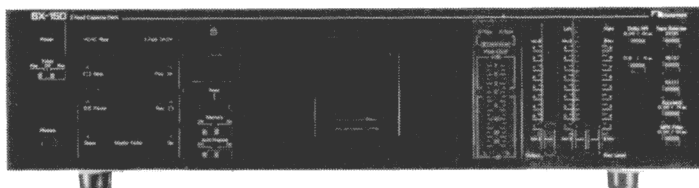




Service Manual

Nakamichi BX-150 BX-150E

2 Head Cassette Deck



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1. GENERAL

1.1. Voltage Selector

Voltage selector is installed on the rear panel for Other version of the Nakamichi BX-150.
This voltage selector can select either 120 V or 220-240 V at customer's disposal.

1.2. Packing Materials and Owner's Manual

Part No.	Description	Q'ty
0F03738A	Carton Box BX-150 (Silver)	1
0F03739A	Carton Box BX-150 (Black)	1
0F03752A	Carton Box BX-150E (Silver)	1
0F03753A	Carton Box BX-150E (Black)	1
0F03674B	Packing	2
0D04313A	Owner's Manual (BX-150 (U.S.A., Canada & Australia) & BX-150E (UK))	1
0D04314A	Owner's Manual (BX-150 (Japan))	1
0D04318A	Owner's Manual (BX-150 (Others) & BX-150E (220V Class 2))	1

1.3. Serial Number

The BX-150 has two versions, Silver and Black.

In the service manual, serial numbers of these versions are identified as follows:

Silver version: A320xxxxx

Black version: A321xxxxx

However, the actual serial number on the serial number plate of the BX-150 is indicated as A320.1xxxxx.

The serial number begins with A320.101001.

2. MECHANICAL ADJUSTMENTS

2.1. Tape Guide Height Check for Record/Playback Head and Erase Head

With use of an M-300 produced by Information Terminals, tape guide height check for the Record/Playback and Erase Heads shall be made, wherein a small block shall be pushed straight down to the base while in use of the M-300. Refer to Fig. 2.1.

- (1) **Record/Playback Head Tape Guide Height**
 - (a) Load the base of the M-300 carefully, then set the cassette deck in Play mode.
 - (b) Place the small block of the M-300 on the base.
 - (c) Slide the small block against the tape guide of the Record/Playback Head, and check to insure that the block is accepted by the tape guide.
 - (d) If not, loosen the screw and insert a shim (either 30 μm (OC80048A), 60 μm (OC80038A), or 100 μm (OC80039A)) to raise the Record/Playback Head, then tighten and apply a quantity of lock tight paint to the screw.
- (2) **Erase Head Tape Guide Height**
 - (a) Load the base of the M-300 carefully, then set the cassette deck in Play mode.
 - (b) Place the small block of the M-300 on the base.
 - (c) Slide the small block against the tape guide of the Erase Head, and check whether the block is accepted by the tape guide.

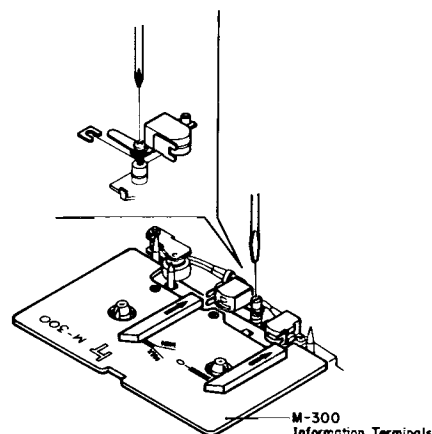


Fig. 2.1

2.2. Head Base Stroke Check

Refer to Fig. 2.2.

- (1) Load the base of the M-300 carefully, then push the base toward the Record/Playback Head to eliminate the clearance between the reference pin and the base.
- (2) Set the cassette deck in Play mode.
- (3) Place the small block of the M-300 on the base.
- (4) Contact the small block with the Record/Playback Head surface and the Erase Head surface, and check whether the end of the small block is located within the specified tolerance as shown in the figure.

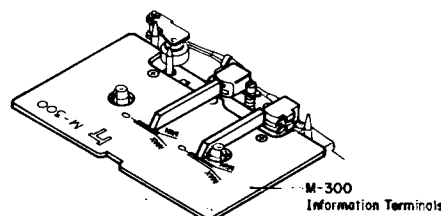


Fig. 2.2

2.3. Record/Playback Azimuth Alignment and Height Check

Refer to Fig. 2.1.

- (1) Connect a VTVM to the Output Jacks.
- (2) Load a 15 kHz Azimuth Tape (DA09004B), then set the cassette deck in Play mode.
- (3) Turn the Azimuth Alignment Screw until the outputs of both channels become maximum.
- (4) Load a 1 kHz Track Alignment Tape (DA09007B), then set the cassette deck in Play mode.
- (5) Check to insure that the readings of both channels on the VTVM are below -25 dB. If not, replacement of the Record/Playback Head will be required.
- (6) Apply a quantity of lock tight paint to the Azimuth Alignment Screw.

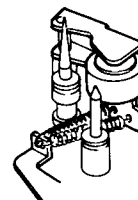


Fig. 2.3

2.4. Pressure Adjustment of Pressure Roller

Refer to Fig. 2.3.

- (1) In Play mode, measure the torque of the Pressure Roller and check whether the torque is in a range of 320 $\pm$ 50 g-cm.
- (2) If torque is out of the range, correct it by changing the installation point of the Pressure Roller Spring.

2.5. Tape Travelling Check

Load the Tape Travelling Cassette (DA09027B), then set the cassette deck in Play mode and check the following:

- (1) After more than 2 seconds, the fluctuation of the tape travelling on the Record/Playback Head is small.
- (2) Tape is in contact with the head sufficiently.
- (3) Tape waving is small on the heads and pressure roller.

2.6. Eject Damper Adjustment

Refer to Fig. 2.4. Load a cassette tape, and with opening the Cassette Case by pressing the Eject button and closing it by hand, adjust the speed of damper movement by the Adjustment Screw.

CCW: Damper moves fast.

CW: Damper moves slowly.

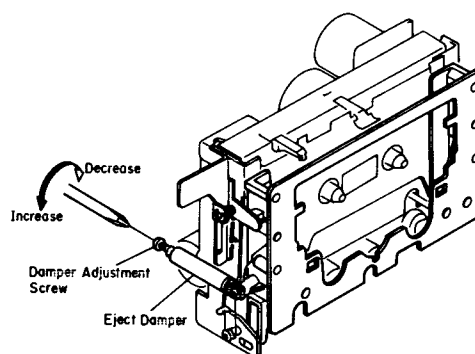


Fig. 2.4

2.7. Reel Motor Speed Adjustment in Play Mode

- (1) To warm-up the cassette deck, load a C-60 cassette tape and set the cassette deck in Play mode.
- (2) After more than four minutes, load a torque meter TW-211 (made by Sony) and set the cassette deck in Play mode.
- (3) Adjust VR601 on the Main P.C.B. Ass'y to obtain exactly 50 g-cm on the torque meter.

2.8. Tape Speed Adjustment

Refer to Fig. 2.5.

- (1) Connect a frequency counter to the Output Jacks.
- (2) Load a 3 kHz Speed and Wow/Flutter Tape (DA09006C) and Play it back.
- (3) Adjust the Tape Speed Adjustment Volume incorporated in the Capstan Motor to obtain 3,000 Hz on the frequency counter.
CCW: Motor drives slowly.
CW: Motor drives fast.

2.9. Lubrication

The tape transport is of a lubrication-free type mechanism. When the following parts are replaced, apply the specified lubricant.

- (1) Molykote (R) Grease (X5-6020)
Cam Motor Pulley
Thrust portion on the Capstan Shaft
- (2) FLOIL GB-TS-1
Washer between Reel Hub Ass'y and Back Tension Spring
- (3) Diamond Oil (EP56)
Reel Hub Shaft
- (4) Anderol 456
Capstan Shaft

Note: We suggest that you use the above specified lubricant or equivalent type.

The company dealing in the above lubricant is as follows:

- (a) Molykote (R) Grease (X5-6020)
Dowcorning Co., Ltd., 1-15-1 Nishishinbashi, Minato-ku, Tokyo, Japan
- (b) FLOIL GB-TS-1
Kanto Chemicals Co., Ltd., 2-7 Kanda Sakuma-cho, Chiyoda-ku, Tokyo, Japan
- (c) Diamond Oil (EP-56)
Mitsubishi Oil Co., Ltd., 1-2-4 Toranomon, Minato-ku, Tokyo, Japan
- (d) Anderol 456
Toyo Kokusai Oil Co., Ltd., 3-3-5 Hatchobori, Chuo-ku, Tokyo, Japan

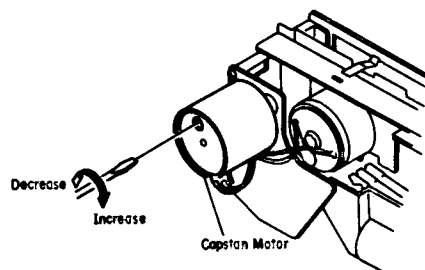


Fig. 2.5

3. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

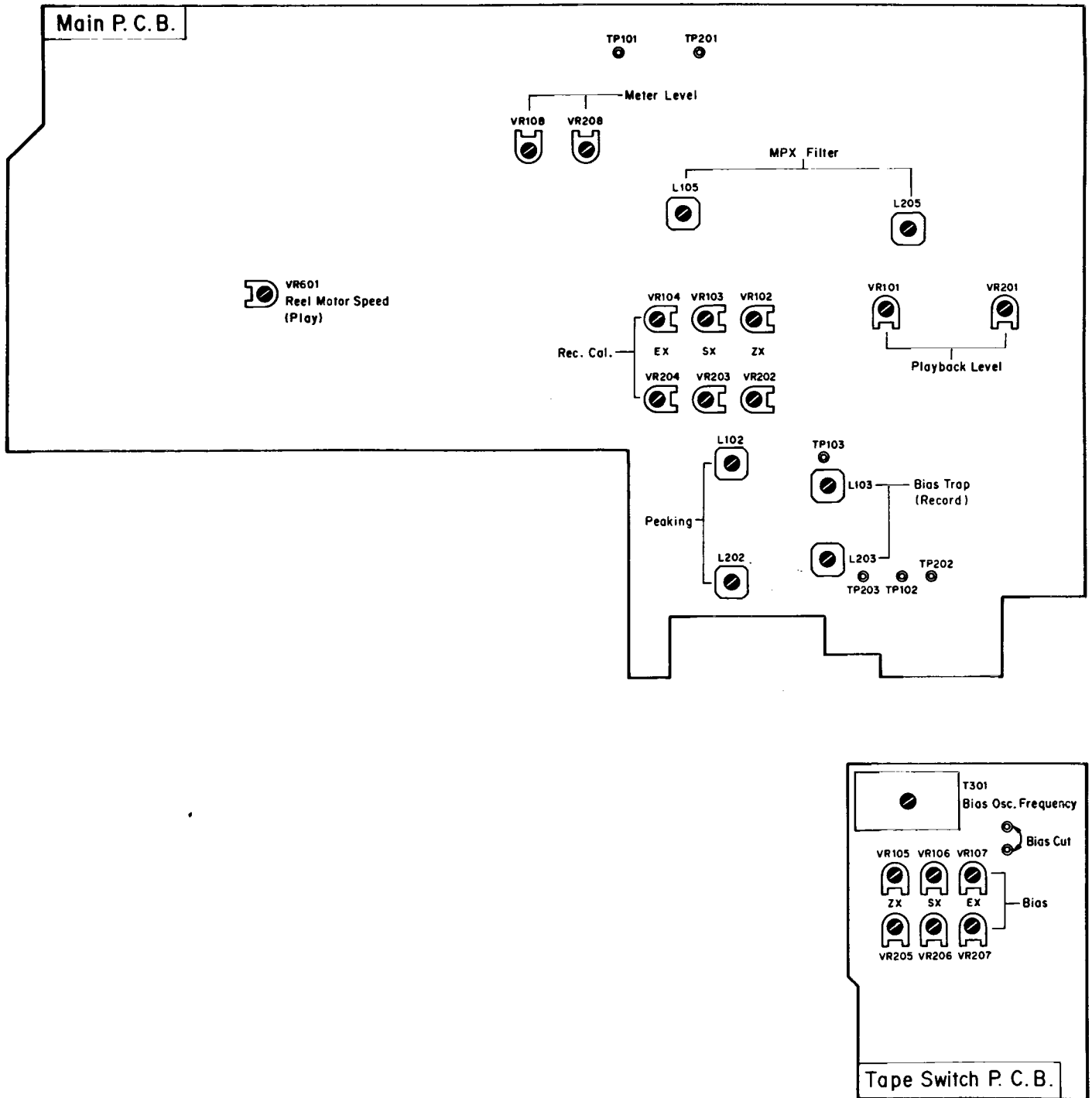


Fig. 3

4. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

Note: Electrical adjustment should be performed after mechanical adjustment is completed.

