

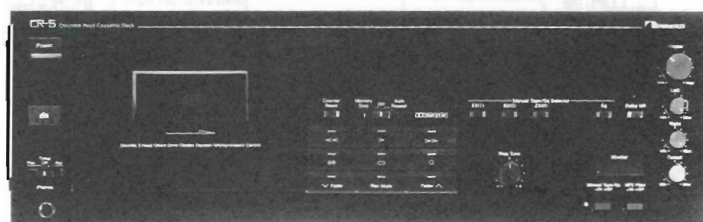


Service Manual

Nakamichi

CR-5 CR-5A CR-5E

Discrete 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 CR-5. This voltage selector can select either 120 V or 220-240 V at customer's disposal.

1.2. Packing Materials and Owner's Manuals

Part No.	Description	Q'ty
0F03900A	Packing	2
0F03927A	Carton Box CR-5A	1
0F03902A	Carton Box CR-5E	1
0F03925A	Carton Box CR-50	1
0F03899A	Carton Box CR-5	1
0M03884A	Voltage Label 120V CR-5 (Canada)	2
0M03457A	Voltage Label 240V CR-5 (Australia) & CR-5E (UK)	2
0D04561B	Owner's Manual CR-7E/CR-5E, CR-7/CR-5 (English/German/French)	1
0D04562B	Owner's Manual CR-70/CR-50 (Japanese)	1
0D04563B	Owner's Manual CR-7A/CR-5A, CR-7/CR-5 (English)	1

2. TEST TAPES AND GAUGES

- | | |
|--|---|
| (1) 400 Hz Level Tape (DA09005B) | (10) Reference SX Tape (DA09025B) |
| (2) 1 kHz Track Alignment Tape (DA09007B) | (11) Reference SX-E Tape (DA09086A) |
| (3) 10 kHz PB Frequency Response Tape (DA09003B) | (12) Reference ZX Tape (DA09037B) |
| (4) 15 kHz PB Frequency Response Tape (DA09002B) | (13) EH Tilt Check Gauge S (DA09088A) |
| (5) 20 kHz PB Frequency Response Tape (DA09001B) | (14) Stroke Check Gauge S (DA09090A) |
| (6) 15 kHz Azimuth Alignment Tape (DA09004B) | (15) Tape Guide Height Check Gauge S (DA09091A) |
| (7) 3 kHz Speed and Wow/Flutter Tape (DA09006C) | (16) Tilt Check Gauge (DA09039B) |
| (8) Tape Travelling Cassette Tape (DA09071A) | (17) Torque Gauge FWD (DA09082A) |
| (9) Reference EXII Tape (DA09066B) | |

3. MECHANICAL ADJUSTMENTS

3.1. Record Head and Playback Head Tilt Adjustment

Remove the Cover Plate Ass'y by loosening two screws. Refer to Fig. 3.1.

- (1) Remove the pad lifter from the playback head.
- (2) Load a Tilt Check Gauge in the cassette deck.
- (3) Remove both of the Height Gears (PH and RH).
- (4) 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 away from the heads, then return them to their original places to be in contact with the record head and the playback head surfaces after Play mode is securely locked.
- (5) The Beacon Playback Head "Lower" will light up when the height adjustment screw (PH) is turned counterclockwise but the Playback Head "Upper" when clockwise. Adjust so that both "Upper" and "Lower" will light up even when you move the slide knob away from the head and then return it to the original place.
- (6) The same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (RH).

- (7) Set the cassette deck in Stop mode and fit both of the serrated Height Gears. Then set the cassette deck in Play mode again and insure all of the 4 Beacons are illuminating. If not, (5) and (6) will have to be repeated till satisfactory results are obtained.
- (8) Mount the pad lifter on the playback head.

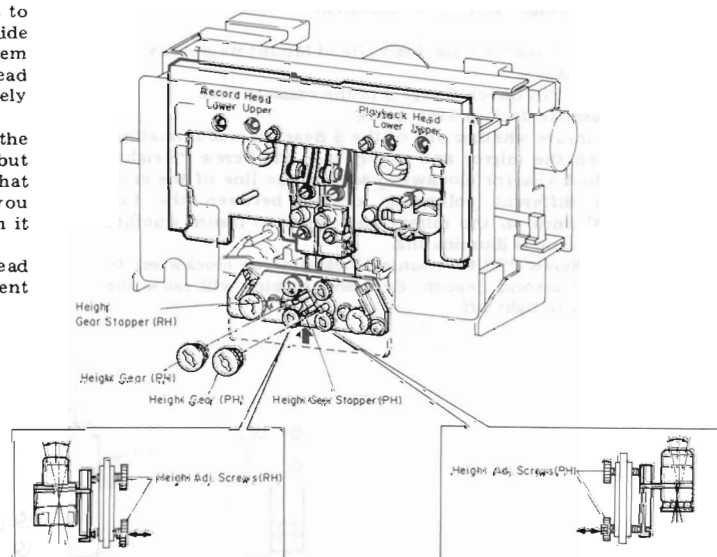


Fig. 3.1

3.2. Head Base Stroke Check

Remove the Cover Plate Ass'y. Refer to Fig. 3.2.

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

- (1) Load a Stroke Check Gauge S in the cassette deck.
- (2) Move the Record Head Indicator and the 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 make sure that each of the Indicators is in contact with the record and the 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 Indicator, thus check can be made on record head stroke.

3.3. Erase Head Stroke Adjustment and Tape Guide Height Check

Remove the Head Mount Base Ass'y and the Cover Plate Ass'y. Refer to Fig. 3.3.

(1) Erase Head Stroke Adjustment

- (a) Load a Tape Guide Height Check Gauge S 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 the erase head with erase head plate.
- (d) After completion of the adjustment, screw A shall be locked with lock tight paint.

(2) Supply Tape Guide Height Check

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

(3) Take-up Tape Guide Height Check

- (a) Load a Tape Guide Height Check Gauge S in the cassette deck.
- (b) Set the cassette deck in Play mode.
- (c) Slide the Take-up Tape Guide Check Bar down onto 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.

3.4. Erase Head Height and Tilt Adjustment

Refer to Fig. 3.4.

- (1) Remove the Cassette Case Ass'y, Head Mount Base Ass'y and Cover Plate Ass'y.
- (2) Load an EH Tilt Check Gauge S 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 line of the erase head (in different color) is located between the two horizontal lines on the mirror and check to insure whether the first Beacon is illuminating.
- (5) Turn the Screw "Tilt" counterclockwise (or clockwise) to light up the second Beacon. Excessive turning will cause the first Beacon to light off.

Adjustment of the 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 up 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 of the erase head is located between two lines on the mirror. If not, (4) through (6) will 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.

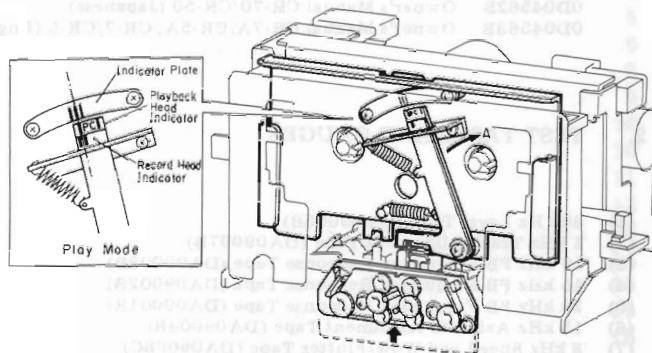


Fig. 3.2

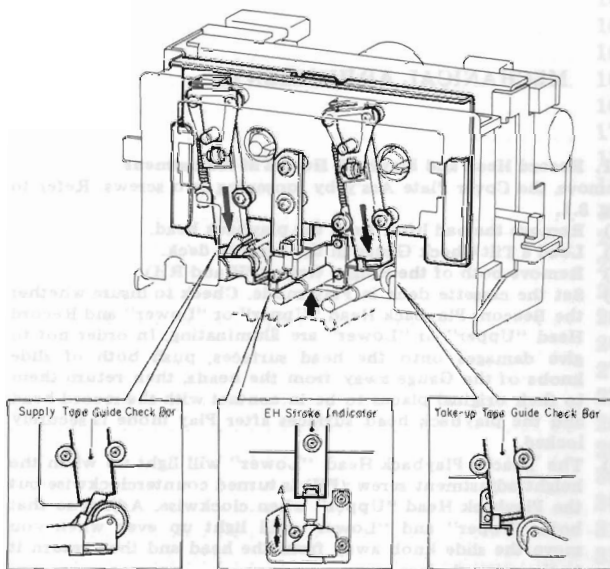


Fig. 3.3

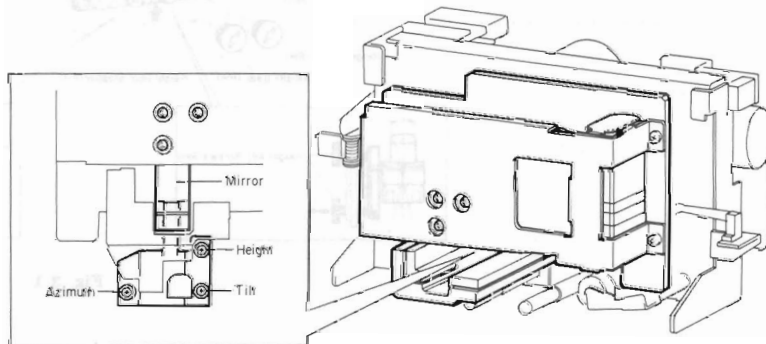


Fig. 3.4

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

Refer to Fig. 3.5.

- (1) **Playback Head Height Adjustment and Azimuth Alignment**
 - (a) Set the Monitor switch to Tape and connect a VTVM to the Output Jacks.
 - (b) Load a 1 kHz Track Alignment Tape and set the cassette deck in Play mode.
 - (c) Turn the PH Height Gear until the outputs of both channels become minimum.
 - (d) Load a 15 kHz Azimuth Tape and set the cassette deck in Play mode.
 - (e) Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.
 - (f) Repeat above steps (b) through (e) one or two times to obtain optimum performance.
- (2) **Record Head Height Adjustment and Azimuth Alignment**
 - (a) Set the cassette deck in Stop mode.
 - (b) Set the Monitor switch to Tape and Eq. switch to 70 μ s.
 - (c) Load a reference ZX tape and connect a VTVM to Output Jacks.
 - (d) Feed in 400 Hz (0 dBV) to the Input Jacks.
 - (e) Set the cassette deck in Record and Play mode and turn the RH Height Gear until the outputs of both channels become maximum.
 - (f) Feed in 15 kHz (-20 dBV) to the Input Jacks and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.
 - (g) Repeat (d) through (f) one or two times to obtain optimum performance.

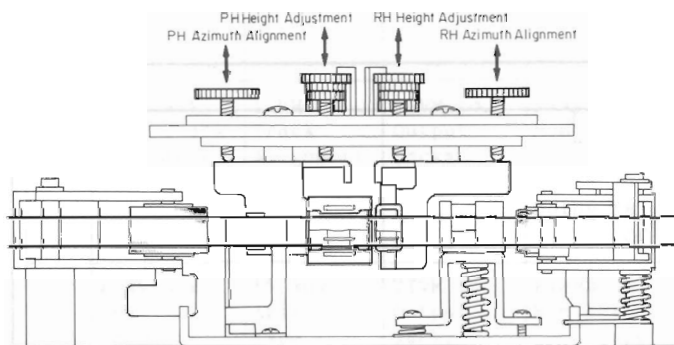


Fig. 3.5

3.6. Tape Travelling Check

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

- (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 guide.

3.7. Eject Damper Adjustment

Refer to Fig. 3.6. Load a cassette tape and with opening and closing the Cassette Case, adjust the speed of damper action by the Damper Adjustment Screw.

3.8. Reel Motor Speed Adjustment in Play Mode

- (1) In order to warm-up the cassette deck, load a C-60 cassette tape and play it back.
- (2) After more than four minutes, load a Torque Gauge FWD and set the cassette deck in Play mode.
- (3) Adjust VR601 on the Logic P.C.B. Ass'y to obtain exactly 50 g-cm on the torque gauge.

3.9. Tape Speed Adjustment

Refer to Fig. 3.7.

- (1) Connect a frequency counter to the Output Jack.
- (2) Load a 3 kHz Speed and Wow/Flutter Tape and play it back.
- (3) Adjust VR101 on the Motor P.C.B. Ass'y to obtain 3,000 Hz $\pm$ 15 Hz on the frequency counter.
CCW: Motor runs fast.
CW: Motor runs slowly.

