

# OPERATING INSTRUCTIONS & SERVICE MANUAL

SOLID-STATE REVERBERATION AMPLIFIER

## SANSUI RA-500



*Sansui*

SANSUI ELECTRIC COMPANY LIMITED

Congratulations on joining the thousands of proud, satisfied owners of quality stereo components from Sansui.

The RA-500 reverberation amplifier is a unique component to add a new thrilling pleasure to your stereo enjoyment. It can provide reverberation effects to all the program sources set up on your existing stereo control amplifier, including the playback from, recording on a tape deck, and tape-to-tape reprinting between two tape decks. The continuously controllable reverberation time, multicolored reverberation indicator and other new ideas have been engineered into the RA-500.

This manual has been prepared to guide you in connecting and operating the reverberation amplifier correctly. Please read it carefully before operating the amplifier and retain it for future reference.

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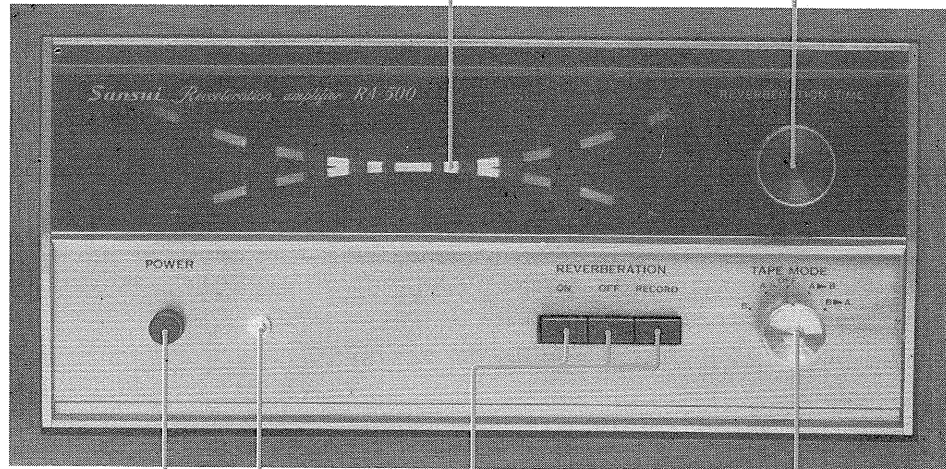
# SWITCHES AND CONTROLS

## REVERBERATION INDICATOR

The reverberation indicator is illuminated when the REVERBERATION ON or RECORD button and the TAPE MODE selector are used in correct combinations to produce reverberation. The multi-colored geometrical figure comes out more clearly as the reverberation time is shortened.

## REVERBERATION TIME CONTROL

Use this control to adjust the reverberation time while watching the reverberation indicator. To lengthen the time, turn it clockwise; to shorten the time, turn it counterclockwise.



## POWER SWITCH

Push this switch once to turn the power on; push it again to turn the power off.

## POWER INDICATOR

The power indicator is lit when the POWER switch is turned on. It remains lit while the amplifier is on.

## REVERBERATION PUSHBUTTONS

**ON**—When the ON button is pushed on and the TAPE MODE selector is turned to its OFF position, reverberation is applied to all program sources (except tape decks) set up on the control amplifier connected to the RA-500.

**OFF**—With the OFF button pushed, any program sources are played without reverberation effects.

**RECORD**—The RECORD button is used in conjunction with the TAPE MODE selector to provide reverberation effects to the playback, recording or tape-to-tape reprinted.

