HITACHI
SERVICE MANUAL

TK **No. 2324E**

VT-MTS1

Technical Data

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

STEREO ADAPTER

September 1985 **TOKAI WORKS**

CHAPTER 1
SAFETY PRECAUTIONS AND SPECIFICATION

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions, and safety related notes located on or inside the cabinet and on the chassis.

1. When replacing a chassis in the instrument, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covers/shields, isolation resistor-resistors/capacitors etc.
2. When service is required, observe the original lead dress. Extra precautions should be taken to assure correct lead dress in the high voltage circuit.
3. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturer's. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
4. Before returning an instrument to a customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently defeated during servicing.

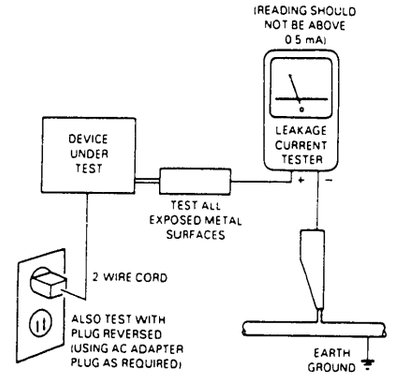
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the AC 120V, 60 Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC 500V), connect one lead to the jumpered AC plug and touch the other lead to exposed metal part (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3MΩ and a maximum resistor reading of 5 MΩ. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a AC 120V, 60 Hz outlet (do not use an isolation transformer for this check). Turn the AC power switch on. Using a "Leakage Current Tester", measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5 mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE UNIT TO THE CUSTOMER.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by making with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service manual, may create shock, fire or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

FOR CANADA

CAUTION AGAINST FUSE REPLACEMENT

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL LABEL.
The following is the indication of the fuse symbol label which is affixed adjacent to the fuse in the equipment.

*Example

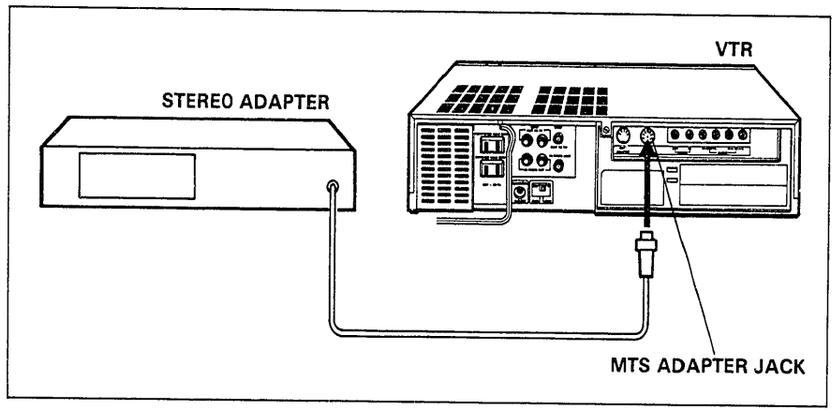
This symbol indicates Fast Operating Type 2A, 250V Fuse.

SPECIFICATIONS

Power Input	:	12V DC
Power Consumption	:	1.5 Watts
Dimensions	:	255(W)×50(H)×215(D)mm (10-1/16"×1-15/16"×8-7/16")
Weight	:	1.1 kg

Installation

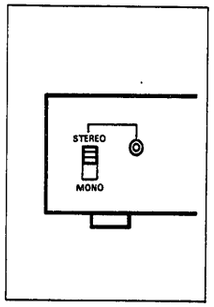
- Turn off the VTR power.
- Connect the Stereo Adapter to the VTR as shown in the diagram.



Operation

1. Set the Stereo/Mono switch on the Adapter to the Stereo position.
2. Tune the VTR to a TV channel transmitting stereo broadcast sound. When a stereo broadcast is being transmitted and received, the Stereo indicator will light.
3. Record and playback according to the instructions in the VTR Instruction Manual.

   Note: The Stereo/Mono switch may be set to the Mono position to minimize noise on weak signals.



CHAPTER 2
DISASSEMBLY

1. Top Panel Removal
2. Stereo Adapter Circuit Board Removal.
3. Stereo Indicator Circuit Board Removal.

1. Top Panel Removal (Fig. 1)

1) Remove the screws located on each side of the top panel.
2) Lift the right of the top panel upward to release 2 tabs on the left of the panel.

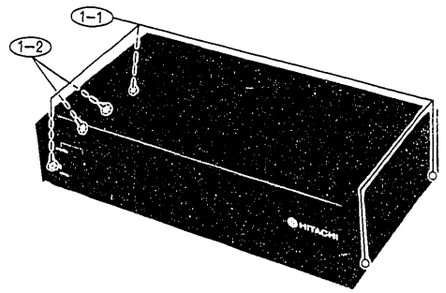


Fig. 1

2. Stereo Adapter Circuit Board Removal (Fig. 2)

1) Remove the top panel. (Fig. 1)
2) Disconnect 3 connectors (PG101, PG102 and PG103).
3) Release 4 tabs holding the circuit board.