3.10. Lubrication

The tape transport mechanism is of a lubrication-free type. However, when the following parts are replaced with new ones, 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 Sakumacho, Chiyoda-ku, Tokyo, Japan
- (c) Diamond Oil (EP-56)
Mitsubishi Oil Co., Ltd., 1-2-4 Toranomom, Minato-ku, Tokyo, Japan
- (d) Anderol 456
Tokyo Kokusai Oil Co., Ltd., 3-3-5 Hatchobori, Chuo-ku, Tokyo, Japan

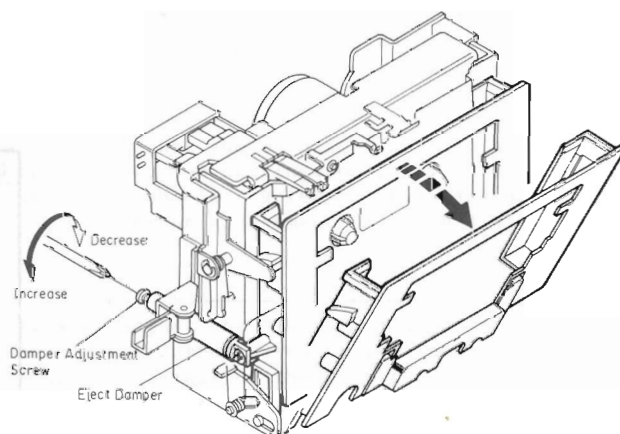


Fig. 3.6

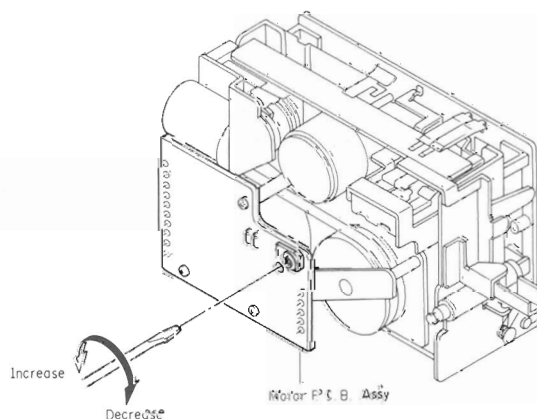


Fig. 3.7

4. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

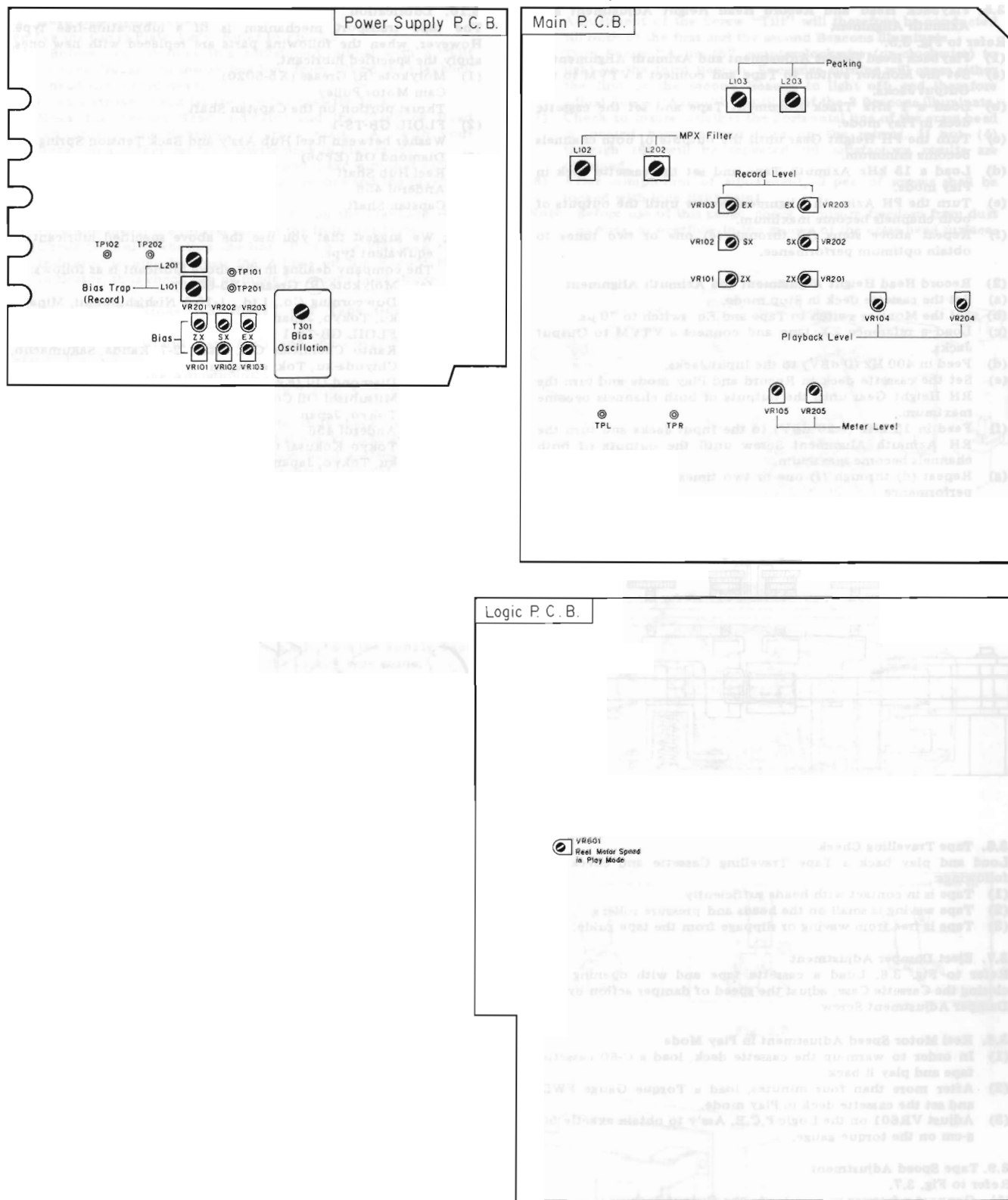


Fig. 4

5. ELECTRICAL ADJUSTMENTS

Notes: 1. Electrical adjustment should be performed after mechanical adjustment is completed.
2. Before adjustment, set the Bias Tune control on the Front Panel to the mechanical center position.

5.1. Adjustment Instructions

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed Adjustment	3 kHz Speed and Wow/Flutter Tape	Frequency Counter to Output Jacks	Playback Eq. - 70 μ s	Motor P.C.B. VR101	Adjust VR101 to obtain 3 kHz $\pm$ 15 Hz on the frequency counter.
2	Meter Level Calibration	400 Hz to Input Jacks	VTVM to TPL, TPR on Main P.C.B.	Monitor - Source	Main P.C.B. VR105 VR205	1. Feed in 400 Hz and adjust the Input Level controls to obtain 350 mV -0.6 dB on the VTVM. 2. Adjust VR105 (VR205) so that the 0 dB segment on the level meter starts illuminating.
3	MPX Filter Adjustment	19 kHz to Input Jacks	VTVM to Output Jacks	Monitor - Source MPX - OFF/ON	Main P.C.B. L102 L202	1. Set the Output Level control to max. 2. Adjust Input Level controls to obtain 0 dBV (1 V) on the VTVM. 3. Set the MPX Filter switch to ON and adjust L102 (L202) to obtain minimum reading on the VTVM. (The minimum reading will be less than -30 dBV.)
4	Playback Head Track Alignment	1 kHz Track Alignment Tape	VTVM to Output Jacks	Playback Monitor - Tape Eq. - 70 μ s Dolby NR - OFF	PH Height Gear	Adjust the PH Height Gear to obtain the minimum readings on the VTVM for both channels. Refer to "Playback Head Height Adjustment" in item 3.5.
5	Playback Head Azimuth Alignment	15 kHz Azimuth Tape	VTVM to Output Jacks	Playback Monitor - Tape Eq. - 70 μ s Dolby NR - OFF	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum readings on the VTVM for both channels. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 3.5. Note: Repeat steps 4 and 5 one or two times to obtain optimum performance.
6	Playback Level Calibration	400Hz Level Tape	VTVM to TPL,TPR on Main P.C.B.	Same as above	Main P.C.B. VR104 VR204	1. Set the Output Level control to max. 2. Adjust VR104 (VR204) to obtain 350 mV on the VTVM,

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
7	Playback Frequency Response Adjustment	400Hz Level Tape 10 kHz PB Frequency Response Tape 15 kHz PB Frequency Response Tape 20 kHz PB Frequency Response Tape	VTVM to Output Jacks	Playback Monitor - Tape Eq. - 70 μ s Dolby NR - OFF	Main P.C.B. R143 R144 R243 R244	1. Load a 400 Hz level tape and play it back. Adjust the Output Level control to a certain level (0 dBV for example). 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 VTVM with each tape. Short R143 (R243) or R144 (R244) to obtain the following levels against the level for 400Hz level tape. 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 Refer to "Playback Frequency Response Adjustment" in item 5.2. 3. Conduct step 5 "Playback Head Azimuth Alignment".
8	Bias Oscillation Frequency and Erase Current Adjustment		VTVM across the additional 0.1 ohm resistor and Frequency Counter between terminals 1 and 2 of CN-33 on Power Supply P.C.B.	Rec, Pause Monitor - Source Tape - ZX Eq. - 70 μ s	Power Supply P.C.B. T301 R303 R304	1. Connect an additional 0.1 ohm resistor in series to the Erase Head and connect a VTVM across the resistor. 2. Adjust T301 to obtain 105 kHz on the frequency counter. 3. Check the erase current by the VTVM. Erase current will be within the range of 310 mA to 400 mA (typically approx. 350 mA). If erase current is not sufficient, increase it by shorting either R303 or R304. 4. After completion of the erase current adjustment, re-check the bias oscillation frequency. 5. Remove the additional 0.1 ohm resistor.
9	Record Amplifier Equalizer Adjustment	23 kHz (-20 dBV) to Input Jacks	VTVM to TP101, TP201 on Power Supply P.C.B.	Same as above	Main P.C.B. L103 L203	1. Remove the bias-cut-jumper on the dip side of the Power Supply P.C.B. Ass'y. 2. Adjust L103 (L203) to obtain approx. 16 dB at 23 kHz on the VTVM. 3. Re-solder the bias-cut-jumper.
10	Bias Trap Adjustment (Record Amp.)	Remove Input Signals	VTVM to TP102, TP202 on Power Supply P.C.B.	Same as above	Power Supply P.C.B. L101 L201	Adjust L101 (L201) to obtain minimum reading on the VTVM.
11	Record Head Height Adjustment	400 Hz (0 dBV) to Input Jacks	VTVM to Output Jacks	Record, Playback Monitor - Tape Tape - ZX Eq. - 70 μ s Dolby NR - OFF	RH Height Gear	1. Load a reference ZX tape, and record and play it back. 2. Adjust the RH Height Gear to obtain maximum readings for both channels on the VTVM. Refer to "Record Head Height Adjustment and Azimuth Alignment" in item 3.5.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
12	Record Head Azimuth Alignment	15 kHz (-20 dBV) to Input Jacks	VTVM to Output Jacks	Record, Playback Monitor - Tape - ZX Eq. - 70 μ s Dolby NR - OFF	Record Head Azimuth Alignment Screw	Adjust the Record Head Azimuth Alignment Screw to obtain maximum readings for both channels on the VTVM. Refer to "Record Head Height Adjustment and Azimuth Alignment in item 3.5. Note: Repeat steps 11 and 12 one or two times to obtain optimum performance.
13	Record Level Calibration and Recording Bias Current Adjustment	400 Hz and 15 kHz (-20 dBV) to Input Jacks	VTVM to Output Jacks	Record, playback Monitor - Source/ Tape - ZX/SX/EX Eq. - 70 μ s (ZX/SX) 120 μ s (EX)	Main P.C.B. (Level) ZX: VR101 VR201 SX: VR102 VR202 EX: VR103 VR203 Power Supply P.C.B. (Bias) ZX: VR101 VR201 SX: VR102 VR202 EX: VR103 VR203	Adjustment should be made in the order of ZX, SX and EX. 1. Set the Monitor switch to Source. 2. Feed in 400 Hz, and set the Input Level controls to obtain 0 dBV (1 V) on the VTVM. 3. Set the Monitor switch to Tape. 4. Load a reference ZX tape, reference SX or SX-E (for European models) tape and reference EXII tape. 5. Set Record Cal. VR 101 (VR201) for ZX, VR102 (VR202) for SX and VR103 (VR203) for EXII tape to their center position. 6. Adjust Bias VR101 (VR201) for ZX, VR102 (VR202) for SX and VR103 (VR203) for EXII tape to obtain maximum readings on the VTVM. 7. Feed in 15 kHz (-20 dBV) and adjust Bias VR101 (VR201), VR102 (VR202) and VR103 (VR203) to obtain the same readings as source monitor levels on the VTVM. 8. Feed in 400 Hz (0 dBV) and adjust Record Cal. VR101 (VR201), VR102 (VR202) and VR103 (VR203) to obtain 0 dBV (1 V) on the VTVM. 9. Repeat above 7 and 8 one or two times to obtain optimum performance.
14	Overall Frequency Response Adjustment	400 Hz (0 dBV) and 20 Hz to 20 kHz (-20 dBV) to Input Jacks	VTVM to Output Jacks	Record, Playback Monitor - Source/ Tape - ZX/SX/EX Eq. - 70 μ s (ZX/SX) 120 μ s (EX) Dolby NR - OFF	Main P.C.B. L103, L203	1. Set the Monitor switch to Source. 2. Feed in 400 Hz and adjust the Input Level controls to obtain -20 dBV on the VTVM. 3. Set the Monitor switch to Tape, then record and play it back. 4. Feed in 20 Hz to 20 kHz and check to insure whether the output levels are within -20 dBV +3 dB. 5. If above is not sufficient, adjust L103 (L203) to obtain approx. -20 dBV on the VTVM. 6. Conduct step 13 "Record Level Calibration and Recording Bias Current Adjustment". 7. If above is not sufficient, precise re-adjustment of step 7 "Playback Frequency Response", replacement of Playback Head or Record Head, check on item 3.6 "Tape Travelling Check" will be required.

