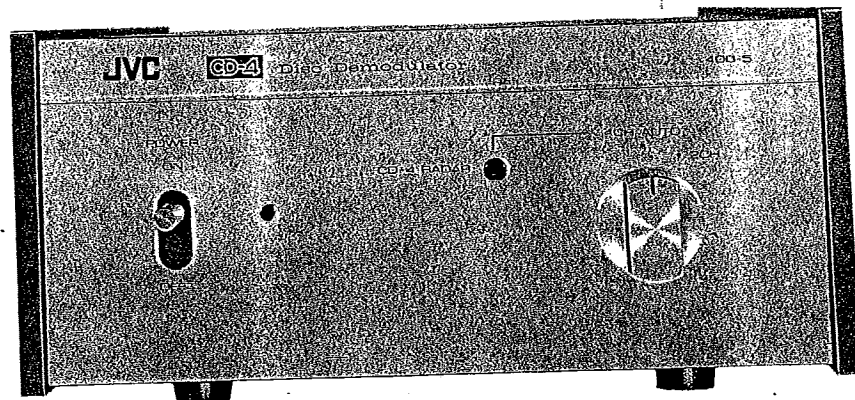


SERVICE MANUAL



MODEL 4DD-5

CD-4 DISC DEMODULATOR

DIMENSIONS : H 3-3/8", W 6-7/8", D 12-3/4" WEIGHT : 5 lbs.

SPECIFICATIONS

Type	: CD-4 disc demodulator
Semi-conductor	: 6 IC's 27 Transistors 6 FET's 23 Diodes
Frequency response	: 20Hz to 16,000Hz
Input level	: 1.0~5.0mV (at 1kHz) 1.0~7.0mV (at 30kHz)
Rating output level	: 300mV
Input impedance	: 100k Ω
Output impedance	: 5k Ω
Power supply Voltage	: AC 120V or AC 100/120/220/240V Selectable
Power consumption	: 8W
Fuse rating	: 0.5A

FRONT PANEL CONTROLS

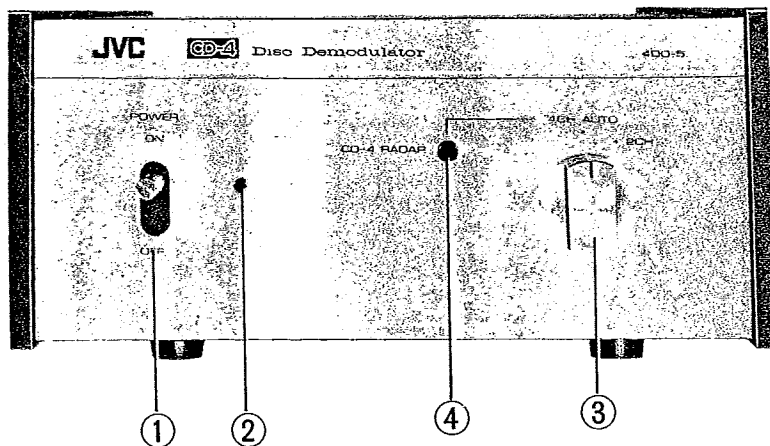


Fig. 1

- Power Switch ①

Switch up to switch the 4DD-5 on.

- Power Indicator ②

When the demodulator is switched ON this will glow red.

- Selector Switch ③

This selects the mode with which the demodulator will work.

4CH AUTO When it is in this position the demodulator will inspect the input signal and, if it is a CD-4 disc signal, it will demodulate it. In case of a 2 channel or matrix record, stereo 2 channel sound will be played back through 4 speaker.

2 CH The '2CH DIRECT OUT' switch on the rear panel is in the OFF position, the input signal will pass through the main channel of demodulator and go to 4CH OUT jack. However, when the '2CH DIRECT OUT' switch is in the ON position the input signal will go directly to the '2 CH DIRECT OUT' jacks.

- CD-4 Radar ④

When the demodulator is being used to demodulate a 4 channel, this light will glow red.

