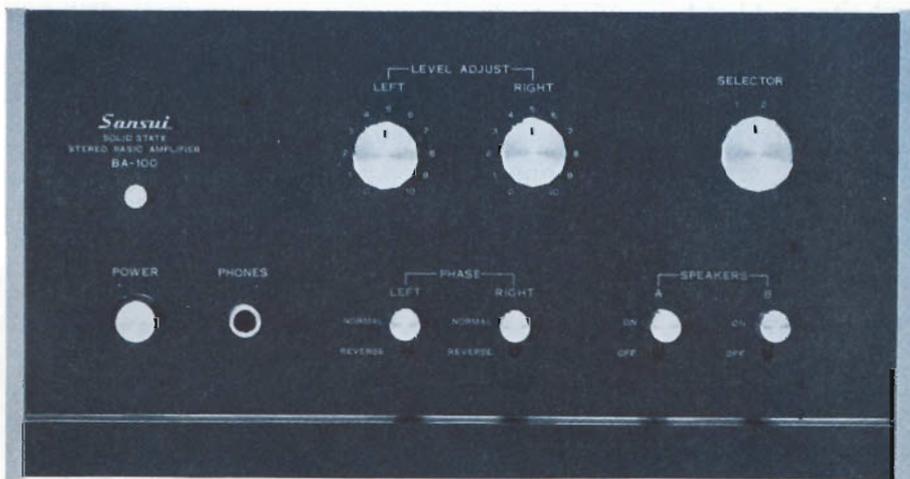


# OPERATING INSTRUCTIONS & SERVICE MANUAL

SOLID-STATE BASIC AMPLIFIER

## SANSUI BA-100



**Sansui**

SANSUI ELECTRIC COMPANY LIMITED

Congratulations on joining the thousands of proud, satisfied owners of quality stereo components from Sansui, the world's foremost audio-only specialist.

Designed specifically for an ardent audiophile like you, the BA-100 features the refined non-glare black panel common to all Sansui professional components; thoroughly direct-coupled pure complementary circuits which deliver a full 100 watts (4Ω) in music power output with unprecedentedly good tone quality; two sets of program inputs controlled by the front selector switch; two sets of speaker terminals which permit connecting two sets of stereo speaker systems; and separate phase switches which simplify the speaker phasing.

Before leaving our factory, your new BA-100 was tested, inspected and certified to be in perfect operating conditions. It is now up to you to keep it that way. This manual has been prepared to guide you in connecting and operating the BA-100 correctly. It contains some very helpful information on using controls properly and operating components most effectively. Please read it carefully before operating the amplifier and retain it for future reference.

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# CONNECTIONS

## Input Connections

The BA-100 provides two separate program inputs controlled by the SELECTOR switch. The two sets of inputs can accommodate a pair of preamplifiers, a preamplifier and tuner, etc. To connect the preamplifier or tuner to the BA-100 with the pin-plug cords (supplied), proceed as follows:

1. Connect the left channel output of the preamplifier (or tuner) to the LEFT INPUT 1 (or 2) jack of the BA-100.
2. Connect the right channel output of the preamplifier (or tuner) to the RIGHT INPUT 1 (or 2) jack of the BA-100.
3. Set the SELECTOR switch to 1 or 2 depending on which inputs are being used.

## Speaker Connections

Two sets of stereo speaker systems can be connected to the BA-100. They can be used individually or simultaneously with the SPEAKERS switches.

### To connect a set of speaker systems to the amplifier:

1. Connect the plus (+) terminal of the speaker on your left (as viewed from the listening area) to the plus (+) LEFT SYSTEM-A terminal of the amplifier.
2. Connect the minus (-) terminal of the left speaker to the minus (-) LEFT SYSTEM-A terminal.
3. Connect the plus (+) terminal of the right speaker to the plus (+) RIGHT SYSTEM-A terminal.
4. Connect the minus (-) terminal of the right speaker to the minus (-) RIGHT SYSTEM-A terminal.
5. Turn on the A SPEAKERS switch.

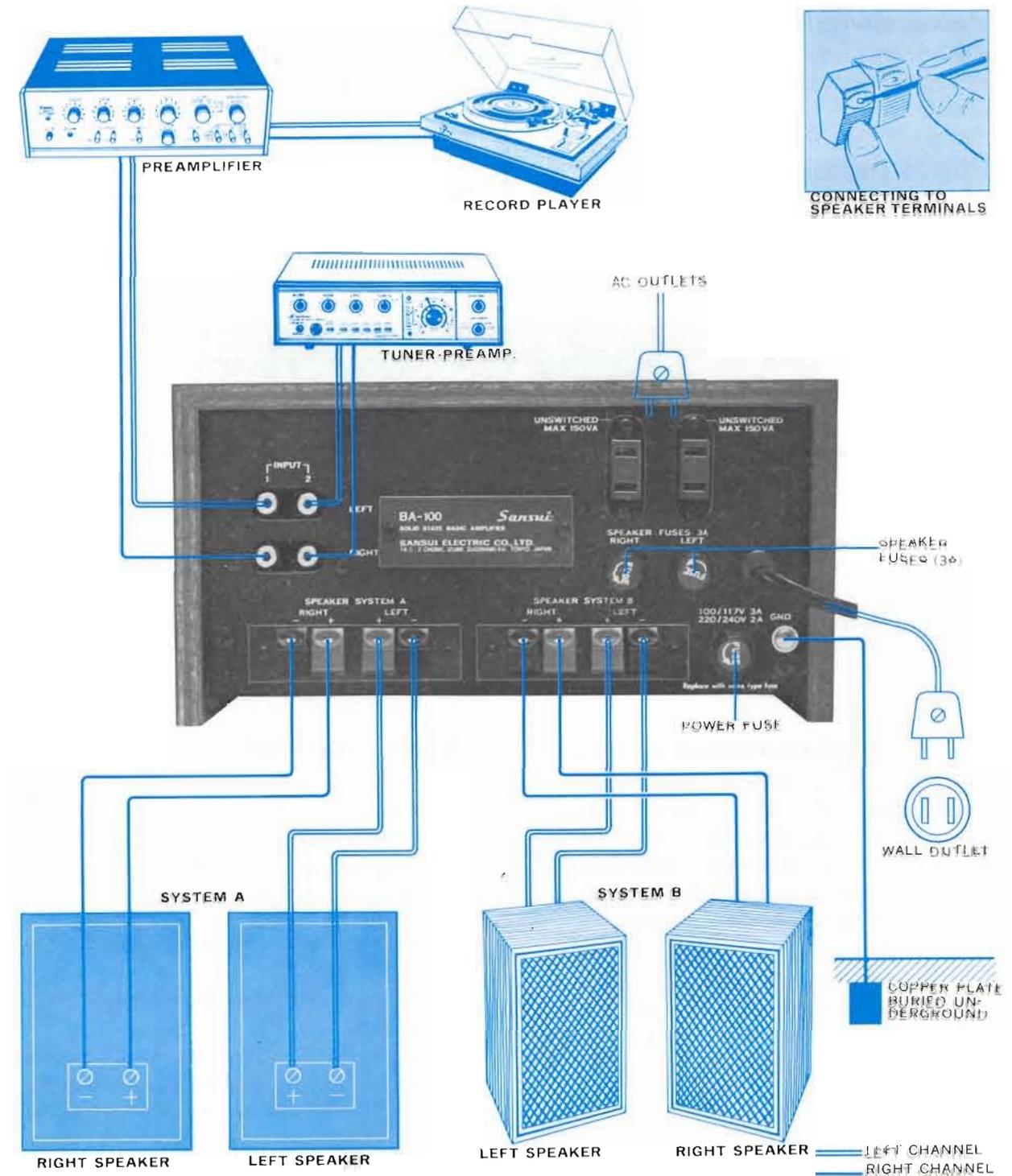
### To connect another set of speaker systems to the amplifier:

The connections of another set of speaker systems are made at the SYSTEM-B terminals on the rear panel of the amplifier. To listen to the speakers connected to the SYSTEM-B terminals, turn the B SPEAKERS switch ON. To use both speaker systems connected to the SYSTEM-A and -B terminals at the same time, turn both A and B SPEAKERS switches ON. When using the headphones for private listening, turn both A and B SPEAKERS switches OFF.

#### Notes:

- Any 4- to 16-ohm speakers can be connected to the BA-100.
- If you want to connect two or more speakers to one channel in parallel, their combined impedance must be more than 4 ohms.
- If you want to use the two pairs of stereo speaker systems at the same time, each system must have the impedance of more than 8 ohms.

**Caution:** The lead from the minus terminal (marked - or C) of the right speaker system should be connected to the RIGHT (-) terminal of the amplifier; the lead from the minus terminal of the left unit to the LEFT terminal. Do not connect the two leads to one minus terminal of the amplifier. Doing so will deprive the PHASE switches of their function and may also damage the power transistors.



# SWITCHES AND CONTROLS

## Power Switch

The amplifier is turned on when the POWER switch is depressed. Push it again to turn the amplifier off.

## Power Indicator

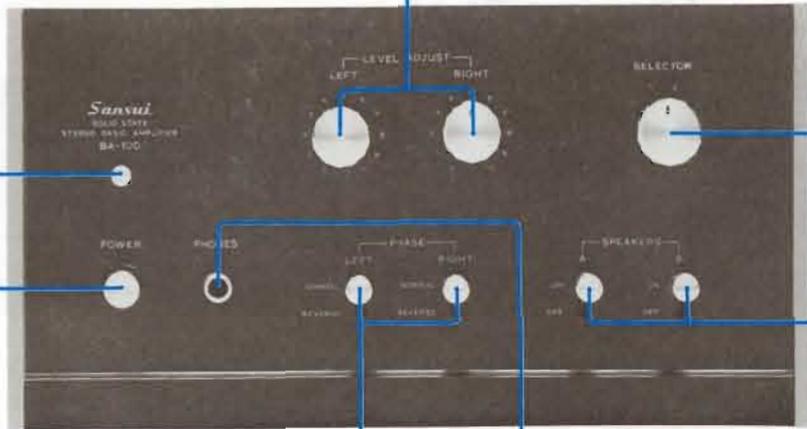
This indicator is lit when the POWER switch is pushed on. It remains lit during the operation.

## Level Controls

These controls adjust the output level of each channel individually. Turning clockwise increases the level of the signal which is fed to the speaker system.

## Selector Switch

This switch selects between the two program sources connected to the input jacks 1 and 2 on the rear panel.



## Phase Switches

The right and left speakers must be properly phased for natural sound. They must push the sound waves out together. If one pushes while the other pulls, there is sound cancellation at some frequencies or in some listening locations. With the PHASE switches, connections to either speaker system can quickly reversed to determine the in-phase position by ear. Incorrect phasing is evidenced by loss of bass when you are listening to a monophonic record or FM program at a point midway between the two speaker systems.

**Note:** Both PHASE switches should be in their NORMAL position if the right and left speaker systems are correctly connected to the amplifier.

## Headphones Jack

Plug in headphones for private listening or monitoring. The PHONES jack will accept any standard stereo phone plug. Dynamic headphones are recommended for use.

## Speakers Switches

**A**—Controls the signal to the SPEAKER SYSTEM A terminals.

**B**—Controls the signal to the SPEAKER SYSTEM B terminals.

When these switches are both ON, you will hear sound from all speakers connected to the amplifier. Turn both switches off for private listening with the headphones connected to the PHONES jack.

# FOUR-CHANNEL STEREO

The Sansui 4 Channel Synthesizer QS-1 is uniquely able to convert any 2-channel program source into 4-channel stereo sound. Thanks to Sansui's new reproducing matrix and "phase modulation" technique sounds from all four speaker systems merge in a perfectly integrated sound field for unprecedented presence of reproduced sound.

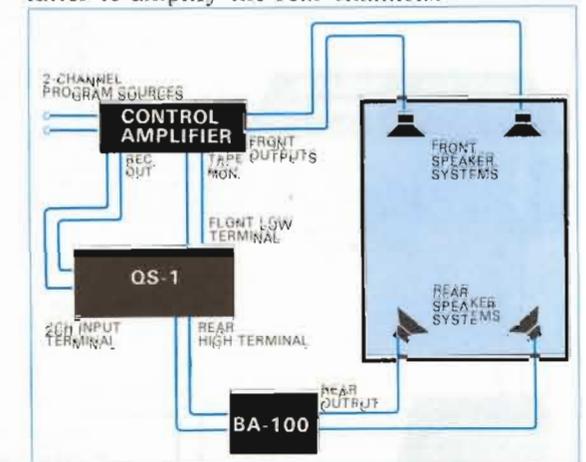
The circuitry of the QS-1 is completely electronic, utilizing new Sansui-developed integrated circuits (ICs) and encapsulated modules. There is nothing mechanical which might impair the tonal quality of reproduced sound or cause a deterioration in the unit's performance with the passage of time.