5.2. Playback Frequency Response Adjustment

Figs. 5.1 and 5.2 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 either R143 (R243) or R144 (R244) on the Main P.C.B. Ass'y.

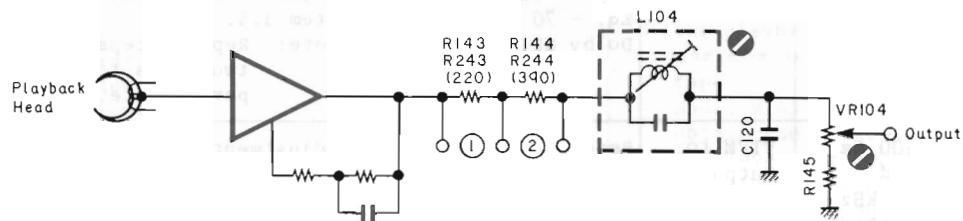


Fig. 5.1

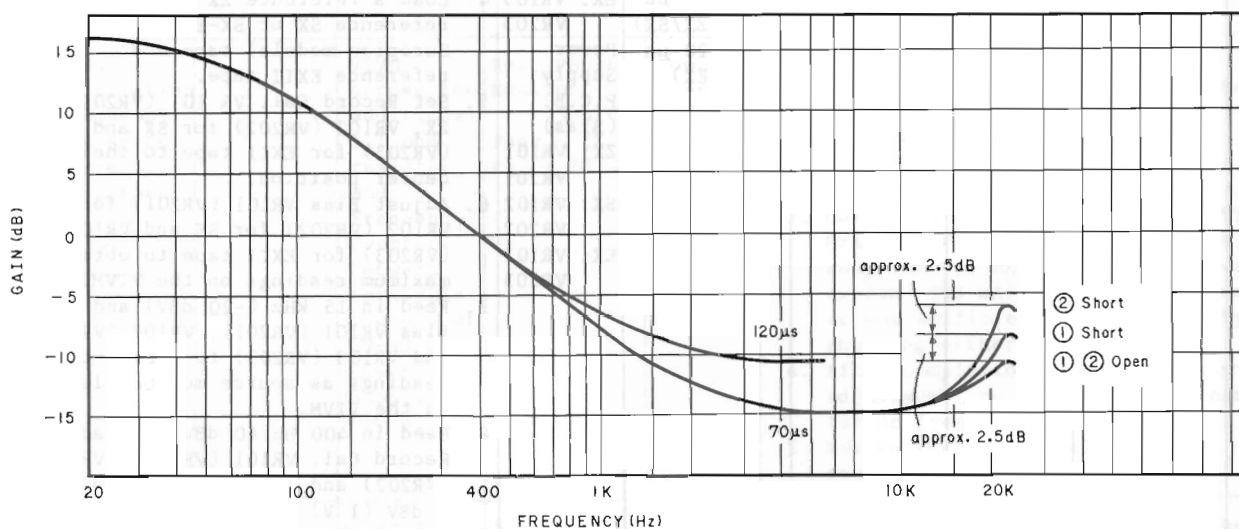


Fig. 5.2

6. MECHANISM ASS'Y AND PARTS LIST

6.1. Synthesis

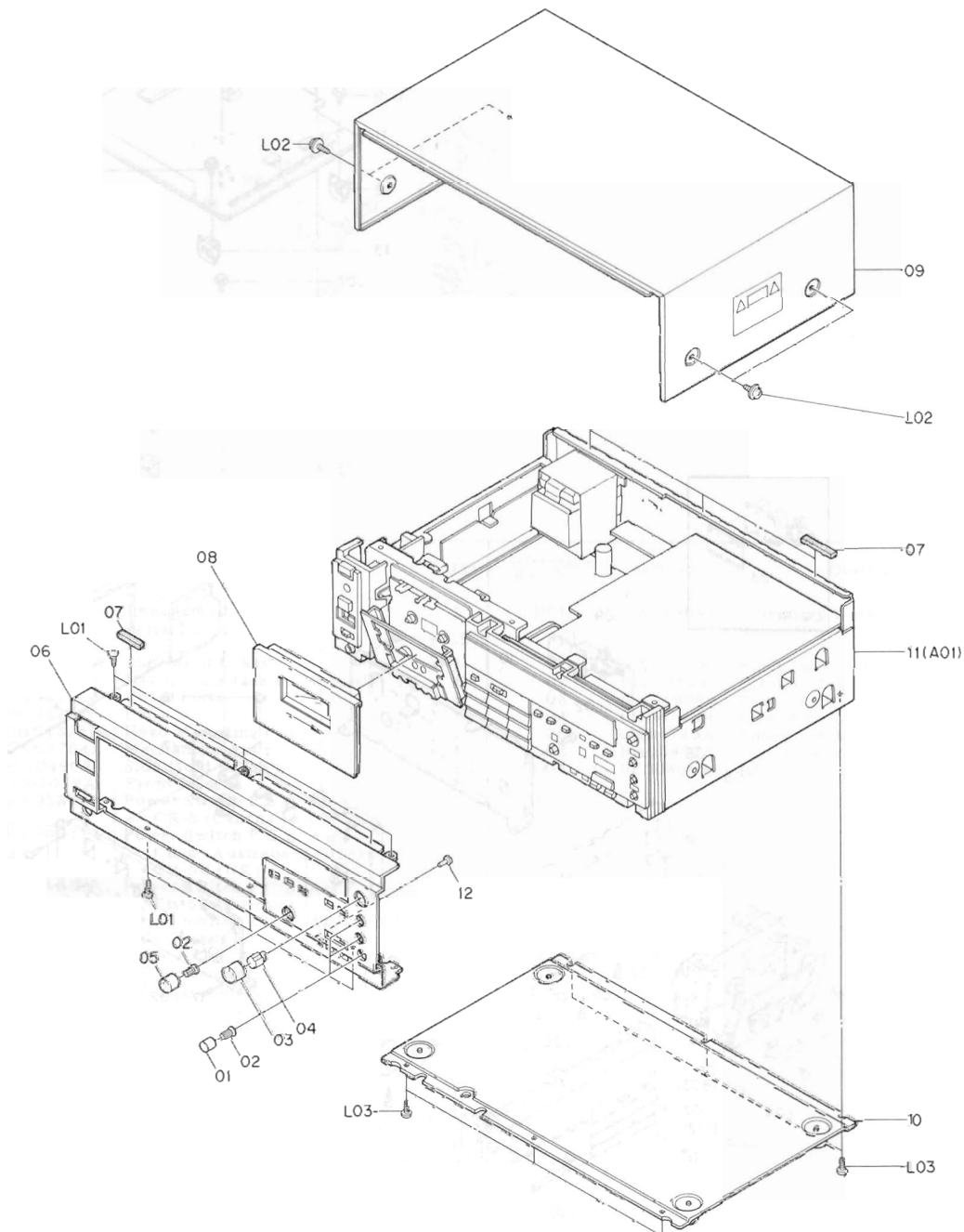


Fig. 6.1

Schematic Ref. No.	Part No.	Description	Qty	Schematic Ref. No.	Part No.	Description	Qty
		Synthesis Serial No.: A12901001 -			(0H04725A)	Top Cover	(1)
					(0M04377B)	Caution Label	(1)
					(0J04753A)	Vibration Isolating Rubber	(1)
					JA04164A	Bottom Cover Ass'y (Consisting of the followings)	1
					(0J05076A)	Bottom Cover	(1)
					(0J03564A)	Leg T-S	(4)
					(0M04377B)	Caution Label	(1)
					(0E00865A)	BT3x10 @ Binding	(4)
					—	Chassis Ass'y	1
					11	—	1
					12	—	1
					0H04767B	Lens	2
					0J05158A	Top Cover Cushion B	2
					0E00921A	BT3x8 @ Binding (Black Chromate)	6
					0E03032A	BT4x8 @ Pan Washer-faced (Black Chromate)	4
					0E00868A	BT3x8 @ Binding	6
01	0H04342A	Volume Knob (S)	3	10			
02	0H03737A	Volume Knob Base (S)	4				
03	0H04716A	Volume Knob (L)	1				
04	0H03739A	Volume Knob Base	1				
05	0H04343A	Volume Knob (M)	1				
06	0H04748A	Front Panel CR-5	1				
	0H04796A	Front Panel CR-5A	1				
	0H04749A	Front Panel CR-5E	1				
	0H04791A	Front Panel CR-50	1				
07	0J04550A	Top Cover Cushion A	6				
08	HA04910A	Cassette Case Cover Ass'y	1	L01			
09	HA04894A	Top Cover Ass'y (Consisting of the followings)	1	L02			
				L03			

