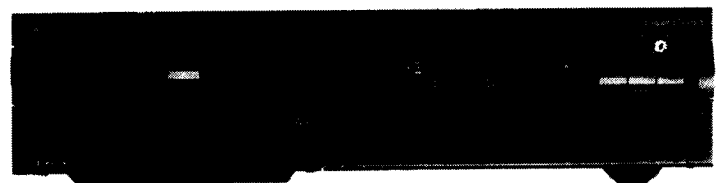


Service Manual

Nakamichi Cassette Deck 1



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1. GENERAL

1.1. Production No.

Production No.: A133

1.2. Destinations

USA, CAN, EP, UK, AUS, OTR, SAU, JPN

Abbreviation

USA — U.S.A.	AUS — Australia
CAN — Canada	OTR — Other
EP — Europe	SAU — Saudi Arabia
UK — United Kingdom	JPN — Japan

1.3. Parts Supply

(1) Unstocked Parts


Parts marked with "★" at the head of part No. are not stocked. So, it takes time to supply the parts after we receive your order.

(2) Unsupplied Parts

Parts without part Nos. (indicated as "—" in the parts list) are not supplied.

1.4. CAUTIONS/WARNINGS

(1) Product Safety Notice

Parts marked with the symbol  in the schematic diagram have critical characteristics.

Use ONLY replacement parts recommended by the manufacturer.

It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

(2) Leakage Current Check/Resistance Check

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.

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

1.5. Voltage Selector

Voltage selector is installed on the Rear Panel of the Nakamichi Cassette Deck 1 (Other & Saudi Arabia). The voltage selector can select either 110V/127V or 220V/240V at customer's disposal.

1.6. Package Ass'y and Accessory Ass'y

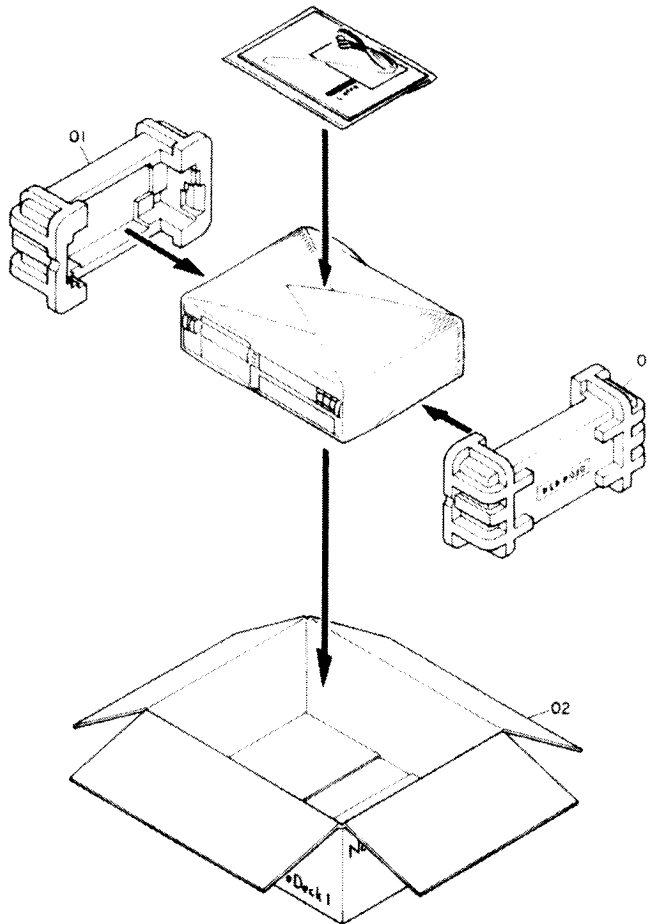


Fig. 1

Schematic Ref. No.	Part No.	Description	Qty
	—	Package Ass'y	
01	0F04483A	Packing	2
02	0F04457A	Carton Box	1
	DA04402A	Accessory Ass'y (USA, CAN)	1
	DA04407A	Accessory Ass'y (UK)	1
	DA04404A	Accessory Ass'y (EP)	1
	DA04403A	Accessory Ass'y (AUS, OTR, SAU)	1
	DA04401A	Accessory Ass'y (JPN)	1
	0D06122A	Owner's Manual (Japanese)	1
	0D06123A	Owner's Manual (English/French/Germany)	1
	DA04439A	Pin-Pin Cord Ass'y	1

2. REMOVAL PROCEDURES

2.1. Top Cover

Refer to Fig. 2.1.

- (1) Loosen screws F01 (2 pcs.) and F02 (4 pcs.), and remove F03 (Top Cover).

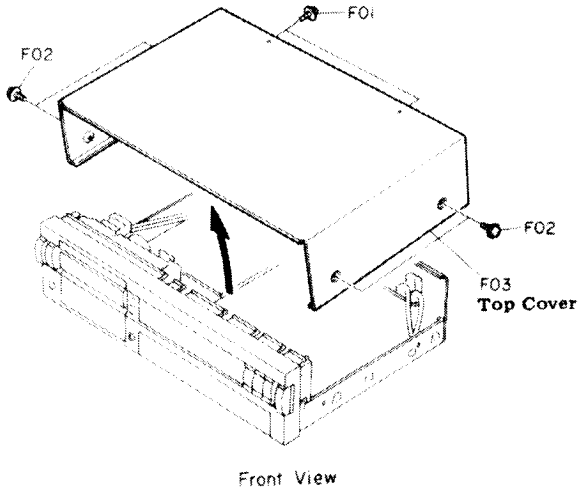


Fig. 2.1

2.2. Cassette Case Cover Ass'y

Refer to Fig. 2.2.

- (1) Press the Eject button to open F01 (Cassette Case Cover Ass'y).
- (2) Pull F01 (Cassette Case Cover Ass'y) upward.

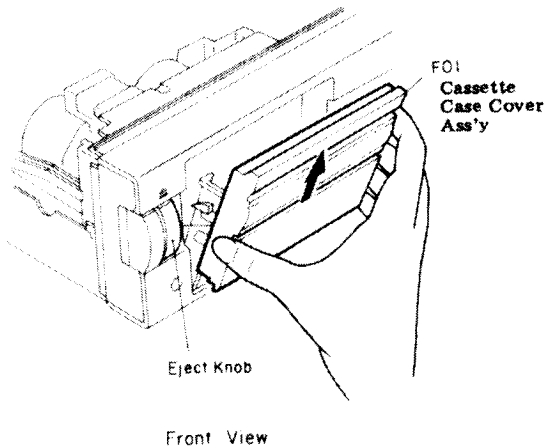


Fig. 2.2

2.3. Sealing Panel Ass'y

Refer to Fig. 2.3.

- (1) Open F01 (Sealing Panel Ass'y).
- (2) Hold by hand and pull F01 (Sealing Panel Ass'y) in the direction of the arrow.

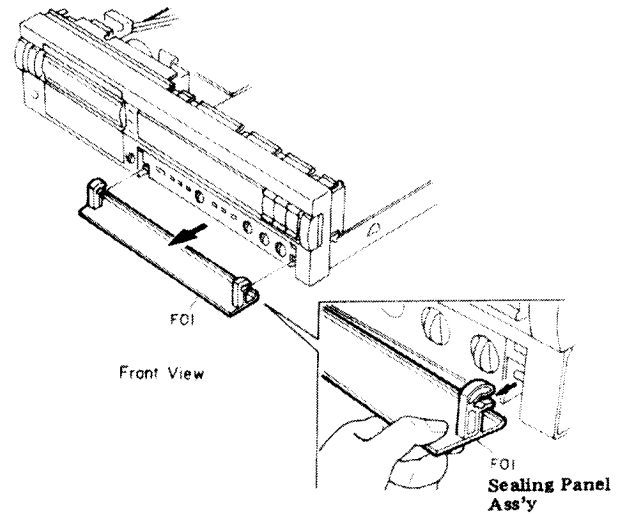


Fig. 2.3

2.4. Front Panel

Refer to Fig. 2.4.

- (1) Remove the Top Cover referring to item 2.1.
- (2) Loosen screws F01 (2 pcs.), F02 (1 pce.) and F03 (2 pcs.).
- (3) With pressing claws A (3 pcs.), remove F04 (Front Panel).

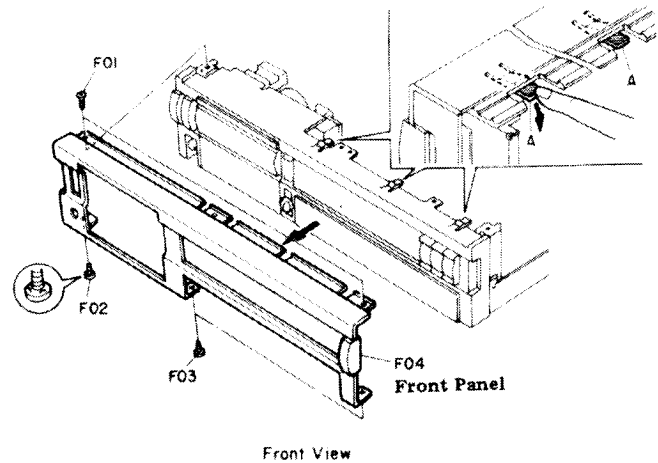


Fig. 2.4

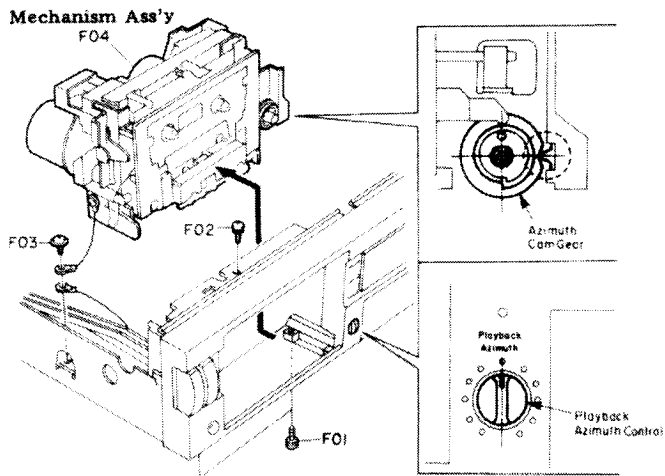
2.5. Mechanism Ass'y

Refer to Fig. 2.5.

- (1) Remove the Top Cover and Cassette Case Cover Ass'y referring to item 2.1 and 2.2.
- (2) Loosen screws F01 (2 pcs.), F02 (1 pce.) and F03.
- (3) Remove F04 (Mechanism Ass'y) in the direction of the arrow.

Note: When installing the Mechanism Ass'y, perform the following:

- (1) Turn the Azimuth Cam Gear by hand so that it is set as shown in the figure.
(In this position, playback head azimuth is set to zero.)
- (2) Set the Playback Azimuth control on the Front Panel to the center position.
- (3) Install the Mechanism Ass'y by reversing the above procedure.



Front View

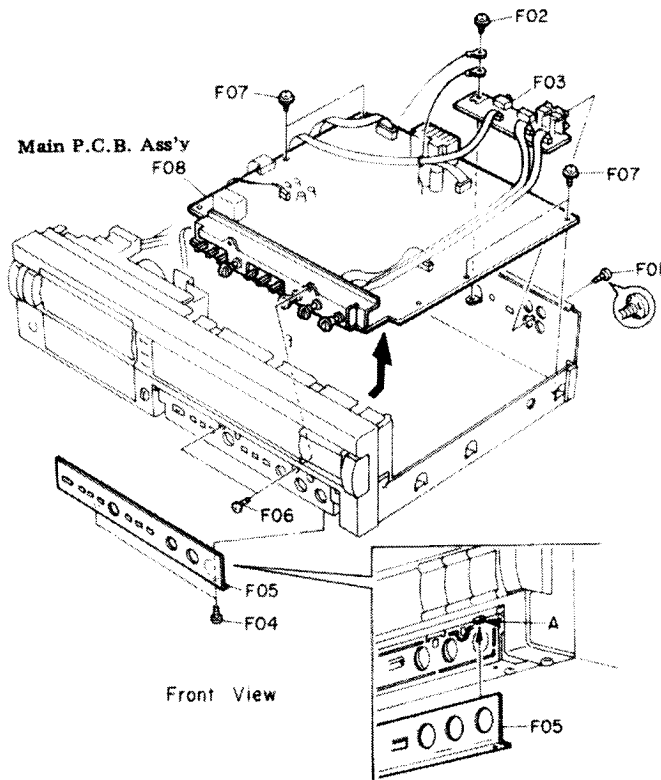
Fig. 2.5

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

Refer to Fig. 2.6.

- (1) Remove the Top Cover and Sealing Panel Ass'y referring to items 2.1 and 2.3.
- (2) Loosen screws F01 (1 pce.) and F02 (1 pce.), and remove F03 (Pin Jack P.C.B. Ass'y).
- (3) Loosen screws F04 (2 pcs.) and remove F05 (Inner Panel).
- (4) Loosen screws F06 (2 pcs.) and F07 (4 pcs.), and remove F08 (Main P.C.B. Ass'y) in the direction of the arrow.

Note: When installing F05 (Inner Panel), insert protrusions A (3 pcs.) into the claws of F05 (Inner Panel) and fasten F05 (Inner Panel) with screws F04 (2 pcs.).



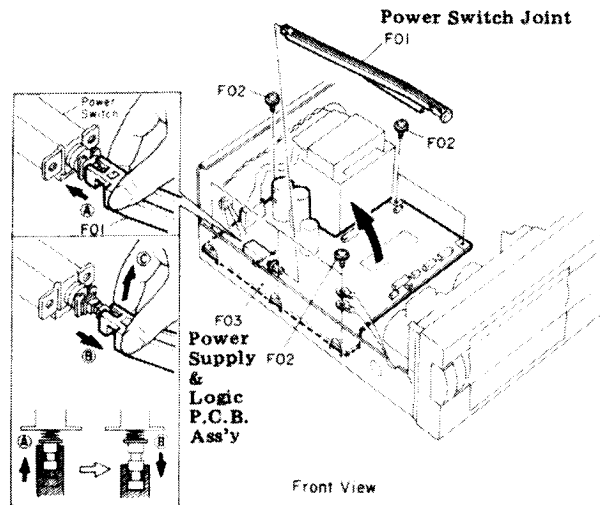
Front View

Fig. 2.6

2.7. Power Switch Joint and Power Supply and Logic P.C.B. Ass'y

Refer to Fig. 2.7.

- (1) Remove the Top Cover Ass'y referring to item 2.1.
- (2) Push F01 (Power Switch Joint) backward (in the direction of (A)).
- (3) Pull F01 (Power Switch Joint) forward (in the direction of (B)).
- (4) Pull F01 (Power Switch Joint) upward (in the direction of (c)) to remove it.
- (5) Loosen screws F02 (6 pcs.) and remove F03 (Power Supply and Logic P.C.B. Ass'y) in the direction of the arrow.



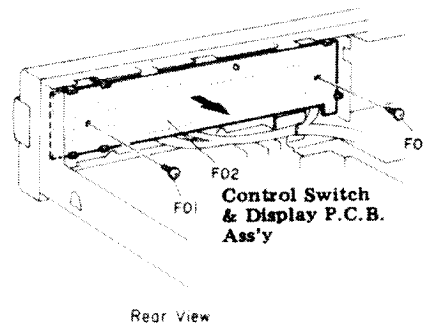
Front View

Fig. 2.7

2.8. Control Switch & Display P.C.B. Ass'y

Refer to Fig. 2.8.

- (1) Remove the Mechanism Ass'y referring to item 2.5 to gain access to the fastening screw.
- (2) Loosen screws F01 (2 pcs.), unhook the claws (6 pcs.), and remove F02 (Control Switch & Display P.C.B. Ass'y).



Rear View

Fig. 2.8

3. TEST TAPES AND GAUGES

2.9. Head Mount Base Ass'y

Refer to Fig. 2.9.1.

- (1) Remove the Mechanism Ass'y referring to item 2.5.
- (2) Loosen screws F01 (2 pcs.) and remove F02 (Head Mount Cover).
- (3) Loosen screws F03 (2 pcs.) and remove F04 (Head Mount Base Ass'y).

Note: When installing the Head Mount Base Ass'y, follow the next steps. Refer to Figs. 2.9.2 and 2.9.3.

- (a) Insert the Plate Washers into the grooves of the shafts by hand. See Fig. 2.9.2.
- (b) Install F04 (Head Mount Base Ass'y) and fasten F03 (2 pcs.). Push the Plate Washers with a blade of the screwdriver so that the Plate Washers come off the grooves. See Fig. 2.9.3.

- (1) 400 Hz Level Tape (DA09005B)
- (2) 1 kHz Track Alignment B Tape (DA09007B)
- (3) 10 kHz PB Frequency Response Tape (DA09003B)
- (4) 15 kHz PB Frequency Response Tape (DA09002B)
- (5) 20 kHz PB Frequency Response Tape (DA09001B)
- (6) 15 kHz Azimuth Tape (DA09004B)
- (7) 3 kHz Speed and Wow/Flutter Tape (DA09006C)
- (8) Tape Travelling Cassette (DA09071A)
- (9) Reference EXII Tape (DA09111A)
- (10) Reference SX Tape (DA09110A)
- (11) Reference ZX Tape (DA09109A)
- (12) EH Tilt Check Gauge S (DA09088A)
- (13) Stroke Check Gauge S (DA09090A)
- (14) Tape Guide Height Check Gauge S (DA09091A)
- (15) Tilt Check Gauge S (DA09039B)
- (16) Torque Gauge FWD (DA09082A)
- (17) Playback Azimuth Centering Pin (OD09066A)

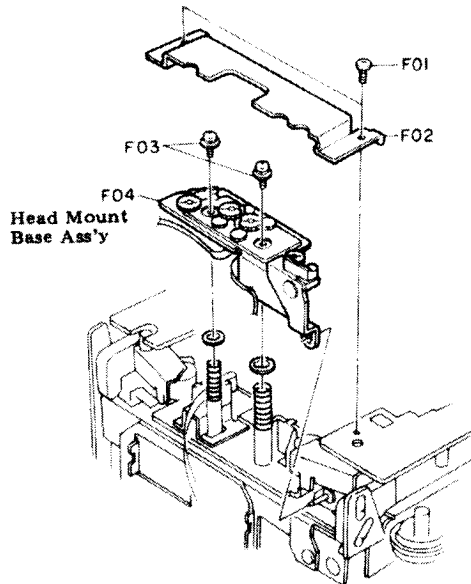


Fig. 2.9.1

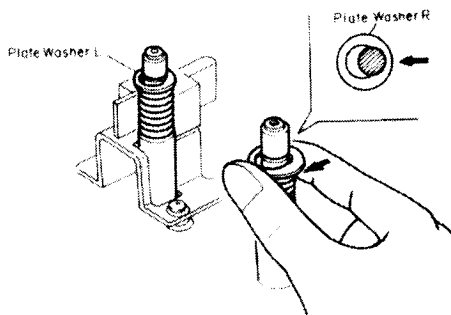


Fig. 2.9.2

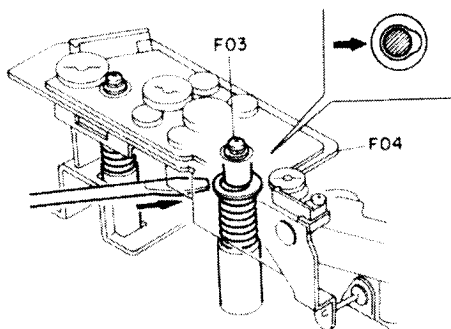


Fig. 2.9.3

Playback Azimuth
Centering Pin
(OD09066A)



4. MECHANICAL ADJUSTMENTS

4.1. Record Head and Playback Head Tilt Adjustment

Note: Before adjusting items 4.1 to 4.5, pull out the Cassette Case Cover Ass'y referring to item 2.2 and remove the Head Mount Cover by loosening two screws.

Refer to Fig. 4.1.

- (1) Remove the pad lifter from the playback head.
- (2) Load a Tilt Check Gauge S (DA09039B) in the cassette deck.
- (3) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the chassis of the cassette deck with the other end.
- (4) Remove both of the Height Gears.
- (5) Set the cassette deck in Play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to away from the heads, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.
- (6) Beacon Playback Head "Lower" will light on when height adjustment screw (PH) turned counterclockwise but playback Head "Upper" when clockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob away from the heads and then return it to the original place.
- (7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (RH).
- (8) Set the cassette deck in Stop mode and fit both of the serrated Height Gears. Then set the cassette deck again in Play mode and insure all of the 4 Beacons are illuminating. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
- (9) Mount the pad lifter on the playback head.

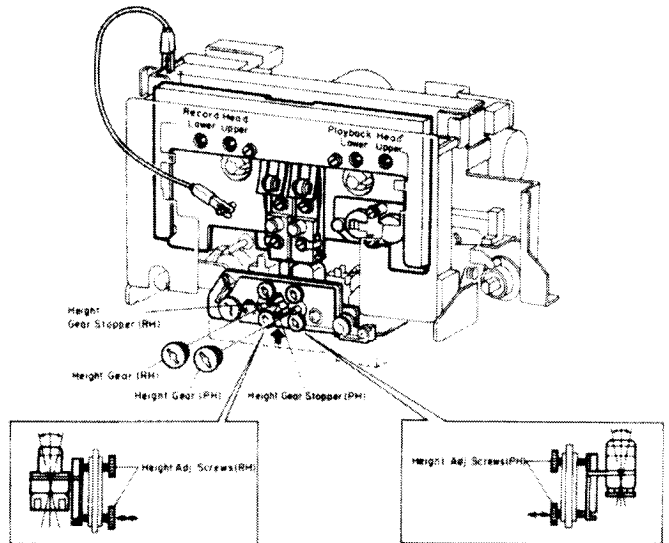


Fig. 4.1

4.2. Head Base Stroke Check

Remove the Cover Plate Ass'y.

Refer to Fig. 4.2.

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge S" to insure freedom from tilt on the playback head and record head.

- (1) Load a Stroke Check Gauge S (DA09090A) in the cassette deck.
- (2) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the cassette deck in Play mode. Then slowly release the indicators and insure whether each of the indicators is in contact with record and playback heads.
- (3) Check to insure whether the line "P" on the Playback Head Indicator meets the central line on the Indicator Plate.
- (4) Check to insure whether the line "P" on the Playback Head Indicator locates between the 2 lines on the Record Head stroke. Thus check can be made on record head stroke.

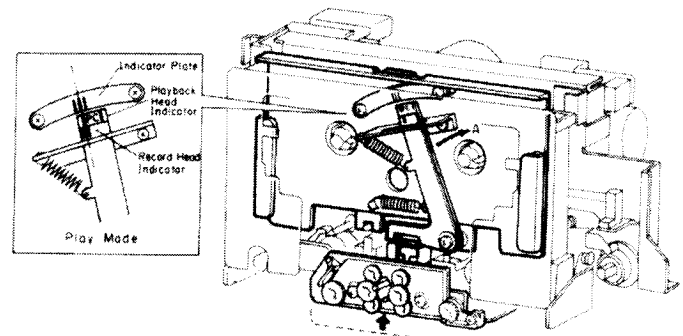


Fig. 4.2

4.3. Erase Head Stroke Adjustment and Tape Guide Height Check

Remove the Cover Plate Ass'y and the Head Mount Base Ass'y.

Refer to Fig. 4.3.

(1) Erase Head Stroke Adjustment

- (a) Load a Tape Guide Height Check Gauge S (DA09091A) in the cassette deck.
- (b) Set the cassette deck in Play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.
- (c) Check to insure whether the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head stroke by loosening screw A that assembles erase head with erase head plate.
- (d) After completion of adjustment, screw A shall be locked with lock tight paint.

(2) Supply Tape Guide Height Adjustment

- (a) Load a Tape Guide Height Check Gauge S (DA09091A) in the cassette deck.
- (b) Set the cassette deck in Play mode.
- (c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, and check to insure that the Supply Tape Guide Check Bar is accepted by the supply tape guide. If not, adjust the supply tape guide height by turning screw B.

(3) Take-up Tape Guide Height Check

- (a) Load a Tape Guide Height Check Gauge S (DA09091A) in the cassette deck.
- (b) Set the cassette deck in Play mode.
- (c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, and check to insure that the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

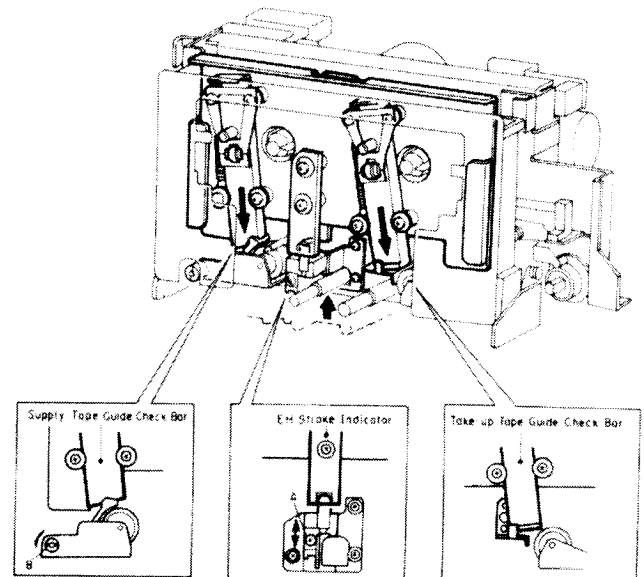


Fig. 4.3

4.4. Erase Head Height and Tilt Adjustment

Refer to Fig. 4.4.