4.1. Adjustment and Measurement Instructions

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed Adjustment	3 kHz Speed and Wow/Flutter Tape (DA09006C)	Frequency Counter to Output Jacks	Playback Eq. SW — 70 μ s	Tape Speed Adjustment Volume	Adjust the volume incorporated in the capstan motor to obtain 3 kHz $\pm 0.5\%$ on the frequency counter.
2	Meter Level Calibration	400 Hz to Input Jacks	VTVM to TP101, TP201 on Main P.C.B.	Record, Pause	Main P.C.B. VR108, VR208	1. Feed in 400 Hz, then adjust the Input Level control to obtain 350 mV -0.8 dB on the VTVM. 2. Adjust VR108 (VR208) so that the 0 dB segment of the level meter starts illuminating. 3. Adjust the Input Level control to obtain 350 mV on the VTVM, then decrease the generator output level by 20 dB. 4. Check to insure that the segment for -20 dB illuminates.
3	MPX Filter Adjustment	19 kHz ± 100 Hz to Input Jacks	VTVM to Output Jacks	Record, Pause MPX SW — OFF/ON	Main P.C.B. L105, L205	1. Adjust the Input Level control to obtain 0 dB (500 mV) on the VTVM. 2. Set the MPX Filter switch to ON, then adjust L105 (L205) to obtain minimum reading on the VTVM (minimum reading will be less than -30 dB).
4	Record/Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004B)	VTVM to Output Jacks	Playback Eq. SW — 70 μ s Dolby NR SW — OFF MPX SW — OFF	Record/Playback Head Azimuth Alignment Screw	Adjust the Record/Playback Head Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM.
5	Playback Level Calibration	400 Hz Level Tape (DA09005B)	VTVM to TP101, TP201 on Main P.C.B.	Same as above	Main P.C.B. VR101, VR201	Adjust VR101 (VR201) to obtain 350 mV on the VTVM.
6	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005B) 10 kHz PB Frequency Response Tape (DA09003B) 15 kHz PB Frequency Response Tape (DA09002B) 20 kHz PB Frequency Response Tape (DA09001B)	VTVM to Output Jacks	Playback Eq. SW — 70 μ s Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. R110, R210 R195, R295	1. Load a 400 Hz level tape and play it back. 2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the record/playback head azimuth to obtain maximum levels on the VTVM with each tape. 3. Read the maximum levels with each tape and check to insure that the levels against the 400 Hz level tape are within the following ranges. If not, short R110 (R210) or R195 (R295) on the Main P.C.B. Assy to obtain satisfactory results. 10 kHz (-20 dB) -2 dB to $+2$ dB 15 kHz (-20 dB) -2 dB to $+3$ dB 20 kHz (-20 dB) -2 dB to $+4$ dB Check to insure that the difference in level between 10 kHz (-20 dB) and 20 kHz (-20 dB) is less than 2 dB. Refer to the "Playback Frequency Response Adjustment" in item 4.2 for the detailed description. 4. Conduct step 4 "Record/Playback Head Azimuth Alignment".
7	Bias Oscillation Frequency and Erase Current Adjustment		Frequency Counter to TP102 on Main P.C.B. and VTVM across the additional 0.1 Ω resistor	Record, Pause Tape SW — ZX Eq. SW — 70 μ s Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. T301 R318, R350	1. Adjust T301 to obtain 105 kHz on the frequency counter. 2. Connect an additional 0.1 Ω resistor in series to the Erase Head, then connect a VTVM across it. 3. Check the erase current by the VTVM. Erase current will be in a range of 145 mA to 185 mA (typically approx. 165 mA). If erase current is not sufficient, increase it by shorting R318 or R350. 4. After completion of the erase current adjustment, re-check the bias oscillation frequency. 5. Remove the additional 0.1 Ω resistor.
8	Record Amplifier Equalizer Adjustment	21 kHz (-20 dB) to Input Jacks	VTVM to TP102, TP202 on Main P.C.B.	Same as above	Main P.C.B. L102, L202	1. Short both Bias Stop test pins with a clip to stop the bias oscillation. 2. Adjust L102 (L202) to obtain peak reading at 21 kHz on the VTVM. 3. Remove the clip from the test pins.
9	Bias Trap Adjustment (Record Amp.)	Remove input signals	VTVM to TP103, TP203 on Main P.C.B.	Same as above	Main P.C.B. L103, L203	Adjust L103 (L203) to obtain maximum reading on the VTVM.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
10	Record Level Calibration and Recording Bias Current Adjustment	400 Hz (0 dB), 400 Hz (-20 dB), 10 kHz (-20 dB) and 17 kHz (-20 dB) to Input Jacks	VTVM to TP101, TP201 and TP102, TP202 on Main P.C.B. and VTVM and Distortion Meter to Output Jacks	Record and Playback Tape SW — ZX/SX/EX Eq. SW — 70 μ s (ZX/SX) 120 μ s (EX) Dolby NR SW — C-Type/B-Type/OFF MPX SW — OFF	Main P.C.B. (Level) ZX: VR102,VR202 SX: VR103,VR203 EX: VR104,VR204 (Bias) ZX: VR105,VR205 SX: VR106,VR206 EX: VR107,VR207	Adjustment should be made in the order of ZX, SX and EX. 1. Set the Dolby NR switch to C-Type. 2. Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y. 3. Set the BX-150 in Record/Pause mode. 4. Feed in 400 Hz, then adjust the Input Level control to obtain 350 mV (0 dB) on the VTVM. 5. Load a reference ZX tape (DA09037B), reference SX tape (DA09025B) and reference EXII tape (DA09066B). 6. Adjust Record Cal. VR102 (VR202) for ZX, VR103 (VR203) for SX and VR104 (VR204) for EXII to center positions. 7. Connect the VTVM to TP102 (TP202) on the Main P.C.B. Ass'y. Adjust Bias VR105 (VR205) for ZX, VR106 (VR206) for SX and VR107 (VR207) for EXII to obtain the following bias current in Record/Pause mode (the VTVM is connected across a 10-ohm resistor). ZX: approx. 1 mA SX: approx. 0.5 mA EXII: approx. 0.3 mA 8. Connect the VTVM to the Output Jacks. 9. Feed in 400 Hz (-20 dB) and 17 kHz (-20 dB), then record, rewind and play them back. Adjust Bias VR105 (VR205) for ZX, VR106 (VR206) for SX and VR107 (VR207) for EXII to obtain the same playback levels at 400 Hz (-20 dB) and 17 kHz (-20 dB) on the VTVM. 10. Feed in 400 Hz (0 dB), then record, rewind and play it back. Adjust Record Cal. VR102 (VR202) for ZX, VR103 (VR203) for SX and VR104 (VR204) for EXII to obtain 0 dB on the VTVM. 11. Repeat above 9 and 10 two or three times to obtain optimum performance. 12. Set the Dolby NR switch to OFF. 13. Feed in 400 Hz (-20 dB), 10 kHz (-20 dB) and 17 kHz (-20 dB), then record, rewind and play them back. Check to insure that the playback levels are within -20 dB $\pm$ 3 dB against the levels in Dolby NR C-Type. 14. Set the Dolby NR switch to B-Type. 15. Feed in 10 kHz (-20 dB) and 17 kHz (-20 dB), then record, rewind and play them back. Check to insure that the levels are within -20 dB $\pm$ 2 dB against the levels in Dolby NR OFF. 16. Check to insure whether the total harmonic distortion is less than 1.0% for ZX and EXII tapes and 1.2% for SX tape. 17. If above is not sufficient, repeat 9 to 16 till satisfactory results are obtained.
11	Overall Frequency Response Adjustment	400 Hz (0 dB) and 20 Hz to 17 kHz (-20 dB) to Input Jacks	VTVM to Output Jacks	Record and Playback Tape SW — ZX/SX/EX Eq. SW — 70 μ s (ZX/SX) 120 μ s (EX) Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. L102,L202	1. Set the BX-150 in Record/Pause mode. 2. Feed in 400 Hz, then set the Input Level control to obtain 0 dB (500 mV) on the VTVM. 3. Decrease the generator output control by 20 dB. 4. Feed in 20 Hz to 17 kHz (-20 dB) and record, rewind and play them back, then check to insure whether the output levels are within -20 dB $\pm$ 4 dB. 5. If above is not sufficient, adjust L102 (L202) to obtain approx. -20 dB on the VTVM, then conduct step 10 "Record Level Calibration and Recording Bias Current Adjustment". 6. If above is not sufficient, precise re-adjustment of step 6 "Playback Frequency Response", replacement of Record/Playback Head or check on item 2.5 "Tape Travelling Check" will be required.
12	Crosstalk Measurement	1 kHz to Input Jacks	1 kHz Band Pass Filter and VTVM to Output Jacks	Record and Playback Tape SW — ZX Eq. SW — 70 μ s Dolby NR SW — OFF MPX SW — OFF		1. Erase the tape with bulk eraser. 2. Adjust the Input Level control to obtain 0 dB on the VTVM, and record the signals on the reference ZX tape (DA09037B). 3. Turn the cassette tape the other way round and play it back. 4. Measure the difference between 2 and 3.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
13	Channel Separation Measurement	1 kHz to Input Jacks	1 kHz Band Pass Filter and VTVM to Output Jacks	Record and Playback Tape SW — ZX Eq. SW — 70 μ s Dolby NR SW — OFF MPX SW — OFF		1. Erase the tape with bulk eraser. 2. Adjust the Input Level control to obtain 0 dB on the VTVM, and set the Balance control to the extreme left (right). 3. Record, rewind and play it back, then measure the R ch (L ch) level.
14	Erase Measurement	100 Hz to Input Jacks	100 Hz Band Pass Filter and VTVM to Output Jacks	Same as above		1. Erase the tape with bulk eraser. 2. Adjust the Input Level control to obtain 0 dB on the VTVM, and record the signals on the reference ZX tape (DA09037B). 3. Rewind the tape, set the Input Level control to minimum, and then record again. 4. Rewind the tape, play it back, and then measure the difference between 2 and 3.
15	Signal to Noise Ratio Measurement	400 Hz to Input Jacks	IHF-A Curve, Filter, VTVM and Distortion Meter to Output Jacks	Record and Playback Tape SW — ZX Eq. SW — 70 μ s Dolby NR SW — B-Type/C-Type MPX SW — OFF		1. Set the Dolby NR switch to B-Type/C-Type. 2. Feed in 400 Hz, then record, rewind and play it back. 3. Adjust the Input Level control to obtain 3% total harmonic distortion in Playback mode. 4. Set the Input Level control to minimum then record again. 5. After rewind, play back and check the output level difference between 3 and 4. Note: The filter of IHF-A curve shall be used in the measurements.
16	Total Harmonic Distortion Measurement	400 Hz to Input Jacks	VTVM and Distortion Meter to Output Jacks	Record and Playback Tape SW — ZX/SX/EX Eq. SW — 70 μ s (ZX/SX) 120 μ s (EX) Dolby NR SW — OFF MPX SW — OFF		1. Adjust the Input Level control to obtain 0 dB on the VTVM. 2. Record, rewind and play it back. 3. Read the distortion meter and check to insure that the distortion is as follows: EXII 1.0% or less SX 1.2% or less ZX 1.0% or less
17	Wow/Flutter Measurement	3 kHz Speed and Wow/Flutter Tape (DA09006C)	Wow/Flutter Meter to Output Jacks	Playback Eq. SW — 70 μ s		Play back and read the wow/flutter meter.

4.2. Playback Frequency Response Adjustment

Figs. 4.1 and 4.2 show the playback amp. circuit for adjustment and the playback equalization curve.

This adjustment will be required if playback level is not sufficient during playing back a 20 kHz PB frequency response tape. The peaking portion of the equalization curve compensates the gap loss of the playback head. Peaking level is varied by the short circuit of R110 (R210) or R195 (R295).

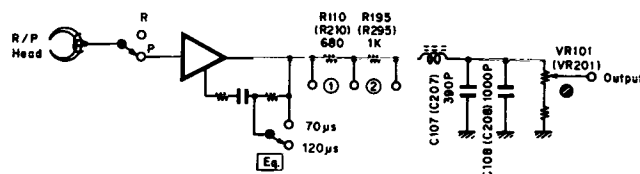


Fig. 4.1

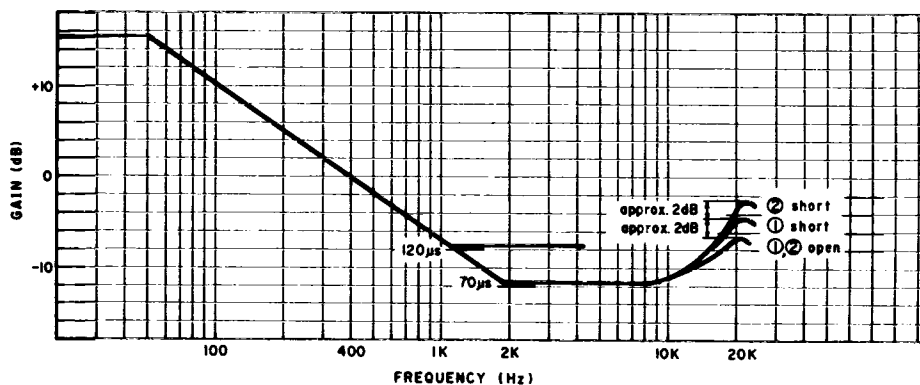


Fig. 4.2

4.3. Dolby NR Circuit Check

Dolby NR circuit incorporates Dolby NR ICs which have no adjustment point.

Perform the following checks and make sure that the IC operates accurately, i.e., frequency response through IC is accurate.

4.3.1. Dolby NR B-Type Circuit Check

(1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to negative side of C134 (C234) on Main P.C.B. (Positive side is connected to IC101-9 (IC201-9)).
Output Connection: VTVM to test point TP101 (TP201) on Main P.C.B.
Mode: Stop
Dolby NR SW — ON (B-Type)/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Set the Dolby NR switch to B-Type. Feed in 1.4 kHz and adjust the generator output control to obtain 35 mV on the VTVM.
- Set the Dolby NR switch to OFF. Check to insure that the reading is +3.2 dB $\pm$ 1.5 dB on the VTVM.

(2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks
Output Connection: VTVM to test point TP101 (TP201) and negative side of C140 (C240) on the Main P.C.B.
Mode: Record/Pause
Dolby NR SW — ON (B-Type)/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Feed in 1.4 kHz and adjust the Input level control to obtain 35 mV/11.1 mV on the VTVM.
- Remove the VTVM from TP101 (TP201) and reconnect it to negative side of C140 (C240).
- Check to insure that the reading at C140 (C240) corresponds to the following with Dolby NR switch OFF and B-Type.

Input Level at TP101 (TP201)	Level at negative side of C140 (C240)	
	Dolby NR OFF	Dolby NR B-Type
35 mV	0 dB	+3.2 dB $\pm$ 1.5 dB
11.1 mV	0 dB	+8.2 dB $\pm$ 1.5 dB

4.3.2. Dolby NR C-Type Circuit Check

(1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to negative side of C134 (C234) on Main P.C.B. (Positive side is connected to IC101-9 (IC201-9)).
Output Connection: VTVM to test point TP101 (TP201) on Main P.C.B.
Mode: Stop
Dolby NR SW — ON (C-Type)/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Set the Dolby NR switch to C-Type. Feed in 1.4 kHz and adjust the generator output control to obtain 35 mV on the VTVM.
- Set the Dolby NR switch to OFF. Check to insure that the reading is +6.5 dB $\pm$ 1.5 dB on the VTVM.

(2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks
Output Connection: VTVM to test point TP101 (TP201) and negative side of C140 (C240) on the Main P.C.B.
Mode: Record/Pause
Dolby NR SW — ON (C-Type)/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Feed in 1.4 kHz and adjust the Input level control to obtain 35 mV/11.1 mV on the VTVM.
- Remove the VTVM from TP101 (TP201) and reconnect it to negative side of C140 (C240).

- Check to insure that the reading at C140 (C240) corresponds to the following with Dolby NR switch OFF and C-Type.

Input Level at TP101 (TP201)	Level at negative side of C140 (C240)	
	Dolby NR OFF	Dolby NR C-Type
35 mV	0 dB	+6.5 dB $\pm$ 1.5 dB
11.1 mV	0 dB	+11.4 dB $\pm$ 1.5 dB

5. MECHANISM ASS'Y AND PARTS LIST

5.1. Synthesis

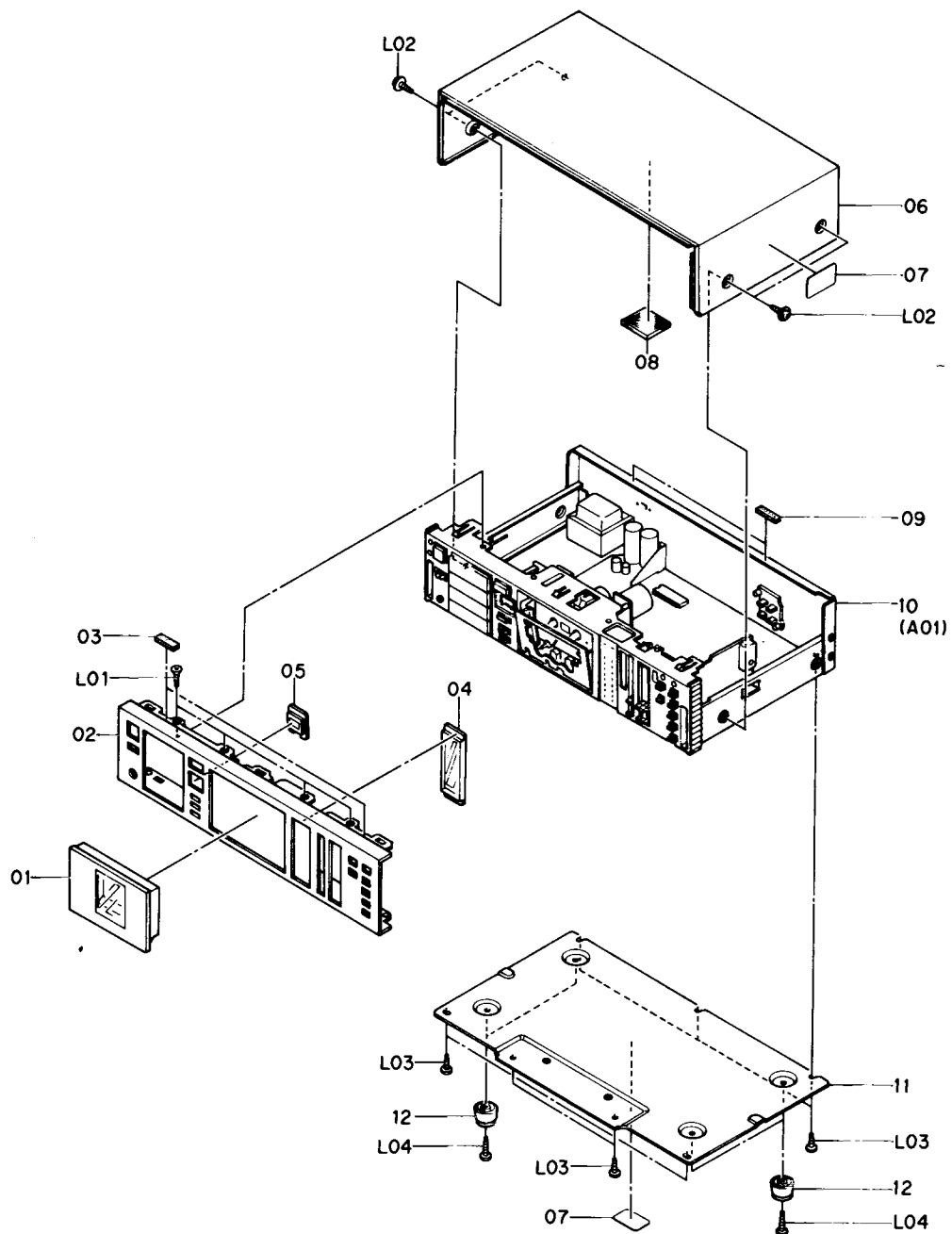


Fig. 5.1

Schematic Ref. No.	Part No.	Description	Qty	Schematic Ref. No.	Part No.	Description	Qty
		Synthesis Serial No.: A32001001 - (Silver)				Synthesis Serial No.: A32101001 - (Black)	
01	HA04494A	Cassette Case Cover Ass'y	1	01	HA04495A	Cassette Case Cover Ass'y	1
02	OH04265A	Front Panel BX-150	1	02	OH04266A	Front Panel BX-150	1
	OH04360A	Front Panel BX-150E	1		OH04361A	Front Panel BX-150E	1
03	OJ04628A	Top Cover Cushion (Front)	2	03	OJ04628A	Top Cover Cushion (Front)	2
04	OH04308A	Meter Cover	1	04	OH04308A	Meter Cover	1
05	OH04293A	Counter Cover	1	05	OH04293A	Counter Cover	1
06	OH04155B	Top Cover	1	06	OH04156B	Top Cover	1
07	OM04377A	Caution Label	1	07	OM04377A	Caution Label	1
08	OJ04630A	Top Cover Rubber	1	08	OJ04630A	Top Cover Rubber	1
09	OJ04629A	Top Cover Cushion (Rear)	2	09	OJ04629A	Top Cover Cushion (Rear)	2
10	—	Synthesis Mechanism Ass'y	1	10	—	Synthesis Mechanism Ass'y	1
11	OJ04762A	Bottom Cover	1	11	OJ04762A	Bottom Cover	1
12	OJ03564A	Leg T-H	4	12	OJ03564A	Leg T-H	4
L01	OE03054A	BT 3x8 @ Countersunk	4	L01	OE03054A	BT 3x8 @ Countersunk	4
L02	OE03033A	BT 4x8 @ Pan Washer-Faced	4	L02	OE03033A	BT 4x8 @ Pan Washer-Faced	4
L03	OE00868A	BT 3x8 @ Binding	7	L03	OE00868A	BT 3x8 @ Binding	7
L04	OE00865A	BT 3x10 @ Binding	4	L04	OE00865A	BT 3x10 @ Binding	4