6.2. Chassis Ass'y (A01)

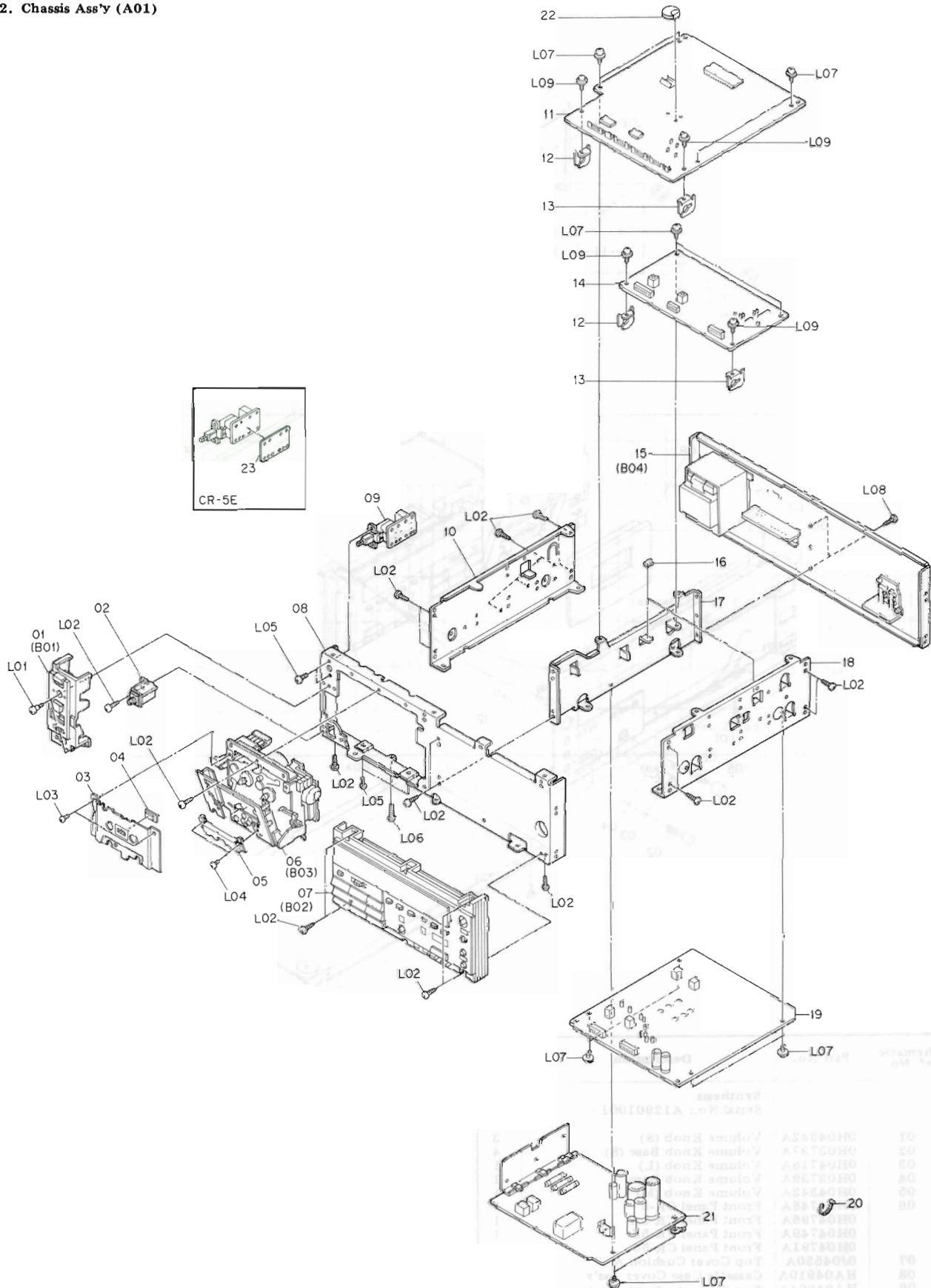


Fig. 6.2

6.3. Side Mold L Ass'y (B01)

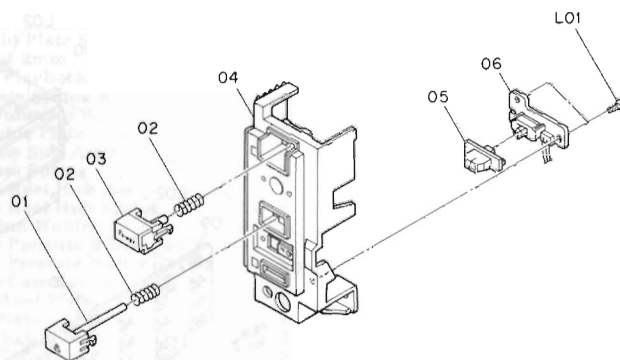


Fig. 6.3

Schematic Ref. No.	Part No.	Description	Qty	Schematic Ref. No.	Part No.	Description	Qty
A01	—	Chassis Ass'y Serial No.: A12901001 -	1	B01	HA04904A	Side Mold L Ass'y Serial No.: A12901001 -	1
01	HA04904A	Side Mold L Ass'y	1	01	HA04909C	Eject Button Ass'y	1
02	BA05866A	Headphone Jack P.C.B. Ass'y	1	02	OJ05084A	Eject Spring	2
03	OH04726B	Cover Plate	1	03	HA04908A	Power Switch Button	1
04	OH04722C	Lens	1	04	OH04740B	Side Mold L	1
05	OH04415B	Head Mounting Cover	1	05	OH04745A	Slide Switch Knob	1
06	CA08764A	Mechanism Ass'y	1	06	BA05867A	Timer Switch P.C.B. Ass'y	1
07	HA04903A	Side Mold R Ass'y	1	L01	OE00859A	BT2.6x6 Binding	2
08	OJ05072A	Front Chassis	1				
09	BA05879A	Power Switch P.C.B. Ass'y CR-5 (Canada) & CR-5A	1				
	BA06071A	Power Switch P.C.B. Ass'y CR-5 (Australia & Others) & CR-5E (UK)	1				
	BA05880A	Power Switch P.C.B. Ass'y CR-5E (Europe)	1				
	BA05878A	Power Switch P.C.B. Ass'y CR-50	1				
10	OJ05073A	Side Chassis L	1				
11	BA05864A	Logic P.C.B. Ass'y	1				
12	OJ05080A	P.C.B. Holder L	2				
13	OJ05081A	P.C.B. Holder R	2				
14	BA05877A	Dolby NR P.C.B. Ass'y	1				
15	HA04973A	Rear Panel Ass'y CR-5 (Canada)	1				
	HA04901A	Rear Panel Ass'y CR-5 (Australia)	1				
	HA04900A	Rear Panel Ass'y CR-5 (Others)	1				
	HA04898A	Rear Panel Ass'y CR-5A	1				
	HA04897A	Rear Panel Ass'y CR-5E (UK)	1				
	HA04902A	Rear Panel Ass'y CR-5E (Europe)	1				
	HA04899A	Rear Panel Ass'y CR-50	1				
16	OJ05115A	P.C.B. Cushion	2				
17	OJ05075B	Center Chassis	1				
18	OJ05074A	Side Chassis R	1				
19	BA05863A	Main P.C.B. Ass'y CR-5, CR-5A & CR-50	1				
	BA05863A-E	Main P.C.B. Ass'y CR-5E	1				
20	OB08515A	Insu-Lock	19				
21	BA05871A	Power Supply P.C.B. Ass'y CR-5 (Canada & Others) & CR-5A	1				
	BA05872A	Power Supply P.C.B. Ass'y CR-5 (Australia) & CR-5E	1				
	BA05870A	Power Supply P.C.B. Ass'y CR-50	1				
22	OB90141A	Lithium Battery CR2032-FT	1				
23	OJ05107C	Insulator (CR-5E)	1				
L01	OE03135B	M3x8 Binding	2				
L02	OE00868A	BT 3x8 Binding	21				
L03	OE00939A	BT 2.6x4 Binding (Black Chromate)	2				
L04	OE03202A	M2.6x3 Binding (Black Chromate)	2				
L05	OE00896A	M3x6 Binding	4				
L06	OE00865A	BT 3x10 Binding	1				
L07	OE03157A	BT 3x8 Binding with Washer	12				
L08	OE00921A	BT 3x8 Binding (Black Chromate)	2				
L09	OE00606A	M3x6 Binding (3A)	4				

6.4. Side Mold R Ass'y (B02)

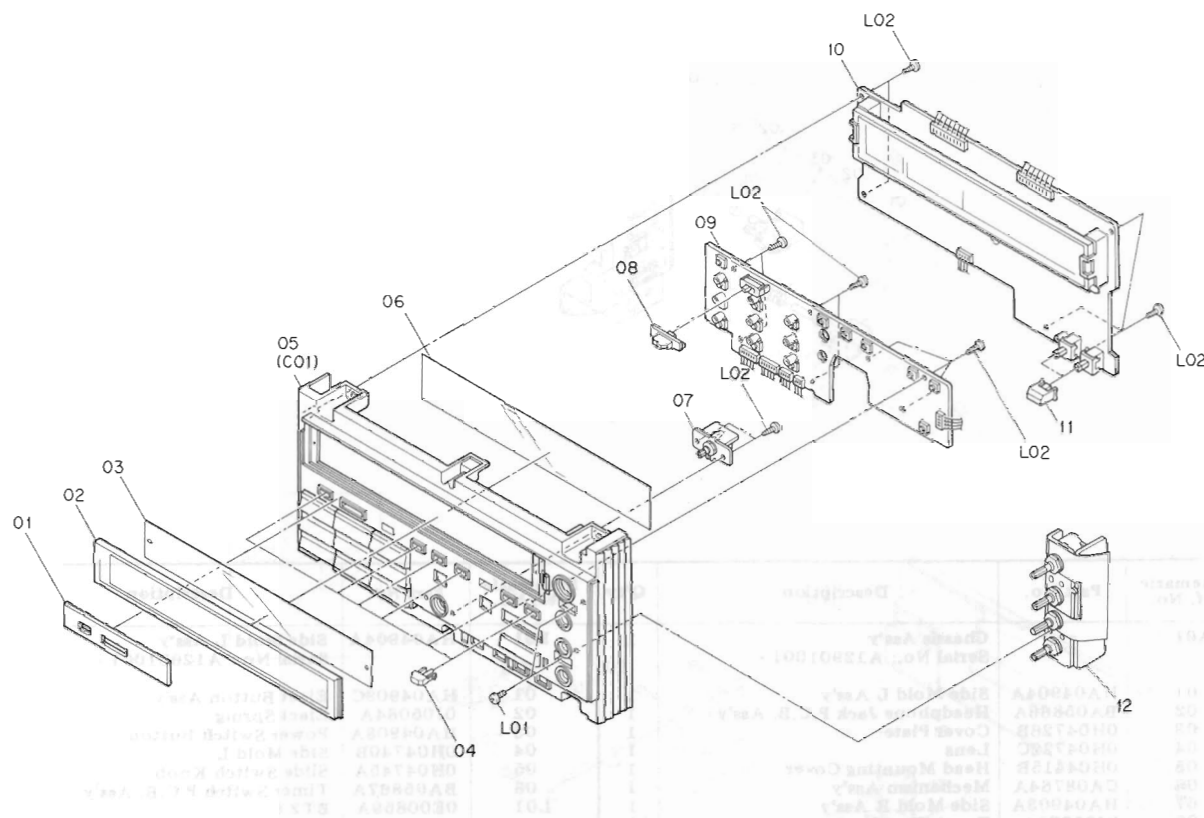
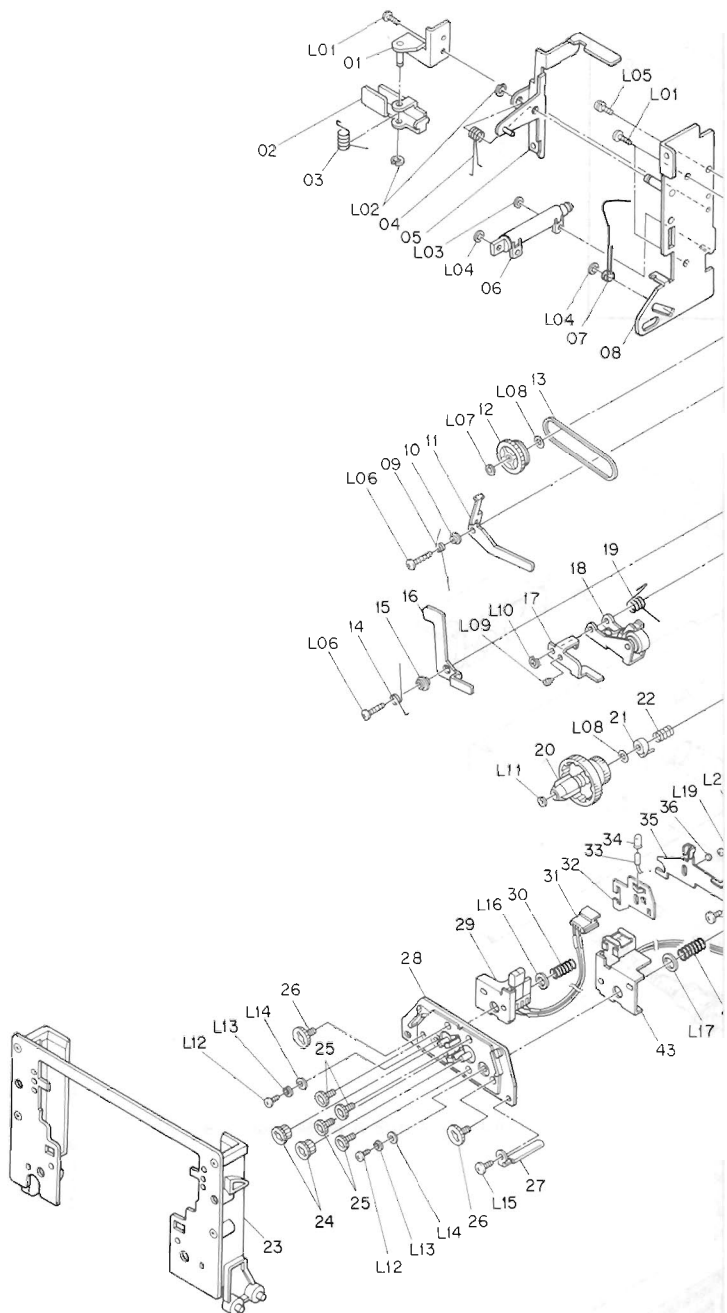


Fig. 6.4

Schematic Ref. No.	Part No.	Description	Qty	Schematic Ref. No.	Part No.	Description	Qty
B02	HA04903A	Side Mold R Ass'y Serial No.: A12901001 -	1	B03	CA08764A	Mechanism Ass'y Serial No.: A12901001 -	1
01	0H04747A	Front Plate	1	01	0C81322A	Eject Lever Holder	1
02	0H04711C	Display Lens	1	02	0C81321A	Eject Lever B	1
03	0J05066B	Display Filter B	1	03	0C81323A	Eject Lever B Spring	1
04	0H04736A	Push Button (S)	6	04	0C80020A	Eject Lever A Spring	1
05	HA04905A	Side Mold R Sub Ass'y	1	05	0C81329A	Eject Lever A	1
06	0J05065A	Display Filter A	1	06	CA80006A	Pneumatic Damper Ass'y	1
07	BA05865A	Bias Volume P.C.B. Ass'y	1	07	0C80019A	Eject Spring	1
08	0H04745A	Slide Switch Knob	1	08	0C80018B	Cassette Case Holder L	1
09	BA05876A	Control Switch P.C.B. Ass'y	1	09	0C80617A	Back Tension Arm Spring	1
10	BA05874A	Display P.C.B. Ass'y	1	10	0C80618A	Back Tension Arm Collar	1
11	0H04738A	Push Switch Button (L)	2	11	0C80619A	Back Tension Arm	1
12	BA05868A	Volume P.C.B. Ass'y	1	12	0C80620A	Back Tension Pulley	1
L01	0E00896A	M3x6 Binding	2	13	0C80621A	Back Tension Belt	1
L02	0E00857A	BT3x6 Binding	14	14	0C80013A	Lock Lever Spring	1
				15	0C80014A	Lock Lever Collar	1
				16	0C80015A	Lock Lever	1
				17	0C80615A	Pressure Roller Plate	1
				18	CA80203A	Supply Pressure Roller Ass'y	1
				19	0C80616A	Supply Pressure Roller Spring	1
				20	CA80202A	Supply Reel Hub Ass'y	1
				21	0C80612A	Spring Holder	2
				22	0C80614A	Supply Reel Hub Spring	1
				23	CA80200A	Cassette Case Ass'y	1
				24	0C80762A	Head Height Adjustment Gear	2
				25	0C80761A	Head Height Adjustment Screw	4
				26	0C80763A	Azimuth Alignment Screw	2
				27	0C80605A	Wire Clamper	1
				28	CA08637A	Head Mount Base Sub Ass'y	1
				29	CA08659B	R-3L Record Head Ass'y	1
				30	0C80776A	Head Plate Spring (L)	1
				31	0C81313A	4P-H Connector R	1
				32	0C81326A	Lamp Holder	1
				33	0C81327A	Lamp	1
				34	0C81402A	Rubber Cap	1
				35	0C80003A	Head Base Hold Plate	1
				36	0C80004A	Steel Ball 3mm	1
				37	GA02201A	E-41° Erase Head	1
				38	0C81314A	2P-H Connector E	1
				39	0C80768A	E.H. Hold Plate	1
				40	0C80889A	E.H. Hold Plate Tapering Spring	2