The QS-1 can be connected to any stereo system which incorporates an amplifier with a tape monitor circuit, including control amplifiers, receivers, ensemble stereo and modular stereo. Further, its 4-channel control section can be independently used to control any 4-channel sound that may be fed from or to a 4-channel tape deck.

The QS-1 so dramatically improves the smoothness and dynamic range of reproduced sound that even compact speaker systems can render

sound as lifelike and powerful as that heard from much larger systems. With the QS-1, the age of the multi-dimensional sound field has arrived.

You only need add the QS-1, BA-100 and another set of speaker systems to your present 2-channel stereo set-up to enjoy the exciting 4-channel stereo sound. The 4-channel stereo is accomplished by connecting your present receiver (or control amplifier) and the BA-100 to the QS-1 as illustrated below, employing the former to amplify the front channels and the latter to amplify the rear channels.

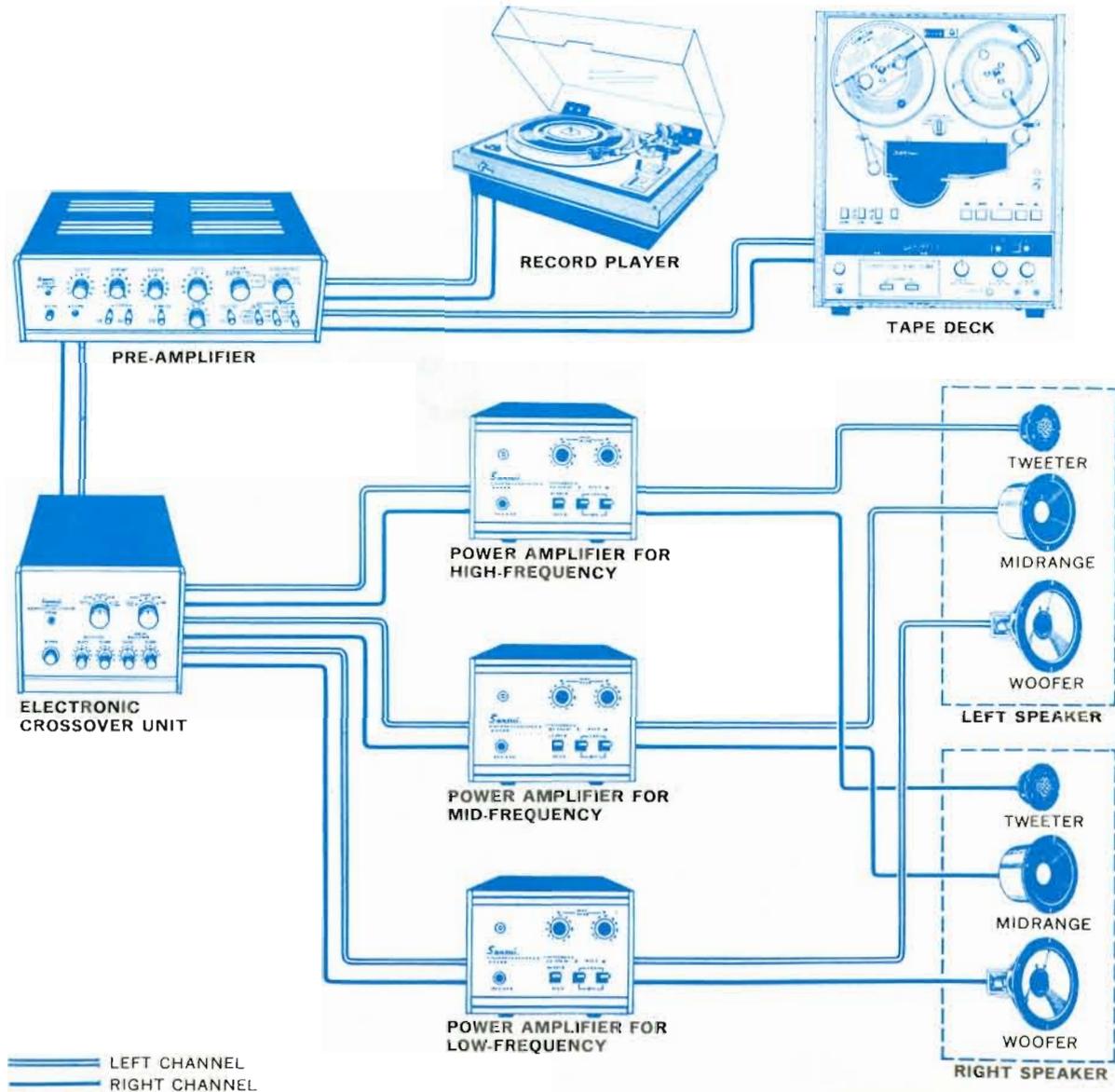


# ELECTRONIC CROSSOVER STEREO

Another lifelike stereo sound is reproduced by an electronic crossover system. The electronic crossover stereo, or multi-amplifier stereo as it is called in some area, involves dividing the input signal bandwidth of each stereo channel into two or three ways, amplifying each of the resultant frequency bands with separate power amplifiers and reproducing them with the woofers, midranges and tweeters separately.

This results in better tonal quality and reduced distortion.

In addition to your present conventional stereo system, an electronic crossover divider and two or three power amplifiers are required for the electronic crossover stereo. Below is the connection diagram of the three-amplifier electronic crossover system. The new and thrilling stereo sound is yours with the BA-100.



# HINTS ON USE

## Input Connections

Accompanying shielded cables with pin-plugs should be used to connect a preamplifier or tuner to the BA-100. If additional connecting cords are required for the input connections, be sure to use the identical shielded cables.

**Important:** Before turning the amplifier on, check to see that all plugs are correctly and firmly inserted and that all leads from the speakers are correctly and firmly to the terminals of the amplifier.