- (1) Remove the Cassette Case Cover Ass'y, Cover Plate Ass'y, and Head Mount Base Ass'y.
- (2) Load an EH Tilt Check Gauge S (DA09088A) in the cassette deck.
- (3) Set the cassette deck in Stop mode.
- (4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed on the line (in different color) of the erase head, and check to insure whether the first Beacon is illuminating.
- (5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on the second Beacon. Excessive turning will cause the first Beacon to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the first and the second Beacons illuminate.
- (6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light on the third Beacon. Excessive turning will cause either the first or the second Beacon to light off, and therefore adjust Screw "Azimuth" until all of the 3 Beacons illuminate.

- (7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
- (8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirt, or overflow in the groove of the erase head surface.

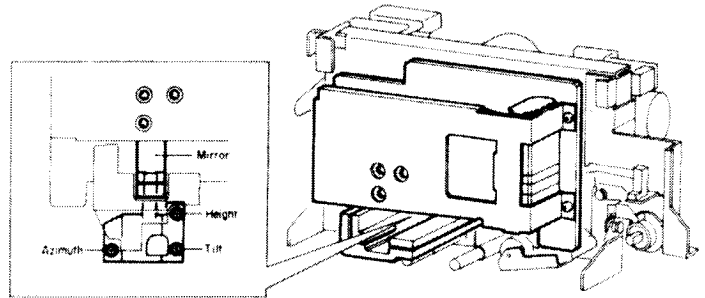


Fig. 4.4

4.5. Playback Head and Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 4.5.1 and 4.5.2.

(1) Playback Head Height Adjustment and Azimuth Alignment

Note: The Cassette Deck 1 is equipped with the playback azimuth control which can change the playback azimuth manually. So, before adjusting the playback head, perform the following to fix the playback head azimuth to the mechanical center.

1. Set the Playback Azimuth control on the Front Panel to the center position. (See Fig. 4.5.1.)
2. Insert the Playback Azimuth Centering Pin (OD09066A) securely as shown in Fig. 4.5.1.

- (a) Press the Monitor button to select TAP \bar{c} indication.
- (b) Connect an AC voltmeter to the Output Jacks.
- (c) Load a 1 kHz Track Alignment B Tape (DA09007B) and set the cassette deck in Play mode.
- (d) Turn the PH Height Gear until the outputs of both channels become minimum.
- (e) Load a 15 kHz Azimuth Tape (DA09004B) and set the cassette deck in Play mode.
- (f) Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.
- (g) Repeat above steps (c) through (f) two or three times to obtain optimum performance.

(2) Record Head Height Adjustment and Azimuth Alignment

- (a) Connect an AC voltmeter to Output Jacks.
- (b) Press the Monitor button to select TAPE indication.
- (c) Press the Type IV button.
- (d) Load a reference ZX tape.

- (e) Feed in 400 Hz (0 dB) to the Input Jacks.
- (f) Set the cassette deck in Record and Play mode and turn the RH Height Gear until the outputs of both channels become maximum.
- (g) Feed in 15 kHz (-20 dB) to the Input Jacks and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.
- (h) Repeat (e) to (g) two or three times to obtain optimum performance.
- (i) Set the cassette deck in Stop mode and remove the Playback Azimuth Centering Pin.

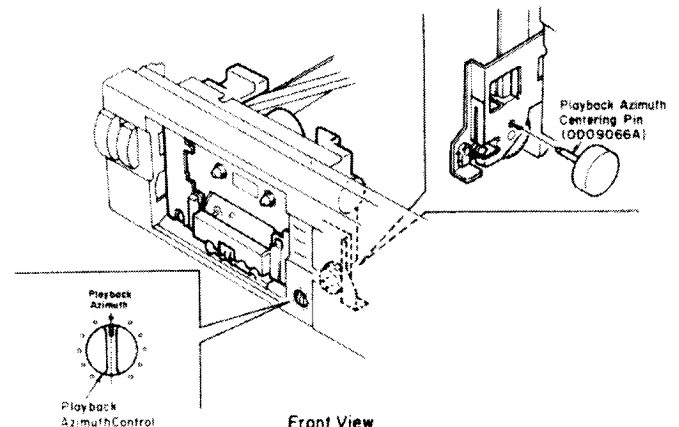


Fig. 4.5.1

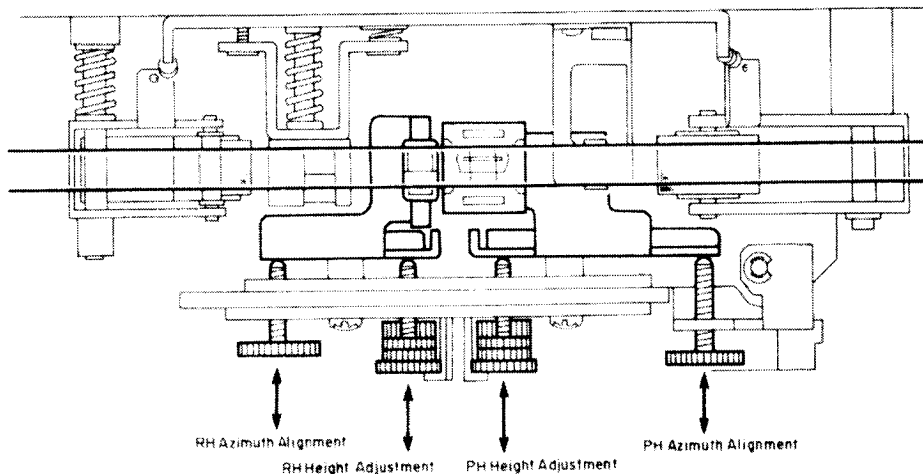


Fig. 4.5.2

4.6. Tape Travelling Check

Load and play back a Tape Travelling Cassette and check the following:

- (1) Tape is in contact with heads sufficiently.
- (2) Tape waving is small on the heads and pressure rollers.
- (3) Tape is free from waving or slippage from the tape guides.

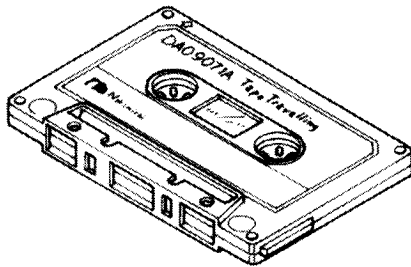


Fig. 4.6

4.7. Eject Damper Adjustment

Refer to Fig. 4.7. 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 action by the Adjustment Screw.

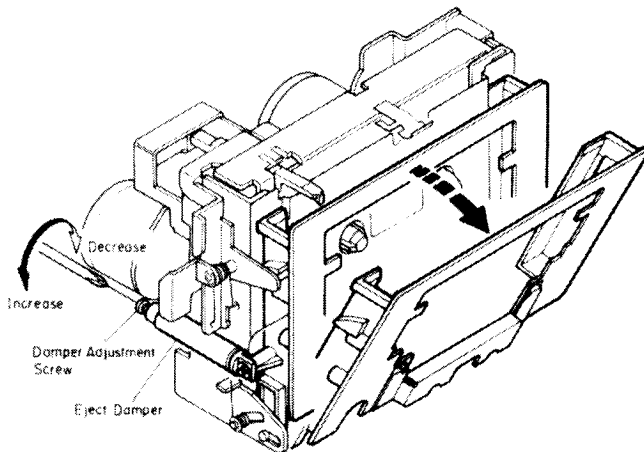


Fig. 4.7

4.8. 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 Gauge FWD (DA09082A) and set the cassette deck in Play mode.
- (3) Adjust VR501 on the Power Supply & Logic P.C.B. Ass'y to obtain 47 ± 1 g-cm on the torque gauge.

4.9. Tape Speed Adjustment

Refer to Fig. 4.8.

- (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.

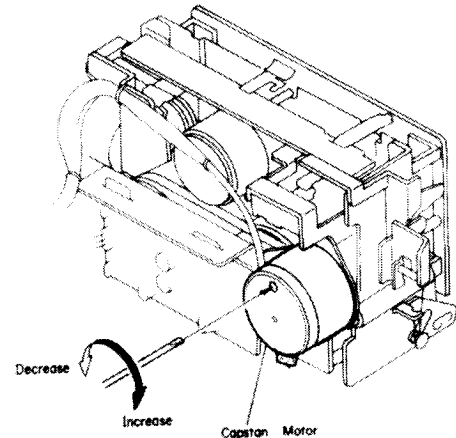


Fig. 4.8

4.10. Lubrication

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

- (1) Molykote [®] 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 (EP-56)
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 [®] Grease (X5-6020)
Dowcoming 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 Toranomom, Minato-ku, Tokyo, Japan
- (d) Anderol 456
Toyo Kokusai Oil Co., Ltd., 3-3-5 Hatchobori, Chuo-ku, Tokyo, Japan

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

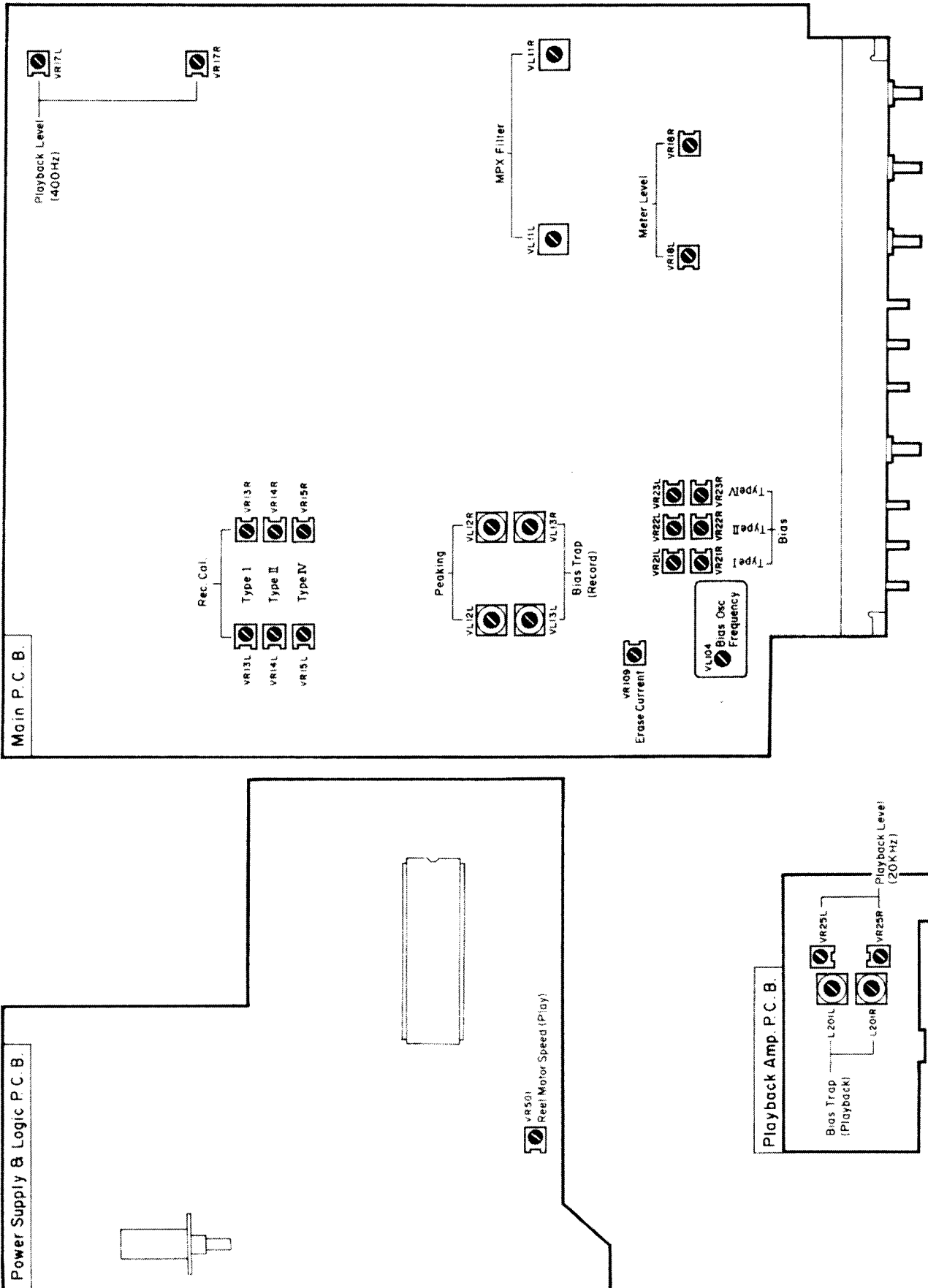
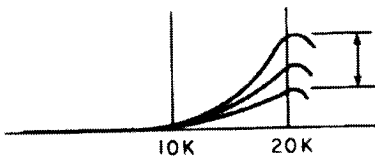


Fig. 5

6. ELECTRICAL ADJUSTMENTS

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Preliminary Step			Output Level - Max. Balance - Center Bias Tune - Center Monitor - Tape Tape - IV MPX Filter - OFF Dolby NR - OFF		Set the Cassette Deck 1 as shown in MODE.
2	Reel Motor Speed Adjustment (Play)	Torque Gauge FWD (DA09082A)		Playback	Power Supply & Logic P.C.B. VR501	Adjust VR501 to obtain 47 ± 1 g-cm on the torque gauge.
3	Tape Speed Adjustment	3 kHz Speed and Wow/Flutter Tape (DA09006C)	Frequency Counter to Output Jacks	Playback Monitor - Tape Tape - I	Tape Speed Adj. Volume (Capstan Motor)	Adjust the volume incorporated in the Capstan Motor Ass'y to obtain 3 kHz \pm 15 Hz on the frequency counter.
4	Meter Level Calibration	400 Hz to Input Jacks	AC Voltmeter to Output Jacks	Monitor - Source	Main P.C.B. VR18L VR18R	1. Feed in 400 Hz and adjust the Record Level control to obtain 500 mV -2 dB on the AC voltmeter. 2. Adjust VR18L (VR18R) so that the 0 dB segment on the level meter starts illuminating.
5	MPX Filter Adjustment	19 kHz \pm 100 Hz to Input Jacks	AC Voltmeter to Output Jacks	Monitor - Source MPX - OFF/ON	Main P.C.B. VL11L VL11R	1. Adjust the Input Level control to obtain 500 mV (0 dB) on the AC voltmeter. 2. Set the MPX Filter switch to ON and adjust VL11L (VL11R) to obtain minimum reading on the AC voltmeter. (The minimum reading will be less than -30 dB.)
6	Playback Head Track Alignment	1 kHz Track Alignment B Tape (DA09007B)	AC Voltmeter to Output Jacks	Playback Monitor - Tape Tape - IV Dolby NR - OFF	PH Height Gear	Adjust the PH Height Gear to obtain the minimum readings on the AC voltmeter for both channels. Refer to "Playback Head Height Adjustment" in item 4.5. (Azimuth Centering Pin (OD09066A) must be set before adjusting.)
7	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004B)	AC Voltmeter to Output Jacks	Same as above	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum readings on the AC voltmeter for both channels. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 3.5. (Azimuth Centering Pin (OD09066A) must be set before adjusting.) Note: Repeat Steps 6 and 7 two or three times to obtain optimum performance.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARK
8	Playback Level Calibration	400Hz Level Tape (DA09005B)	AC Voltmeter to Output Jacks	Playback Monitor - Tape - IV Dolby NR - OFF	Main P.C.B. VR17L VR17R	Adjust VR17L (VR17R) to obtain 500 mV on the AC voltmeter.
9	Playback Frequency Response Adjustment	400Hz Level Tape (DA09005B) 10 kHz PB Frequency Response Tape (DA09003B) 15 kHz PB Frequency Response Tape (DA09002B) 20 kHz PB Frequency Response Tape (DA09001B)	AC Voltmeter to Output Jacks	Same as above	Playback Amp. P.C.B. VR25L VR25R	<p>1. Load a 400 Hz level tape, play it back, and read the playback level on the AC voltmeter.</p> <p>2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the playback head azimuth to obtain maximum levels on the AC voltmeter with each tape.</p> <p>Check that the playback levels are as follows with respect to the level for 400 Hz level tape.</p> <p>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</p> <p>If the levels are out of the ranges, play back the 20 kHz PB frequency response tape and adjust VR25L (VR25R) to obtain -20 dB +1.0 dB. VR25L (VR25R) compensates the playback frequency response at 20 kHz as shown below:</p>  <p>3. Conduct Step 7 "Playback Head Azimuth Alignment".</p>
10	Bias Oscillation Frequency and Erase Current Adjustment	None	AC Voltmeter across the additional 0.1 ohm resistor and Frequency Counter between terminals 1 and 2 of CN-102 (i.e., across Erase Head) on Main P.C.B.	Record, Playback Monitor - Source Tape - IV Dolby NR - OFF	Main P.C.B. VL104 VR109	<p>1. Connect an additional 0.1 ohm resistor in series to the Erase Head and connect the AC voltmeter across the resistor.</p> <p>2. Record and playback a reference ZX tape.</p> <p>3. Adjust VL104 to obtain 105 kHz on the frequency counter.</p> <p>4. Check the erase current by the AC voltmeter. Erase current will be within the range of 310 mA to 380 mA (typically approx. 350 mA). If erase current is less than 310 mA, adjust VR109 to obtain satisfactory results.</p> <p>5. If erase current is adjusted with VR109, re-check the bias oscillation frequency.</p> <p>6. Remove the additional 0.1 ohm resistor.</p>

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
11	Bias Trap Adjustment (Record Amp.)	Remove input signals	AC Voltmeter between emitter of Q111L/R and GND on Main P.C.B.	Record, Playback Monitor - Source Tape - IV Dolby NR - OFF	Main P.C.B. VL13L VL13R	1. Load a cassette without tape inside. 2. Adjust VL13L (VR13R) to obtain minimum reading on the AC voltmeter.
12	Record Head Height Adjustment	400 Hz (0 dB) to Input Jacks	AC Voltmeter to Output Jacks	Record, Playback Monitor - Tape Tape - II Dolby NR - OFF	RH Height Gear	1. Load a reference SX tape, and record and play it back. 2. Adjust the RH Height Gear to obtain maximum readings for both channels on the AC voltmeter. Refer to "Record Head Height Adjustment and Azimuth Alignment" in item 4.5.
13	Record Head Azimuth Alignment	15 kHz (-20 dB) to Input Jacks	AC Voltmeter to Output Jacks	Same as above	Record Head Azimuth Alignment Screw	Adjust the Record Head Azimuth Alignment Screw to obtain maximum readings for both channels on the AC voltmeter. Refer to "Record Head Height Adjustment and Azimuth Alignment" in item 4.5. Note: Repeat Steps 12 and 13 two or three times to obtain optimum performance.
14	Bias Trap Adjustment (Playback Amp.)	None	AC Voltmeter to Output Jacks	Record, Playback Monitor - Tape Tape - IV Dolby NR - OFF	Playback Amp. P.C.B. L201L L201R	1. Load a cassette without tape inside. 2. Adjust L201L (L201R) to obtain minimum reading on the AC voltmeter.
15	Record Level Calibration and Recording Bias Current Adjustment	400 Hz (0 dB), 20 kHz (-20 dB) and 10 kHz/20 kHz (-20 dB) to Input Jacks	AC Voltmeter to Output Jacks	Record, Playback Monitor - Source/Tape Tape - I/II/IV Dolby NR - OFF/B/C	Main P.C.B. (Level) IV:VR15L VR15R II:VR14L VR14R I:VR13L VR13R (Bias) IV:VR23L VR23R II:VR22L VR22R I:VR21L VR21R	Adjustment should be made in the order of tape type IV, II, and I. 1. Set the Monitor switch to Source and Dolby NR switch to OFF. 2. Feed in 400 Hz, and set the Input Level control to obtain 0 dB (500 mV) on the AC voltmeter. 3. Set the Monitor switch to tape. 4. Load a reference ZX tape, reference SX tape and reference EXII tape. 5. Feed in 400 Hz (0 dB) record and play back, and adjust the following semi-fixed volumes to obtain 0 dB on the AC voltmeter. ZX tape (IV): VR15L, VR15R SX tape (II): VR14L, VR14R EX tape (I): VR13L, VR13R 6. Set the Dolby NR Switch to C. 7. Feed in 20 kHz (-20 dB) and adjust Bias VR23L (VR23R), VR22L (VR22R) and VR21L (VR21R) to obtain the same readings as source monitor levels on the AC voltmeter. (to be continued)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
						<p>8. Repeat above 6 and 7 two or three times to obtain optimum performance.</p> <p>9. Feed in 10 kHz and 20 kHz (-20 dB), record and play them back, and check whether the playback levels are within the following ranges.</p> <p style="padding-left: 20px;">With Dolby NR OFF: -20 dB \pm3 dB</p> <p style="padding-left: 40px;">Level difference between Dolby NR OFF and B: \pm2 dB</p> <p style="padding-left: 40px;">Level difference between Dolby NR OFF and C: \pm3 dB</p> <p>10. Check that the total harmonic distortion is less than 0.8% for ZX and EXII tapes and 1.0% for SX tape. If satisfactory results are not obtained, re-adjust VR21L (VR21R) referring to Step 9 "Playback Frequency Response Adjustment" and repeat above steps.</p>
16	Overall Frequency Response Adjustment	400 Hz (0 dB) and 20 Hz to 20 kHz (-20 dB) to Input Jacks	AC Voltmeter to Output Jacks	Record, Playback Monitor - Source/Tape - I/II/IV Dolby NR - OFF	Main P.C.B. VL12L VL12R	<p>1. Set the Monitor switch to Source.</p> <p>2. Feed in 400 Hz and adjust the Input Level control to obtain -20 dB on the AC voltmeter.</p> <p>3. Set the Monitor switch to Tape.</p> <p>4. Feed in 20 Hz to 20 kHz (-20 dB) and check to insure whether the output levels are within -20 dB \pm3 dB.</p> <p>5. If above is not sufficient, adjust L12L (L12R) to obtain approx. -20 dB at 20 kHz.</p> <p>6. Conduct step 15 "Record Level Calibration and Recording Bias Current Adjustment".</p> <p>7. If above is not sufficient, precise re-adjustment of step 9 "Playback Frequency Response", replacement of Playback Head or Record Head, and check on item 4.7 "Tape Travelling Check" will be required.</p>

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

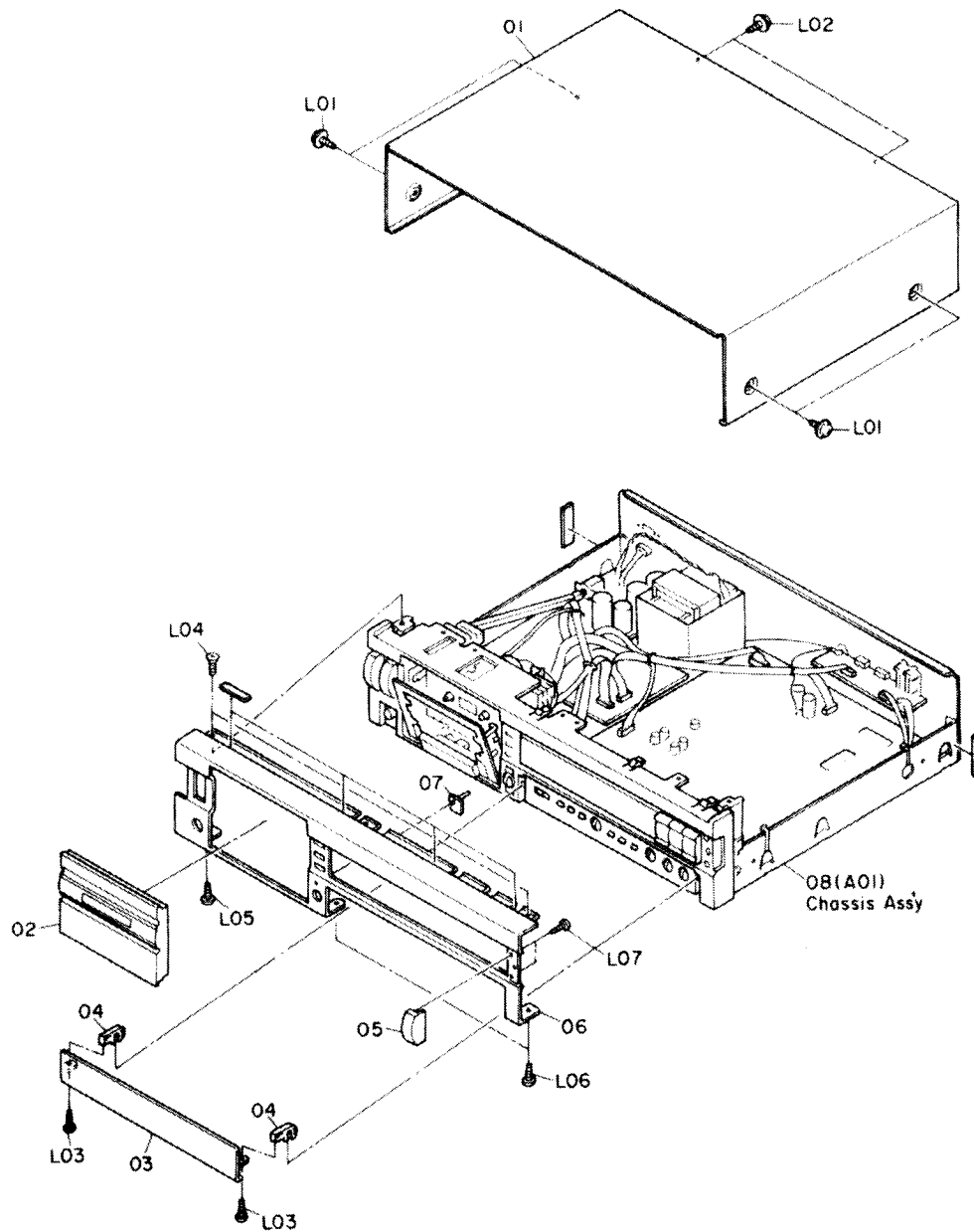


Fig. 7.1

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
7.1. Synthesis				L03	OE03641A	BT3x6 @ Pan (Black Chromate)	
				L04	OE03054A	BT3x8 @ Countersunk	
				L05	OE03366A	BT3x8 @ Binding (Black Chromate)	
01	OH05710A	Top Cover	1	L06	OE00921A	BT3x8 @ Binding (Black Chromate)	
02	HA05935A	Cassette Case Cover Ass'y	1	L07	OE00855A	BT2x6 @ Binding	
03	OH05833A	Sealing Panel	1				
04	OJ06261B	Sealing Arm	2				
05	OH05714A	Dummy Cap	1				
06	OH05831A	Front Panel	1				
07	OH05845A	Center Lens	1				
08	—	Chassis Ass'y	1				
L01	OE03032A	BT4x8 @ Pan Washer Faced (Black Chromate)					
L02	OE03632A	BT3x8 @ Binding With Washer (Black Chromate)					