REAR PANEL CONNECTIONS AND CONTROLS

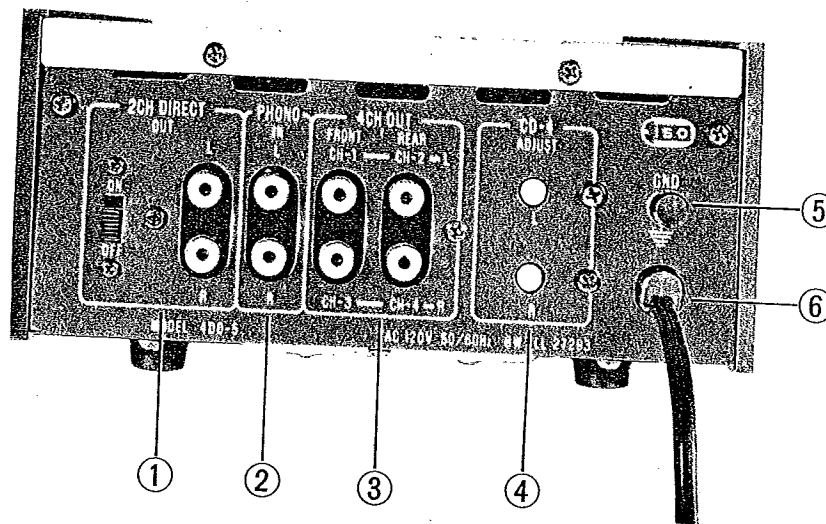


Fig. 2

- **2CH DIRECT OUT ①**
When the selector switch is in the '2CH' position and the '2CH DIRECT OUT' switch on the rear panel is in the ON position, the cartridge output from player go directly to the '2CH DIRECT OUT' jacks. They should be connected to the magnetic PHONO terminals of 2 channel amplifier. Normally these terminals would not be used. The '2CH DIRECT OUT' switch is in the OFF position the cartridge output pass through the main channels of the demodulator and go to the 4CH OUT jacks. 2 channel stereo sound can be heard from four speakers.
- **PHONO IN ②**
Connect here with the provided patch cords to the output of the player fitted with a 4 channel cartridge. The upper jack is left channel and the lower jack is right channel.
- **4CH OUT ③**
Four jacks for connection to AUX or other high level input on a 4 channel amplifier. The channels are numbered and care must be taken that they are connected correctly. The upper jacks are for the left channels and the lower jacks for the right channels. jacks on the left are for the front channels and the jacks on the right are for the rear channels.
- **CD-4 ADJUST ④**
These screws are to adjust the channel balance between the front and rear channels. The upper control is for the left channels, the lower control is for the right channels. Their use is described in the section "Adjustment" (page. 7)
- **GROUND Terminal ⑤**
A one touch terminal for connection to the ground terminal of the record player or amplifier.
- **Power Cord ⑥**
Connect this to a convenient AC outlet.

BLOCK DIAGRAM OF DEMODULATOR SECTION OF THE 4DD-5

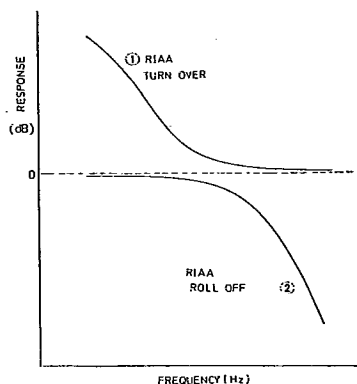


Fig. 3

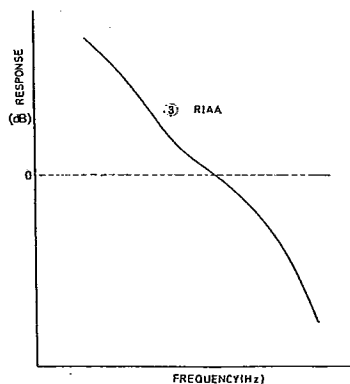


Fig. 4

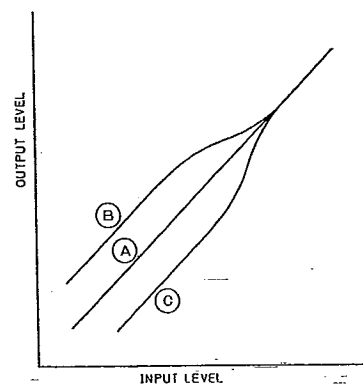


Fig. 5

In the block diagram Fig. 6, the player output enters the equalizer (1/2) (IC101 — 102). This equalizer has a characteristic shown by curve (1) of Fig. 3, which is an RIAA standard turnover curve. On the other hand, the equalizer (2/2) consisting of IC103 — 104 has an equalization curve corresponding to the RIAA roll-off characteristic, as shown by curve (2) of Fig. 3. In conjunction these two equalizers give the complete RIAA equalization shown by curve (3) of Fig. 4. Therefore, the sum signal mentioned in the previous section takes the complete RIAA curve transformation before entering the matrix circuit and the carrier signal goes to the demodulator circuit block transformed by the RIAA turnover curve. F101 (low-pass filter) cuts off the difference signal at 15kHz. The modulated signal is detected by PLL (IC201, 202).

The difference signal from the PLL is transmitted to the muting circuit (X205 — 206), which is adapted to be switched so that it is on line only when a CD-4 record is being played. This circuit is controlled by the muting circuit (X211 — 217). When any record other than a CD-4 record is played, this muting circuit is switched off.

Then it passes through the low-pass filter F201 which removes the carrier component to give an audio signal (difference signal), which is then transmitted to the FM-PM compensation circuit (X301, 302). This circuit equalizes the difference signal which has been phasemodulated in the recording system for the purpose of improving the S/N ratio.

The expander which the signal then enters must be explained together with the compressor in the recording system. While ordinary amplifiers have linear input and output characteristic shown by curve A of Fig. 5, the CD-4 record has been recorded with a compressed characteristic shown by curve B of Fig. 5. As apparent from this diagram a signal whose input level is lower than a determined value is controlled so that an increased gain (recording level) is given to it. On the contrary, the expander functions to decrease the gain of a low level input, as understood from curve C of Fig. 5. The signal passes through the compressor in the recording system and through the expander in the playback system, thereby ensuring a linear playback characteristic.

The greater part of noise heard from the CD-4 record does not come from the source, but originates in the material of the record. Therefore, it can be greatly reduced by cutting back the playback gain of low level signals. This ensures an improvement in S/N ratio.

In the 4DD-5 the expander (X303, 304) is controlled by two control circuits, one (X305 — 308) covering the mid-range frequencies and the other (X309 — 312) handling the high frequencies.

The difference signal from the expander is transmitted to the matrix circuit where it is added to or subtracted from the sum signal. The channel separation is controlled by adjusting the sum signal level by means of VR1 or VR2. While the sum signal level varies with the output of the cartridge or stylus, the difference signal level is determined by the degree of FM and PM modulation in the recording system. Therefore, the separation has only to be adjusted when the cartridge or stylus is replaced with a new one. This ensures that output of this demodulator remains constant even after the replacement of the cartridge or stylus.

