

Technical Data

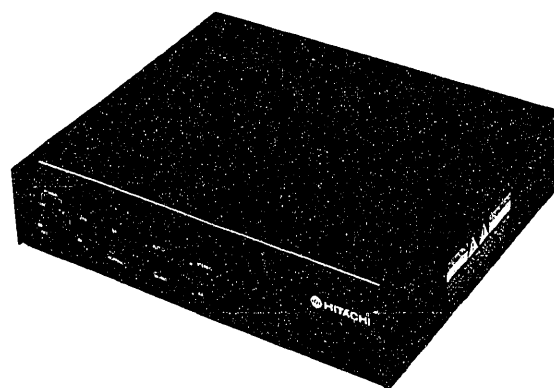


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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

STEREO ADAPTER

September 1985

TOKAI WORKS

CHAPTER 1 SAFETY PRECAUTIONS AND GENERAL

SAFETY PRECAUTIONS

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

- 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 resistors-capacitors, etc.
- When service is required, observe the original lead dress. Extra precautions should be taken to assure correct lead dress in the high voltage circuit.
- 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.
- Before returning an instrument to the 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.

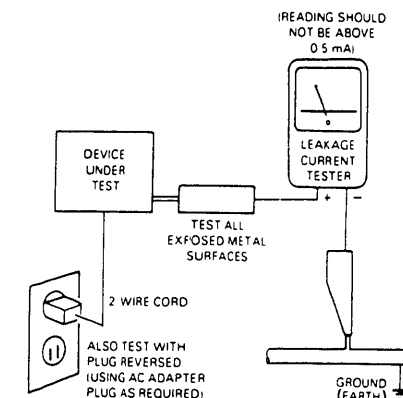
Leakage Current Cold Check

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 parts (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 0.3M Ω and a maximum resistor reading of 5 M Ω . 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 ground (earth) (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 marking with a Δ 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 : 120 volts AC 60 Hz
 Power Consumption : 10 Watts
 Operating Temperature : 0°C to 40°C (32°F to 104°F)
 Storage Temperature : -20°C to 60°C (-4°F to 140°F)
 Weight : 2 kg (4.4 lbs)
 Dimension : 255(W) × 50(H) × 215(D)/mm
 (10-1/16" × 1-15/16" × 8-7/16")
 Stereo Separation : 15 dB 100 Hz- 5 kHz
 Audio Frequency:(Stereo) ± 2 dB 50 Hz-10 kHz (1 kHz : 0 dB)
 (SAP) ± 2 dB 100 Hz- 5 kHz

DIFFERENCES

Item	VT-MTS1	VT-MTS2
Controls and Functions	STEREO/MONO	AUTO/MONO SA/NORMAL
IN/OUT Terminal	Not provided	POWER ON/OFF IF Input (From TV) Audio Output (R/L) VTR Jack
Power Source	Not provided	Provided

STEREO ADAPTER OUTPUT SIGNAL

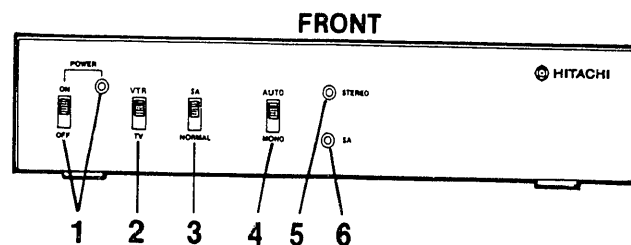
ADAPTER TV BROADCAST PROGRAM	VT-MTS1			VT-MTS2						
	MONO OR STEREO SWITCH	OUTPUT(DIN)		MONO/ AUTO SWITCH	NORMAL/ SA SWITCH	OUTPUT(DIN)			OUTPUT(LINE)	
		L	R			L	R	LINER	L	R
MONO	MONO OR STEREO	M	M	MONO OR AUTO	NORMAL OR SA	M	M	M	M	M
MONO + SAP	MONO OR STEREO	M	M	MONO	NORMAL OR SA	M	M	M	M	M
				AUTO	NORMAL	M	M	M	M	M
					SA			SAP	SAP	SAP
STEREO	MONO	L+R	L+R	MONO	NORMAL OR SA	L+R	L+R	L+R	L+R	L+R
	STEREO	L	R	AUTO		L	R	L+R	L	R
STEREO + SAP	MONO	L+R	L+R	MONO	NORMAL OR SA	L+R	L+R	L+R	L+R	L+R
	STEREO	L	R	AUTO	NORMAL	L	R	L+R	L	R
					SA			SAP	SAP	SAP

* M: MONO

RECORDED PATTERN

TV BROADCAST PROGRAM	TRACK		
	Linear	FM-L	FM-R
MONO	* Main (MONO)	Main (MONO)	Main (MONO)
SAP	Main (MONO)/SAP	Main (MONO)	Main (MONO)
Stereo	* Main (L+R)	L	R
Stereo & SAP	Main (L+R)/SAR	L	R
* Main (MONO), * Main (L+R); Main MONO or L+R			

CONTROLS AND FEATURES



1. POWER SWITCH AND INDICATOR

2. VTR/TV SELECTOR SWITCH

The Stereo adapter can be used with VTRs and TVs. If your adapter is connected to both a VTR and TV, the VTR/TV switch is used to select which signal will be decoded. In the VTR position, the channel that the VTR is tuned to will be decoded. In the TV position, the channel that the TV is tuned to will be decoded.

3. SA/NORMAL SELECT SWITCH

When the switch is in the SA position and a Second Audio Program (SAP) is being broadcast (SA indicator is lit), the SAP or bilingual sound is provided to the audio jacks on the back of the adapter and to the linear soundtrack of the VTR.

When the switch is in the NORMAL position the SAP sound will not be recorded or heard even if the SA indicator is on.

4. AUTO/MONO SELECT SWITCH

Place the switch in the AUTO position to hear or record broadcast stereo sound when the Stereo indicator is on. Place the switch in the MONO position if the stereo signal is noisy.

Note: In order to receive the stereo or SAP signal, the AUTO/MONO switch must be in the AUTO position.

5. STEREO INDICATOR

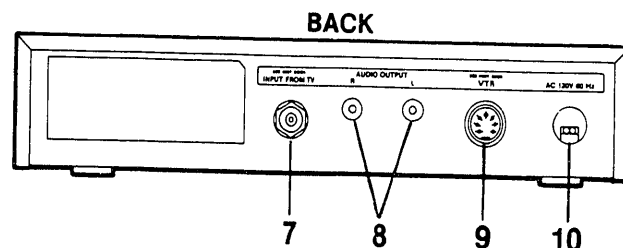
Lights when receiving a stereo program.

Note: AUTO/MONO switch must be in the AUTO position for the stereo indicator to light.

6. SA INDICATOR

Lights when receiving a SAP signal.

Note: AUTO/MONO switch must be in the AUTO position for the SA indicator to light.



7. INPUT FROM TV

Connect to Stereo adapter jack on TV.

8. AUDIO OUTPUTS

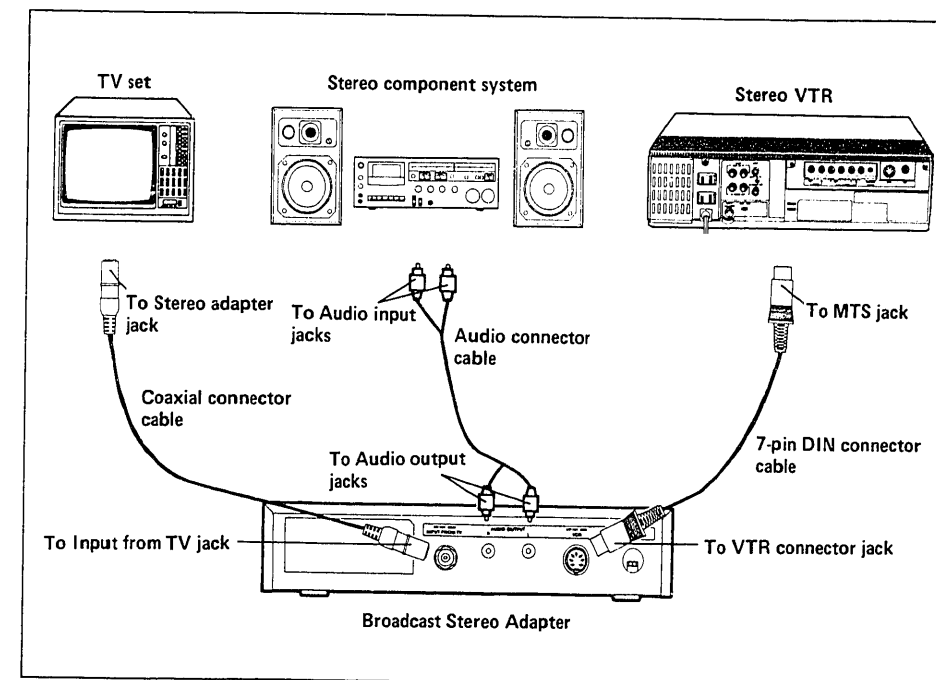
Permit audio connections of your adapter to your stereo system.

9. VTR JACK

For VTR connection.

10. AC POWER CORD

CONNECTIONS



CONNECTING THE ADAPTER TO THE VTR

1. Connect the end of the 7-pin DIN cable without the locking button to the "VTR" connector on the adapter.
2. Connect the other end of the 7-pin DIN cable with the locking button to the MTS jack on the VTR.
3. Connect the audio outputs of the VTR to your stereo system or stereo TV.

CONNECTING THE ADAPTER TO A TV

1. Attach the cable (provided) to the "INPUT FROM TV" connector on the adapter.
2. Attach the other end of the cable to the STEREO ADAPTER jack on the TV.
3. Connect the audio outputs of the adapter to your stereo system using the audio cables provided.