7.2. Chassis Ass'y (A01)

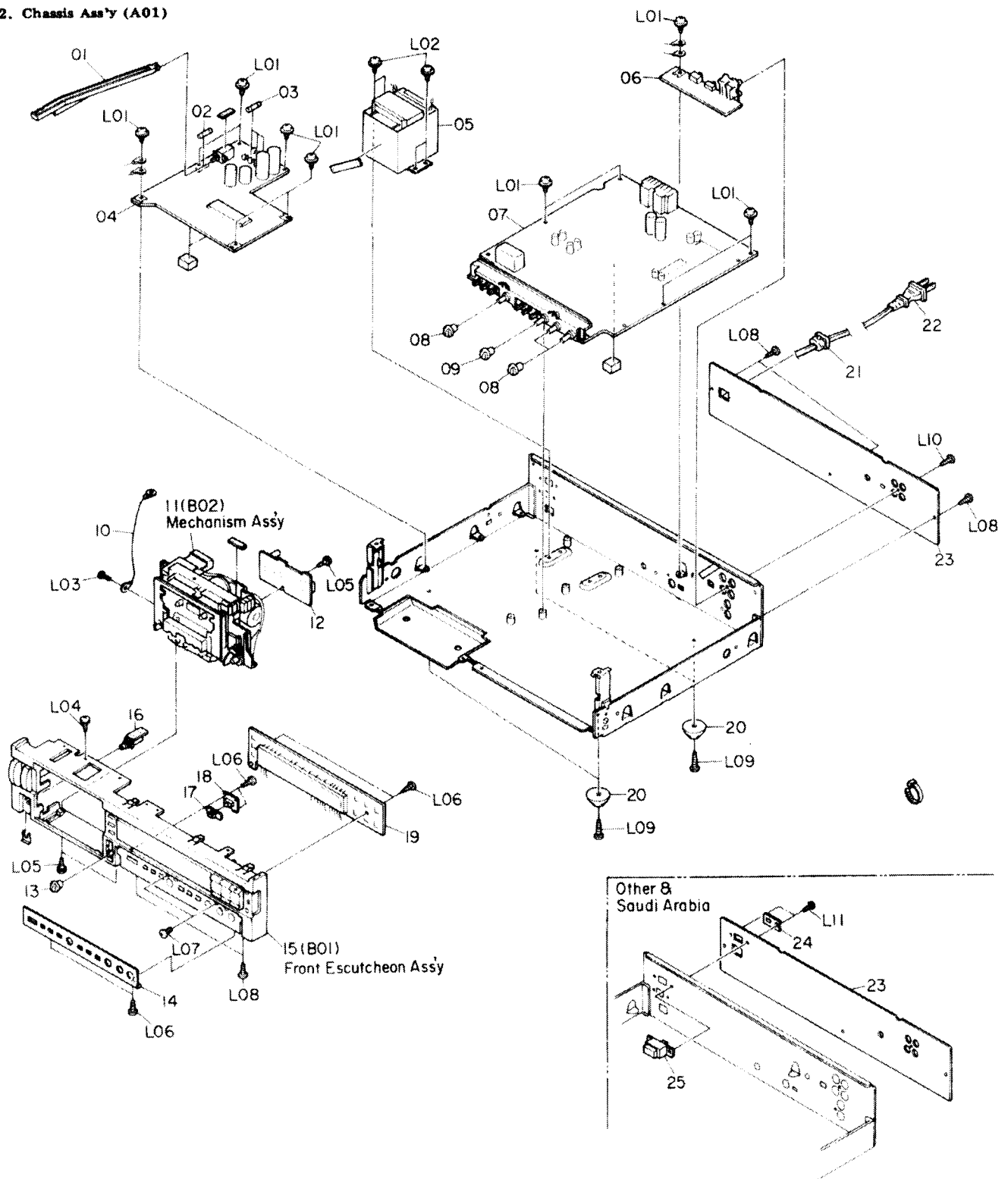


Fig. 7.2

7.3. Front Escutcheon Ass'y (B01)

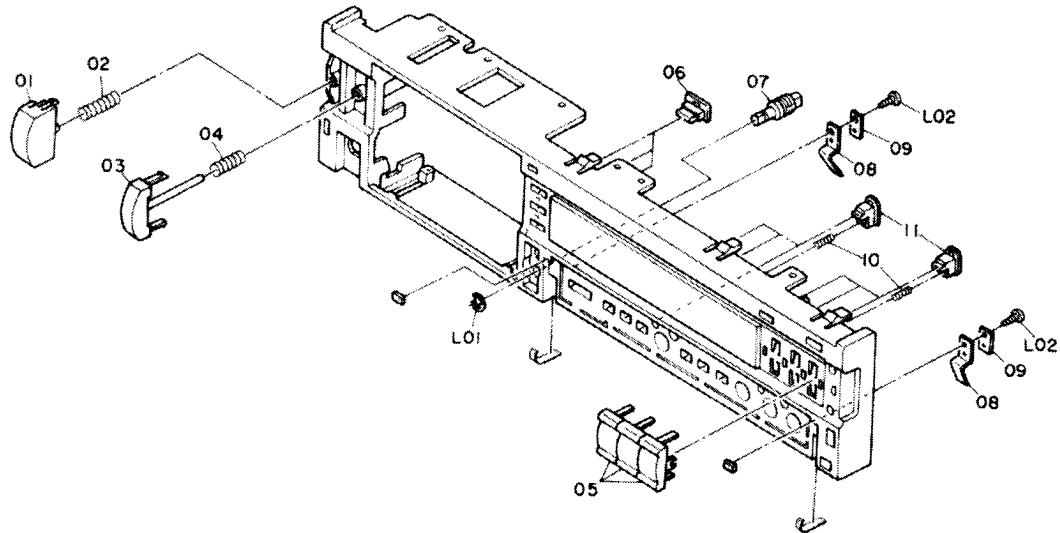


FIG. 7.3

*: Unstocked parts:

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
7.2. Chassis Ass'y							
A01	—	Chassis Ass'y	1	25	OB07092U	Voltage Selector (OTR, SAU)	1
01	OJ06258B	Power Switch Joint	1	L01	OE03157A	BT3x8 @ Binding With Washer	
02	OB90493A	Fuse 500mA [F404] (USA, CAN, JPN)	1	L02	OE03592A	BT4x6 @ Binding Washer Faced (Black Chromate)	
	OB08505A	Fuse F500mA [F404] (EP, UK, AUS, OTR, SAU)	1	L03	OE03042A	FT2.5x5 @ Pan	
03	OB90375A	Fuse 1.6A [F401-403] (USA, CAN, JPN)	3	L04	OE03212A	BT2.6x6 @ Binding Toothed Lock	
	OB90382A	Fuse T1.25A [F401-403] (EP, UK, AUS, OTR, SAU)	3	L05	OE03435A	M2.6x6 @ Binding With Toothed Lock	
04	* BA07988A	Power Supply & Logic P.C.B. Ass'y (USA, CAN, EP, UK, AUS, OTR, SAU)	1	L06	OE00921A	BT3x8 @ Binding (Black Chromate)	
	* BA07981A	Power Supply & Logic P.C.B. Ass'y (JPN)	1	L07	OE00896A	M3x6 @ Binding	
05	OB50183A	Power Transformer 120V (USA, CAN)	1	L08	OE00860A	BT3x6 @ Binding (Black Chromate)	
	OB50182A	Power Transformer 230V (EP)	1	L09	OE03012A	BT3x12 @ Binding (Black Chromate)	
	OB50179A	Power Transformer 240V (UK, AUS)	1	L10	OE03366A	BT3x8 @ Binding Projected (Black Chromate)	
	OB50181A	Power Transformer 115-230V (OTR, SAU)	1	L11	OE00985A	M3x6 @ Binding (Black Chromate) (OTR, SAU)	
	OB50180A	Power Transformer 100V (JPN)	1	7.3. Front Escutcheon Ass'y (B01)			
06	* BA07985A	Pin Jack P.C.B. Ass'y	1	B01	—	Front Escutcheon Ass'y	1
07	* BA07984A	Main P.C.B. Ass'y	1	01	OH05723A	Power Switch Button	1
08	OH05821A	Input & Bias Tuning Volume Knob	3	02	OC09392A	Power Switch Spring	1
09	OH05822A	Output Volume Knob	1	03	HA05929A	Eject Knob Ass'y	1
10	OB83916A	Mechanism GND Ass'y	1	04	OJ06252A	Eject Spring	1
11	CA09048A	Mechanism Ass'y	1	05	OH05716A	Control Knob A	3
12	* BA07987A	Playback Amp. P.C.B. Ass'y	1	06	OH05825B	Tact Knob	3
13	OH05711A	Playback Azimuth Knob	1	07	OJ06260A	Azimuth Joint	1
14	OH05834A	Inner Panel	1	08	OJ06262A	Sealing Spring	2
15	—	Front Escutcheon Ass'y	1	09	OJ06334A	Lock Plate	2
16	* BA07986A	Headphone P.C.B. Ass'y	1	10	OJ06253A	Push Knob Spring	6
17	OH05823A	Slide Knob	1	11	OH05819A	Push Knob	6
18	* BA07983A	Timer Switch P.C.B. Ass'y	1	L01	OE00134A	E-Ring 4mm	
19	* BA07982A	Control Switch & Display P.C.B. Ass'y	1	L02	OE00921A	BT3x8 @ Binding (Black Chromate)	
20	HA05833A	Leg Ass'y	4				
21	OB90280A	Cord Bushing (USA, CAN, EP, UK, AUS)	1				
	OB90283A	Cord Bushing (OTR, SAU, JAN)	1				
22	OB08504A	Power Cord (USA, CAN)	1				
	OB08093U	Power Cord (EP)	1				
	OB08348A	Power Cord (UK)	1				
	OB05241A	Power Cord (AUS)	1				
	OB08533A	Power Cord (OTR, SAU)	1				
	OB08219B	Power Cord (JPN)	1				
23	OH05835A	Rear Panel (USA, CAN, EP, UK, AUS, JPN)	1				
	OH05848A	Rear Panel (OTR, SAU)	1				
24	OM05611A	Voltage Lock Plate (OTR, SAU)	1				

*: Unstocked parts:

Schematic Ref. No.	Part No.	Description	Qty	Schematic Ref. No.	Part No.	Description	Qty
7.4. Mechanism Ass'y (B02)				82	OC81416A	Thrust Spring B	1
			1	83	OC80027A	Mode Switch	3
			1	84	OC81415A	Warm Thrust Bush	1
			1	85	CA81646A	Control Motor Ass'y	1
01	OC85309A	Eject Arm	1	86	OC85319A	Azimuth Arm Spring B	1
02	OC85310A	Eject Arm Spring	1	87	CA81670A	Azimuth Arm B Sub Ass'y	1
03	CA80006A	Pneumatic Damper Ass'y	1	88	CA81669A	Azimuth Plate Sub Ass'y	1
04	OC82720A	Eject Lever Spring	1	89	OC85314A	Azimuth Cam Gear	1
05	OC85414A	Eject Lever	1	90	OC85315A	Cassette Case Spring	1
06	OC85301A	Cassette Case Holder L	1	91	OC85316A	Cassette Case Spring Collar	1
07	OC80019B	Eject Spring	1	92	CA81667A	Azimuth Chassis Sub Ass'y	1
08	OC80620A	Back Tension Arm Pulley	1	93	OC85318A	Azimuth Cam Spring	1
09	OC80621A	Back Tension Arm Belt	1	94	OC85317A	Azimuth Cam Switch	1
10	OC80617A	Back Tension Arm Spring	1	95	CA81671A	Azimuth 2P Connector Ass'y	1
11	OC80618A	Back Tension Arm Collar	1	96	OC80012A	Sensor Switch	1
12	OC80619A	Back Tension Arm	1	97	CA81673A	5P Connector Ass'y	1
13	OC85425A	Lock Lever Spring	1	98	CA81672A	9P Connector Ass'y	1
14	OC85426A	Lock Lever Collar	1	L01	OE00698A	E-Ring 2.5mm	1
15	OC85427A	Lock Lever	1	L02	OE00181A	E-Ring 3mm	1
16	CA80726A	Supply Reel Hub Ass'y	1	L03	OE00222A	E-Ring 2mm	1
17	OC80612A	Spring Holder	2	L04	OE00042A	E-Ring 1.5mm	1
18	OC80614A	Supply Reel Hub Spring	1	L05	OE00165A	E-Ring 1.2mm	1
19	OC81421A	Supply Pressure Roller Arm	1	L06	OE03052A	CS Stopper 2.4mm	1
		Adjustment Nut	1	L07	OE03042A	FT2.5x5 @Pan	1
20	CA80366A	Supply Pressure Roller Arm Ass'y	1	L08	OE03043A	FT2.5x10 @Pan	1
21	OC81420A	Supply Pressure Roller Arm Spring	1	L09	OE03202A	M2.6x3 @ Binding (Black Chromate)	1
22	OC81422A	Supply Pressure Roller Arm Track Spring	1	L10	OE03437A	FT2.5x3.5 @Pan (Black Chromate)	1
23	OH04415C	Head Mount Cover	1	L11	OE03654A	M2x4 @Pan (3A)	1
24	CA80200B	Cassette Case Ass'y	1	L12	OE03018A	M2x5 @Pan	1
25	HA05937A	Cover Plate Ass'y	1	L13	OE03232A	M1.7x7 @Pan	1
26	OC08762A	Head Height Adjustment Gear	2	L14	OE03222A	Washer 1.8x3.8x0.3	1
27	OC08761A	Head Height Adjustment Screw	4	L15	OE03655A	M2x5 @Pan (2A)	1
28	OC08763A	Azimuth Alignment Screw	1	L16	OE03234A	M2x3 @Pan	1
29	OC85424A	Head Mount Plate	1	L17	OE03228A	FT3x4 @Pan	1
30	CA08659B	R-3L Record Head Ass'y	1	L18	OE03236A	M2x5 @Pan (2A)	1
31	OC08776A	Head Plate Spring L	1	L19	OE03231A	M2x30 @Pan	1
32	CA81676A	RH 4P Connector Ass'y	1	L20	OE03041A	FT2.5x4 @Pan	1
33	OC08026D	PB Head Azimuth Alignment Screw	1	L21	OE03233A	Washer 2.6x8x1	1
34	OC81391A	PB Head Azimuth Alignment Screw Stopper	1	L22	OE03230A	ST2.6x12 @Pan	1
		PB Head Azimuth Arm Shaft A	1	L23	OE03045A	M2.6x3 @ Binding	1
35	OC85313A	PB Head Azimuth Arm Shaft A	1	L24	OE03229A	FT5x6 @Pan	1
36	OC85312A	PB Head Azimuth Arm A	1	L25	OC82725A	M2.6x9 Washer Faced	1
37	CA08755A	P2H-3L Playback Head Ass'y	1	L26	OE00691A	M2x3 @Pan	1
38	OC08775A	Head Plate Spring R	1	L27	OE03044A	FT2.5x20 @Pan	1
39	CA81675A	PH 4P Connector Ass'y	1	L28	OE00851A	ST3x5 @Pan	1
40	CA81674A	EH 2P Connector Ass'y	1	L29	OE03666A	ST3.5x6 @Pan	1
41	GA02201A	E-4F Erase Head	1	L30	OE03035A	M2x3.2 @ Truss	1
42	OC08768A	E.H. Hold Plate	1	L31	OE03235A	Washer 2x5x0.25	1
43	OC08889A	E.H. Hold Plate Tapering Spring	2	L32	OE03225A	Washer 1.8x3.8x0.5	1
44	OC08886A	E.H. Hold Plate Spring	1	L33	OE03226A	Washer 2.1x4.5x0.1	1
45	OC82710A	Head Base Hold Plate	1	L34	OC85423A	S. Thrust Spring Washer	1
46	OC80004A	Steel Ball 3mm	1	L35	OE03049A	Washer 1.8x3.2x0.5	1
47	OC08771A	Tape Guide Plate	1	L36	OC08774A	Plate Washer L	1
48	CA80365A	Head Base Sub Ass'y	1	L37	OC08773A	Plate Washer R	1
49	OC80007A	Steel Ball 2mm	3	L38	OE03227A	Washer 2.7x5x0.5	1
50	CA80725A	Take-up Reel Hub Ass'y	1	L39	OE03237A	Nut Hex. M2.6	1
51	OC80613A	Take-up Reel Hub Spring	1	L40	OE00694A	Nut M2	1
52	CA80368A	Take-up Pressure Roller Arm Ass'y	1	L41	OC82716A	Capstan Washer S	1
53	OC81423A	Take-up Pressure Roller Arm Spring	1	L42	OC82717A	Capstan Washer T	1
54	OC85429A	Switch Hold Plate	1	L43	OE00912A	Polyalider FT25	1
55	OC80623A	Switch Plate	2	L44	OE03509A	Washer 1.3x3.4x0.5	1
56	OC80624A	Switch Collar A	2	L45	OE03653A	Washer 1.6x4x0.25	1
57	OC80626A	Leaf Switch	1	L46	OE03508A	Washer 1.7x6x0.25	1
58	OC80625A	Switch Collar B	2	L47	OE03180A	Washer 2.6mm	1
59	OC80017B	Record Protector Lever	1	L48	OE03645A	Washer 1.6x4x0.25	1
60	OC80022B	Cassette Hold Spring	1	L49	OE03194A	Washer 2.1mm	1
61	CA80736A	Mechanism Chassis Ass'y	1				
62	* CA80011B	Shut-off P.C.B. Ass'y	1				
63	CA08204A	Brake Ass'y	1				
64	OC80628A	Brake Spring B	1				
65	OC80630A	Brake Arm Collar	1				
66	OC80629A	Brake Arm	1				
67	OC82724A	Reel Motor Holder	1				
68	CA81699A	Reel Motor Ass'y	1				
69	OC83380A	Idle Gear	1				
70	OC82701A	Supply Capstan Flange	1				
71	OC82700A	Take-up Capstan Flange	1				
72	OC80428A	Hold Spring	2				
73	OC82699A	Supply Flywheel	1				
74	OC82698A	Take-up Flywheel	1				
75	OC82702A	Capstan Belt	1				
76	OC82718A	Thrust Plate	2				
77	OC82726A	Floating Rubber	3				
78	CA81698A	Capstan Motor Ass'y	1				
79	OC85320A	Flywheel Holder	1				
80	OC81417A	Cam Gear B	1				
81	OC81418A	Control Motor Holder	1				

7.4. Mechanism Ass'y (B02)

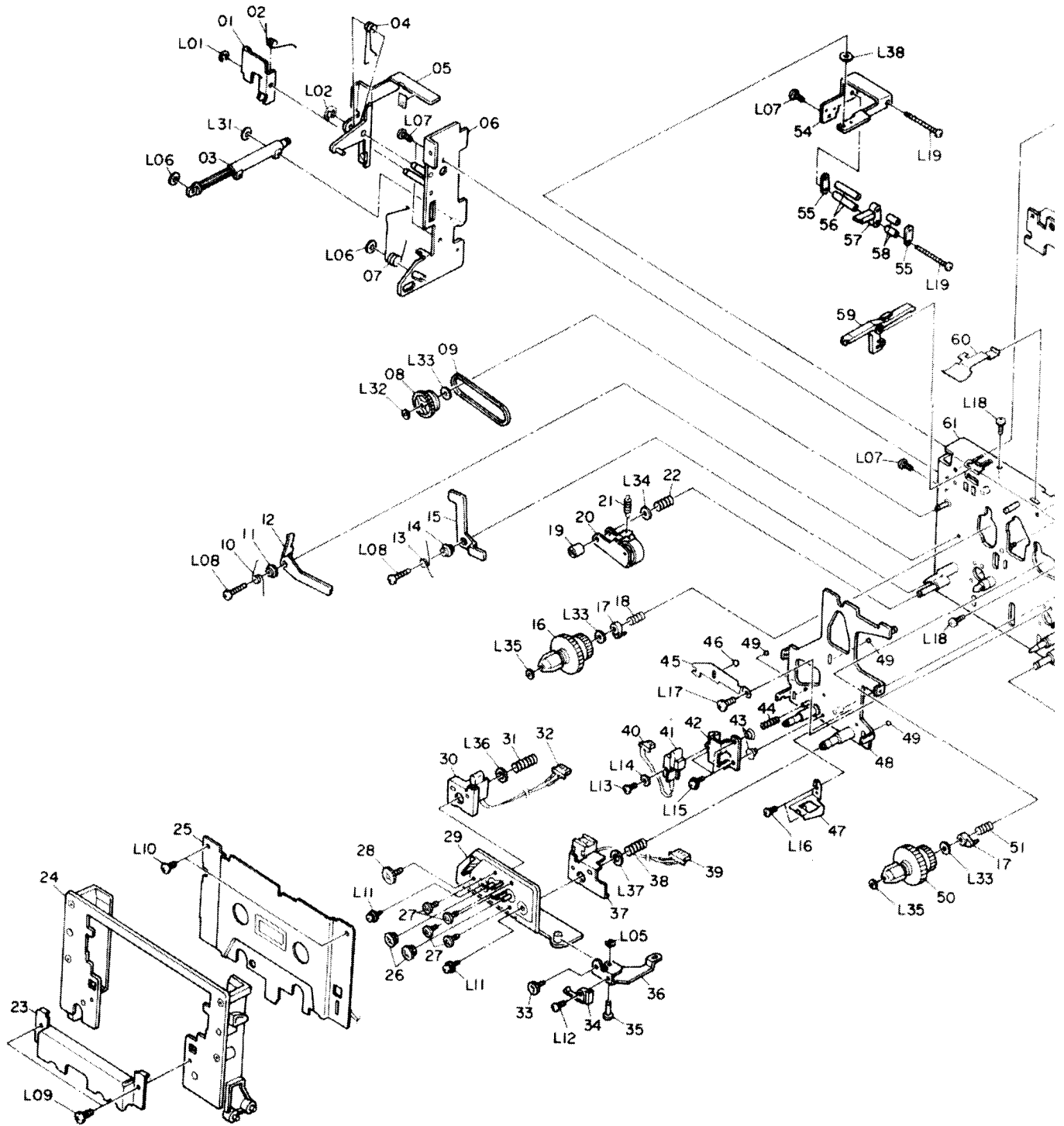
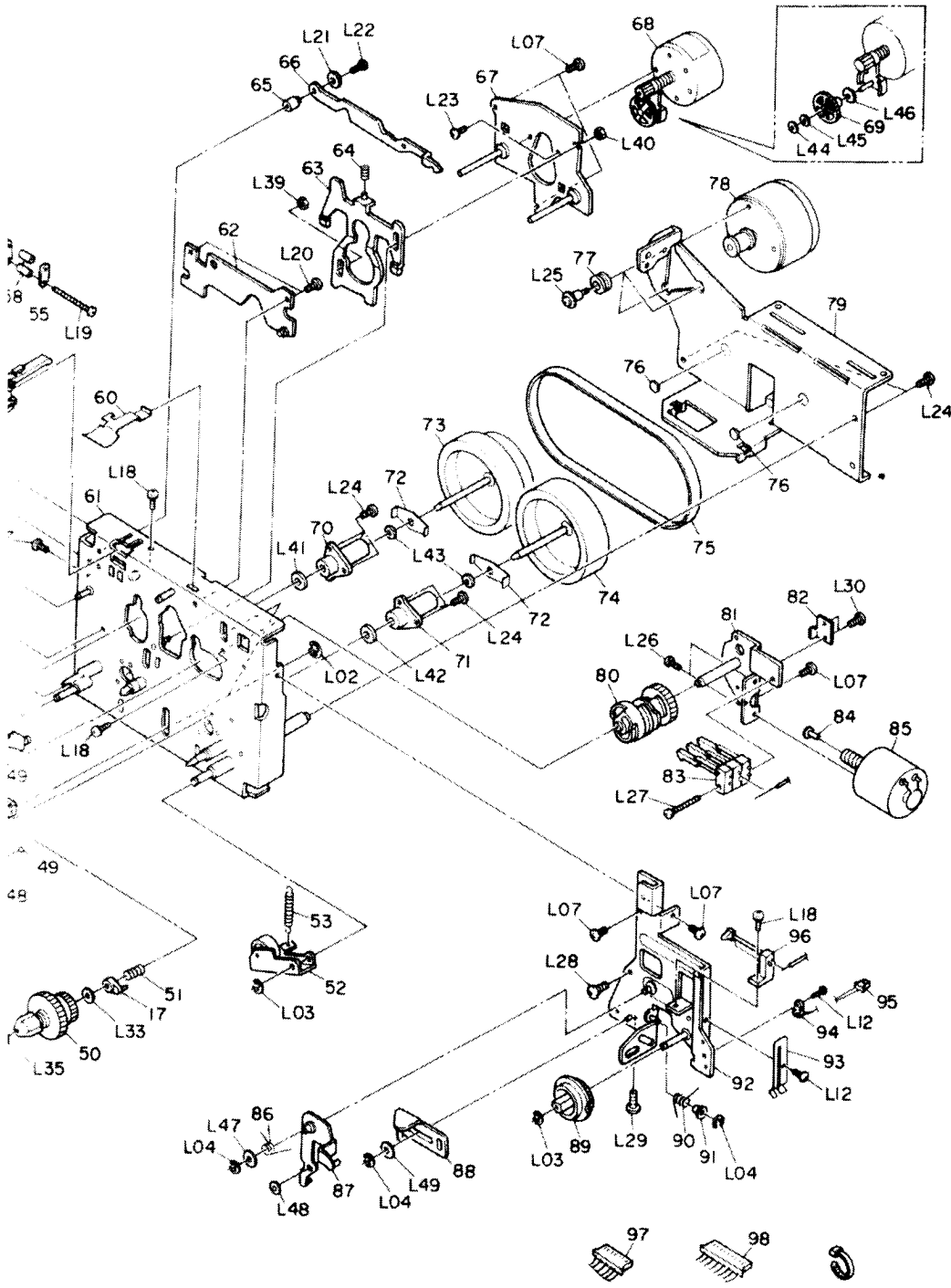