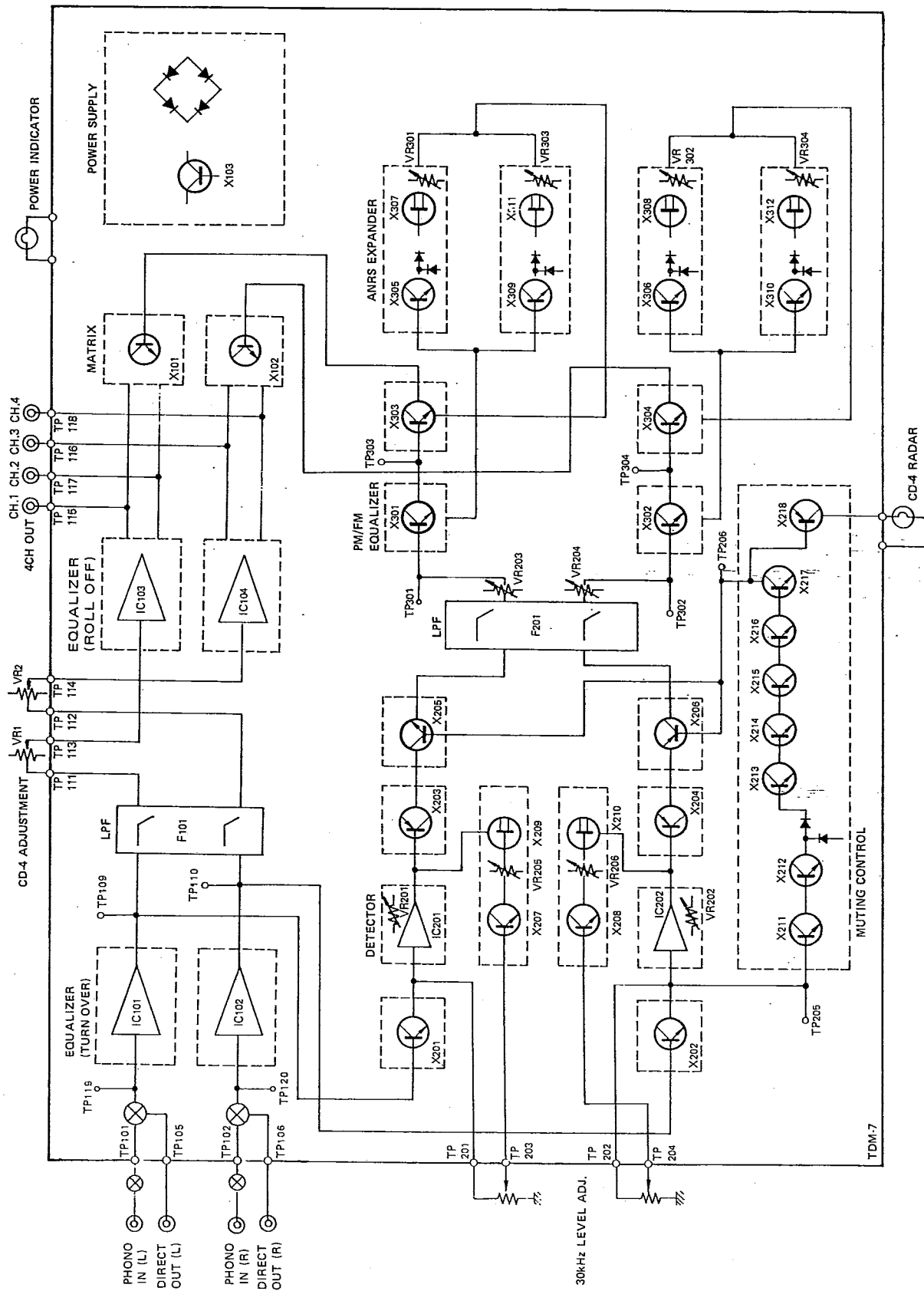


Fig. 6

ADJUSTMENT

30kHz level adjustment

The 30kHz sub-channel carrier output differs between cartridges and this screw on the bottom panel is to adjust the level. This adjustment should be made while playing the CD-4 Demodulator Adjustment Record ; 4DE-202 supplied with this demodulator.

Tune to clockwise the '30kHz LEVEL' screw until the stop position.

On the inside band of CD-4 Demodulator Adjustment Record there is a 400Hz sub channel signal (4kHz deviation). If the signal is distorted, the screw turned counter-clockwise until a position is reached where distorted sound is not heard. Although distorted sound may still be heard, it might be acceptable in sound quality when playing CD-4 music records with the setting remaining in the 0 position.

If the sound is still unsatisfactory with CD-4 music records, the cartridge is then considered inadequate for CD-4 record reproduction.

CD-4 Adjustment

These adjustments should be made while playing Band 1 and Band 2 of the record 4DE-202.

There is a passage of adjustment signals, Band 1 for left channels, and then for the right channels. There are a warbling note and while this passage is playing the adjustment should be made.

1. Lower the volume of the front (CH-1, CH-3) speakers so that sound is only heard from rear (CH-2, CH-4) speakers.
2. Band 1. The adjustment of the left channel is done first. Tune the upper control (Fig. 8) of CD-4 ADJUST on the rear panel so that the volume of the rear left is as low as possible.
3. Band 2. The adjustment of the right channel is done next, in the same way, by turning the lower control to minimize the volume of the rear right.