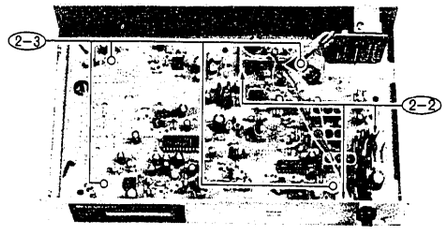


Fig. 2

3. Stereo Indicator Circuit Board Removal (Fig. 3)

1) Remove the top panel. (Fig. 1)
2) Disconnect 2 connectors (PG102 and PG103).
3) Remove screw holding the circuit board.

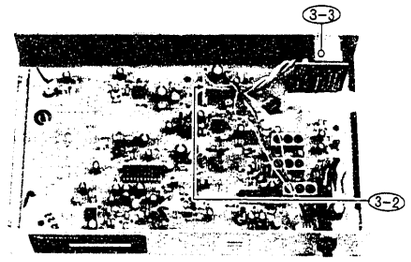


Fig. 3

CHAPTER 3
ADJUSTMENT

1. TEST EQUIPMENT REQUIRED

The following equipment are required for adjustment of Stereo Broadcast Adapter.

1) MTS Sound Signal Generator
   Output Impedance : 75 ohms
   Main Channel (L+R) : 1 Vp-p terminated with 75 ohms
   1 st Sub Channel (L−R): 2Vp-p terminated with 75 ohms
   Pilot Signal : 0.2Vp-p terminated with 75 ohms
2) Frequency Counter
   Sensitivity: 25mV−5V
   Range : DC50 Hz−100 MHz
3) DC voltmeter
   Range: 0.1mV DC400V
   1mV AC400V
4) DC Power Supply
   Range: 0−50V, 2A Well Filtered

2. ADJUSTMENT CONDITIONS

Setting Up

1) Set an MTS sound signal generator as shown below.
   Output Signal : Main (L+R), 1 st Sub(L−R), Pilot
   OSC Frequency: 400 Hz
   MOD Function : Monaural
2) Adjust the MTS sound signal generator as shown below.
   Modulation Level: 30%
   Output Level : 138mVrms
3) Set the DC power supply to 12V±0.5V.

STEREO ADAPTER CIRCUIT ADJUSTMENT

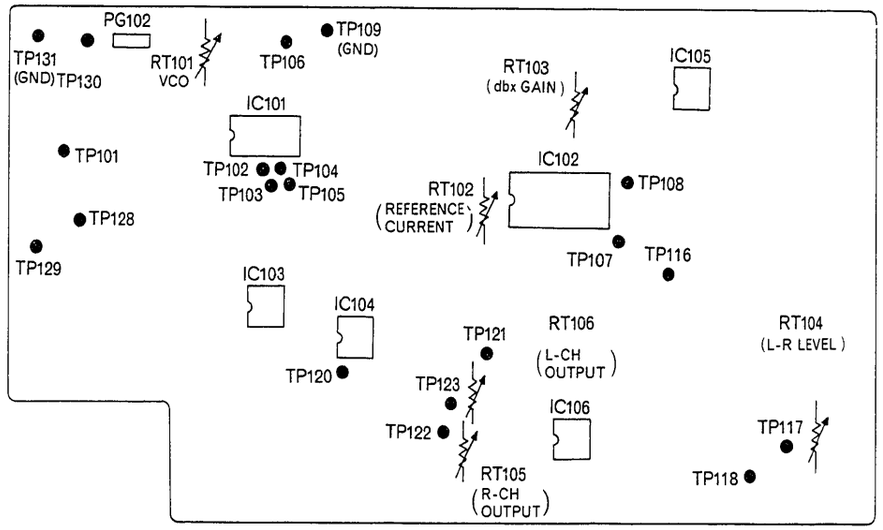


Fig. 1 STEREO ADAPTER P.C BOARD.

1. VCO Adjustment

Test Point: TP106 (VCO) Stereo Adapter
Adjust : RT101 (VCO) Stereo Adapter

This adjustment sets the oscillation frequency of the VCO in the stereo demodulator IC to 15.734 kHz.
(The VCO oscillation frequency can be measured at TP106 when disconnecting CN102 from PG102.)
When this adjustment is incomplete, the pilot signal cannot be detected, so a stereo broadcast cannot be decoded.

1) Disconnect CN102 from PG102.
2) Connect a frequency counter to TP106.
3) Adjust the VCO control (RT101) for 15.734±0.05 kHz.
4) Reconnect CN102 to PG102.