5.2. Synthesis Mechanism Assy (A01)

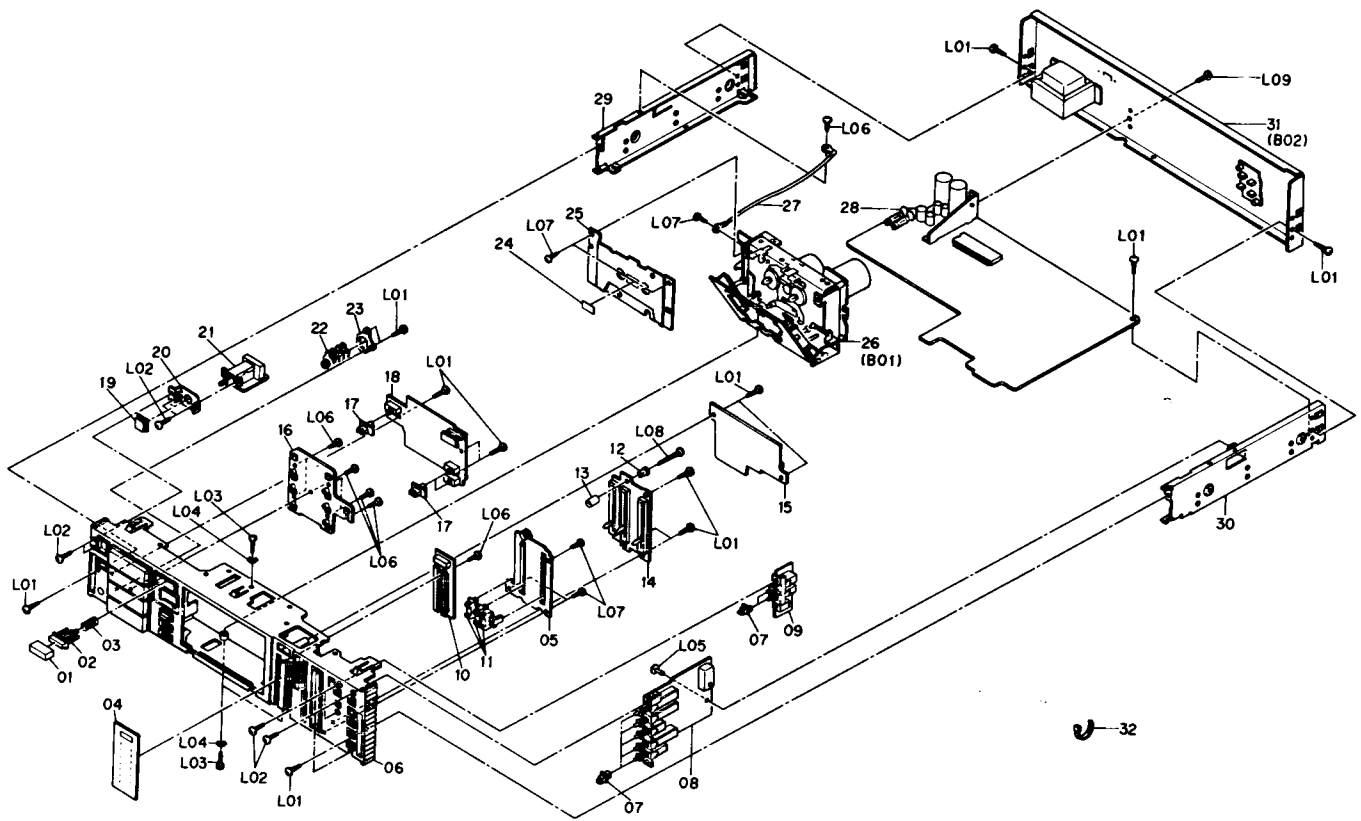


Fig. 5.2

Schematic Ref. No.	Part No.	Description	Qty	Schematic Ref. No.	Part No.	Description	Qty
A01		Synthesis Mechanism Ass'y Serial No.: A32001001 - (Silver)	1	A01		Synthesis Mechanism Ass'y Serial No.: A32101001 - (Black)	1
01	OH04270A	Eject Button	1	01	OH04269A	Eject Button	1
02	OJ04766A	Button Joint	1	02	OJ04766A	Button Joint	1
03	OJ04765A	Spring	1	03	OJ04765A	Spring	1
04	OH04279A	Meter Scale	1	04	OH04279A	Meter Scale	1
05	OH04285A	Volume Plate	1	05	OH04285A	Volume Plate	1
06	HA04524A	Front Chassis Ass'y	1	06	HA04525A	Front Chassis Ass'y	1
07	OH04288A	Push Switch Button	7	07	OH04248A	Push Switch Button	7
08	BA05100A	Tape Switch P.C.B. Ass'y	1	08	BA05100A	Tape Switch P.C.B. Ass'y	1
09	BA05103A	Dolby NR Switch P.C.B. Ass'y	1	09	BA05103A	Dolby NR Switch P.C.B. Ass'y	1
10	BA05135A	Indicator Ass'y	1	10	BA05135A	Indicator Ass'y	1
11	OH04289A	Volume Knob	3	11	OH04247A	Volume Knob	3
12	OJ04704A	P.C.B. Spacer B	1	12	OJ04704A	P.C.B. Spacer B	1
13	OJ04703A	P.C.B. Spacer A	1	13	OJ04703A	P.C.B. Spacer A	1
14	BA05102A	Volume P.C.B. Ass'y	1	14	BA05102A	Volume P.C.B. Ass'y	1
15	BA05101A	Indicator P.C.B. Ass'y	1	15	BA05101A	Indicator P.C.B. Ass'y	1
16	BA05104A	Control Switch P.C.B. Ass'y	1	16	BA05104A	Control Switch P.C.B. Ass'y	1
17	OH04309A	Slide Switch Knob	3	17	OH04242A	Slide Switch Knob	3
18	BA05105A	Counter P.C.B. Ass'y	1	18	BA05105A	Counter P.C.B. Ass'y	1
19	OH04290A	Power Switch Button	1	19	OH04243A	Power Switch Button	1
20	OJ04763A	Power Switch Holder	1	20	OJ04763A	Power Switch Holder	1
21	BA04823A	Power Switch P.C.B. Ass'y (BX-150 (U.S.A. & Canada))	1	21	BA04823A	Power Switch P.C.B. Ass'y (BX-150 (U.S.A. & Canada))	1
	BA04824A	Power Switch P.C.B. Ass'y (BX-150 (Australia & Others) & BX-150E)	1		BA04824A	Power Switch P.C.B. Ass'y (BX-150 (Australia & Others) & BX-150E)	1
	BA04825A	Power Switch P.C.B. Ass'y (BX-150 (Japan))	1		BA04825A	Power Switch P.C.B. Ass'y (BX-150 (Japan))	1
22	OB08511A	Headphone Jack	1	22	OB08511A	Headphone Jack	1
23	OJ04611A	Headphone Plate	1	23	OJ04611A	Headphone Plate	1
24	OM04196A	Cassette Label	1	24	OM04196A	Cassette Label	1
25	OH04154B	Cover Plate	1	25	OH04154B	Cover Plate	1
26	CA08498A	Mechanism Ass'y	1	26	CA08498A	Mechanism Ass'y	1
27	BA05131A	Earth Wire	1	27	BA05131A	Earth Wire	1
28	BA05090A	Main P.C.B. Ass'y	1	28	BA05090A	Main P.C.B. Ass'y	1
29	OJ04603E	Side Chassis L	1	29	OJ04603E	Side Chassis L	1
30	OJ04773A	Side Chassis R	1	30	OJ04773A	Side Chassis R	1
31	HA04511A	Rear Panel Ass'y BX-150 (U.S.A. & Canada)	1	31	HA04517A	Rear Panel Ass'y BX-150 (U.S.A. & Canada)	1
	HA04512A	Rear Panel Ass'y BX-150 (Japan)	1		HA04518A	Rear Panel Ass'y BX-150 (Japan)	1
	HA04513A	Rear Panel Ass'y BX-150 (Others)	1		HA04519A	Rear Panel Ass'y BX-150 (Others)	1
	HA04514A	Rear Panel Ass'y BX-150 (Australia)	1		HA04520A	Rear Panel Ass'y BX-150 (Australia)	1
	HA04510A	Rear Panel Ass'y BX-150E (UK)	1		HA04516A	Rear Panel Ass'y BX-150E (UK)	1
	HA04515A	Rear Panel Ass'y BX-150E (220V Class 2)	1		HA04521A	Rear Panel Ass'y BX-150E (220V Class 2)	1
32	OB08515A	Insu-Lock	1	32	OB08515A	Insu-Lock	1
L01	OE00868A	BT 3x8 @ Binding	16	L01	OE00868A	BT 3x8 @ Binding	16
L02	OE00766A	M3x8 @ Binding	6	L02	OE00766A	M3x8 @ Binding	6
L03	OE03074A	BT 2.6x8 @ Binding	2	L03	OE03074A	BT 2.6x8 @ Binding	2
L04	OE00233A	Washer 2.6mm Toothed Lock	2	L04	OE00233A	Washer 2.6mm Toothed Lock	2
L05	OB08583A	Plastic Rivet	1	L05	OB08583A	Plastic Rivet	1
L06	OE00857A	BT 3x6 @ Binding	7	L06	OE00857A	BT 3x6 @ Binding	7
L07	OE00859A	BT 2.6x6 @ Binding	6	L07	OE00859A	BT 2.6x6 @ Binding	6
L08	OE00835A	BT 3x25 @ Pan	1	L08	OE00835A	BT 3x25 @ Pan	1
L09	OE03028A	BT 3x8 @ Binding (Nickel)	1	L09	OE00921A	BT 3x8 @ Binding (Black Chromate)	1

5.3. Mechanism Assy (B01)

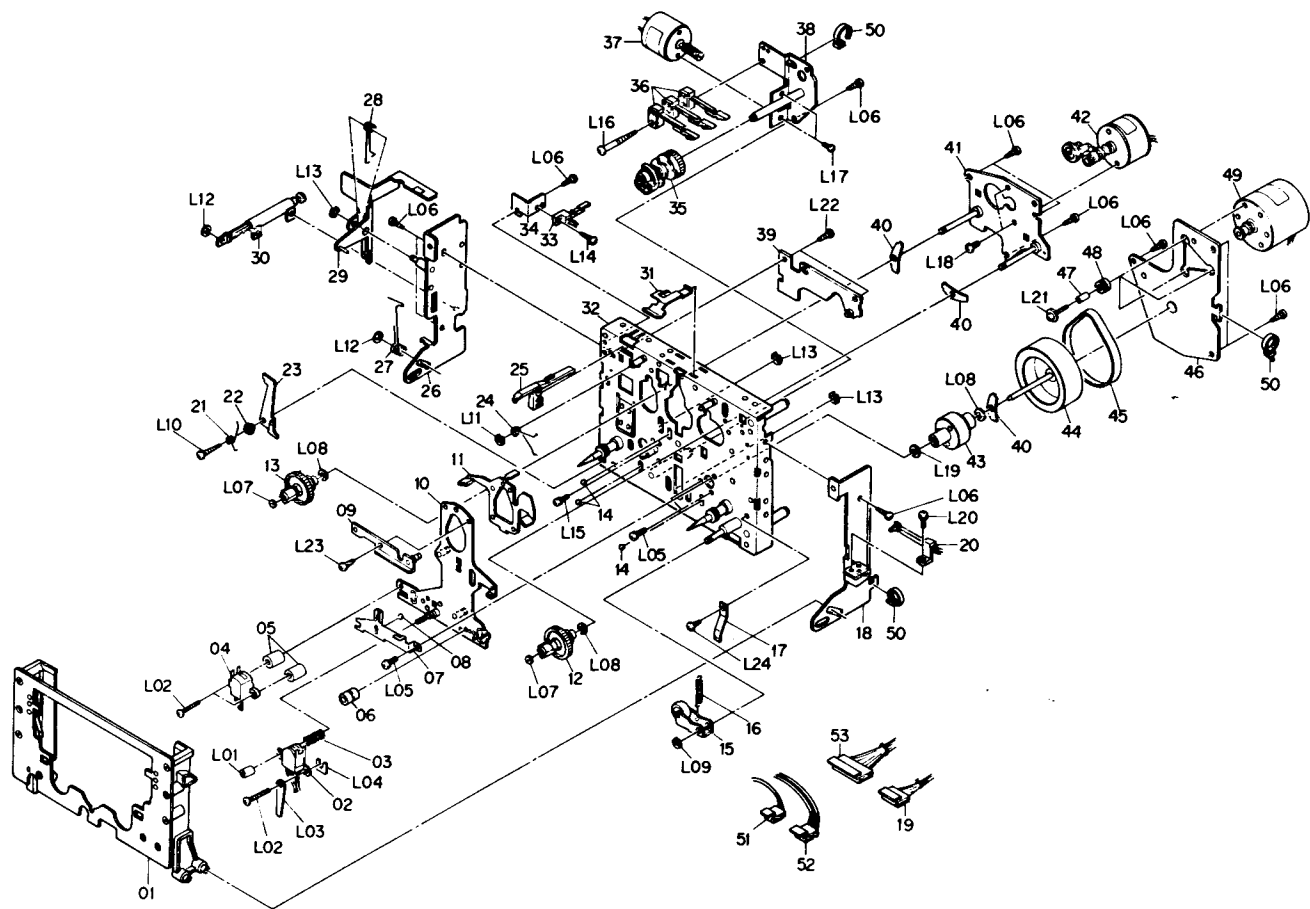


Fig. 5.3

Schematic Ref. No.	Part No.	Description	Qty
B01	CA08498A	Mechanism Ass'y Serial No.: A320.101001 -	1
01	CA80001A	Cassette Case Ass'y	1
02	OG01371A	Record/Playback Head RP-2G	1
03	OC80001A	Azimuth Adjust Spring	1
04	OG01365A	Erase Head E-2D	1
05	OC80044A	Erase Head Collar	2
06	OC80045A	Record/Playback Head Collar	1
07	OC80003A	Head Base Hold Plate	1
08	OC80004A	Steel Ball 30	1
09	OC80005A	Reinforce Plate	1
10	OC80006A	Head Base	1
11	CA80002A	Brake Ass'y	1
12	CA80003B	Take-up Reel Hub Ass'y	1
13	CA80004B	Supply Reel Hub Ass'y	1
14	OC80007A	Steel Ball 20	3
15	CA80005A	Pressure Roller Ass'y	1
16	OC80008A	Pressure Roller Spring	1
17	OC80009A	Cassette Case Spring	1
18	OC80010B	Cassette Case Holder R	1
19	OC80043A	5P-H Connector	1
20	OC80012A	Eject Sensor	1
21	OC80013A	Lock Lever Spring	1
22	OC80014A	Lock Lever Collar	1
23	OC80015B	Lock Lever	1
24	OC80016A	Brake Spring	1
25	OC80017A	Record Protector Lever	1
26	OC80018A	Cassette Case Holder L	1
27	OC80019B	Eject Spring	1
28	OC80020A	Eject Lever Spring	1
29	OC80021A	Eject Lever	1
30	CA80006A	Pneumatic Damper Ass'y	1
31	OC80022B	Cassette Hold Spring	1
32	OC80023A	Mechanism Chassis	1
33	OC80024A	Record Protector	1
34	OC80025A	Record Protector Holder	1
35	OC80026A	Cam	1
36	OC80027A	Mode Switch	3
37	CA80007A	Control Motor Ass'y	1
38	OC80028A	Control Motor Holder	1
39	CA80011A	Shut-off P.C.B. Ass'y	1
40	OC80029A	Back Tension Spring	3
41	OC80030A	Reel Motor Holder	1
42	CA80008B	Reel Motor Ass'y	1
43	OC80031A	Capstan Flange	1
44	OC80033A	Flywheel	1
45	OC80034A	Capstan Belt	1
46	CA80009A	Flywheel Holder Ass'y	1
47	OC80035A	Sleeve	3
48	OC80036A	Floating Rubber	3
49	CA80010A	Capstan Motor Ass'y	1
50	OC80037A	Insu-Lock	3
51	OC80040A	2P-H Connector	1
52	OC80041A	4P-H Connector	1
53	OC80042A	9P-H Connector	1
L01	OC80046A	Azimuth Adjust Screw	1
L02	OE03038A	M2x12 @ Binding	3
L03	OE03053A	Wire Holder	1
L04	OC80048A	Shim 0.03T	(1)
	OC80038A	Shim 0.06T	(1)
	OC80039A	Shim 0.1T	(1)
L05	OE03046A	M2.6x6 @ Pan (2A)	3
L06	OE03042A	FT M2.5x5 @ Pan	12
L07	OE03049A	Washer 1.8mm FT	2
L08	OE03050A	Washer 3.1mm FT	3
L09	OE00222A	E-Ring 2mm	1
L10	OE03043A	FT M2.5x10 @ Pan	1
L11	OE00698A	E-Ring 2.5mm	1
L12	OE03052A	Stopper Ring 2.4mm	2
L13	OE00181A	E-Ring 3mm	3
L14	OE03048A	FT M2.6x6 @ Pan	1
L15	OE03036A	M2x4 @ Pan (2A)	1
L16	OE03044A	FT M2.5x20 @ Pan	1
L17	OE00691A	M2x3 @ Pan	2
L18	OE03045A	M2.6x3 2 Binding	2
L19	OE03051A	Capstan Washer	1
L20	OE03037A	M2x5 @ Pan (2A)	1
L21	OE03047A	M2.6x9 @ Pan	3
L22	OE03041A	FT M2.5x4 @ Pan	2
L23	OE03040A	FT M2.5x3.5 @ Pan	1
L24	OE03035A	M2x3.2 @ Truss	1