## AC Outlets

The BA-100 is provided with two AC outlets on its rear panel. They are used for powering other components such as a preamplifier and tuner. They have a maximum rating of 150VA each. Never use them beyond their rated capacity.



## Power Fuse

If the amplifier remains completely dead and the POWER indicator fails to light when the POWER switch is depressed, the power fuse is probably blown. In this case, remove the power plug from its wall outlet and replace the fuse after finding and eliminating the trouble that caused the fuse to blow. Use an identical glass-tubed 3-ampere fuse for 100–117 volt operation or 2-ampere unit for 220–240 volt operation. Never attempt to use a piece of wire or a fuse of a different capacity as a substitute. Note that the accompanying quick-acting fuses cannot be used as a power fuse.



## Grounding

If hum is introduced, connect a PVC wire or enameled wire from the GND terminal to a grounded metal conductor, such as a cold-water pipe or copper plate buried underground. The chassis ground of other components may also be connected to this terminal in order to eliminate the ground-loop hum.



# HINTS ON USE / ACCESSORIES

## Quick-Acting Fuses

If sound is suddenly distorted or muted, immediately remove the power plug from its outlet, check for the blown SPEAKER FUSES on the rear panel. If O.K., remove the bonnet from the chassis and check the four quick-acting fuses inside the amplifier. The blown fuse should be replaced with the new 3-ampere unit (supplied) after checking for the source of trouble that caused the fuse to blow. The trouble may be attributed to excessive input or shorted output circuit.

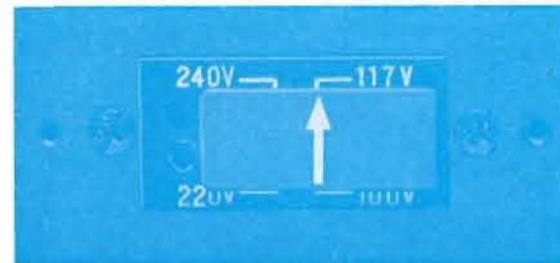


## Volt Adjustment

To reach the volt selector, remove the two screws from the nameplate on the rear panel and then remove the nameplate. The volt selector makes it possible to operate the BA-100 at the correct volt in any area. The volt has been pre-adjusted at the factory, but can be easily readjusted as follows:

1. Set the arrow on the volt selector plug to the required volts: 100, 117, 220 or 240 volts.
2. The power fuse should also be changed, if required. For 100-117 volt operation, a 3-ampere fuse is required; for 220-240 volt operation, a 2-ampere unit is required.

**Note:** The volt selector can also be used to eliminate the trouble caused by noticeable voltage fluctuation. To do so, adjust it to the peak voltage.



## ACCESSORIES

- |  |   |
|--|---|
| 1. OPERATING INSTRUCTIONS AND SERVICE MANUAL ..... | 1 |
| 2. CONNECTING CORDS WITH PIN-PLUGS .....           | 2 |
| 3. QUICK-ACTING FUSES (3A) .....                   | 2 |
| 4. BUTTERFLY BOLTS .....                           | 2 |
| 5. WASHERS .....                                   | 2 |
| 6. POLISHING CLOTH.....                            | 1 |

# SPECIFICATIONS / CHARACTERISTICS

## POWER OUTPUT

MUSIC POWER (IHF): 100W at 4 ohms load  
70W at 8 ohms load

CONTINUOUS POWER: 40/40W at 4 ohms load  
30/30W at 8 ohms load

TOTAL HARMONIC DISTORTION: less than 0.3% at rated output

INTERMODULATION DISTORTION: (600Hz:7,000Hz=4:1 SMPTE method) less than 0.3%

POWER BANDWIDTH: 5 to 40,000Hz at 8 ohms load

FREQUENCY RESPONSE: 10 to 40,000Hz  $\pm 0.5$ dB  $-2$ dB (at normal listening level)

CHANNEL SEPARATION: better than 60dB (at 1,000Hz, rated output)

HUM AND NOISE (IHF): better than 80dB

INPUT SENSITIVITY: 0.7V for rated output

INPUT IMPEDANCE: more than 30k ohms

LOAD IMPEDANCE: 4 to 16 ohms

DAMPING FACTOR: 40 at 8 ohms load

## SELECTOR

INPUT SELECTOR: 1, 2

SPEAKER SELECTOR A,B: ON, OFF

PHASE SWITCH L, R: NORMAL, REVERSE

## POWER REQUIREMENTS

POWER VOLTAGE: 100, 117, 220, 240V  
50/60Hz

POWER CONSUMPTION: 175VA (max. signal)

## OTHER SPECIAL ACCESSORY

HEAD PHONE JACK

INPUT LEVEL ADJ

## SEMICONDUCTORS:

DIODES: 11

TRANSISTORS: 18

## DIMENSIONS:

250mm (9 7/8") W,

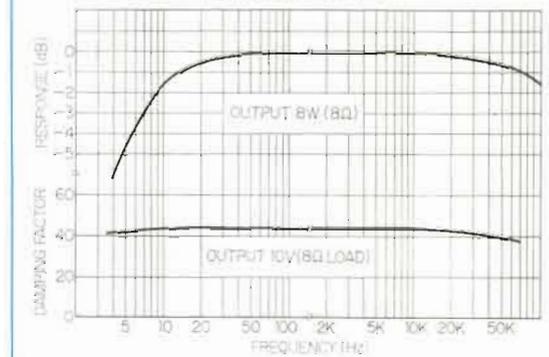
127mm (5") H,

278mm (11") D

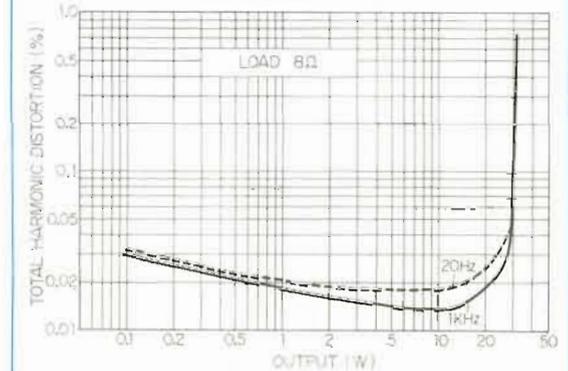
## WEIGHT:

7.2kg (15.9 lbs)