OPERATION

1. Turn on power.
2. Set the VTR/TV switch to the desired position.
The VTR/TV switch selects whether the adapter operates with the VTR or TV.
If you only have a VTR attached to the adapter, leave the switch in the VTR position.
If you only have a TV attached, leave the switch in the TV position.
If you have both a VTR and a TV connected to the adapter, select the unit that you want to receive stereo by setting the switch to the VTR or TV position.
3. Set the AUTO/MONO select switch to the AUTO position. When a stereo broadcast is received, the Stereo indicator will come on. When a signal is too weak and noisy for enjoyable listening, set this switch to the MONO position.
4. Set the SA/NORMAL switch to the desired position.
In the SA position the adapter automatically supplies the SAP signal to the audio output jacks of the adapter and to the linear track of VTR, whenever a SAP is being broadcast (whenever SA indicator is on). When the switch is in the SA position, but there is no SAP being broadcast (SA indicator is off) normal stereo audio is provided at the audio output jacks of the adapter. When the switch is in the NORMAL position, normal stereo audio is provided at the audio output jacks even if the SA indicator is on.

NOTES ON OPERATION WITH VTRS AND TELEVISIONS

This adapter is designed to operate with specific VHS Hi-Fi VTRs, such as the VT-87A. When used with these VTRs, the main audio signal, whether mono or stereo, is always recorded on the VHS Hi-Fi tracks. If the SA indicator is on and the SA/NORMAL switch is in the SA position, the SAP sound is recorded on the VTR's linear track, and may be heard during recording or play back by placing the AUDIO OUTPUT switch (AUTO/MIX/LINEAR) in the LINEAR position.

- This adapter may also be used with the VT-86A, VT-89A, VT-78AY and VT-860A, however it is not possible to record the SAP channel.
- If the VT-65A or VT-76AY is used with this adapter, the SAP signal is recorded on the right channel of the VTR's linear track. To playback these recorded SAP signal, set the Audio output (CH1/CH2/CH1 + 2) switch on the VTR to the CH1 position. The normal audio signal recorded on the left channel of the tape is played back when the switch is placed in the CH2 position or the SAP signal mixed with the normal audio signal is played back when the switch is placed in the CH1 + 2 position.
- See the table below for more information.
- If your reception of a channel is noisy due to an weak signal, the audio output of the adapter will be muted.

TV BROADCAST	VT-MTS2		VT-65A/76AY			VT-89A/86A/76AY			VT-87A		
	POSITION OF AUTO/MONO SWITCH	POSITION OF SA/NORMAL SWITCH	POSITION OF STEREO/SAP SWITCH	RECORDED SIGNAL ON TAPE		RECORDED SIGNAL ON TAPE		LINEAR TRACK	RECORDED SIGNAL ON TAPE		LINEAR TRACK
				L	R	Hi-Fi TRACK	Hi-Fi TRACK		Hi-Fi TRACK	Hi-Fi TRACK	
MONO + SAP	AUTO	NORMAL	ANY	MONO		MONO	MONO	MONO	MONO	MONO	MONO
		SA	SAP	MONO	SAP						
STEREO	AUTO	ANY	STEREO	L	R	L	R	L+R	L	R	L+R
			SAP	L+R	L+R						
STEREO + SAP	AUTO	NORMAL	STEREO	L	R	L	R	L+R	L	R	L+R
			SAP	L+R	L+R						
		SA	STEREO	L	R	L	R	L+R	L	R	SAP
			SAP	L+R	SAP						

CHAPTER 2 DISASSEMBLY

1. Top panel removal.
2. IF demodulator circuit board removal.
3. Main circuit board removal.
4. Front switch circuit board removal.
5. Rear jack circuit board removal.

1. Top Panel Removal (Fig. 1)

- 1) Remove the 4 screws located on the each side of the top panel.
- 2) Lift the top panel upward.

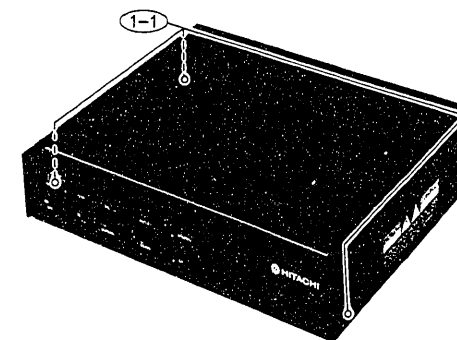


Fig. 1

2. IF Demodulator Circuit Board Removal (Fig. 2)

- 1) Remove the top panel. (Fig. 1)
- 2) Release 3 tabs holding the circuit board.
- 3) Disconnect connector PG503.
- 4) Lift the circuit board upward.

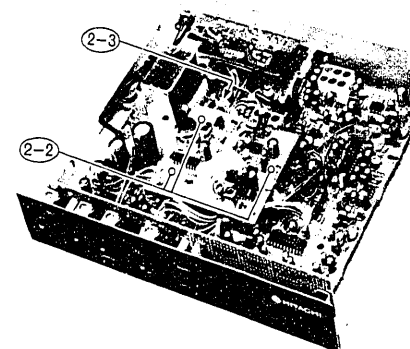


Fig. 2

3. Main Circuit Board Removal (Fig. 3)

- 1) Remove the top panel.
- 2) Remove IF Demodulator Circuit Board (Fig. 2)
- 3) Release 3 tabs holding the circuit board.
- 4) Remove 2 screws holding the transformer on the circuit board.
- 5) Disconnect 6 connectors (PG601, PG603, PG702, PG703, PG704 and PG705) and 2 RF cables.
- 6) Lift the circuit board upward.

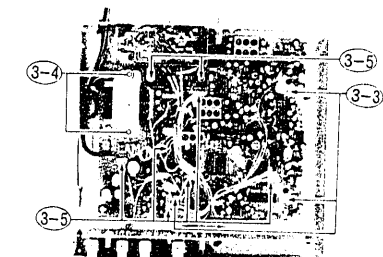


Fig. 3

4. Front Switch Circuit Board Removal (Fig. 4)

- 1) Remove the top panel. (Fig. 1)
- 2) Remove 4 screws.
- 3) Remove the nylon retainer on the circuit board.
- 4) Disconnect 4 connectors (PG702, PG703, PG704 and PG705).
- 5) Remove the Front Switch Board in the direction of the arrow.

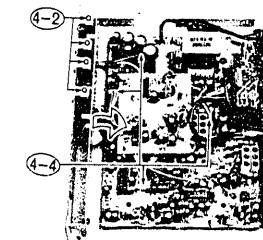


Fig. 4

5. Rear Jack Circuit Board Removal (Fig. 5)

- 1) Remove the top panel. (Fig. 1)
- 2) Remove 4 screws on the rear panel.
- 3) Remove IF Demodulator Circuit Board. (Fig. 2)
- 4) Disconnect 2 connectors (PG601 and PG603) and 2 RF cables.
- 5) Release Main Circuit Board. (Fig. 3)

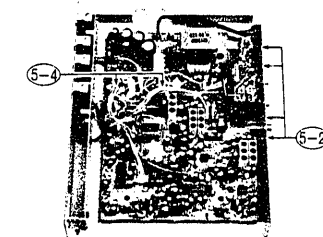


Fig. 5

CHAPTER 3 ADJUSTMENT

TEST EQUIPMENT REQUIRED

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

1) MTS Sound Signal Generator

Output Impedance : 75 ohms
Main Channel (L+R) : 1Vp-p terminated with 75 ohms
1st Sub Channel (L-R) : 2Vp-p terminated with 75 ohms
2nd Sub Channel (SAP) : 0.6Vp-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) AC Millivoltmeter (or DVM)

Range : 0.1mV DC 400VDC
1mVAC 400VAC

4) Oscilloscope

Frequency : DC 100 MHz
Sensitivity : 1mV-5V/div. (Vertical)

5) IF Sweep Marker Generator

OSC Frequency Range : 35.5-51.5 MHz

6) TV IF Modulator

Modulation Input level : Video Signal 1.0Vp-p terminated with 75 ohms

7) TV Channel Converter

Input Level : 100 dBμ (100mVrms)

ADJUSTMENT CONDITIONS

Setting UP

1) Set a MTS sound signal generator as shown below.
Output Signal : Main (L+R), 1st Sub (L-R), 2nd Sub (SAP) Pilot
OSC Frequency : 400 Hz
MOD. Function : Monaural

2) Adjust the MTS sound signal generator as shown below.
Modulation Level : 30%
Output Level : 138mVrms
Connect a jumper between TP611 and TP701.

* Perform all the following adjustments after 5 minutes have elapsed after power is supplied.

STEREO DEMODULATOR/SAP DEMODULATOR SIGNAL SWITCHING P.C. BOARD

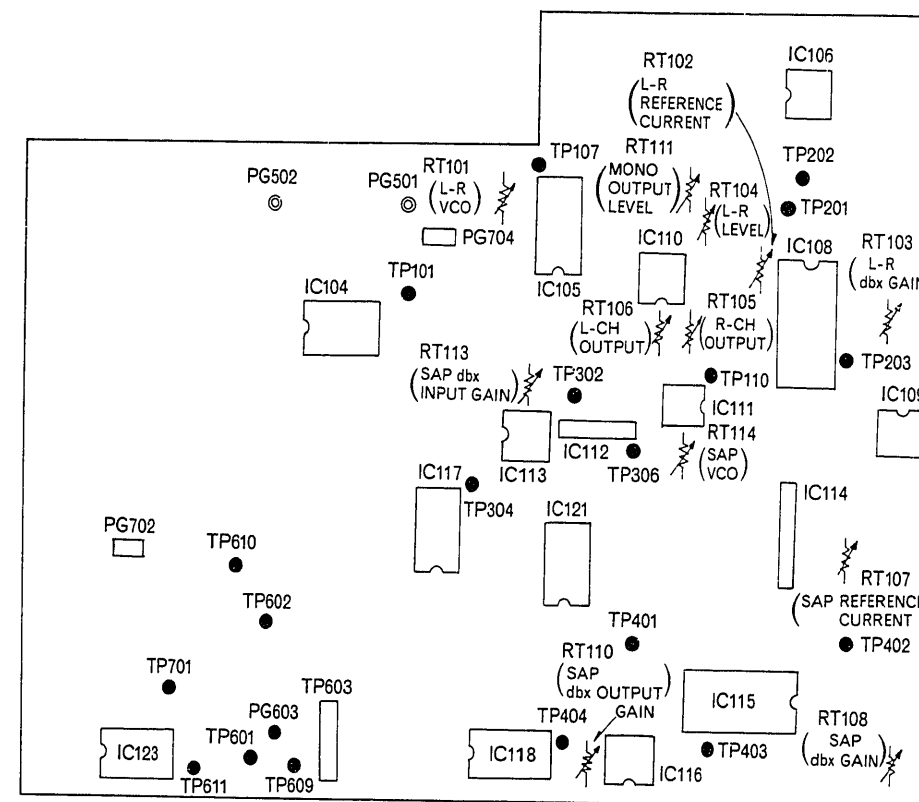


Fig. 1 MAIN P.C. Board

1. STEREO DEMODULATOR ADJUSTMENT

1. Sub (L-R) VCO Adjustment

Test Point : RT107 (L-R VCO) Main
Adjust : RT101 (L-R VCO) Main

This adjustment sets the oscillation frequency of the VCO in the L-R demodulator IC to 15.734 kHz.