## TAPE MODE SELECTOR

**B**—Use this position to record on the tape deck connected to the TAPE DECK B jacks.

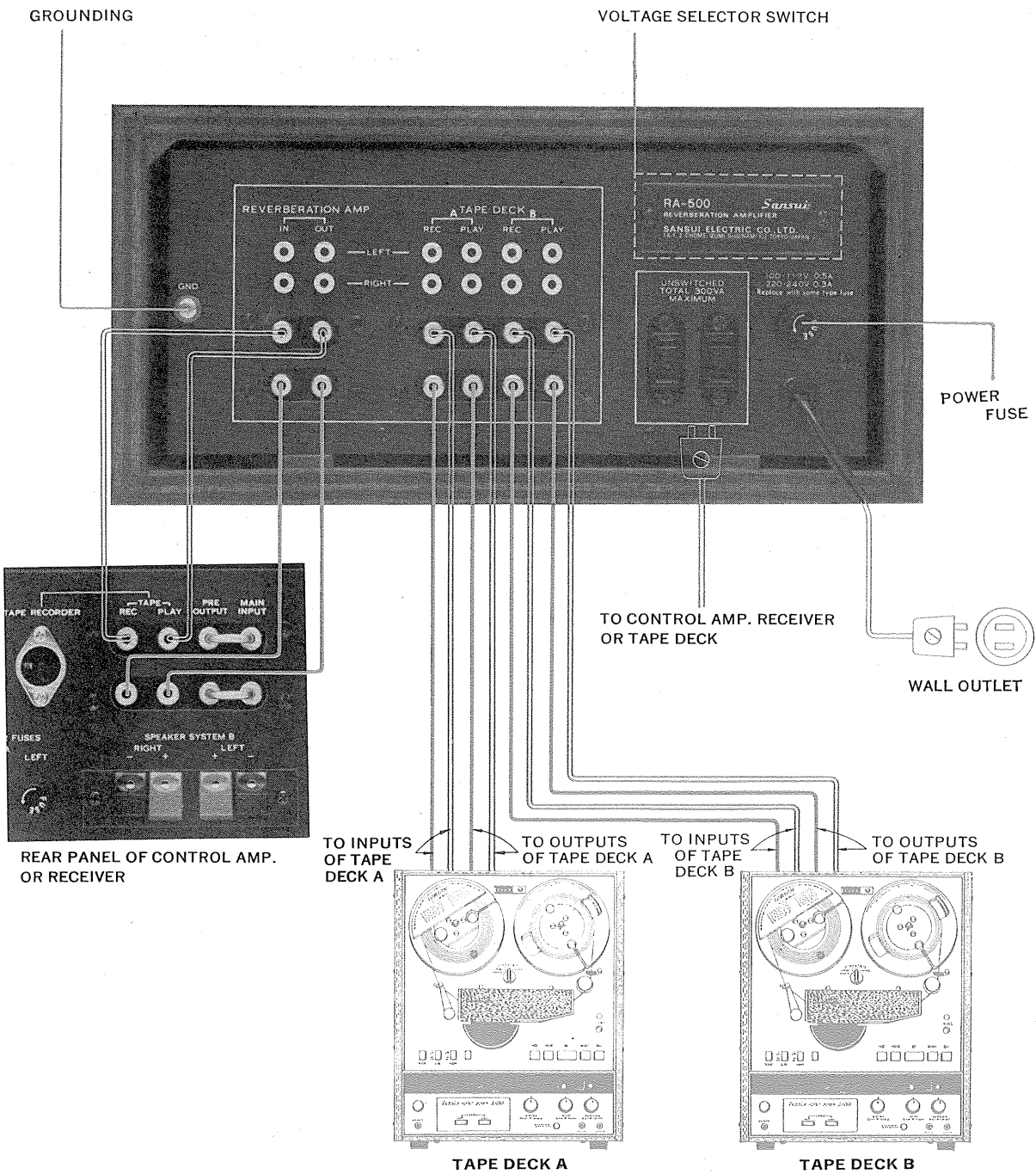
**A**—Use this position to record on the tape deck connected to the TAPE DECK A jacks.

**OFF**—Use this position to provide reverberation effects to a program source set up on the control amplifier connected to the RA-500. With the selector switched to this position, the reverberation amplifier is disconnected from the tape deck circuits.

**A▶B**—Use this position to play back through the RA-500 on the tape deck A or to record from the tape deck A to the tape deck B.

**B▶A**—Use this position to play back through the RA-500 on the tape deck B or to record from the tape deck B to the tape deck A.

# CONNECTIONS



# OPERATIONS

All connections in the upper row of jacks are the left channel as viewed from the listening area. All connections in the lower row are the right channel. For connecting to a stereo control amplifier and tape decks, be sure to use shielded cable with pin plugs as indicated in this section.

## I. Reverberation of All Program Sources Except Tape Decks

By connecting to your existing stereo control amplifier, the RA-500 can provide reverberation effects to all program sources set up on the amplifier (Instructions for the connection of tape decks will be found in the section II).

### Connection to Control Amplifier

1. Connect the left channel IN jack on the RA-500 to the left channel TAPE RECORD output on the control amplifier and the right channel IN jack to the right channel TAPE RECORD output on the control amplifier.
2. Connect the left channel OUT jack on the RA-500 to the left channel TAPE PLAYBACK (or TAPE MONITOR) input on the control amplifier and the right channel OUT jack to the right channel TAPE PLAYBACK (or TAPE MONITOR) input on the control amplifier.

**Note:** For the connection to the control amplifier, use the connecting cord accompanying the RA-500.

### Operation

1. Set the Tape Monitor switch on the control amplifier to its PLAYBACK or ON position.
2. Depress the REVERBERATION ON button on the RA-500.
3. Turn the TAPE MODE selector to its OFF position.
4. Turn the REVERBERATION TIME control to produce your desired reverberation.

## II. Reverberation of Tape Decks

### A. Recording and Playback

A pair of tape decks with built-in preamplifier can be connected to record from, and play back through the RA-500 for reverberation effects.

### Connection

After connecting the RA-500 to the stereo control amplifier as indicated in the preceding section, connect a tape deck as follows:

1. Connect the left channel input on the tape deck to the left channel TAPE REC A (or B) jack on the RA-500 and the right channel input to the right channel TAPE REC A (or B) jack.
2. Connect the left channel output on the tape deck to the left channel TAPE PLAY A (or B) jack on the RA-500 and the right channel output to the right channel TAPE PLAY A (or B) jack.

### Recording

1. Set the Tape Monitor switch on the control amplifier to its PLAY BACK or ON position.
2. Make appropriate settings of controls on the tape deck.
3. Depress the REVERBERATION RECORD button on the RA-500. (If you want not to apply reverberation to the tape deck, depress the REVERBERATION OFF button.)
4. Turn the TAPE MODE selector to A or B depending on which jacks are being used.
5. Turn the REVERBERATION TIME control to produce your desired reverberation.

### Notes:

1. During the recording process, the original program to which reverberation has been applied can be played back through the control amplifier.
2. For use with a 3-head tape deck having separate recording and playback heads, the

actual recording can be monitored by connecting the outputs of the tape deck to the TAPE PLAYBACK (or MONITOR) jacks on the control amplifier.