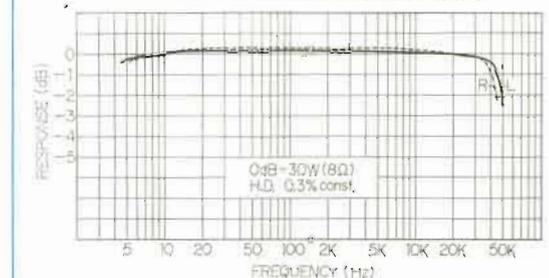
FREQUENCY RESPONSE/DAMPING FACTOR CHARACTERISTIC



TOTAL HARMONIC DISTORTION CHARACTERISTIC

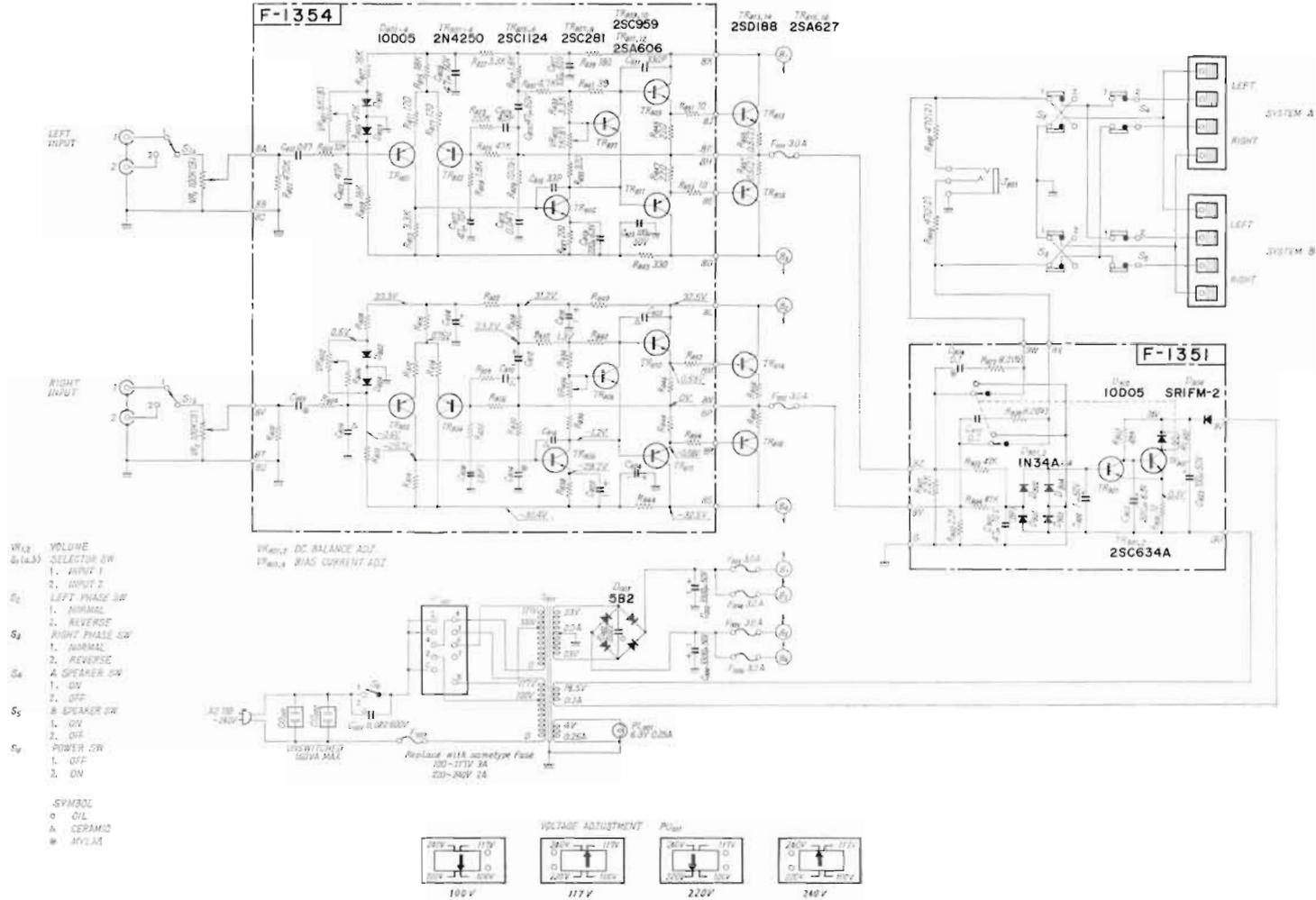


POWER BANDWIDTH CHARACTERISTIC



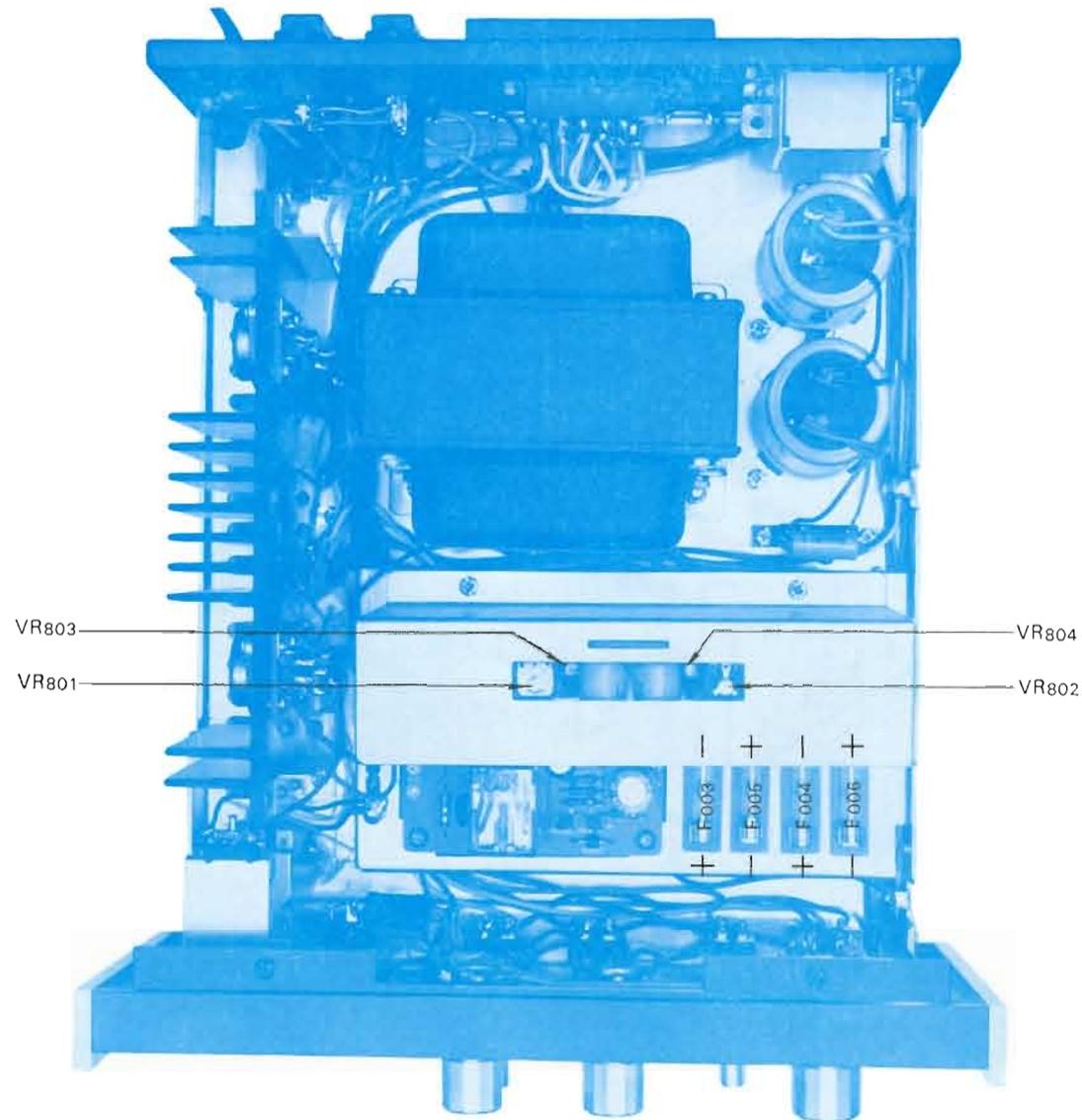
\* Manufacturer reserves right to change design and/or specifications without notice for purpose of improvement.

# SCHEMATIC DIAGRAM





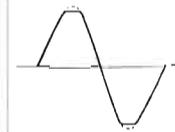
# TEST POINTS



# ALIGNMENT

## OUTPUT BALANCE ADJUSTMENT

STEP	WHAT TO DO	REMARKS
1.	Connect an 8 to 16-ohm load resistor to the left-channel SYSTEM A speaker terminal.	
2.	Connect a voltmeter in parallel with the load resistor.	The Voltmeter should be used in the 0.5~3V range.
3.	Turn SPEAKER A switch ON.	
4.	Turn POWER switch on.	
5.	Adjust VR <sub>801</sub> (left channel) so that the voltage will be kept within $0 \pm 20\text{mV}$ .	
	For the right channel, follow the same procedures as above. In Step 5, adjust VR <sub>802</sub> .	



## CURRENT ADJUSTMENT

STEP	AMMETER (TESTER)	WHAT TO DO	REMARKS
1.		Remove F <sub>003</sub> and F <sub>004</sub> .	Ammeter required: 100mA or 50mA range
2.		Set VR <sub>803</sub> and VR <sub>804</sub> to minimum.	
3.		Turn POWER switch ON.	
4.	Set to 100mA range.	Set ammeter in place of F <sub>003</sub> . Connect its ⊖ terminal to B <sub>1</sub> in schematic diagram.	Be sure to turn POWER switch on and then connect ammeter.
5.		Turn VR <sub>803</sub> (left channel) and adjust current to $25 \pm 3\text{mA}$ .	
6.		Turn POWER switch OFF and reset F <sub>003</sub> to its original position.	
7.	Set to 100mA range.	Turn POWER switch ON and set ammeter in place of F <sub>004</sub> . Connect its ⊖ terminal to B <sub>2</sub> .	
8.		Turn VR <sub>804</sub> (right channel) and adjust current to $25 \pm 3\text{mA}$ .	
9.		Turn POWER switch OFF, and attach F <sub>004</sub> .	