Fig. 7.4



8. MOUNTING DIAGRAMS AND PARTS LIST

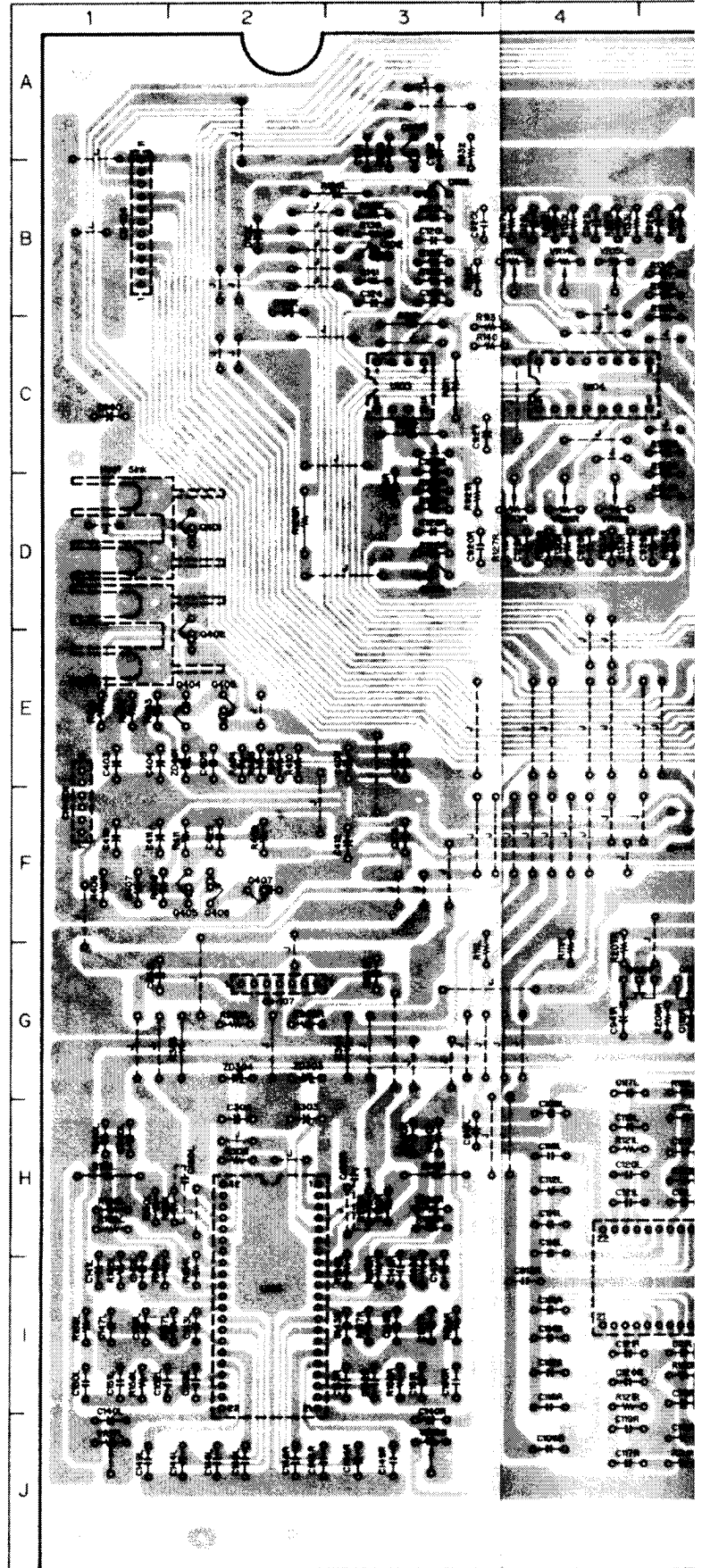
8.1. Main P.C.B. Assy

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. Abbreviation for part name:
 TR — Transistor, SiD — Silicon Diode,
 ZD — Zener Diode, Varicap — Variable Capacitance Diode
 RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor,
 RC — Cement Resistor
 CE — Electrolytic Capacitor, CML — Mylar Capacitor, CC — Ceramic Capacitor, CPP — PP Capacitor, CMM — Metalized Mylar Capacitor,
 CSP — Polystyrene Capacitor, C — Mica Capacitor, CT — Tantalum Capacitor

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
U101	I-8	Q405	F-2
U102	H-5	Q406	F-2
U103	C-3	Q407	F-2
U104	C-4	Q930	A-3
U105	I-10	Q960L	F-9
U106	I-2	Q960R	H-9
U107	C-6	Q980	B-9
U108	H-10	ZD15L	G-10
Q101L	B-3	ZD15R	H-10
Q101R	D-3	ZD96L	G-10
Q102	B-3	ZD96R	H-10
Q105	B-8	ZD301	I-6
Q106L	B-6	ZD302	H-6
Q106R	D-6	ZD303	G-2
Q107L	B-7	ZD304	G-2
Q107R	D-7	ZD401	E-2
Q108L	B-7	D101L	B-2
Q108R	D-7	D101R	B-2
Q109L	B-6	D103L	B-6
Q109R	D-6	D103R	D-5
Q110L	B-6	D104L	B-5
Q110R	D-6	D104R	E-6
Q111L	B-7	D105L	B-5
Q111R	D-7	D105R	E-6
Q112	B-8	D106L	B-5
Q115L	G-5	D106R	E-6
Q115R	G-5	D107L	B-5
Q116L	G-5	D107R	E-6
Q116R	G-4	D108L	B-7
Q117L	G-8	D108R	D-7
Q117R	G-7	D109	B-8
Q118L	G-8	D110L	G-10
Q118R	G-7	D110R	H-10
Q119	B-9	D111L	G-10
Q120	D-9	D111R	H-10
Q121	D-9	D112L	G-5
Q122	D-9	D112R	G-5
Q123	B-9	D113L	G-8
Q124	C-9	D113R	G-7
Q125	C-9	D114	B-9
Q401	D-2	D115	E-9
Q402	E-2	D960L	G-10
Q403	E-2	D960R	H-9
Q404	E-2		



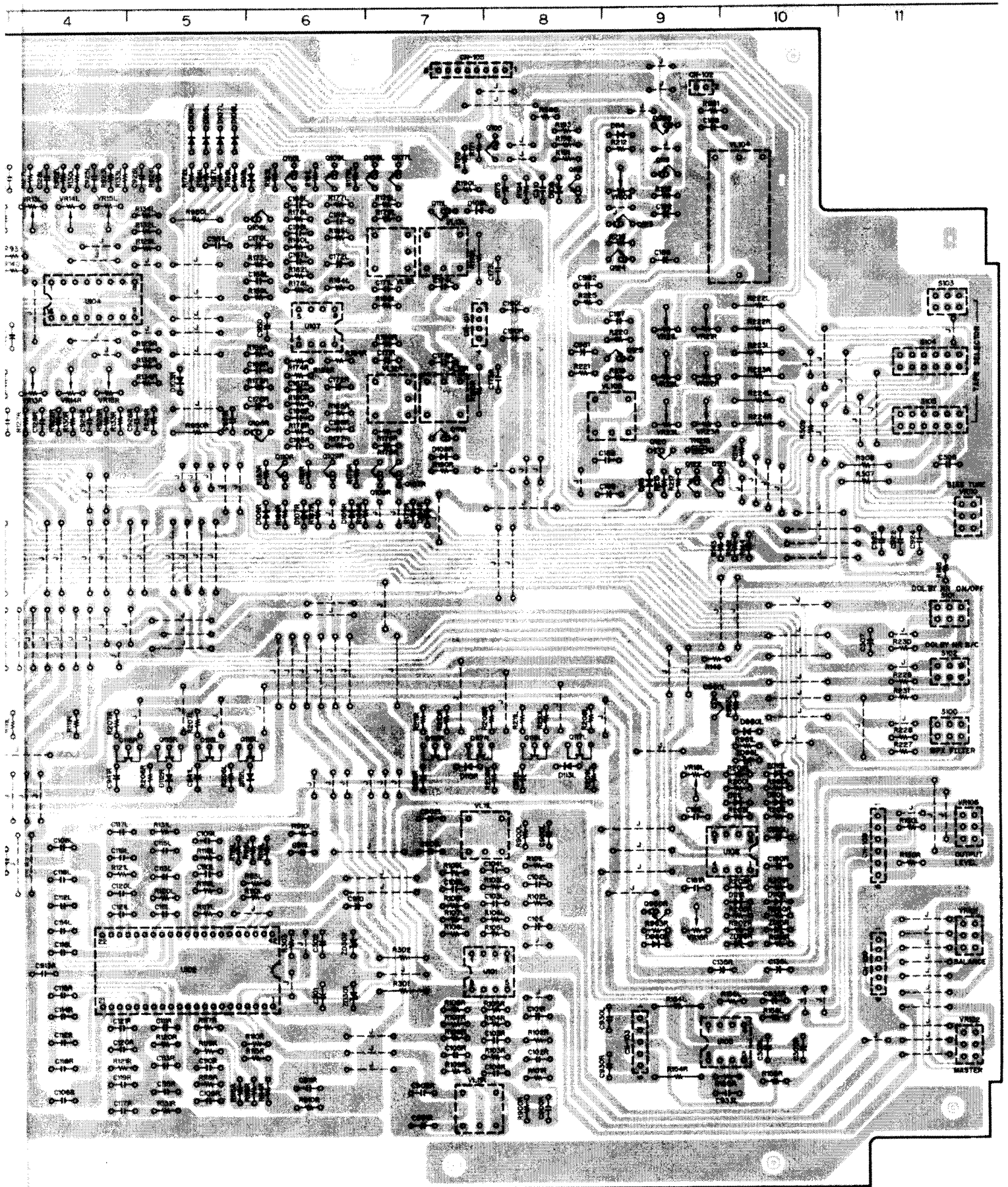


Fig. 8.1

Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
				S103-105	OB70176A	Push Switch TAPE (1)
IC CX20188	R208L,R	OB09733A	RK 220K 1/6W J			
ZD 10V MA4100(N)	R209L,R	OB09749A	RK 1M 1/6W J			
Semi VR 5K	R210L,R	OB09733A	RK 220K 1/6W J			
RK 680 1/6W J	R211L,R	OB09725A	RK 100K 1/6W J			
RK 100K 1/6W J	C912L,R	OB40778A	CE 10µ 25V			
RM 1K 1/4W F	C941L,R	OB40778A	CE 10µ 25V			
RM 2.2K 1/4W F						
RM 3.24K 1/4W F						
RM 3.83K 1/4W F	Q119	OB10055A	TR DTA124ES	CN100	OB60849A	Main P.C.B.
RK 1M 1/6W J	Q120	OB10070A	TR DTC143ES		OB83926A	6P H-Connector Ass'y 330
RM 562 1/4W F	Q121	OB10033A	TR 2SC1740S (S)	CN103	OB83929B	5P H-Connector Ass'y 600
RM 22.1K 1/4W F	Q122	OB06069A	TR 2SB564	CN104	OB83932A	11P H-Connector Ass'y 250
RK 7.5K 1/6W J	Q123	OB10033A	TR 2SC1740S (S)	CN105	OB83931B	8P H-Connector Ass'y 150
RK 9.1K 1/6W J	Q124	OB06451A	TR 2SB1015	CN107	OB83928A	7P H-Connector Ass'y 410
RF 56 1/4W J	Q125	OB10222A	TR 2SC2705 (Y)	CN108	OB83925A	6P H-Connector Ass'y 360
RM 130K 1/4W F	Q980	OB10053A	TR DTA144ES	CN401	OB83930B	6P H-Connector Ass'y 270
RM 100 1/4W F	D114,115	OB06398A	SiD 1SS176		OE00174A	Earth Lug B-4 (2)
CML 120P 50V J	VL104	OB51047A	Bias Osc.		OE00985A	M3x6 Ø Binding (Black Chromate) (2)
CPP 2200P 100V G	VL105	OB51372A	Osc. Tune		OJ06254A	Volume Holder (1)
CPP 2200P 100V G	TH215	OB19006A	Thermistor 3.3K			
CPP 3900P 100V G	VR109	OB32192A	Semi VR 5K			
CML 0.47µ 50V J	VR110	OB30138A	Volume 10K			
CE 1µ 50V (BP)	R212,213	OB09665A	RK 330 1/6W J			
CML 0.15µ 50V J	R214	OB09701A	RK 10K 1/6W J			
CML 0.015µ 50V J	R216	OB9711A	RK 27K 1/6W J			
CML 0.22µ 50V J	R217	OB09653A	RK 100 1/6W J			
CML 0.068µ 50V J	R218	OB09701A	RK 10K 1/6W J			
CE 1µ 50V (BP)	R219	OB09725A	RK 100K 1/6W J			
CML 0.056µ 50V J	R220	OB09701A	RK 10K 1/6W J			
CPP 5600P 100V G	R221	OB09617A	RK 3.3 1/6W J			
CML 0.01µ 50V J	R225	OB09701A	RK 10K 1/6W J			
CPP 100P 100V J	R952L,R	OB09648A	RK 62 1/6W J			
CE 470µ 16V	R980	OB09717A	RK 47K 1/6W J			
CML 120P 50V J	R981	OB09693A	RK 4.7K 1/6W J			
Amp. -	C185,186	OB40780A	CE 100µ 16V			
C M5216	C187	OB09993A	CML 820P 50V J			
VR 10K(A)	C188	OB41255A	CPP 0.018µ 100V J			
RM 2.2K 1/4W F	C189	OB41261A	CPP 0.033µ 100V J			
RF 10 1/4W J	C192	OB40778A	CE 10µ 25V			
RK 47K 1/6W J	C952L,R	OB40608A	CE 470µ 16V			
RK 47K 1/6W J	C981	OB40115A	CE 4.7µ 50V			
CE 10µ 25V	C982	OB41196A	CSP 470P 160V J			
CE 100µ 16V	CN102	OB81459A	2P T-Post			
CPP 3900P 100V G						
CSP 68P 160V J						
3P T-Post (1)						
ly -						
FR 2SD1406	VR21L,R	OB32195A	Semi VR 50K			
FR 2SC2240	VR22L,R	OB32194A	Semi VR 20K			
FR 2SA970	VR23L,R	OB32193A	Semi VR 10K			
FR 2SB1015	R222L,R	OB09705A	RK 15K 1/6W J			
ZD 5.1V	R223L,R	OB09697A	RK 6.8K 1/6W J			
MA4051N-M	R224L,R	OB09653A	RK 100 1/6W J			
RK 2.2K 1/6W J						
RK 1K 1/6W J	U108	OB06124A	IC NJM4558D			
RM 3.9K 1/4W F	Q960L,R	OB06299A	TR 2SC2878			
RM 4.7K 1/4W F	ZD15L,R	OB12714A	ZD 3.3V RD3.3ESB1			
RK 2.2K 1/6W J	ZD96L,R	OB12289A	ZD 5.1V MTZ5.1C			
RK 1K 1/6W J	D110L,R	OB06398A	SiD 1SS176			
RM 12K 1/4W F	D111L,R	OB06398A	SiD 1SS176			
RM 15K 1/4W F	D960L,R	OB06398A	SiD 1SS176			
RK 470 1/6W J	VR18L,R	OB32192A	Semi VR 5K			
RK 1.6K 1/6W J	R200L,R	OB09749A	RK 1M 1/6W J			
CE 100µ 25V	R201L,R	OB09741A	RK 470K 1/6W J			
CML 0.1µ 50V J	R202L,R	OB09677A	RK 1K 1/6W J			
CE 3300µ 16V	R203L,R	OB09677A	RK 1K 1/6W J			
CML 0.1µ 50V J	R960L,R	OB09696A	RK 6.2K 1/6W J			
CE 100µ 25V	R961L,R	OB09682A	RK 1.6K 1/6W J			
CE 2200µ 16V	R963L,R	OB09701A	RK 10K 1/6W J			
CML 0.1µ 50V J	C180L,R	OB40257A	CE 3.3µ 50V (LN)			
CML 0.1µ 50V J	C181L,R	OB40817A	CE 1µ 50V (BP)			
Heat Sink (2)	C960	OB40608A	CE 470µ 16V			
e Switch -						
FR FET 2SK246	R226	OB09701A	RK 10K 1/6W J			
FR FET 2SK246	R227	OB09685A	RK 2.2K 1/6W J			
FR FET 2SK246	R228	OB09709A	RK 22K 1/6W J			
FR FET 2SK246	R230,231	OB09701A	RK 10K 1/6W J			
SiD 1SS176	R307	OB09711A	RK 27K 1/6W J			
SiD 1SS176	R308,309	OB09725A	RK 100K 1/6W J			
RK 1M 1/6W J	C190L,R	OB41196A	CSP 470P 160V J			
RK 100K 1/6W J	C307	OB40559A	CE 47µ 16V			
	C308	OB41298A	CML 0.1µ 50V			
	S100-102	OB70177A	Push Switch MPX-DOLBY (1)			

8.2. Power Supply & Logic P.C.B. Assy

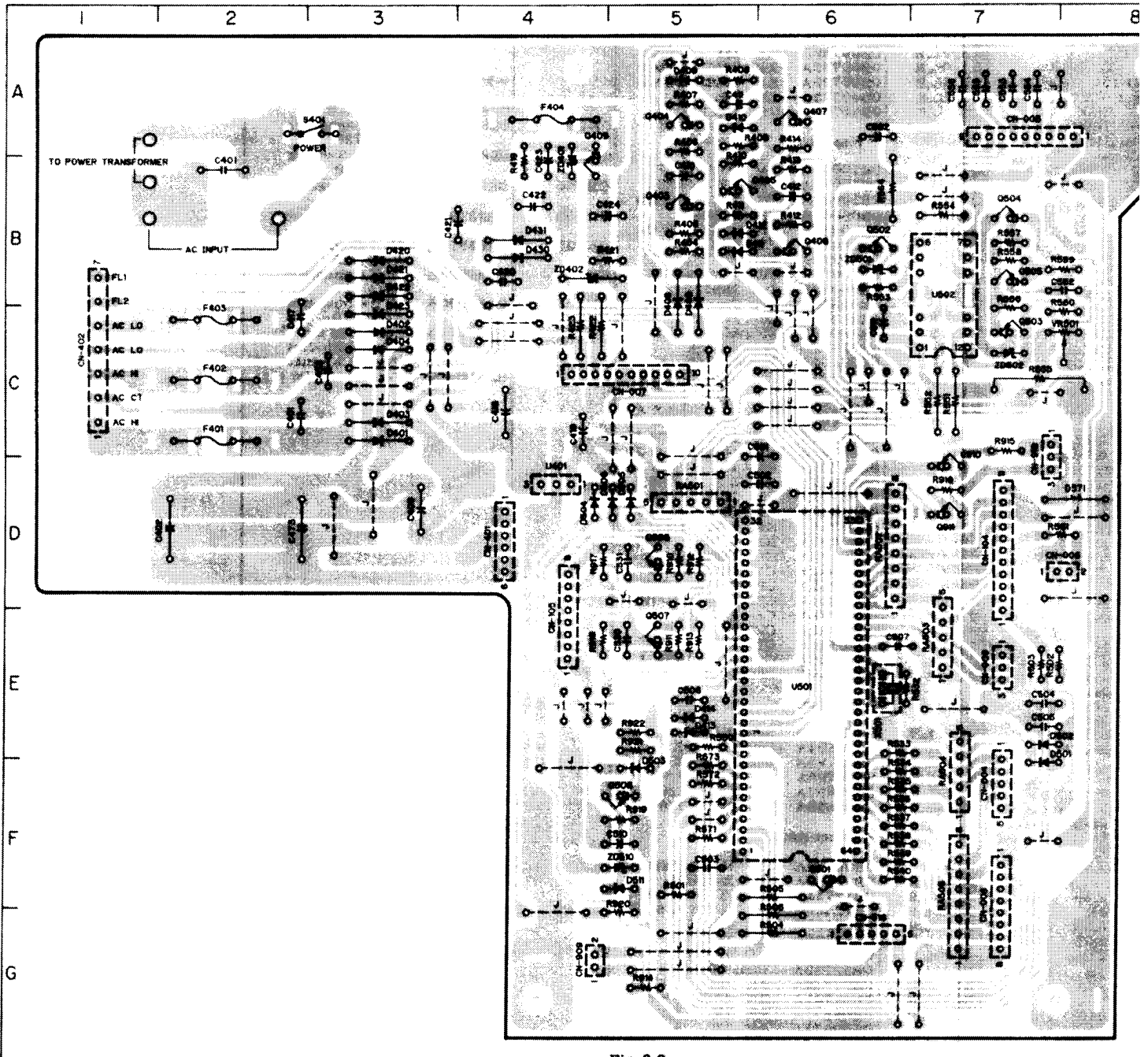


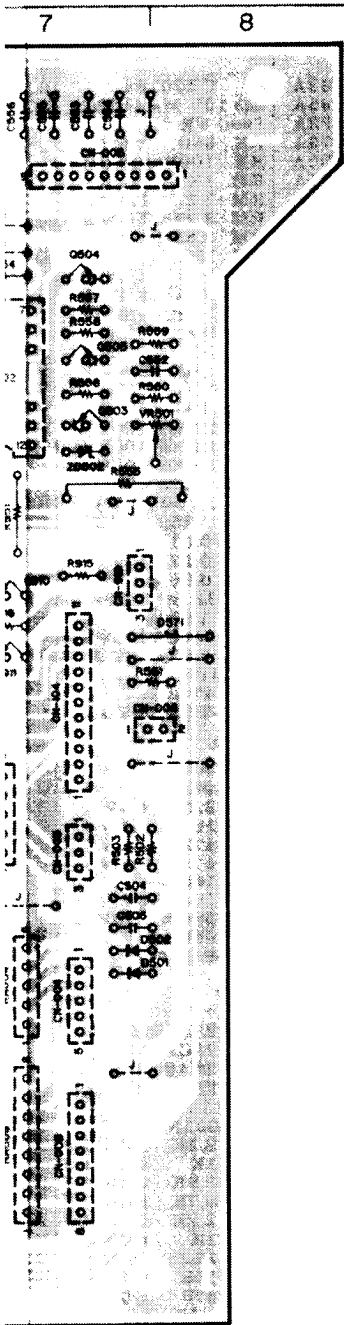
Fig. 8.2

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
U401	D-4	Q503	C-7	ZD502	C-7	D412	B-5	D503	F-5
U501	E-6	Q504	B-7	ZD510	F-5	D413	E-5	D504	D-4
U502	B-7	Q505	B-7	D401	C-3	D414	E-5	D505	D-5
Q403	B-5	Q506	D-5	D402	C-3	D420	B-3	D506	D-4
Q404	A-5	Q507	E-5	D403	C-3	D421	B-3	D511	F-5
Q405	B-5	Q508	F-5	D404	C-3	D422	B-3	D571	D-8
Q406	B-6	Q910	C-7	D405	B-5	D423	B-3		
Q407	A-6	Q911	D-7	D406	B-5	D430	B-4		
Q409	A-4	ZD401	B-4	D409	A-5	D431	B-4		
Q501	F-6	ZD402	B-4	D410	A-5	D501	E-7		
Q502	B-6	ZD501	B-6	D411	B-5	D502	E-7		

