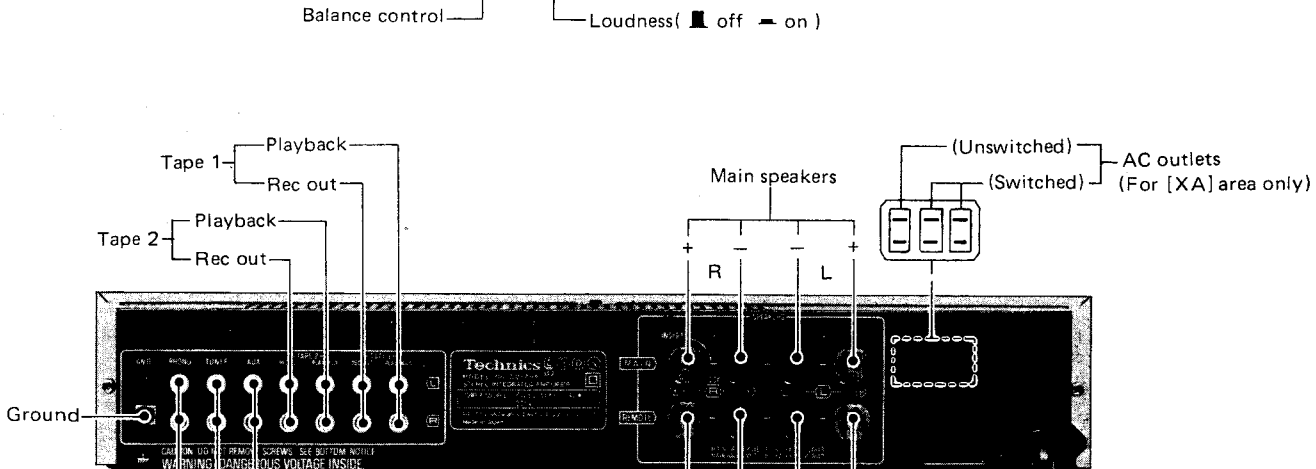
Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ CONTENTS

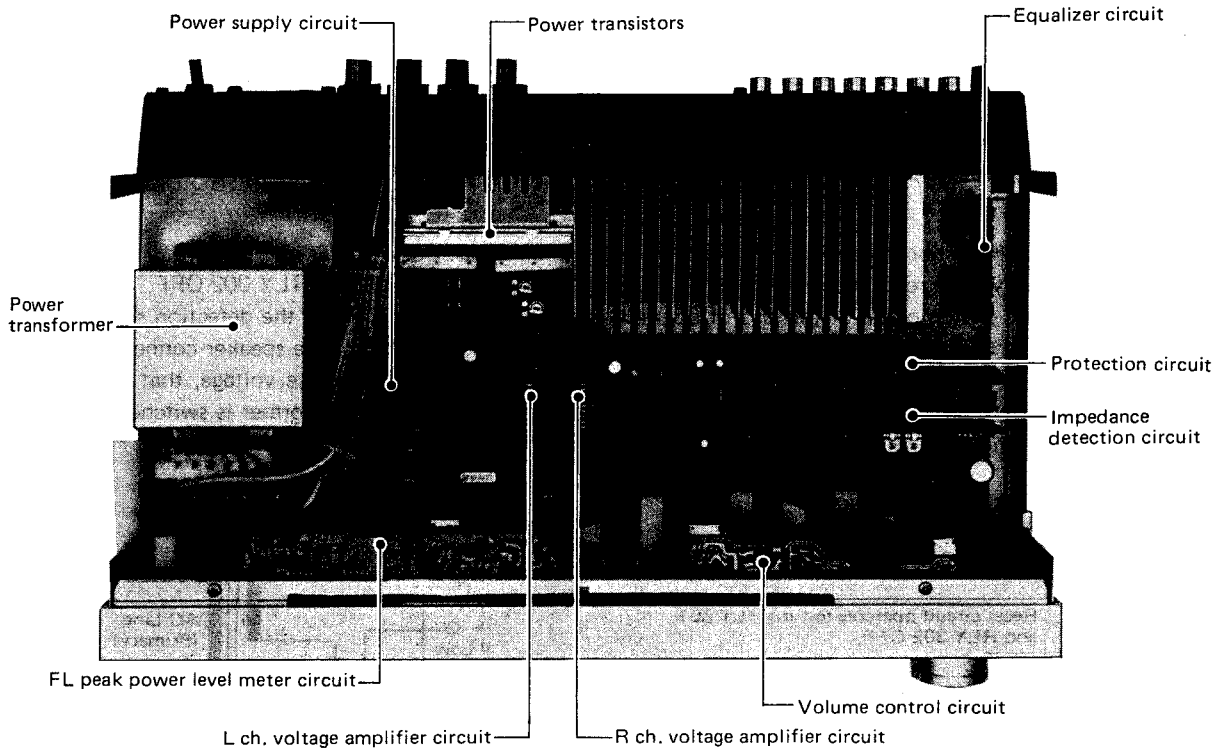
■ LOCATION OF CONTROLS





- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.

* 220V (50/60Hz) for continental Europe.
* 240V (50/60Hz) for United Kingdom and Australia.
* 110V/120V/220V/240V (50/60Hz) for other areas.
– [XA area] for other areas is provided with voltage selector and AC outlets.
* Phono input capacitance is about 150pF.



■ BEFORE REPAIR AND ADJUSTMENT

Turn off the power supply and short-circuit both ends of power supply condensers (C501, 502, 6800μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Avoid short-circuit with a screwdriver or the like, otherwise the transistors or diodes may break down.
Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a voltage regulator to make sure that the current consumed is free of abnormality. The current consumed at 60Hz/50Hz in no-signal mode is shown below with respect to supply voltage 110V/120V/220V/240V.

Power supply voltage		AC 110V	AC 120V	AC 220V	AC 240V
Current consumed	50Hz	220 ~ 440mA	200 ~ 400mA	110 ~ 220mA	100 ~ 200mA
	60Hz	200 ~ 400mA	180 ~ 360mA	100 ~ 200mA	90 ~ 180mA

• Caution

* When the power transformer has been replaced, attach the thermistor (100kΩ) to the cover of power transformer by using the thermistor retainer, and secure it with adhesive.

* How to fix the thermistor. The thermistor is covered with insulating tube, as illustrated, to prevent shortcircuit.

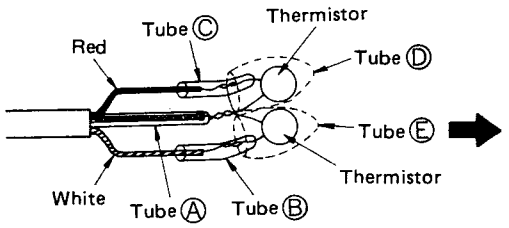


Fig. 1

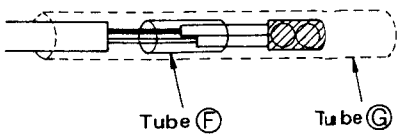


Fig. 2

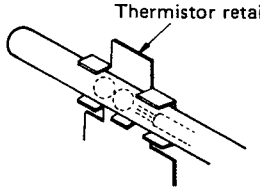


Fig. 3

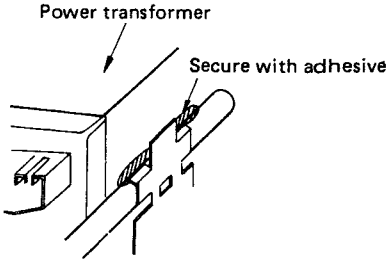


Fig. 4

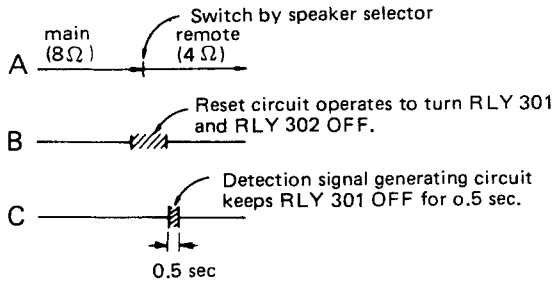
■ TECHNICAL GUIDES

1. SPEAKER IMPEDANCE DETECTION CIRCUIT

This circuit detects the impedance of the speaker connected to the speaker terminal and serves to keep the operation of the unit in best conditions, controlling the constant voltage power supply circuit. It consists of a "**voltage comparing circuit**", "**reset circuit**", "**detection signal generating circuit**" and "**relay drive circuit**".

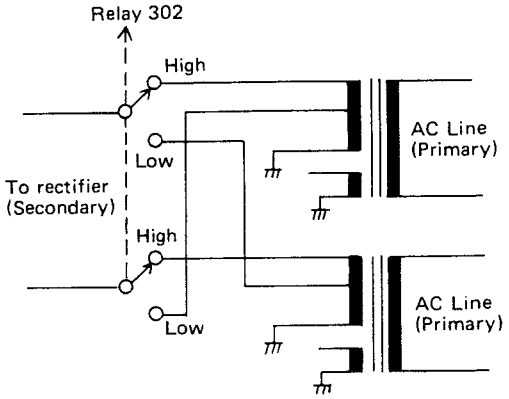
① Basic principles

The built-in reset switch is short-circuited only for a moment when speaker selector is operated. (Fig. 1-A) Simultaneously, the reset circuit operates (Fig. 1-B) to turn both RLY 301 and RLY 302 OFF. Subsequently, the reset switch opens at the end of operating the speaker selector. Then, the detection signal generating circuit keeps RLY 301 OFF for 0.5 second more. (Fig. 1-C) Since RLY 301 is OFF, the speaker connected to speaker terminal contacts with the voltage comparing circuit. The difference from the reference voltage, that is, the type of speaker connected, is detected; and the secondary side tap voltage of the power transformer is switched by RLY 301 so that the voltage matches the connected speaker.



(Operation time of each circuit)

Fig. 1



(Power transformer)

Fig. 2

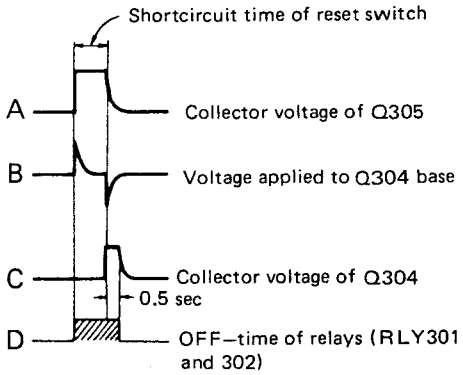
② Reset circuit and detection signal generating circuit

As already explained, when the reset switch is short-circuited, Q305 in the reset circuit turns ON. Positive voltage is generated at the collector of Q305 as shown in Fig. 3-A, causing Q302 in the relay drive circuit [I] to turn ON. (But, the base of Q302 is usually at 0 volt and OFF.)

When Q302 turns ON, the base of Q301 is grounded and turns OFF, causing RLY 301 to turn OFF. Also, the collector voltage of Q301 becomes positive, causing Q306 as well as RLY 302 to turn OFF. (Q301 emitter is connected to pin ⑥ of IC401 and the voltage of this pin is usually zero or a little positive.) In other words, RLY 301 and RLY 302 are OFF while the reset switch is short-circuited.

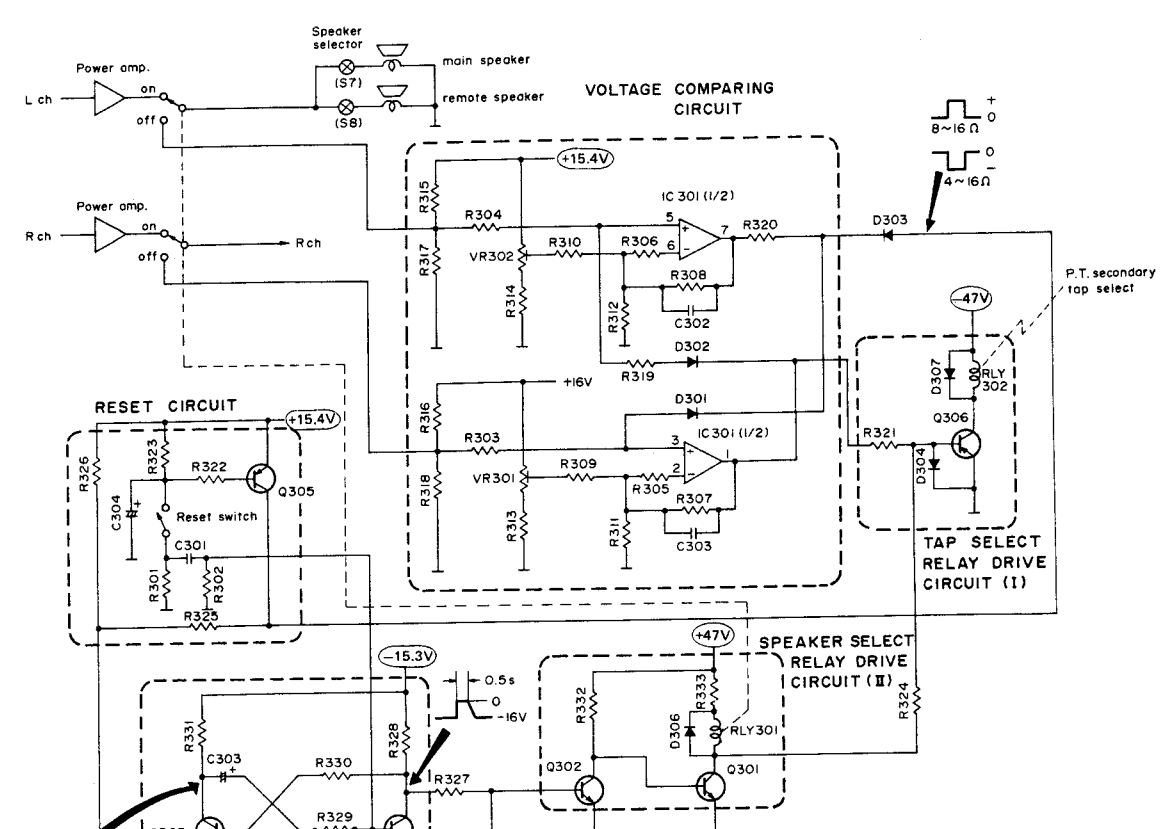
Also, at the moment when the reset switch opens, the voltage as in Fig. 3-B is applied to the base of Q304 in the detection signal generating circuit which uses a multi-vibrator due to the charge and discharge of C301, thus causing this transistor to turn ON.