### Playback

1. Set the Tape Monitor switch on the control amplifier to its PLAYBACK or ON position.
2. Make appropriate settings of controls on the tape deck.
3. Depress the REVERBERATION RECORD button on the RA-500. (If you want not to apply reverberation to the tape deck, depress the REVERBERATION OFF button.)
4. Turn the TAPE MODE selector to A►B (or B►A) depending on which jacks are being used.
5. Turn the REVERBERATION TIME control to produce your desired reverberation.

## B. Tape-to-Tape Reprinting

The two sets of TAPE DECK jacks can accommodate a pair of tape decks. This feature enables you to record from the tape deck connected to the A jacks to the tape deck connected to the B jacks, and vice versa. Of course, reverberation can be applied to the recording.

### Connection

Connect one tape deck to the TAPE DECK A jacks and the other to the TAPE DECK B jacks as indicated in the preceding section.

### To Record from Tape Deck A to Tape Deck B:

1. Set the tape deck A in the playback mode.
2. Set the tape deck B in the recording mode.
3. Depress the REVERBERATION RECORD button. (If you want not to apply reverberation to the recording, push the REVERBERATION OFF button.)
4. Turn the TAPE MODE selector to A►B.

5. Turn the REVERBERATION TIME control to produce your desired reverberation.

### To Record from Tape Deck B to Tape Deck A:

1. Set the tape deck A in the recording mode.
2. Set the tape deck B in the playback mode.
3. Depress the REVERBERATION RECORD button. (If you want not to apply reverberation to the recording, push the REVERBERATION OFF button.)
4. Turn the TAPE MODE selector to B►A.
5. Turn the REVERBERATION TIME control to produce your desired reverberation.

### Notes:

1. During the recording process, the original program to which reverberation has been applied can be played back through the control amplifier.
2. To monitor in case of recording from the tape deck A to the tape deck B, connect a 3-head tape deck to the B jacks and then connect its outputs to the TAPE PLAYBACK (or MONITOR) jacks on the control amplifier. To monitor in case of recording from the tape deck B to the tape deck A, connect the 3-head tape deck to the A jacks.

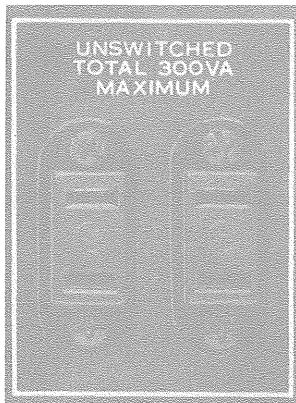
# HINTS ON USE/SPECIFICATIONS/ACCESSORIES

## Connections

Be sure to use shielded cable (four connecting cords supplied) to connect a control amplifier and tape decks to the RA-500. The use of an ordinary twin leadwire may cause hum or noise. Always check to see if the connecting cords are plugged firmly and properly into their corresponding output or input jacks. If the connections are loose or in touch with other parts, the RA-500 will not perform normally, and may produce undesirable noise. If used in such a way for a long time, it will eventually break down.

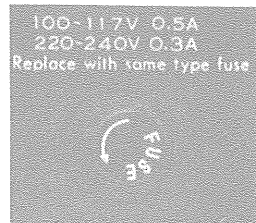
## A.C. Outlets

The two a.c. outlets on the rear panel are live at all times and for plugging in a pair of tape decks. They have a maximum capacity of 300 VA total. Never use them beyond their rated capacity.



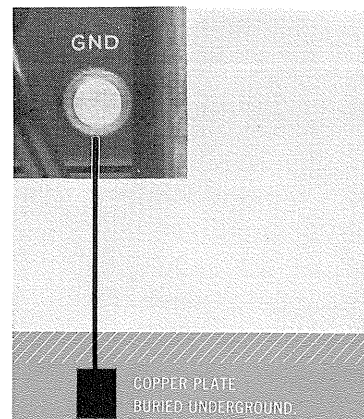
## Power Fuse

If the unit remains completely dead when the power is switched on (the POWER indicator fails to light), the power fuse is probably blown. In this case, remove the line cord from its a.c. outlet and replace the fuse after finding and eliminating the trouble that caused the fuse to blow. Use only an identical glass-tubed fuse. For 100-117 volt operation, a 0.5 ampere fuse is required. For 220-240 volt operation, a 0.3 ampere fuse should be used. Never attempt to use a piece of wire or a fuse of a different capacity as a substitute.



## Grounding

Connect one end of vinyl or enameled wire to the terminal screw marked GND on the rear of the amplifier, attach a copper plate to the other end and bury it underground. In all cases, grounding is desirable since it allows a better SN ratio to be obtained. To ground an entire audio system, connect the grounding wire of each component to this terminal.





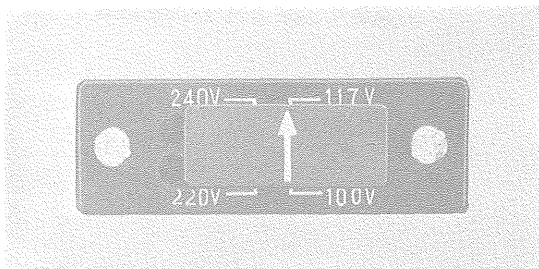
## Voltage Adjustment

To reach the voltage selector, remove the two screws from the nameplate on the rear panel and then remove the nameplate. The voltage selector makes it possible to operate the RA-500 at the correct volt in any area. The volt has been pre-adjusted at the factory, but can be easily readjusted as follow:

**1.** Set the arrow on the voltage selector plug to the required volt: 100, 117, 220 or 240 volts.

**2.** The power fuse should also be changed whenever the a.c. line voltage is changed. For 100-117 volt operation, a 0.5 ampere fuse is required. For 220-240 volt operation, the fuse should be changed to a 0.3 ampere fuse.