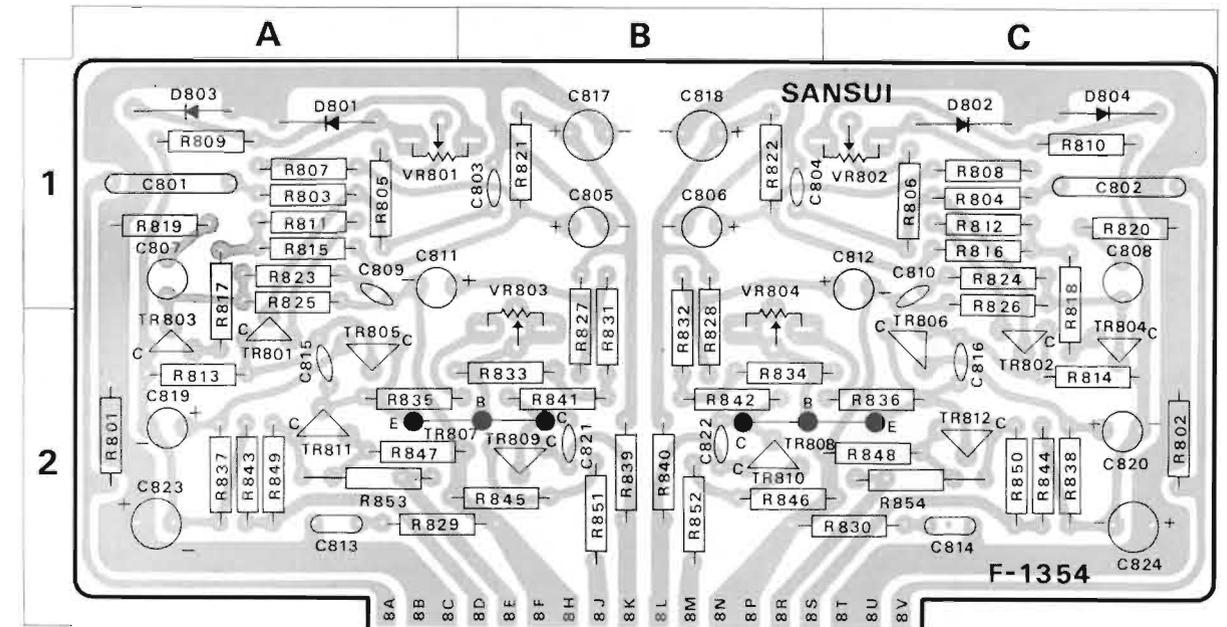
# PRINTED CIRCUIT BOARDS AND PARTS LIST

W: Parts No. X: Parts Name Y: Stock No. Z: Position of Parts

## DRIVER BLOCK <F-1354>

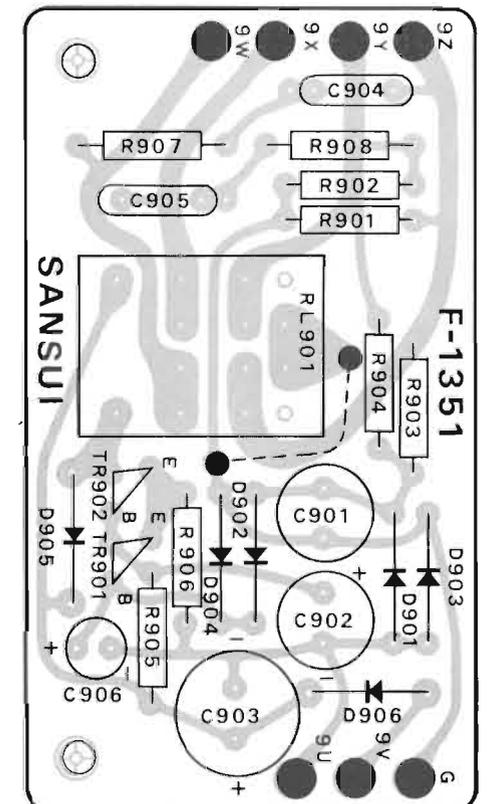
W	X	Y	Z
R801	470kΩ	0101474	2A
R802	470kΩ	0101474	2C
R803	10kΩ	0101103	1A
R804	10kΩ	0101103	1C
R805	47kΩ	0101473	1A
R806	47kΩ	0101473	1C
R807	18kΩ	0101183	1A
R808	18kΩ	0101183	1C
R809	18kΩ	0101183	1A
R810	18kΩ	0101183	1C
R811	120Ω	0101121	1A
R812	120Ω	0101121	1C
R813	3.3kΩ	0101332	2A
R814	3.3kΩ	0101332	2C
R815	18kΩ	0101183	1A
R816	18kΩ	0101183	1C
R817	120Ω	0101121	1, 2A
R818	120Ω	0101121	1, 2C
R819	1.8kΩ	0101182	1A
R820	1.8kΩ	0101182	1C
R821	3.3kΩ	0101332	1B
R822	3.3kΩ	0101332	1B
R823	220kΩ	0101224	1A
R824	220kΩ	0101224	1C
R825	47kΩ	0101473	1A
R826	47kΩ	0101473	1C
R827	1.8kΩ	0101182	1, 2B
R828	1.8kΩ	0101182	1, 2B
R829	10Ω	0111100	2A, B
R830	10Ω	0111100	2B, C
R831	4.7kΩ	0101472	1, 2B
R832	4.7kΩ	0101472	1, 2B
R833	3.3kΩ	0101332	2B
R834	3.3kΩ	0101332	2B, C
R835	820Ω	0101821	2A, B
R836	820Ω	0101821	2C
R837	220Ω	0101221	2A
R838	220Ω	0101221	2C
R839	180Ω	0101181	2B
R840	180Ω	0101181	2B
R841	39Ω	0101390	2B
R842	39Ω	0101390	2B
R843	330Ω	0101331	2A
R844	330Ω	0101331	2C
R845	220Ω	0101221	2B
R846	220Ω	0101221	2B, C
R847	220Ω	0101221	2A, B
R848	220Ω	0101221	2C
R851	10Ω	0101100	2B
R852	10Ω	0101100	2B

W	X	Y	Z
R853	10Ω	0101100	2A
R854	10Ω	0101100	2C
VR801	5kΩ(B)	1031092	1A, B
VR802	5kΩ(B)	1031092	1C
VR803	1kΩ(B)	1031052	2B
VR804	1kΩ(B)	1031052	1B
C801	0.47μF	0601478	1A
C802	0.47μF	0601478	1C
C803	47pF	0660470	1B
C804	47pF	0660470	1B
C805	47μF	0515470	1B
C806	47μF	0515470	1B
C807	47μF	0531470	1A
C808	47μF	0531470	1C
C809	4.7pF	0660479	1A
C810	4.7pF	0660479	1C
C811	47μF	0515470	1A
C812	47μF	0515470	1C
C813	0.047μF	0601477	2A
C814	0.047μF	0601477	2C
C815	33pF	0660330	2A
C816	33pF	0660330	2C
C817	100μF	0515101	1B
C818	100μF	0515101	1B
C819	220μF	0510221	2A
C820	220μF	0510221	2C
C821	330pF	0660331	2B
C822	330pF	0660331	2B
C823	100μF	0515101	2A
C824	100μF	0515101	2C
TR801		0303160,1,2	2A
TR802		0303160,1,2	2C
TR803		0303160,1,2	2A
TR804		0303160,1,2	2C
TR805		0305901,2	2A
TR806		0305901,2	2C
TR807		0305122	2A, B
TR808		0305122	2B, C
TR809		0305741,2,3	2B
TR810		0305741,2,3	2B
TR811		0300211,2,3	2A
TR812		0300211,2,3	2C
D801		0310880	1A
D802		0310880	1C
D803		0310880	1A
D804		0310880	1C



## SPEAKER PROTECTOR BLOCK <F-1351>

W	X	Y
R901	2.2kΩ	0101222
R902	2.2kΩ	0101222
R903	47kΩ	0101473
R904	47kΩ	0101473
R905	68kΩ	0101683
R906	10Ω	0101100
R907	8.2Ω	0111829
R908	8.2Ω	0111829
C901	47μF	0531470
C902	220μF	0510221
C903	100μF	0515101
C904	0.1μF	0601108
C905	0.1μF	0601108
TR901		0305891,2,3
TR902		0305891,2,3
D901		0310400
D902		0310400
D903		0310400
D904		0310400
D905		0310880
D906		0310870
RL901	Relay	1150100,1