And voltage as in Fig. 3-C is generated at the collector. The voltage in Fig. 3-C turns Q302 ON, and Q301 OFF, therefore both RLY 301 and RLY 302 turn OFF. RLY 301 and RLY 302 are OFF for 0.5 second. That is, RLY 301 and RLY 302 are turned OFF during shortcircuit of the reset switch and for 0.5 sec. more after opening of the switch.



(Voltage generated at each terminal)

Fig. 3



(Speaker impedance detection circuit)
Fig. 4

③ Voltage comparing circuit

While the relay (RLY302) is OFF, the speaker is in contact with the voltage comparing circuit. (Fig. 5)
The reference voltage is applied to the negative input terminal of operation amplifier (IC301), and the voltage of positive input terminal varies depending on the speaker impedance as shown in Fig. 5. The alteration of voltage is directly related with the output of operation amplifier. Usually the unit is adjusted so that the output voltage is zero with 6Ω speaker connected, and the output voltage of operation amplifier becomes negative with 4Ω speaker connected, and the output voltage becomes positive with 8Ω speaker connected. Only when the voltage is negative, Q306 and RLY 302 turn ON, switching the secondary side tap voltage of power transformer to 28.7V.
Incidentally, when 8Ω speaker is connected to Rch and 4Ω to Lch, negative voltage is generated.

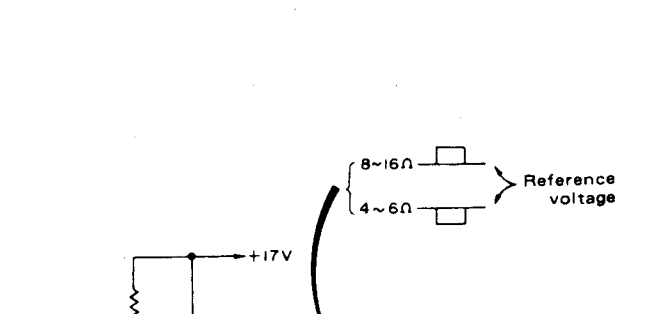


Fig. 5

④ Voltage comparing circuit and reset circuit

The operation amplifier of **"voltage comparing circuit"** holds the detected impedance 8Ω or 4Ω. **Therefore, if a speaker of different impedance is connected, it is necessary to turn off the power supply or switch the speaker selector and to operate the reset circuit. That is, the relays (RLY301 and 302) must be turned OFF.**

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again.

Note:

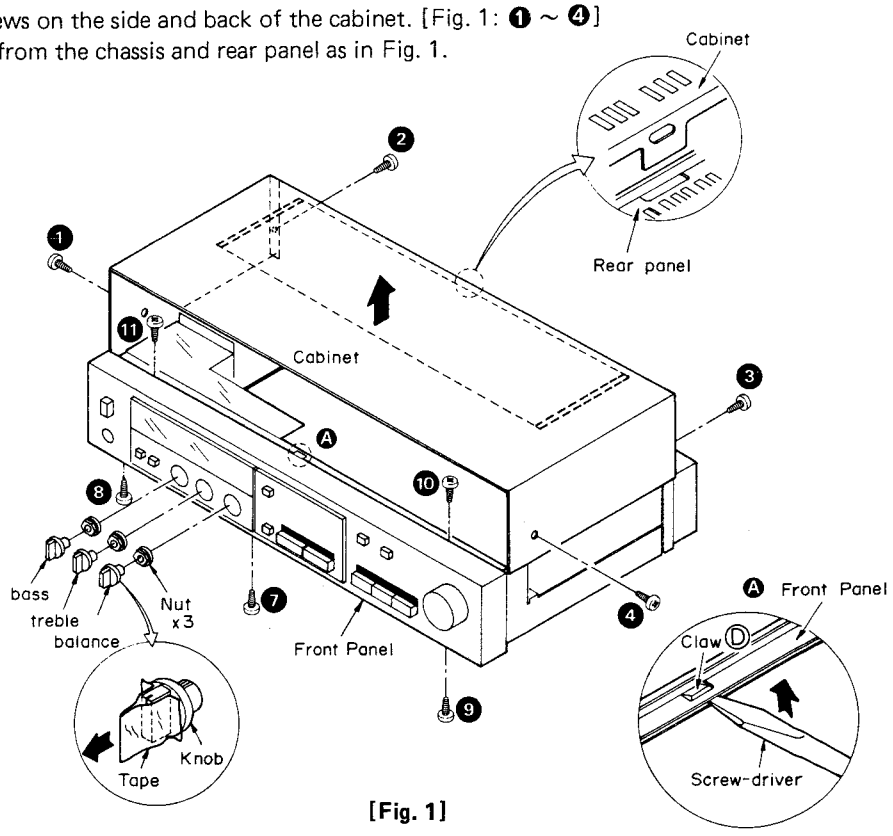
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ DISASSEMBLY INSTRUCTIONS

1. How to remove the cabinet

(1) Remove the 4 setscrews on the side and back of the cabinet. [Fig. 1: ❶ ~ ❹]

(2) Remove the cabinet from the chassis and rear panel as in Fig. 1.



[Fig. 1]

2. How to remove the bottom board

(1) Loosen the 2 setscrews [Fig. 1: ❽, ❾].

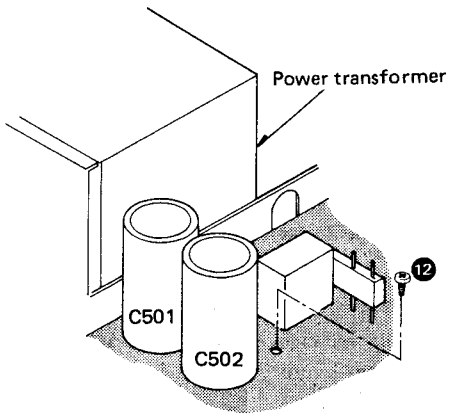
(2) Remove the 3 setscrews [Fig. 2: ❺ ~ ❼] of the bottom board. [Screw ❼ is also used to fit the front panel.]

(3) Remove the setscrew [Fig.1-1: ⓬] of the printed circuit board.

(4) Lift the back [rear panel] of bottom board and remove claw Ⓒ from the rear panel.

(5) Lifting the back of bottom board, insert a flat-head screwdriver between the front chassis and bottom board as in Fig. 3 in order to remove claw Ⓐ.

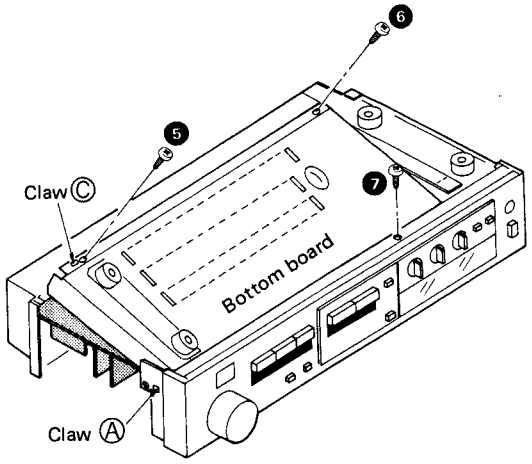
(6) Remove the bottom board from the chassis.



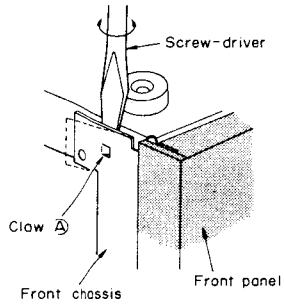
[Fig. 1–1]

3. How to fit the bottom board

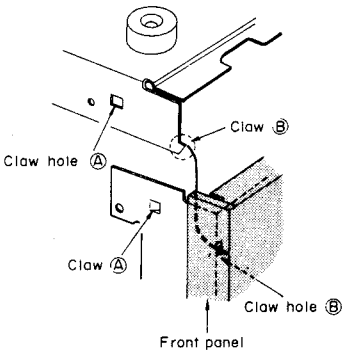
(1) Insert the front of bottom board between the front chassis and front panel.
(2) Insert claw Ⓑ of board into claw hole Ⓑ of front chassis. [See Fig. 4]
(3) Insert claw Ⓒ of bottom board into claw hole Ⓒ of rear panel. [See Fig. 5.]
(4) Secure it with 6 setscrews.



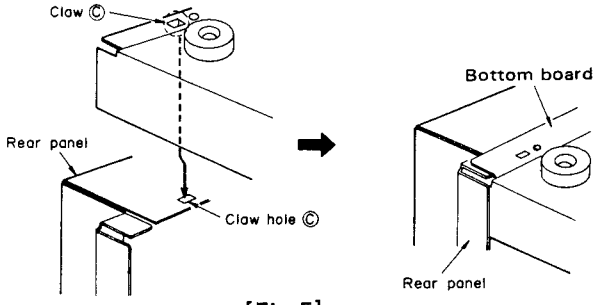
[Fig. 2]



[Fig. 3]



[Fig. 4]



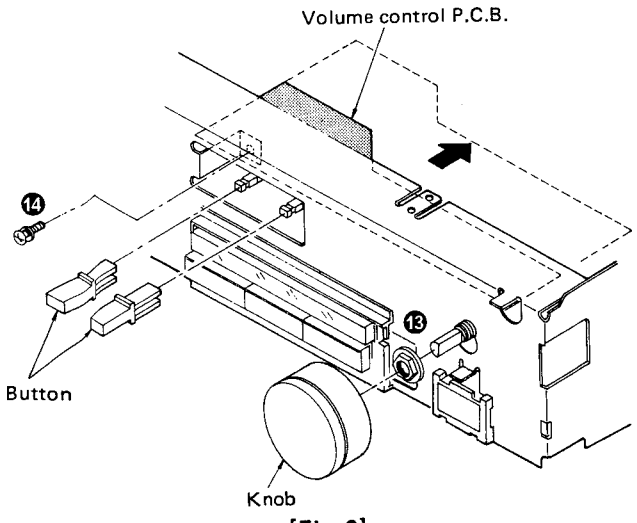
[Fig. 5]

4. How to remove the front panel

(1) Remove the 5 setscrews [Fig. 1: ❼ ~ ⓫] of front panel. [Screw ❼ is also used to fit the bottom board.]
(2) Stick an adhesive tape to bass, treble and balance knobs as in Fig. 1, then pull them off the front panel.
(3) Remove the nuts of bass, treble and balance knobs.
(4) Insert a falt-head screwdriver between the front panel and chassis in order to remove claw Ⓓ. [See Fig. 1.]
(5) Remove the front panel.

5. How to remove the volume P.C.B.

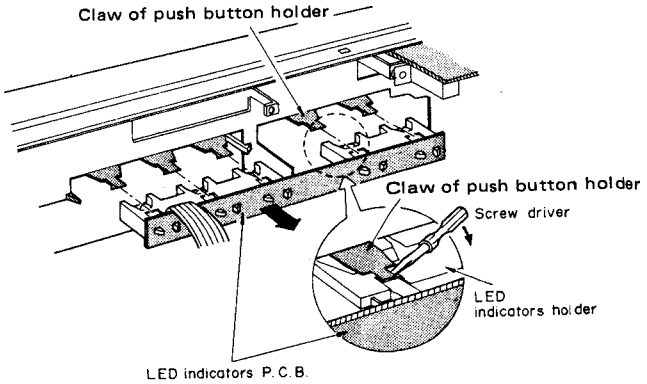
(1) Remove the front panel.
(2) Remove the volume knob and nut (Fig. 6: ⓭) and P.C.B. setscrew (Fig. 6: ⓮)
(3) Remove the 2 buttons and pull the P.C.B. out of the chassis.



[Fig. 6]

6. How to remove the LED indicator P.C.B.

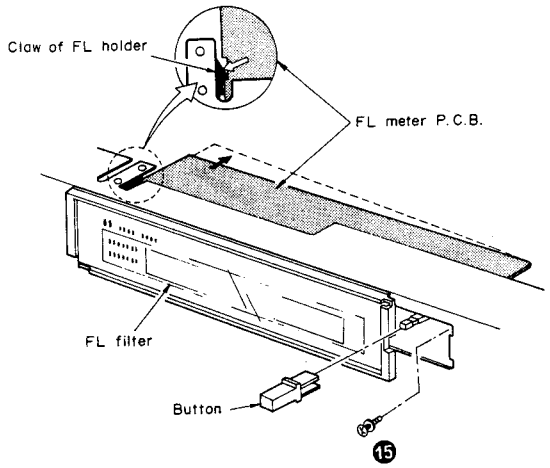
(1) Remove the volume control P.C.B.
(2) Remove the LED indicator holder and push-button holder by use of a screwdriver, gaining access from the inside of chassis as shown in Fig. 7. [Remove the 5 claws of push-button holder.]
(3) Pull the P.C.B. toward the inside of chassis.



[Fig. 7]

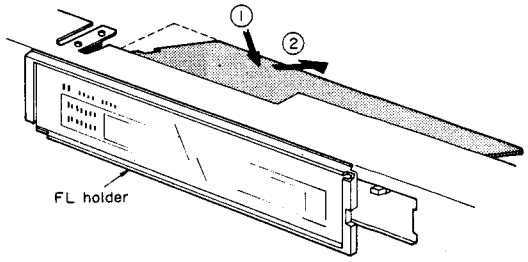
7. How to remove the FL meter P.C.B.

(1) Remove the front panel.
(2) Remove the setscrew ⑮ of meter range switch button as in Fig. 8.