2. Reference Current Adjustment

Test Points: TP107 Stereo Adapter
: TP108 Stereo Adapter
Adjust : RT102 (Reference Current)

This adjustment sets the current of the dbx decoder IC to the specified value.

1) Connect a millivoltmeter between TP107 (positive: +) and TP108 (negative: −)
2) Adjust the Reference Current control (RT102) for 15mV±0.7mV DC.

3. L/R Output Level Adjustment

Test Points: TP128 (L-ch Out) Stereo Adapter
TP129 (R-ch Out) Stereo Adapter
Adjust : RT106 (L-ch Output) Stereo Adapter
RT105 (R-ch Output) Stereo Adapter

This adjustment sets the output level to the specified level.

1) Connect the MTS sound signal generator to TP101.
2) Connect a millivoltmeter to TP128.
3) Adjust the L-ch Output Level control (RT106) for 138mV±8mVrms.
4) Connect the millivoltmeter to TP129.
5) Adjust the R-ch Output Level control (RT105) for 138mV±8mVrms.

4. L-R Level Adjustment

Test Point: TP128 (L-ch Out) Stereo Adapter
Adjust : RT104 (L-R Level) Stereo Adapter

This adjustment equalizes the L-R decode signal level with the L+R signal level.
When this adjustment is incomplete, separation is degraded.

1) Connect the MTS sound signal generator to TP101.
MOD Function : 1st Sub (L-R) Stereo
Modulation Level: 1st Sub (L-R) 22%
2) Connect a millivoltmeter to TP128.
3) Adjust the L-R Level control (RT104) for 138mV ±8mVrms.

5. dbx Gain Adjustment

Test Point: TP116 (dbx Out) Stereo Adapter
Adjust : RT103 (dbx Gain) Stereo Adapter

This adjustment sets the gain of the dbx decoder.
When this adjustment is incomplete, separation in high frequencies is degraded.

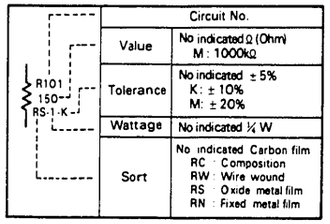
1) Connect the MTS sound signal generator to TP101.
OSC Frequency : 10 kHz
MOD Function : L Stereo
Modulation Level: Main (L+R) 70%/1 st Sub (L−R) 60%
2) Connect a millivoltmeter to TP116.
3) Adjust the dbx Gain control (RT103) for 39mV ±2mVrms.

CHAPTER 4

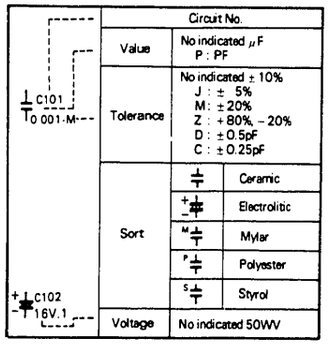
SCHEMATIC/CIRCUIT BOARD DIAGRAMS

Note

1. Voltage measured at base of chassis with minimum volume control and no signal
( ) are shown in recording condition.
2. Nomenclature of Resistors and Capacitors.



Circuit No.	
Value	No indicated Ω (Ohm) M: 1000kΩ
Tolerance	No indicated ±5% K: ±10% M: ±20%
Wattage	No indicated ¼ W
Sort	No indicated Carbon film RC: Composition RW: Wire wound RS: Oxide metal film RN: Fixed metal film

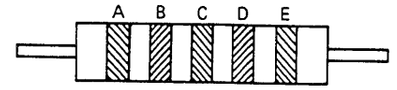


Circuit No.		
Value	No indicated μF P: PF	
Tolerance	No indicated ±10% J: ±5% M: ±20% Z: +80%, −20% D: ±0.5pF C: ±0.25pF	
Sort		Ceramic
		Electrolitic
		Mylar
		Polyester
		Styrol
Voltage	No indicated 50WV	

3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked with • use specified ones stated on parts list since required temperature characteristics