(The L-R VCO oscillation frequency can be measured at TP107 when removing CN704 from PG704.)

When this adjustment is incomplete, the pilot signal cannot be detected, so a stereo broadcast cannot be decoded.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Disconnect CN704 from PG704.
- 5) Connect a frequency counter to TP107.
- 6) Adjust the L-R VCO Control (RT101) for 15.734 ± 0.1 kHz.
- 7) Reconnect CN704 to PG704.

2. Sub (L-R) Reference Current Adjustment

Test Points : TP202 (L-R dbx REF.) Main
TP203 (L-R dbx REF.) Main

Adjust : RT102 (L-R Reference Current) Main

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

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect a DVM between TP202 (positive: +) and TP203 (negative: -).
- 5) Adjust the L-R Reference Current Control (RT102) for 15mV ± 0.7mVDC.

3. L/R Output Level Adjustments

Test Points : TP609 (L-ch Out)	Main
TP610 (R-ch Out)	Main
Adjust : RT106 (L-ch Output)	Main
RT105 (R-ch Output)	Main

This adjustment sets the output level to the specified level.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
- 5) Connect a millivoltmeter to TP609.
- 6) Adjust the L-ch Output Level Control (RT106) for $138\text{mV} \pm 3\text{mVrms}$.
- 7) Connect the millivoltmeter to TP610.
- 8) Adjust the R-ch Output Level Control (RT105) for $138\text{mV} \pm 3\text{mVrms}$.

4. Mono Output Level Adjustment

Test Points : TP603 (Mono Out)	Main
Adjust : RT111 (Mono Output Level)	Main

This adjustment sets the output level to the specified level.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
MOD. Function : Main (L+R); MONO
Modulation Level : Main (L+R); 30%
- 5) Connect a millivoltmeter to TP603.
- 6) Adjust the Mono Output Level Control (RT111) for $138\text{mV} \pm 3\text{mVrms}$.

5. Sub (L-R) Level Adjustment

Test Point : TP609 (L-ch Out)	Main
Adjust : RT104 (L-R Level)	Main

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

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
MOD. Function : 1st Sub (L-R); Stereo
Modulation Level : 1st Sub (L-R); 23%
- 5) Connect a millivoltmeter to TP609.
- 6) Adjust the L-R Level Control (RT104) for $155\text{mVrms} \pm 4\text{mVrms}$.

6. Sub (L-R) dbx Gain Adjustment

Test Point : TP609 (L-ch Out)	Main
Adjust : RT103 (L-R dbx Gain)	Main

This adjustment sets the gain of the L-R dbx decoder IC. When this adjustment is incomplete, separation at high frequencies is degraded.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
MOD. Function : 3 kHz-1st sub (L-R)
Modulation Level : 3 kHz-1st Sub (L-R); 62%
- 5) Connect a millivoltmeter to TP609.
- 6) Adjust the L-R dbx Gain Control (RT103) for $155\text{mVrms} \pm 4\text{mVrms}$.

2. SAP DEMODULATOR ADJUSTMENT

1. SAP VCO Adjustment

Test Point : TP306 (SAP VCO)	Main
Adjust : RT114 (SAP VCO)	Main

This adjustment sets the oscillation frequency of the VCO in the SAP demodulator IC to $78.67 \pm 10\text{kHz}$.

When this adjustment is incomplete, the pilot signal cannot be detected, so a stereo broadcast cannot be decoded.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect a frequency counter between IC112-(2) pin and chassis (GND).
- 5) Adjust the SAP VCO Control (RT114) for $78.67 \pm 10\text{kHz}$.

2. SAP Reference Current Adjustment

Test Points : TP402 (SAP dbx REF.)	Main
TP403 (SAP dbx REF.)	Main
Adjust : RT107	Main
(SAP Reference Current)	

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

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect a DVM between TP402 (positive: +) and TP403 (negative: -).
- 5) Adjust the SAP Reference Current Control (RT107) for $15\text{mV} \pm 0.7\text{mVDC}$.

3. SAP dbx Input Gain Adjustment

Test Point : TP304 (SAP dbx In)	Main
Adjust : RT113 (SAP dbx Input Gain)	Main

This adjustment sets the Input gain of the SAP dbx decoder IC to the specified value.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to SA.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
MOD. Function : 2nd Sub (SAP)
Modulation Level : 2nd Sub (SAP); 23%
- 5) Connect a millivoltmeter to TP304.
- 6) Adjust the SAP dbx Input Gain Control (RT113) for $77.6\text{mV} \pm 2\text{mVrms}$.

4. SAP dbx Output Gain Adjustment

Test Point : TP603 (Linear Out)	Main
Adjust : RT110 (SAP dbx Output Gain)	Main

This adjustment sets the output level to the specified level.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to SA.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
MOD. Function : 2nd Sub (SAP)
Modulation Level : 2nd Sub (SAP); 23%
- 5) Connect a millivoltmeter to TP603.
- 6) Adjust the SAP dbx Output Gain Control (RT110) for $138\text{mV} \pm 3\text{mVrms}$.

5. SAP dbx Gain Adjustment

Test Point : TP603 (Linear Out)	Main
Adjust : RT108 (SAP dbx Gain)	Main

This adjustment sets the gain of the SAP dbx decoder IC.

When this adjustment is incomplete, separation at high frequencies is degraded.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to SA.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the MTS sound signal generator between PG502 and chassis (GND).
MOD. Function : 3 kHz-2nd Sub (SAP)
Modulation Level : 3 kHz-2nd Sub (SAP); 62%
- 5) Connect a millivoltmeter to TP603.
- 6) Adjust the SAP dbx Gain Control (RT108) for $138\text{mV} \pm 3\text{mVrms}$.

3. IF DEMODULATOR CIRCUIT ADJUSTMENT

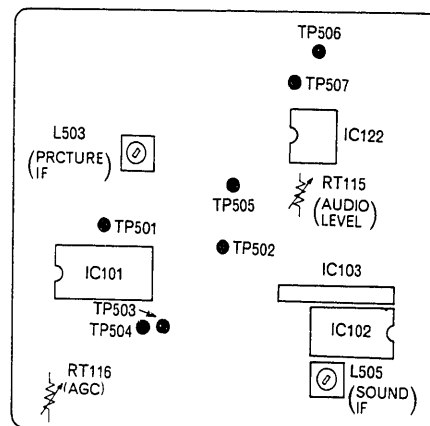


Fig. 2 IF DEMODULATOR P.C. Board

1. Picture-IF Adjustment (Fig. 4, 5)

Test Points : TP501 (AGC Level) IF Demodulator
 TP502 (Picture-IF) IF Demodulator
 TP503 (Picture-IF) IF Demodulator
 TP504 (Picture-IF) IF Demodulator
 Adjust : L503 (Picture-IF) IF Demodulator

This adjustment not only tunes the picture IF but also sound. If this adjustment is incomplete, buzz is heard.

- 1) Set the VTR/TV switch of the Stereo Adapter to TV.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect a DC power supply between TP501 and chassis (GND), and set the DC power supply to $7.7 \pm 0.1V$ DC.
- 5) Connect the Sweep Out (RF Out) terminal of a sweep marker generator to PG501.
- 6) Connect a resistance (50 ohms) between TP503 and TP504.
- 7) Connect the Pulse Out (Marker Out) terminal of the sweep marker generator to channel-1 of an oscilloscope.
- 8) Connect the H. Scope terminal of the sweep marker generator to the EXT. TRIG terminal of the oscilloscope. (See illustration on next page.)
- 9) Connect channel-2 of the oscilloscope to TP502.
- 10) Adjust the sweep marker generator for an optimum RF output of the generator.
- 11) Set the oscilloscope to the ADD mode and adjust the Picture-IF Control (L503) to minimize the RF Output waveform of the sweep marker generator at 45.75MHz.

2. Sound-IF Adjustment

Test Point : TP505 (Sound-IF) IF Demodulator
 Adjust : L505 (Sound-IF) IF Demodulator

This adjustment tunes sound. If this adjustment is incomplete, sound is not output.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the Output terminal of the TV IF modulator and the Input terminal of a TV channel converter.
- 5) Connect the Output terminal of the TV channel converter and the VHF-In terminal of a VTR provided with a stereo TV connector the Stereo Adapter.
- 6) Connect the Stereo TV connectors of the VTR and using a 7-pin DIN cord.
- 7) Turn "on" the VTR switch of the VTR.
- 8) Connect an AC millivoltmeter to TP505.
- 9) Adjust the TV IF modulator to modulate the audio signal to 400 Hz, 30%. (7.5 kHz deviation)
- 10) Adjust the Sound-IF Control (L505) for maximum sound level on the AC millivoltmeter. Then, turn the Audio Level Control (RT115) and AGC (RT116) fully counterclockwise (viewed from components side).

3. Audio Level Adjustment

Test Point : TP505 (Sound-IF) IF Demodulator
 Adjust : RT115 (Audio Level) IF Demodulator

This adjustment tunes the sound detection level precisely. If this adjustment is incomplete, the sound output level drifts from the maximum.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the Output terminal of the TV IF modulator and the Input terminal of a TV channel converter.
- 5) Connect the Output terminal of the TV channel converter and the VHF-In terminal of a VTR provided with a stereo TV connector the Stereo Adapter.
- 6) Connect the Stereo TV connectors of the VTR and using a 7-pin DIN cord.
- 7) Turn "on" the VTR switch of the VTR.
- 8) Connect an AC millivoltmeter to TP505.
- 9) Adjust the TV IF modulator to modulate the audio signal to 400 Hz, 30%. (7.5 kHz deviation)
- 10) Adjust the Audio Level Control (RT115) for $122mV \pm 2mVrms$.