[Fig. 8]

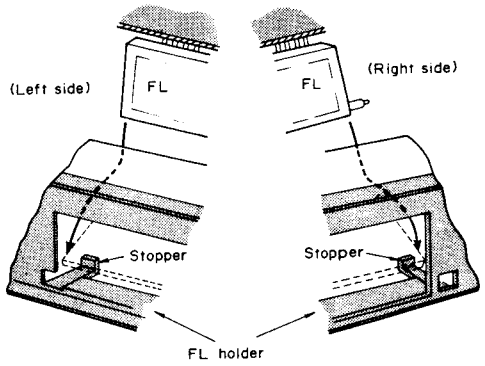
(3) Push the FL holder claw in the direction of the arrow (➡) and then pull the P.C.B. backwards.
(4) Next, incline the P.C.B. in the direction of the arrow ① as in Fig. 9. Then pull it in the direction of the arrow ② to remove it from the chassis.



[Fig. 9]

8. How to install the FL meter P.C.B.

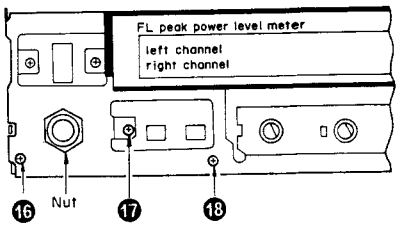
*The P.C.B. can be installed by reversing the procedure for removal. Fit the FL as follows:
(1) Remove the FL filter. [Fig. 8]
(2) Fit the right and left sides of FL into the stopper of FL holder as in Fig. 10.
(3) Fit the P.C.B. in the original position.
(4) Set the FL filter in place.



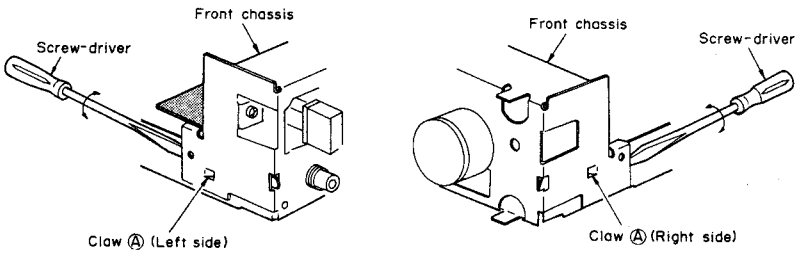
[Fig. 10]

9. How to remove the front chassis

*When replacing the push-button switches or the repairing the headphone jack P.C.B., remove the front chassis as follows:
(1) Remove the front panel.
(2) Remove the bottom board.
(3) Remove the LED indicator P.C.B. [See Fig. 6.]
(4) Remove the 3 setscrews [Fig. 11: ⑯ ~ ⑱] and the nut of headphone jack.
(5) Insert a screwdriver between the front chassis and the panel in order to remove claw Ⓐ as shown in Fig. 12.
(6) Remove the front chassis from the main P.C.B.



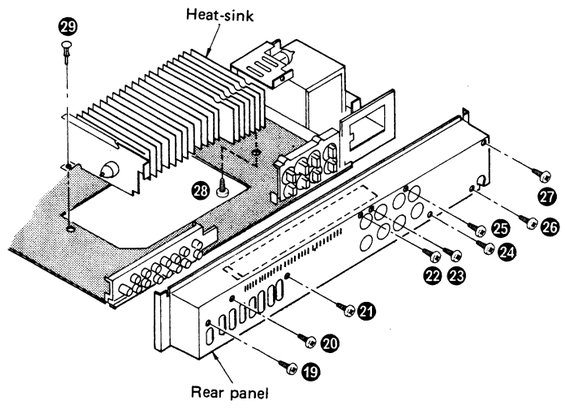
[Fig. 11]



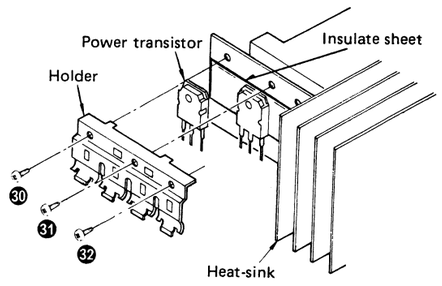
[Fig. 12]

10. How to remove the power transistor

(1) Remove the cabinet and bottom board.
(2) Remove the 9 rear panel setscrews (Fig. 13: ⑲ ~ ㉗) and unsolder the power transistor.
(3) Remove the heat-sink setscrew (Fig. 13: ㉘) and circlip (Fig. 13: ㉙) to remove the heat-sink.
(4) Remove the 3 setscrews (Fig. 14: ㉚ ~ ㉜) of the power transistor holder to remove the power transistor.



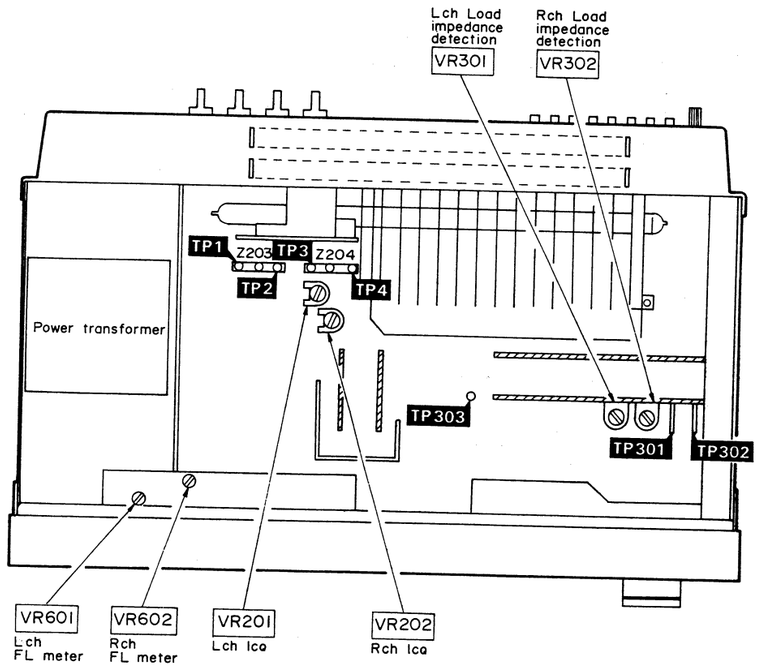
[Fig. 13]



[Fig. 14]

■ MEASUREMENTS AND ADJUSTMENTS

- Adjustment points



1. Load impedance detection and idling current of power transistor (ICQ)

- **Setting and instruments used**

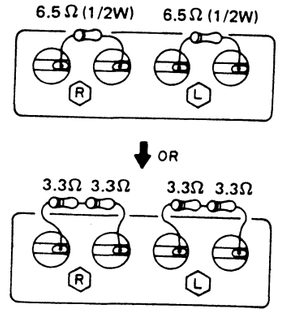
1. Speaker selector . . . . . main
2. DC voltmeter
3. Instruments for circuit operation check (AC voltmeter, 1kHz oscillator, 8Ω load, 5W 0.33Ω resistor, 1/2W 6.5Ω or 3.3Ω & 3.3Ω)

Item	Connection of DC voltmeter	VR adjusted	Adjustment
Adjustment of load impedance detection circuit	*Connect a load with 6.5Ω (1/2W carbon resistor) or series-connected 3.3Ω and 3.3Ω (1/2W, ±5%) to the "main" speaker terminal. (Fig. 15) *Connect a DC voltmeter between TP301 and chassis.	VR301	1. Connect TP303 and chassis. 2. Completely turn VR301 and VR302 clockwise beforehand. 3. Adjust VR301 so that the voltage of TP301 is −0.1V. 4. Adjust VR302 so that the voltage of TP302 is 0V in 100mV range.
	*Connect a load with 6.5Ω (1/2W carbon resistor) or series-connected 3.3Ω and 3.3Ω (1/2W, ±5%) to the "main" speaker terminal. (Fig. 15) *Connect a DC voltmeter between TP302 and chassis.	VR302	
Adjustment of ICQ	L channel Connect voltmenter to TP1 (+) and TP2 (−)	VR201	1. Completely turn VR201 and VR202 anticlockwise beforehand 2. Adjust VR201 (L channel) and VR202 (R channel) so that the voltage is 0.5mV, about 1 min. after power supply ON.
	R channel Connect voltmeter to TP3 (+) and TP4 (−)	VR202	

2. Check point

- **DC balance**

1. Connect DC voltmeter and 8Ω load to speaker terminal.
2. Make sure that output voltage is within ±100mV.



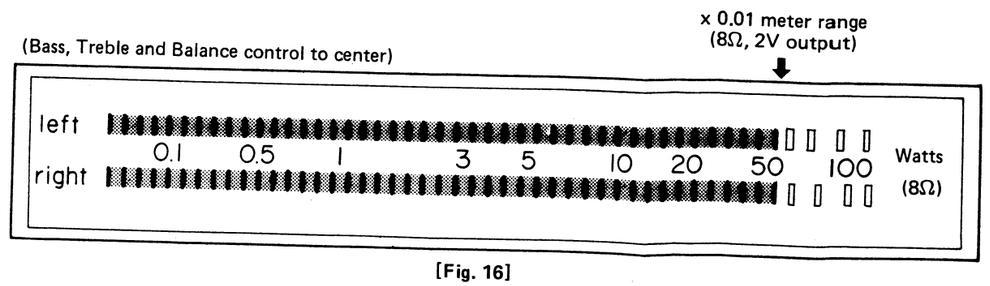
[Fig. 15]

3. Fluorescent peak power meter

Setting

- Connect a low frequency oscillator to the tuner input terminal, and 8-ohm load resistor and AC electronic voltmeter to the speaker terminal.
- Add 1kHz signal from the low frequency oscillator to the set.
- Set the sound volume to the maximum point.

Item	Meter range select switch position	VR adjusted	Adjustment
Peak-power indicators	Range switch . . . X0.01	VR601 (L ch) VR602 (R ch)	1. Adjust the input level so that the AC voltmeter indicates 2 volts. 2. Adjust the semi-fixed variable resistors VR601 (L ch.) and VR602 (R ch.) so that the 50W segment of FL meter lights up dimly. (Fig. 16)



[Fig. 16]

■ HOW TO REPLACE CHIPS (RESISTORS)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 1.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig. 2.

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

- **Note for replacing chips**

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

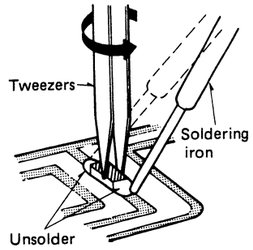


Fig. 1

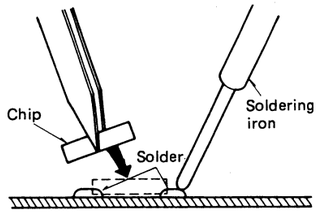
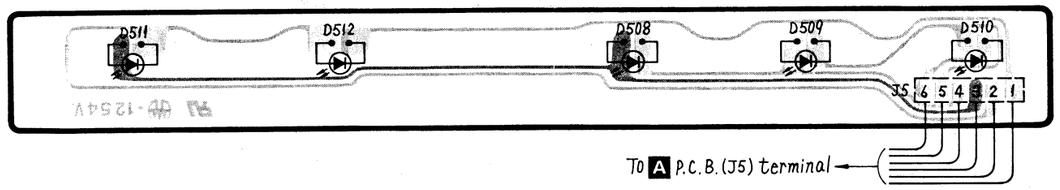


Fig. 2

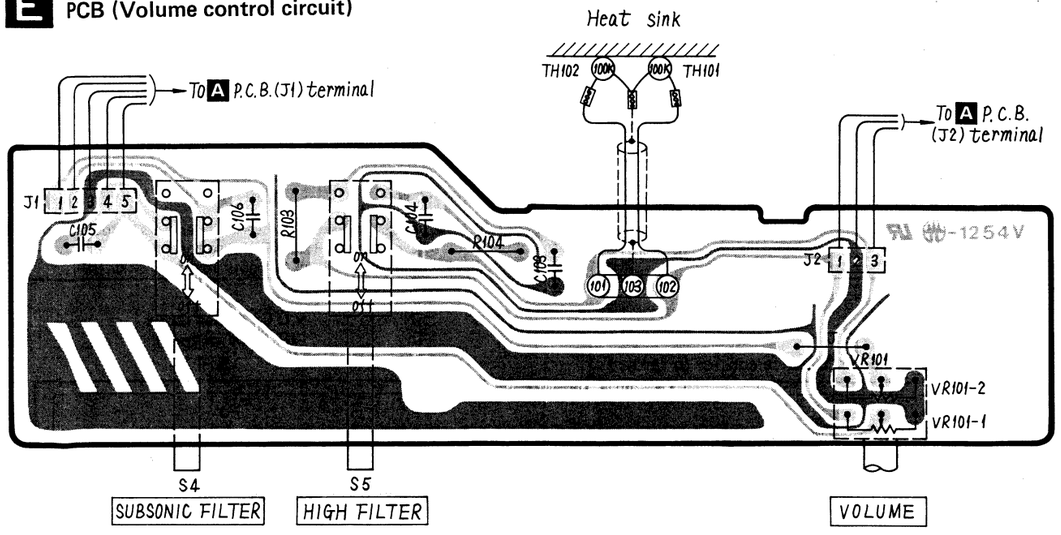
■ PRINTED CIRCUIT BOARDS

Ground (Earth) line

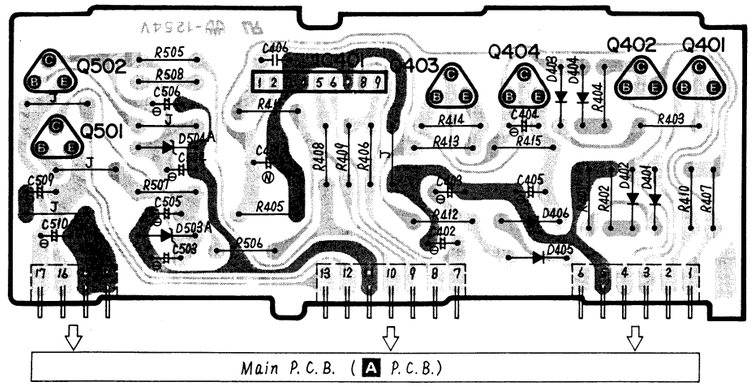
C PCB (Selector position LED indicators)