Fig. 7

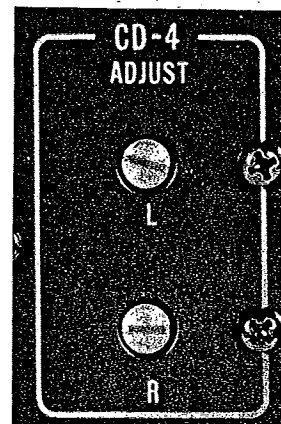


Fig. 8

REMOVAL OF TOP COVER

1. Loosen 2 screws ① from the Top Cover.
2. Slide the Top Cover rearwards.

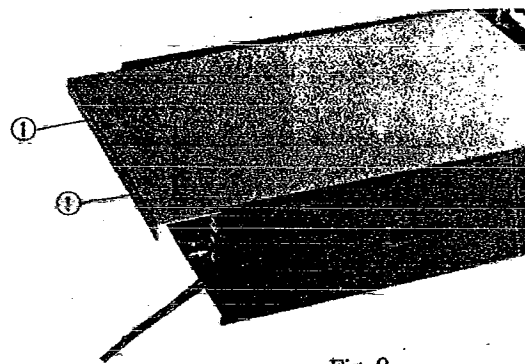


Fig. 9

REMOVAL OF SIDE BOARDS

3. Loosen 2 screws ② and bracket ③ from the side Boards.
4. Loosen 2 screws ④ from the Rear panel.
5. Loosen 2 screws ⑤ from the Front panel.
6. Loosen 6 screws ⑥ from the Bottom plate

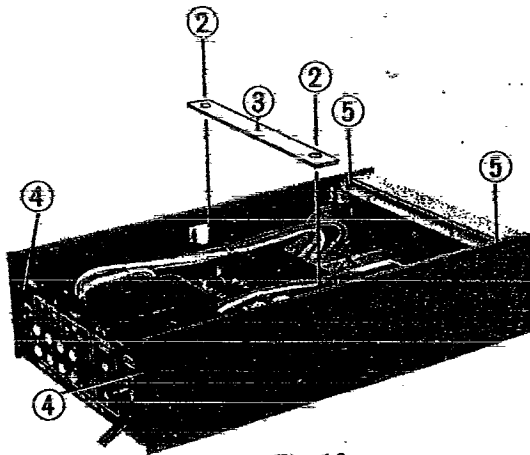


Fig. 10

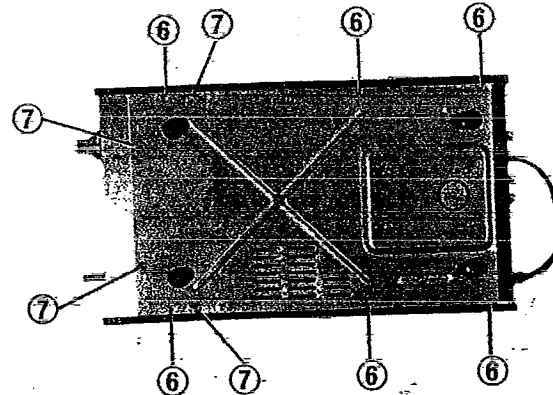


Fig. 11

REMOVAL OF BOTTOM PLATE

7. Loosen 4 screws ⑦ from the Bottom plate.

Parts Number of Screws

Dwg. No.	Parts No.	Parts Name	Q'ty
1	SBSB3008M	Tapping Screw	2
2	STSA3010N	Tapping Screw	2
4	STSA3010M	Tapping Screw	2
5	STSA3010N	Tapping Screw	2
6	STSA3010N	Tapping Screw	6
7	SBSB3008N	Tapping Screw	4