4. AGC Adjustment

Test Point : TP506 (Muting level) IF Demodulator
 Adjust : RT116(AGC) IF Demodulator

This adjustment determines the audio muting level. If this adjustment is incomplete, the audio signal is muted regardless of the sound level.

- 1) Set the VTR/TV switch of the Stereo Adapter to VTR.
- 2) Set the SA/NORMAL switch of the Stereo Adapter to NORMAL.
- 3) Set the AUTO/MONO switch of the Stereo Adapter to AUTO.
- 4) Connect the Output terminal of the TV IF modulator and the Input terminal of a TV channel converter.
- 5) Connect the Output terminal of the TV channel converter and the VHF-In terminal of a VTR provided with a stereo TV connector the Stereo Adapter.
- 6) Connect the Stereo TV connectors of the VTR and using a 7-pin DIN cord.
- 7) Turn "on" the VTR switch of the VTR.
- 8) Connect an AC millivoltmeter to TP506.
- 9) Adjust the TV IF modulator to modulate the audio signal to 400 Hz, 30%. (7.5 kHz deviation)
- 10) Set the IF output of the TV channel converter to channel-2 (IF to 55.25 MHz) and the level to more than $60dB\mu$ ($1mVrms$), then tune to the IF output with the above VTR.
- 11) Turn the AGC (RT116) fully counterclockwise (viewed from components side).
- 12) Adjust the IF output level of the TV channel converter and set it to $35dB\mu$ ($56\mu Vrms$) and check that the AC millivoltmeter reads less than $3.0Vrms$.
- 13) Adjust the IF output level of the TV channel converter and set it to $25dB\mu$ ($17\mu Vrms$), and check that the AC millivoltmeter reads more than $6.0Vrms$.

Note : If the above 1 and 2 cannot be confirmed, check the following.

Fix the IF output level of the TV channel converter to $25dB\mu$ ($17\mu Vrms$) and turn the AGC (RT116) clockwise (viewed from components side) and stop turning when the AC millivoltmeter reads more than $6.0Vrms$.

Then set the IF output level of the TV channel converter to $35dB\mu$ ($56\mu Vrms$) and check that the AC millivoltmeter reads less than $3.0Vrms$.

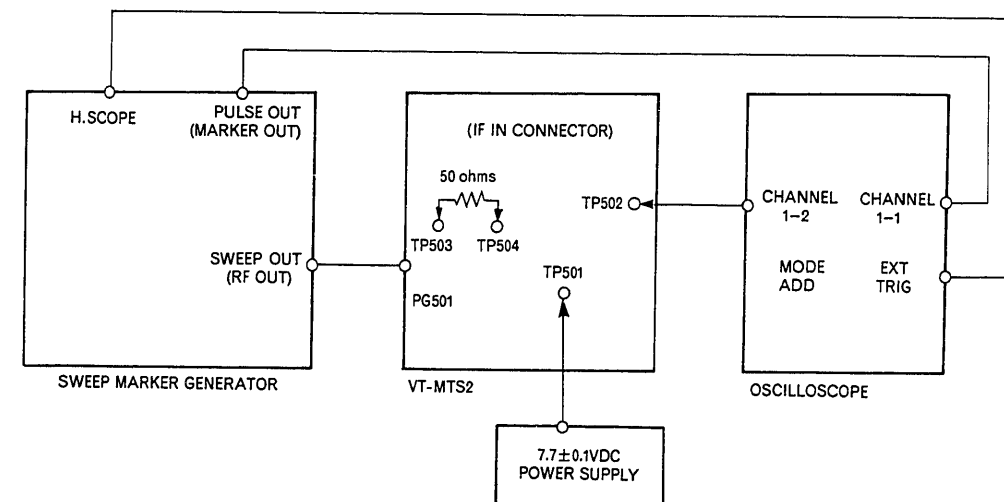


Fig. 3 Connection for Picture-IF Adjustments

CHAPTER 4
SCHEMATIC/CIRCUIT BOARD DIAGRAM
AND
ELECTRICAL REPLACEMENT PARTS LIST

Note

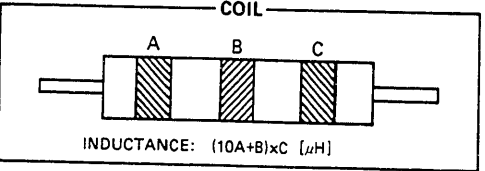
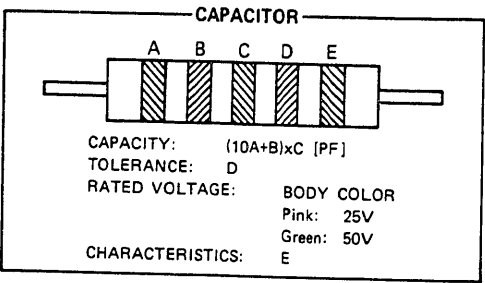
- 1 Voltage measured at base of chassis with minimum volume control and no signal.
() are shown in recording condition.
2 Nomenclature of Resistors and Capacitors.

Circuit No.	
Value	No indicated 0 (Ohm) M: 1000K
Tolerance	No indicated $\pm 5\%$ K: $\pm 10\%$ M: $\pm 20\%$
Wattage	No indicated $\frac{1}{4}$ W
Sort	No indicated Carbon film RC Composition RW Wire wound RS Oxide metal film RN Fixed metal film

Circuit No.	
Value	No indicated μ F P: PF
Tolerance	No indicated $\pm 10\%$ J: $\pm 5\%$ M: $\pm 20\%$ Z: $\pm 80\%$ - 20% D: ± 0.5 pF C: ± 0.25 pF
Sort	 Ceramic  Electrolytic  Mylar  Polyester  Styrol
Voltage	No indicated 50VV

- 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

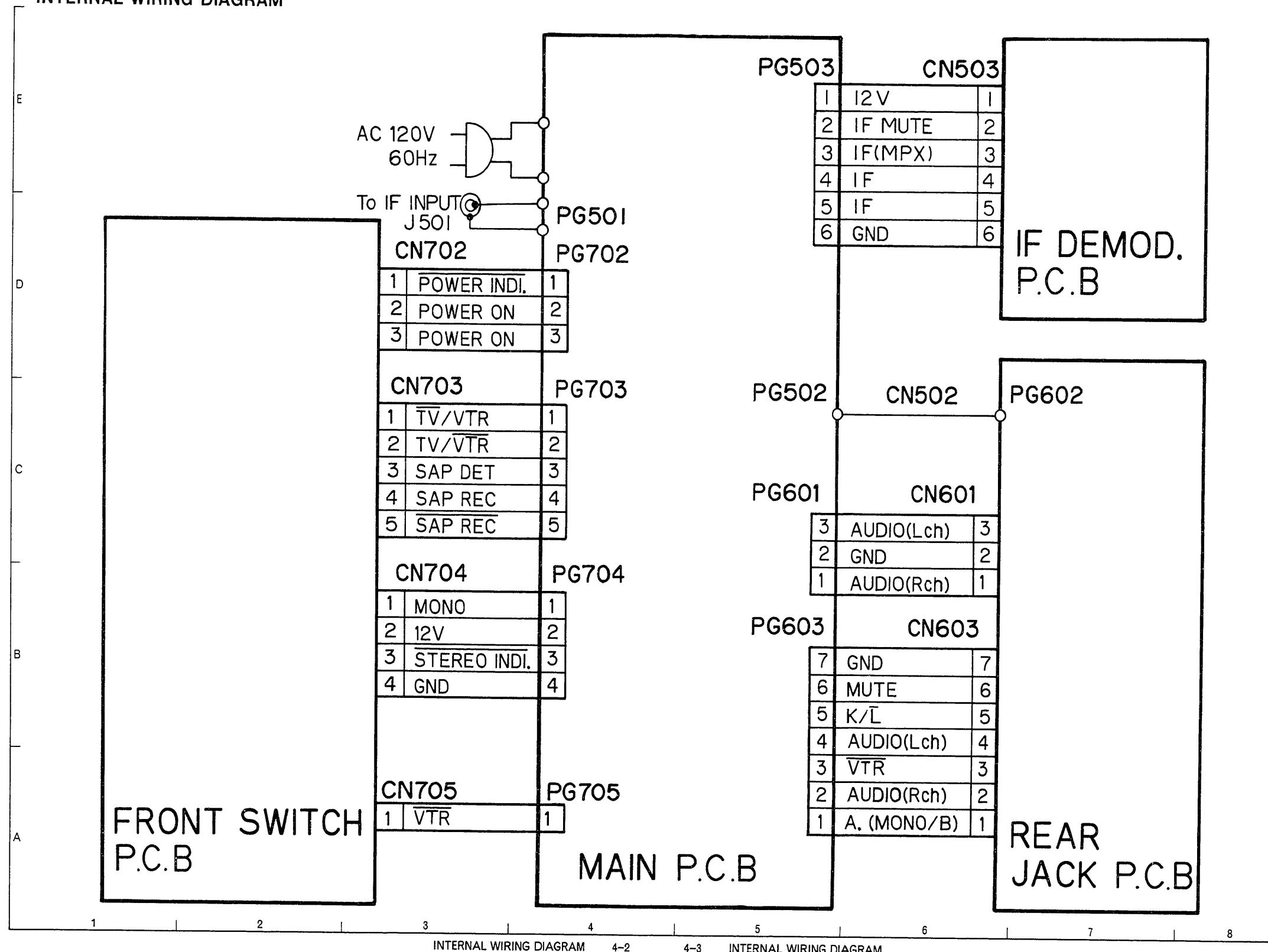


COLOR	A, B	C	D	E
Black	0	10^0	$\pm 20\%$	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		$\pm 30\%$	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	$\pm 5\%$	
Silver		10^{-2}	$\pm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