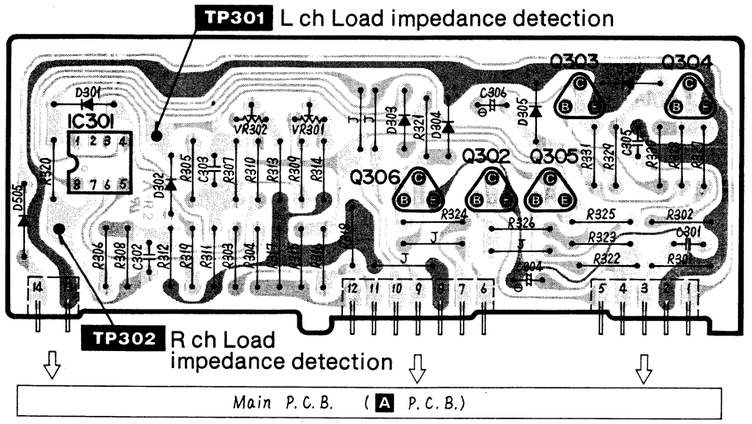
E PCB (Volume control circuit)



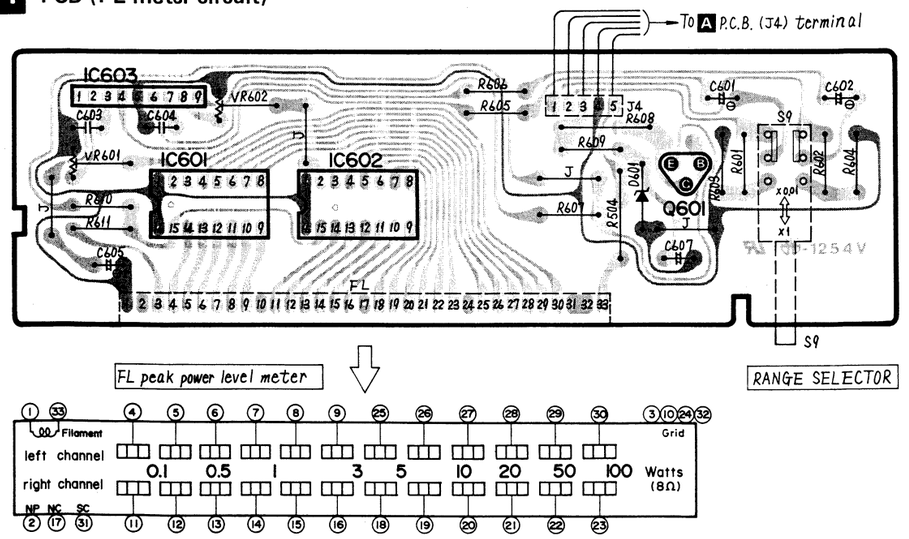
F PCB (Protection circuit)

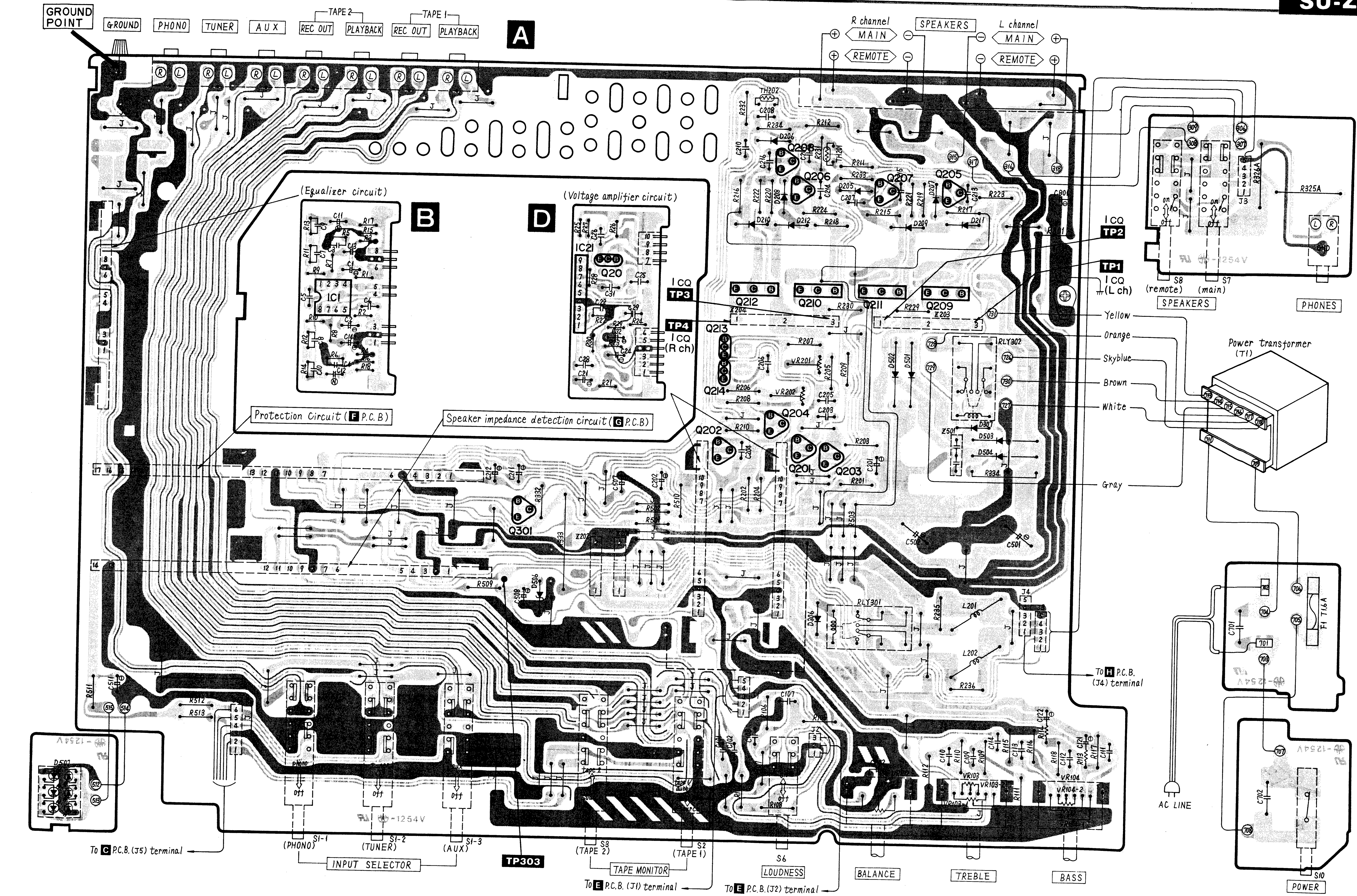


G PCB (Speaker impedance detection circuit)

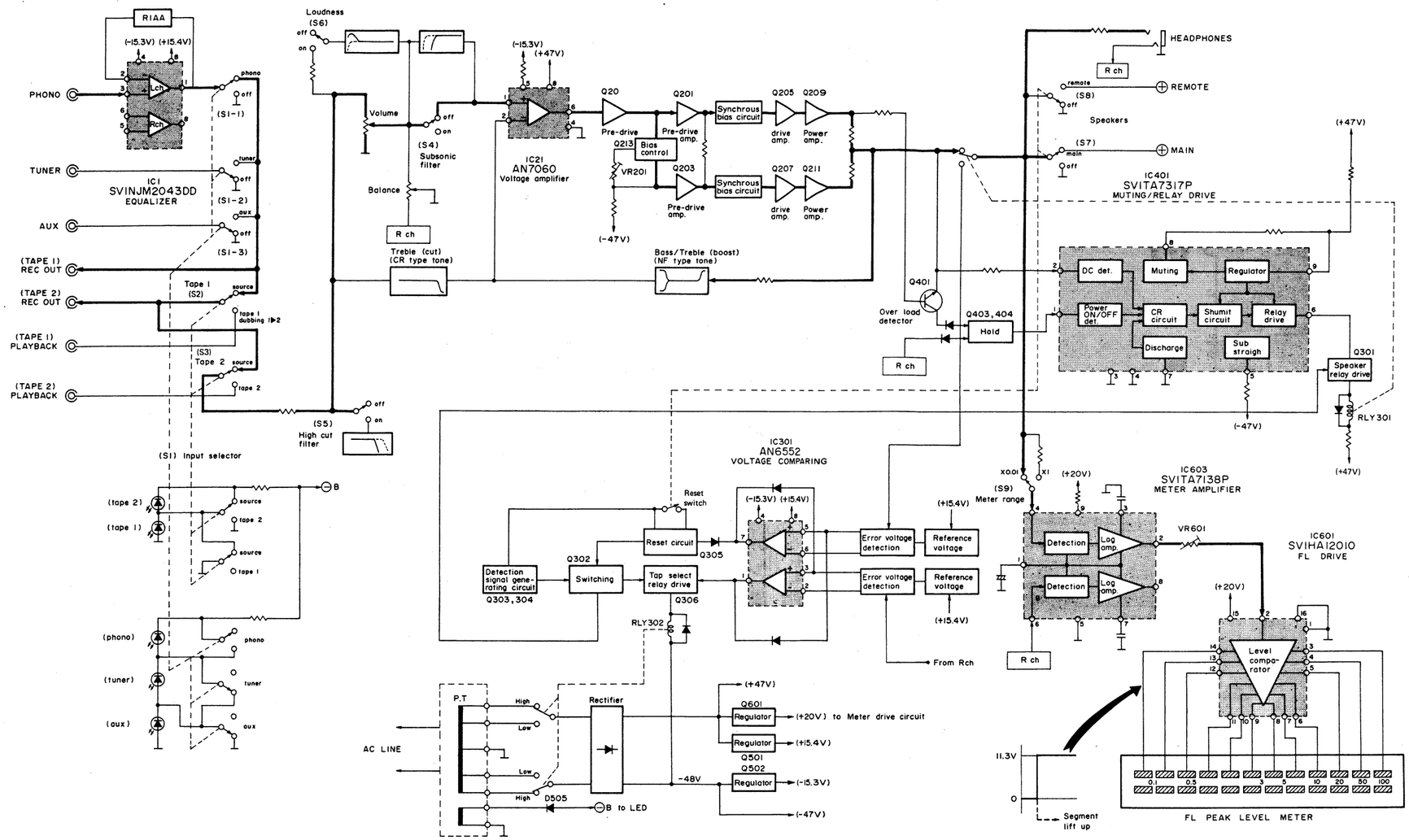


H PCB (FL meter circuit)

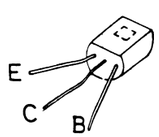
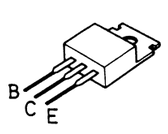
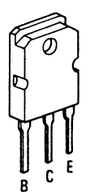
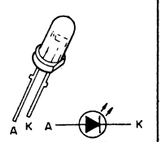
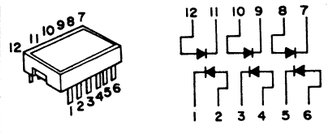
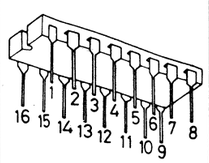
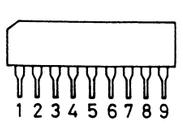
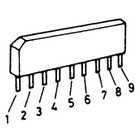
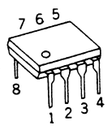
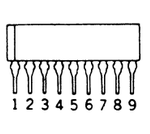
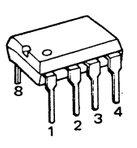


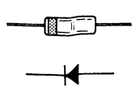
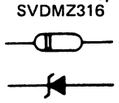
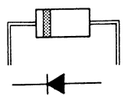

GROUND POINT
GROUND
PHONO
TUNER
AUX
TAPE 2
REC OUT
PLAYBACK
TAPE 1
REC OUT
PLAYBACK
A
R channel
MAIN
REMOTE
SPEAKERS
L channel
MAIN
REMOTE
(Equalizer circuit)
B
(Voltage amplifier circuit)
D
IC1
IC21
Q20
ICQ
TP3
TP4
ICQ (R ch)
TP2
ICQ
TP1
ICQ (L ch)
Protection Circuit (F P.C.B)
Speaker impedance detection circuit (G P.C.B)
Q212
Q210
Q211
Q209
Q213
Q214
Q202
Q204
Q201
Q203
Q208
Q206
Q207
Q205
Q301
RLY302
RLY301
Yellow
Orange
Skyblue
Brown
White
Gray
Power transformer (T1)
S8 (remote)
S7 (main)
SPEAKERS
PHONES
J3
F1 T1.6A
AC LINE
S10
POWER
To H P.C.B. (J4) terminal
To C P.C.B. (J5) terminal
S1-1 (PHONO)
S1-2 (TUNER)
S1-3 (AUX)
INPUT SELECTOR
TP303
S3 (TAPE 2)
S2 (TAPE 1)
TAPE MONITOR
To E P.C.B. (J1) terminal
S6
LOUDNESS
To E P.C.B. (J2) terminal
BALANCE
TREBLE
BASS