5.4. Rear Panel Ass'y (B02)

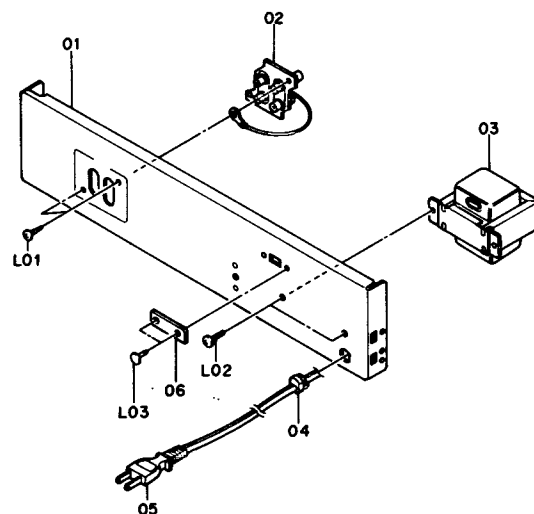
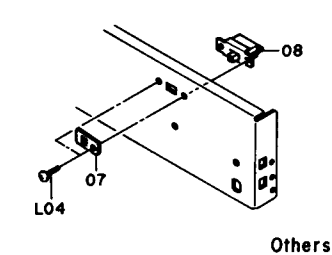
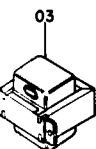


Fig. 5.4



Schematic Ref. No.	Part No.	Description	Qty
B02	HA04511A	Rear Panel Ass'y BX-150 (U.S.A. & Canada)	1
	HA04512A	Rear Panel Ass'y BX-150 (Japan)	1
	HA04513A	Rear Panel Ass'y BX-150 (Others)	1
	HA04514A	Rear Panel Ass'y BX-150 (Australia)	1
	HA04510A	Rear Panel Ass'y BX-150E (UK)	1
	HA04515A	Rear Panel Ass'y BX-150E (220V Class 2) Serial No.: A32001001 - (Silver)	1
01	OH04300A	Rear Panel BX-150	1
	OH04364A	Rear Panel BX-150E	1
02	OB81001A	4P PIN Jack	1
03	OB50017A	Power Transformer (BX-150 (U.S.A. & Canada))	1
	OB50011A	Power Transformer (BX-150 (Japan))	1
	OB50009A	Power Transformer (BX-150 (Australia) & BX-150E)	1
	OB50010A	Power Transformer (BX-150 (Others))	1
04	OB08037A	Cord Bushing 4P-4 (BX-150 & BX-150E (220V Class 2))	1
	OB08351A	Cord Bushing 4K-4 (BX-150E (UK))	1
05	OB08533A	Power Cord (BX-150 (U.S.A. & Canada & Others))	1
	OB08219B	Power Cord (BX-150 (Japan))	1
	OB08348A	Power Cord (BX-150E (UK))	1
	OB08093U	Power Cord (BX-150E (220V Class 2))	1
	OB05241A	Power Cord (BX-150 (Australia))	1
06	QJ04622B	Switch Cover Gray (BX-150 (U.S.A., Canada, Japan & Australia) & BX-150E)	1
07	OM04407A	Voltage Selector Lock Plate Gray (BX-150 (Others))	1
08	OB07092U	Voltage Selector (BX-150 (Others))	1
L01	OE03028A	BT 3x8 Φ Binding (Nickel)	2
L02	OE03024A	BT 4x8 Φ Binding (Nickel)	2
L03	OB08583A	Plastic Rivet	2
L04	OE03031A	M3x8 Φ Binding (Nickel)	2
B02	HA04517A	Rear Panel Ass'y BX-150 (U.S.A. & Canada)	1
	HA04518A	Rear Panel Ass'y BX-150 (Japan)	1
	HA04519A	Rear Panel Ass'y BX-150 (Others)	1
	HA04520A	Rear Panel Ass'y BX-150 (Australia)	1
	HA04516A	Rear Panel Ass'y BX-150E (UK)	1
	HA04521A	Rear Panel Ass'y BX-150E (220V Class 2) Serial No.: A32101001 - (Black)	1
01	OH04301A	Rear Panel BX-150	1
	OH04365A	Rear Panel BX-150E	1
02	OB81001A	4P PIN Jack	1
03	OB50017A	Power Transformer (BX-150 (U.S.A. & Canada))	1
	OB50011A	Power Transformer (BX-150 (Japan))	1
	OB50009A	Power Transformer (BX-150 (Australia) & BX-150E)	1
	OB50010A	Power Transformer (BX-150 (Others))	1
04	OB08037A	Cord Bushing 4P-4 (BX-150 & BX-150E (220V Class 2))	1
	OB08351A	Cord Bushing 4K-4 (BX-150E (UK))	1
05	OB08533A	Power Cord (BX-150 (U.S.A. & Canada & Others))	1
	OB08219B	Power Cord (BX-150 (Japan))	1
	OB08348A	Power Cord (BX-150E (UK))	1
	OB08093U	Power Cord (BX-150E (220V Class 2))	1
	OB05241A	Power Cord (BX-150 (Australia))	1
06	QJ04601B	Switch Cover Black (BX-150 (U.S.A., Canada, Japan & Australia) & BX-150E)	1
07	OM03948A	Voltage Selector Lock Plate Black (BX-150 (Others))	1
08	OB07092U	Voltage Selector (BX-150 (Others))	1
L01	OE00921A	BT 3x8 Φ Binding (Black Chromate)	2
L02	OE00915A	BT 4x8 Φ Binding (Black Chromate)	2
L03	OB08583A	Plastic Rivet	2
L04	OE00818A	M3x8 Φ Binding (Black Chromate)	2

6.5. Control Switch P.C.B. Ass'y

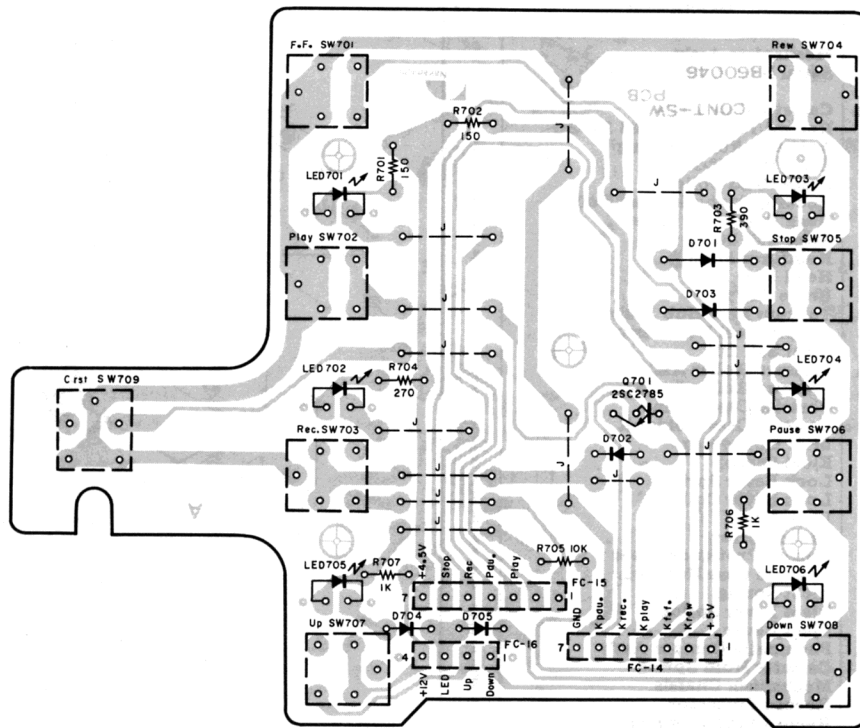


Fig. 6.5

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
SW1 M2 M2 M2	BA04823A	Power Switch P.C.B. Ass'y (BX-150 (U.S.A., Canada & Others))	VR101,201 VR301 R501,601 C501,601 Cds301	BA05102A	Volume P.C.B. Ass'y
	BA04824A	Power Switch P.C.B. Ass'y (BX-150 (Australia) & BX-150E)		OB60043B	Volume P.C.B. Slide Volume 100K (A)
	BA04825A	Power Switch P.C.B. Ass'y (BX-150 (Japan))		OB31002A	Slide Volume 10K (A)x2
	OB02573D	Power Switch P.C.B.	Q701 D701,702 703,704 705 R701 R702 R703 R704 R705 R706,707 SW701-709 LED701 702,703 LED704 705,706	OB09733A	RK 220K 1/6W J
	OB70002A	Power Switch		OB09282A	CC 100P 50V K
	OB08363A	Spark Killer (BX-150 (Japan))		OB06325B	Photocoupler MCD7214F
	OB08342A	Spark Killer (BX-150 (U.S.A., Canada & Others))		OB81011A	Dip Mate 4P (1)
	OB08955A	Spark Killer (BX-150 (Australia) & BX-150E)		OB81012A	Dip Mate 5P (2)
	OE00752A	Eyelet 2x3 (2)		BA05104A	Control Switch P.C.B. Ass'y
R341 R361,362	BA05103A	Dolby NR Switch P.C.B. Ass'y		OB60046A	Control Switch P.C.B. TR 2SC2785
	OB60044B	Dolby NR Switch P.C.B.		OB06456A	SiD 1SS176
	OB09697A	RK 6.8K 1/6W J		OB05795A	RK 150 1/4W J
	OB09677A	RK 1K 1/6W J		OB09657A	RK 150 1/6W J
	OB70009A	Push Switch (1)		OB09667A	RK 390 1/6W J
	OB02351A	6P JP Connector (1)		OB09663A	RK 270 1/6W J
Q601 Q602 R601,603 R602	CA80011A	Shut-off P.C.B. Ass'y		OB09701A	RK 10K 1/6W J
	OC80047A	Shut-off P.C.B.		OB09677A	RK 1K 1/6W J
	OB06388A	TR 2SC2812		OB70004A	Touch Switch 4.3mm
	OB06389A	Photo Reflector NJL5141		OB06334A	LED TLG124A GRN
	OB09840A	RK 680 Leadless		OB06333A	LED TLR124A RED
	OB09841A	RK 18K Leadless		OJ04744A	LED Reflector (6)

6. MOUNTING DIAGRAMS AND PARTS LIST

- Notes: 1. Mounting diagram shows a dip side view of the printed circuit board.
 2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
 3. Following transistors are interchangeable with each other.
 a. 2SA733, 2SA608SP, 2SA1048, 2SA1175
 b. 2SC945, 2SC536SP, 2SC2458, 2SC2785
 4. Abbreviation for part name:
 TR — Transistor, SiD — Silicon Diode, GD — Germanium Diode, ZD — Zener Diode
 RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor, RC — Cement Resistor,
 RW — Wire Wound Resistor
 CE — Electrolytic Capacitor, CM — Mylar Capacitor, CC — Ceramic Capacitor, CP — PP Capacitor,
 CT — Tantalum Capacitor, CM — Film Capacitor, C — Mica Capacitor