MAIN PARTS ARRANGEMENT

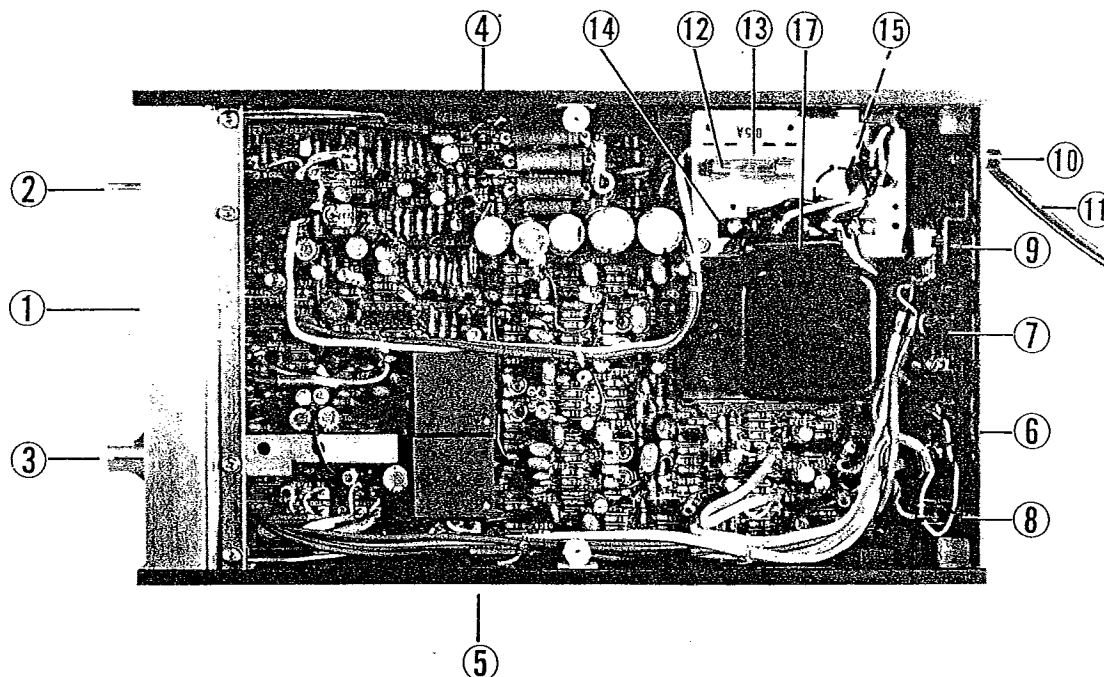


Fig. 12

Dwg. No.	Parts No.	Parts Name	Description
1	E33336-004	Front Panel Ass'y	(LEFT) (RIGHT)
2	QSU1120-005	Lever Switch	
3	E48233-002	Select Knob	(JVC) (0.5A) (JVC)
4	E33340-003	Side Board Ass'y	
5	E33340-004	"	(JVC) (Europe) C3
6	E33346-005	Rear Panel	
7	E03043-80	Pin Jack Ass'y	
8	QSS6224-001	Slide Switch	
9	E03415-003	Volume	
10	E04069-001S	Push Terminal	
11	Q03056-14	Power Cord	
12	QMF61M2-R5U	Fuse	
13	Q30218-002	Fuse Board Ass'y	
14	E46301-001	Terminal Board	
15	E03504-003	Volume	
16	E03164-13B	Power Trans.	
17	E03164-14	Power Trans.	
	QFH53AM-103	Metalized Mylar Capacitor	

CIRCUIT BOARD REPAIR

After removing the Top Cover, Side Boards, and Bottom Plate, the circuit board should be stood as shown by Fig. 13

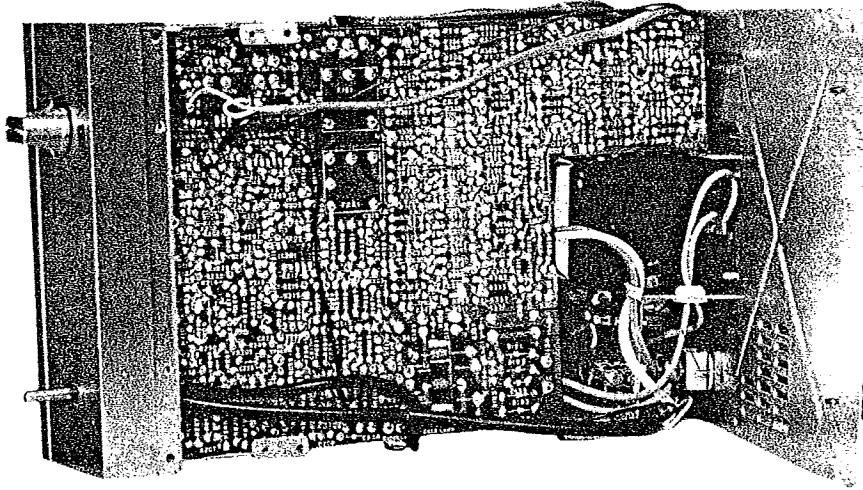


Fig. 13

EXPLODED VIEW OF REAR PANEL PARTS

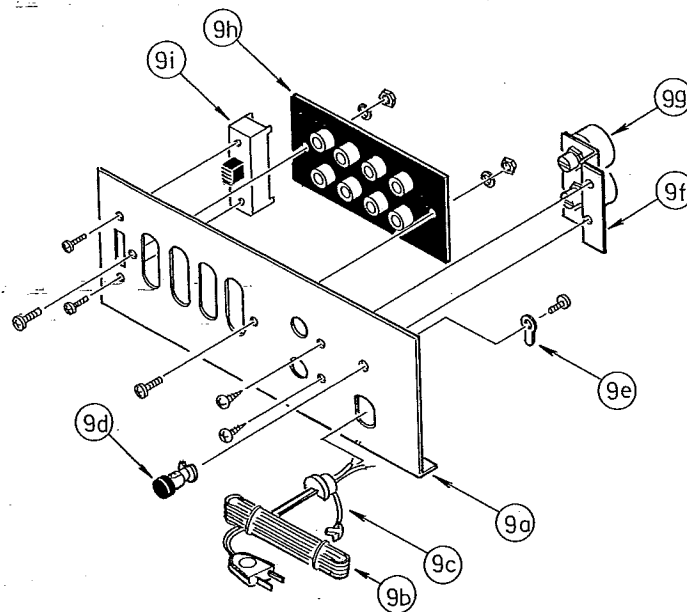


Fig. 14

Dwg. No.	Parts No.	Parts Name	Description
9a	E33346-005	Rear Panel	(USA)
9b	Q03056-14	Power Cord	(USA)
9c	E31704-001	Cord Stopper	(USA)
9d	E04069-001S	Push Terminal	
9e	52868-3	Earth Lag	
9f	E48230-001	Volume Bracket	
9g	E03415-003	Volume	
9h	E03043-80	Pin Jack Ass'y	
9i	QSS6244-001	Slide Switch	