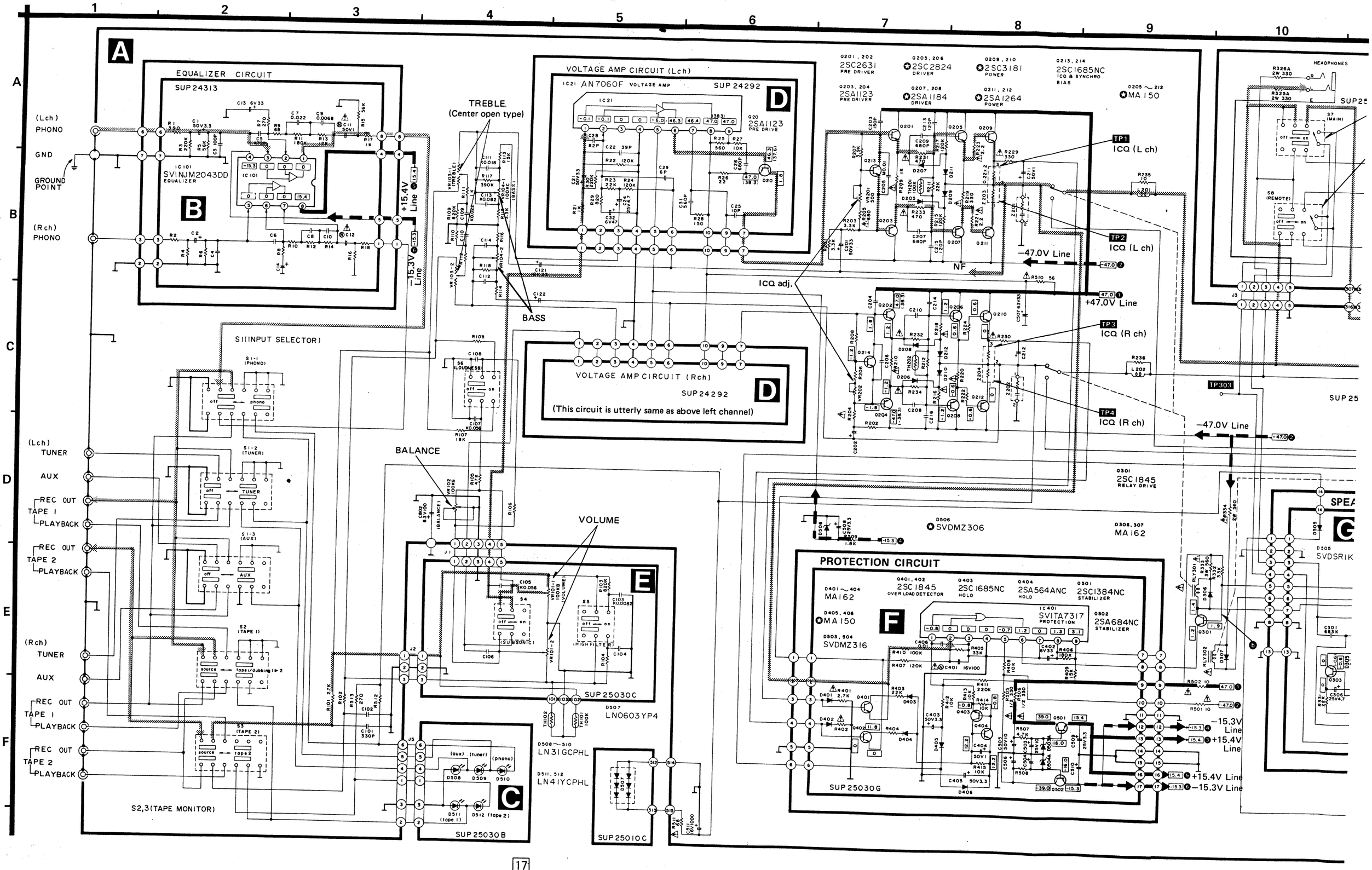
■ BLOCK DIAGRAM

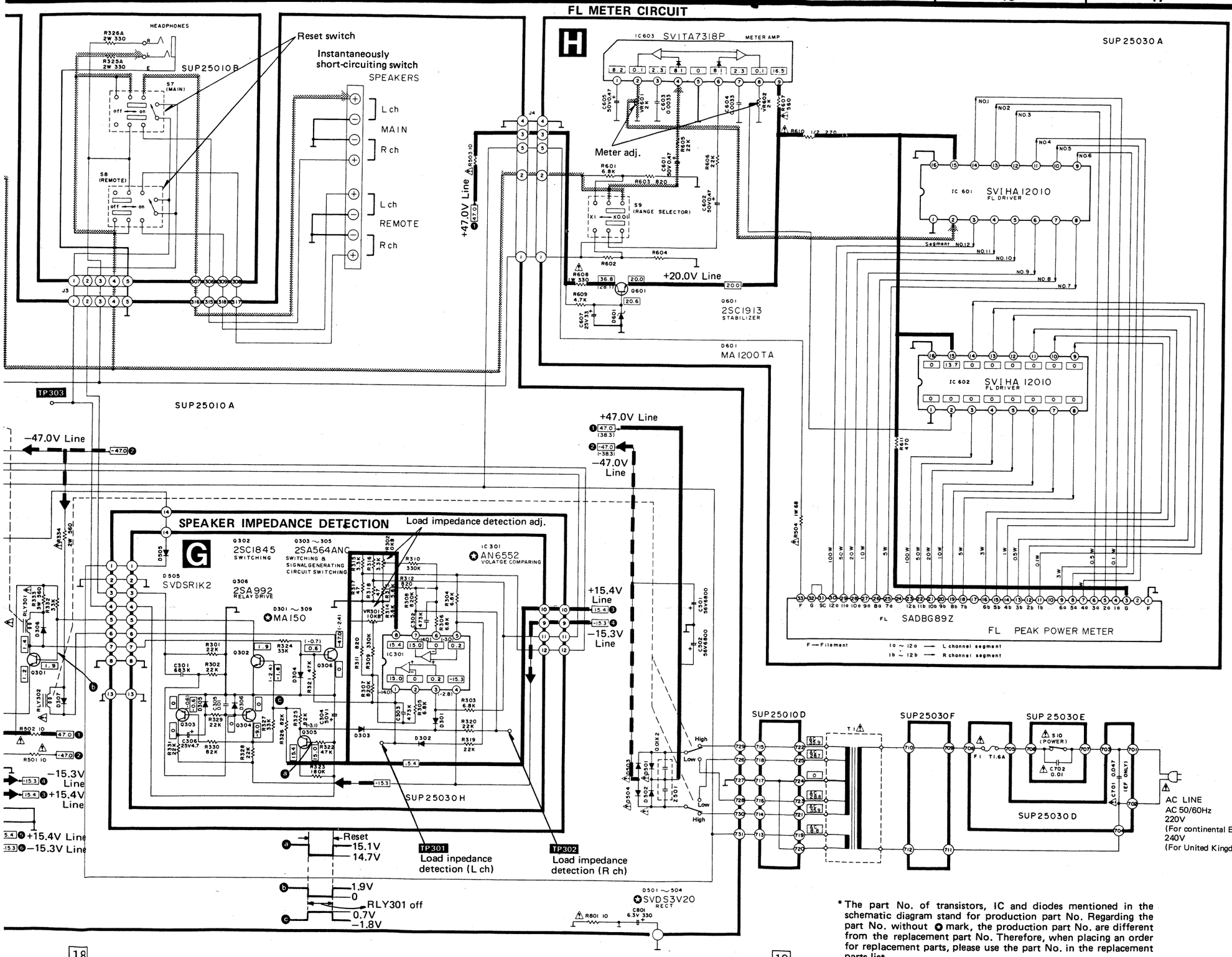


■ TERMINAL GUIDE OF TRANSISTORS, DIODES AND IC'S

2SA1123, 2SC2631, 2SC1685, 2SC1845, 2SA564, 2SA992, 2SC1384, 2SA684	2SC2824, 2SA1184, 2SC1913	2SD3181, 2SA1264	LN31GCPHL (Green) LN41YCPHL (Yellow)	LN0603YP4	SVIHA12010	SVITA7317P	SVITA7318P	SVINJM2043DD	AN7060F	AN6552
										

MA150, MA162	MA1200, SVDMZ306, SVDMZ316	SVDSR1K2, SVDS3V20
		


EQUALIZER CIRCUIT
SUP24313
IC101 SVINJM2043DD EQUALIZER
(Lch) PHONO
GND
GROUND POINT
(Rch) PHONO
+15.4V Line
−15.3V Line
TREBLE (Center open type)
BASS
VOLUME
BALANCE
VOLTAGE AMP CIRCUIT (Lch)
IC21 AN7060F VOLTAGE AMP
SUP24292
Q20 2SA1123 PRE DRIVE
VOLTAGE AMP CIRCUIT (Rch)
SUP24292
(This circuit is utterly same as above left channel)
ICQ adj.
Q201, 202 2SC2631 PRE DRIVER
Q205, 206 2SC2824 DRIVER
Q209, 210 2SC3181 POWER
Q213, 214 2SC1685NC ICQ & SYNCHRO BIAS
Q203, 204 2SA1123 PRE DRIVER
Q207, 208 2SA1184 DRIVER
Q211, 212 2SA1264 POWER
D205 ~ 212 MA150
TP1 ICQ (L ch)
TP2 ICQ (L ch)
TP3 ICQ (R ch)
TP4 ICQ (R ch)
−47.0V Line
+47.0V Line
NF
HEADPHONES
SP (MAIN)
SB (REMOTE)
SUP25
TP303
S1(INPUT SELECTOR)
S1-1 (PHONO)
S1-2 (TUNER)
S1-3 (AUX)
S2 (TAPE 1)
S3 (TAPE 2)
S2,3(TAPE MONITOR)
(Lch) TUNER
AUX
REC OUT
TAPE 1 PLAYBACK
REC OUT
TAPE 2 PLAYBACK
(Rch) TUNER
AUX
REC OUT
TAPE 1 PLAYBACK
REC OUT
TAPE 2 PLAYBACK
SUP25030B
SUP25030C
D507 LN0603YP4
D508~510 LN31GCPHL
D511, 512 LN41YCPHL
SUP25010C
Q301 2SC1845 RELAY DRIVE
D506 SVDMZ306
D306, 307 MA162
PROTECTION CIRCUIT
D401~404 MA162
Q401, 402 2SC1845 OVER LOAD DETECTOR
Q403 2SC1685NC HOLD
Q404 2SA564ANC HOLD
Q501 2SC1384NC STABILIZER
D405, 406 MA150
D503, 504 SVDMZ316
IC401 SVITA7317 PROTECTION
Q502 2SA684NC STABILIZER
SUP25030G
−15.3V Line
+15.4V Line
SUP25
SVDSRIK



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

1. This is the basic circuit diagram (For continental Europe) of this unit.
   Note that part of the circuit is subject to change depending on the areas.
2. Regarding the circuits to be changed in the basic circuit diagram (For continental Europe) and related areas [EF], [XL] and [XA], refer to the separate service manual (Order No. SD82052184C8–A).
3. **S1-1 ~ S1-3:** Input selector switch in **"phono"** position.
   (S1-1: phono S1-2: tuner S1-3: aux)
4. **S2:** Tape monitor (tape 1) switch in **"source"** position.
   source ⟷ tape 1/dubbing 1 ▶ 2
5. **S3:** Tape monitor (tape 2) switch in **"source"** position.
   source ⟷ tape 2
6. **S4:** Loudness switch in **"off"** position.
7. **S5:** Subsonic filter switch in **"off"** position.
8. **S6:** High filter switch in **"off"** position.
9. **S7:** Main speaker switch in **"on (main)"** position.
10. **S8:** Remote speaker switch in **"off"** position.
11. **S9:** FL meter range selector switch in **"X0.01"** position.
    X0.01 ⟷ X1
12. **S10:** Power source switch in **"on"** position.
13. **S11 ([XA] area only):** Voltage selector switch in **"240V"** position. (Refer to booklet contain)
    120V ⟷ 110V ⟷ 220V ⟷ 240V
14. ▭ Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the ground point taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
15. The parenthesized value is the voltage when the supply voltage is shifted to "low" with the power supply tap chage relay (RLY302) turned "on".
16. ▒▒▒ Phono signal lines of left channel
17. ▬▶ Positive (+B) voltage lines
18. ▬▬▶ Negative (−B) voltage lines
19. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. without ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.

REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.
4. The "S" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the column of description stand for the quantity per set.
6. [K] -marked parts are used for black only, while ○-marked parts are for silver type only.
7. Parts other than [K] - and ○- marked are used for both black ans silver types.