6.1. Power Switch P.C.B. Ass'y

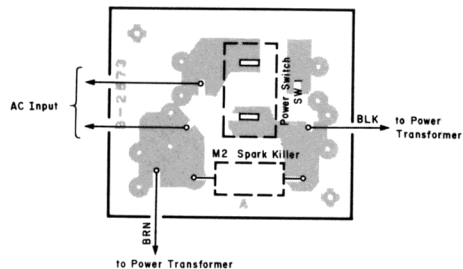


Fig. 6.1

6.2. Dolby NR Switch P.C.B. Ass'y

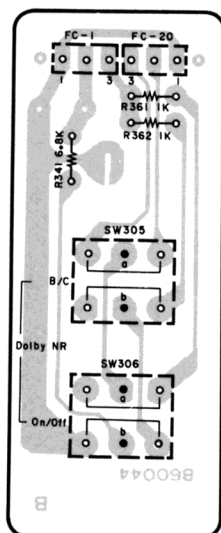


Fig. 6.2

6.3. Shut-off P.C.B. Ass'y

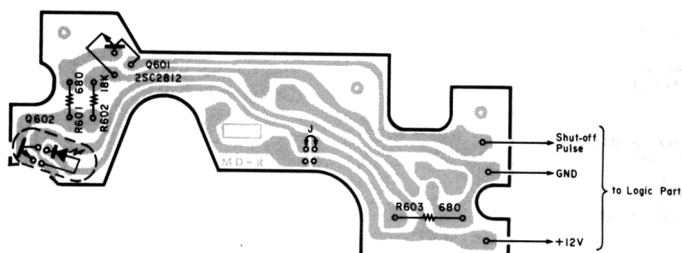


Fig. 6.3

6.4. Volume P.C.B. Ass'y

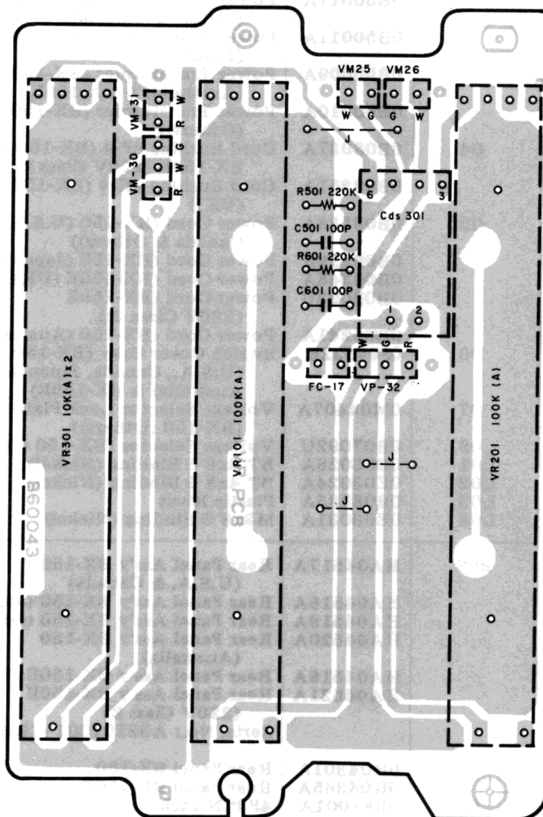


Fig. 6.4

6.7. Tape Switch P.C.B. Ass'y

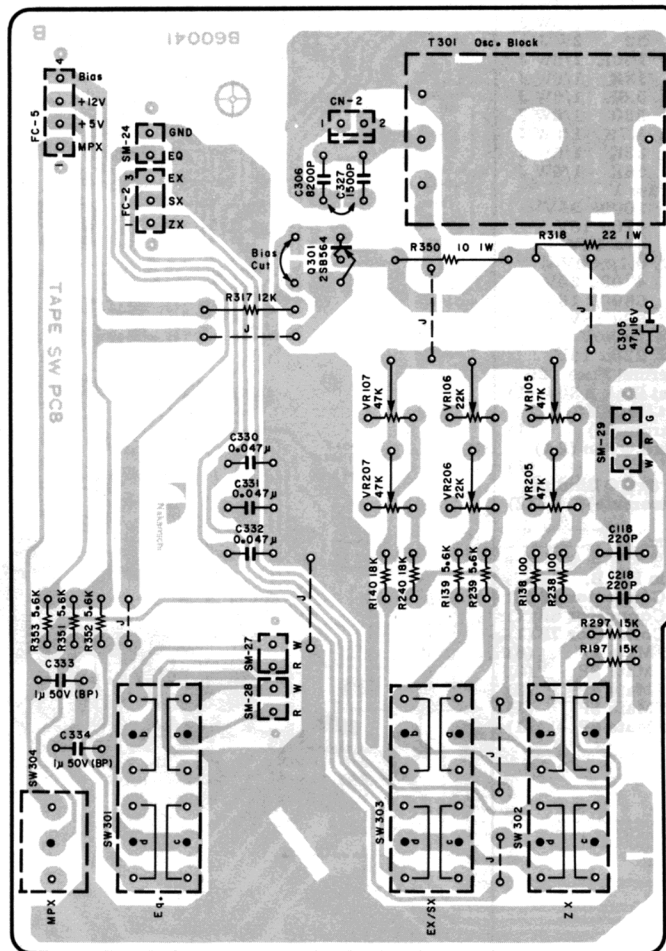


Fig. 6.7

6.8. Indicator P.C.B. Ass'y

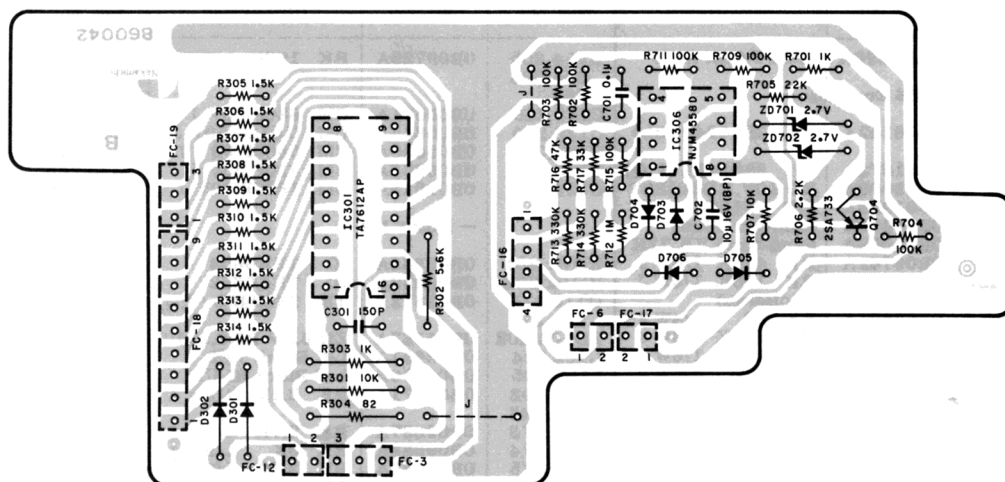


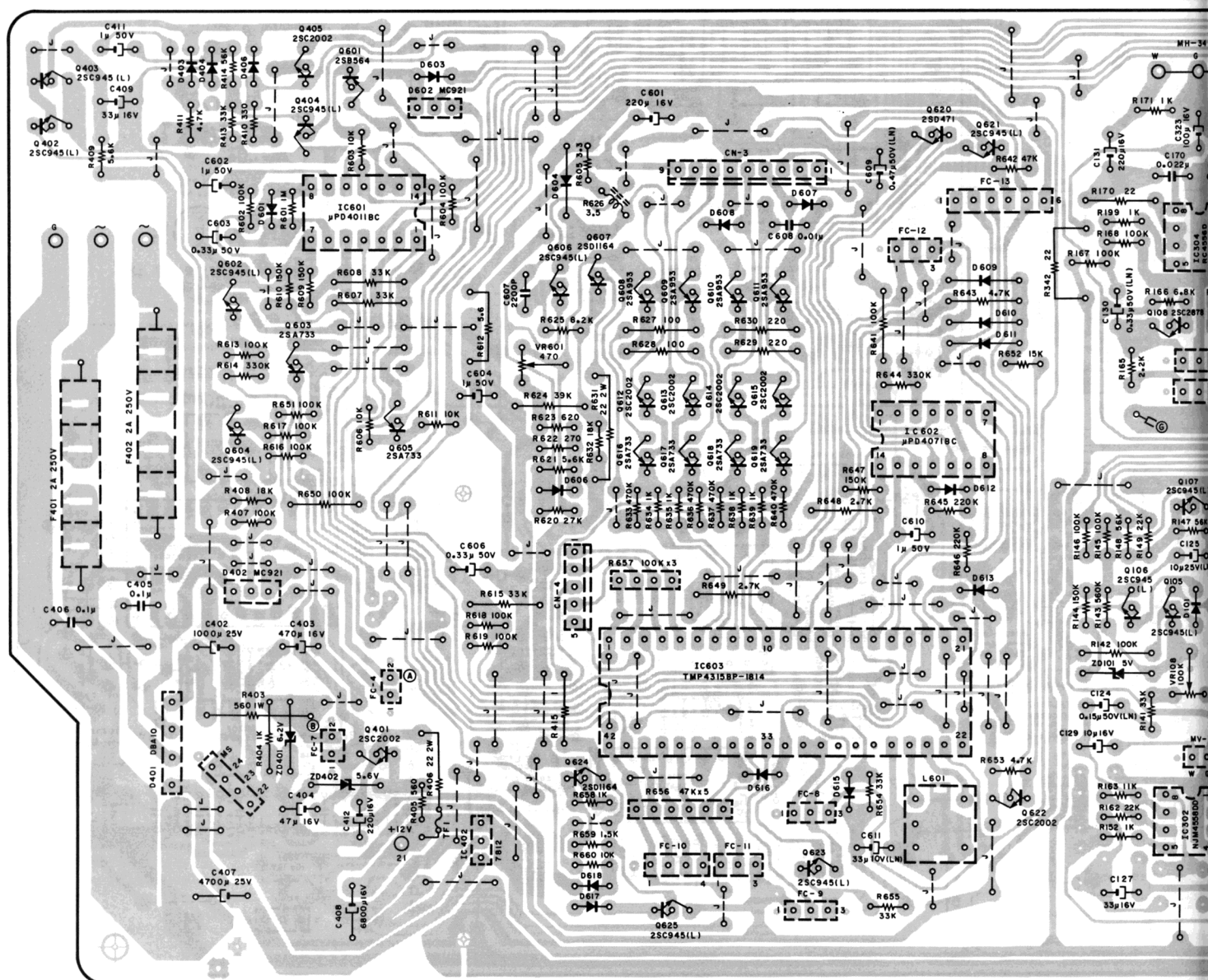
Fig. 6.8

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA05105A	Counter P.C.B. Ass'y		BA05101A	Indicator P.C.B. Ass'y
IC701 Q701,702 703,704 705 LED701 R701,702 705 R703 R704,705 706,707 716 R708-714 R715 C701 C702 SW701,702 SW703	OB60047A OB06368A OB06455A OB12098A OB05625A OB09701A OB09687A OB09661A OB01846A OB09282A OB05557A OB70010A OB07437A OB81016A OB81017A 0J04786A	Counter P.C.B. IC LM6416E-106 TR 2SA1175 Counter LED RK 220K 1/4W J RK 10K 1/6W J RK 2.7K 1/6W J RK 220 1/6W J ⁽⁷⁾ RK 4.7K 1/4W J CC 100P 50V K CM 0.015μ 50V J Slide Switch 2-2 Slide Switch 2-3 IC Socket 9P (1) IC Socket 11P (1) Counter Himelon (1)	IC301 IC306 Q704 ZD701,702 D301,302 703,704 705,706 R301 R302 R303 R304 R305-314 R701 R702,703 704,709 711,715 R705 R706 R707 R712 R713,714 R716 R717 C301 C701 C702	OB60042B OB06369A OB11031A OB06013A OB06191A OB06398A OB01888A OB01887A OB01857A OB05631A OB09681A OB09677A OB09725A OB09709A OB09685A OB09701A OB09749A OB09737A OB09717A OB09713A OB09281A OB09868A OB09163A OB02349A OB02356A OB81011A OB81012A	Indicator P.C.B. IC TA7612AP IC NJM4558D TR 2SA733 (P,Q) ZD 2.7V RD2.7EB SiD 1SS176 RK 10K 1/4W J RK 5.6K 1/4W J RK 1K 1/4W J RK 82 1/4W J RK 1.5K 1/6W J ⁽¹⁰⁾ RK 1K 1/6W J RK 100K 1/6W J RK 22K 1/6W J RK 2.2K 1/6W J RK 10K 1/6W J RK 1M 1/6W J RK 330K 1/6W J RK 47K 1/6W J RK 33K 1/6W J CC 150P 50V K CF 0.1μ 50V J CE 10μ 16V (BP) JP Connector 4P (1) JP Connector 12P (1) Dip Mate 4P (1) Dip Mate 5P (1)
	BA05100A	Tape Switch P.C.B. Ass'y			
Q301 T301 VR105,107 205,207 VR106,206 R138,238 R139,239 351,352 353 R140,240 R197,297 R317 R318 R350 C118,218 C305 C306 C327 C330,331 332 C333,334 CN2	OB60041B OB06332A OB06688C OB32010A OB32009A OB09653A OB09695A OB09707A OB09705A OB09263A OB09831A OB09837A OB09283A OB01403A OB09828A OB41229A OB05796A OB09187A OB81051A OB70005A OB81010A OB81011A OB81012A 0J04768A	Tape Switch P.C.B. TR 2SB564M Bias Osc. Unit Semi-fixed VR 47K Semi-fixed VR 22K RK 100 1/6W J RK 5.6K 1/6W J RK 18K 1/6W J RK 15K 1/6W J RK 12K 1/4W J RF 22 1W J RF 10 1W J CC 220P 50V K CE 47μ 16V CP 8200P 100V J CP 1500P 100V J CM 0.047μ 50V J CE 1μ 50V (BP) 2P-S Post Push Switch (1) Dip Mate 3P (1) Dip Mate 4P (2) Dip Mate 5P (1) Earth Plate A (1)			

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA05090A	Main P.C.B. Ass'y	R354,355 356,363 364	OB09725A	RK 100K 1/6W J	VR108,208 R141,241 R142,242 R143,243 R144,244 R145,146 245,246 R147,148 247,248 R149,249 R320 C124,224 C125,225 C308	OB32011A OB09713A OB01889A OB09743A OB09729A OB09725A OB09719A OB09709A OB09216A OB09570A OB09148A OB01400A	Semi-fixed VR 100K RK 33K 1/6W J RK 100K 1/4W J RK 560K 1/6W J RK 150K 1/6W J RK 100K 1/6W J RK 56K 1/6W J RK 22K 1/6W J RF 10 1/4W J CE 0.15μ 50V (LN) CE 10μ 25V (LN) CE 100μ 16V
Q101,102 201,202 Q103,203 ZD301 D304 L101,201 VR101,201 R101,201 R102,103 202,203 R104,204 R105,205 R106,206 R107,207 R108,208 R109,209 R110,210 R111,211 R112,212 R195,295 R319 R357 C102,202 C103,203 C104,204 C105,205 C106,206 C107,207 C108,208 C304 C307 RL301 CN1	— PB Eq. Amp. — OB06142A TR 2SC2240 (BL) OB01872A TR 2SC945L (P,Q) OB12009A ZD 10V RD10JB2T OB01909A SiD 1S1555 OB03919B Inductor 36mH OB32009A Semi-fixed VR 22K OB09741A RK 470K 1/6W J OB09330A RK 100K 1/4W J (Noiseless) OB05631A RK 82 1/4W J OB09731A RK 180K 1/6W J OB09685A RK 2.2K 1/6W J OB09711A RK 27K 1/6W J OB09830A RM 4.87K 1/4W F OB09829A RM 3.32K 1/4W F OB09673A RK 680 1/6W J OB01888A RK 10K 1/4W J OB09703A RK 12K 1/6W J OB09677A RK 1K 1/6W J OB01857A RK 1K 1/4W J OB09725A RK 100K 1/6W J OB09137A CE 22μ 25V (LN) OB09283A CC 220P 50V K OB01403A CE 47μ 16V OB01863A CE 3.3μ 50V OB05832A CM 0.018μ 50V J OB41002A CP 390P 100V J OB05550A CM 1000P 50V J OB09868A CF 0.1μ 50V J OB01400A CE 100μ 16V OB90011A DS Relay OB02242A 4P-T Post	IC101,201 IC102,202 Q110,111 210,211 ZD102,202 L104,204 L105,205 R154,193 254,293 R173,273 R174,274 R175,275 R176,276 R178,278 R180,280 R181,281 R182,282 R184,284 R185,285 R186,286 R187,190 287,290 R188,189 288,289 R191,291 R192,194 292,294 R196,296 R340 R358,359 R702,802 C132,134 232,234 C135,235 C136,236 C137,237 C138,140 154,238 240,254 321 C139,239 C141,241 C142,148 242,248 C143,147 243,247 C144,244 320 C145,245 C149,249 C150,250 C151,251 C152,252 C153,253 C172,272	— Dolby NR — OB06383A IC TEA0654 OB06382A IC TEA0652 OB01872A TR 2SC945L (P,Q) OB06167A ZD 6.2V RD6.2EB3 OB06691A L-C Block YEL OB06690A L-C Block BLUE OB05671A RK 2.2M 1/4W J OB09687A RK 2.7K 1/6W J OB09688A RK 3K 1/6W J OB09686A RK 2.4K 1/6W J OB22286A RM 3.30K 1/6W F OB22229A RM 1.00K 1/6W F OB09721A RK 68K 1/6W J OB22309A RM 5.10K 1/6W F OB22265A RM 2.20K 1/6W F OB22305A RM 4.70K 1/6W F OB09717A RK 47K 1/6W J OB09722A RK 75K 1/6W J OB09737A RK 330K 1/6W J OB09739A RK 390K 1/6W J OB09796A RM 12K 1/4W F OB09709A RK 22K 1/6W J OB09723A RK 82K 1/6W J OB09330A RK 100K 1/4W J OB09725A RK 100K 1/6W J OB01679A RK 100 1/4W J OB40185A CE 1μ 50V OB09312A CP 0.01μ 100V G OB09240A CP 0.033μ 100V G OB05652A CM 4700P 50V J OB01412A CE 10μ 16V OB09280A CC 47P 50V J OB09864A CF 0.047μ 50V J OB09862A CF 0.033μ 50V J OB09868A CF 0.1μ 50V J OB09570A CE 0.15μ 50V (LN) OB09866A CF 0.068μ 50V J OB09872A CF 0.22μ 50V J OB09189A CM 2700P 50V J OB05687A CM 1200P 50V J OB40054A CE 2200μ 6.3V OB09191A CP 4700P 100V G OB01400A CE 100μ 16V	IC304 Q108,208 R165,265 R166,266 R167,168 267,268 R170,270 R171,199 271,299 R342 C130,230 C131,231 C170,270 C323 IC601 IC602 IC603 Q601 Q602,604 606,621 623,625 Q603,605 616,617 618,619 Q607,624 Q608,609 610,611 Q612,613 614,615 Q620 Q622 D601,603 604 606-613 615-618 D602 L601 VR601 R601 R602,604 R601 613,616 617,618 619,651 R603,606 611,660 R605 R607,608 615 R609,610 647 R612 R614,644 R620 R621 R622 R623 R624 R625 R626 R627,628 R629,630 R631 R632 R633,636 637,640	— Headphone Amp. — OB06370A IC 4556D OB06299A TR 2SC2878 OB09685A RK 2.2K 1/6W J OB09697A RK 6.8K 1/6W J OB09725A RK 100K 1/6W J OB05579A RK 22 1/4W J OB09677A RK 1K 1/6W J OB09049A RF 22 1/4W J OB09327A CE 0.33μ 50V (LN) OB01398A CE 220μ 16V OB09291A CC 0.022μ 50V Z OB01400A CE 100μ 16V — Logic — OB06178A IC μPD4011BC OB06214A IC μPD4071BC OB11020A IC TMP4315BP-1814 OB06332A TR 2SB564M OB01872A TR 2SC945L (P,Q) OB06013A TR 2SA733 (P,Q) OB10021A TR 2SD1164 (K,L) OB06372A TR 2SA953 (K,L) OB06322A TR 2SC2002 (K,L) OB06066A TR 2SD471 (L,M) OB10023A TR 2SC2002 (K) OB06181A SiD 1S553 (15) OB12100A Double SiD MC921 OB06689A L-C Block OB32007A Semi-fixed VR 470 OB09749A RK 1M 1/6W J OB09725A RK 100K 1/6W J OB09701A RK 10K 1/6W J OB09304A RK 3.3 1/4W J OB05509A RK 33K 1/4W J OB09729A RK 150K 1/6W J OB09217A RF 5.6 1/4W J OB09737A RK 330K 1/6W J OB09711A RK 27K 1/6W J OB09695A RK 5.6K 1/6W J OB09663A RK 270 1/6W J OB09672A RK 620 1/6W J OB01854A RK 39K 1/4W J OB09699A RK 8.2K 1/6W J OB06706A R Coil 3.5 OB01679A RK 100 1/4W J OB01933A RK 220 1/4W J OB24007A RF 22 ZW J OB09707A RK 18K 1/6W J OB09741A RK 470K 1/6W J			
R127,227 R128,228 R129,229 R130,230 R131,231 R132,135 137,232 235,237 R133,136 233,236 R198,298	— Rec. Eq. Amp. — OB06387A IC NJM2043DD OB06299A TR 2SC2878 OB00068A Trap Coil 10.5mH OB06696A L-C Block OB09711A RK 27K 1/6W J OB09701A RK 10K 1/6W J OB09725A RK 100K 1/6W J OB09677A RK 1K 1/6W J OB09731A RK 180K 1/6W J OB09691A RK 3.9K 1/6W J OB09665A RK 330 1/6W J OB09669A RK 470 1/6W J OB09715A RK 39K 1/6W J OB09697A RK 6.8K 1/6W J OB05936A RK 10 1/4W J OB09741A RK 470K 1/6W J OB01804A CM 3900P 50V J OB40178A CE 0.47μ 50V OB01862A CE 22μ 16V OB05659A CM 5600P 50V J OB41186A CM 5100P 50V J OB01412A CE 10μ 16V OB09866A CF 0.068μ 50V J OB09280A CC 47P 50V J OB09187A CE 1μ 50V (BP) OB09815A CE 47μ 6.3V — Rec. Level — OB11027A IC TC9145P OB01872A TR 2SC945L (P,Q) OB32009A Semi-fixed VR 22K OB32008A Semi-fixed VR 10K OB09705A RK 15K 1/6W J OB22327A RM 7.15K 1/6W F OB09699A RK 8.2K 1/6W J OB01888A RK 10K 1/4W J OB09707A RK 18K 1/6W J OB09701A RK 10K 1/6W J OB05629A RK 2.7K 1/4W J OB09704A RK 22K 1/6W J	IC302 R152,252 R162,262 R163,263 C127,227 C129,229 Q105,106 107,205 206,207 ZD101,201 D101,201 D102,202 305	— Line Amp. — OB06146A IC NJM4558DD OB09677A RK 1K 1/6W J OB09709A RK 22K 1/6W J OB09702A RK 11K 1/6W J OB09251A CE 33μ 25V OB01412A CE 10μ 16V — Meter Amp. — OB01872A TR 2SC945L (P,Q) OB12101A ZD 5V 5C-1 OB06398A SiD 1S5176 OB06181A SiD 1S553					