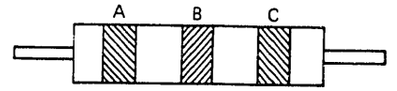
HOW TO READ CAPACITY AND INDUCTANCE OF RESISTOR SHAPE CAPACITORS AND COILS

CAPACITOR



CAPACITY: (10A+B)xC [PF]
TOLERANCE: D
RATED VOLTAGE: BODY COLOR
Pink: 25V
Green: 50V
CHARACTERISTICS: E

COIL



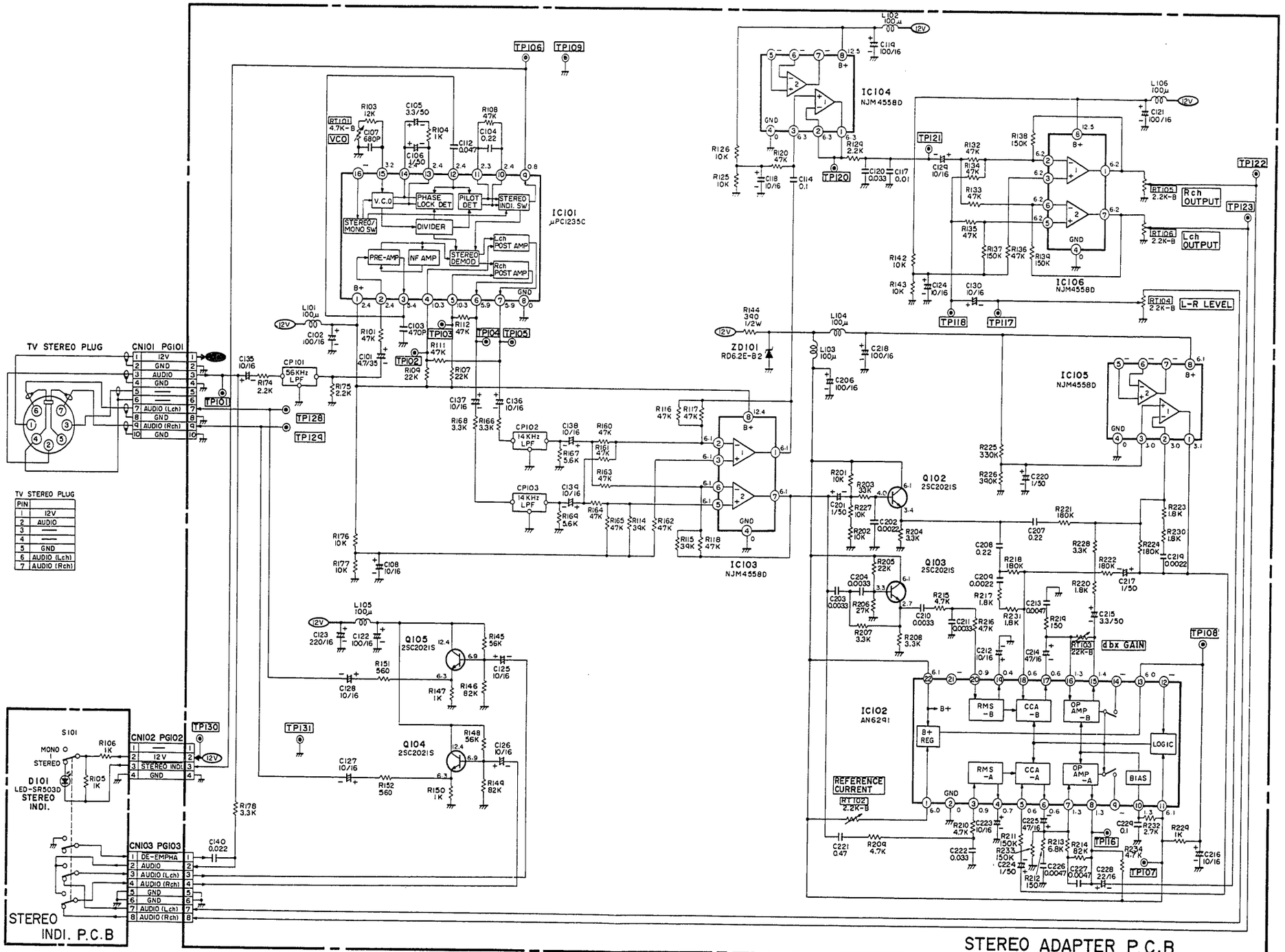
INDUCTANCE: (10A+B)xC [μH]