Black type model No. SU-Z65 (K)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	SVINJM2043DD	Equalizer Amplifier
IC21 (×2)	AN7060F	Voltage Amplifier
IC301	AN6552F	Voltage Comparing
IC401	SVITA7317P	Muting/Relay Drive
IC601, 602	SVIHA12010	Level Comparator
IC603	SVITA7318P	Meter Amplifier
TRANSISTORS		
Q20 (×2)	2SA1123—R	Pre Drive
Q201, 202	2SC2631—R	Pre Drive
Q203, 204	2SA1123—R	Pre Drive Use in pair ranks Q201, 202, Q203 & Q204
Q205, 206	2SC2592—R	Drive Amp.
Q207, 208	2SA1112—R	Drive Amp. Use in pair ranks Q205, 206 Q207&208
Q209, 210	2SD718—O	Power Amp.
Q211, 212	2SB688—O	Power Amp. Use in pair ranks Q209, 210, Q211&212
Q213, 214	2SC1685—QNC	Bias Control
Q301, 302	2SC1845	Relay Drive
Q303~305	2SA564A—QNC	Detection Si
Q306	2SA992—E	Relay Drive
Q401, 402	2SC1845	Over Load Detector
Q403	2SC1685—QNC	Hold
Q404	2SA564A—QNC	Hold
Q501	2SC1384A—R	Current Stabilizer
Q502	2SA684—QNC	Current Stabilizer
Q601	2SC1913A—Q	Current Stadilizer
DIODES		
D205~212 S	MA162A	Switching Protection Circuit
D301~305 S	MA162A	Protection Circuit
D306, 307 S	MA162A	Protection Circuit
D401~404 S	MA162A	Protection Circuit
D405, 406 S	MA162A	Protection Circuit
D501~504 ⚠S	SVDS3V40	Rectifier
D503A, 504A	SVDMZ316A	16V, Zener
D505 S	SVDSR1K2	Rectifier
D506 S	RVDEQA0106S	6V, Zener
D507	LN0603YP4	New Class A Indicator
D508~510	LN31GCPHL	Input Selector Indicator
D511, 512	LN41YCPHL	Tape Monitor Indicator
D601	MA1200	20V, Zener
COILS		
L201, 202	SLQY15G—30	Choke Coil
TRANSFORMERS		
T1 ⚠	SLT5U21	Power Source
T1 (EK, XL) ⚠	SLT5U17	Power Source
T1 (XA) only ⚠	SLT5U19	Power Source

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR101	EWJGFA067B15	Volume, 100kΩ(B)
VR102	EWHFKA004G15	Balance, 100kΩ(G)
VR103	EWCX9A005012	Treble
VR104	EWCXAA005C15	Bass, 100kΩ(C)
VR201, 202	EVNK6AA00B52	ICQ Adjustment, 500Ω(B)
VR301, 302 S	EVNM0AA00B14	Load Impedance Detect Adjustment, 10kΩ(B)
VR601, 602	EVNK6AA00B23	FL Meter Level Adjustment, 2kΩ(B)
COMPONENT COMBINATION		
Z201, 202	ECQJ0517	0.047μF, 10Ω
Z203, 204	ERF3GBKR22N	3W, 0.22Ω(×2)
Z501	SXRFS203ZSM	0.01μF(×2)
THERMISTORS		
TH101, 102	RRT104	100kΩ
TH201, 202	RRT104	100kΩ
FLUORESCENT DISPLAY TUBE		
FL	SADBG89Z	Peak Power Meter
FUSES		
F1 ⚠	XBA2C16TR0	250V, T1.6A
F2 (XA) only ⚠	XBA2C31TR0	250V, T3.15A
SWITCHES		
S1	SSH3033	Input Selector
S2, 3, 6	SSH3043	Tape Monitor & Loudness
S4, 5	SSH2035	Subsonic Filter & High Filter
S7, 8	SSH2037	Speakers (Main & Remote)
S9	SSH1053	Range Selector
S10 ⚠	ESB822S	Power Source
S10 (XA)only ⚠	ESB90227S	Power Source
S11 (XA)only ⚠	ESE37219	Voltage Selector
RELAYS		
RLY301 ⚠	SSY107	Speaker Relay
RLY302 ⚠	SSY109	Tap Relay

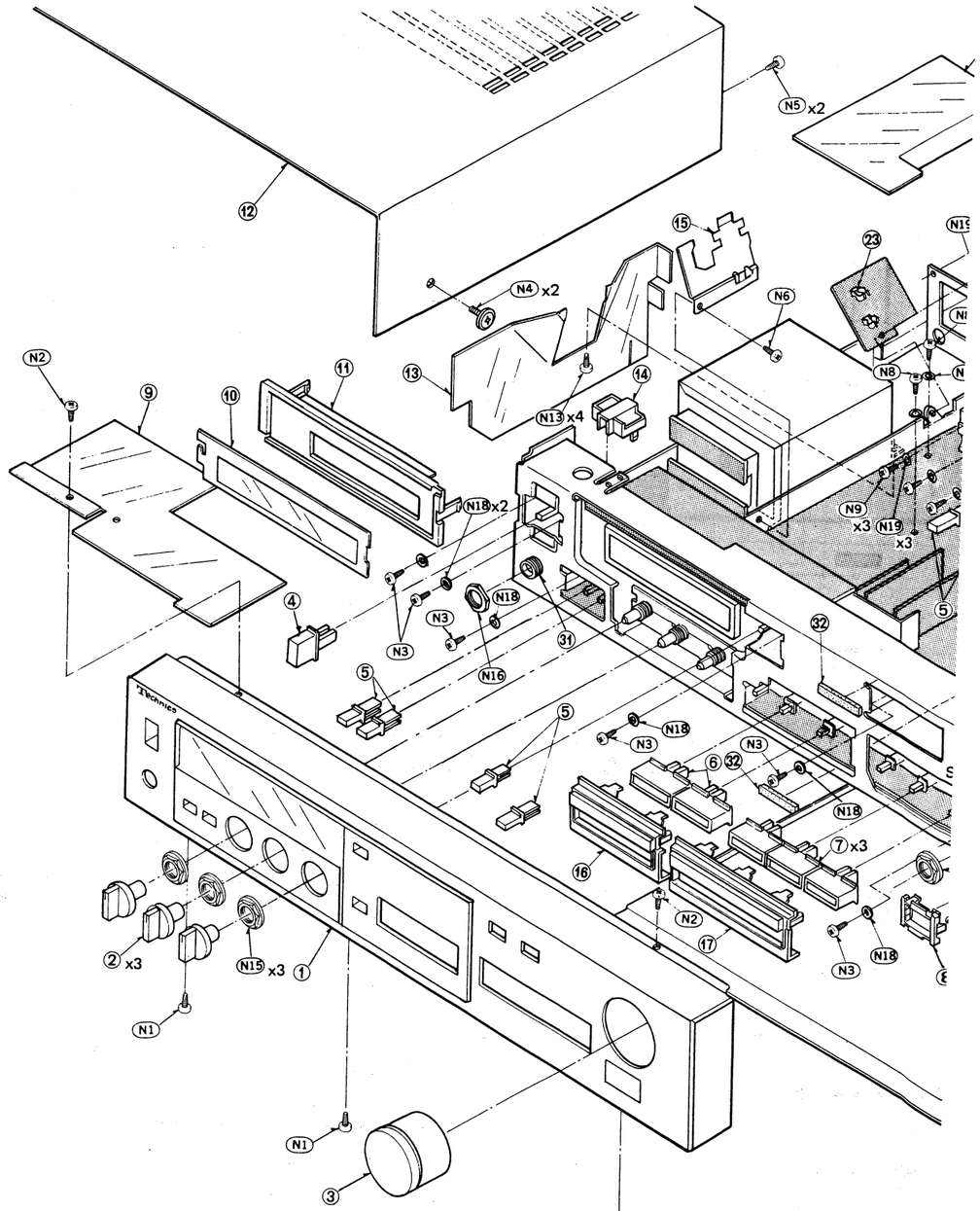
Ref. No.	Part No.	Description & Pcs
CABINET and CHASSIS PARTS		
1 ○	SYW581	Front Panel Ass'y (Silver) (1)
1 [K]	SYW581—1	Front Panel Ass'y (Black) (1)
2	SBN1089	Knob, Bass, Treble and Balance (3)
3	SBN1125	Knob, Volume (1)
4	SBC337—1	Button, Power Source (1)
5	SBC441	Button, Speaker, Loudness, Range Soubsonic, High Filter (6)
6	SBC445—1	Button, Tape Monitor (2)
7	SBC443—1	Button, Input Selector (3)
8	SGX7363	Holder, New Class A Diode (1)
9	SMX617—2	Insulator (1)
10 ○	SDU131	Filter, FL (Silver) (1)
10 [K]	SDU131—1	Filter, FL (Black) (1)
11	SGX7327	Holder, FL (1)
12 ○	SKC1050S2	Cabinet (Silver) (1)
12 [K]	SKC1050BB2	Cabinet (Black) (1)
13	SMX649	Insulator (1)
14	SMX609	Insulator (1)
15	SUS275—1	Holder, Thermistor (1)
16 ○	SGXUZ45E1	Holder, Tape (Silver) (1)
16 [K]	SGXUZ45KE1	Holder, Tape (Black) (1)
17 ○	SGXUZ45E	Holder, Input Selector (1) (Silver)
17 [K]	SGXUZ45KE	Holder, Input Selector (1) (Black)
18	SKUUZ45E	Bottom Board (1)
19	SKL249	Foot (1)
20	SMP323—1	Holder, LED (Tape) (1)
21	SMP321—1	Holder, LED (Input) (1)
22	SHR401—1	Circlip (1)
23	SJT347	Holder, Fuse (2)
24	SJF4815	Terminal, Speakers (1)
25	SJF3051—3N	Terminal, Input & Output (1)
26	SMX615—1	Insulator (1)
27 (E)	SGP3170C	Rear Panel (1)
27 (EK)	SGPUZ65E	Rear Panel (1)
27 (other areas)	SGP3170D	Rear Panel (1)
27 (XA)	SGP3170—1C	Rear Panel (1)
27 (XL)	SGP3170—2C	Rear Panel (1)
28	SHR127	Bushing, AC Cord (1)
28 (EK) only	SHR129	Bushing, AC Cord (1)
28 (XL) only	SHR131	Bushing, AC Cord (1)
29 ⚠S	SJA88	AC Cord (1)
29 (EK) ⚠	RJA45YA	AC Cord (1)
29 (XA) ⚠	SJA111	AC Cord (1)
29 (XL)⚠S	QFC1207MA	AC Cord (1)
31	SJJ71B	Jack, Headphone (1)
32	SHG6227	Cushion, Front Panel (2)
33	SHG6187—1	Cushion, Rear Panel (1)
34	SHS6111	Spacer, Cabinet (1)
35 (XA) ⚠ only	SJS601—2	Socket (1)
36 (XA) ⚠ only	SMX633—1	Insulator (1)
37	SUW1935	Holder, Power Transistor (1)
38	SMX653	Insulator plate (1)

Ref. No.	Part No.	Description & Pcs
SCREWS		
N1	XTBS3+8BFYR1	Tapping, with Detent (3)
N2 S	XTB3+8BFN	Tapping, ⊕3×8 (2)
N3 S	XSN3+6S	⊕3×6 (6)
N4 ○	SNE2095—3	Tapping (Silver) (2)
N4 [K]	SNE2095—3	Tapping (Black) (2)
N5 ○	XTB3+8BFN	Tapping, ⊕3×8 (Silver) (2)
N5 [K]	XTB3+8BFZ	Tapping, ⊕3×8 (Black) (2)
N6 S	XTB3+8BFN	Tapping, ⊕3×8 (1)
N7 S	XTN3+8B	Tapping, ⊕3×8 (1)
N8 S	XTN3+10B	Tapping, ⊕3×10 (2)
N9 S	XTN3+12B	Tapping, ⊕3×12 (3)
N10 S	XTN3+8B	Tapping, ⊕3×8 (3)
N11	XTBS3+8BFYR1	Tapping, with Detent (2)
N12	XTBS3+8BFZ1	Tapping, with Detent (6)
N13 S	XTB4+10BFZ	(4)
N14	XTN3+10S	+ 3×10 (1)
NUTS		
N15	SNE4021	Nut, with Plain (4)
N16 S	XNS12	ϕ12 (1)
N17 S	XNG3B	ϕ 3 (1)
WASHERS		
N18 S	XWA3B	Spring, ϕ3 (6)
N19 S	XWG3	Plain, ϕ3 (10)
N20 S	XWG3E10	Plain, ϕ3 (1)
N21 S	XWG3	Plain, ϕ3 (1)
ACCESSORIES		
A1 (XA) ⚠ only	SJP5213—1	Plug Adaptor, (C→U) (1)
A2 (XA) ⚠ only	SJP5215	Plug Adaptor, (U→B) (1)
A3		
A3 (E, EH, EB)	SQF11271	Instructions Book (1)
A3 (EK, XL)	SQF11275	Instructions Book (1)
A3 (EF)	SQF11277	Instructions Book (1)
A3 (XA)	SQF11279	Instructions Book (1)
A3 (Ei)	SQF11365	Instructions Book (1)
PACKING PARTS		
P1 ○	SPG3945	Carton Box (Silver) (1)
P1 (EF) ○	SPG3947	Carton Box (Silver) (1)
P1 (XL) ○	SPG3949	Carton Box (Silver) (1)
P1 [K]	SPG3997	Carton Box (Black) (1)
P2	SPS3661	Pad, Left Side (1)
P2 (XL) only	SPS3661—1	Pad, Left Side (1)
P3	SPS3663	Pad, Right Side (1)
P3 (XL) only	SPS3663—1	Pad, Right Side (1)
P4	SPS3815	Pad, Corner (1)
P4 (XL) only	SPS3633	Pad, Corner (1)
P5 ○	SPP699	Polyethylene Bag (Silver) (1)
P5 [K]	SPP649	Polyethylene Bag (Black) (1)