Schematic Ref. No.	Part No.	Description	Q'ty
41	0C08886A	E.H. Hold Plate Spring	1
42	0C80007A	Steel Ball 2mm	3
43	CA08658B	P2H-3L Playback Head Ass'y	1
44	0C08775A	Head Plate Spring R	1
45	0C81312A	4P-H Connector P	1
46	0C08771A	Tape Guide Plate	1
47	CA08638A	Head Base Sub Ass'y	1
48	0C80611A	Head Base Spring	1
49	CA80201A	Take-up Reel Hub Ass'y	1
50	0C80613A	Take-up Reel Hub Spring	1
51	0C81324A	Mechanism Holder A	1
52	CA80005A	Take-up Pressure Roller Ass'y	1
53	0C80609A	Take-up Pressure Roller Spring	1
54	0C80610A	Cassette Case Spring	1
55	0C80622A	Switch Hold Plate	1
56	0C80623A	Switch Plate	1
57	0C80626A	Leaf Switch	3
58	0C81315A	Switch Collar C	2
59	0C81320A	Metal Lever Spring	1
60	0C81319A	Metal Lever	1
61	0C80017A	Record Protect Lever	2
62	0C81316A	Mechanism Chassis	1
63	0C80022A	Cassette Hold Spring	1
64	0C81325A	Mechanism Holder B	1
65	CA80011A	Shut-off P.C.B. Ass'y	1
66	CA80204A	Brake Ass'y	1
67	0C80628A	Brake Spring B	1
68	0C80630A	Brake Arm Collar	1
69	0C80629A	Brake Arm	1
70	0C80030A	Reel Motor Holder	1
71	0C80635B	Idler Pulley	1
72	CA80205A	Reel Motor Ass'y	1
73	CA80206A	D.D. Motor Ass'y	1
74	0C80634A	Capstan Belt	1
75	0C81417A	Cam Gear B	1
76	0C81418A	Control Motor Holder	1
77	0C80027A	Mode Switch	1
78	CA80007A	Control Motor Ass'y	1
79	0C80010D	Cassette Case Holder R	1
80	0C80012A	Eject Sensor	1
81	0C80037A	Insu-Lock	3
82	0C81317A	7P-H Connector	1
83	0C81318A	9P-H Connector	1
84	0C81415A	Thrust Bushing	1
85	0C81416A	Thrust Spring B	1
L01	0E03229A	FT2.5x6 ⊕ Pan	14
L02	0E00181A	E-Ring 3mm	4
L03	0E03235A	Washer 2x5x0.25 (Plastics)	1
L04	0E03052A	CS Stopper Ring 2.4mm	2
L05	0E03236A	M2x5 ⊕ Pan (2A)	4
L06	0E03043A	FT2.5x10 ⊕ Pan	2
L07	0E03225A	Washer 1.8x3.8x0.5	1
L08	0E03226A	Washer 2.1x4.5x0.1	3
L09	0E00224A	M2x3 Cup Point	1
L10	0E00222A	E-Ring 2mm	2
L11	0E03049A	Washer 1.8x3.2x0.5	2
L12	0E00976A	M2x5 ⊕ Binding	5
L13	0E00025A	Washer 2mm (Spring)	2
L14	0E00117A	Washer 2x4.3x0.4	5
L15	0E00866A	M2.6x4 ⊕ Binding	1
L16	0C08774A	Plate Washer L	1
L17	0C08773A	Plate Washer R	1
L18	0E03228A	FT3x4 ⊕ Pan	1
L19	0E03232A	M1.7x7 ⊕ Pan	1
L20	0E03222A	Washer 1.8x3.8x0.3	1
L21	0E03234A	M2x3 ⊕ Pan	2
L22	0E03035A	M2x3.2 ⊕ Truss	3
L23	0E03227A	Washer 2.7x5x0.5	2
L24	0E03231A	M2x30 ⊕ Pan	2
L25	0E00698A	E-Ring 2.5mm	1
L26	0E03041A	FT2.5x4 ⊕ Pan	5
L27	0E03233A	Washer 2.6x8x1	1
L28	0E03230A	ST2.6x12 ⊕ Pan	1
L29	0E03245A	Washer 1.3x3.3x0.3 (Plastics)	1
L30	0E03237A	Nut Hex. M2.6	1
L31	0E03045A	M2.6x3 ⊕ Binding	2
L32	0E00694A	Nut Hex. M2	1
L33	0E00691A	M2x3 ⊕ Pan	2
L34	0E03044A	FT2.5x20 ⊕ Pan	1

6.5. Mechanism Ass'y (B03)



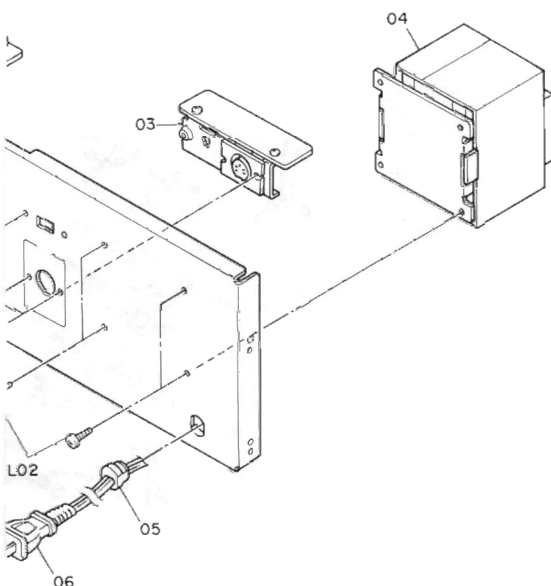
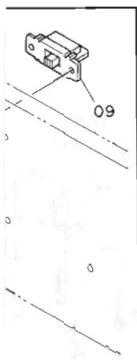


Fig. 6.6

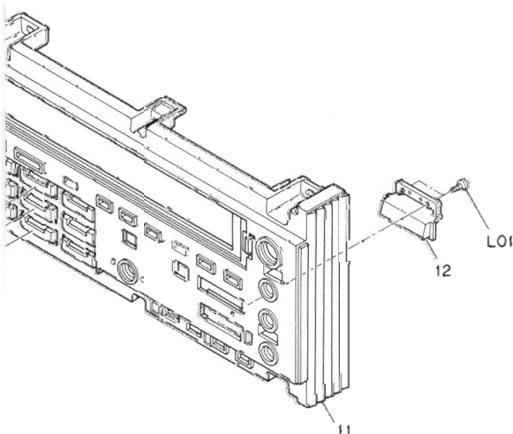


Fig. 6.7

Schematic Ref. No.	Part No.	Description
SW1 M2 M2 M2	BA05879A	Power Switch P.C.B. Ass'y CR-5 (Canada) & CR-5A
	BA06071A	Power Switch P.C.B. Ass'y CR-5 (Australia & Others) & CR-5E (UK)
	BA05880A	Power Switch P.C.B. Ass'y CR-5E (Europe)
	BA05878A	Power Switch P.C.B. Ass'y CR-50
	OB60279A	Power Switch P.C.B.
	OB70002A	Power Switch
	OB08342A	Spark Killer CR-5 (Canada) & CR-5A
	OB08955A	Spark Killer CR-5 (Australia & Others), CR-5E (UK) & CR-50
	OB08445A	Spark Killer CR-5E (Europe)
	OB90059A	Spark Killer Cover CR-5E (Europe) (1)
	OE00752A	Eyelet 2x3 (2)
Q601 Q602 R601 R602 R603	CA80011A	Shut-off P.C.B. Ass'y
	OC80047A	Shut-off P.C.B.
	OB06388A	TR 2SC2812
	OB06389A	Photoreflexor NJL5141
	OB09840A	RK 680 Leadless
	OB09841A	RK 15K Leadless
CN25 CN29	BA05875A	Pin Jack P.C.B. Ass'y
	OB60278A	Pin Jack P.C.B.
	OB82527A	3P-H Connector
	OB81229A	3P-T Post (Red)
	OB81477A	4P Pin Jack (1)
	BA06082A	Earth Lug Ass'y (1)
CN-30	BA05866A	Headphone Jack P.C.B. Ass'y
	OB60271B	Headphone Jack P.C.B.
	OB82532A	3P-H Connector
	OB81478A	Headphone Jack (1)
	OJ05077A	Headphone Jack Holder (1)
	OJ05092A	Snap Plate (1)
CN4	BA05869A	DIN Jack P.C.B. Ass'y
	OB60274B	DIN Jack P.C.B.
	OB82509A	7P-H Connector
	OB81479A	8P DIN Socket
	OJ05078A	DIN Bracket (1)
	OE00868A	BT 3x8 Binding (2)
VR301 CN31	BA05865A	Bias Volume P.C.B. Ass'y
	OB60270B	Bias Volume P.C.B.
	OB30016A	VR 100K (A)x2
	OB82533A	3P-H Connector Plate (1)
SW620 CN6	BA05867A	Timer Switch P.C.B. Ass'y
	OB60272B	Timer Switch P.C.B.
	OB07437A	Slide Switch
	OB82511A	3P-H Connector

Schematic Ref. No.	Part No.	Description	Q'ty	
B04	HA04973A	Rear Panel Ass'y CR-5 (Canada)	1	
	HA04901A	Rear Panel Ass'y CR-5 (Australia)	1	
	HA04900A	Rear Panel Ass'y CR-5 (Others)	1	
	HA04898A	Rear Panel Ass'y CR-5A	1	
	HA04897A	Rear Panel Ass'y CR-5E (UK)	1	
	HA04902A	Rear Panel Ass'y CR-5E (Europe)	1	
	HA04899A	Rear Panel Ass'y CR-50 Serial No.: A12901001 -	1	
	01	OH04724D	Rear Panel CR-5	1
		OH04798C	Rear Panel CR-5A	1
		OH04723C	Rear Panel CR-5E	1
OH04793D		Rear Panel CR-50	1	
02	BA05875A	Pin Jack P.C.B. Ass'y	1	
03	BA05869A	Remote Socket P.C.B. Ass'y	1	
04	OB50057A	Power Transformer CR-5 (Canada) & CR-5A	1	
	OB50058A	Power Transformer CR-5 (Australia) & CR-5E	1	
	OB50059A	Power Transformer CR-5 (Others)	1	
	OB50056A	Power Transformer CR-50	1	
05	OB08351A	Cord Bushing 4K-4 CR-5 (Canada), CR-5E (UK) & CR-5A	1	
	OB08037U	Cord Bushing C CR-5 (Australia & Others), CR-5E (Europe) & CR-50	1	
	06	OB08504A	Power Cord CR-5 (Canada) & CR-5A	1
OB05241A		Power Cord CR-5 (Australia)	1	
OB08533A		Power Cord CR-5 (Others)	1	
OB08348A		Power Cord CR-5E (UK)	1	
07	OB08093U	Power Cord CR-5E (Europe)	1	
	OB08219B	Power Cord CR-50	1	
	OJ04601B	Switch Cover CR-5 (Canada & Australia), CR-5A & CR-5E	1	
	08	OM03948A	Voltage Lock Plate CR-5 (Others)	1
09	OB07092U	Voltage Selector CR-5 (Others)	1	
	OF01071A	Free-up Belt CR-5 (Australia) & CR-5E (UK)	1	
L01	OE00948A	BT 3x10 $\oplus$ Binding (Black Chromate)	2	
L02	OE00915A	BT 4x8 $\oplus$ Binding (Black Chromate)	4	
L03	OE03327A	M2.6x8 $\oplus$ Binding (Black Chromate)	2	
L04	OB08583A	Plastic Rivet (except CR-5 (Others))	2	
L05	OE00818A	M3x8 $\oplus$ Binding (except CR-5 (Others))	2	
C01	HA04905A	Side Mold R Sub Ass'y Serial No.: A12901001 -	1	
01	OH04734B	Fader Button (Down)	1	
02	OH04731B	Record Mute Button	1	
03	OH04735B	Fader Button (Up)	1	
04	OH04732B	Pause Button	1	
05	OH04728B	Stop Button	1	
06	OH04733B	Record Button	1	
07	OH04730B	Rewind Button	1	
08	OH04727B	Play Button	1	
09	OH04729B	FF Button	1	
10	OH04746A	Control Button Lens	9	
11	OH04739C	Side Mold R	1	
12	OH04744A	Monitor Button	1	
L01	OE03328A	BT2x5 $\oplus$ Pan	2	