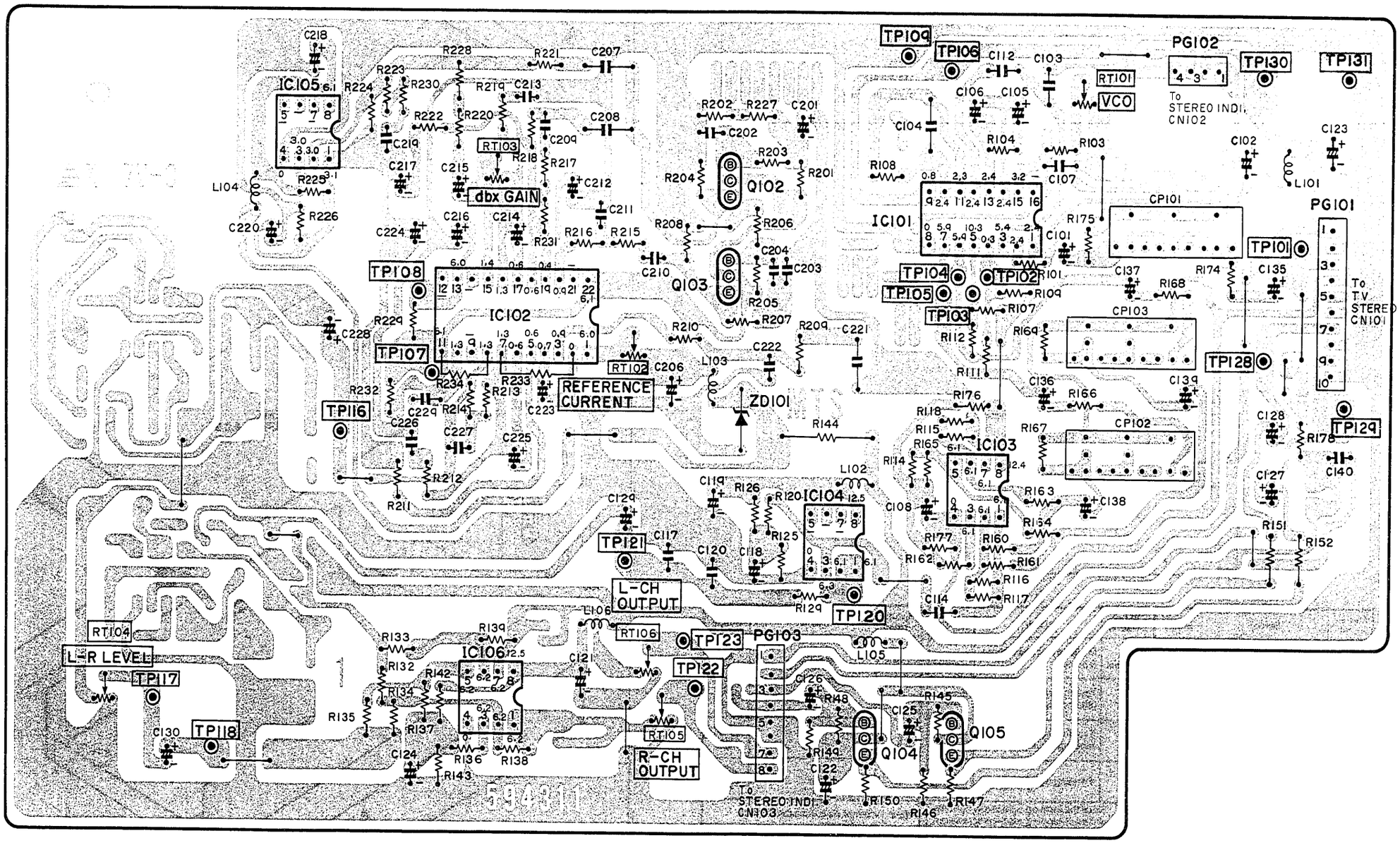
COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during soldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a workers should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

STEREO ADAPTER SCHEMATIC





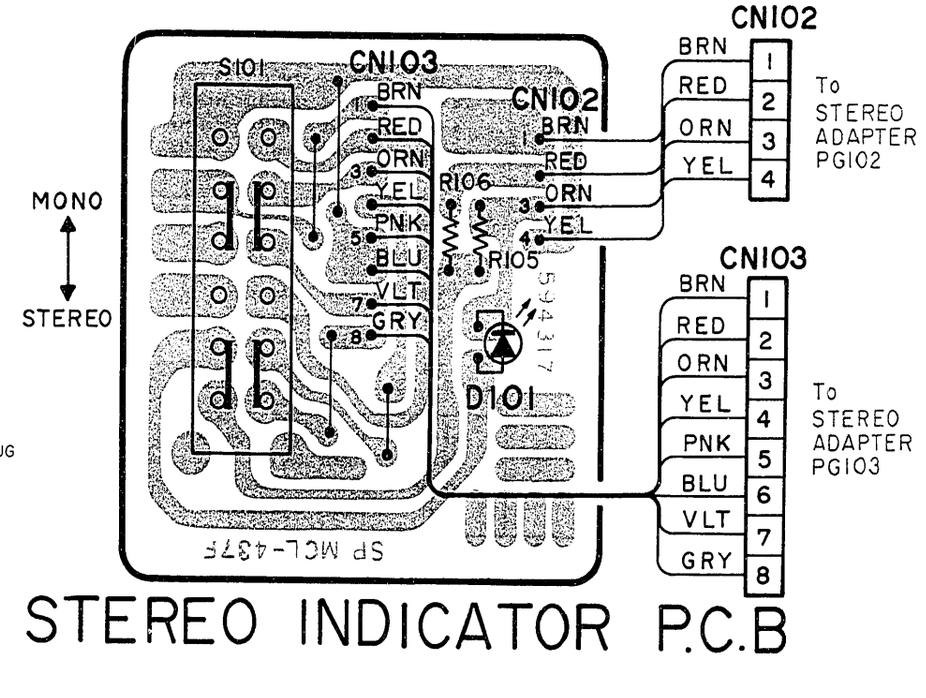
※ ONE VOLTAGE: PB OR REC MODE.