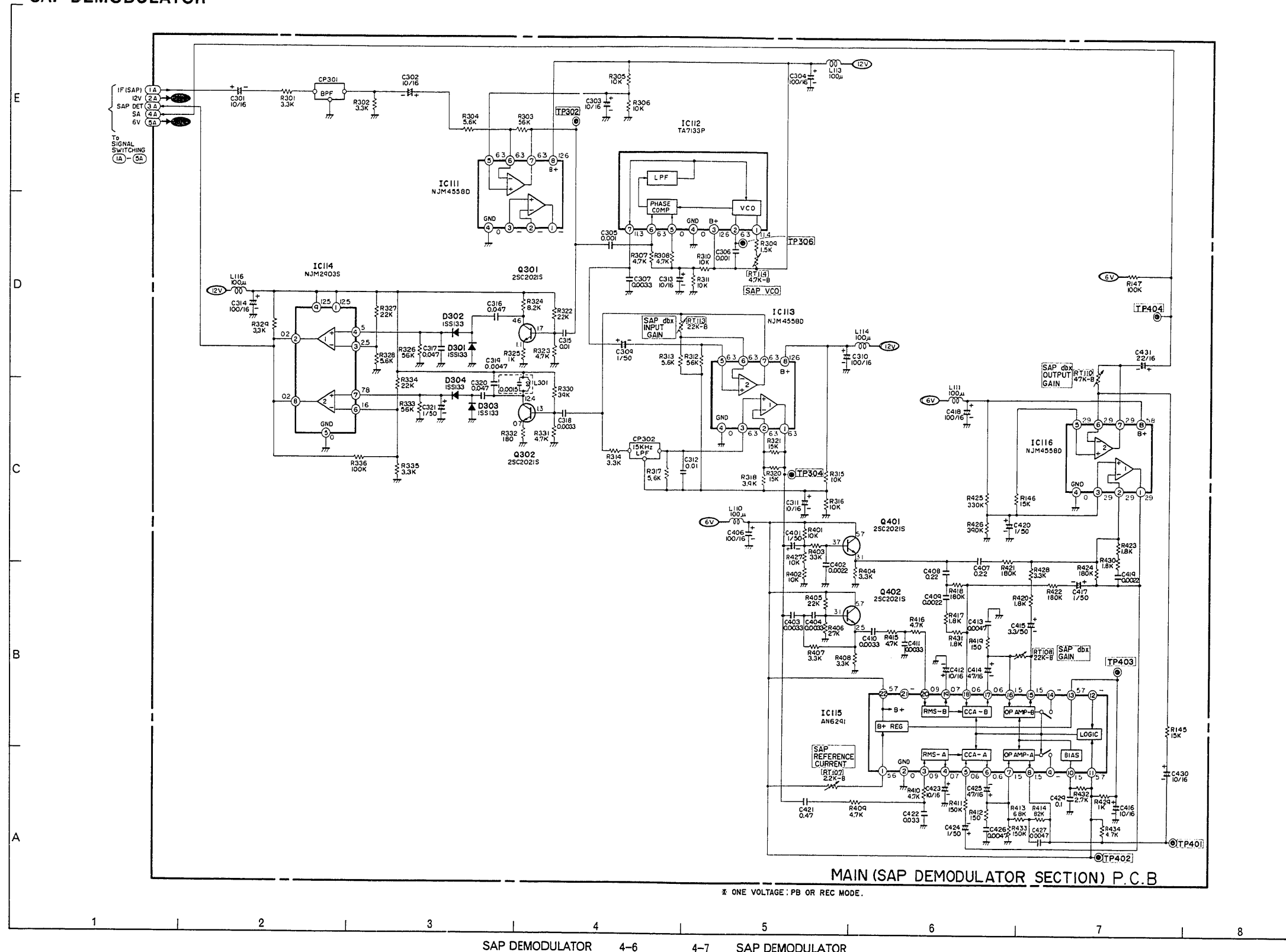
Cautions on use of MOS ICs

- MOS ICs are 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.
- High voltages may be applied during soldering caused by leakage from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
- 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 workers should be grounded.
- Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

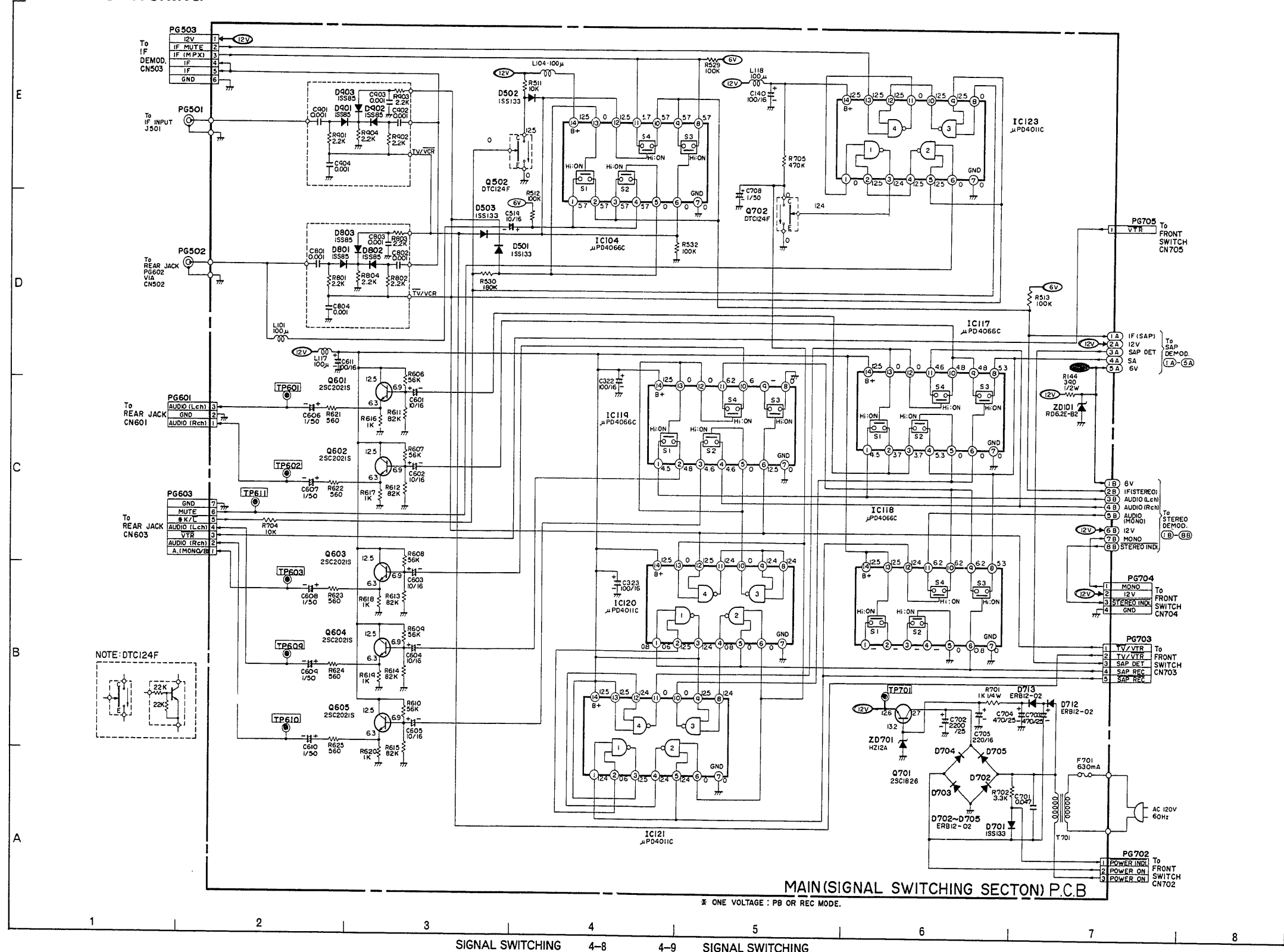
INTERNAL WIRING DIAGRAM



SAP DEMODULATOR



SIGNAL SWITCHING



RT101
L-R
VCO

To IF INPUT
J501

To REAR JACK
CN602

RT101
L-R
VCO

PG501 C901 C903 C902 C802 C803 C801 PG502
D901 R903 R902 R802 R803 R801
R904 C904 C804 R804

PG704 To
FRONT SWITCH
CN704

To IF DEMOD.
CN503

PG503
R532
YEL
BRN
L101
L104
IC104
C514
R512
D703 C701 R702
Q502
D702 D701
D705 D704
ZD701
Q701
PG601
R622
To REAR JACK
CN601
C702
C607
R621
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IF DEMODULATOR P.C.B

* ONE VOLTAGE : PB OR REC MODE.