*: Unstocked parts:

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
8.2. Power Supply & Logic P.C.B Assy			R560	OB09677A	RK 1K 1/6W J
	*	BA07988A Power Supply & Logic P.C.B. Assy (USA, CAN, EP, UK, AUS, OTR, SAU)	R561	OB09669A	RK 470 1/6W J
	*	BA07981A Power Supply & Logic P.C.B. Assy (JPN)	R564	OB09217A	RF 5.6 1/4W J
-- Power Supply --			C551	OB40078A	CE 100µ 16V
U401	OB11753A	IC NJM7805FA	C552	OB41286A	CML 0.01µ 50V J
Q403,404	OB10033A	TR 2SC1740S (S)	C553,554	OB41298A	CML 0.1µ 50V J
Q405	OB10033A	TR 2SC1740S (S)	C555,556	OB41298A	CML 0.1µ 50V J
Q406	OB10058A	TR DTA114ES	C562	OB40079A	CE 220µ 16V
Q407	OB10033A	TR 2SC1740S (S)	CN005	OB84084A	9P T-Post
Q409	OB10015A	TR 2SA1020	CN006	OB84278A	2P T-Post
ZD401	OB12708A	ZD 24V MA4240N-H	-- MPU --		
ZD402	OB12707A	ZD 4.7V MA4047N	U501	OB11884A	IC µPD75106CW
D401,402	OB12365A	SID 1SR35-100A	Q501	OB10068A	TR DTC114ES
D403,404	OB12365A	SID 1SR35-100A	Q506,507	OB10029A	TR 2SA933S (S)
D405,406	OB12365A	SID 1SR35-100A	Q508	OB10029A	TR 2SA933S (S)
D409,410	OB06398A	SID 1SS176	Q910,911	OB10053A	TR DTA144ES
D411,412	OB06398A	SID 1SS176	ZD510	OB12895A	ZD 10V MA4100(N)
D420,421	OB12365A	SID 1SR35-100A	D501,502	OB06398A	SID 1SS176
D422,423	OB12365A	SID 1SR35-100A	D511	OB06398A	SID 1SS176
D430,431	OB12365A	SID 1SR35-100A	D571	OB12834A	Varistor 02YS
R404	OB09709A	RK 22K 1/6W J	X501	OB92045A	Crystall 4.0MHZ
R405	OB09703A	RK 12K 1/6W J	RA501	OB21101A	R Network 10Kx3
R406	OB09701A	RK 10K 1/6W J	RA502	OB21102A	R Network 10Kx6
R407,408	OB09693A	RK 4.7K 1/6W J	RA503	OB21101A	R Network 10Kx3
R409	OB09719A	RK 56K 1/6W J	RA504	OB21101A	R Network 10Kx3
R410	OB09713A	RK 33K 1/6W J	RA506	OB21102A	R Network 10Kx6
R411,412	OB09693A	RK 4.7K 1/6W J	R501	OB09689A	RK 3.3K 1/6W J
R413	OB09719A	RK 56K 1/6W J	R502,503	OB09701A	RK 10K 1/6W J
R414	OB09713A	RK 33K 1/6W J	R504,505	OB09701A	RK 10K 1/6W J
R419	OB09685A	RK 2.2K 1/6W J	R506	OB09701A	RK 10K 1/6W J
R421	OB09701A	RK 10K 1/6W J	R532,533	OB09677A	RK 1K 1/6W J
R422,423	OB09653A	RK 100 1/6W J	R534,535	OB09677A	RK 1K 1/6W J
C401	OB41825A	CC 4700P AC400V (USA, CAN, EP, UK, AUS, OTR, SAU)	R536,537	OB09677A	RK 1K 1/6W J
			R538,539	OB09677A	RK 1K 1/6W J
			R540	OB09677A	RK 1K 1/6W J
			R550	OB09701A	RK 10K 1/6W J
			R571	OB09677A	RK 1K 1/6W J
			R572,573	OB09701A	RK 10K 1/6W J
			R910,911	OB09709A	RK 22K 1/6W J
			R912,913	OB09725A	RK 100K 1/6W J
			R914	OB09701A	RK 10K 1/6W J
			R915,916	OB09661A	RK 220 1/6W J
			R917,918	OB09725A	RK 100K 1/6W J
			R919	OB09721A	RK 68K 1/6W J
			R920	OB09669A	RK 470 1/6W J
			R921	OB09725A	RK 100K 1/6W J
			R922	OB09701A	RK 10K 1/6W J
C402	OB40801A	CE 6800µ 25V	C501	OB40077A	CE 47µ 16V
C409	OB40863A	CE 2200µ 25V	C502	OB41298A	CML 0.1µ 50V J
C410	OB40630A	CE 22µ 10V (LN)	C503	OB41302A	CML 0.22µ 50V J
C411,412	OB40255A	CE 1µ 50V (LN)	C504,505	OB41286A	CML 0.01µ 50V J
C416	OB40862A	CE 6800µ 16V	C506,507	OB41274A	CML 1000P 50V J
C417	OB41298A	CML 0.1µ 50V J	C510	OB40756A	CE 1µ 50V (LN)
C419	OB40067A	CE 470µ 10V	C530,531	OB41290A	CML 0.022µ 50V J
C420	OB41298A	CML 0.1µ 50V J	CN004	OB81482A	5P T-Post
C421	OB40798A	CE 330µ 35V	CN007	OB84302A	10P T-Post
C422	OB40120A	CE 100µ 50V	CN008	OB84296A	8P T-Post
C423	OB40100A	CE 10µ 35V	CN009	OB84281A	3P T-Post
C424	OB40802A	CE 1000µ 35V	CN104	OB84305A	11P T-Post
C451,452	OB41298A	CML 0.1µ 50V J	CN105	OB81465A	8P T-Post
C473	OB40801A	CE 6800µ 25V	CN516	OB84286A	5P T-Post
S401	OB71012A	Power Switch 1P TV-4	CN909	OB81459A	2P T-Post
CN401	OB81463A	6P T-Post	CN919	OB81460A	3P T-Post
CN402	OB81574A	7P T-Post	-- Miscellaneous --		
	OB08349B	Fuse Clip (8)	OB60846A	Power Supply & Logic P.C.B.	
	OE08355A	Earth Lug for P.C.B. (4)			
-- Motor Driver --					
U502	OB11368A	IC IC LB1649			
Q502	OB10062A	TR DTC144ES			
Q503	OB10029A	TR 2SA933S (S)			
Q504	OB10062A	TR DTC144ES			
Q505	OB10033A	TR 2SC1740S (S)			
ZD501	OB12290A	ZD 5.6V MTZ5.6A			
ZD502	OB12288A	ZD 5.1V MTZ5.1B			
D413,414	OB06398A	SID 1SS176			
D503,504	OB06398A	SID 1SS176			
D505,506	OB06398A	SID 1SS176			
VR501	OB32192A	Semi VR 5K			
R551,552	OB01857A	RK 1K 1/4W J			
R553,554	OB09677A	RK 1K 1/6W J			
R555	OB24349A	RF 27 1/2W			
R556	OB09701A	RK 10K 1/6W J			
R557	OB09681A	RK 1.5K 1/6W J			
R558	OB09695A	RK 5.6K 1/6W J			
R559	OB09717A	RK 47K 1/6W J			



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

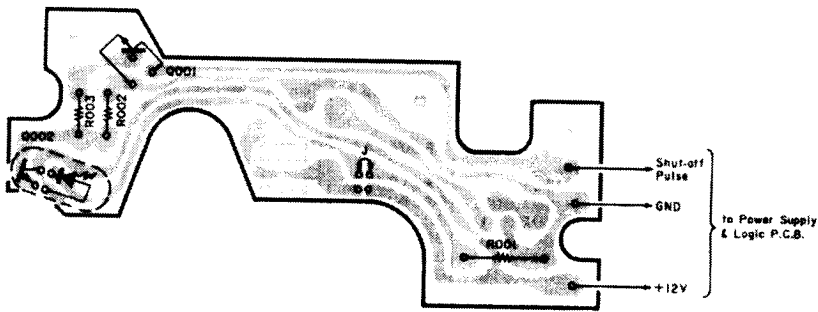


Fig. 8.3

8.4. Timer Switch P.C.B. Ass'y

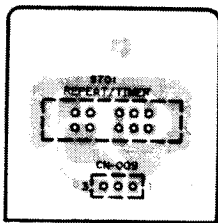


Fig. 8.4

8.5. Headphone P.C.B. Ass'y

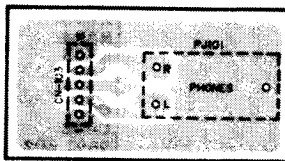


Fig. 8.5

8.6. Pin Jack P.C.B. Ass'y

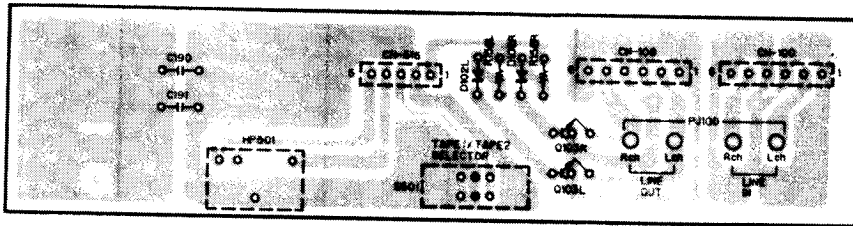


Fig. 8.6

8.7. Playback Amp. P.C.B. Ass'y

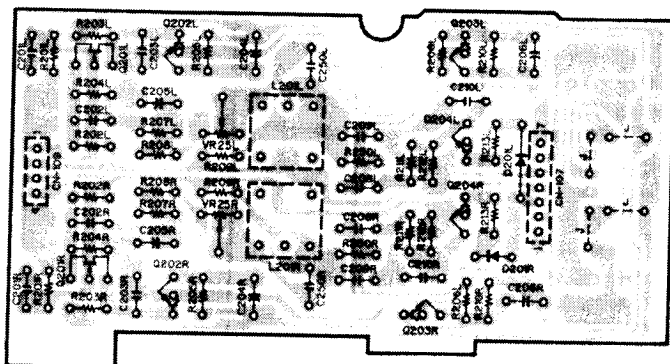
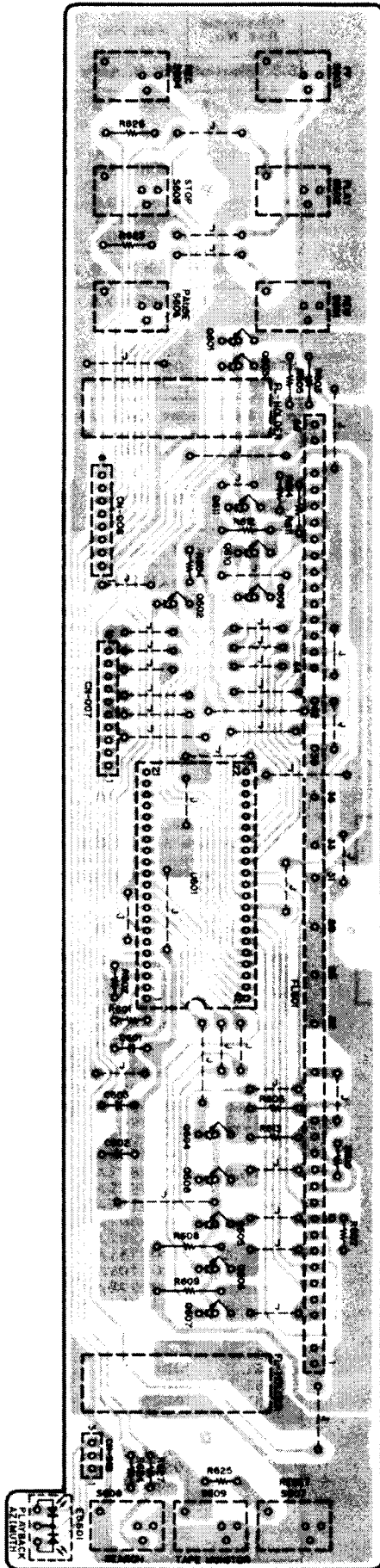


Fig. 8.7

*: Unstocked parts:

Schematic Ref. No.	Part No.	Description
8.3. Shut-off P.C.B. Ass'y		
	* CA80011B	Shut-off P.C.B. Ass'y
Q001	0C80047A	Shut-off P.C.B.
Q002	0B06388A	TR 2SC2812
	0B06389A	Photo Reflector
		NJL5141
R001	0C81330A	RM 750
R002	0B09841A	RK 15K
R003	0B09840A	RK 680
8.4. Timer Switch P.C.B. Ass'y		
	* BA07983A	Timer Switch P.C.B. Ass'y
S701	0B60848A	Timer Switch P.C.B.
CN009	0B70175A	Slide Switch 2-4
	0B83936A	3P H-Connector Ass'y
8.5. Headphone P.C.B. Ass'y		
	* BA07986A	Headphone P.C.B. Ass'y
PJ101	0B60851A	Headphone P.C.B.
	0B81478A	Headphone Jack
8.6. Pin Jack P.C.B. Ass'y		
	* BA07985A	Pin Jack P.C.B. Ass'y
Q103L,R	0B60850A	Pin Jack P.C.B.
D102L,R	0B06299A	TR 2SC2878
R152L,R	0B06398A	SID 1S5176
C190	0B09693A	RK 4.7K 1/6W J
C191	0B05550A	CML 1000P 50V J
S501	0B41298A	CML 0.1μ 50V J
HP501	0B70178A	Slide Switch 2-2
PJ100	0B84028A	Stereo Mini Jack
CN516	0B84350A	4P Pin Jack
	0B83927A	5P H-Connector Ass'y 300
	0E03355A	Earth Lug for P.C.B. (1)
8.7. Playback Amp. P.C.B. Ass'y		
	* BA07987A	Playback Amp. P.C.B. Ass'y
Q201L,R	0B10883A	Playback Amp. P.C.B.
Q202L,R	0B10050A	FET 2SK369 (GR)
Q203L,R	0B06142A	TR 2SA970 (BL)
Q204L,R	0B10033A	TR 2SC2240 (BL)
D201L,R	0B06398A	TR 2SC1740S (S)
L201L,R	0B51375A	SID 1S5176
VR25L,R	0B32190A	PB Trap Coil
R201L,R	0B09725A	Semi VR 1KB
R202L,R	0B25074A	RK 100K 1/6W J
R203L,R	0B25285A	RM 54.6 1/4W F
R204L,R	0B25401A	RM 2.61K 1/4W F
R205L,R	0B09673A	RM 140K 1/4W F
R206L,R	0B09713A	RK 680 1/6W J
R207L,R	0B25672A	RK 33K 1/6W J
R208L,R	0B09665A	RM 6.2K 1/4W F
R208L,R	0B09665A	RK 330 1/6W J
R210L,R	0B09709A	RK 22K 1/6W J
R211L,R	0B09697A	RK 6.8K 1/6W J
R212L,R	0B25292A	RM 10.2K 1/4W F
R213L,R	0B09741A	RK 470K 1/6W J
R250L,R	0B09701A	RK 10K 1/6W J
C201L,R	0B25279A	RM 7.5K 1/4W F
C202L,R	0B41754A	CSP 150P 160V J
C203L,R	0B05582A	CML 0.022μ 50V J
C204L,R	0B41763A	CSP 10P 160V J
C205L,R	0B40086A	CE 330μ 10V
C206L,R	0B40778A	CE 10μ 25V
C208L,R	0B40050A	CE 220μ 6.3V
C209L,R	0B05530A	CML 6800P 50V J
C210L,R	0B41139A	CFF 3900P 100V J
C250L,R	0B47027A	CML 470P 50V J
CN107	0B41816A	CSP 220P 160V J
CN109	0B81464A	7P T-Post
	0B81461A	4P T-Post

8.8. Control Switch and Display P.C.B. Ass'y



Schematic Ref. No.	Part No.	Description
8.8. Control Switch & Display P.C.B. Ass'y		
*	BA07982A	Control Switch & Display P.C.B. Ass'y
	0B60847A	Control Switch & Display P.C.B.
U601	0B11860A	IC MSC7112-01
Q601,602	0B10033A	TR 2SC1740S (S)
Q603,604	0B10033A	TR 2SC1740S (S)
Q605,606	0B10033A	TR 2SC1740S (S)
Q607,608	0B10033A	TR 2SC1740S (S)
Q609,610	0B10033A	TR 2SC1740S (S)
Q611	0B10033A	TR 2SC1740S (S)
ED601	0B12709A	LED TLG126
R601	0B09713A	RK 33K 1/6W J
R602	0B09701A	RK 10K 1/6W J
R603,604	0B09717A	RK 47K 1/6W J
R605,606	0B09717A	RK 47K 1/6W J
R607,608	0B09717A	RK 47K 1/6W J
R609,610	0B09717A	RK 47K 1/6W J
R611,612	0B09717A	RK 47K 1/6W J
R613	0B09629A	RK 10 1/6W J
R614	0B09717A	RK 47K 1/6W J
R623	0B09701A	RK 10K 1/6W J
R624	0B09693A	RK 4.7K 1/6W J
R625	0B09705A	RK 15K 1/6W J
R626	0B09701A	RK 10K 1/6W J
R627	0B09693A	RK 4.7K 1/6W J
C601	0B41974A	CC 100P 50V J
C602	0B40158A	CE 100µ 6.3V
S601,602	0B70161A	Tact Switch
S603,604	0B70161A	Tact Switch
S605,606	0B70161A	Tact Switch
S607,608	0B70161A	Tact Switch
S609	0B70161A	Tact Switch
CN007	0B88935A	10P H-Connector Ass'y 400
CN008	0B88934A	8P H-Connector Ass'y 300
CN919	0B88937A	3P H-Connector Ass'y 250
FL601	0B90461A	FL Display FIP13BW7Y
	0J06219C	FL Cushion
	0J06238A	FL Stopper

Fig. 8.8

9. SCHEMATIC DIAGRAM

9.1. IC Block Diagrams

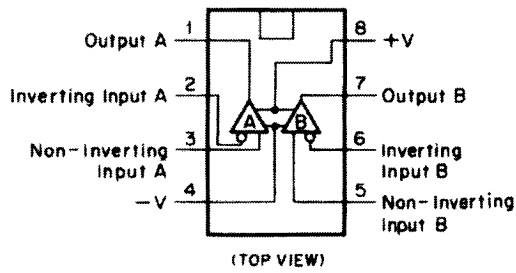


Fig. 9.1.1 Operational Amp. IC 4558D, 5532DD, 5216

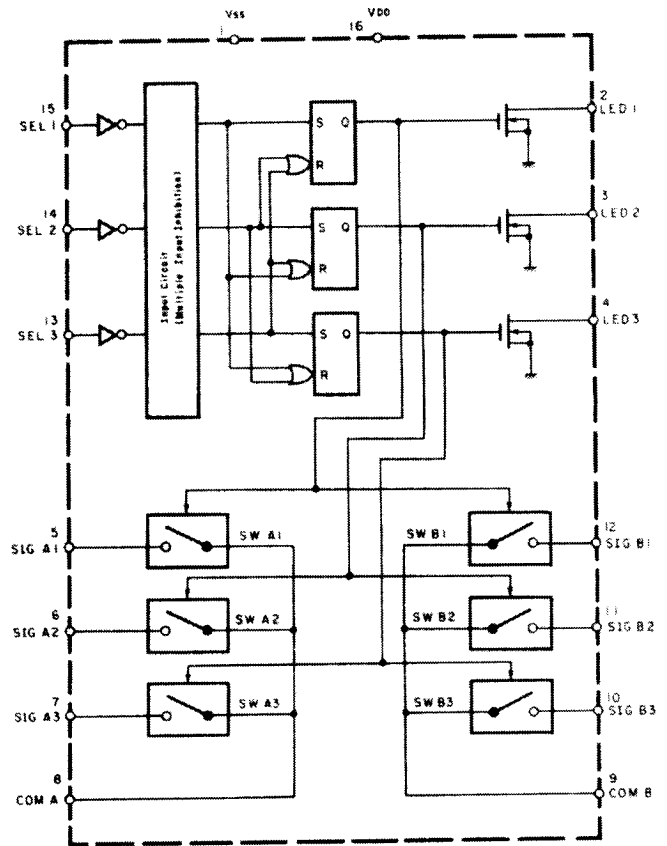
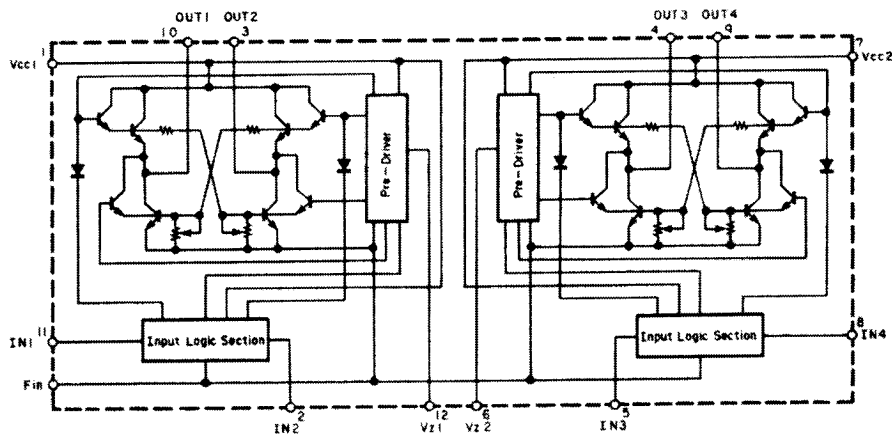



Fig. 9.1.2 Analog Switch Selector TC9145P

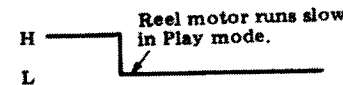







INPUT		OUTPUT		OPERATION
IN1/3	IN2/4	OUT1/3	OUT2/4	
0	0	0	0	Braking
1	0	1	0	Forward (Reverse)
0	1	0	1	Reverse (Forward)
1	1	0	0	Braking