**Note:** The voltage selector can be also used to eliminate the trouble caused by the considerable voltage fluctuation. In this case, it should be set to the peak voltage.



## SPECIFICATIONS

### RATED OUTPUT VOLTAGE:

300mV (at 1,000Hz, Reverberation time minimum, input level 200mV)

### MAXIMUM INPUT VOLTAGE:

3V (at 1,000Hz, Reverberation time minimum)

### HARMONIC DISTORTION:

Less than 0.2% (at 1,000Hz, Reverberation time minimum output level 300mV)

### FREQUENCY RESPONSE:

20 to 30,000Hz  $\pm 2$ dB  
(at Reverberation time minimum)

20 to 30,000Hz  $\pm 10$ dB  
(at Reverberation time maximum)

### SIGNAL TO NOISE RATIO:

65dB (at output level 300mV)

### REVERBERATION TIME:

1.9 to 3.2 second (at 1,000Hz)

### INPUT IMPEDANCE:

greater than 200K ohms (at 1,000Hz)

### INPUT AND OUTPUT JACKS:

INPUT  
OUTPUT  
TAPE RECORDING—A  
TAPE RECORDING—B  
TAPE PLAY BACK —A  
TAPE PLAY BACK —B

### LOAD IMPEDANCE: 100k ohms

### SWITCHES AND CONTROLS:

REVERBERATION MODE:  
ON, OFF, RECORDING

### TAPE MODE:

PLAY BACK—B, PLAY BACK—A, A-B PRINT,  
B-A PRINT

### REVERBERATION TIME:

### POWER REQUIREMENT:

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

### POWER CONSUMPTION: 10VA

### SEMI CONDUCTORS: Transistors:11 Diodes:3

DIMENSIONS:  $11\frac{57}{64}$ "(302mm)W,  
 $6\frac{3}{8}$ "(162mm)H,  
 $10\frac{7}{16}$ "(265mm)D

### WEIGHT:

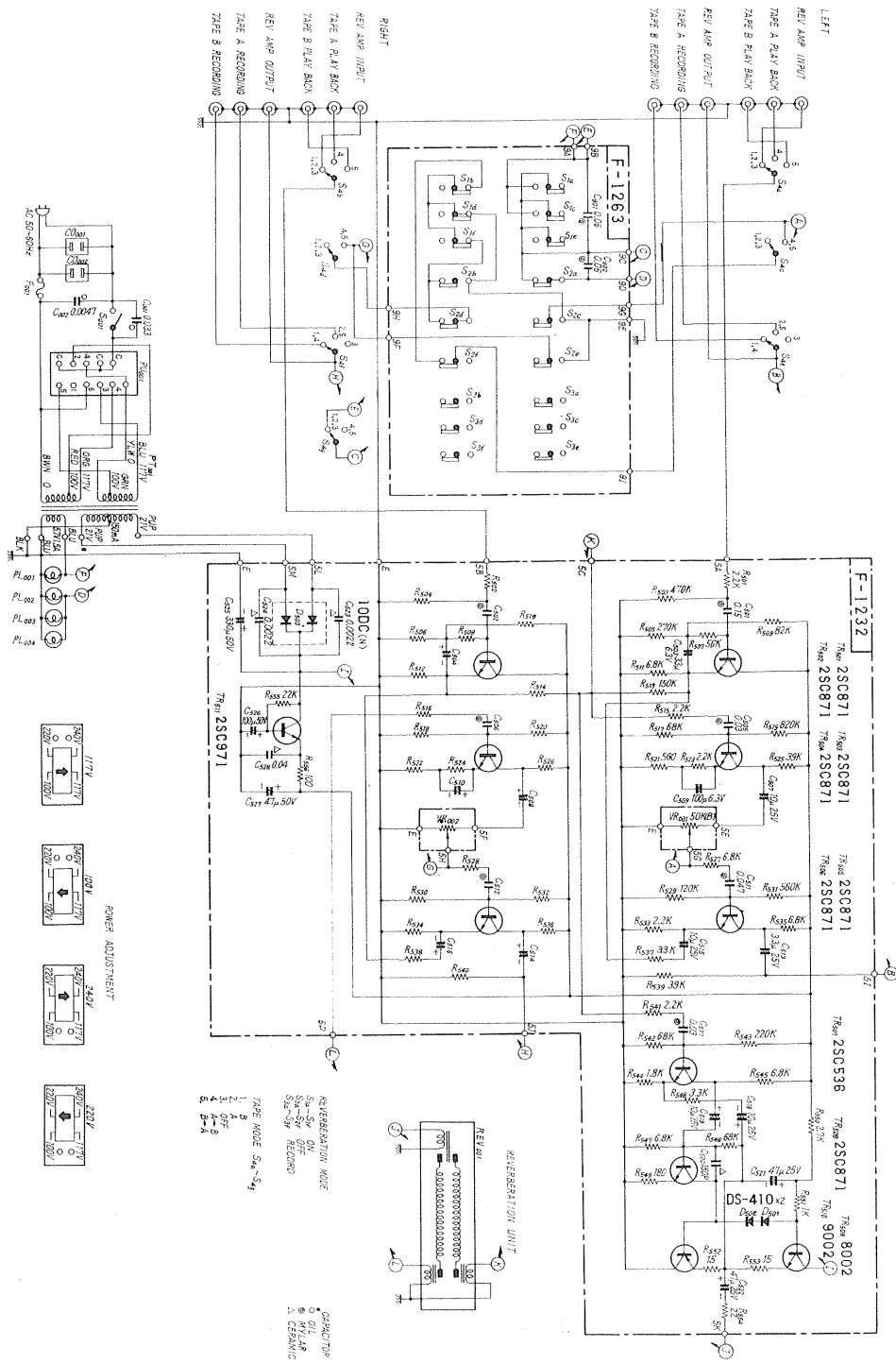
11.4 lbs. (5.2kg)