STEREO ADAPTER P.C.B

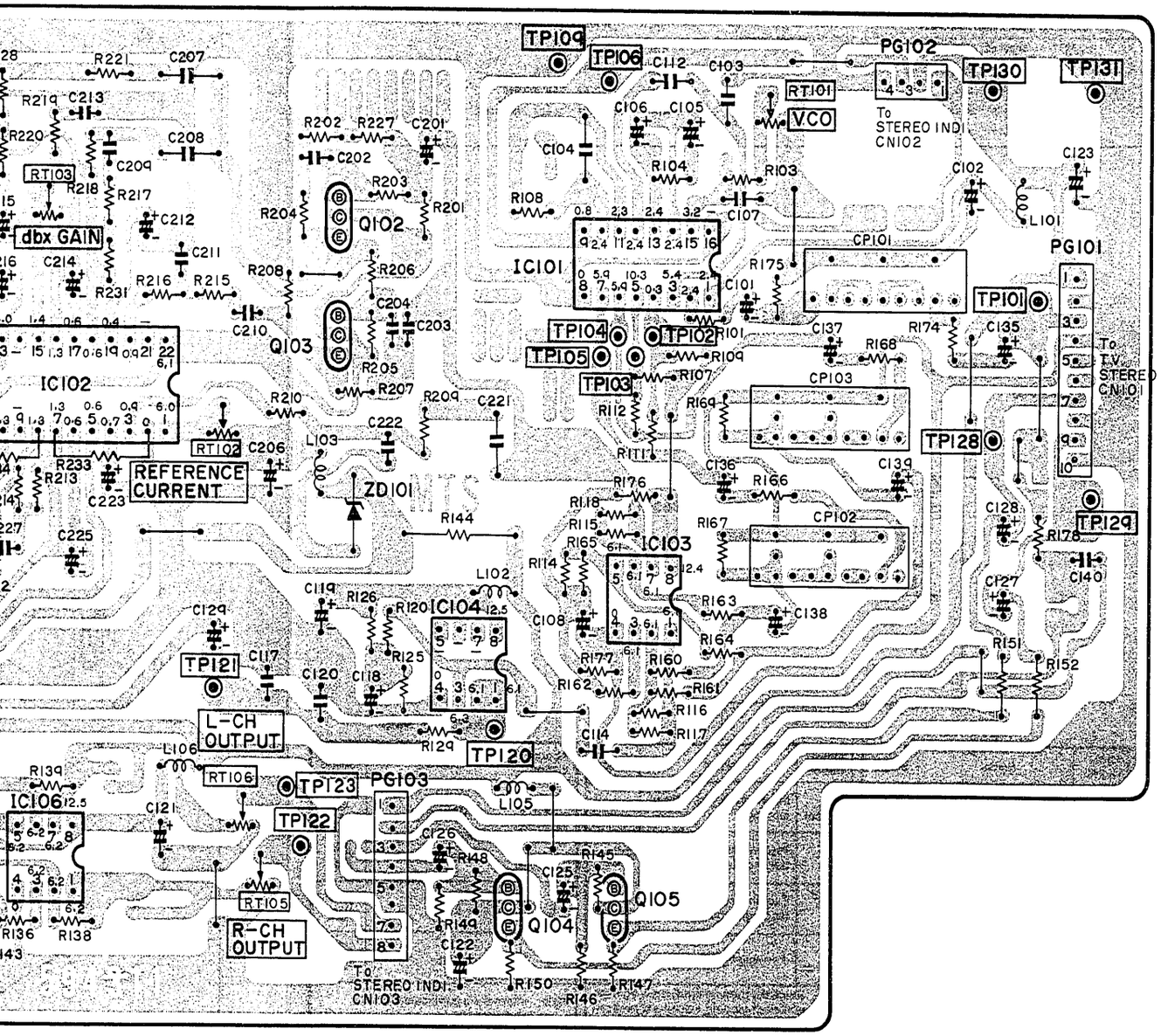
MONO
STEREO

STEREO ADAPTER 4-4 4-5 STEREO ADAPTER

STEREO INDICATOR P.C BOARD



STEREO INDICATOR P.C.B



B OR REC MODE.