Description	Schematic Ref. No.	Part No.	Description
Semi-fixed VR 100K	R634,635	OB09677A	RK 1K 1/6W J
RK 33K 1/6W J	638,639		
RK 100K 1/4W J	658		
RK 560K 1/6W J	R641,650	OB01889A	RK 100K 1/4W J
RK 150K 1/6W J	R642	OB09717A	RK 47K 1/6W J
RK 100K 1/6W J	R643	OB01846A	RK 4.7K 1/4W J
	R645,646	OB09733A	RK 220K 1/6W J
RK 56K 1/6W J	R648,649	OB05629A	RK 2.7K 1/4W J
	R652	OB09705A	RK 15K 1/6W J
RK 22K 1/6W J	R653	OB09693A	RK 4.7K 1/6W J
RF 10 1/4W J	R654,655	OB09713A	RK 33K 1/6W J
CE 0.15μ 50V (LN)	R656	OB09803A	R-Network 47Kx5
CE 10μ 25V (LN)	R657	OB09824A	R-Network 100Kx3
CE 100μ 16V	R659	OB09681A	RK 1.5K 1/6W J
	C601	OB40079A	CE 220μ 16V
	C602,604	OB01405A	CE 1μ 50V
	610		
IC 4556D	C603,606	OB40024A	CE 0.33μ 50V
TR 2SC2878	C607	OB01802A	CM 2200P 50V J
RK 2.2K 1/6W J	C608	OB09290A	CC 0.01μ 50V Z
RK 6.8K 1/6W J	C609	OB09222A	CE 0.47μ 50V (LN)
RK 100K 1/6W J	C611	OB09817A	CE 33μ 10V (LN)
		OB02243A	5P-T Post (1)
RK 22 1/4W J		OB02245A	9P-T Post (1)
RK 1K 1/6W J			
		— DC Supply —	
RF 22 1/4W J		IC 402	IC NJM7812
CE 0.33μ 50V (LN)	IC402	OB06380A	TR 2SC2002 (K,L)
CE 220μ 16V	Q401,405	OB06322A	TR 2SC945L (P,Q)
CC 0.022μ 50V Z	Q402,403	OB01872A	
CE 100μ 16V	404		
	ZD401	OB06167A	ZD 0.2V RD6.2EB3
	ZD402	OB12003A	ZD 5.6V RD5.6JB2T
	D401	OB06282A	Diode Bridge DBA10
IC μPD4011BC	D402	OB12100A	Double SiD MC921
IC μPD4071BC	D403,404	OB06398A	SiD 1SS176
IC TMP4315BP-	406		
1814	R403	OB24006A	RF 560 1W J
TR 2SB564M	R404	OB01857A	RK 1K 1/4W J
TR 2SC945L (P,Q)	R405	OB09671A	RK 560 1/6W J
	R406	OB24007A	RF 22 2W J
	R407	OB09725A	RK 100K 1/6W J
TR 2SA733 (P,Q)	R408	OB09707A	RK 18K 1/6W J
	R409	OB09695A	RK 5.6K 1/6W J
	R410	OB09665A	RK 330 1/6W J
TR 2SD1164 (K,L)	R411	OB09693A	RK 4.7K 1/6W J
TR 2SA953 (K,L)	R413	OB09713A	RK 33K 1/6W J
	R414	OB09719A	RK 56K 1/6W J
TR 2SC2002 (K,L)	R415	OB24023A	R Fuse 1
	C402	OB40095A	CE 1000μ 25V
TR 2SD471 (L,M)	C403	OB01392A	CE 470μ 16V
TR 2SC2002 (K)	C404	OB01403A	CE 47μ 16V
SiD 1SS53 (15)	C405,406	OB09292A	CC 0.1μ 50V Z
	C407	OB09799A	CE 4700μ 25V
	C408	OB09798A	CE 6800μ 16V
	C409	OB40011A	CE 33μ 16V
	C411	OB01405A	CE 1μ 50V
Double SiD MC921	C412	OB01398A	CE 220μ 16V
L-C Block	TF1	OB08715A	Thermal Fuse 129
Semi-fixed VR 470		OB08676B	Heat Sink A304 (1)
RK 1M 1/6W J		OE00507A	Nut Hex. M3
RK 100K 1/6W J			(Chromate) (1)
		OE00612A	M3x6 ⊕ Pan (2A)
			(1)
RK 10K 1/6W J		OE00857A	BT 3x6 ⊕ Binding
RK 3.3 1/4W J			(Chromate) (2)
RK 33K 1/4W J			
		— Miscellaneous —	
RK 150K 1/6W J		OB60040B	Main P.C.B.
RF 5.6 1/4W J		OB02348A	JP Connector 3P (3)
RK 330K 1/6W J		OB02351A	JP Connector 6P (1)
RK 27K 1/6W J		OB02352A	JP Connector 7P (1)
RK 5.6K 1/6W J		OB81002A	Dip Mate 2P (6)
RK 270 1/6W J		OB81010A	Dip Mate 3P (6)
RK 620 1/6W J		OB81011A	Dip Mate 4P (3)
RK 39K 1/4W J		OB81012A	Dip Mate 5P (1)
RK 8.2K 1/6W J		OB81013A	Dip Mate 6P (1)
R Coil 3.5			
RK 100 1/4W J			
RK 220 1/4W J			
RF 22 2W J			
RK 18K 1/6W J			
RK 470K 1/6W J			

6.9. Main P.C.B. Ass'y



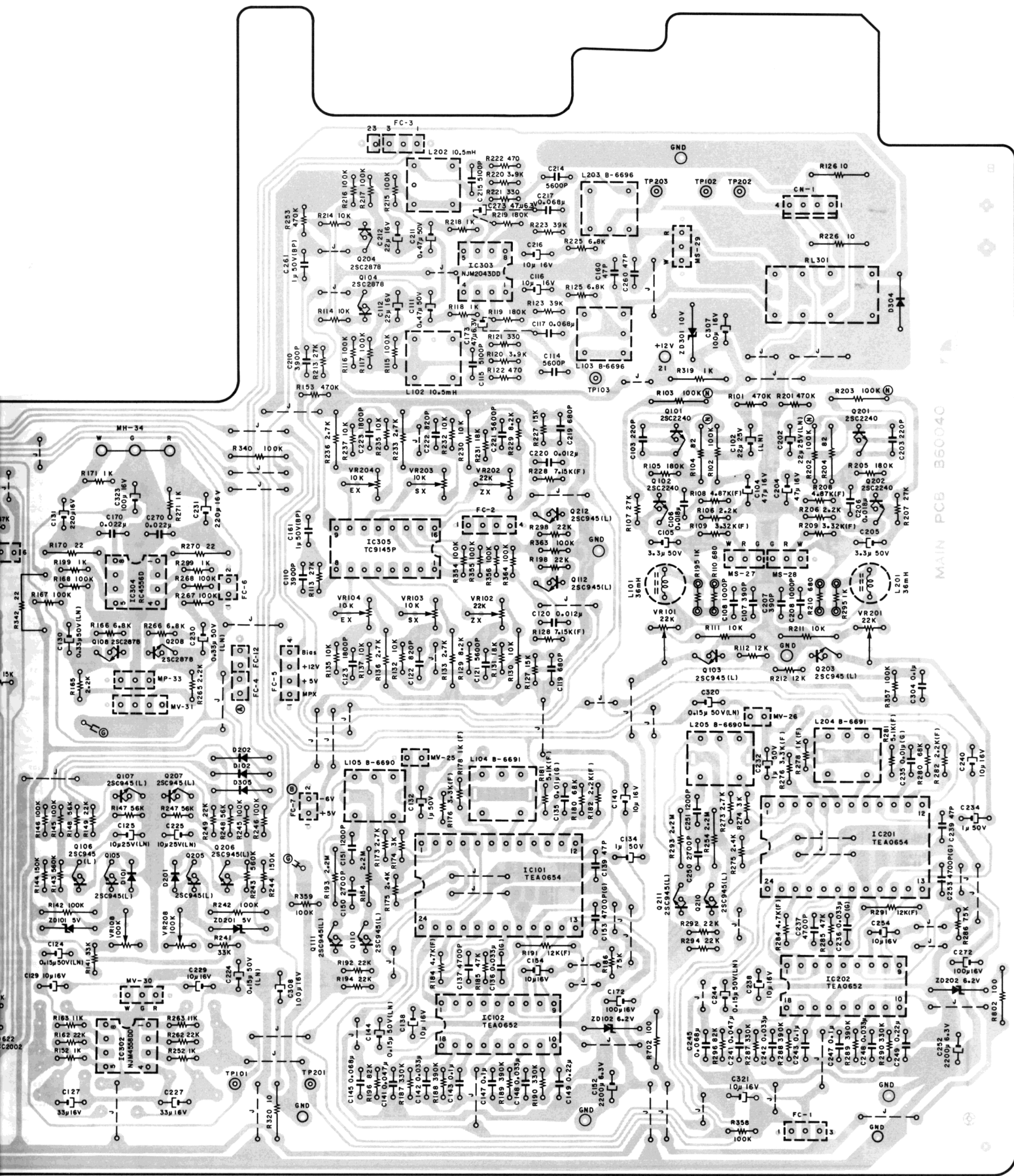
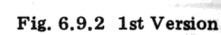


Fig. 6.9.1 2nd Version



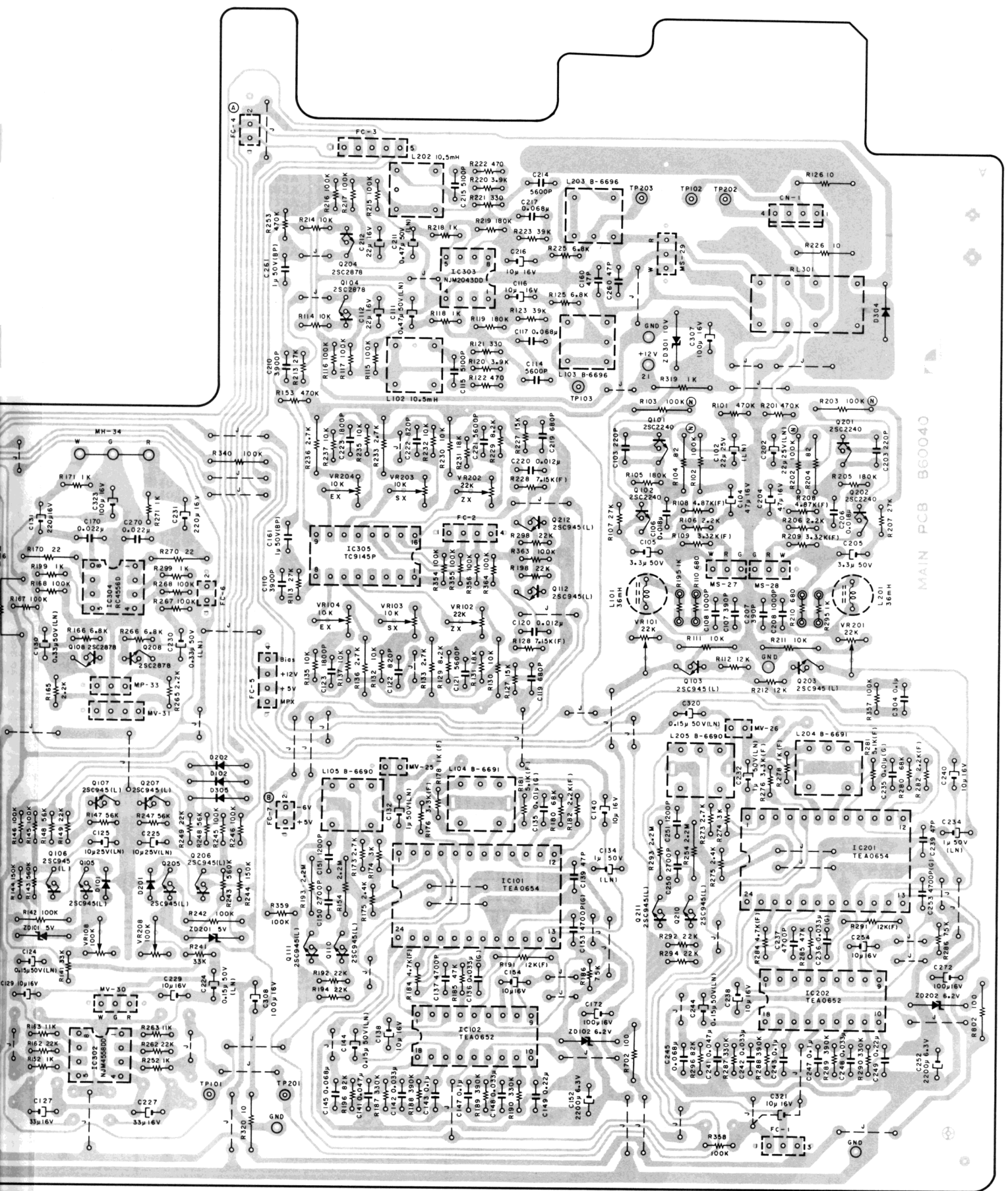


Fig. 6.9.2 1st Version

7. SCHEMATIC DIAGRAMS

7.1. Attention to Servicemen

(1) Caution

- If a part is in need of removing (or replacing) for service, it should be remounted (or replaced with specified parts) by the same methods as before after servicing.
- The appliance should be used only specified parts for preventing a risk of fire and electric shock and maintaining the characteristics.
- Before returning the repaired appliance to a customer, check to insure that the exposed part is accurately insulated from the Power Supply by measuring the leakage current or the insulation resistance between them.

(2) Parts Replacement

Following parts shall be replaced with the specified ones. Refer to the parts list.

(a) Power Supply Circuit

Power Cord
Power Transformer: T1
Fuses: F401, 402

(b) Power Switch P.C.B. Ass'y

Power Switch: SW1
Spark Killer: M2

(c) Tape Switch P.C.B. Ass'y

Power Transistor: Q301
Fail Safe Type Resistor: R318, 350

(d) Main P.C.B. Ass'y

Regulator IC: IC402
Power Transistors: Q601, 607, 620, 624
Diode Bridge: D401
Fail Safe Type Resistors: R320, 342, 403, 406, 612, 631
Thermal Fuse: TF1