EXPLODED VIEW OF FRONT BRACKET

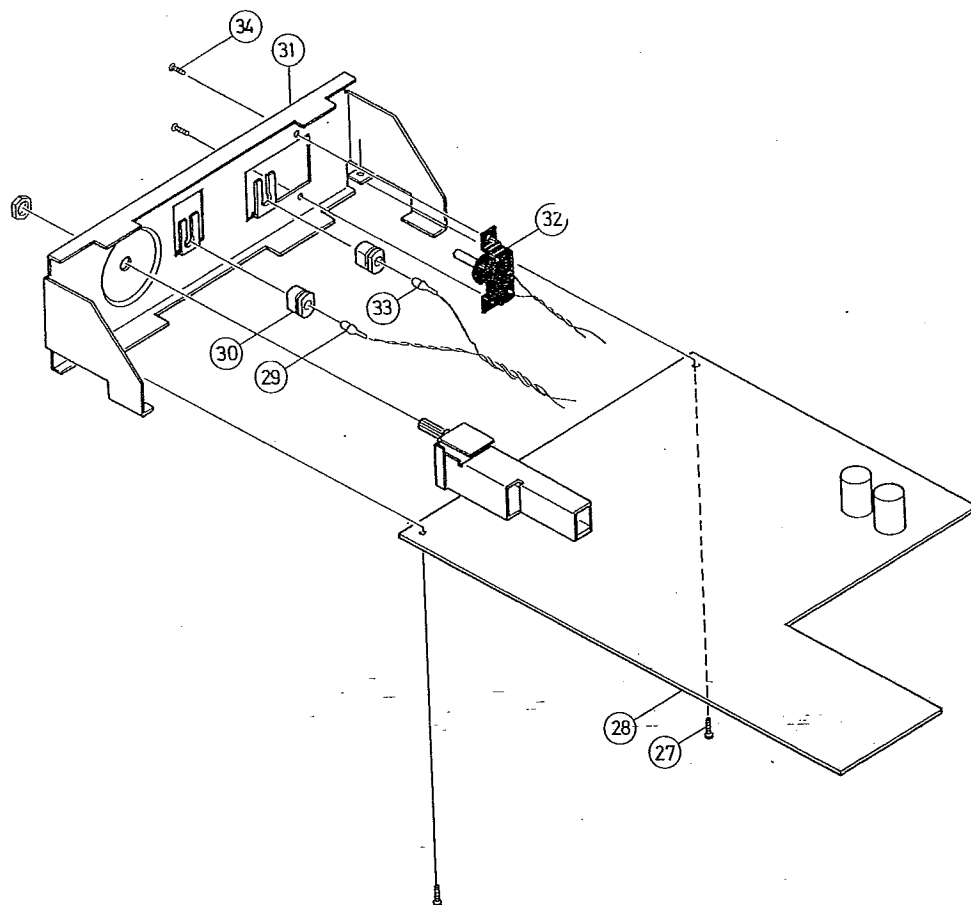


Fig. 15

Dwg. No.	Parts No.	Parts Name	Description
27	SBSB3008N	Tapping Screw	6V 25mA
28	TDM-7	Circuit Board Ass'y	
29	QLP3104-101	Mini Lamp	
30	E46029-001	Rubber Bushing	
31	E33339-001	Front Bracket	(USA)
32	QSU1120-005	Lever Switch	6V 35mA
33	QLP3104-102	Mini Lamp	
34	SSSP3008NS	Screw	