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## ACCESSORIES

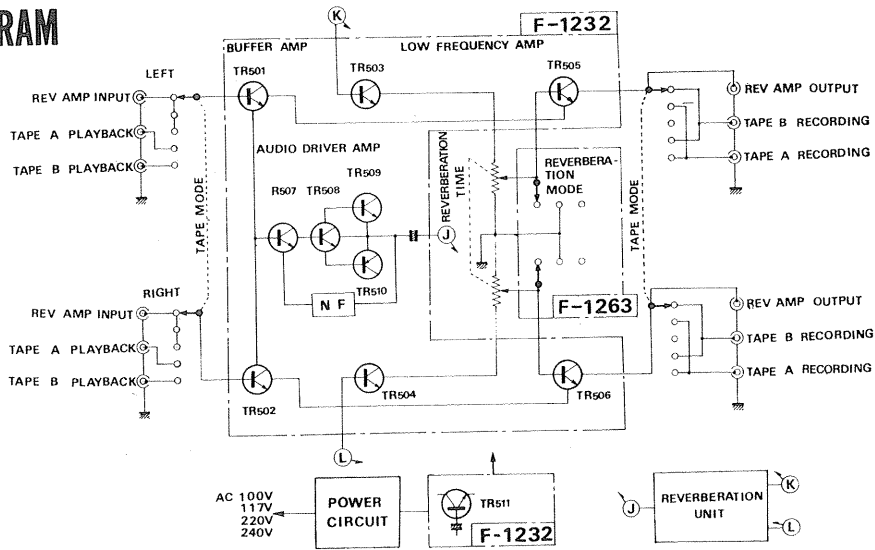
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# SCHEMATIC DIAGRAM