STEREO ADAPTER P.C.B

CHAPTER 5

REPLACEMENT PARTS LIST

ELECTRICAL PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C 207	0268294	MYLAR 0.22UF+-5% 50V
C 208	0268294	MYLAR 0.22UF+-5% 50V
C 221	0268295	MYLAR 0.47UF+-5%50V
		RESISTORS
RT 101	5007446	RESISTOR SEMI VARIABLE 4.7KOHM
RT 102	5007433	RESISTOR SEMI VARIABLE 2.2KOHM
RT 103	5007436	RESISTOR SEMI VARIABLE 22KOHM
RT 104	5007433	RESISTOR SEMI VARIABLE 2.2KOHM
RT 105	5007433	RESISTOR SEMI VARIABLE 2.2KOHM
RT 106	5007433	RESISTOR SEMI VARIABLE 2.2KOHM
		SEMI-CONDUCTORS
D 101	5380561	LED SR503D
IC 101	5366431	IC UPC1235C
IC 102	5366421	IC AN6291
IC 103	5350601	IC NJM 4558D
IC 104	5350601	IC NJM 4558D
IC 105	5350601	IC NJM 4558D
IC 106	5350601	IC NJM 4558D
Q 102	5321662	TRANSISTOR 2SC2021S
Q 103	5321662	TRANSISTOR 2SC2021S
Q 104	5321662	TRANSISTOR 2SC2021S
Q 105	5321662	TRANSISTOR 2SC2021S
ZD 101	5331583	DIODE RD 6.2EB3
		COILS
L 101	5152337	CHOKE COIL
L 102	5152337	CHOKE COIL
L 103	5152337	CHOKE COIL
L 104	5152337	CHOKE COIL
L 105	5152337	CHOKE COIL
L 106	5152337	CHOKE COIL
		MISCELLANEOUS
CP 101	5162832	LOW PASS FILTER
CP 102	5162831	LOW PASS FILTER
CP 103	5162831	LOW PASS FILTER
S 101	5623871	SLIDE SWITCH

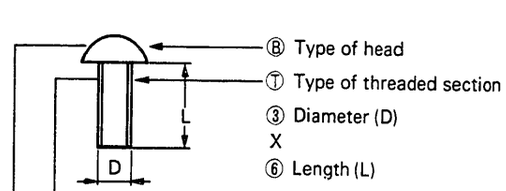
MECHANICAL PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6020363	TOP COVER
102	6026131	BOTTOM CASE
103	6572001	LEG
104	6885881	HOLDER
106	5855101	DIN CORD
107	6794601	BUSHING
108	7391702	BRACKET
109	7689051	PLATE
110	6872782	LED HOLDER
901	8699408	SCREW 3MMDX8MM

EXPLODED VIEWS

SCREW CLASSIFICATION

Example: BT3 × 6



Abbre-viation	Name	Shape
No symbol	Brazier head	
P	Pan head	
B	Binding head	
O	Oval countersunk head	
F	Flat countersunk head	

Abbre-viation	Name	Shape
No symbol	Machine (clamps without tapping)	
t	Tapping (clamps with tapping) Type 1	
T	Tapping (clamps with tapping) Type 2	
f	Forming tight (for metal)	

Note: Since the forming tight screw tightens while self-tapping machine screws can be replaced by tapping screws.

Washers and Nuts

Abbre-viation	Name	Shape
W	Washer	
SW	Spring washer	
LW	Locking washer	
E	E-ring	
N	Nut	

Note: Internal dia is indicated for nuts and washers.

LUBRICATION

Lubrication points are shown in the exploded view diagrams by marks (Ⓢ, Ⓗ)
Lubricants shown in the diagram are as follows.

Ⓢ Sonic slider oil (# 1600)
Ⓗ Hitazol (MO-138)

TION
SC2021S
SC2021S
SC2021S
SC2021S
E83
TER
TER
TER

MECHANICAL PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6020363	TOP COVER
102	6026131	BOTTOM CASE
103	6572001	LEG
104	6885881	HOLDER
106	5855101	DIN CORD
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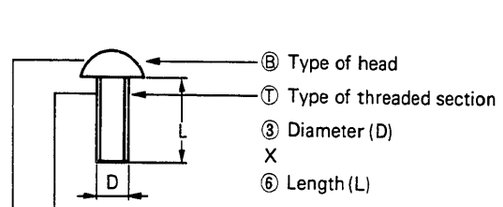
108	7391702	BRACKET
109	7689051	PLATE
110	6872782	LED HOLDER
901	8699408	SCREW 3MMDX8MM