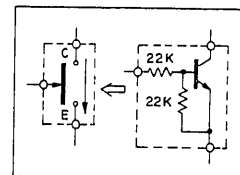
1 2 3 4 5 6 7 8

IF DEMODULATOR 4-12 4-13 IF DEMODULATOR

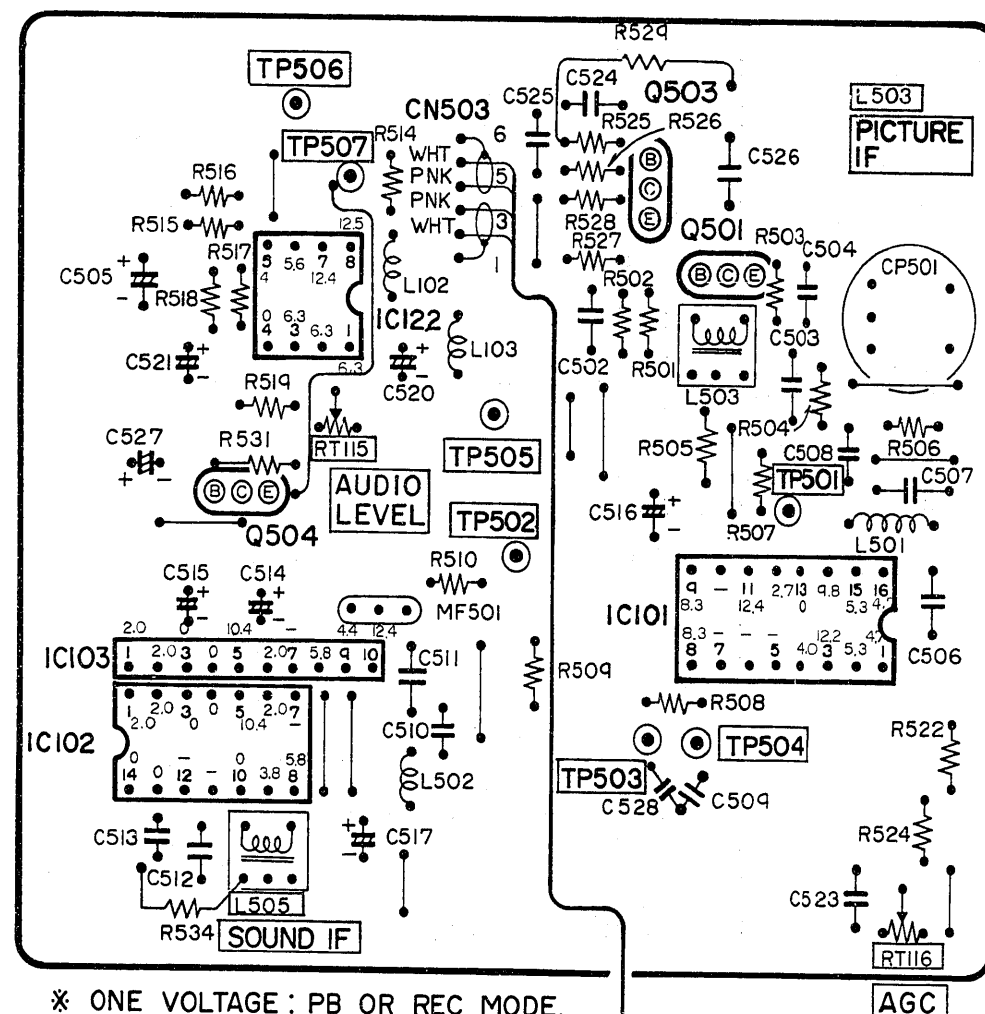
IF DEMODULATOR P.C.B

* ONE VOLTAGE : PB OR REC MODE.

NOTE: DTC124F

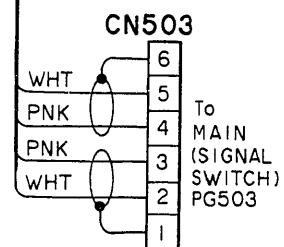


IF DEMODULATOR	4-12	4-13	IF DEMODULATOR
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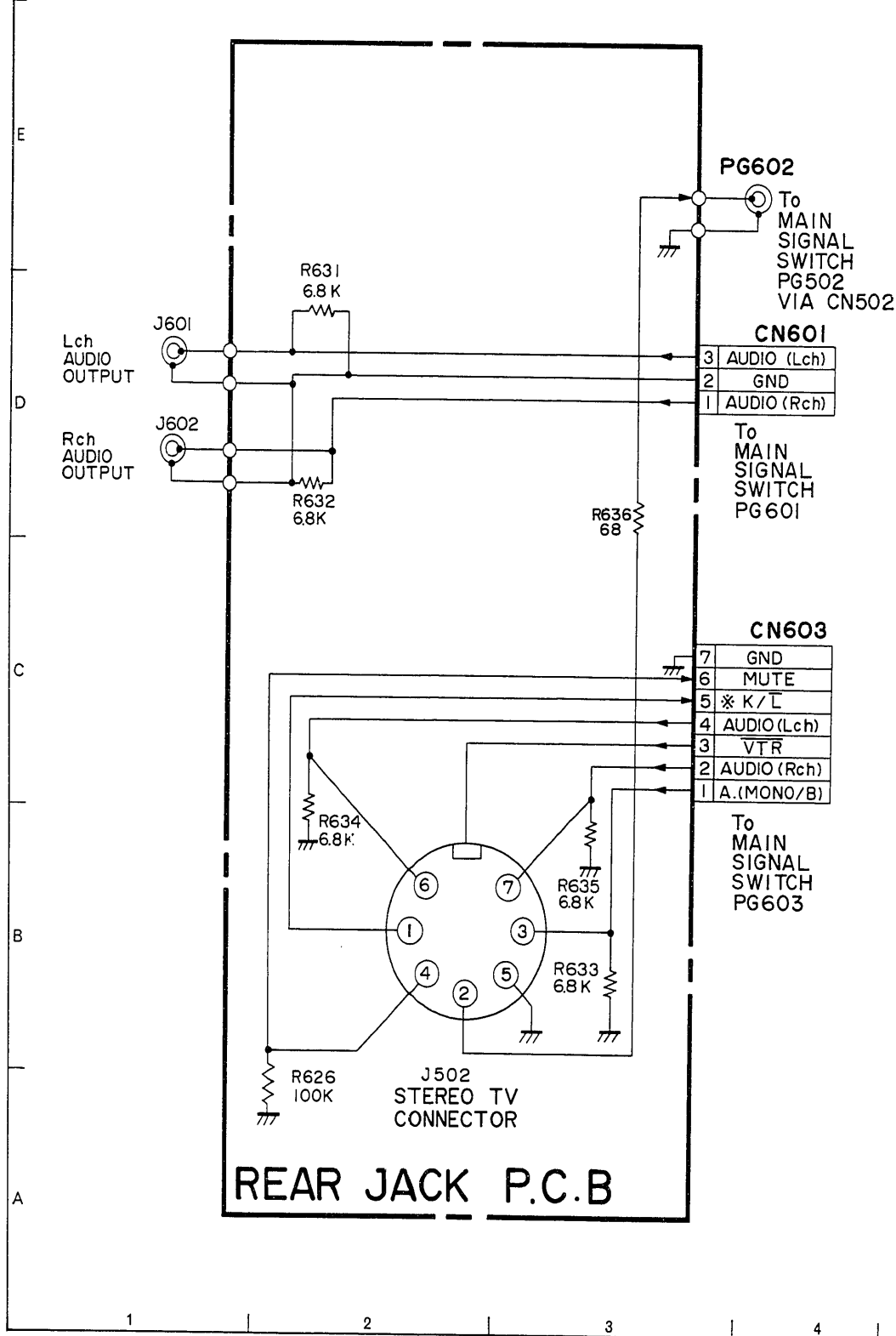


* ONE VOLTAGE : PB OR REC MODE.