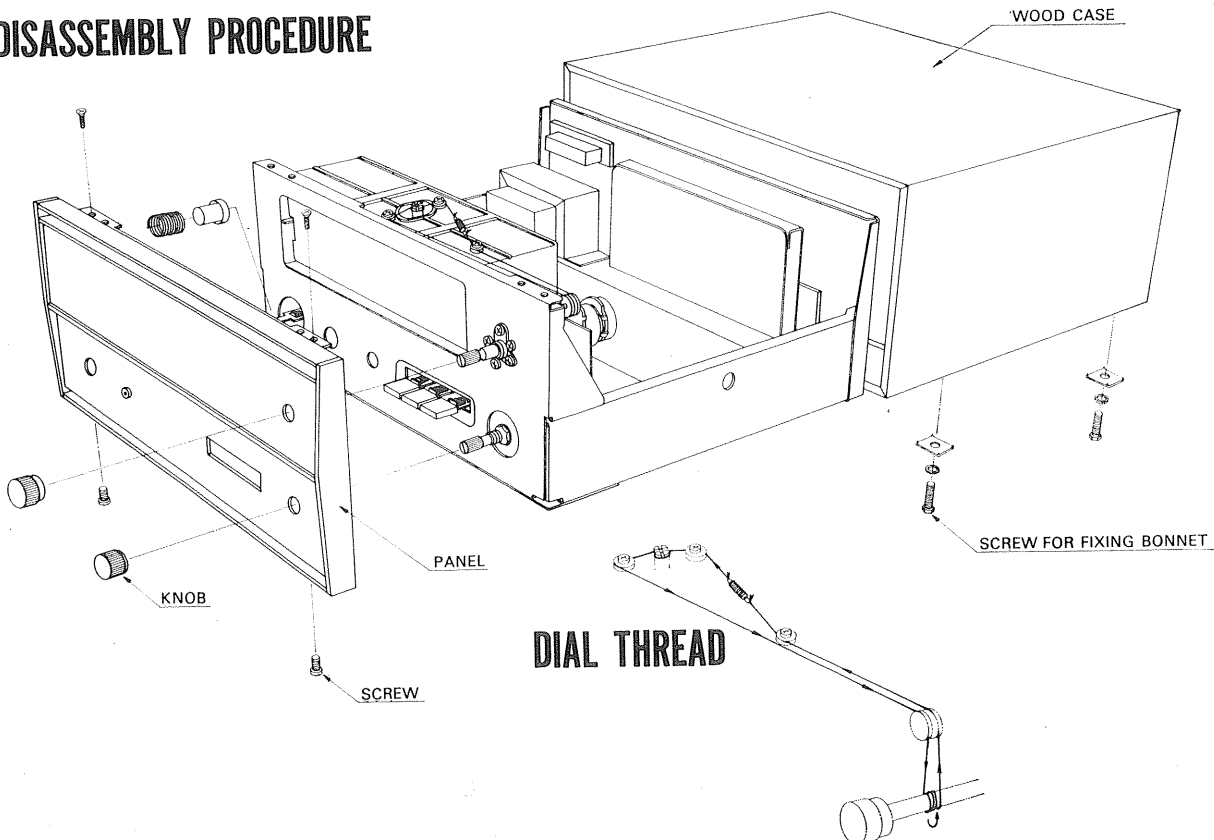


# BLOCK DIAGRAM / DISASSEMBLY PROCEDURE / DIAL THREAD

## BLOCK DIAGRAM



## DISASSEMBLY PROCEDURE



# PRINTED CIRCUIT BOARDS AND PARTS LIST

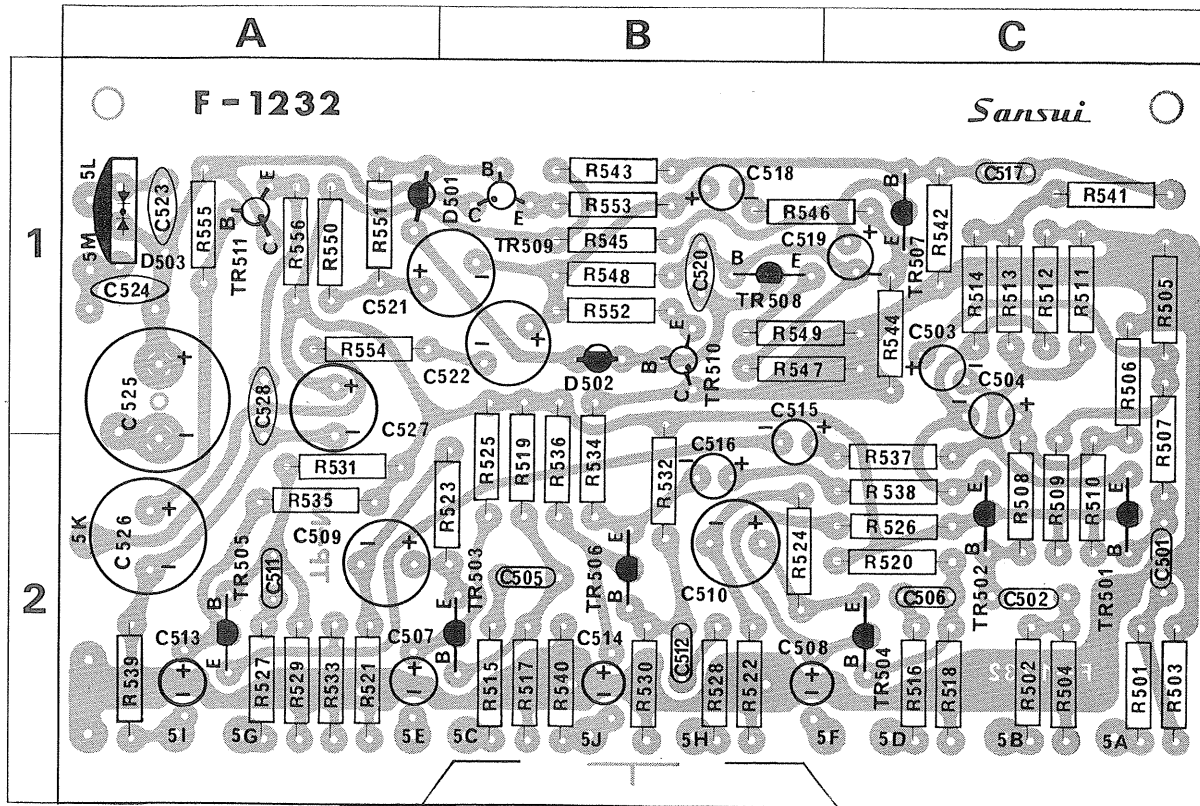
X: Parts No Y: Parts Name Z: Position of Parts

## AUDIO DRIVER BLOCK <F-1232>

X	Y	Z
R501	2.2k $\Omega$	2C
R502	2.2k $\Omega$	2C
R503	470k $\Omega$	2C
R504	470k $\Omega$	2C
R505	270k $\Omega$	1C
R506	270k $\Omega$	1C
R507	56k $\Omega$	1, 2C
R508	56k $\Omega$	2C
R509	82k $\Omega$	2C
R510	82k $\Omega$	2C
R511	6.8k $\Omega$	1C
R512	6.8k $\Omega$	1C
R513	150k $\Omega$	1C
R514	150k $\Omega$	1C
R515	2.2k $\Omega$	2B
R516	2.2k $\Omega$	2C
R517	68k $\Omega$	2C
R518	68k $\Omega$	2B
R519	820k $\Omega$	1, 2B
R520	820k $\Omega$	2C
R521	560 $\Omega$	2A
R522	560 $\Omega$	2B
R523	2.2k $\Omega$	2B
R524	2.2k $\Omega$	2B
R525	39k $\Omega$	1, 2B
R526	39k $\Omega$	2C
R527	6.8k $\Omega$	2A
R528	6.8k $\Omega$	2B
R529	120k $\Omega$	2A
R530	120k $\Omega$	2B
R531	560k $\Omega$	2A
R532	560k $\Omega$	2B
R533	2.2k $\Omega$	2A
R534	2.2k $\Omega$	1, 2B
R535	6.8k $\Omega$	2A
R536	6.8k $\Omega$	1, 2B
R537	3.3k $\Omega$	2C
R538	3.3k $\Omega$	2C
R539	39k $\Omega$	2A
R540	39k $\Omega$	2B
R541	2.2k $\Omega$	1C
R542	68k $\Omega$	1C
R543	220k $\Omega$	1B
R544	1.8k $\Omega$	1C
R545	6.8k $\Omega$	1B
R546	3.3k $\Omega$	1B, C
R547	6.8k $\Omega$	1B, C
R548	68k $\Omega$	1B
R549	180 $\Omega$	1B, C
R550	2.7k $\Omega$	1A
R551	1k $\Omega$	1A
R552	15 $\Omega$	1B
R553	15 $\Omega$	1B
R554	22 $\Omega$	1A
R555	22k $\Omega$	1A
R556	100 $\Omega$	1A