6.6. Rear Panel Ass'y (B04)

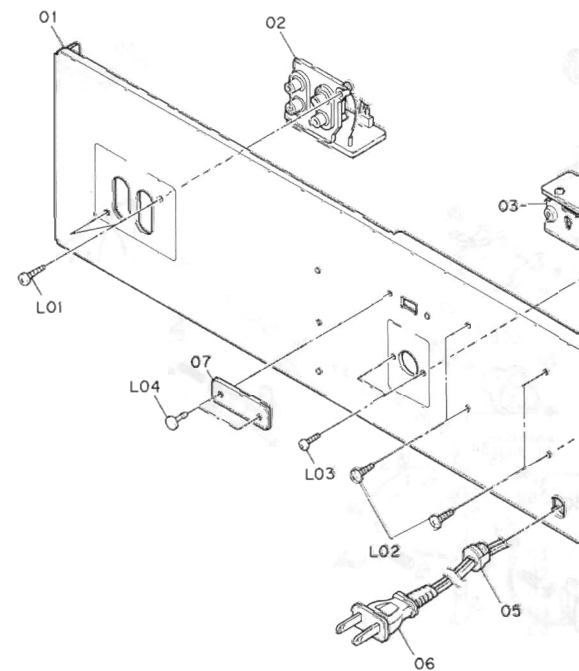
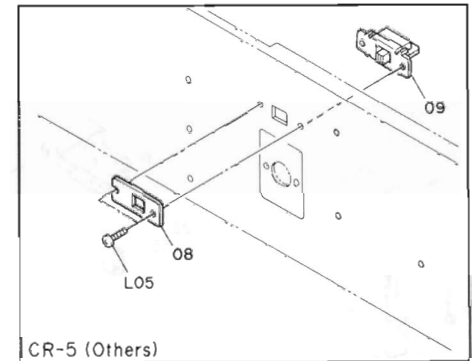


Fig. 6.6

6.7. Side Mold R Sub Ass'y (C01)

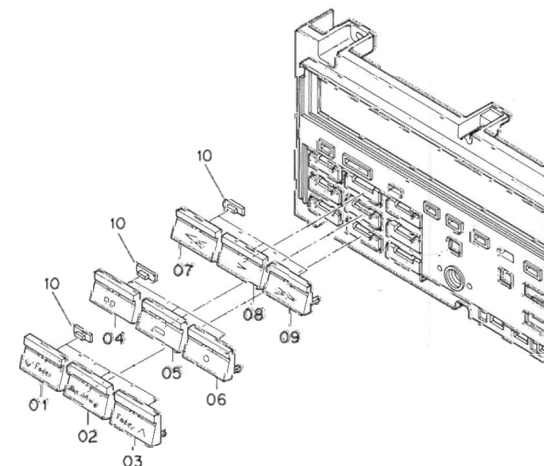


Fig. 6.7

7. 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, RW — Wire Wound Resistor

CE — Electrolytic Capacitor, CM — Mylar Capacitor, CC — Ceramic Capacitor, CP — PP Capacitor,

CT — Tantalum Capacitor, CF — Film Capacitor, C — Mica Capacitor

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

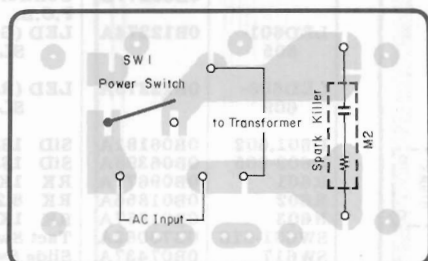


Fig. 7.1

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

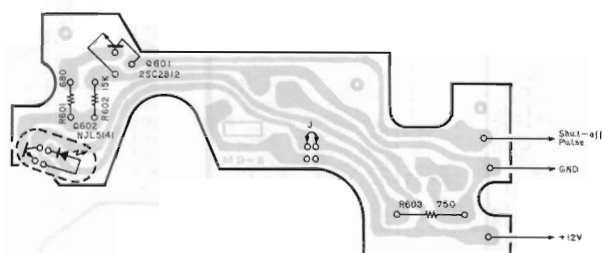


Fig. 7.2

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

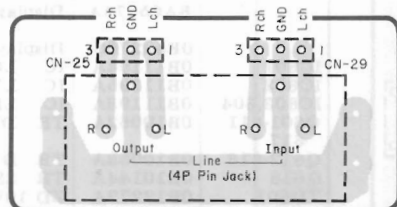


Fig. 7.3

7.4. Headphone Jack P.C.B. Ass'y

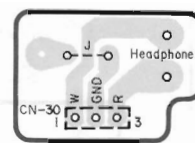


Fig. 7.4

7.5. Remote Socket P.C.B. Ass'y

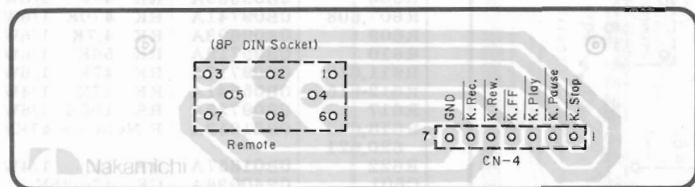


Fig. 7.5

7.6. Bias Volume P.C.B. Ass'y

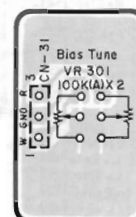


Fig. 7.6

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

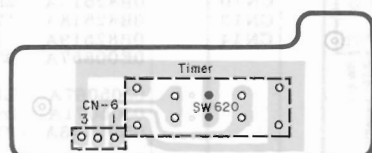


Fig. 7.7

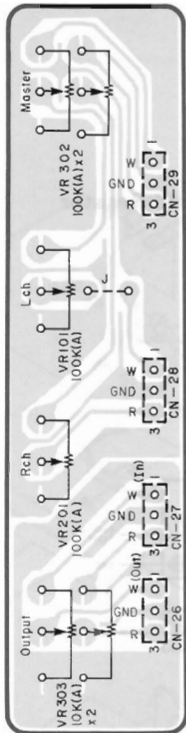


Fig. 7.8

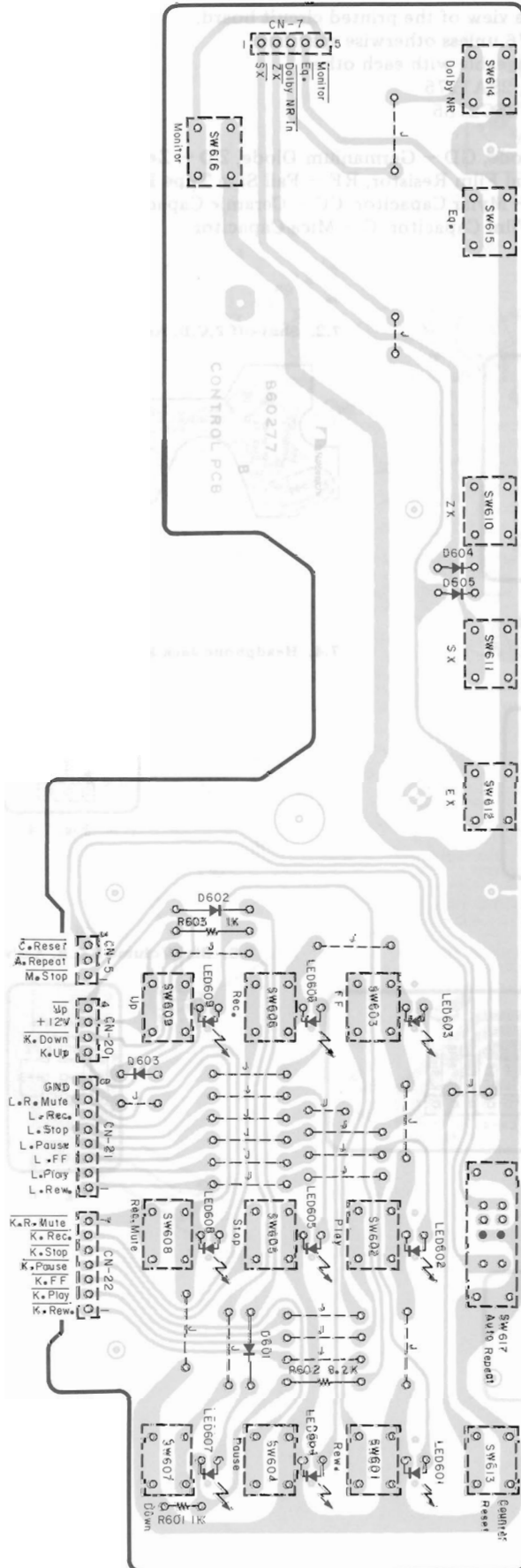


Fig. 7.9

Schematic Ref. No.	Part No.	Description
	BA05868A	Volume P.C.B. Ass'y
VR101,201	OB60273B	Volume P.C.B.
VR302	OB30050A	VR 100K (A)
VR303	OB30049A	VR 100K (A)x2
CN26	OB82528A	VR 10K (A)x2
CN27	OB82529A	3P-H Connector
CN28	OB82530A	3P-H Connector
CN29	OB82531A	3P-H Connector
	OJ05068A	Volume Holder (1)
	OJ05113A	Shield Plate (1)
	BA05876A	Control Switch P.C.B. Ass'y
	OB60277B	Control Switch P.C.B.
LED601-605	OB12274A	LED (Green) SLR-34MG3 (5)
LED606-609	OB12275A	LED (Red) SLR-34VR3 (4)
D601,602	OB06181A	SiD 1SS53
D603-605	OB06398A	SiD 1SS176 (3)
R601	OB09677A	RK 1K 1/6W J
R602	OB01856A	RK 8.2K 1/4W J
R603	OB01857A	RK 1K 1/4W J
SW601-616	OB70062A	Tact Switch
SW617	OB07437A	Slide Switch
CN5	OB82510A	3P-H Connector
CN7	OB82512A	5P-H Connector
CN20	OB82523A	4P-H Connector
CN21	OB82524A	8P-H Connector
CN22	OB82525A	7P-H Connector
	OJ05067A	LED Holder (9)
	BA05874A	Display P.C.B. Ass'y
IC601	OB60276C	Display P.C.B.
IC602	OB11194A	IC LC7550
IC603,604	OB11195A	IC L78N09
Q601-611	OB11193A	IC LB1240
617	OB10062A	TR DTC144ES (12)
Q612-616	OB10053A	TR DTA144ES (5)
Q618	OB10144A	TR 2SB963 (L,K)
ZD601	OB12272A	ZD 10V MTZ10B T-77
LED601	OB12354A	LED (Red) SLR-34VR5
D601	OB06398A	SiD 1SS176
D602	OB06109A	SiD GP08B
R605	OB24021A	RF 68 1W J
R606	OB09669A	RK 470 1/6W J
R607,608	OB09741A	RK 470K 1/6W J
R609	OB09693A	RK 4.7K 1/6W J
R610	OB09719A	RK 56K 1/6W J
R611,616	OB09717A	RK 47K 1/6W J
R612-615	OB05641A	RK 47K 1/4W J
R617	OB09725A	RK 100K 1/6W J
R618,619	OB21013A	R-Network 47Kx12
620,621		
R622	OB01857A	RK 1K 1/4W J
C601	OB40036A	CE 47μ 25V
C602	OB40009A	CE 10μ 16V
C603,604	OB40012A	CE 47μ 16V
C608	OB05550A	CM 1000P 50V J
TF601	OB06715A	Thermal Fuse 129°C
SW601,602	OB70014A	Push Switch
CN8	OB82513A	5P-H Connector
CN10	OB82515A	2P-H Connector
CN13	OB82518A	12P-H Connector
CN14	OB82519A	11P-H Connector
	OE00857A	BT 3x6 Binding (2)
	OJ05067A	LED Holder (1)
	OJ05071A	Indicator Holder (2)
	OB90143A	FL Indicator (1)