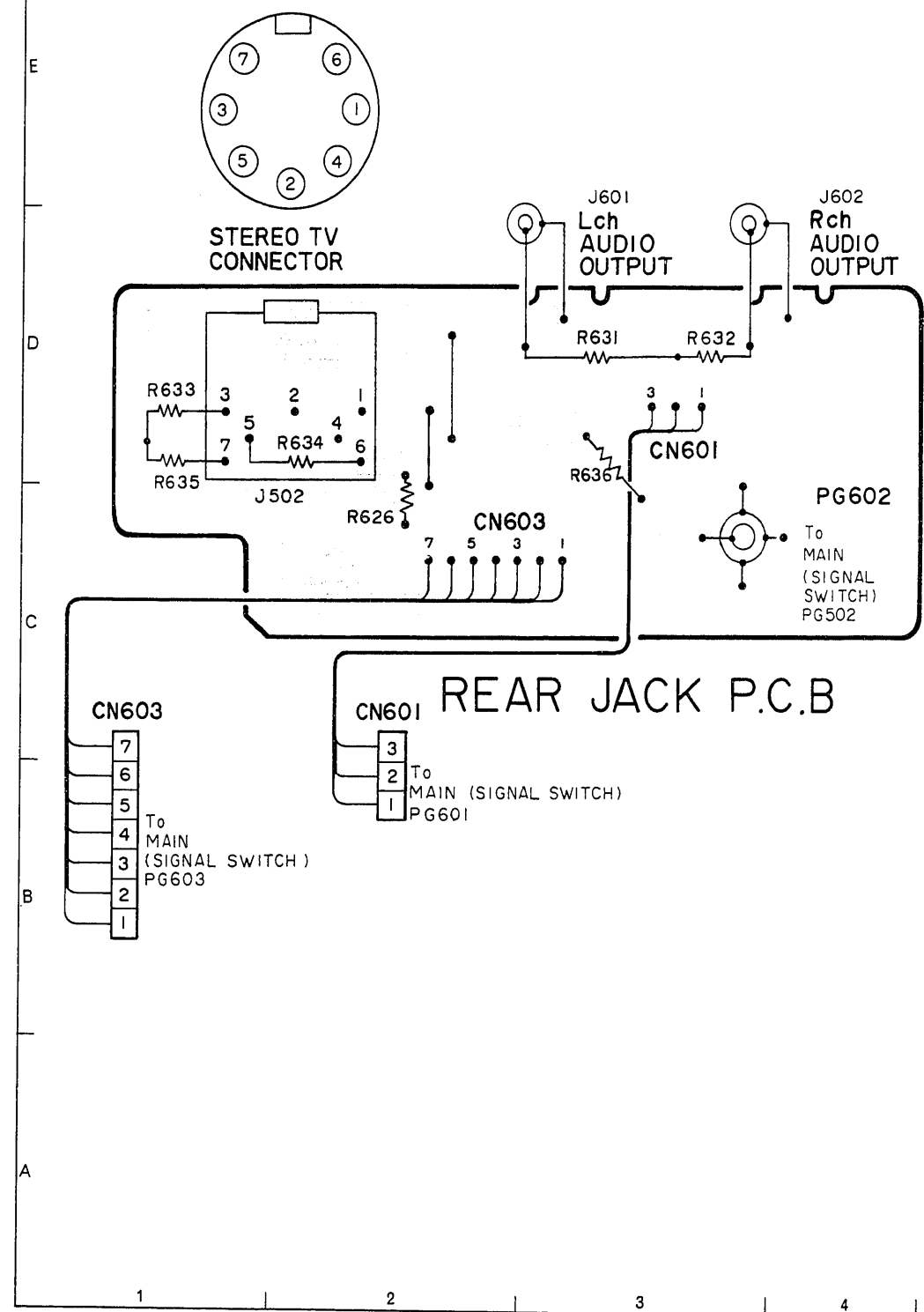
IF DEMODULATOR P.C.B



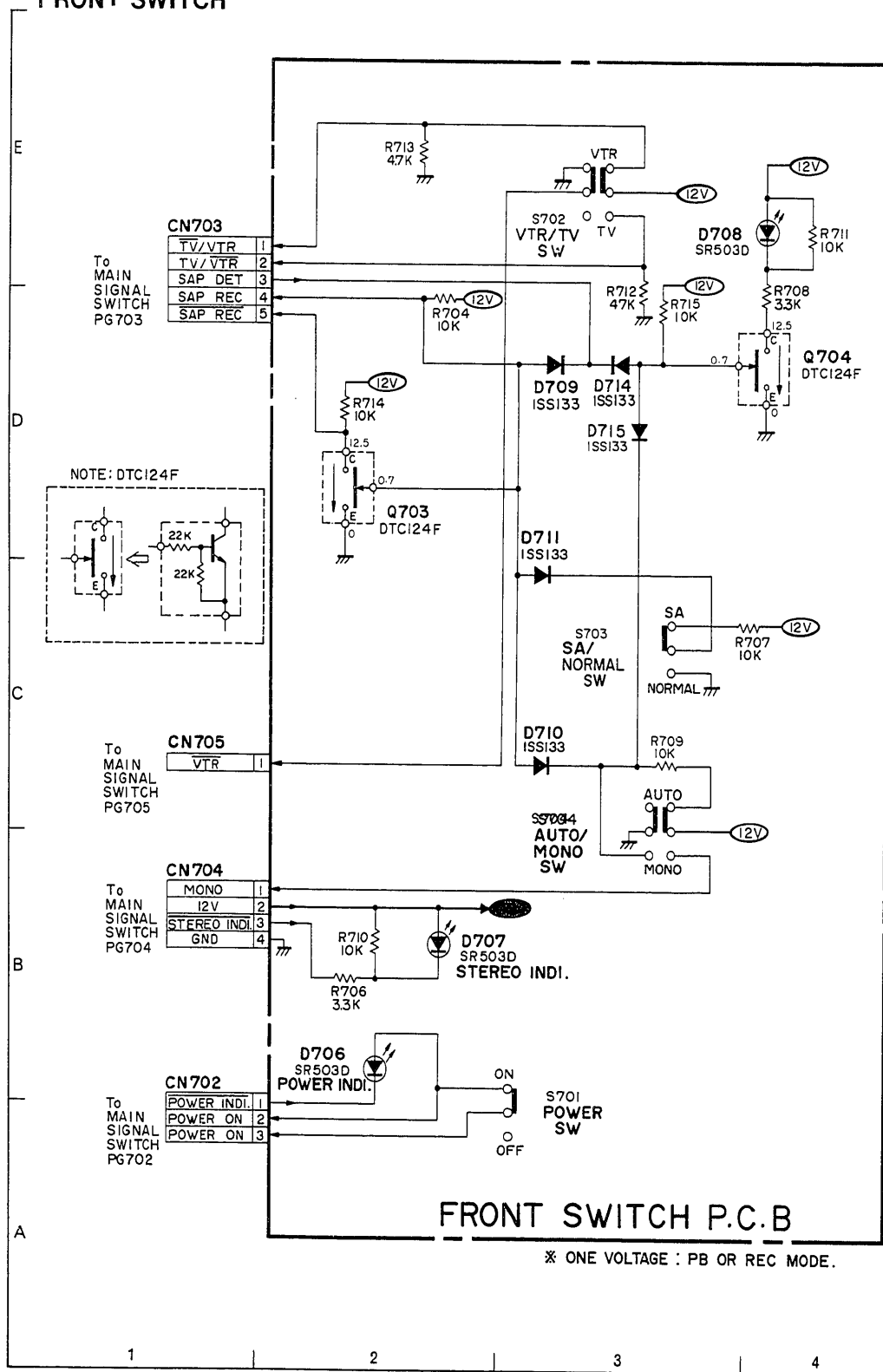
REAR JACKS

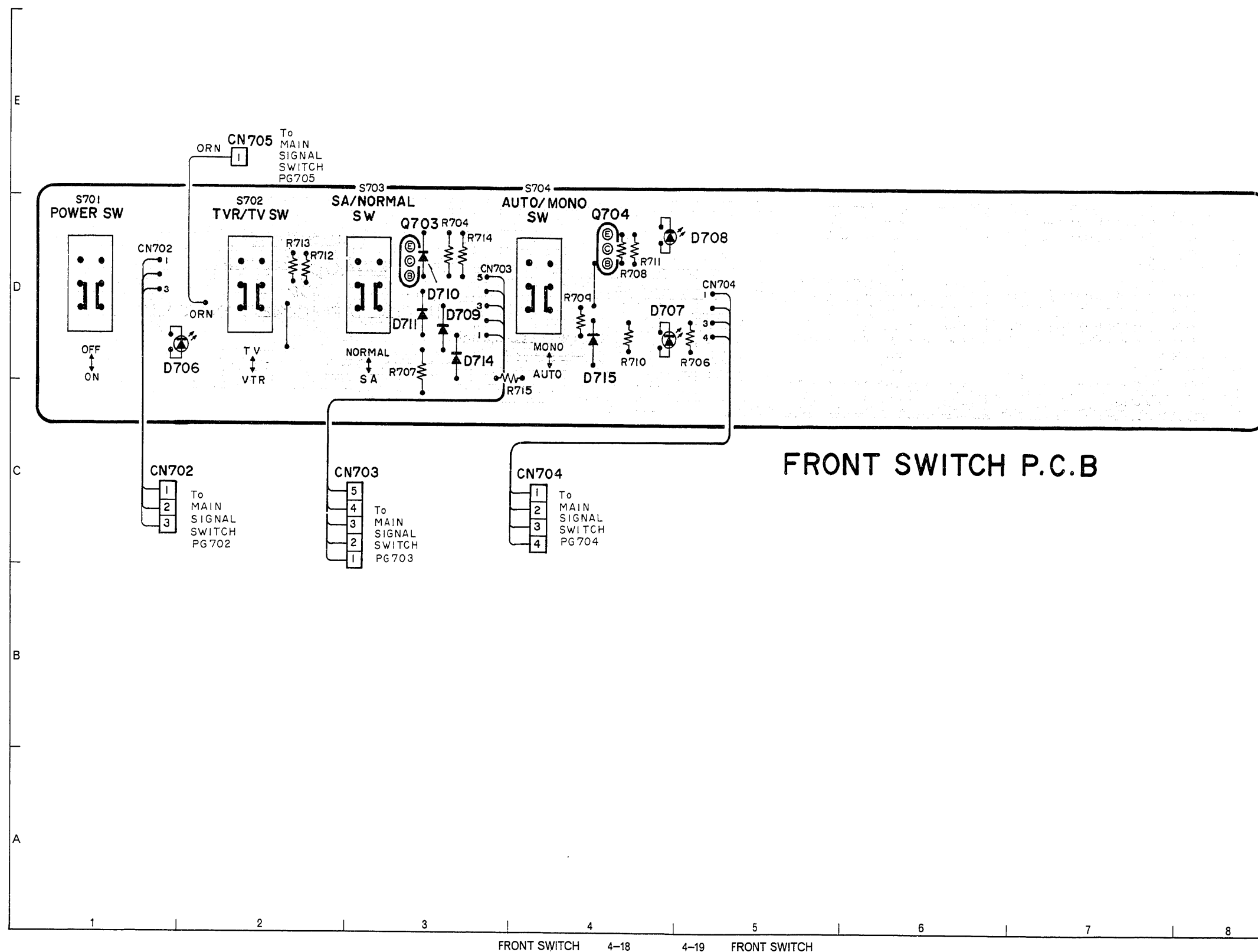


OUTSIDE VIEW



FRONT SWITCH





FRONT SWITCH REPLACEMENT PARTS LIST
ELECTRICAL PARTS / MECHANICAL PARTS

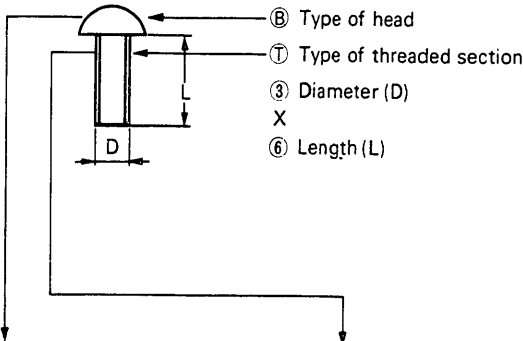
SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
CAPACITORS					
C 207	0268294	MYLAR 0.22MF +-5%	IC 111	5350601	IC NJM4558D
C 208	0268294	MYLAR 0.22MF +-5%	IC 112	5366011	IC TA7133P
C 221	0268295	MYLAR 0.47MF +-5%	IC 113	5350601	IC NJM4558D
C 407	0268294	MYLAR 0.22MF +-5%	IC 114	5355781	IC NJM2903S
C 408	0268294	MYLAR 0.22MF +-5%	IC 115	5366421	IC AN6291
C 421	0268295	MYLAR 0.47MF +-5%	IC 116	5350601	IC NJM4558D
RESISTORS					
RT 101	5007446	SEMI VARIABLE RESISTOR 4.7KOHM	IC 117	5359901	IC UPD4066C
RT 102	5007433	SEMI VARIABLE 2.2KOHM	IC 118	5359901	IC UPD4066C
RT 103	5007436	SEMI VARIABLE 22KOHM	IC 119	5359901	IC UPD4066C
RT 104	5007433	SEMI VARIABLE 2.2KOHM	IC 120	5359501	IC MPD4011C
RT 105	5007433	SEMI VARIABLE 2.2KOHM	IC 121	5359501	IC MPD4011C
RT 106	5007433	SEMI VARIABLE 2.2KOHM	IC 123	5359501	IC MPD4011C
RT 107	5007433	SEMI VARIABLE 2.2KOHM	Q 201	5321662	TRANSISTOR 2SC2021S
RT 108	5007436	SEMI VARIABLE 22KOHM	Q 202	5321662	TRANSISTOR 2SC2021S
RT 110	5007437	SEMI VARIABLE 47KOHM	Q 301	5321662	TRANSISTOR 2SC2021S
RT 111	5007438	SEMI VARIABLE 100KOHM	Q 302	5321662	TRANSISTOR 2SC2021S
RT 113	5007436	SEMI VARIABLE 22KOHM	Q 401	5321662	TRANSISTOR 2SC2021S
RT 114	5007434	SEMI VARIABLE 4.7KOHM	Q 402	5321662	TRANSISTOR 2SC2021S
SEMI-CONDUCTORS					
D 301	5339021	1SS133T	Q 502	5323561	TRANSISTOR DTC124F
D 302	5339021	1SS133T	Q 601	5321662	TRANSISTOR 2SC2021S
D 303	5339021	1SS133T	Q 602	5321662	TRANSISTOR 2SC2021S
D 304	5339021	1SS133T	Q 603	5321662	TRANSISTOR 2SC2021S
D 501	5331592	DIODE 1SS133	Q 604	5321662	TRANSISTOR 2SC2021S
D 502	5331592	DIODE 1SS133	Q 605	5321662	TRANSISTOR 2SC2021S
D 503	5331592	DIODE 1SS133	Q 701	5324011	TRANSISTOR 2SC1826
D 701	5339021	1SS133T	Q 702	5323561	TRANSISTOR DTC124F
D 702	5332192	DIODE ERB12-02	Q 703	5323561	TRANSISTOR DTC124F
D 703	5332192	DIODE ERB12-02	Q 704	5323561	TRANSISTOR DTC124F
D 704	5332192	DIODE ERB12-02	ZD 101	5331583	DIODE RD6.2E-B2
D 705	5332192	DIODE ERB12-02	ZD 701	5330531	ZENER DIODE SILICON HZ-12A 10MHZ 40 OHM
D 706	5380561	LED SR503D	TRANSFORMERS		
D 707	5380561	LED SR503D	L 101	5152337	CHOKE COIL 100UH
D 708	5380561	LED SR503D	L 104	5152337	CHOKE COIL 100UH
D 709	5339021	1SS133T	L 105	5152337	CHOKE COIL 100UH
D 710	5339021	1SS133T	L 106	5152337	CHOKE COIL 100UH
D 711	5339021	1SS133T	L 107	5152337	CHOKE COIL 100UH
D 712	5332192	DIODE ERB12-02	L 108	5152337	CHOKE COIL 100UH
D 713	5332192	DIODE ERB12-02	L 109	5152337	CHOKE COIL 100UH