EXPLODED VIEWS

SCREW CLASSIFICATION

Example: BT3 × 6



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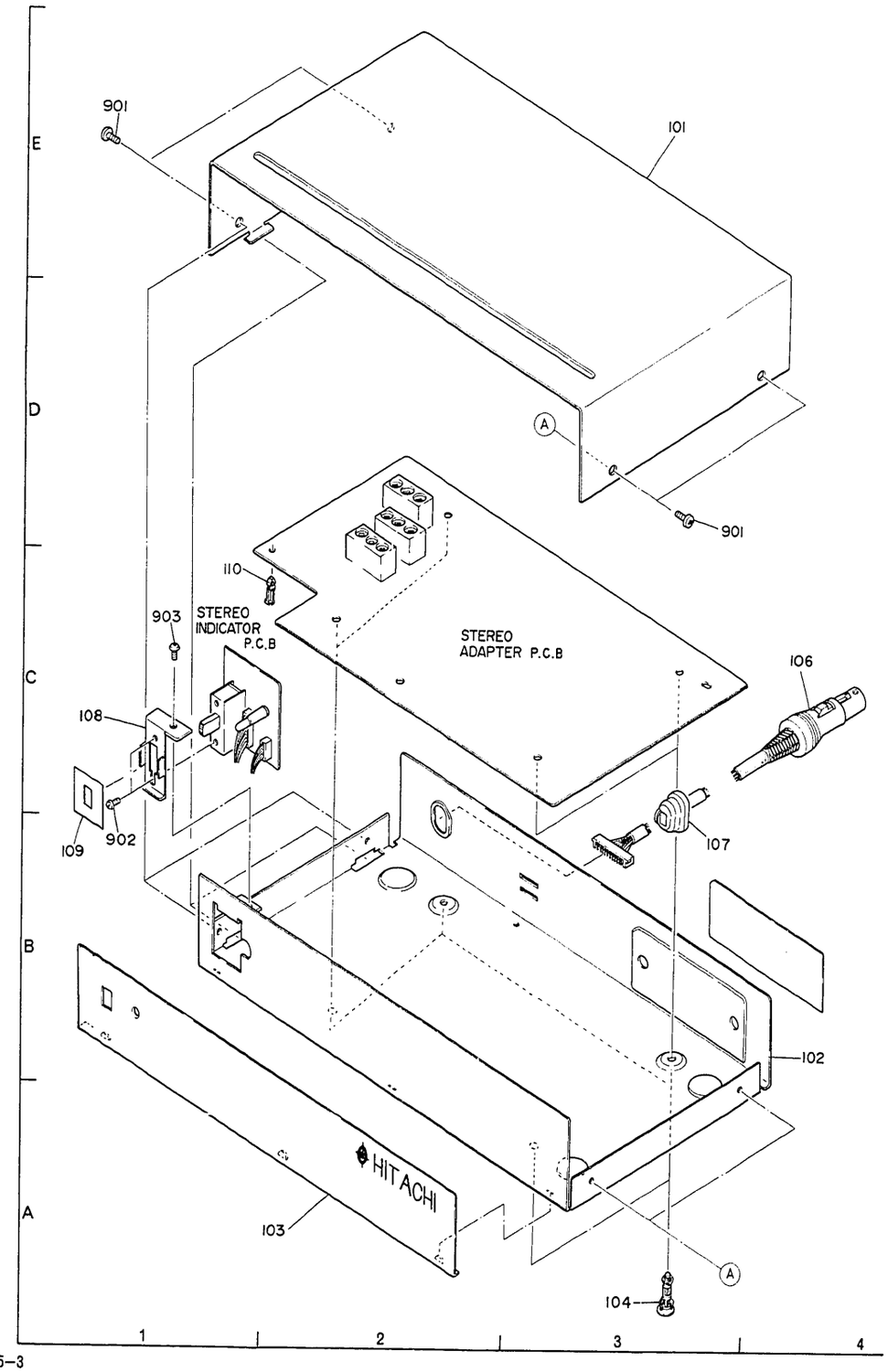
Ⓢ Sonic slider oil (# 1600)
Ⓗ Hitazol (MO-138)



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HITACHI SALES CORPORATION OF AMERICA
Eastern Regional Office
1290 Wall Street West, Lyndhurst, New Jersey 07071, U.S.A.
Tel. 201-935-8980

Mid-Western Regional Office
1400 Morse Ave., Elk Grove Village, III. 60007, U.S.A.
Tel. 312-593-1550

Southern Regional Office
510 Plaza Drive, College Park, Georgia 30349, U.S.A.
Tel. 404-763-0360

Western Regional Office
401 West Artesia Boulevard, Compton, California 90220 U.S.A.
Tel. 213-537-8383

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3219 Koapaka Street. Honolulu, Hawaii 96819, U.S.A.
Tel. 808-836-3621

HITACHI (HSC) CANADA INC.
3300 Trans-Canada Highway, Pointe Claire, Quebec,
H9R 1B1, Canada
Tel. 514-697-9150

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Tel. 28-2011, 28-0037

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Edificio Brasil 100, (Apartado 7657) Panama 5
Panama City, Rep. of Panama
Tel. 61-3100, 61-4305

Hitachi Sales de Chile Cia., Ltda.
Av. Mexico, 0183, Casilla 9793, Correo Central
Santiago, Chile
Tel. 774165

HITACHI Ltd. TOKYO JAPAN
Head Office: THE HITACHI ATAGO BLDG.
No. 15-12, 2-Chome Nishi-Shinbashi
Minato-Ku, Tokyo 105, Japan
Tel. Tokyo (03) 502-2111

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