# OTHER PARTS AND THEIR POSITION ON CHASSIS

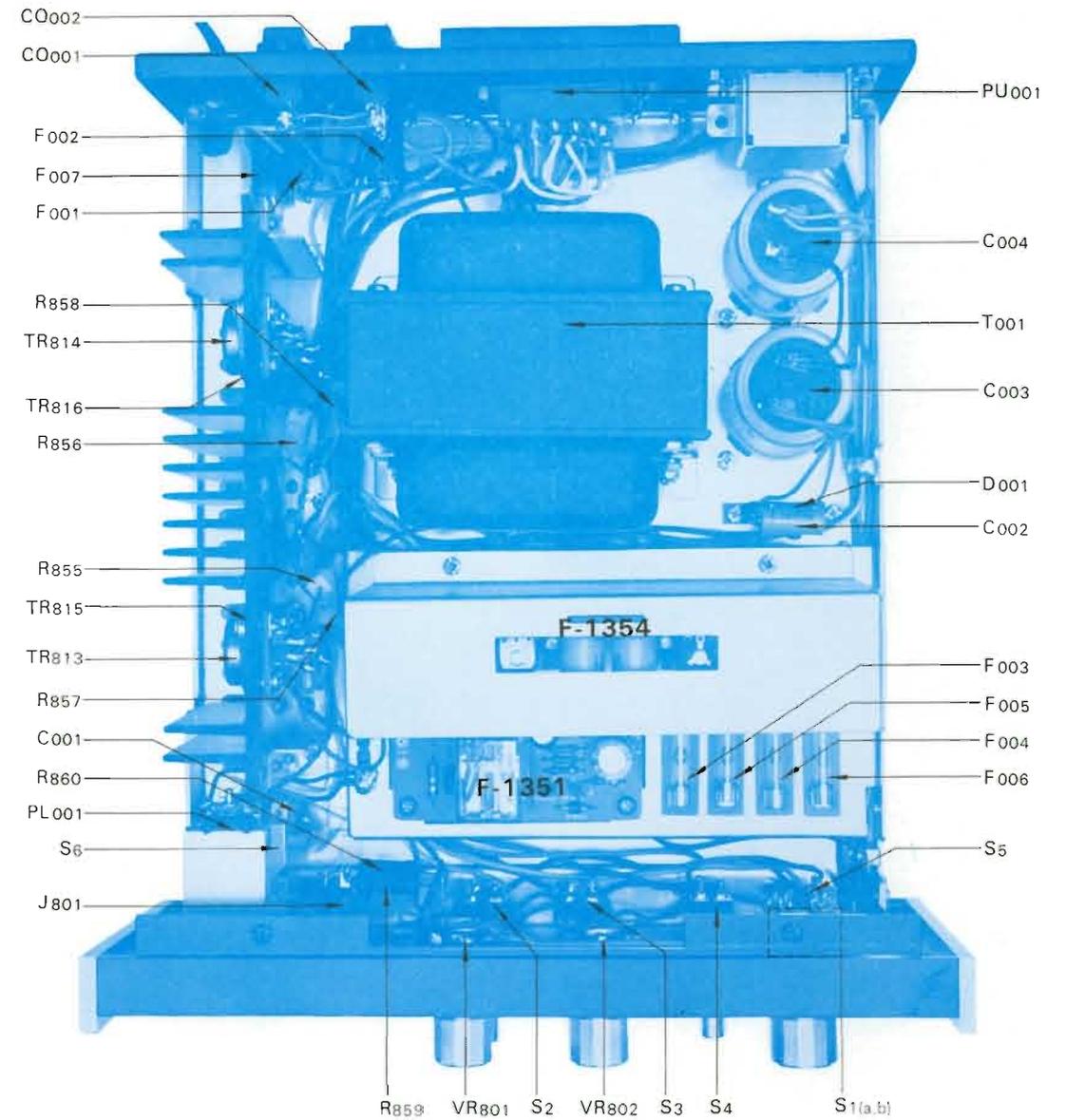
W: Parts No. X: Parts Name Y: Stock No.

## OTHER PARTS

W	X	Y
R855	0.47Ω	0152478
R856	0.47Ω	0152478
R857	0.47Ω	0152478
R858	0.47Ω	0152478
R859	470Ω	0172471
R860	470Ω	0172471
	±10% 2W CeR.	
VR1	100kΩ(B)	1000220
VR2	100kΩ(B)	1000220
	Level Adj.	
C001	0.022μF	0591227
C002	0.022μF	0590227
C003	3300μF	0559310
C004	3300μF	0559310
C907	0.022μF	0656223
	600V OC.	
	400V OC.	
	50V EC.	
	±80% -20%	
	25V CC.	
TR813	} 2SD188 (N, M, L)	0308300,1,2
TR814		0308300,1,2
TR815	} 2SA627 (N, M, L)	0300230,1,2
TR816		0300230,1,2
D001	5B2	0310660
T001	Power Transformer 400-B1010XX	4000940
S1(a, b)	Selector Switch	1101250,1
S2	Phase Switch (L)	1170180
S3	Phase Switch (R)	1170180
S4	Speaker Switch (A)	1170180
S5	Speaker Switch (B)	1170180
S6	Power Switch	1130320
J801	Headphones Jack	2430071
PU001	Voltage Selector Socket	2410080
	Voltage Selector Plug	2410090
CO001,002	AC Outlet	2450040
F001~006	3A Quick Acting Fuse	0433252
F007	3A Fuse (100~117V)	0431262
	2A Fuse (220~240V)	0431242
PL001	6.3V 0.25A Power Indicator	0400090

### Abbreviations

**CR** : Carbon Resistor  
**SR** : Solid Resistor  
**CeR** : Cement Resistor  
**MFR** : Metal Oxide Film Resistor  
**MC** : Mylar Capacitor  
**CC** : Ceramic Capacitor  
**EC** : Electrolytic Capacitor  
**BPEC** : Bi-Polar Electrolytic Capacitor  
**OC** : Oil Capacitor



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**Sansui**

**SANSUI ELECTRIC COMPANY LIMITED**

Head Office; 14-1, 2-chome, Izumi, Suginami-ku, Tokyo, Japan. TEL. 323-1111

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Printed in Japan (O1400M2)