7.2. IC Block Diagrams

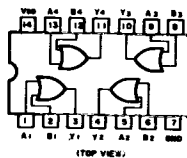


Fig. 7.2.1. OR Gate C-MOS IC μ PD4071BC

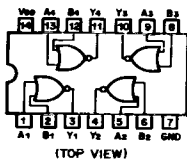


Fig. 7.2.2. NAND Gate C-MOS IC μ PD4011BC

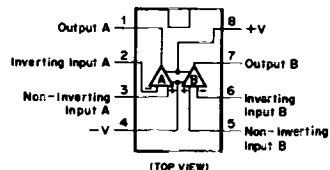


Fig. 7.2.3. Operational Amp. IC4558DD, 4556D, NJM4558D, NJM2043DD

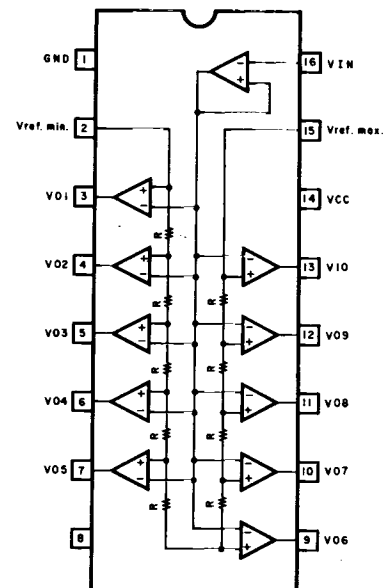


Fig. 7.2.4. Level Meter Driver TA7612AP

7.3. Schematic Diagram

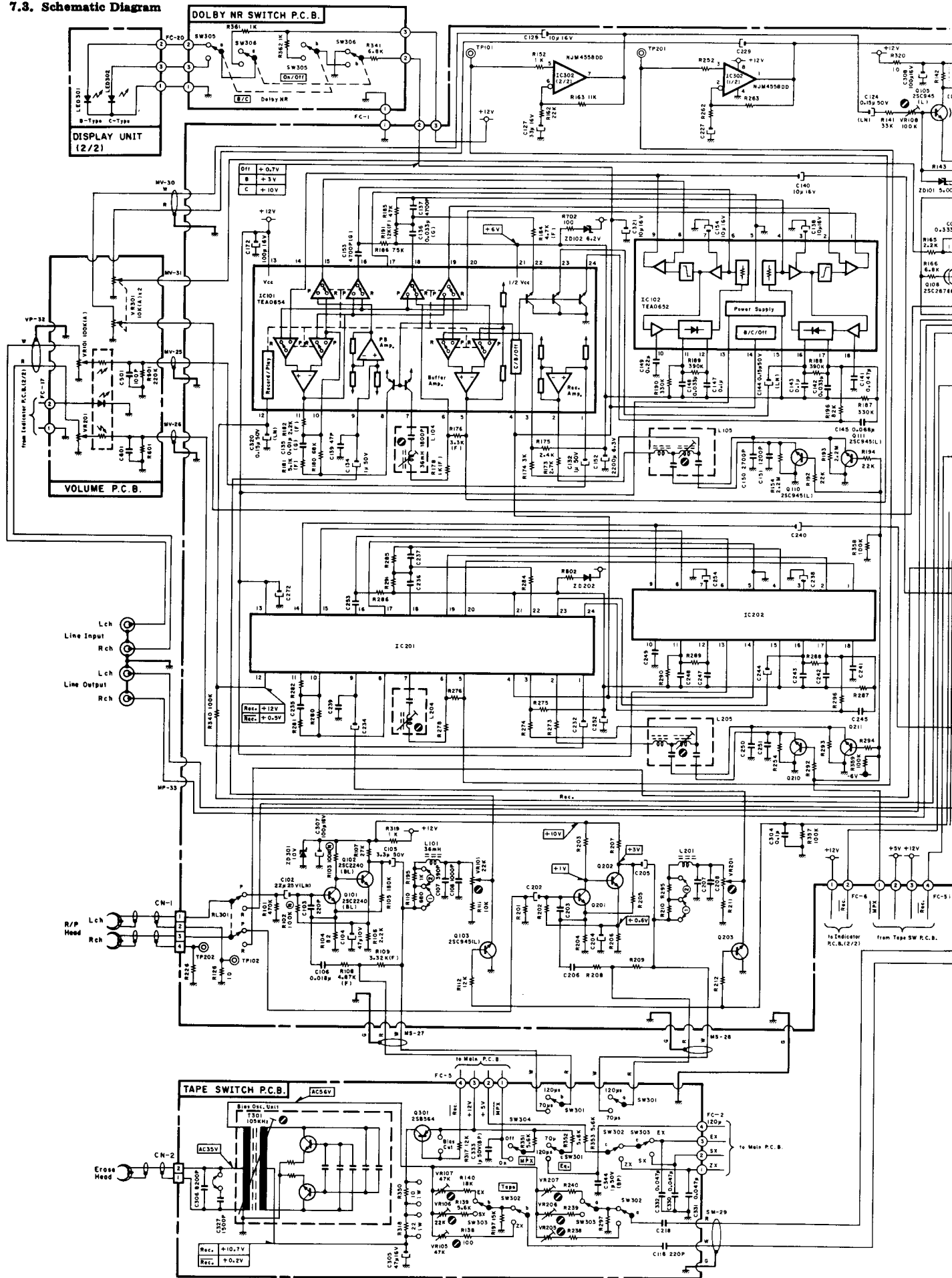
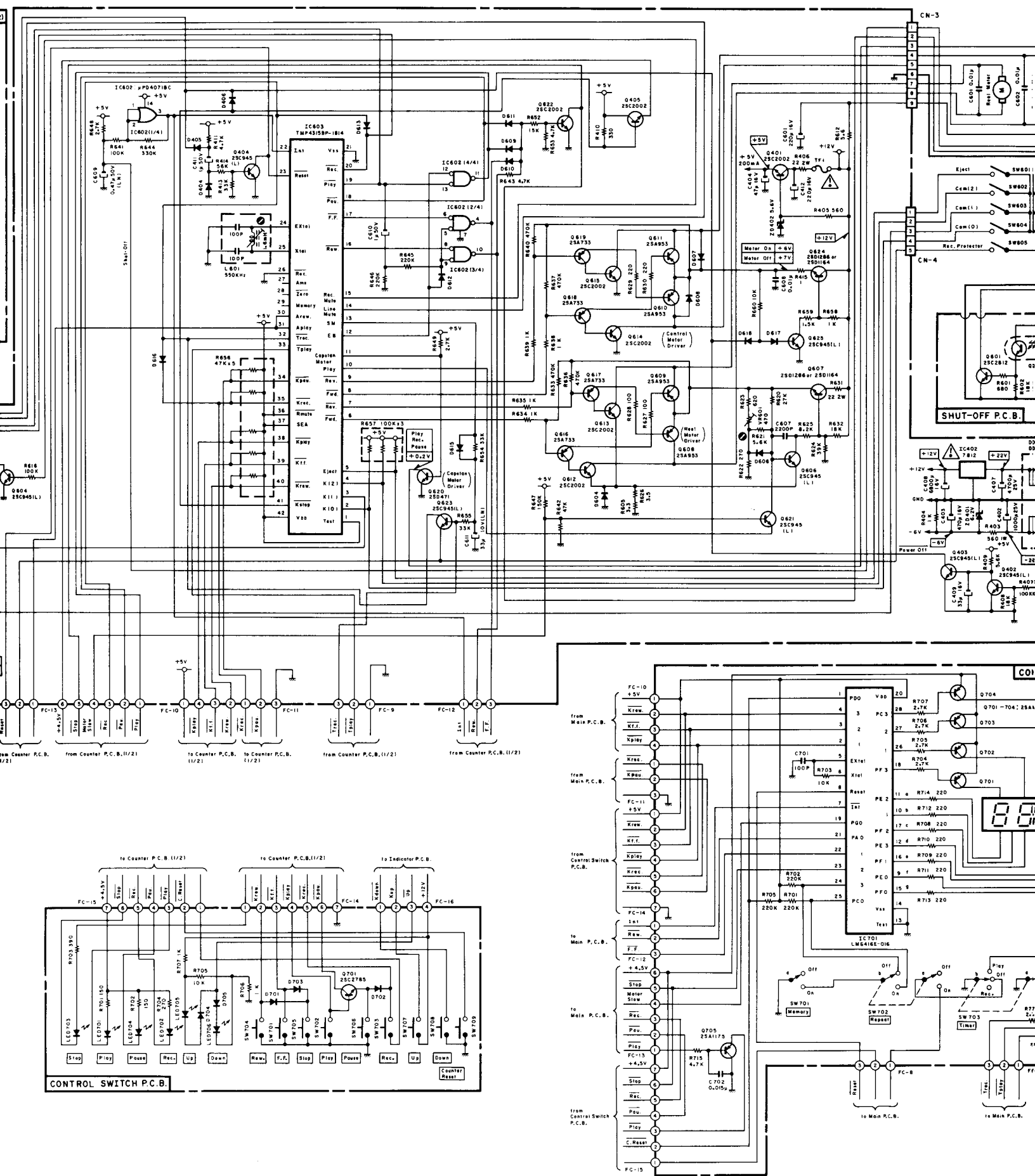
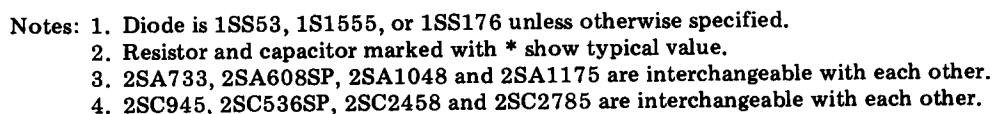
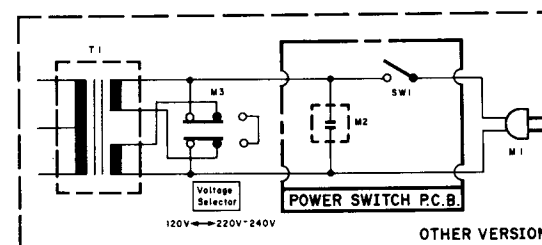
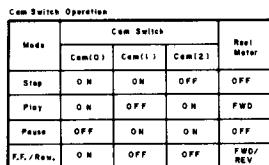




Fig. 7.3





WARNING — DO NOT return the unit to the customer until the problem is located and corrected.

8. WIRING DIAGRAM

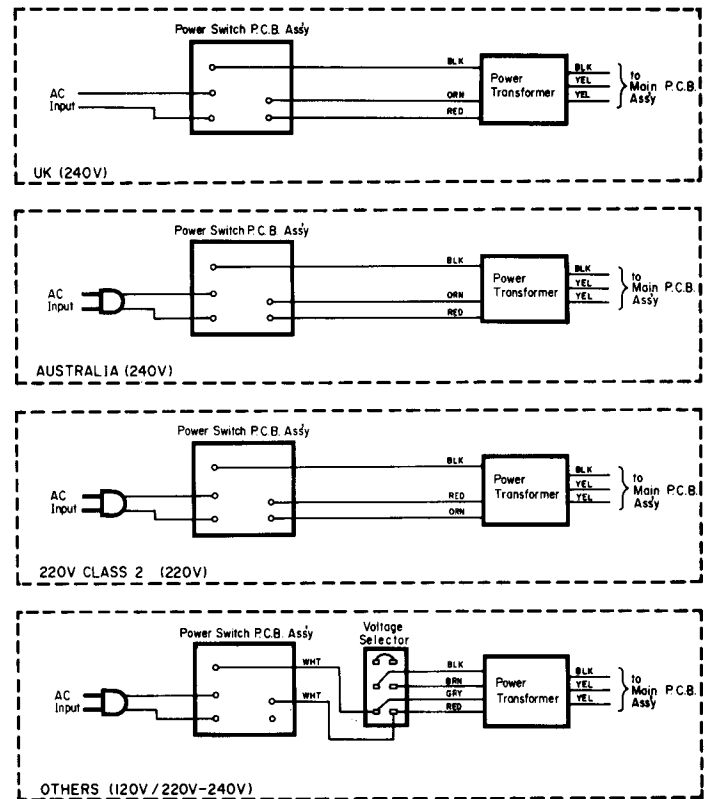


Fig. 8.1

Notes: 1. Table of wire colors

BRN — Brown	BLU — Blue
RED — Red	VIO — Violet
ORN — Orange	GRY — Gray
YEL — Yellow	WHT — White
GRN — Green	BLK — Black

2. Component side view of the P.C.B. is illustrated unless otherwise

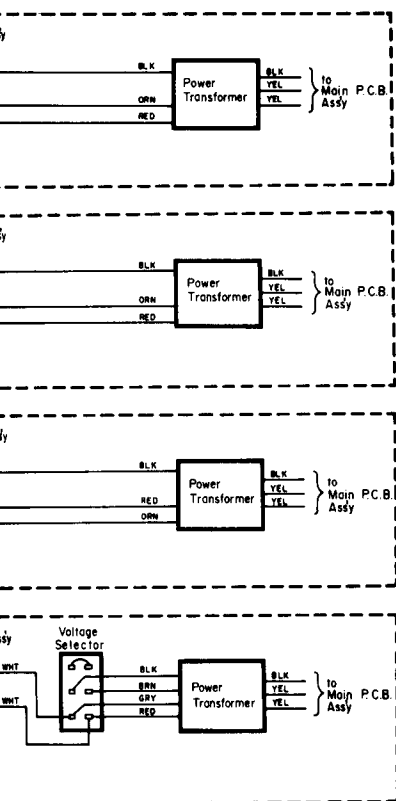
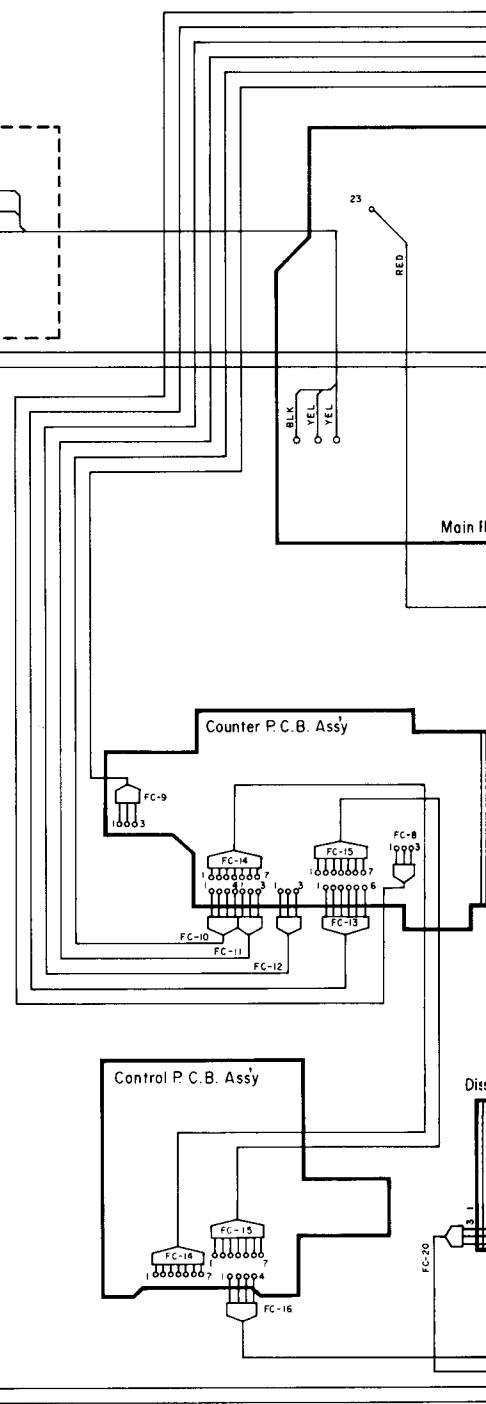
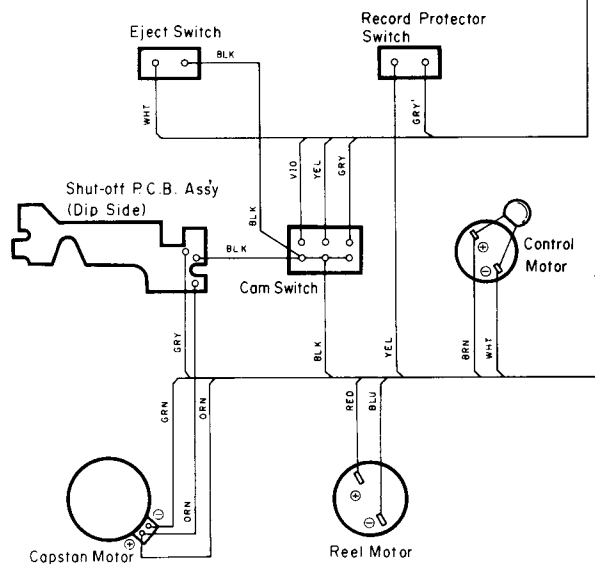
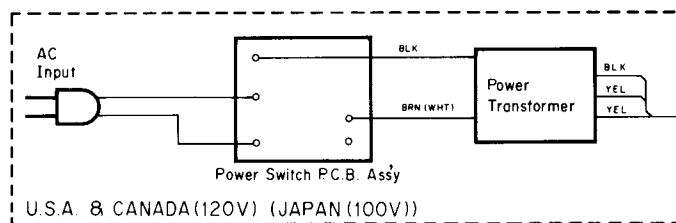


Fig. 8.1



Colors
n
n
ge
w
n
e view of the P.C.B. is illustrated unless otherwise specified.