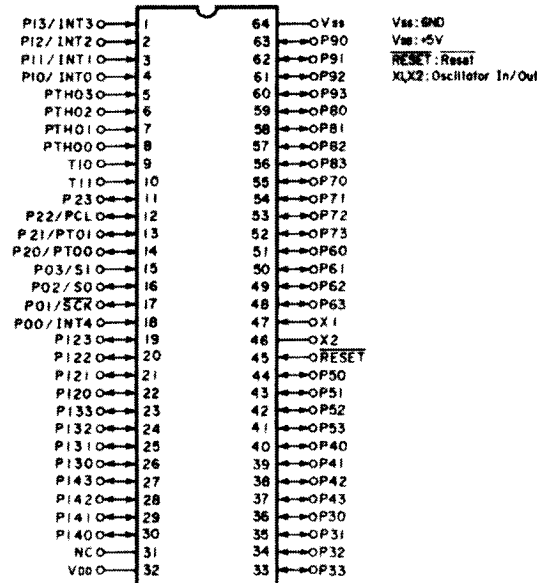
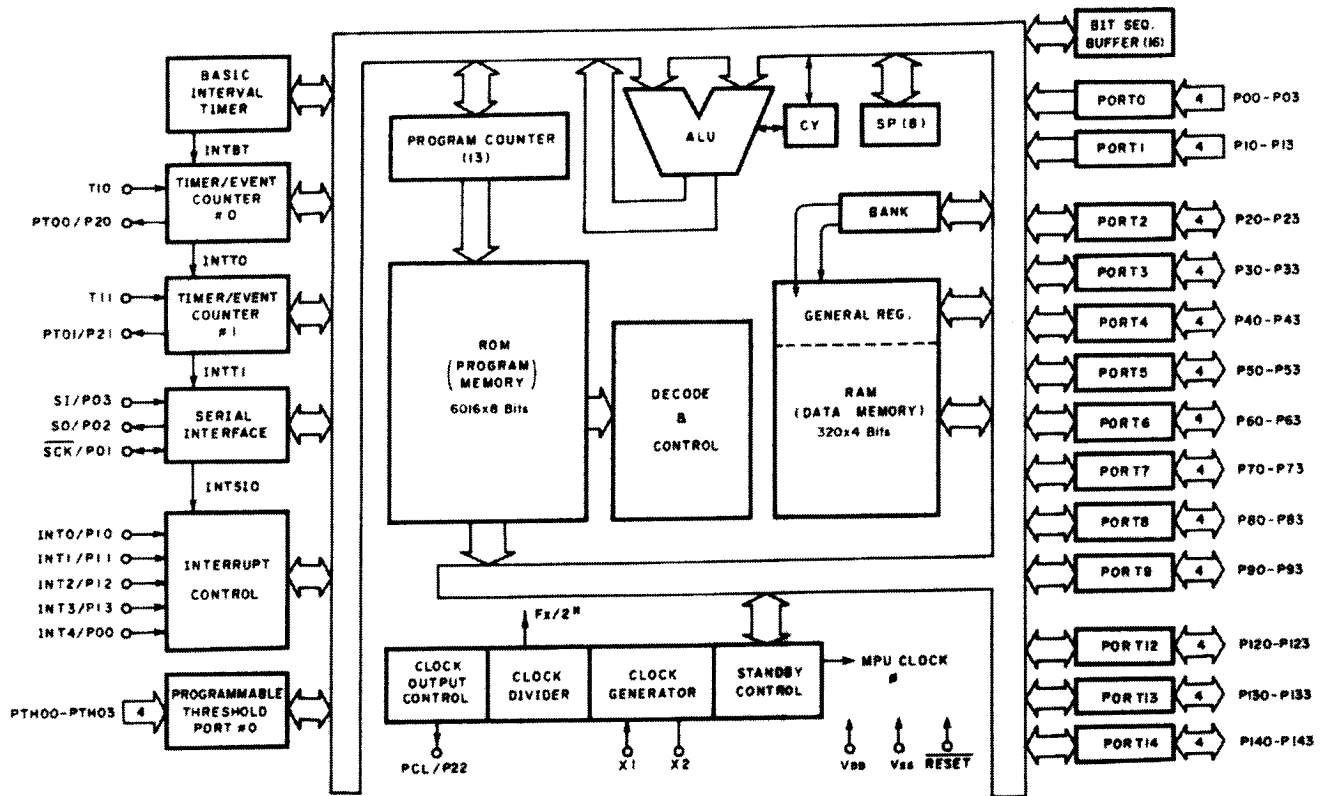
Fig. 9.1.3 Motor Driver IC LB1649

U501 μ PD75106CW (Microprocessing Unit (MPU))

Pin No.	Signal Name	In/Out	Function
1	—	I	Not used. Connected to GND.
2	AZCT	I	Playback azimuth control center detect switch is connected. Becomes "H" when the Playback Azimuth control on the Front Panel is set to the center position.
3	REM	I	Remote control receiver signal input.
4	REL P	I	Reel motor pulse input. Pulse train is input while take-up reel hub is rotating, i.e., tape is running.
5	LVR	I	Rch input for level meter. Input level is A/D-converted in this IC and the converted result is transferred to the Display Control IC (U601) via pin 13 (DDAT).
6	LVL	I	Lch input for level meter. The function is the same as above LVR (Rch).
7	KS1	I	Record/Monitor switch input. Record switch ON: 0 V Monitor switch ON: 1.6 V
8	KSO	I	Stop/Counter Search/Counter Reset switch input. Stop switch ON: 0 V Counter Search switch ON: 1.6 V Counter Reset switch ON: 3.3 V
9	MREM	I	System remote mode signal input. "L": "Tape 1" is selected. "H": "Tape 2" is selected.
10	HD $\bar{2}/3$	I	Fixed to "H".
11	—	O	Not used.
12	DCLK	O	Clock for serial data DDAT at pin 13.
13	DDAT	O	Serial data for Display Control IC (U601), which includes display data and control information.
14	DEN	O	Enable signal to Display Control IC (U601). Active "H".
15 16 17	—	I	Not used. Connected to GND.
18	POFF	I	Power OFF signal input. Becomes "L" when power is turned OFF. Power ON 
19	LMUT	O	Line mute signal output. Active "L".
20	RMUT	O	Record mute signal output. Active "L". Record mute is released only in Record/Play mode.
21	BIAS	O	Bias ON/OFF signal output. "L": Bias ON.
22 23 24	—	O	Not used. (Open).
25	HPLY	O	Source signal output. Active "L".
26	HREC	O	Tape signal output. Active "L".

Pin No.	Signal Name	In/Out	Function												
27	RMS P	O	Reel motor speed select signal output. Becomes "L" in play mode. 												
28	—	O	Not used.												
29	RMR	O	Reel motor drive control signal output. Becomes "H" in Rewind mode. 												
30	RMF	O	Reel motor drive control signal output. Becomes "H" in Play or Fast Forward mode. 												
31	NC	—	No connection.												
32	VDD	—	Supplied with +5 V.												
33	AZRD	O	Off center position indication signal of the Playback Azimuth control. Drives red LED in Rec./Play or Rec./Pause mode.												
34	AZGR	O	Center position indication signal of the Playback Azimuth control. Drives Green LED in Playback mode. <table border="1" data-bbox="1055 976 1485 1092"> <thead> <tr> <th>Mode</th> <th>Center</th> <th>Out of Center</th> </tr> </thead> <tbody> <tr> <td>Play</td> <td>Green</td> <td>—</td> </tr> <tr> <td>Rec./Play Rec./Pause</td> <td>Green</td> <td>Red</td> </tr> </tbody> </table>	Mode	Center	Out of Center	Play	Green	—	Rec./Play Rec./Pause	Green	Red			
Mode	Center	Out of Center													
Play	Green	—													
Rec./Play Rec./Pause	Green	Red													
35	ASMR	O	Control motor reverse drive signal output. Becomes "H" when turning the control motor reverse (in the direction of Play-Pause-Stop-FF/REW). Turns control motor reverse. 												
36	ASMF	O	Control motor forward drive signal output. Becomes "H" when turning the control motor forward (in the direction of FF/REW-Stop-Pause-Play). Turns control motor forward. 												
37 38	TAP B TAP A	I	Tape type select signal input. <table border="1" data-bbox="1096 1543 1429 1680"> <thead> <tr> <th>Type</th> <th>TAP A</th> <th>TAP B</th> </tr> </thead> <tbody> <tr> <td>Type I</td> <td>H</td> <td>H</td> </tr> <tr> <td>Type II</td> <td>L</td> <td>H</td> </tr> <tr> <td>Type IV</td> <td>H/L</td> <td>L</td> </tr> </tbody> </table>	Type	TAP A	TAP B	Type I	H	H	Type II	L	H	Type IV	H/L	L
Type	TAP A	TAP B													
Type I	H	H													
Type II	L	H													
Type IV	H/L	L													
39 40	B/ \bar{C} DOLBY NR	I	Dolby NR mode select signal input. <table border="1" data-bbox="1088 1722 1461 1858"> <thead> <tr> <th>Mode</th> <th>DOLBY</th> <th>B/\bar{C}</th> </tr> </thead> <tbody> <tr> <td>Dolby NR OFF</td> <td>H</td> <td>H/L</td> </tr> <tr> <td>Dolby NR B</td> <td>L</td> <td>H</td> </tr> <tr> <td>Dolby NR C</td> <td>L</td> <td>L</td> </tr> </tbody> </table>	Mode	DOLBY	B/ \bar{C}	Dolby NR OFF	H	H/L	Dolby NR B	L	H	Dolby NR C	L	L
Mode	DOLBY	B/ \bar{C}													
Dolby NR OFF	H	H/L													
Dolby NR B	L	H													
Dolby NR C	L	L													
41	MPX	I	MPX filter switch signal input. "L": MPX Filter ON, "H"=OFF												

Pin No.	Signal Name	In/Out	Function															
42 43	TIM B TIM A	I	Repeat/Timer switch signal input. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Mode</th> <th>TIM A</th> <th>TIM B</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>H</td> <td>H</td> </tr> <tr> <td>Auto Repeat</td> <td>L</td> <td>H</td> </tr> <tr> <td>Timer Play</td> <td>H</td> <td>L</td> </tr> <tr> <td>Timer Record</td> <td>L</td> <td>L</td> </tr> </tbody> </table>	Mode	TIM A	TIM B	OFF	H	H	Auto Repeat	L	H	Timer Play	H	L	Timer Record	L	L
Mode	TIM A	TIM B																
OFF	H	H																
Auto Repeat	L	H																
Timer Play	H	L																
Timer Record	L	L																
44	REC PRO	I	Record protect switch signal input. "H": Recording is allowed.															
45	RESET	I	System reset signal input. Active "L". 															
46 47	X2 X1	I	4 MHz oscillator is connected.															
48 49 50 51	—	O	Not used. (Open)															
52	RREM	O	System remote return signal output.															
53 54 55	—	O	Not used. (Open)															
56	EJC	I	Cassette In switch signal input. Becomes "L" while the Cassette Cover Ass'y is open.															
57 58 59	CAM2 CAM1 CAM0	I	Cam switch signal input. Mode of the mechanism can be sensed according to states of CAM0, CAM1 and CAM2.															
60	KFF	I	FF switch signal input. "L" when pressed.															
61	KREW	I	REW switch signal input. "L" when pressed.															
62	KPUS	I	Pause switch signal input. "L" when pressed.															
63	KPLY	I	Play switch signal input. "L" when pressed.															
64	VSS	—	Grounded.															



Vss: GND
 VDD: +5V
 RESET: Reset
 X1, X2: Oscillator In/Out

(TOP VIEW)

Fig. 9.1.4 Microprocessing Unit (MPU) μPD75106CW

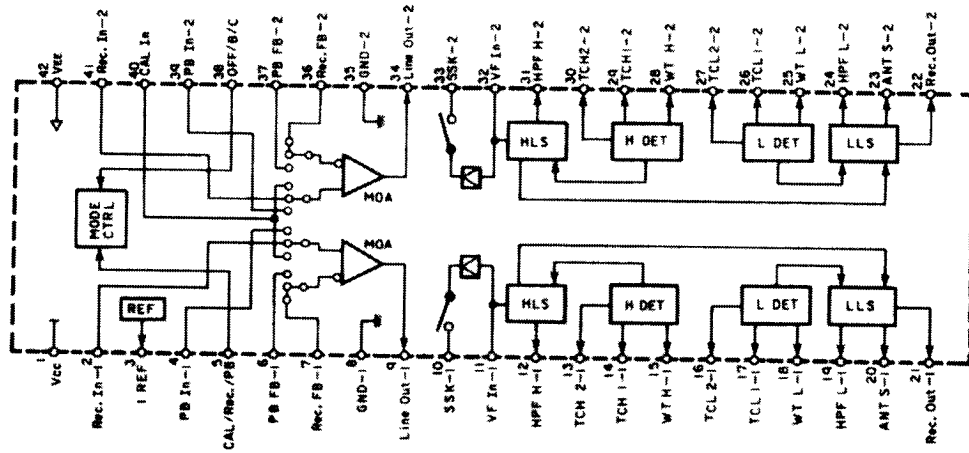


Fig. 9.1.5 Dolby NR IC CX20188

U102/U106 CX20188 (Dolby NR IC)

Pin No.	Signal Name	Function
1	Vcc	Positive power supply input terminal.
2,41	Rec. In	Record signal input terminal.
3	I Ref.	Reference current input terminal.
4,39	PB In	PB signal input terminal.
5	CAL/Rec./PB	Calibration/Recording/Playback select terminal.
6,37	PB FB	Playback signal feedback terminal.
7,36	Rec. FB	Record signal feedback terminal.
8,35	GND	GND terminal.
9,34	Line Out	Line signal (decoded signal) output terminal.
10,33	SSK	Spectral skewing switch terminal.
11,32	VF In	Encode circuit input terminal.
12,31	HPF H	HLS high-pass filter terminal.
13,30	TCH 2	HLS detector time constant determination terminal 2.

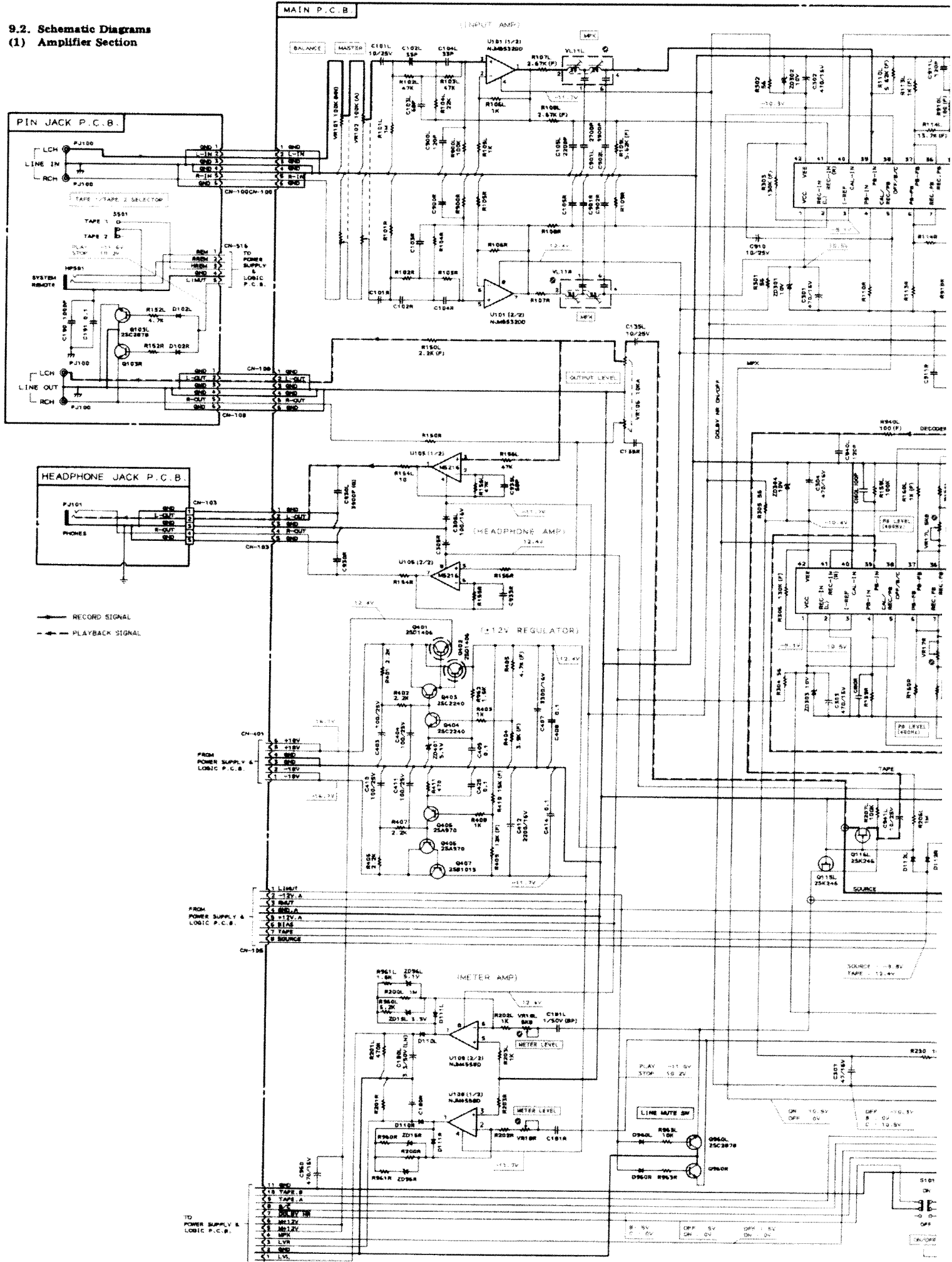
Pin No.	Signal Name	Function
14,29	TCH 1	HLS detector time constant determination terminal 1.
15,28	WT H	HLS weighting terminal.
16,27	TCL 2	LLS detector time constant determination terminal 2.
17,26	TCL 1	LLS detector time constant determination terminal 1.
18,25	WT L	LLS weighting terminal.
19,24	HPF L	LLS high-pass filter terminal.
20,23	ANT S	Anti-saturation terminal.
21,22	Rec. Out	Record signal (encoded signal) output terminal.
38	OFF/B/C	Dolby NR OFF/B-type/C-type select terminal.
40	CAL In	Calibration input terminal. Not used.
42	VEE	Negative power supply input terminal.

U601 MSC7112 (Display Controller)

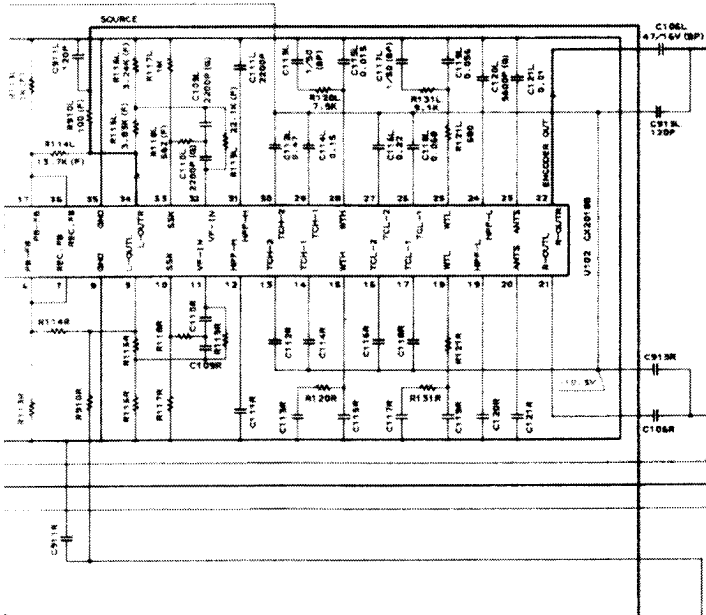
Pin No.	Signal Name	In/Out	Function
1	OSC1	I	An RC circuit is connected for making an oscillation circuit.
2	OSC0	O	
3	FOR	I	Reset signal input at power ON. The IC is reset when "L".
4	VDD	—	Supplied with +5 V.
5 to 16	D1 to D12	O	FL tube grid drive output. (D8—D12 are not used.)
17 to 21	LED1 to LED5	O	Not used. (Open)
22	VSS	—	Grounded.

Pin No.	Signal Name	In/Out	Function
23	VEE	—	Supplied with approx. -25 V.
24 to 39	SEG P to SEG A	O	FL tube anode drive output. Active "H". (SEGP—SEGN are not used.)
40	SCLK	I	Shift clock input for internal shift register. Shifts the data at pin 41 (DATAIN) at every rising edge.
41	DATAIN	I	Control & display serial data sent from the mechanism control MPU (U501). MSB first.
42	LOAD	I	Data latch pulse. The data is latched to the internal register at the falling edge.

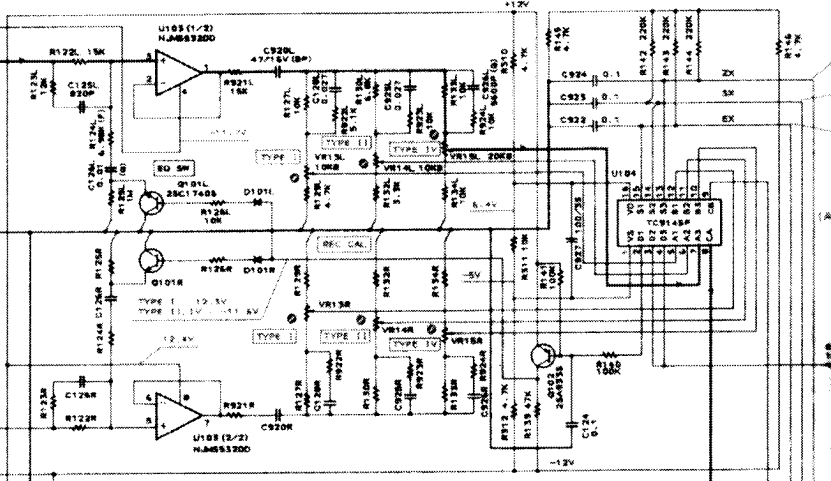
9.2. Schematic Diagrams
 (1) Amplifier Section



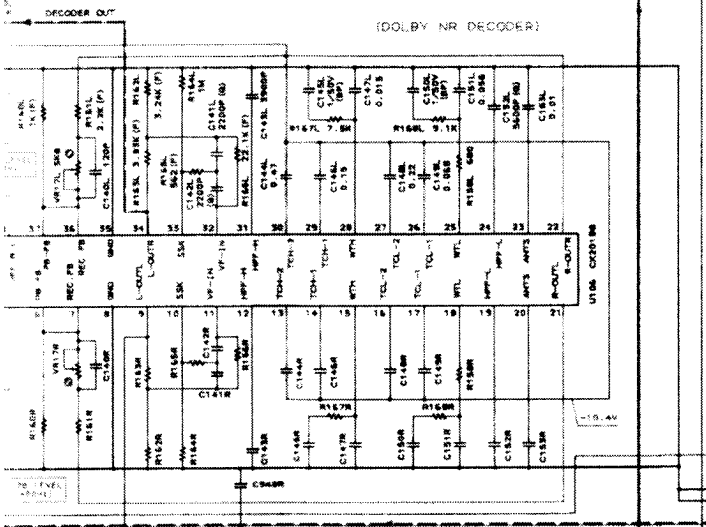
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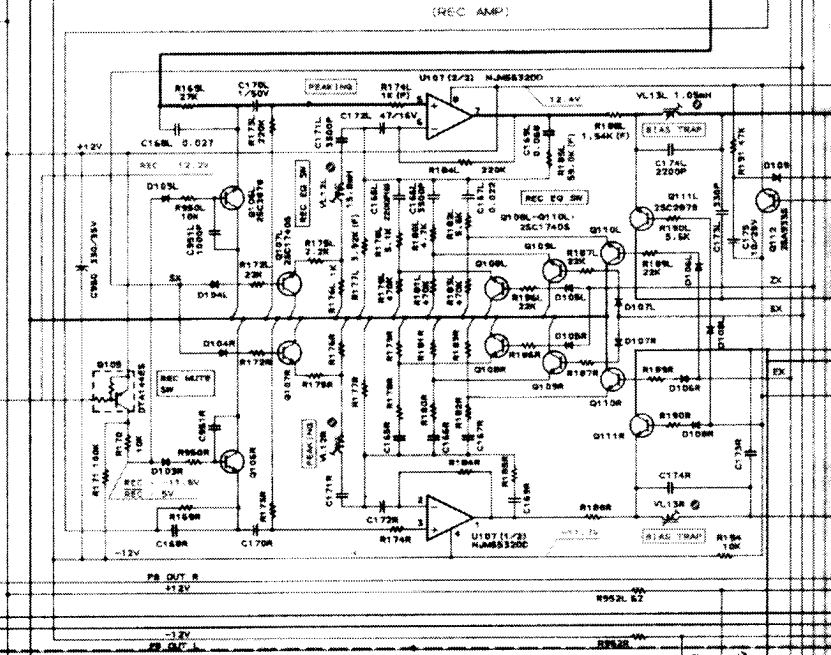
(REC EQ AMP)



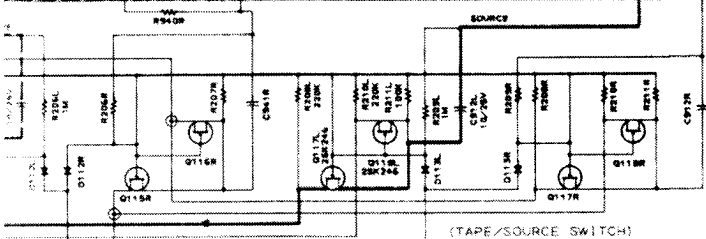
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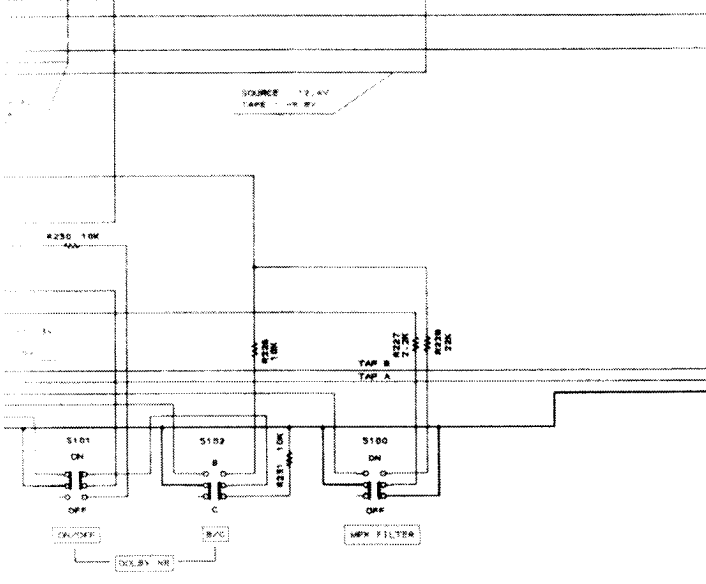
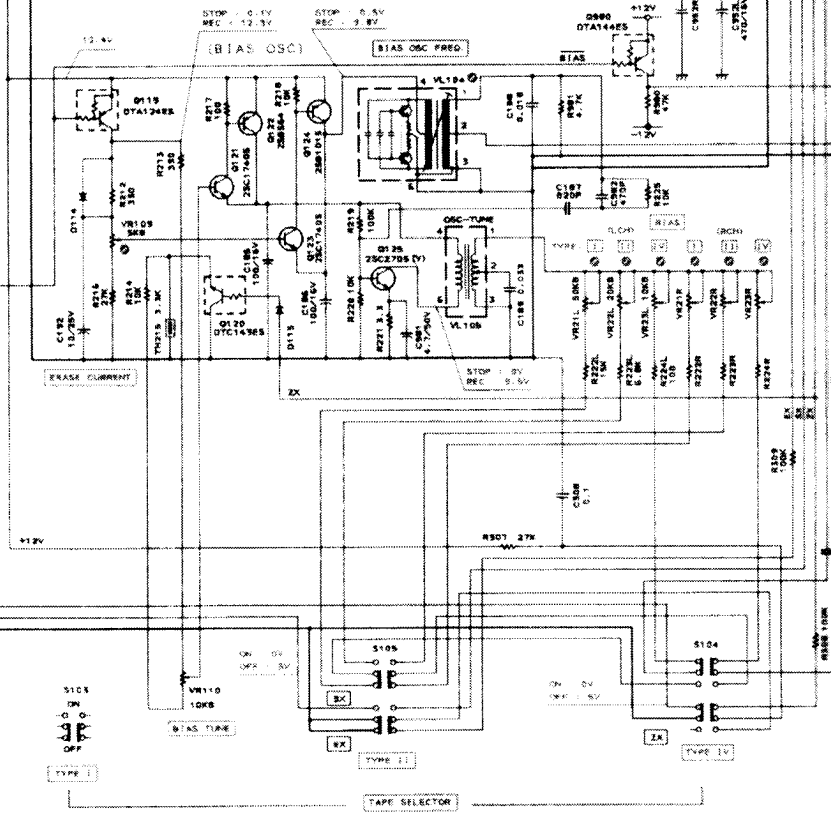
(REC AMP)