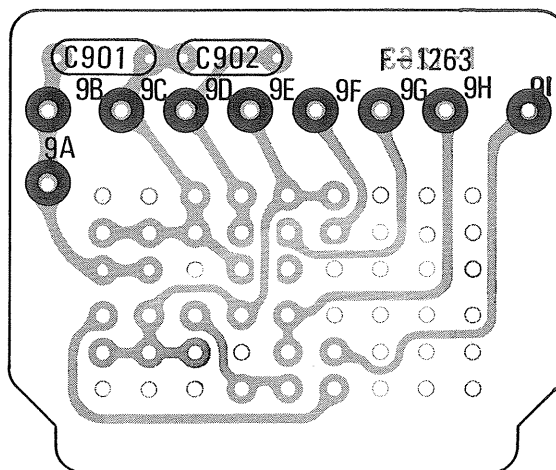
$\pm 10\%$   $\frac{1}{4}$ W Carbon Resistor

X	Y	Z
C501	0.15 $\mu$ F	2C
C502	0.15 $\mu$ F	2C
C503	33 $\mu$ F	1C
C504	33 $\mu$ F	1C
C505	0.03 $\mu$ F	2B
C506	0.03 $\mu$ F	2C
C507	10 $\mu$ F	2A
C508	10 $\mu$ F	2B, C
C509	100 $\mu$ F	2A
C510	100 $\mu$ F	2B
C511	0.047 $\mu$ F	2A
C512	0.047 $\mu$ F	2B
C513	3.3 $\mu$ F	2A
C514	3.3 $\mu$ F	2B
C515	10 $\mu$ F	1, 2B
C516	10 $\mu$ F	2B
C517	0.03 $\mu$ F	1C
C518	10 $\mu$ F	1B
C519	10 $\mu$ F	1C
C520	150pF	1B
C521	47 $\mu$ F	1A, B
C522	47 $\mu$ F	1B
C523	0.0022 $\mu$ F	1A
C524	0.0022 $\mu$ F	1A
C525	330 $\mu$ F	1, 2A
C526	100 $\mu$ F	2A
C527	47 $\mu$ F	1, 2A
C528	0.04 $\mu$ F	1A
D501	DS-410	1A
D502	DS-410	1B
D503	10DC(N)	1A
TR501		2C
TR502		2C
TR503		2B
TR504		2C
TR505		2A
TR506		2B
TR507	2SC536(E)	1C
TR508	2SC871(D,E)	1B
TR509	8002 (A, B, C)	1B
TR510	9002 (A, B, C)	1B
TR511	2SC971 (3)	1A



**MODE SWITCH BLOCK <F-1263>**

X	Y
C901	0.06 $\mu$ F } $\pm 10\%$ 50WV Mylar Capacitor
C902	
S1	Reverberation Mode Switch (113022)



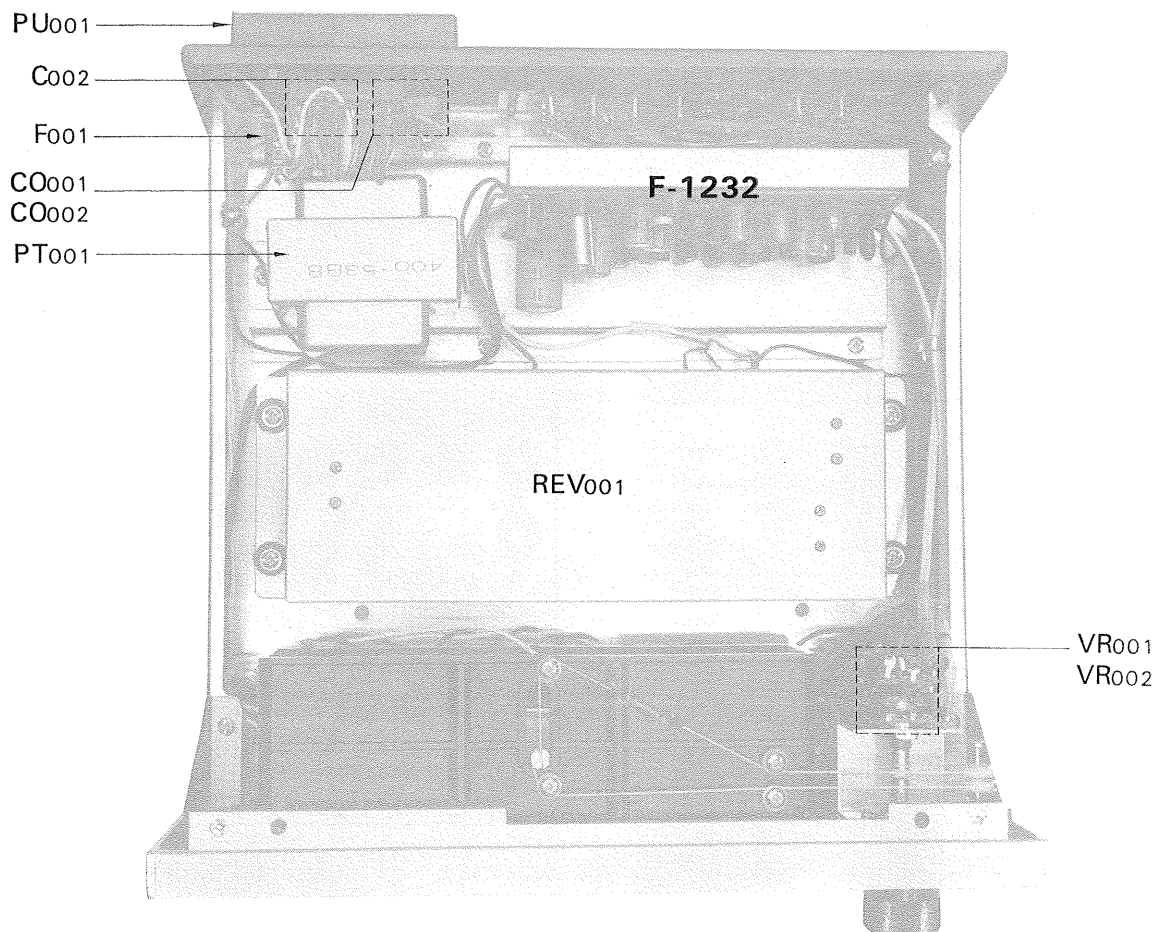
# OTHER PARTS AND THEIR POSITION ON CHASSIS