CIRCUIT BOARD WIRING

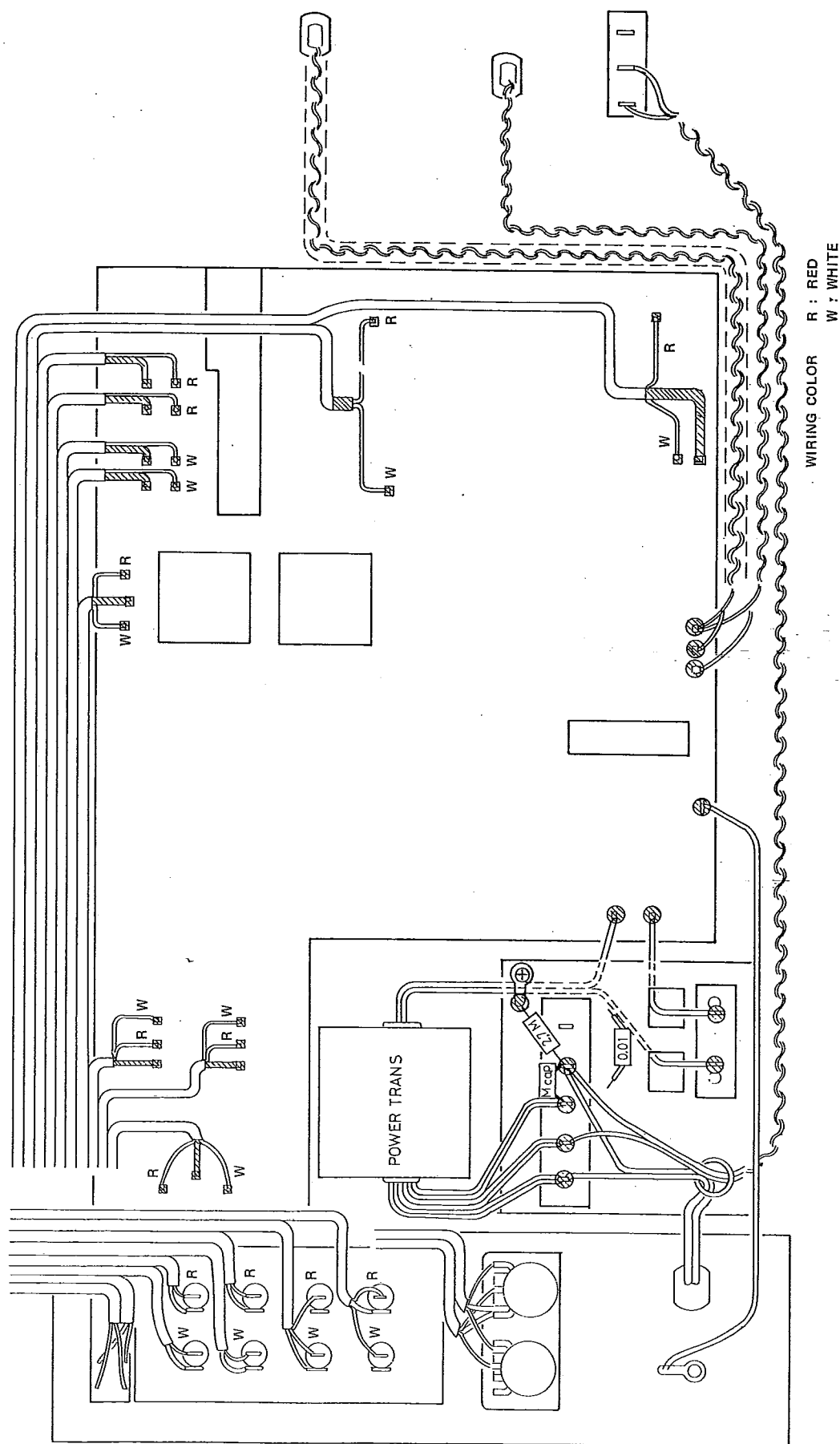
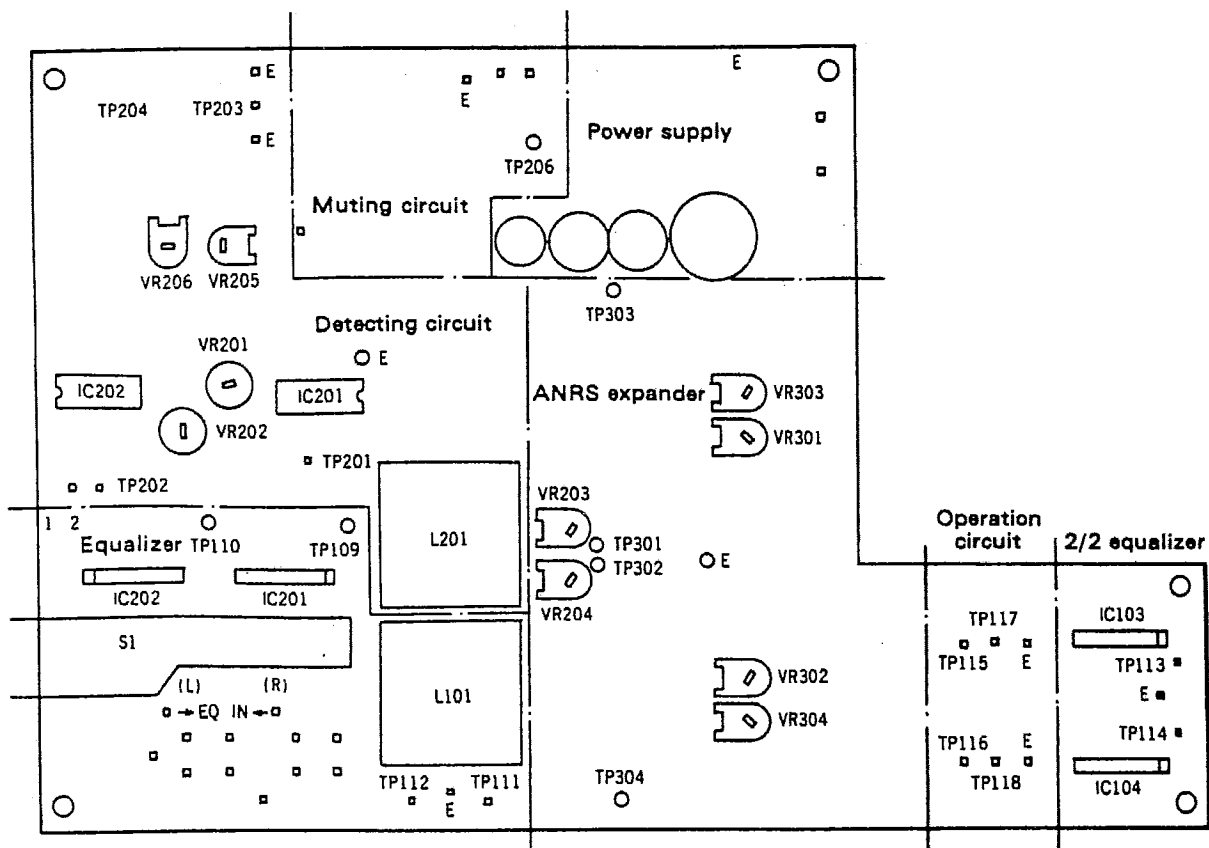


Fig. 19

Test Point Locations



This image shows all test points and adjustment points that are required for modifying and setting up the demodulator, please refer to the service manual for full schematic information.