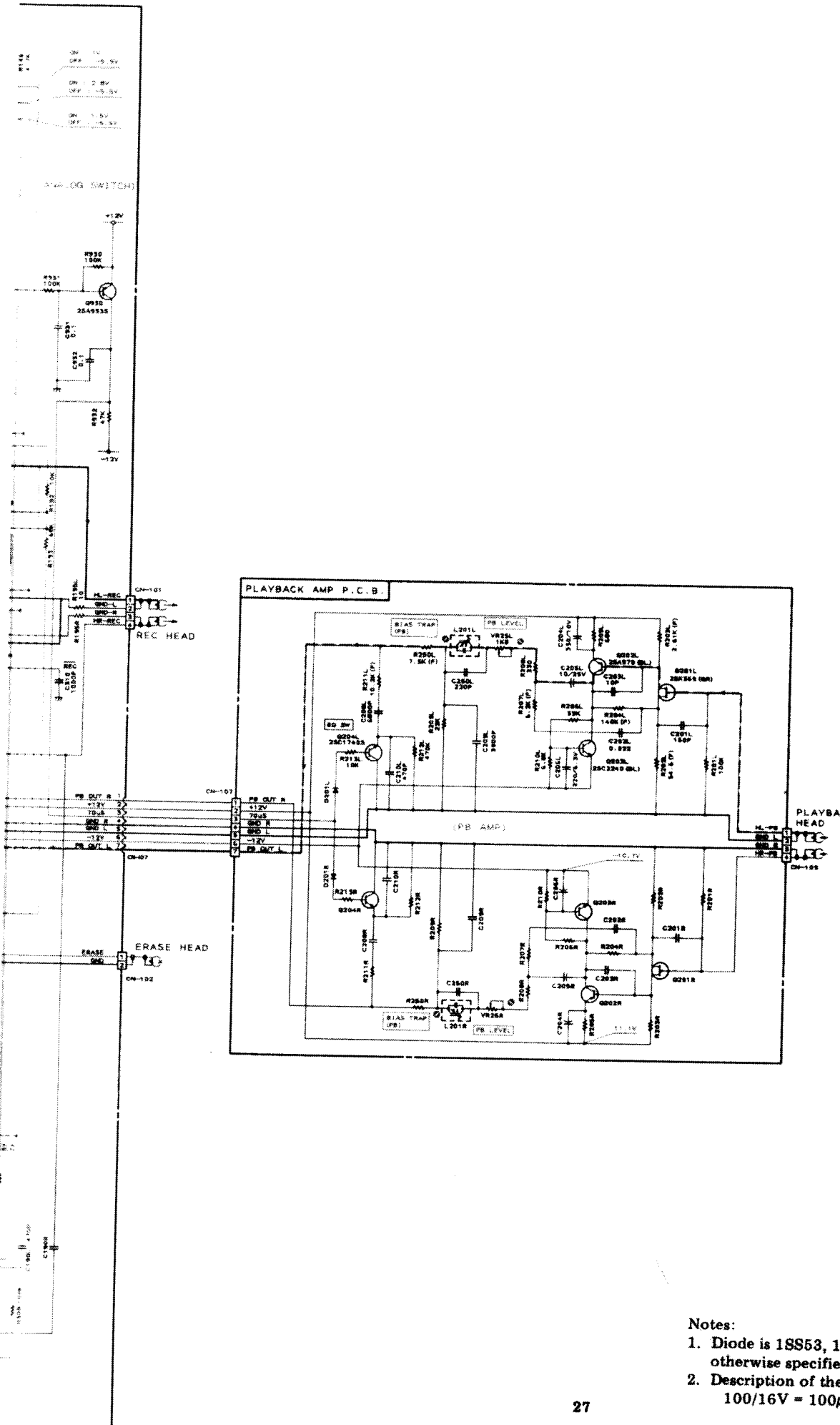




(TAPE/SOURCE SWITCH)

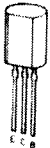



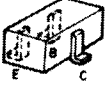
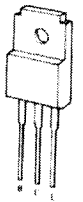
(BIAS OSC)

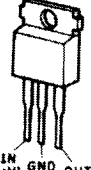
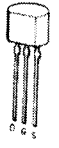


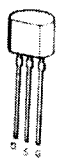


 ECB	 ECB
2SA933S 2SC1740S DTA114ES DTA124ES DTA144ES DTC143ES DTC144ES	2SA970 2SA1020 2SC2240 2SC2878

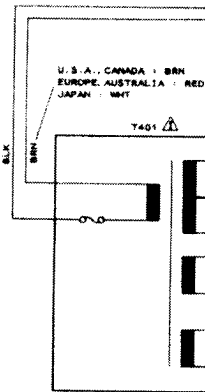
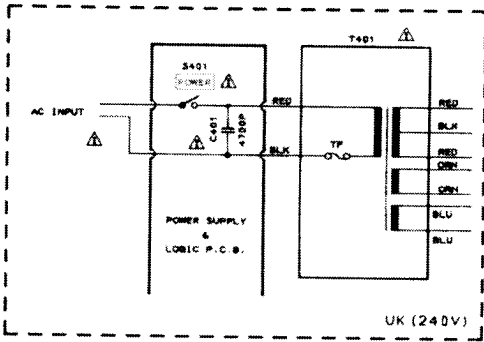
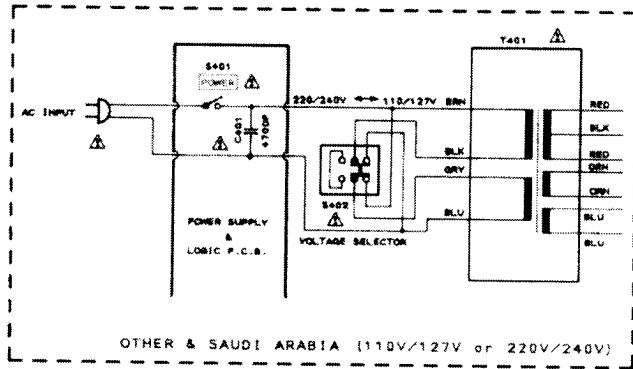
 ECB	 ECB
2SC2705	2SB564

 EBC	 EBC
2SC2812	2SB1015 2SD1406

 IN (+V) GND OUT	 ECB
7805	2SK246

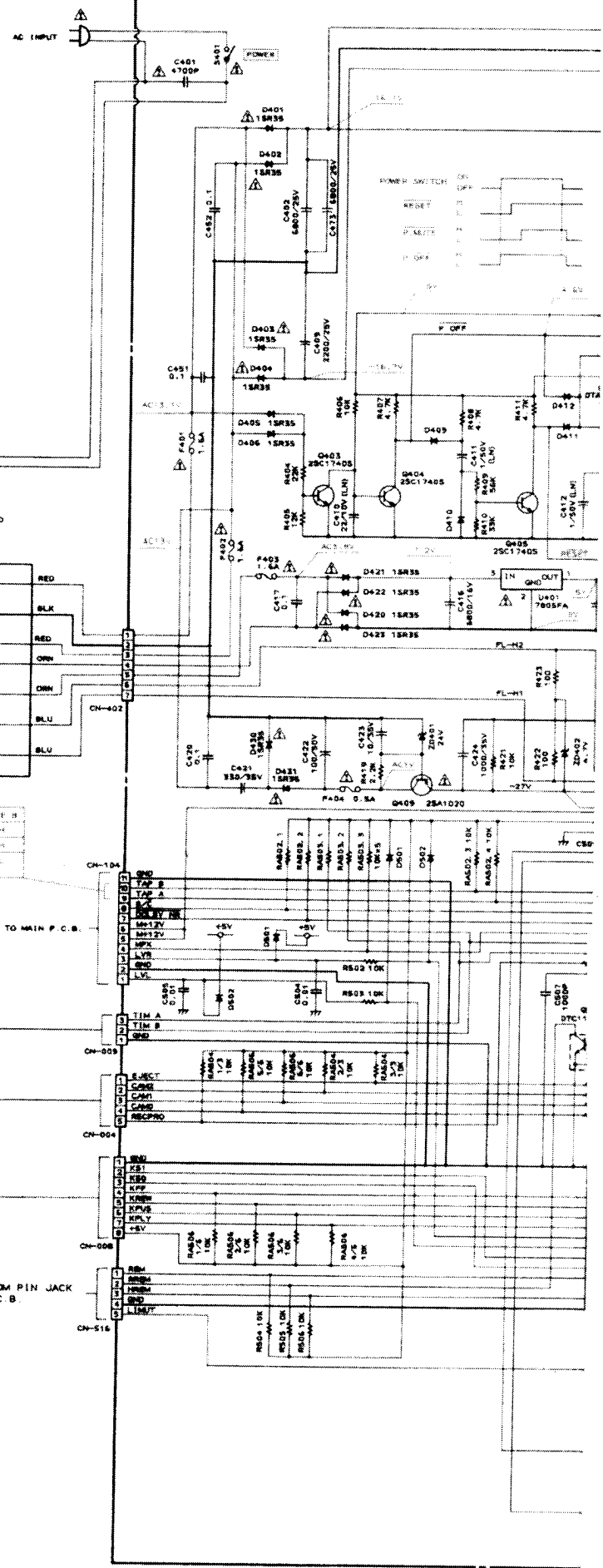

ECB
2SK369

- Notes:
1. Diode is 1S853, 1S1555, or 1S8176 unless otherwise specified.
 2. Description of the electrolytic capacitor:
100/16V = 100μ 16V



TAPT	TAPT A	TAPT B
TYPE I	H	H
TYPE II	H	N
TYPE IV	H	L

POWER SUPPLY & LOGIC P.C.B.



TO MAIN P.C.B.

FROM PIN JACK P.C.B.

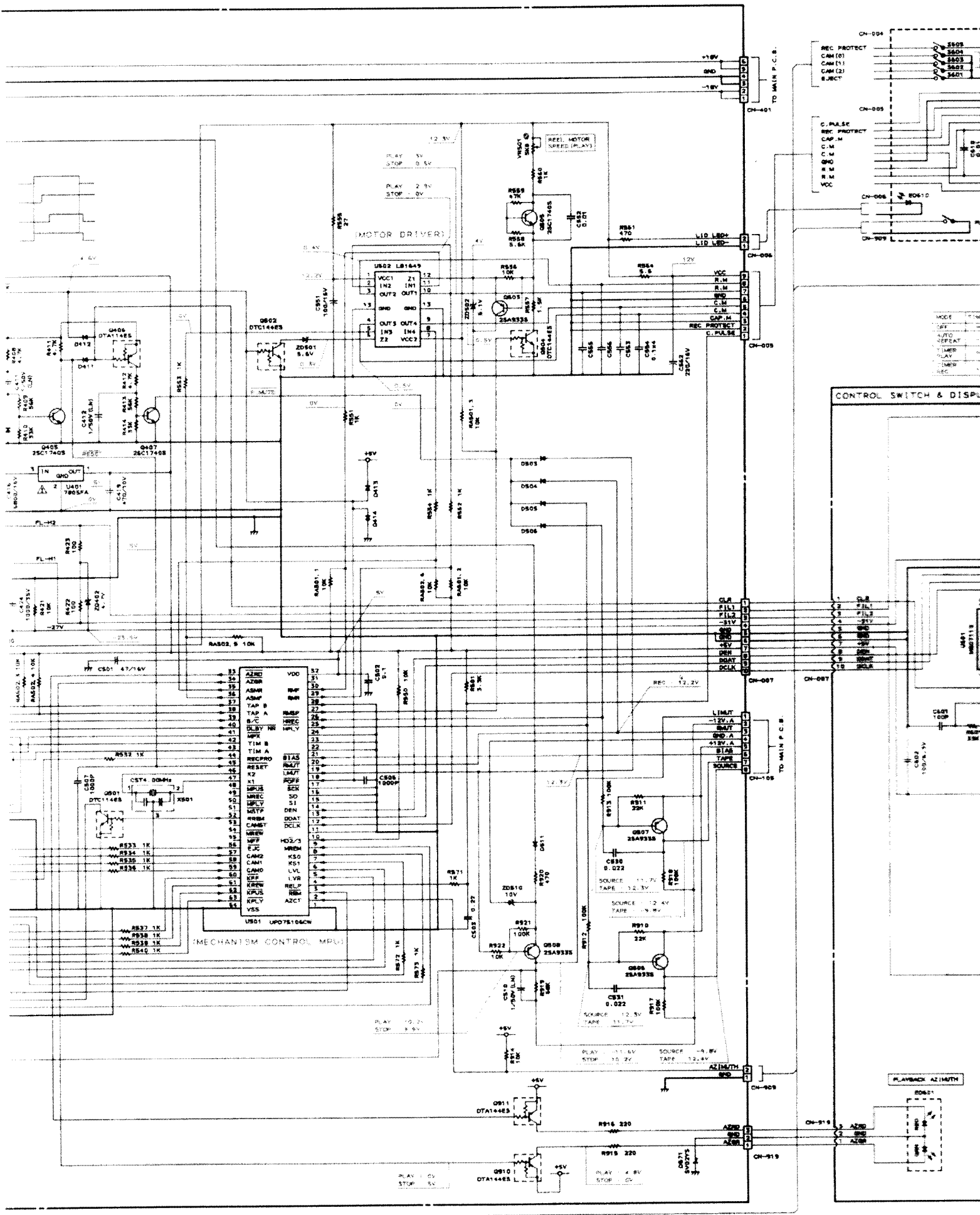
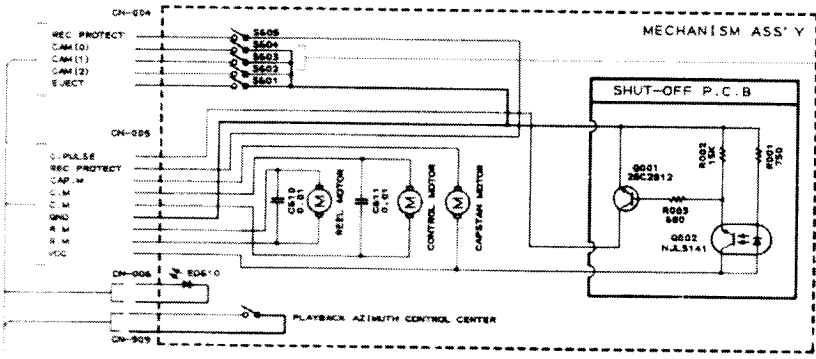
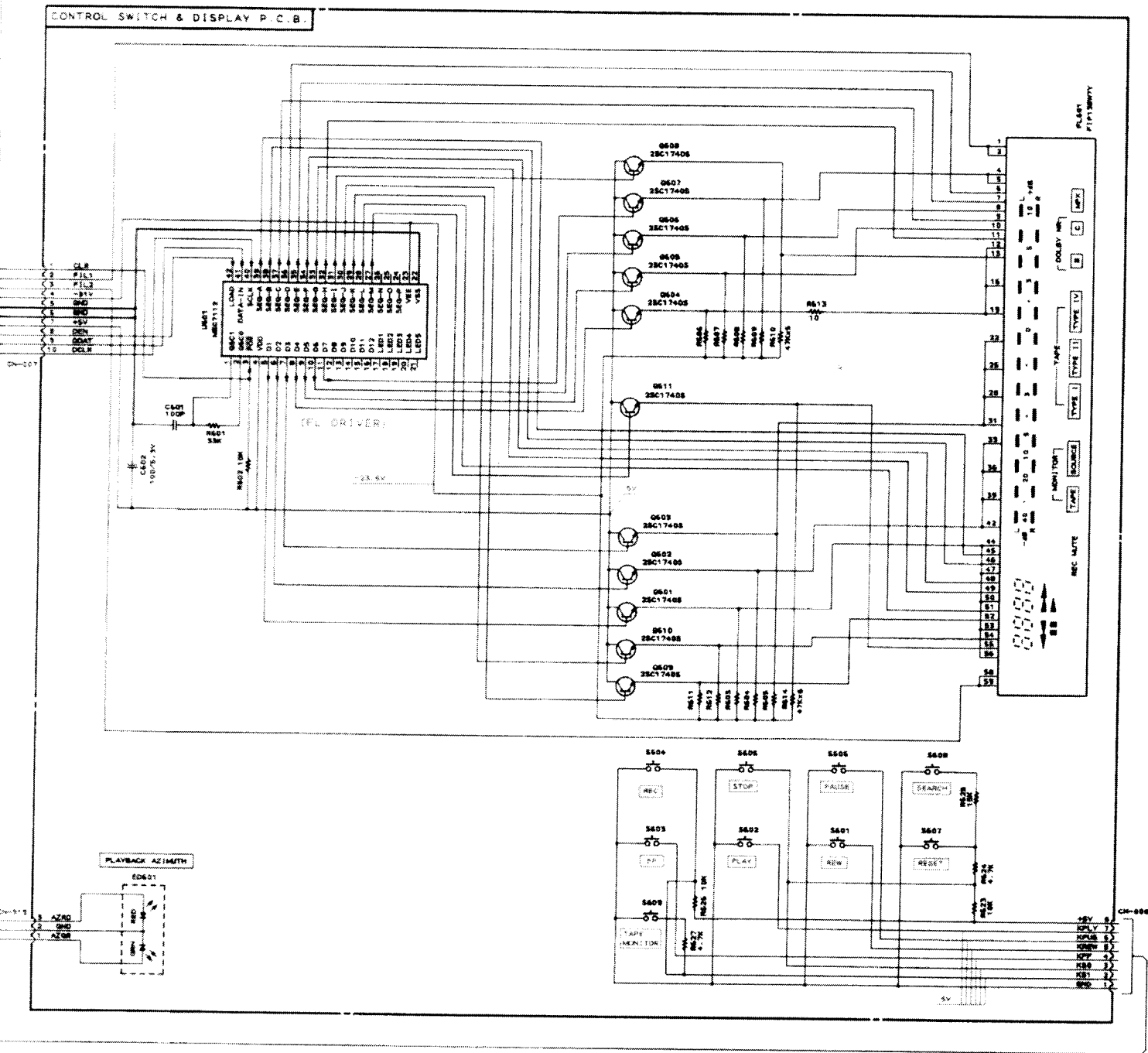
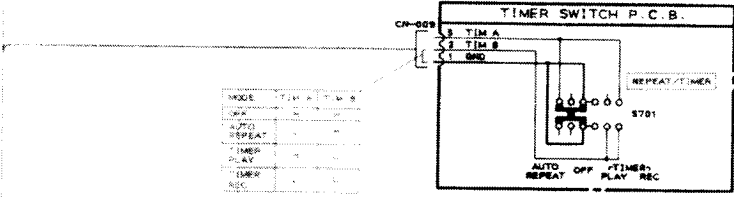


Fig. 9.2.2

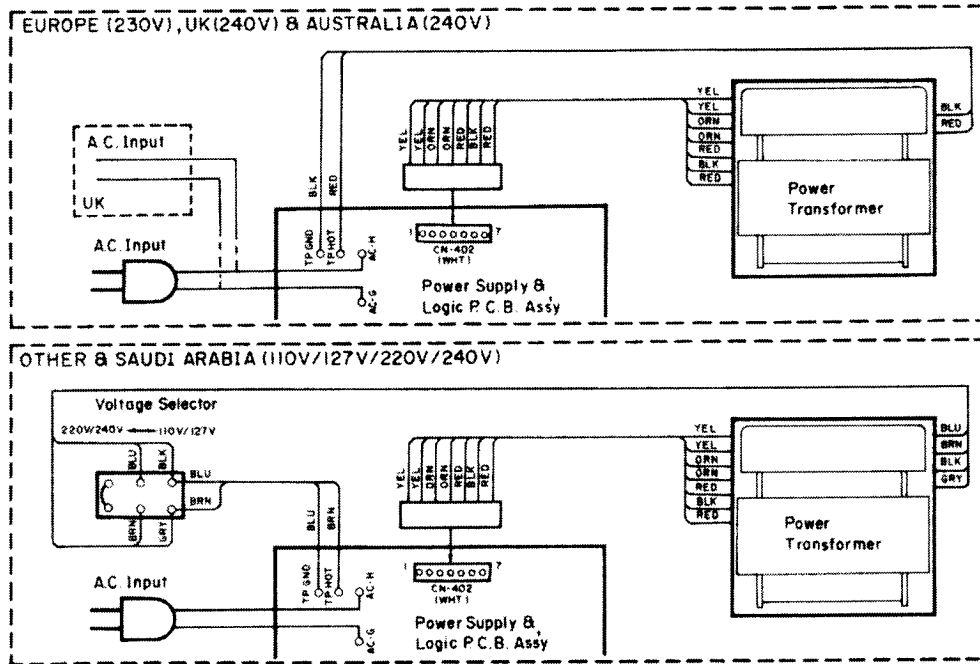


MODE	CAM 0	CAM 1	CAM 2
STOP	ON	ON	OFF
PLAY	ON	OFF	ON
PAUSE	OFF	ON	ON
REC	ON	OFF	ON
FF	ON	OFF	OFF
REW	ON	OFF	OFF

ON = L OFF = H



10. WIRING DIAGRAM



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 specified.
 3. Wire tube color is shown in ().