7.10. Display P.C.B. Assy

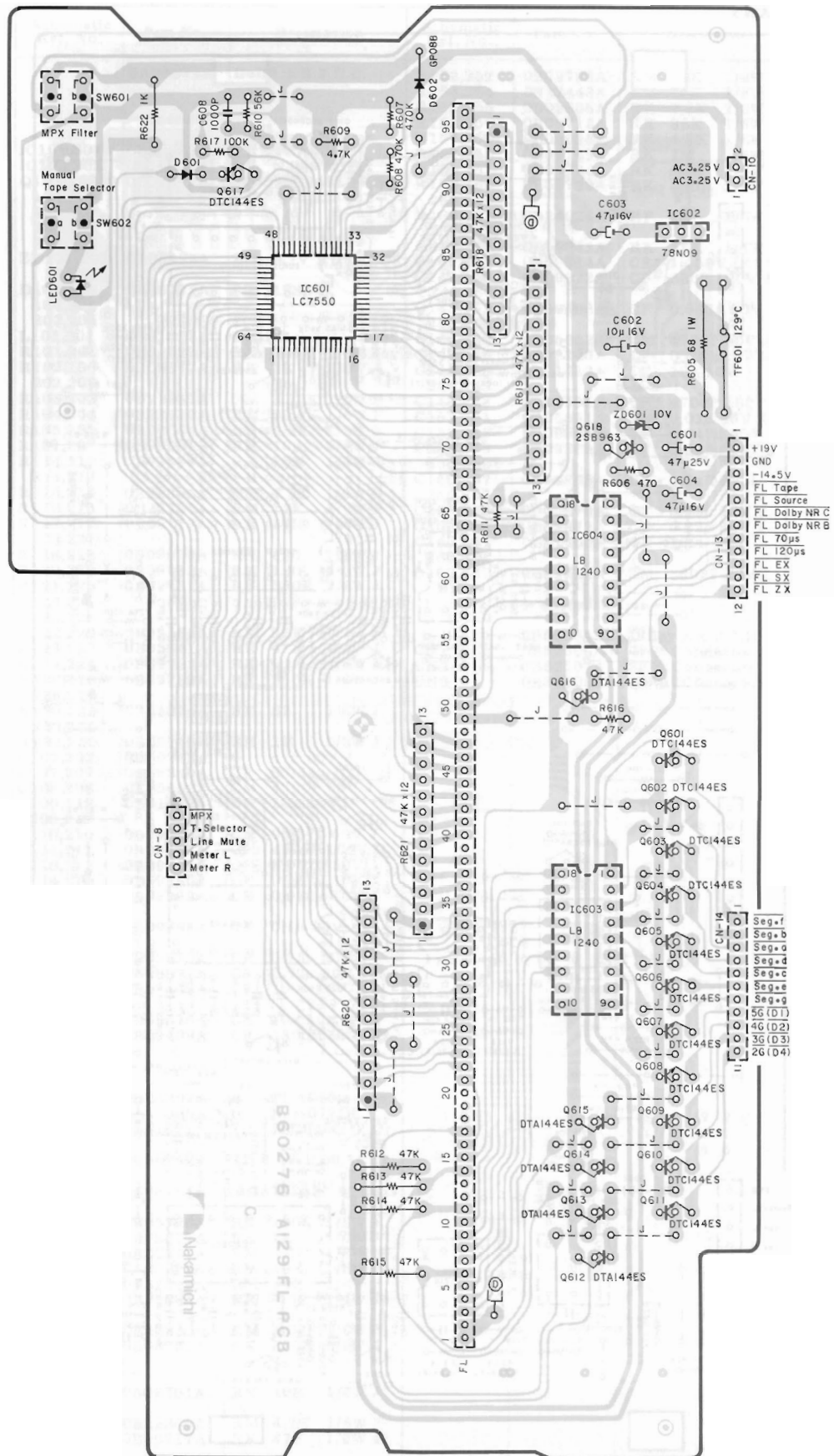


Fig. 7.10

7.11. Dolby NR P.C.B. Ass'y

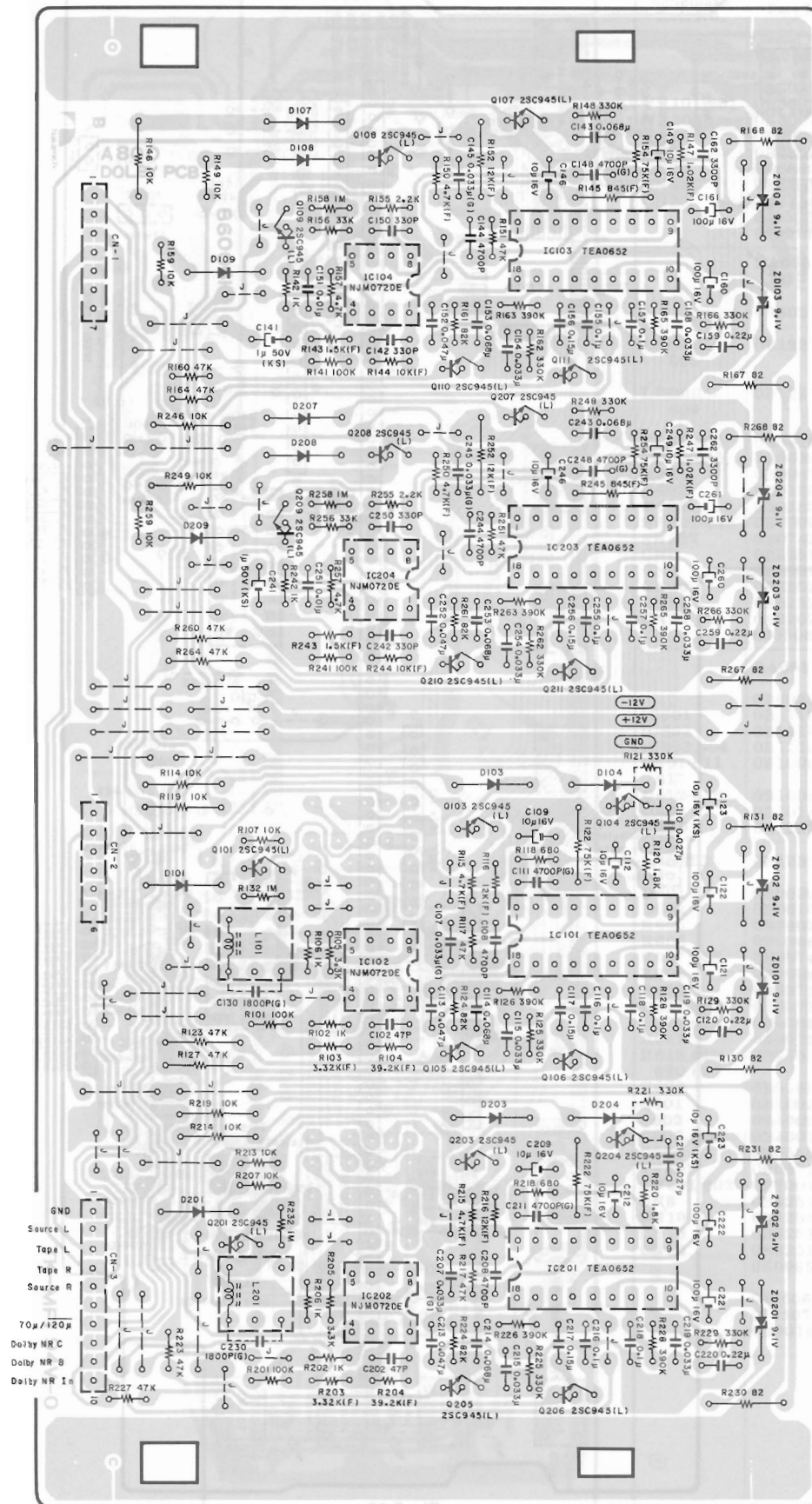


Fig. 7.11

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA05877A	Dolby NR P.C.B. Ass'y	R152,252	OB09796A	RM 12K 1/4W F
	— Encoder —		R154,254	OB22443A	RM 75K 1/6W F
IC101,201	OB06382A	IC TEA0652	R155,255	OB09685A	RK 2.2K 1/6W J
IC102,202	OB11005A	IC NJM072DE	R156,256	OB09713A	RK 33K 1/6W J
Q101,103	OB01872A	TR 2SC945L (P,Q)	R157,257	OB09693A	RK 4.7K 1/6W J
104,105			R158,258	OB09749A	RK 1M 1/6W J
106,201			R161,261	OB09723A	RK 82K 1/6W J
203,204			R163,165	OB09739A	RK 390K 1/6W J
205,206			263,265		
ZD101,102	OB06232A	ZD 9.1V RD9.1EB2	R167,168	OB24024A	RF 82 1/6W J
201,202			267,268		
D101,103	OB06181A	SiD 1SS53	R260,264	OB05641A	RK 47K 1/4W J
104,201			C141,241	OB09814A	CE 1μ 50V (KS)
203,204			C142,150	OB09322A	CP 330P 100V J
L101,201	OB51225A	L-C Block	242,250		
R101,201	OB09725A	RK 100K 1/6W J	C143,153	OB09866A	CF 0.068μ 50V J
R102,106	OB09677A	RK 1K 1/6W J	243,253		
202,206			C144,244	OB05652A	CM 4700P 50V J
R103,203	OB22287A	RM 3.32K 1/6W F	C145,245	OB09240A	CP 0.033μ 100V G
R104,204	OB22410A	RM 39.2K 1/6W F	C146,149	OB01412A	CE 10μ 16V
R105,205	OB09689A	RK 3.3K 1/6W J	246,249		
R107,207	OB09701A	RK 10K 1/6W J	C148,248	OB09191A	CP 4700P 100V G
R114,119	OB01888A	RK 10K 1/4W J	C151,251	OB05681A	CM 0.01μ 50V J
214,219			C152,252	OB09864A	CF 0.047μ 50V J
R115,215	OB22305A	RM 4.7K 1/6W F	C154,158	OB09862A	CF 0.033μ 50V J
R116,216	OB22351A	RM 12K 1/6W F	254,258		
R117,217	OB09717A	RK 47K 1/6W J	C155,157	OB09868A	CF 0.1μ 50V J
223,227			255,257		
R118,218	OB09673A	RK 680 1/6W J	C156,256	OB09870A	CF 0.15μ 50V J
R120,220	OB09683A	RK 1.8K 1/6W J	C159,259	OB09872A	CF 0.22μ 50V J
R121,125	OB09737A	RK 330K 1/6W J	C160,161	OB01400A	CE 100μ 16V
129,221			260,261		
225,229			C162,262	OB01914A	CM 3300P 50V J
R122,222	OB09562A	RM 75K 1/4W F		— Miscellaneous —	
R123,127	OB05641A	RK 47K 1/4W J	CN1	OB60061B	Dolby NR P.C.B.
R124,224	OB09723A	RK 82K 1/6W J	CN2	OB82506A	7P-H Connector
R126,128	OB09739A	RK 390K 1/6W J	CN3	OB82507A	6P-H Connector
226,228				OB82508A	10P-H Connector
R130,131	OB24024A	RF 82 1/6W J			
230,231					
R132,232	OB09749A	RK 1M 1/6W J			
C102,202	OB09242A	C 47P 50V J			
C107,207	OB09240A	CP 0.033μ 100V G			
C108,208	OB05652A	CM 4700P 50V J			
C109,112	OB01412A	CE 10μ 16V			
209,212					
C110,210	OB09045A	CM 0.027μ 50V J			
C111,211	OB09191A	CP 4700P 100V G			
C113,213	OB09864A	CF 0.047μ 50V J			
C114,214	OB09866A	CF 0.068μ 50V J			
C115,119	OB09862A	CF 0.033μ 50V J			
215,219					
C116,118	OB09868A	CF 0.1μ 50V J			
216,218					
C117,217	OB09870A	CF 0.15μ 50V J			
C120,220	OB09872A	CF 0.22μ 50V J			
C121,122	OB01400A	CE 100μ 16V			
221,222					
C123,223	OB09816A	CE 10μ 16V (KS)			
C130,230	OB09409A	CP 1800P 100V G			
	— Decoder —				
IC103,203	OB06382A	IC TEA0652			
IC104,204	OB11005A	IC NJM072DE			
Q107-111	OB01872A	TR 2SC945L (P,Q)			
207-211		(10)			
ZD103,104	OB06232A	ZD 9.1V RD9.1EB2			
203,204					
D107-109	OB06181A	SiD 1SS53 (6)			
207-209					
R141,241	OB09725A	RK 100K 1/6W J			
R142,242	OB09677A	RK 1K 1/6W J			
R143,243	OB22247A	RM 1.5K 1/6W F			
R144,244	OB09929A	RM 10K 1/6W F			
R145,245	OB22549A	RM 845 1/4W F			
R146,246	OB01888A	RK 10K 1/4W J			
249					
R147,247	OB22230A	RM 1.02K 1/6W F			
R148,162	OB09737A	RK 330K 1/6W J			
166,248					
262,266					
R149,159	OB09701A	RK 10K 1/6W J			
259					
R150,250	OB22305A	RM 4.7K 1/6W F			
R151,160	OB09717A	RK 47K 1/6W J			
164,251					