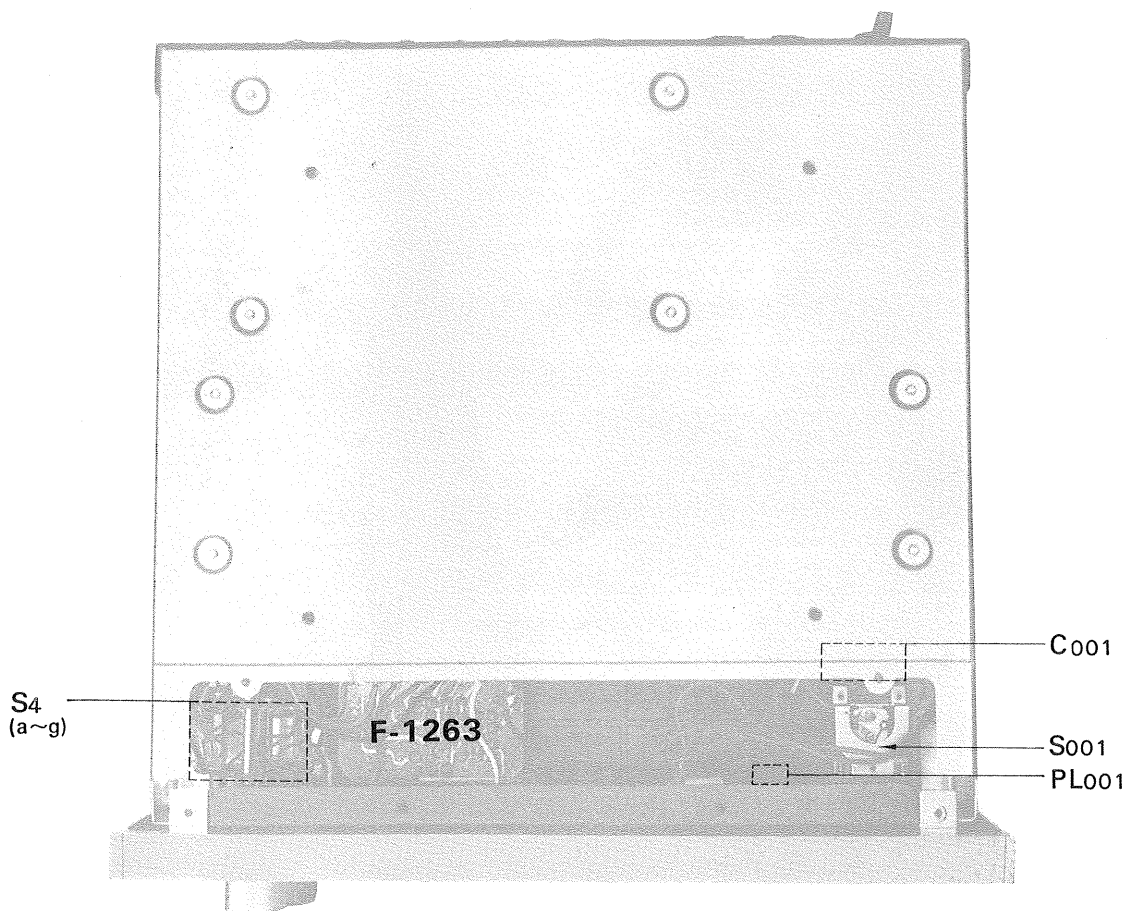
X: Parts No Y: Parts Name

## OTHER PARTS

X	Y
C001 C002	0.033 $\mu$ F } 0.0047 $\mu$ F } 600WV Oil Capacitor
VR001,002	50k $\Omega$ (B) $\times$ 2
PL001 PL002	8V 0.15A (040012)
PL003 PL004	6.3V 0.25A Fuse Type (042002)
F001	0.3A (220~240V) (043045) 0.5A (100~117V) (043001-2)

X	Y
S001	Power Switch (113016)
S4( $\sigma$ ~ $\eta$ )	Tape Mode Switch Y-2-7-5 (110215)
REV001	Reverberation Unit (435-001)
PT001	Power Transformer (400069)
PU001	Voltage Selector (241008) (241009)
CO001 CO002	AC Outlet (245001)







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