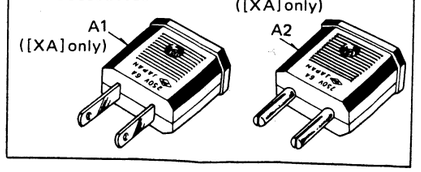
Areas

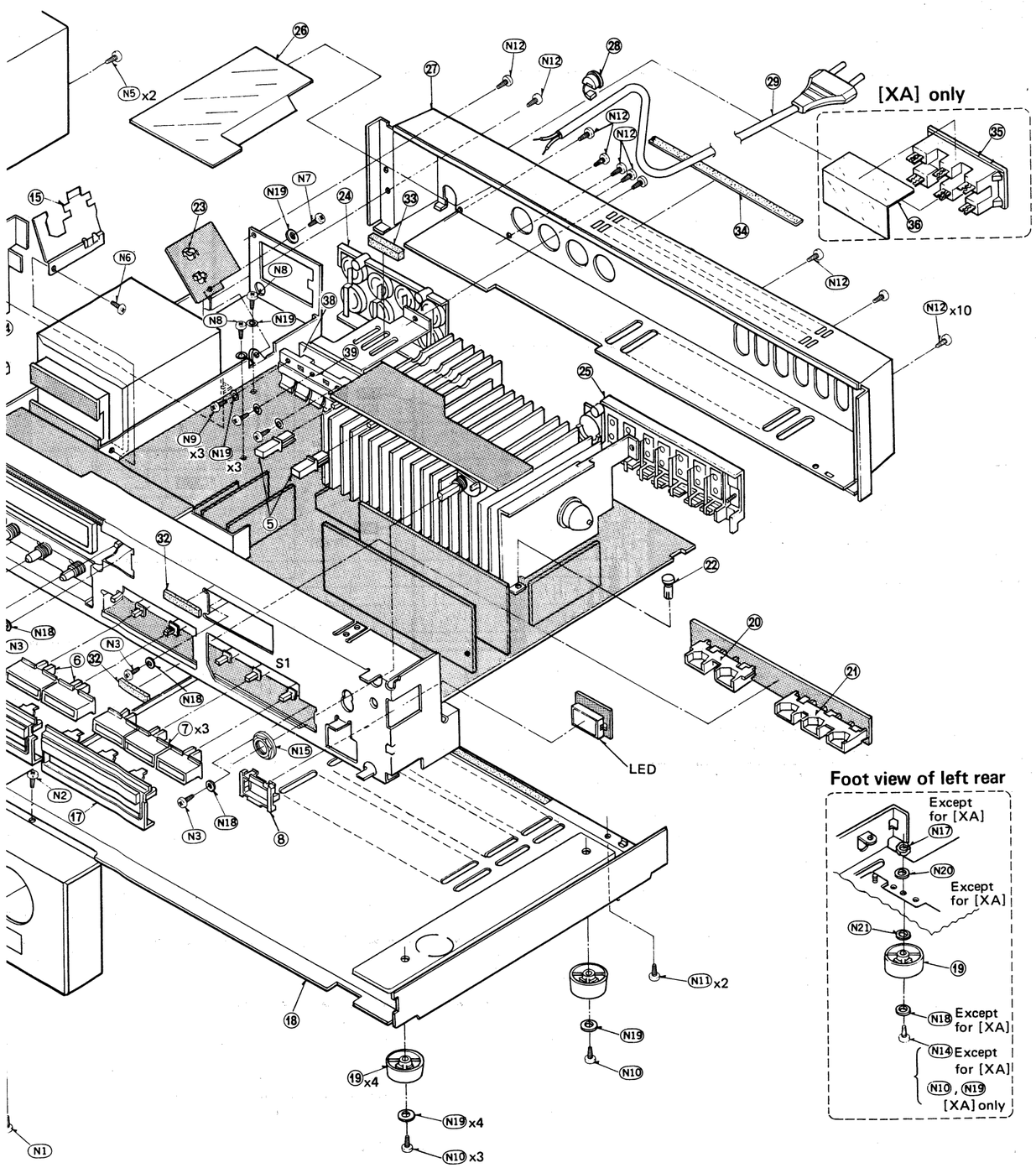
* [E] is available in Scandinavia and Switzerland.
* [EK] is available in United Kingdom.
* [EF] is available in France.
* [EH] is available in Holland.
* [EB] is available in Belgium.
* [Ei] is available in Italy.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.

EXPLODED VIEW



● Accessories





■ RESISTORS & CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "**S**" mark is service standard parts and may differ from production parts.
5. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = μμF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	G : ± 2%
ERG : Metal Oxide	25 : 1/4W	J : ± 5%
ERO : Metal Film	1 : 1W	
	2 : 2W	
	3 : 3W	
	S1 : 1/2W	

ERD10TLJ□□□ ⟶ Chip type carbon
ERO10MKG□□□ ⟶ Chip type metal film

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage: ECEA Type	Voltage: Others	Tolerance
ECEA : Electrolytic	0J : 6.3V	1H : 50V DC	C : ± 0.25pF
ECEA...N : Non Polar Electrolytic	1A : 10V	2H : 500V DC	J : ± 5%
ECCD : Ceramic	1C : 16V	MY : 125V AC	K : ± 10%
ECKD : Ceramic	1E : 25V	KC : 400VAC	**M : ± 20%**
ECQM : Polyester	1H : 50V	2A : 250VAC	Z : +80%, –20%
ECQE : Polyester	1J : 63V		P : +100%, –0%
ECET : Electrolytic	50 : 50V		
	25 : 25V		

Ref. No.	Part No.	Value
RESISTORS		
R1, 2	ERD10TLJ391U	390
R3, 4	ERO10MKG2213	221K
R5, 6	ERO10MKG5622	56.2K
R7, 8	ERD10TLJ271U	270
R9, 10	ERD10TLJ680U	68
R11, 12	ERD10TLJ184U	180K
R13, 14	ERD10TLJ123U	12K
R15, 16	ERD10TLJ563U	56K
R17, 18	ERD10TLJ102U	1K
R21(×2)	ERD10TLJ102U	1K
R22(×2)	ERD10TLJ124U	120K
R23(×2)	ERD10TLJ223U	22K
R24(×2)	ERD10TLJ124U	120K
R25(×2)	ERD10TLJ561U	560
R26(×2)	ERD10TLJ220U	22
R27(×2)	ERD10TLJ103U	10K
R28(×2)	ERD10TLJ151U	150
R29(×2)	ERD10TLJ681U	680
R30(×2)	ERD10TLJ274U	270K
R101, 102 S	ERD25FJ272	2.7K
R103, 104 S	ERD25TJ824	820K
R105, 106 S	ERD25TJ473	47K
R107, 108 S	ERD25TJ183	18K
R109, 110 S	ERD25TJ824	820K
R111, 112 S	ERD25FJ102	1K
R113, 114 S	ERD25TJ153	15K
R115, 116 S	ERD25FJ332	3.3K
R117, 118 S	ERD25TJ394	390K
R201～204 S	ERD25FJ332	3.3K
R205, 206 S	ERD25FJ681	680
R207, 208 S	ERD25FJ392	3.9K
R209, 210 ⚠ S	ERD25FJ102	1K
R211, 212 S	ERD25TJ223	22K
R215～218 S	ERD25TJ124	120K
R219, 220 ⚠ S	ERD25FJ331	330
R221～224 ⚠ S	ERD25FJ2R2	2.2
R229, 230 ⚠ S	ERD25FJ331	330
R231～234 ⚠ S	ERD25FJ471	470
R235, 236 S	ERD25FJ100	10

Ref. No.	Part No.	Value
R301, 302 S	ERD25TJ223	22K
R303～306 S	ERD25FJ682	6.8K
R307, 308 S	ERD25TJ824	820K
R309, 310 S	ERD25TJ334	330K
R311, 312 S	ERD25FJ821	820
R313, 314 S	ERD25FJ562	5.6K
R315, 316 S	ERD25FJ332	3.3K
R317, 318 S	ERD25FJ470	47
R319, 320 S	ERD25TJ223	22K
R321, 322 S	ERD25TJ473	47K
R323 S	ERD25TJ184	180K
R324 S	ERD25TJ333	33K
R325, 326 S	ERD25TJ823	82K
R325A, 326A	ERG2ANJ331	330
R327 S	ERD25TJ333	33K
R328, 329 S	ERD25TJ223	22K
R330 S	ERD25TJ823	82K
R331 S	ERD25TJ223	22K
R332 S	ERD25TJ333	33K
R333 ⚠	ERG3ANJ561	560
R334 ⚠	ERG2ANJ561	560
R401, 402 ⚠ S	ERD25FJ272	2.7K
R403, 404 S	ERD25TJ223	22K
R405 S	ERD25TJ333	33K
R406 S	ERD25TJ184	180K
R407 S	ERD25TJ124	120K
R408 S	ERD25FJ103	10K
R409 S	ERD25TJ153	15K
R410 S	ERD25TJ104	100K
R411 S	ERD25TJ224	220K
R412～415 S	ERD25FJ103	10K
R501～503 ⚠ S	ERD25FJ100	10
R504 ⚠ S	ERG1ANJ680	68
R505, 506 ⚠ S	ERDS1FJ331	330
R507, 508 S	ERD25FJ472	4.7K
R509 S	ERD25FJ182	1.8K
R510 ⚠ S	ERD25FJ560	56
R511 ⚠ S	ERD25FJ680	68
R512, 513 S	ERD25FJ271	270
R601, 602 S	ERD25FJ682	6.8K

Ref. No.	Part No.	Value
R603, 604 S	ERD25FJ821	820
R605, 606 S	ERD25TJ223	22K
R607 ⚠ S	ERD25FJ561	560
R608 ⚠ S	ERG1ANJ331	330
R609 S	ERD25FJ472	4.7K
R610 ⚠	ERDS1FJ271	270
R611 S	ERD25FJ471	470
R801 ⚠ S	ERD25FJ100	10
CAPACITORS		
C1, 2 S	ECEA50M3R3R	3.3
C3, 4 S	ECCD1H101KC	100P
C5, 6 S	ECKD1H471KB	470P
C7, 8 S	ECQM1H223JZ	0.022
C9, 10 S	ECQM1H682JZ	0.0068
C11, 12 ⚠	ECEA1HN010S	1
C13, 14 S	ECEA1CS330	33
C21(×2) S	ECEA50Z3R3	3.3
C22(×2) S	ECCD1H390KC	39P
C24(×2) S	ECEA25Z4R7	4.7
C25(×2) S	ECCD2H100K	10P
C26(×2) S	ECKD1H681KB	680P
C28(×2) S	ECCD1H820K	82P
C29(×2) S	ECCD1H060CC	6P
C31(×2) S	ECKD1H561KB	560P
C32(×2) S	ECEA1AS470	47
C101, 102 S	ECKD1H331KB	330P
C103, 104 S	ECQM1H822JZ	0.0082
C105, 106 S	ECQM1H563JZ	0.056
C107, 108 S	ECQM1H563JZ	0.056
C109, 110 S	ECQM1H223JZ	0.022
C111, 112 S	ECQM1H183JZ	0.018
C113, 114 S	ECQM1H823JZ	0.082
C121, 122 S	ECEA1CS330	33
C201, 202 S	ECEA1JS330	33
C203, 204	ECCD2H151K	150P
C205, 206 S	ECKD1H103MD	0.01
C207～210	ECKD1H681KB	680P
C211, 212 S	ECEA50Z1	1
C213～216	ECCD2H121K	120P

Ref. No.	Part No.	Value
C301 S	ECQM1H683JZ	0.068
C302, 303 S	ECQM1H473JZ	0.047
C304 S	ECEA50Z1	1
C305 S	ECKD1H103MD	0.01
C306 S	ECEA25Z4R7	4.7
C401 ⚠	ECEA1CN101S	100
C402 S	ECEA1CS330	33
C403 S	ECEA50Z3R3	3.3
C404 S	ECEA50Z1	1
C405 S	ECEA50Z3R3	3.3
C406 S	ECKD1H103MD	0.01
C501, 502	ECETS56V682U	6800
C503, 504 S	ECEA1HS100	10
C505, 506 S	ECEA1HS100	10
C507 S	ECEA2AS3R3	3.3
C508～510 S	ECEA50Z3R3	3.3
C511 S	ECEA1CS102	1000
C601, 602 S	ECEA50ZR47	0.47
C603, 604 S	ECKD1H332KB	0.0033
C605 S	ECEA50ZR47	0.47
C607 S	ECEA1VS330	33
C701 [EF] only ⚠	ECQE2A473MW	0.047
C702 ⚠ Except for [XA]	ECKDKC103PF	0.01
C703, 704 ⚠ [XA] only	ECKDKC103PF	0.01
C801 S	ECEA1AS331	330
C802 S	ECEA1AS101	100

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FRANÇAIS

Stereo Integrated Amplifier SU-Z65/SU-Z65(K)

This booklet contains the specifications and adjusting procedures for SU-Z65, written in Franch and Spanish, and the circuits to be changed according to the areas.
File this manual together with the SU-Z65 service manual (Order No. SD82052184C8).

FRANÇAIS

■ CARACTERISTIQUES (Sujet á changement sans préaris.)

(DIN 45 500)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz,	
les deux canaux en circuit	2 × 50W (4Ω)
	2 × 50W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz,	
les deux canaux en circuit	2 × 50W (4Ω)
	2 × 50W (8Ω)
Puissance de sortie continue à 1 kHz	
les deux canaux en circuit	2 × 55W (4Ω)
	2 × 55W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,05% (4Ω)
	0,007% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,05% (4Ω)
	0,007% (8Ω)
à puissance nominale (1 kHz)	0,007% (4Ω)
	0,005% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,007% (8Ω)
à demi-puissance (1 kHz)	0,005% (8Ω)
puissance de −26 dB à 1 kHz	0,01% (4Ω)
puissance de 50 mW à 1 kHz	0,01% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,05%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,007%
Réponse de fréquences	
les deux canaux en circuit, −3 dB	10 Hz~30 kHz (4Ω, 0,03%)
	10 Hz~30 kHz (8Ω, 0,02%)
Bruit et ronflement résiduels	0,6 mV
Coefficient d'amortissement	20 (4Ω), 40 (8Ω)
PHONO (tension d'entrée maximum, 1 kHz RMS)	150 mV
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO	75 dB (IHF, A: 81 dB)
SYNTONISATEUR, AUX, BANDE 1, 2 (TUNER, AUX, TAPE 1, 2)	86 dB (IHF, A: 97 dB)
puissance de −26 dB (4Ω)	
PHONO	65 dB
SYNTONISATEUR, AUX, BANDE 1, 2 (TUNER, AUX, TAPE 1, 2)	65 dB
puissance de 50 mW (4Ω)	
PHONO	62 dB
SYNTONISATEUR, AUX, BANDE 1, 2 (TUNER, AUX, TAPE 1, 2)	62 dB
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
SYNTONISATEUR, AUX (TUNER, AUX)	150 mV/22kΩ
BANDE 1 (TAPE 1)	150 mV/22kΩ
BANDE 2 (TAPE 2)	150 mV/22kΩ
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0,8 dB (30 Hz~15 kHz)
SYNTONISATEUR, AUX, BANDE 1, 2 (TUNER, AUX, TAPE 1, 2)	5 Hz~100 kHz (−3 dB)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtre subsonique	30 Hz, −6 dB/oct.
Filtre coupe-hauts	7 kHz, −6 dB/oct.
Compensateur physiologique (volume à −30 dB)	50 Hz, +9 dB
Tension de sortie et impédance	
SORTIE ENREGISTREMENT (REC OUT)	150 mV
Séparation des canaux, AUX 1 kHz	50 dB
Niveau de sortie des casques et impédance	470 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	4Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

■ DIVERS

Consommation	345W
Alimentation	CA 50 Hz/60 Hz, 220V (Pour l'Europe)
	CA 50 Hz/60 Hz, 110V/120V/220V/240V (Autres)
Dimensions (L×H×Pr)	430 × 86 × 288 mm
Poids	6,3 kg

Remarque:

1. On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045)
2. La Société NATIONAL-PANASONIC-FRANCE, importateur du matériel MATSUSHITA-ELECTRIC déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. (arrêté 14 Janvier 1980).