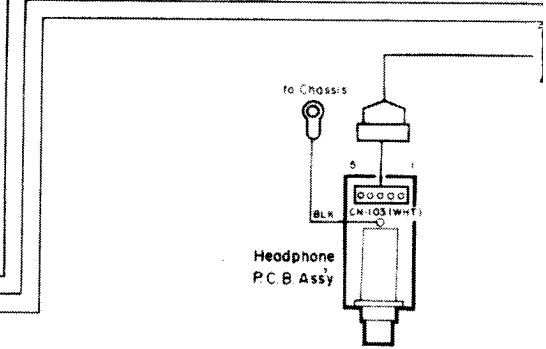
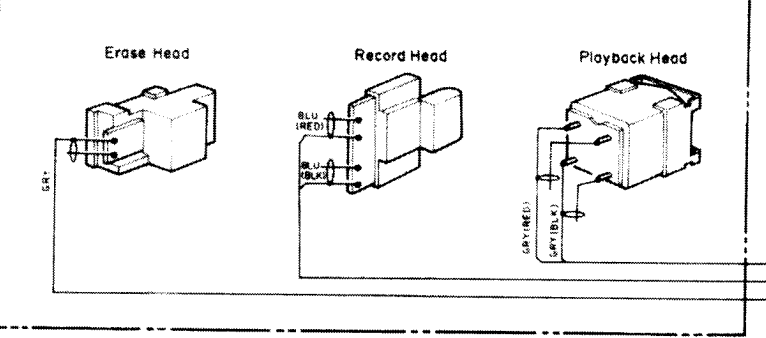
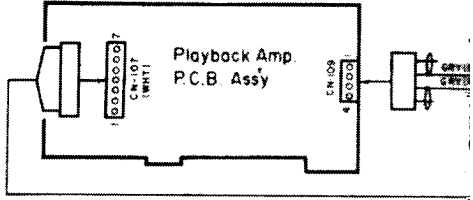
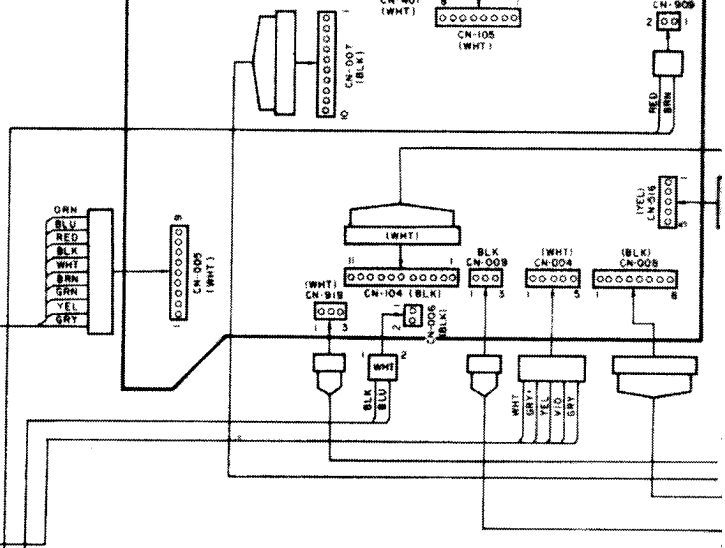
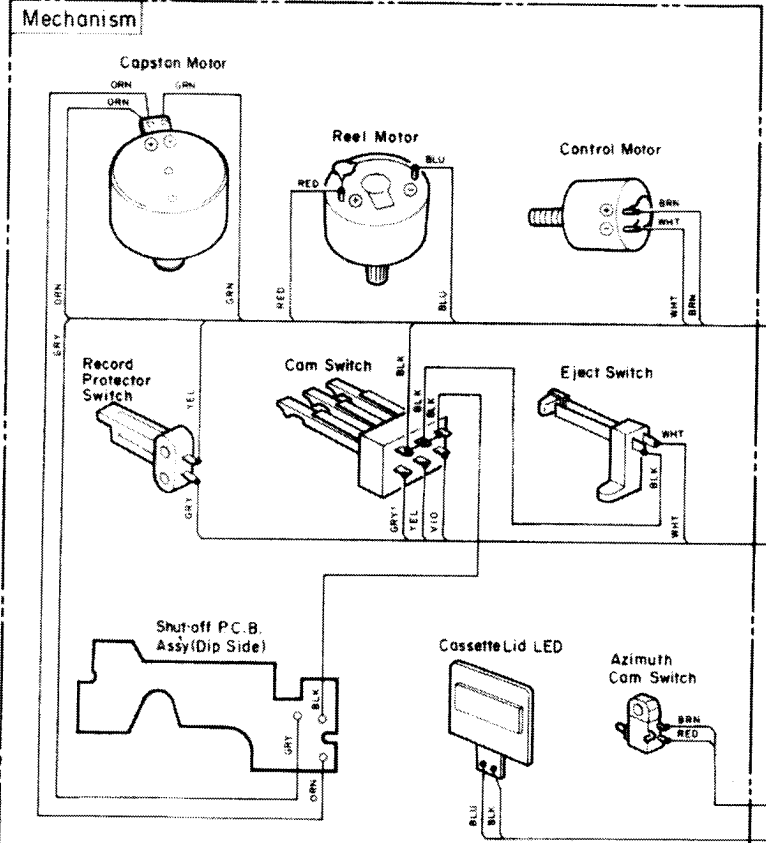
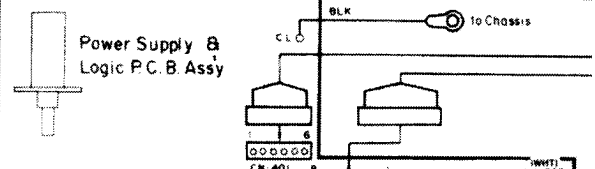
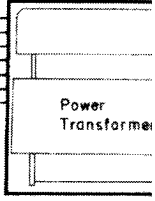
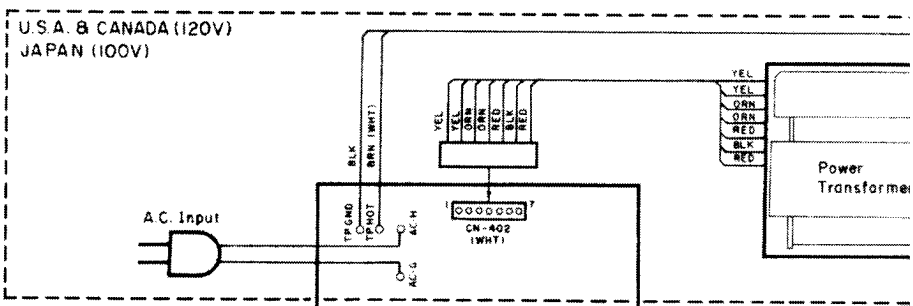
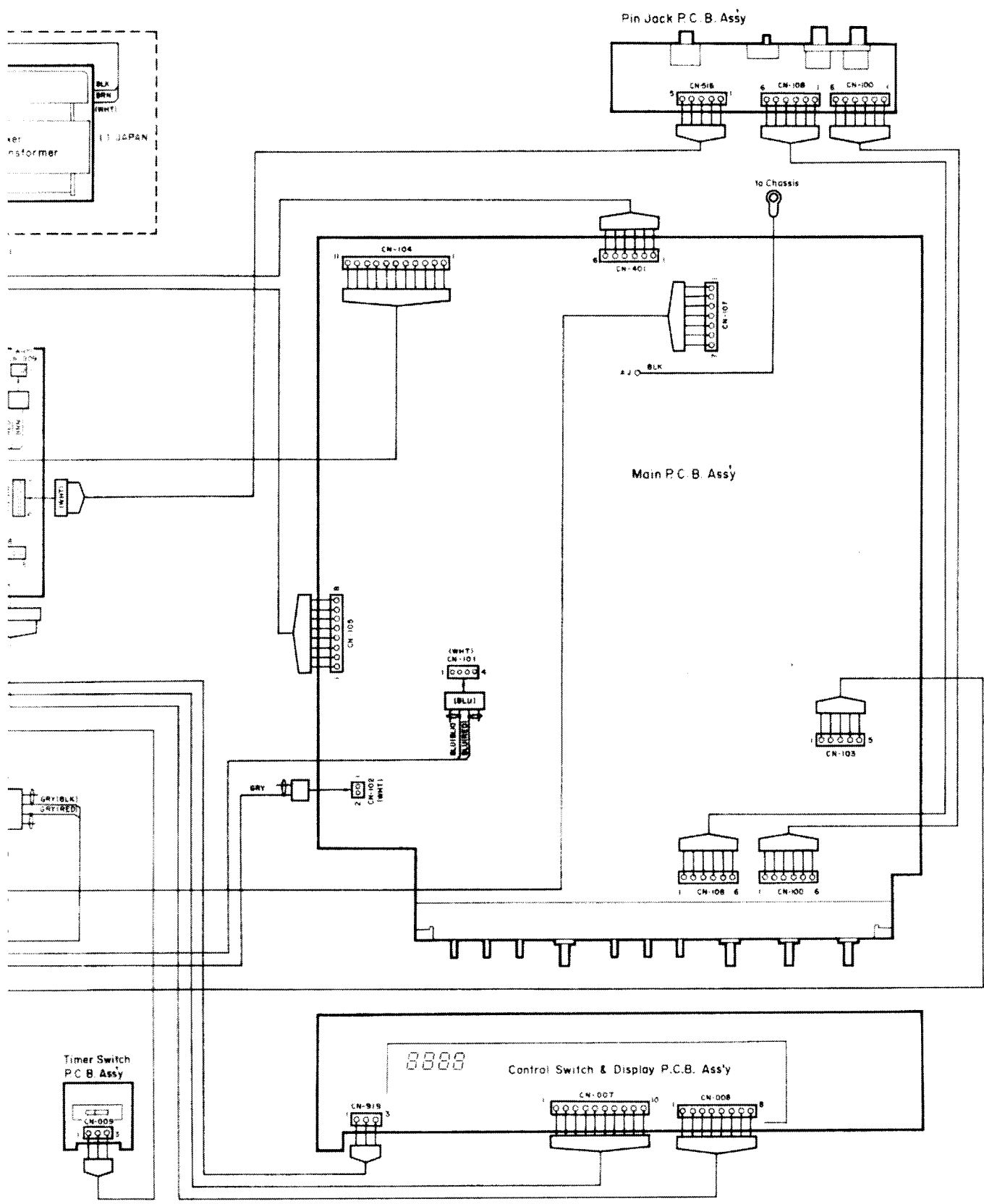


Fig. 10



11. BLOCK DIAGRAMS

11.1. Amplifier Section

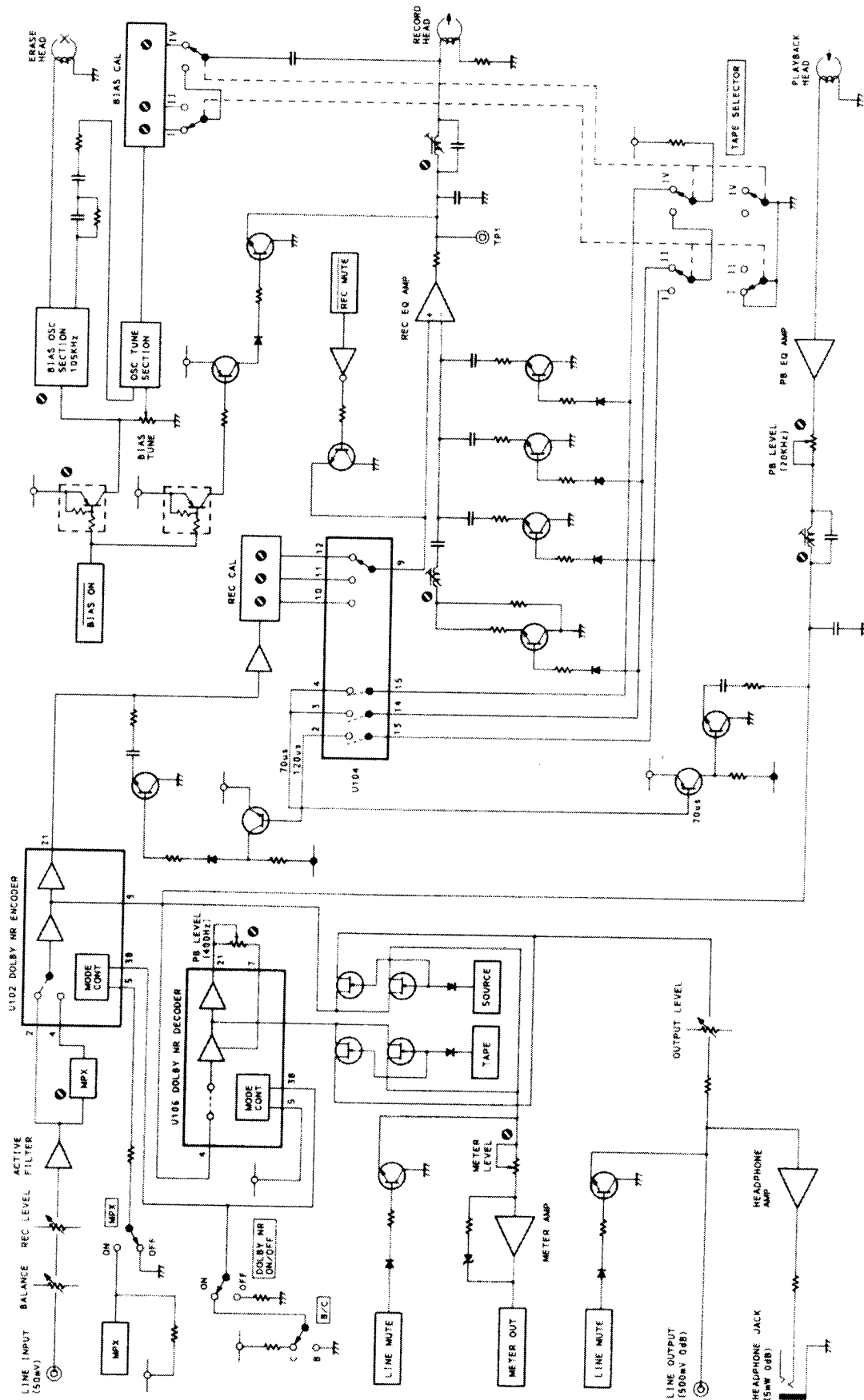


Fig. 11.1

11.2. Mechanism Control Section

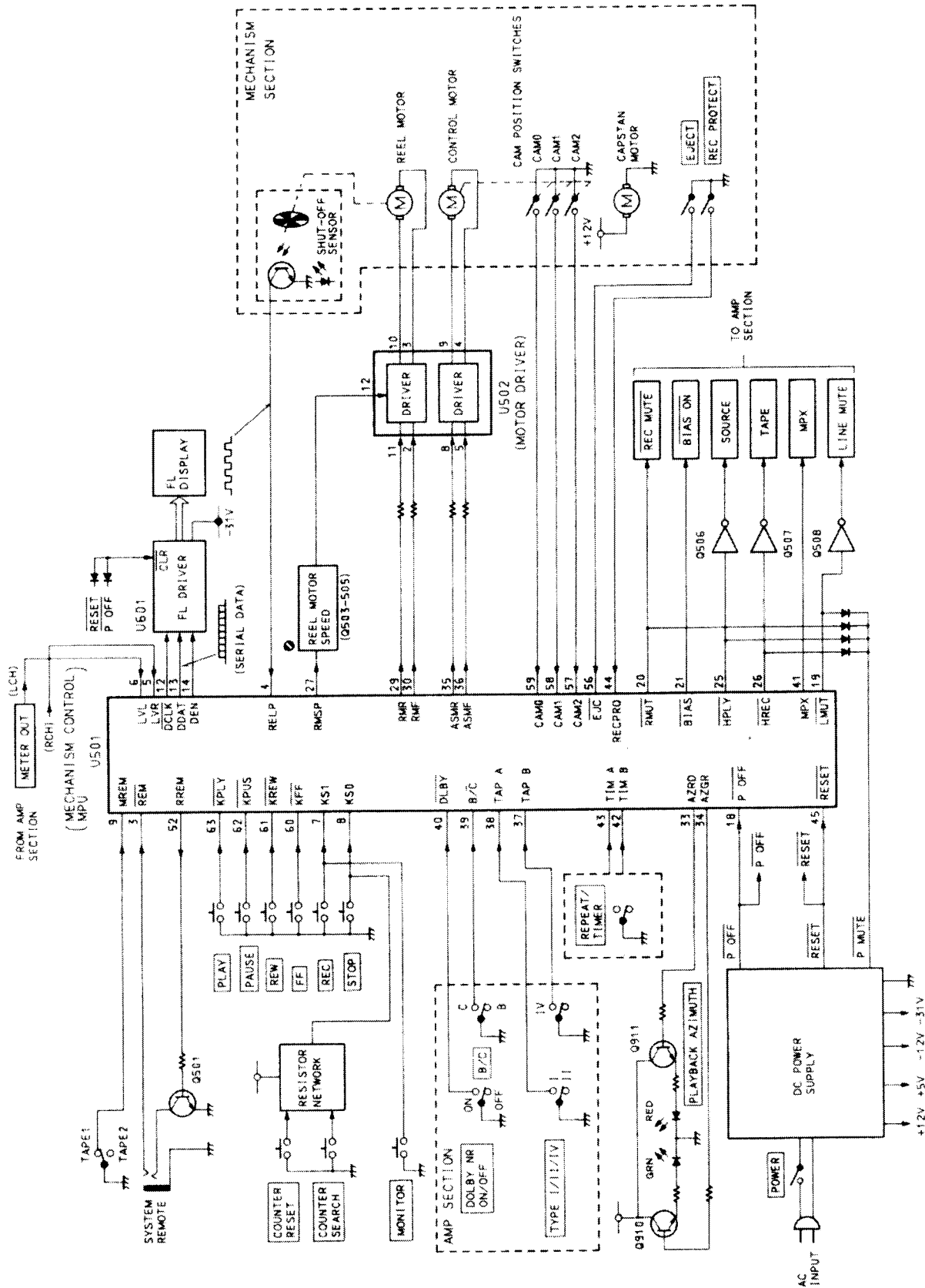


Fig. 11.2

12. TIMING CHARTS AND EQ. AMP. FREQUENCY RESPONSE

12.1. Timing Charts (1) Overall Timing Chart

Mode	Playback			Record		
	Stop	Play	Stop	Rec./Pause	Rec./Play	Stop
Reel Motor	Low	High	Low	Low	High	Low
Line Mute	Low	High	Low	Low	High	Low
Bias	Low	Low	Low	High	High	Low
Rec. Mute	Low	Low	Low	Low	High	Low

Fig. 12.1.1

(2) Mechanism Control Timing Chart

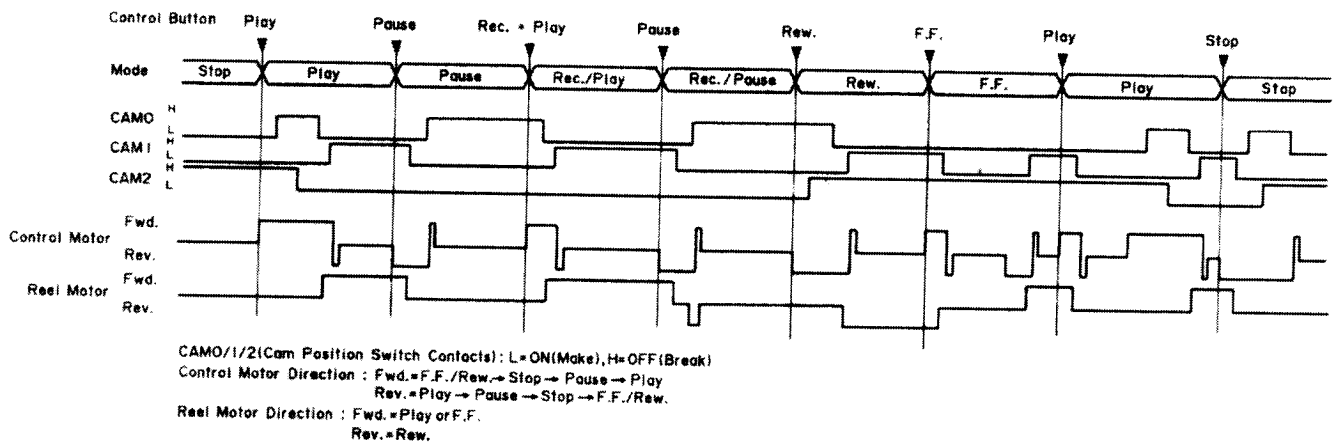


Fig. 12.1.2

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

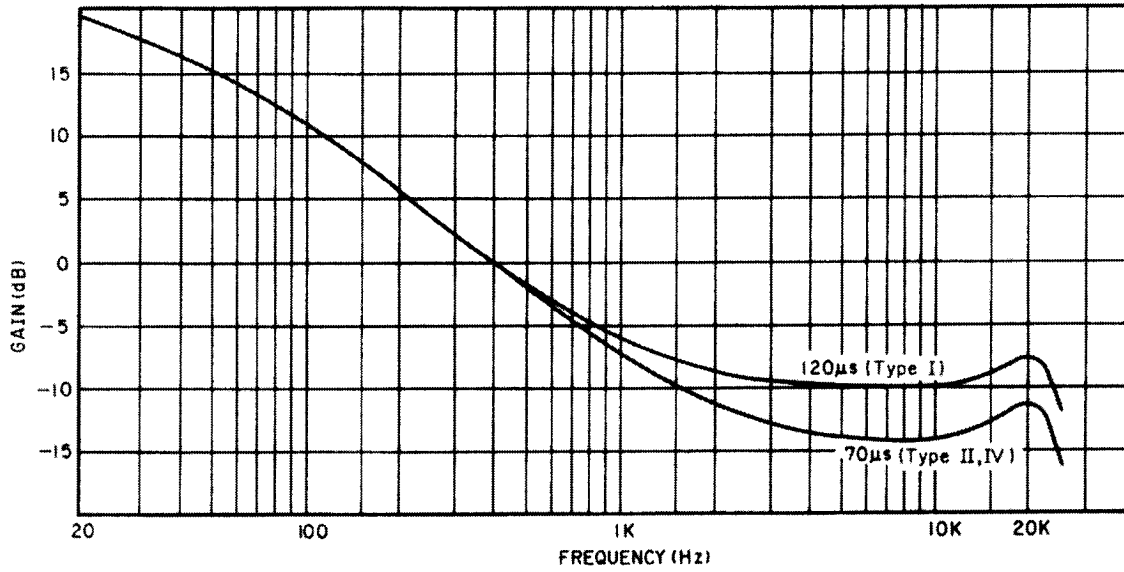


Fig. 12.2.1

(2) Record Current Frequency Response

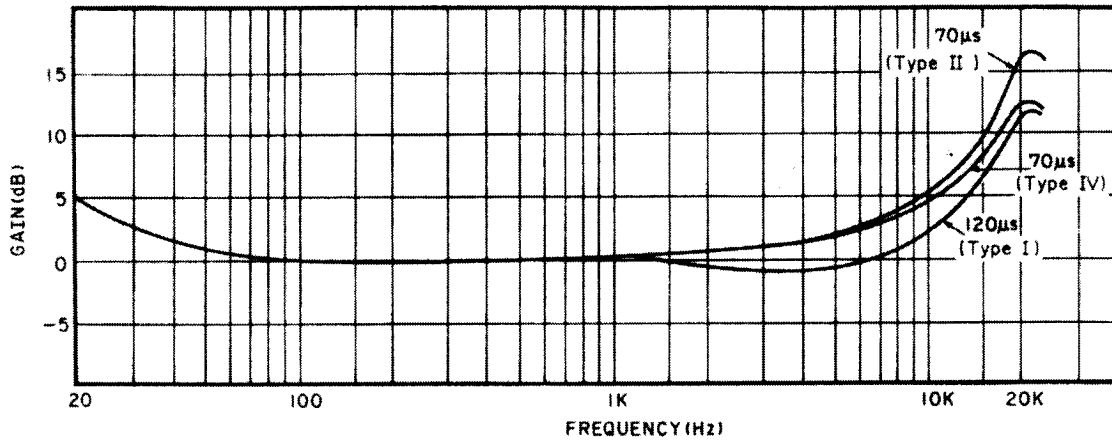


Fig. 12.2.2

13. SPECIFICATIONS

Track Configuration	4 tracks/2-channel stereo
Heads	3 (erase head x 1, record head x 1, playback head x 1)
Motors	
<Tape Transport>	DC servo motor (capstan drive) x 1 DC motor (reel drive) x 1
<Mechanism>	DC motor (cam drive) x 1
Wow and Flutter	Less than $\pm 0.06\%$ WTD Peak Less than 0.035% WTD RMS
Tape Speed	1-7/8 ips. (4.8 cm/sec.) $\pm 0.5\%$
Fast-Wind Time	Approx. 95 seconds (with C-60 cassette)
Frequency Response	20–21,000 Hz ± 3 dB (recording level –20 dB, Type I/II/IV)
Signal to Noise Ratio	
Dolby C-Type NR On	Better than 72 dB (400 Hz, 3% THD, IHF A-WTD RMS)
<70 μ s, Type IV>	
Dolby B-Type NR On	Better than 66 dB (400 Hz, 3% THD, IHF A-WTD RMS)
<70 μ s, Type IV>	
Total Harmonic Distortion	Less than 0.8% (400 Hz, 0 dB, Type I/IV) Less than 1.0% (400 Hz, 0 dB, Type II)
Channel Separation	Better than 37 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Erasure	Better than 60 dB (100 Hz, +10 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV/40 k Ω
Output	
Line	0.5 V/2.2 k Ω (400 Hz, 0 dB, output level control at max.)
Headphones	5.0 mW/8 Ω (400 Hz, 0 dB, output level control at max.)
Power Source	120, 230, 240 V or 110–127/220–240 VAC, 50/60 Hz
Power Consumption	25 W max.
Dimensions*	430 (W) x 100 (H) x 320 (D) mm 16-15/16 (W) x 3-15/16 (H) x 12-5/8 (D) inches
Approximate Weight	5.4 kg/11 lbs. 14 oz.

*: Dimensions do not include protruding parts. Height is the panel height.

- Specifications and Design are subject to change for further improvement without notice.
- Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
- "DOLBY" and the double-D symbol $\square\square$ are trademarks of Dolby Laboratories Licensing Corporation.

Service Manual

Cassette Deck 1

Nakamichi Corporation/Tokyo Office
Nakamichi America Corporation
Nakamichi Canada
Nakamichi Australia
Nakamichi GmbH

Shinjuku Daiichi Seimei Bldg., 2-7-1 Nishishinjuku, Shinjuku-ku, Tokyo 163 Phone: (03) 3342-4461 Telex: 2324721 (NAKAM J)
19701 South Vermont Ave., Torrance, CA 90502 Phone: (213) 538-8150
276 South West, Marine Drive, Vancouver, B.C. V5X 2R4 Phone: (604) 324-7535
Level 2, 61A Dunning Ave., Rosebery, N.S.W. 2018 Phone: (02) 313-7071/7090
Praunheimer Landstraße 32, 6000 Frankfurt Main 90 Phone: (069) 768-2021 (Office), 2025 (Service)