CIRCUIT BOARD WIRING

THE LIST OF TDM-7 CIRCUIT BOARD

No.	Parts No.	Parts Name	Description
1	TDM-7	Circuit Board Ass'y	
	Equalizer (1/2) section		
2	TA7122P-B	IC (I.P.)	IC101,102 (Toshiba)
3	E03137-2.2	Tantal E. Capacitor	C101,102 (2.2 μ F/25V)
4	Q03104-100	Electrolytic Capacitor	C107,108 (100 μ V/6V)
5	Q03110-50	"	C103,104 (47 μ F/25V)
6	Q03110-10	"	C115,116 (10 μ F/25V)
7	E03427-003	Low Pass Filter	F101
	Equalizer (2/2) section		
8	TA7122P-A or B or C	IC	IC103,104 (Toshiba)
9	QEB41EM-224	Low Leak Current Capacitor	C117,118 (0.22 μ F/25V)
10	Q03104-30	Electrolytic Capacitor	C121,122 (33 μ F/6V)
11	Q03110-3	"	C123,124 (3.3 μ F/25V)
	Matrix section		
12	2SC458LGC	Silicon Transistor	X101,102 (Hitachi)
13	Q03110-4.7	Electrolytic Capacitor	C127~129 (4.7 μ F/25V)
14	Q03112-1	"	C131,132 (1 μ F/50V)
	Detector section		
15	2SC711F	Silicon Transistor	X201,202,207,208 (Mitsubishi)
16	CD-894	IC (DIP)	IC201,202
17	2SA628E	Silicon Transistor	X203~206 (mitsubishi)
18	2SK30Y	F.E.T.	X209,210 (Toshiba)
19	1S990	Silicon Diode	S201~205 (J.R.C.)
20	E0771-7	Zener Diode (ZB1-12)	D206 (Fuji)
21	E03427-003	Low Pass Filter	F201
22	E03511-222	Variable Resistor	VR201,202
23	QVP8A0B-014	"	VR205,206
24	E03137-2.2	Tantal E.Capacitor	C219,220
25	QEB41CM-106	Low Leak Current Capacitor	C229,230 (10 μ F/16V)
26	Q03108-10	Electrolytic Capacitor	C213 (10 μ F/16V)
27	Q03112-0.5	"	C225,226,233 (0.47 μ F/50V)
28	Q03112-1	"	C209,210,217,218 (1 μ F/50V)
	Muting section		
29	2SC711E	Silicon Transistor	X211~217 (Mitsubishi)
30	2SA628F	"	X218 (")
31	1S990	Silicon Diode	D207,208 (J.R.C.)
32	QEB41EM-684	Low Leak Current Capacitor	C235 (0.68 μ F/25V)
33	Q03112-0.5	Electrolytic Capacitor	C233 (0.47 μ F/50V)
34	Q03110-10	"	C236 (10 μ F/25V)
	PM/FM Equalizer section		
35	2SC458LGC	Silicon Transistor	X301,302 (Hitachi)
36	Q03112-1	Electrolytic Capacitor	C301,302 (1 μ F/50V)
37	QVP8A0B-053	Variable Resistor	VR203-204
	ANRS Expander section		
38	2SC458LGC	Silicon Transistor	X303,304 (Hitachi)
39	2SC711F	"	X305,306,309,310 (Mitsubishi)
40	2SK40-1	F.E.T.	X311,312 (Hitachi)
41	2SK40-2	"	X307,308 (Hitachi)
42	1S188FM	Silicon Diode	D301~304 (Sanyo)
43	E0771-7	Zener Diode (ZB1-12)	D309 (Fuji)
44	E0747-17	Ferri Inductor	L301,302 (100mH)
45	QEB41CM-224	Low Leak Current Capacitor	C325,326 (0.22 μ F/16V)
46	QEB41CM-684	"	C311,312 (0.68 μ F/16V)
47	Q03104-30	Electrolytic Capacitor	C329,330 (33 μ F/6V)
48	Q03106-10	"	C343 (10 μ F/10V)
49	Q03110-4.7	"	C301,302,341,342 (4.7 μ F/25V)

No.	Parts No.	Parts Name	Description
	Power Supply section		
50	FR2-02	Silicon Diode	D101~104 (Fuji)
51	2SC853L	Silicon Transistor	X103 (NEC)
52	E0771-7	Zener Diode (ZB1-12)	D105,106 (Fuji)
53	Q03112-500	Electrolytic Capacitor	C137 (470 μ F/50V)
54	Q03112-100	"	C133,135 (100 μ F/50V)
55	Q03138-200	"	C134 (220 μ F/35V)
56	Q04772-120	Oxide Metal Fixed Resistor	R154 (2W)
57	Q04774-270	"	R155 (3W)
58	Q04774-820	"	R152 (3W)
59	Q04774-1.5K	"	R151 (3W)
60	Q04770-1.2K	"	R153 (1W)
61	04090-1.2K	Composition Resistor	R156 (1/4W)
62	04091-270	"	R273 (1/2W)
63	04091-680	"	R367 (1/2W)
	Selector Switch section		
64	QSR4682-201	Slide Rotary Switch	S1

■ Carbon Resistor's Parts Number

Q04800

For Example Q04800-1K = Carbon Resistor 1k Ω (1/4W)

■ Mylar Film Capacitor Parts Number

Q03244

For Example Q03244-103 = Mylar Film Capacitor 0.01 μ F

■ Ceramic Capacitor Parts Number

Q04051

For Example Q04051-330 = Ceramic Capacitor 330PF

ACCESSORIES

Parts No.	Parts Name	Q'ty
E64207-001	Envelope	1
E30580-356A	Instruction Book	1
E30580-403A	Instruction sheel	1
4DE-202	CD-4 Demodulator Adjustment Record	1
E33210-003	Signal Cord Ass'y (L,R)	1
E03480-001	Warranty Card	1
BT-20002	Service Station Card	1
BT-10001	Fact Tag	1
E32907-057		1

4CH OUT CH 1
4CH OUT CH 2
DIRECT OUT (L)
PHONO IN (L)
PHONO IN (R)
DIRECT OUT (R)
4CH OUT CH 3
4CH OUT CH 4

30kHz LEVEL ADJUST

IC 201, 202
CD-894
PIN NO.
TOP VIEW

IC 101~104
TA7122P

Note:
1. Voltages shown are those when the 4DD-5 is demodulating a CD-4 record.
2. Waveforms in the difference signal channels were taken when -50dBs (1kHz or 1.3kHz modulation) was applied as the input.
3. Resistors are 1/4W, 10% carbon resistors unless otherwise specified.

S1a-f SELECT SWITCH
S2 POWER SWITCH
S3a-f DIRECT OUT SWITCH

1. Voltages shown are those when the 4DD-5 is demodulating a CD-4 record.
2. Waveforms in the difference signal channels were taken when -50dBs (1kHz or 1.3kHz modulation) was applied as the input.
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S3a-f DIRECT OUT SWITCH