D 714	5339021	1SS133T	L 110	5152337	CHOKE COIL 100UH
D 715	5339021	1SS133T	L 111	5152337	CHOKE COIL 100UH
D 801	5331292	DIODE 1SS85	L 113	5152337	CHOKE COIL 100UH
D 802	5331292	DIODE 1SS85	COILS		
D 803	5331292	DIODE 1SS85	L 114	5152337	CHOKE COIL 100UH
D 901	5331292	DIODE 1SS85	L 116	5152337	CHOKE COIL 100UH
D 902	5331292	DIODE 1SS85	L 117	5152337	CHOKE COIL 100UH
D 903	5331292	DIODE 1SS85	L 118	5152337	CHOKE COIL 100UH
IC 104	5359901	IC UPD4066C	L 119	5152337	CHOKE COIL 100UH
IC 105	5366431	IC HPC1235C	L 301	5120961	TRAP COIL
IC 106	5350601	IC NJM4558D	MISCELLANEOUS		
IC 107	5350601	IC NJM4558D	CP 101	5162832	LOWPASS FILTER
IC 108	5366421	IC AN6291	CP 102	5162831	LOWPASS FILTER
IC 109	5350601	IC NJM4558D	CP 103	5162831	LOWPASS FILTER
IC 110	5350601	IC NJM4558D	CP 301	5162901	BANDPASS FILTER
			CP 302	5162831	LOWPASS FILTER

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
MISCELLANEOUS					
F 701	5721402	FUSE 125V 630MA	S 701	5623573	SWITCH
J 601	5676443	PIN JACK	S 702	5623573	SWITCH
J 602	5676442	JACK	S 703	5623573	SWITCH
PG 501	5671533	JACK	S 704	5623573	SWITCH
PG 502	5671533	JACK			

CHAPTER 5
EXPLODED VIEW
AND
MECHANICAL REPLACEMENT PARTS LIST

SCREW CLASSIFICATION

Example: BT3 X 6



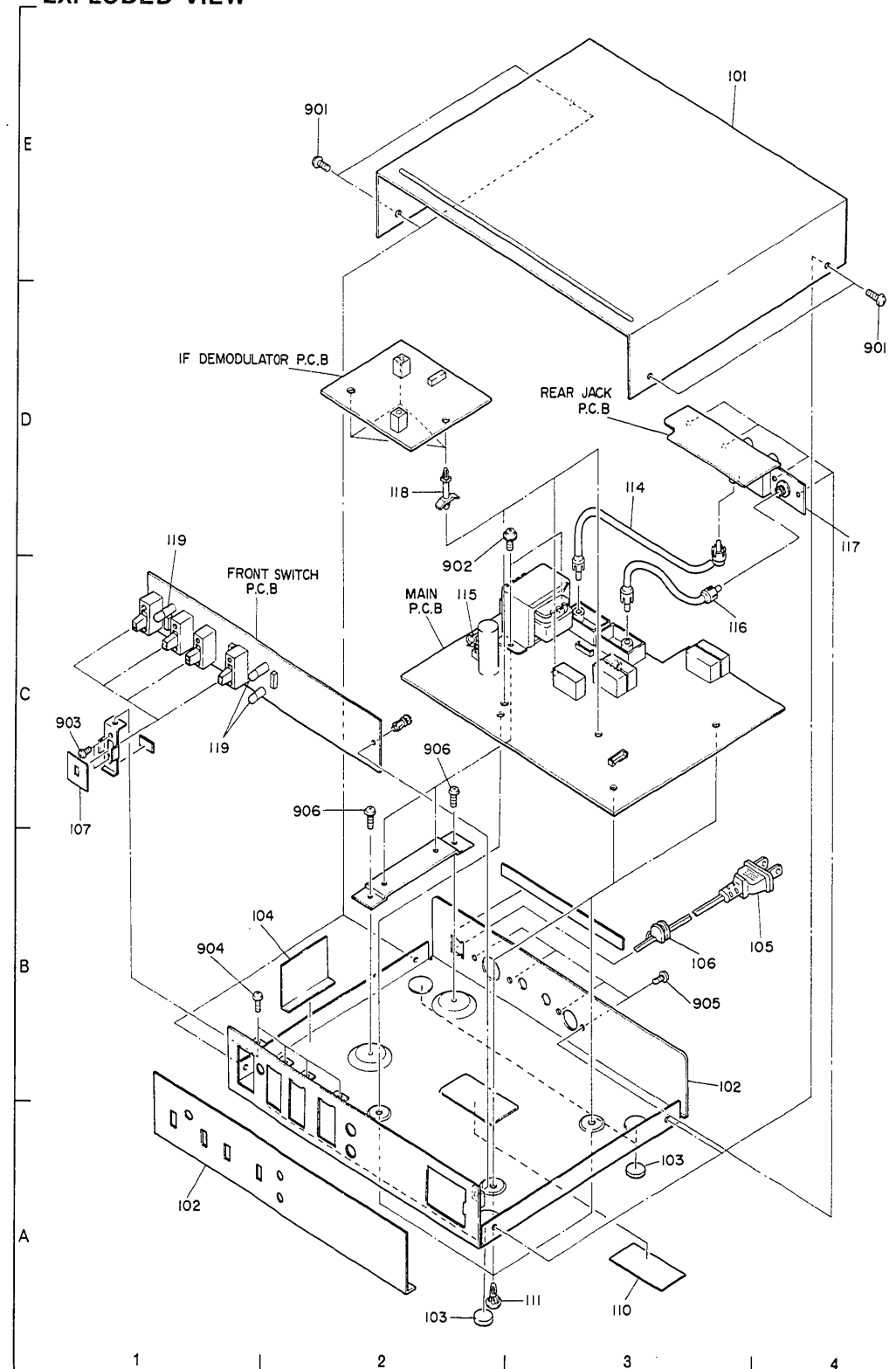
Abbreviation			Name			Shape		
No symbol	Brazier head		No symbol	Machine (clamps without tapping)		W	Washer	
P	Pan head		t	Tapping (clamps with tapping) Type 1		SW	Spring washer	
B	Binding head		T	Tapping (clamps with tapping) Type 2		LW	Locking washer	
O	Oval countersunk head		f	Forming tight (for metal)		E	E-ring	
F	Flat countersunk head		Note Since the forming tight screw tightens while self-tapping, machine screws can be replaced by tapping screws.			N	Nut	
						Note Internal dia is indicated for nuts and washers.		

LUBRICATION

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

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

EXPLODED VIEW



SYMBOL-NO	P-NO	DESCRIPTION
FOR FINAL ASSEMBLY		
101	6049671	TOP COVER
102	6001471	BOTTOM CASE
103	6572001	LEG
104	7685232	SPACER
105	5746492	POWER CORD
106	6794091	BUSHING
107	7381641	SWITCH PLATE
110	6890581	CARD SPACER
111	7392301	HOLDER
114	5855251	DIN CORD
115	5722211	FUSE HOLDER
116	5654471	DIN SOCKET
117	5672651	JACK
118	7392222	HOLDER
119	6872782	LED HOLDER
801	4648272	OPERATING GUIDE
901	8699408	BT BIND HEAD SCREW-3MMDX8MM (BLACK)
902	8661406	SCREW(3X6PW)
903	0741304	BIND SCREW-2.6MMDX4MM
904	8741405	SCREW - 3MMD X 5MM BIND
905	6714211	NYLON RIVET - 3MMD
906	8741405	SCREW - 3MMD X 5MM BIND
907	8744404	BINDING SCREW - 3MMD X 4MM
FOR ACCESSORIES		
	4648272	OPERATING GUIDE
	5747741	CONNECTOR CORD
	5896764	CABLE



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