■ MESURAGES ET RÉGLAGES

1. Détection d'impédance de charge et ICQ

● Réglages et appareils utilisés

1. Sélecteur de haut-parleurs . . . . . principal (main)
2. Voltmètre à C.C.
3. Appareils pour la vérification du fonctionnement du circuit. (Voltmètre à C.A., oscillateur de 1kHz, charge de 8Ω, résistance de 5W 0,33Ω, 1/2W 6,5Ω ou 3,3Ω et 3,3Ω ±5%)

Article	Branchement du voltmètre à C.C.	VR à régler	Réglage
Réglage du circuit de détection d'impédance de charge.	*Mettre en circuit une charge avec 6,5Ω (résistance à couche de carbone de 1/2W) ou un montage en série de 3,3Ω et 3,3Ω (1/2W, ±5%) à la prise du haut-parleur "principal". (Fig. 15) *Brancher un voltmètre à C.C. entre TP301 et le châssis.	VR301	1. Reccorder la borne TP303 et le châssis. 2. Tourner préalablement complètement dans le sens des aiguilles d'une montre VR301 et VR302. 3. Régler VR301 de façon à ce que la tension de TP301 soit de −0.1V. 4. Régler VR302 de façon à ce que la tension de TP302 soit de 0V.
	*Mettre en circuit une charge avec 6,5Ω (résistance à couche de carbone de 1/2W) ou un montage en série de 3,3Ω et 3,3Ω (1/2W, ±5%) à la prise du haut-parleur "principal". (Fig. 15) *Brancher un voltmètre à C.C. entre TP302 et le châssis.	VR302	
Réglage de ICQ	Canal de gauche Brancher le voltmètre à TP1 (+) et TP2 (−).	VR201	1. Tourner préalablement complètrement dans le sens inverse des aiguilles d'une montre VR201 et VR202. 2. Régler VR201 (canal de gauche) et VR202 (canal de droite) de façon à ce que la tension soit de 0.5mV, environ 1 minutes après la mise en marche de la tension d'alimentation.
	Canal de droite Brancher le voltmètre à TP3 (+) et à TP4 (−).	VR202	

2. Points de vérification

● Compensation du C.C.

1. Brancher le voltmètre à C.C. et une charge de 8Ω à la prise de haut-parleurs.
2. S'assurer que la tension de sortie est en deçà de ±100mV.

3. Indicateurs de puissance de crête fluorescents

Réglage:

- Brancher un oscillateur à basse fréquence à la borne de sortie du tuner et une résistance de charge de 8 ohms et un voltmétre électronique à la borne de l'enceinte.
- Par l'oscillateur à basse fréquence, appliquer un signal de 1 kHz à l'appareil.
- Régler le volume du son au maximum.

Article	Position du commutateur de sélection de la gamme du compteur	VR à régler	Réglagr
Indicateurs de puissance de crête fluorescents	Commutateur de gamme X0,01	VR601 (CG) VR602 (CD)	1. Régler le niveau de sortie de telle sorte que la voltmétre CA indique 2,0V. 2. Régler les résistances variables semi-fixes VR601 (canal de gauche) et VR602 (canal de droite), de façon à ce que le segment de 50W de l'appareil de mesure FL s'éclaire faiblement. (Fig. 16)

ESPAÑOL

■ ESPECIFICACIONES (Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

(DIN 45 500)

■ SECCION AMPLIFICADOR

Potencia continua de 20 Hz~20 kHz	
en ambos canales	2 × 50W (4Ω)
	2 × 50W (8Ω)
Potencia continua de 40 Hz~16 kHz	
en ambos canales	2 × 50W (4Ω)
	2 × 50W (8Ω)
Potencia continua de 1 kHz	
en ambos canales	2 × 55W (4Ω)
	2 × 55W (8Ω)
Distorsión armónica total	
potencia de régimen a 20 Hz~20 kHz	0,05% (4Ω)
	0,007% (8Ω)
potencia de régimen a 40 Hz~16 kHz	0,05% (4Ω)
	0,007% (8Ω)
potencia de régimen a 1 kHz	0,007% (4Ω)
	0,005% (8Ω)
mitad de potencia a 20 Hz~20 kHz	0,007% (8Ω)
mitad de potencia a 1 kHz	0,005% (8Ω)
−26 dB de potencia a 1 kHz	0,01% (4Ω)
50 mW de potencia a 1 kHz	0,01% (4Ω)
Distorsión por intermodulación	
potencia de régimen a 250 Hz: 8 kHz=4:1, 4Ω	0,05%
potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,007%
Ancho de banda de potencia	
con ambos canales, −3 dB	10 Hz~30 kHz (4Ω, 0,03%)
	10 Hz~30 kHz (8Ω, 0,02%)
Zumbido residual y ruido	0,6 mV
Factor de amortiguamiento	20 (4Ω), 40 (8Ω)
Voltaje máximo de entrada de PHONO (1 kHz, RMS)	150 mV
Relación de señal a ruido	
potencia de régimen (4Ω)	
TOCADISC. (PHONO)	75 dB (IHF, A: 81 dB)
SINTON., AUX., GRAB. 1, 2 (TUNER, AUX, TAPE 1, 2)	86 dB (IHF, A: 97 dB)
−26 dB de potencia (4Ω)	
TOCADISC. (PHONO)	65 dB
SINTON., AUX., GRAB. 1, 2 (TUNER, AUX, TAPE 1, 2)	65 dB
50 mW de potencia (4Ω)	
TOCADISC. (PHONO)	62 dB
SINTON, AUX., GRAB. 1, 2 (TUNER, AUX, TAPE 1, 2)	62 dB
Sensibilidad e impedancia de entrada	
TOCADISC. (PHONO)	2,5 mV/47kΩ
SINTON., AUX. (TUNER, AUX)	150 mV/22kΩ
GRAB. 1 (TAPE 1)	150 mV/22kΩ
GRAB. 2 (TAPE 2)	150 mV/22kΩ
Respuesta de frecuencia	
TOCADISC. (PHONO)	curva RIAA estándar ±0,8 dB (30 Hz~15 kHz)
SINTON., AUX., GRAB. 1, 2 (TUNER, AUX, TAPE 1, 2)	5 Hz~100 kHz (−3 dB)
Controles de tono	
BAJOS (BASS)	50 Hz, +10 dB~ −10 dB
AGUDOS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtro subsónico	30 Hz, −6 dB/oct.
Filtro de corte de altos	7 kHz, −6 dB/oct.
Control de sonoridad (volumen a −30 dB)	50 Hz, +9 dB
Voltaje e impedancia de salida	
SAL. GRAB. (REC OUT)	150 mV
Separación de canales, AUX 1 kHz	50 dB
Impedancia y nivel de salida de los auriculares	470 mV/330Ω
Impedancia de carga	
MAIN o REMOTE	4Ω~16Ω
MAIN y REMOTE	8Ω~16Ω

■ GENERAL

Consumo de energía	345W
Alimentación de energía	CA 50 Hz/60 Hz, 220V (Para Europa continental)
	CA 50 Hz/60 Hz, 110V/120V/220V/240V (Para otros paises)
Dimensiones (An.×Al.×Prof.)	430 × 86 × 288 mm
Peso	6,3 kg

Nota:
La distorsión armónica total se mide con el analizador de espectro digital (sistema H.P. 3045).

■ MEDICIONES Y AJUSTES

1. Detección de impedancia de carga y corriente de reposo de transistor de potencis (ICQ)

●Puesta e instrumentos usados

1. Selector de altavoz . . . . . principal
2. Voltímetro de CC
3. Instrumentos para verificaicón de operación de circuito (Voltímetro de CA, oscilador 1kHz, carga 8Ω, resistor 5W 0,33Ω, 1/2W 6,5Ω ó 3,3Ω y 3,3Ω)

Item	Conexión de voltimetro de CC	RV ajustado	Procedimiento de ajuste
Ajuste del circuito de detección de impedancia de carga	*Conectar una carga con 6,5Ω (resistor de carbón de 1/2W) ó 3,3Ω y 3,3Ω (1/2W, ±5%), conectados en serie, al terminal del altavoz "principal". (Fig. 15) *Conectar un voltímetro de CC entre TP301 y chasis.	VR301	1.Conectar terminal TP303 y chasis. 2.Girar completamente VR301 y VR302 a la derecha de antemano. 3.Ajustar VR301 de manera que el voltaje de TP301 −0,1V. 4.Ajustar VR302 de manera que el voltaje de TP302 sea 0V.
	*Conectar una carga con 6,5Ω (resistor de carbón de 1/2W) ó 3,3Ω y 3,3Ω (1/2W, ±5%), conectados en serie, al terminal del altavoz "principal". (Fig. 15) *Conectar un voltimetro de CC entre TP302 y chasis.	VR302	
Ajuste de ICQ	Canal I Conectar voltímetro a TP1 (+) y TP2 (−)	VR201	1. Girar completamente VR201 y VR202 a la izquierda de antemano 2. Ajustar VR201 (canal I) y VR202 (canal D) de manera que el voltaje sea 0,5mV, unos 1 min. después de conectar el suministro de energía.
	Canal D Conectar voltímetro a TP3 (+) y TP4 (−)	VR202	

2. Puntos de verificación

- **Equilibrio de CC**
  1. Conectar el voltímetro de CC y carga de 8Ω al terminal del altavoz.
  2. Asegurarse de que el voltaje de salida esté dentro de ±100mV.

3. Medidor fluorescente de potencia de cresta

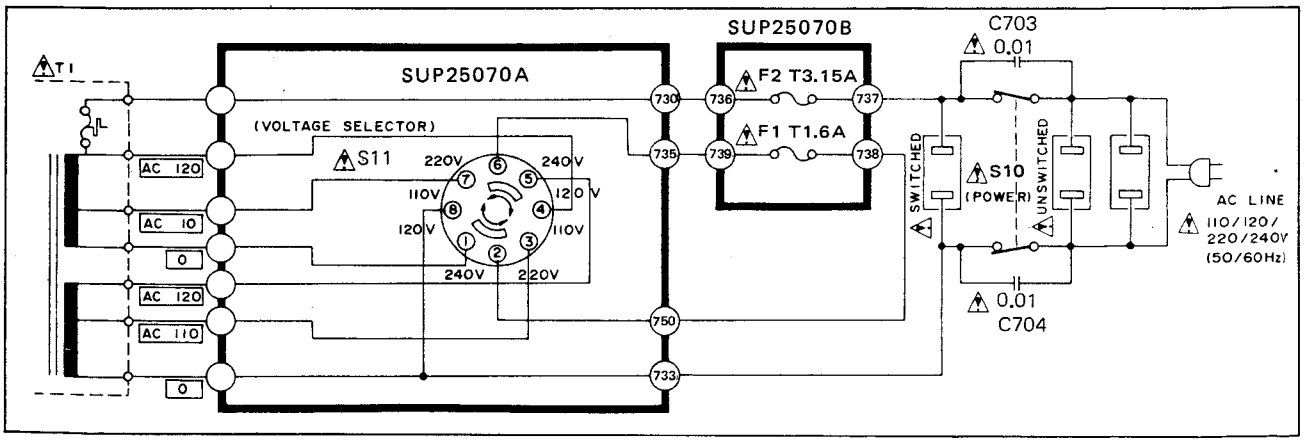
Puesta

- Conectar un oscilador de baja frecuencia al terminal de entrada de sintonizador, y el resistor de carga 8-ohmios y voltímetro electrónico de CA al terminal del altavoz.
- Añadir señal 1kHz del oscilador de baja frecuencia al aparato.
- Poner el volumen de sonido al punto máximo.

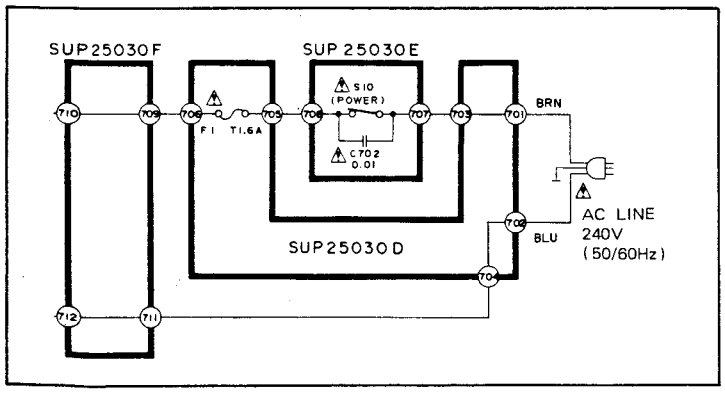
Item	Posición de interruptor selector de game de medidor	RV ajustado	Procedimiento de ajuste
Indicadores de potencia-cresta	Interruptor de game X0.01	VR601 (Canal I) VR602 (Canal D)	1. Ajustar el nivel de entrada de manera que el voltímetro de CA indique 2 voltios. 2. Ajustar los resistores variables semifijos VR601 (C.I.) y VR602 (C.D.) de manera que el segmento de 50W del medidor FI se ilumine debilmente (Fig. 16)

■ CIRCUITS TO BE CHANGED AND THE AREAS

- **Power source circuit** [XA] area



[XL] area



Notes:

* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* S11: Voltage selector in "240V" position.
  120V ⟷ 110V ⟷ 220V ⟷ 240V
* [XL] is available in Australia.

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