BLU — Blue
VIO — Violet
GRY — Gray
WHT — White
BLK — Black

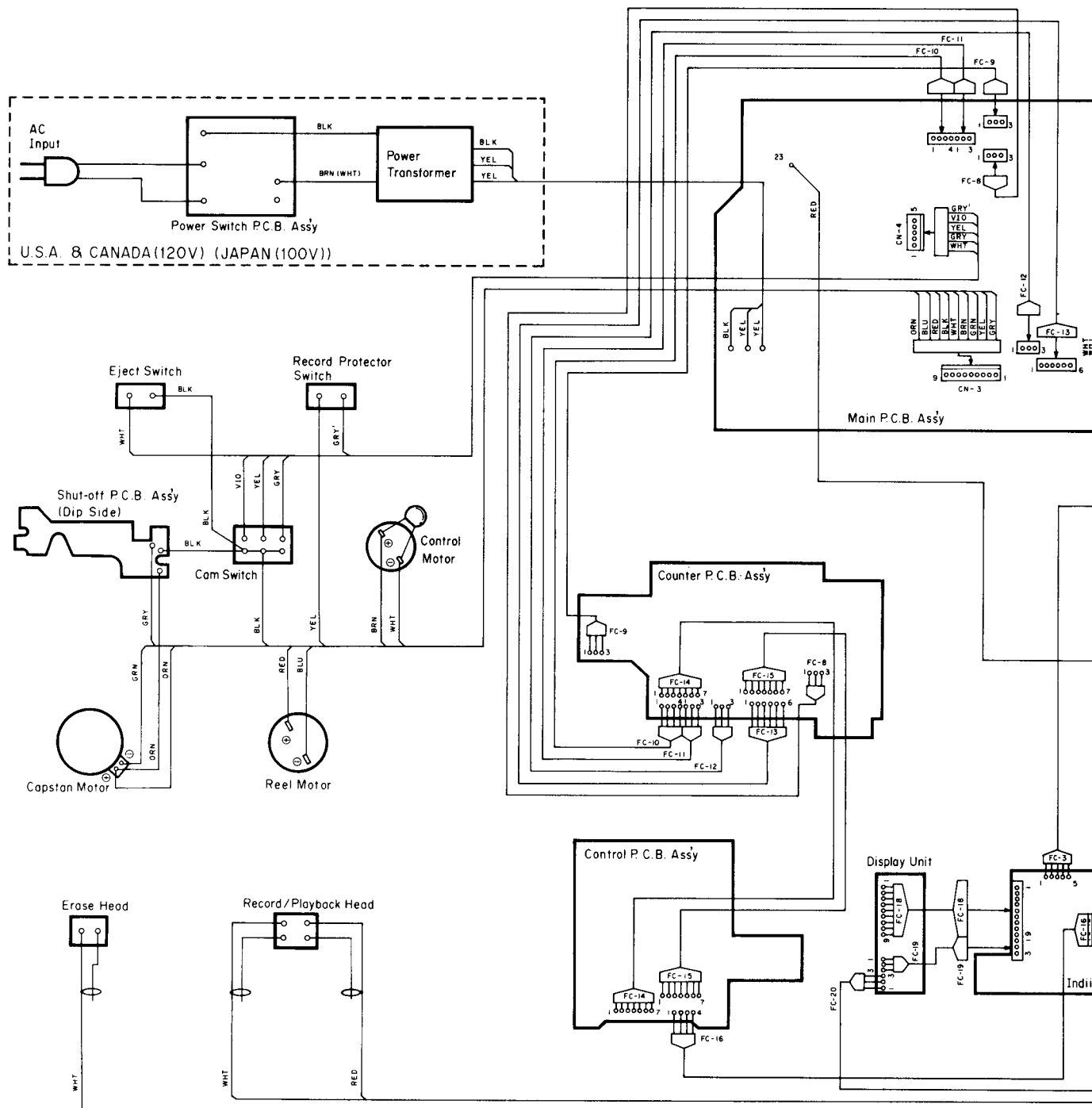


Fig. 8.2.2 1st V

9.2. Mechanism Control Section

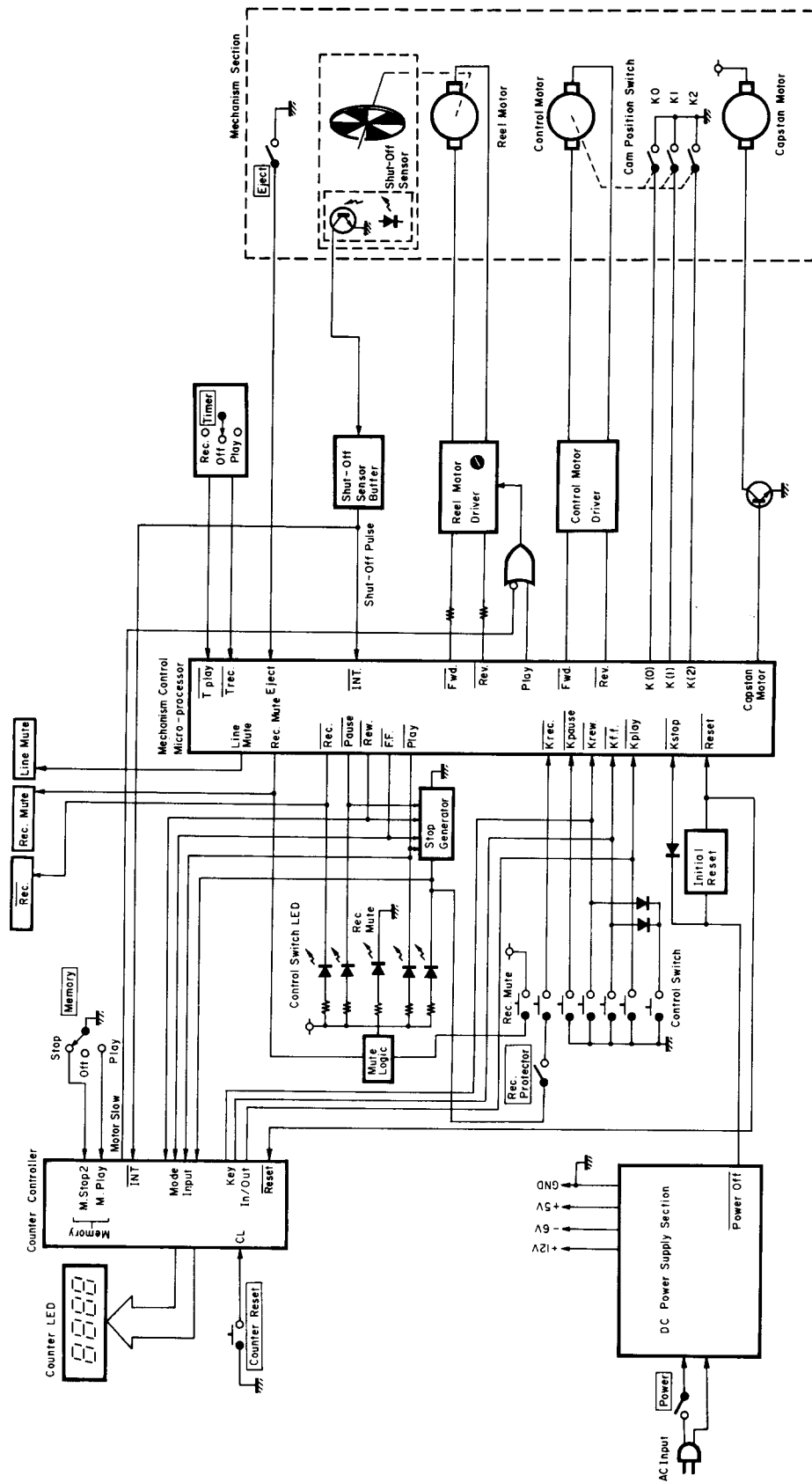


Fig. 9.2

9. BLOCK DIAGRAMS

9.1. Amplifier Section

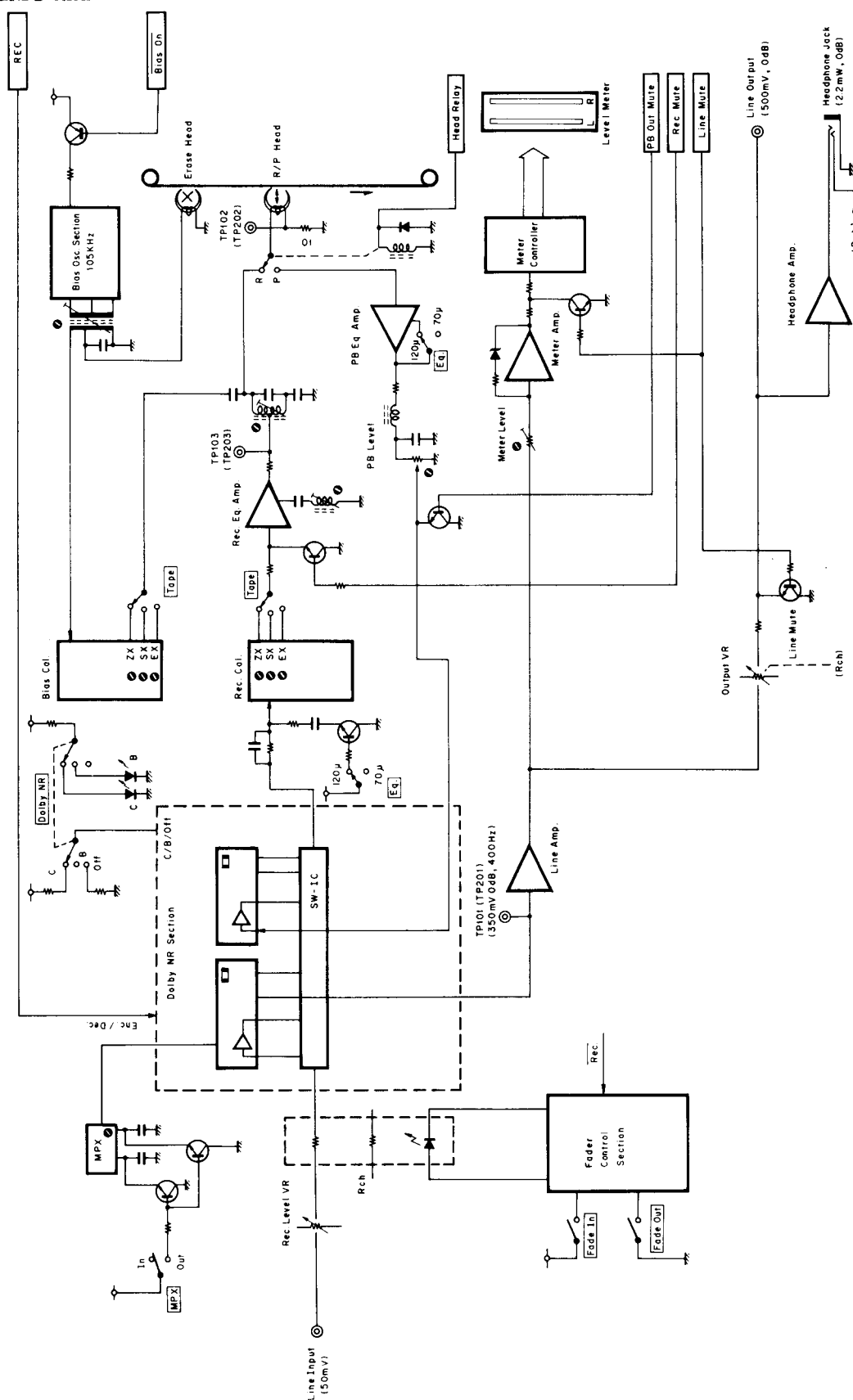


Fig. 9.1

10. TIMING CHART AND EQ. AMP. FREQUENCY RESPONSE

10.1. Timing Chart

(1) Overall Timing Chart

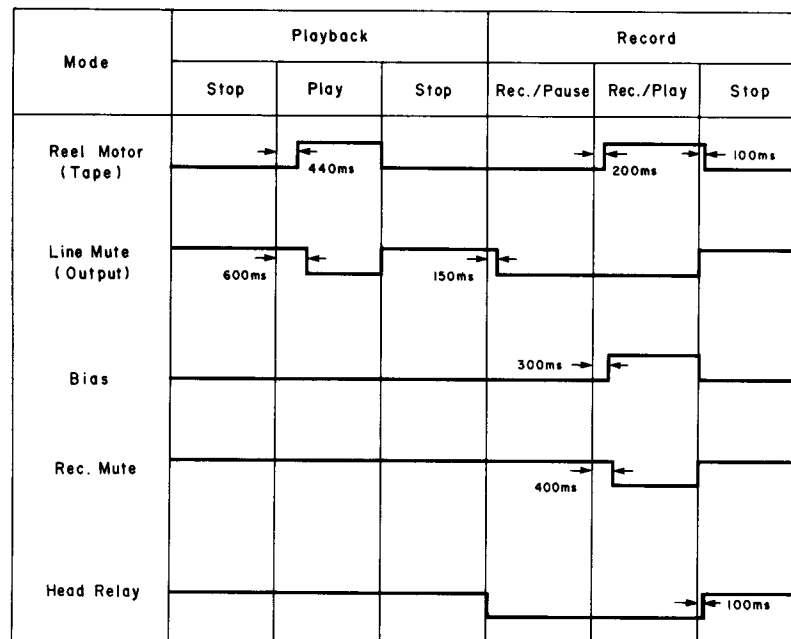


Fig. 10.1.1

(2) Mechanism Control Timing Chart

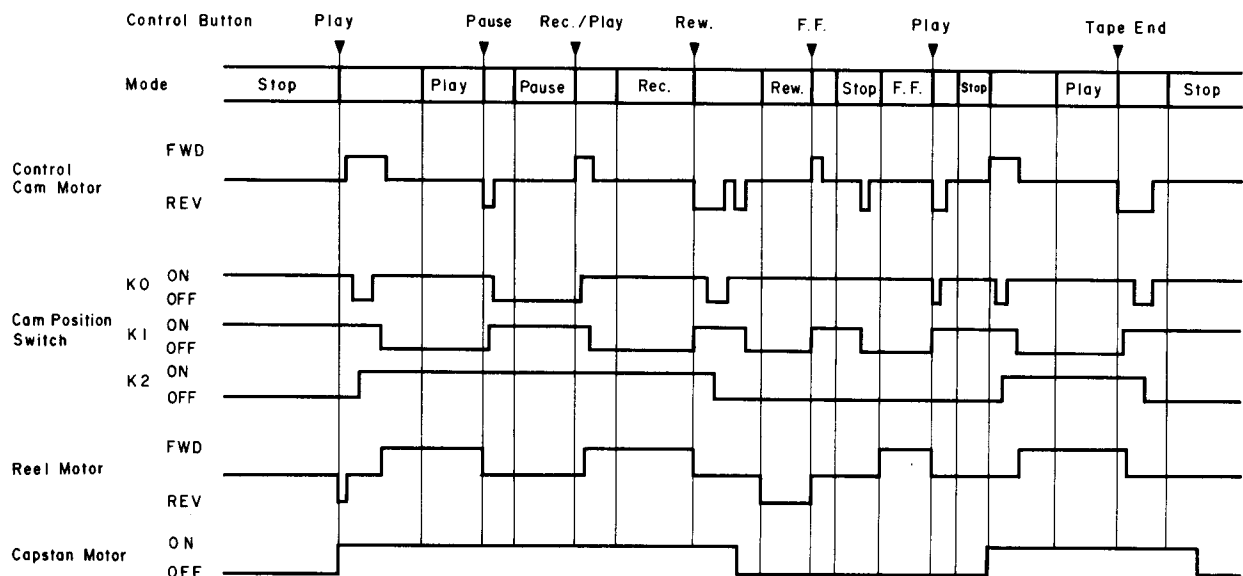


Fig. 10.1.2

10.2. Eq. Amp. Frequency Response
(1) Playback Frequency Response

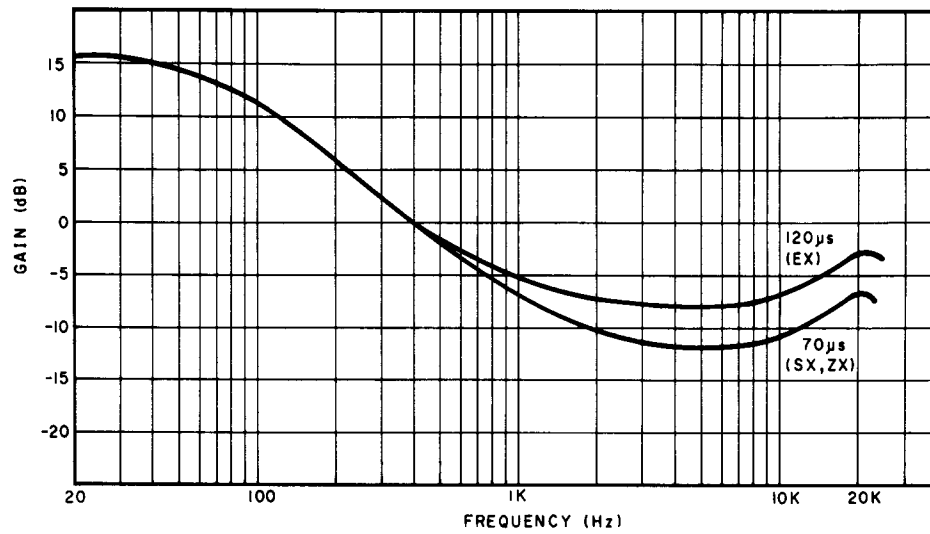


Fig. 10.2.1

(2) Record Current Frequency Response

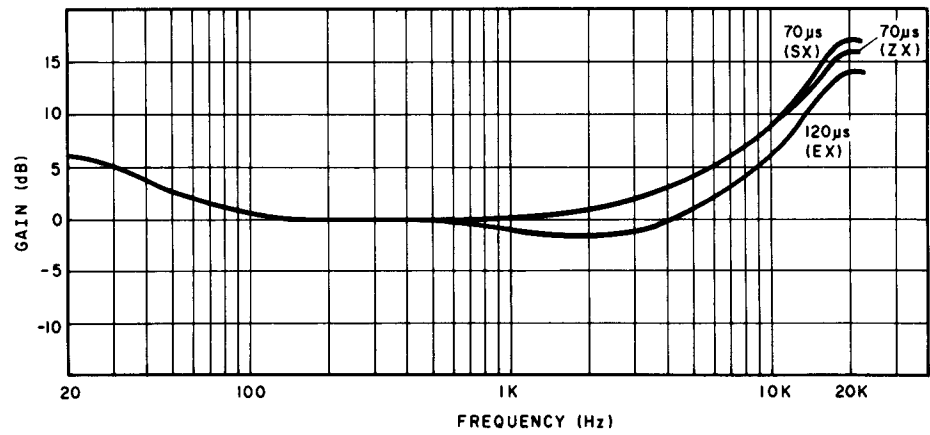


Fig. 10.2.2

11. SPECIFICATIONS

Track Configuration	4 Tracks/2-Channel Stereo
Heads	2 (Erase Head x 1, Record/Playback Head x 1)
Motors (Tape Transport)	DC Servo Motor (Capstan Drive) x 1 DC Motor (Reel Drive) x 1
Power Source	100, 120, 120/220-240, 220 or 240V AC; 50/60 Hz (According to country of sale)
Power Consumption	23 W max.
Tape Speed	1-7/8 ips. (4.8 cm/sec.) $\pm 0.5\%$
Wow-and-Flutter	Less than 0.11% WTD Peak Less than 0.06% WTD RMS
Frequency Response	20 Hz—20,000 Hz (recording level —20 dB)
Signal-to-Noise Ratio	Dolby C-Type NR on <70 μ s, ZX tape> Better than 68 dB (400 Hz, 3% THD, IHF A-WTD RMS) Dolby B-Type NR on <70 μ s, ZX tape> Better than 62 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Total Harmonic Distortion	Less than 1.0% (400 Hz, 0 dB, ZX, EXII tape) Less than 1.2% (400 Hz, 0 dB, SX tape)
Erasure	Better than 60 dB (100 Hz, 0 dB)
Separation	Better than 36 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV, 30 k Ω
Output (Line)	0.5 V (400 Hz, 0 dB, output level control at max.) 2.2 k Ω
(Headphones)	2.2 mW (400 Hz, 0 dB, output level control at max.) 8 Ω load
Fast-Winding Time	Approx. 85 seconds (with C-60 cassette)
Dimensions	430 (W) x 110 (H) x 250 (D) millimeters 16-15/16 (W) x 4-5/16 (H) x 9-7/8 (D) inches
Approximate Weight	5.5 kg 12 lb. 2 oz

- Specifications and appearance design are subject to change for further improvement without notice.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
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Service Manual

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