7.12. Power Supply P.C.B. Ass'y

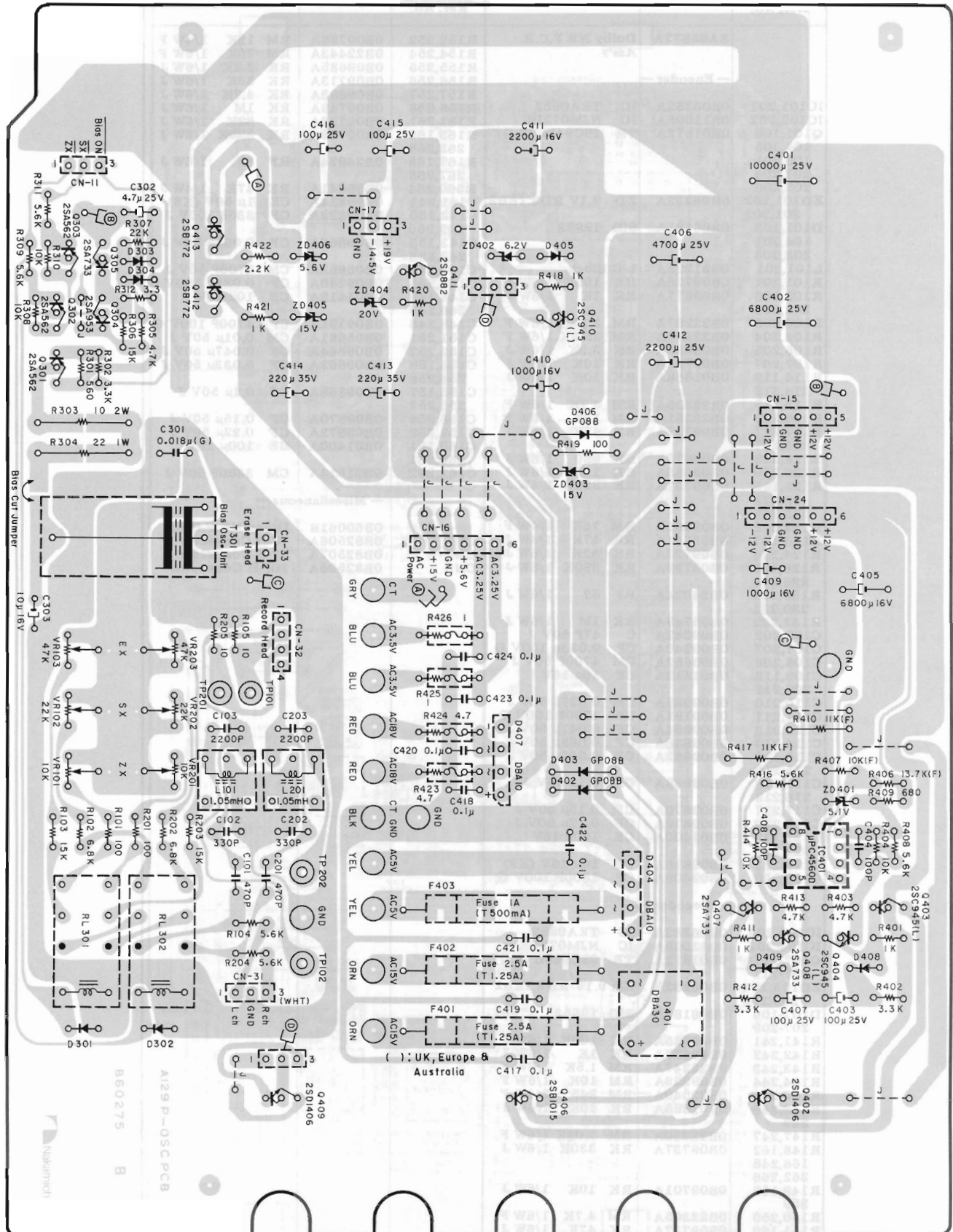


Fig. 7.12

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
IC401 Q301,302 303 Q304 Q305,407 408 Q402,409 Q403,404 410 Q406 Q411 Q412,413 ZD401	BA05871A	Power Supply P.C.B. Ass'y CR-5 (Canada & Others) & CR-5A	CN11 CN15 CN15 CN16,24 CN16 CN17 CN24 CN31 CN32 CN33 F401,402 F403	OB82516A OB81012A OB82520A OB81013A OB82521A OB82522A OB82526A OB81227A OB02242A OB02233A OB08962A OB08374A OB90005A OB82093B OE00037A OE00507A OE00510A	3P-H Connector Dip Mate 5P 5P-H Connector Dip Mate 6P 6P-H Connector 3P-H Connector 6P-H Connector 3P-T Post (White) 4P-T Post 2P-T Post Fuse 2.5A Fuse 1A Insu-Lock 204mm 3P Ribbon Cable (1) Earth Lug B-5 (1) Nut Hex, M3 (2) M3x8 $\oplus$ Pan (2A) (2)
	ZD402	OB12153A	ZD RD5.1JS-T1B2 6.2V RD6.2JS-T1B2	OE00868A	BT3x8 $\oplus$ Binding (5)
	ZD403,405 ZD404 ZD406	OB12321A OB12330A OB12150A	ZD 15V MTZ15C ZD 20V MTZ20C ZD 5.6V RD5.6JS-T1B2	OJ04485A OJ05079A	Heat Sink B (1) Heat Sink (1)
	D301,302 303,304 405,408 409 D401 D402,403 406 D404,407 L101,201 T301 VR101,201 VR102,202 VR103,203 R101,201 R102,202 R103,203 306 R104,204 309,311 408,416 R105,205 R301 R302,402 412 R303 R304 R305,403 413 R307 R308,310 404,414 R312 R401,411 418,420 421 R406 R407 R409 R410,417 R419 R422 R423,424 R425,426 C101,201 C102,202 C103,203 C301 C302 C303 C401 C402 C403,407 415,416 C404,408 C405 C406 C409,410 C411 C412 C413,414 C417-424 RL301,302 CN11,17	OB06398A OB06283A OB06109A OB06282A OB06705A OB51407A OB32061A OB32062A OB32064A OB09653A OB09697A OB09705A OB09695A OB09629A OB09671A OB09689A OB09936A OB09831A OB09693A OB09709A OB09701A OB09617A OB09677A OB22357A OB22343A OB09673A OB09504A OB09215A OB09685A OB24087A OB24023A OB09270A OB09322A OB09834A OB09584A OB01402A OB01412A OB40365A OB40364A OB01272A OB41386A OB40362A OB40197A OB40360A OB40361A OB40363A OB05831A OB09292A OB90142A OB81010A	SiD 1SS176 Diode Bridge DBA30 SiD GP08B Diode Bridge DBA10 Trap Coil 1.05mH Bias Osc. Unit Semi VR 10K Semi VR 22K Semi VR 47K RK 100 1/6W J RK 6.8K 1/6W J RK 15K 1/6W J RK 5.6K 1/6W J RK 10 1/6W J RK 560 1/6W J RK 3.3K 1/6W J RF 10 2W J RF 22 1W J RK 4.7K 1/6W J RK 22K 1/6W J RK 10K 1/6W J RK 3.3 1/6W J RK 1K 1/6W J RM 13.7K 1/6W F RM 10K 1/6W F RK 680 1/6W J RM 11K 1/4W F RF 100 1/4W J RK 2.2K 1/6W J R-Fuse 4.7 R-Fuse 1 CP 470P 100V J CP 330P 100V J CP 2200P 100V J CP 0.018 μ 100V G CE 4.7 μ 25V CE 10 μ 16V CE 10000 μ 25V CE 6800 μ 25V CE 100 μ 25V CP 100P 50V J CE 6800 μ 16V CE 4700 μ 25V CE 1000 μ 16V CE 2200 μ 16V CE 2200 μ 25V CE 220 μ 35V CC 0.1 μ 50V Z (8) Relay MR62-12SR Dip Mate 3P		

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA05863A	Main P.C.B. Ass'y CR-5, CR-5A & CR-50	Q111,211 R146,147 246,247 R148,248 R149,249 R150,250 R151,251 C121,221 C317,318 CN25 CN26 CN30	OB06299A OB09725A OB09639A OB09536A OB09685A OB09693A OB09868A OB40361A OB81229A OB81230A OB81228A	TR 2SC2878 RK 100K 1/6W J RK 27 1/6W J RF 18 1/2W J RK 2.2K 1/6W J RK 4.7K 1/6W J CF 0.1μ 50V J CE 2200μ 16V 3P-T Post (Red) 3P-T Post (Yellow) 3P-T Post (Black)		— Meter Amp. —	
IC302 IC306 Q108,208 ZD303 L104,204 VR104,204 R137,237 R138,238 R139,239 R140,240 R141,241 R142,242 R143,243 R144,244 R145,245 R170,270 R312 C118,218 C119,219 C120,220 C304 C330,331 CN23	OB06146A OB11005A OB06376A OB06418A OB06717A OB32061A OB09725A OB09829A OB09891A OB22548A OB22353A OB22506A OB09661A OB09667A OB09697A OB09699A OB09671A OB09814A OB09591A OB01804A OB01400A OB09302A OB02242A	IC NJM4558DD IC NJM072DE FET 2SK170 (GR) ZD 8.2V RD8.2JB2 Trap Unit Semi VR 10K RK 100K 1/6W J RM 3.32K 1/4W F RM 80.6 1/4W F RM 4.7M 1/4W J RM 12.4K 1/6W F RM 280K 1/6W F RK 220 1/6W J RK 390 1/6W J RK 6.8K 1/6W J RK 470 1/6W J RK 560 1/6W J CE 1μ 50V (KS) CP 0.01μ 100V J CM 3900P 50V J CE 100μ 16V C 100P 50V J 4P-T Post	IC308 Q114,115 214,215 Q116,216 D104,105 106,204 205,206 L105,205 R159,171 259,271 R160,161 168,260 261,268 R162,164 262,264 R163,167 263,267 R165,265 R166,266 R169,269 C124,125 224,225 C139,239	— Line Amp. — OB06443A OB10022A OB01872A OB06398A OB51225A OB09725A OB09749A OB09733A OB09677A OB22342A OB22308A OB09701A OB09814A OB09409A	IC NJM082D FET 2SK246 TR 2SC945L (P,Q) SiD 1SS176 L-C Block RK 100K 1/6W J RK 1M 1/6W J RK 220K 1/6W J RK 1K 1/6W J RM 9.76K 1/6W F RM 4.99K 1/6W F RK 10K 1/6W J CE 1μ 50V (KS) CP 1800P 100V G	IC304 ZD101,201 D101,102 VR105,205 R152,252 R153,253 R154,254 R155,255 R156,256 R157,257 R325 C128,228 C129,229 C136,236 C137,237 C319 CN27	OB06216A OB12271A OB06398A OB32064A OB22357A OB09733A OB09709A OB09737A OB22437A OB22401A OB24088A OB01405A OB09218A OB09327A OB09279A OB40079A OB81225A	IC μPC4556C ZD 4.7V MTZ4.7B T-77 SiD 1SS176 Semi VR 47K RM 13.7K 1/6W F RK 220K 1/6W J RK 22K 1/6W J RK 330K 1/6W J RM 66.5K 1/6W F RM 33.2K 1/6W F R-Fuse 10 1/4W J CE 1μ 50V CE 47μ 16V (LN) CE 0.33μ 50V (LN) CC 22P 50V K CE 220μ 16V 2P-T Post (Red)
	— PB Eq. Amp. —							
	— Rec. Eq. Amp. —							
IC305 Q106,107 206,207 L103,203 R125,225 R126,226 R127,131 227,231 R128,133 228,233 R129,229 R130,230 R132,232 R134,234 R135,235 C110,210 C111,211 C112,212 C113,213 C114,214 C138,238	OB06387A OB06299A OB51226A OB09713A OB09707A OB09731A OB09677A OB22296A OB09703A OB22410A OB22247A OB09701A OB05652A OB09814A OB40154A OB05530A OB05685A OB41237A	IC NJM2043DD TR 2SC2878 L-C Block RK 33K 1/6W J RK 18K 1/6W J RK 180K 16W J RK 1K 1/6W J RM 3.92K 1/6W F RK 12K 1/6W J RM 39.2K 1/6W F RM 1.5K 1/6W F RK 10K 1/6W J CM 4700P 50V J CE 1μ 50V (KS) CE 47μ 16V (KS) CM 6800P 50V J CM 0.082μ 50V J CP 3300P 100V J	R165,265 R166,266 R169,269 C124,125 224,225 C139,239 IC303 Q101-104 201-204 Q301,302 ZD301,302 D302,303 304 L102,202 R101,201 R102,202 R103,203 303,308 313,314 318,319 322 R104,204 R105,205 301,302 324 R106,206 R107,110 207,110 320 R108,109 208,209 316 R111,211 R112,212 R304,323 R306 R307 R315,317 R321 R326 C101,201 C102,202 C103,203 C104,204 C105,205 C301,302 C307 C313 C320 Cds301	OB06124B OB01872A OB06013A OB12360A OB06398A OB06690A OB09733A OB09653A OB09725A OB09705A OB09677A OB22275A OB09701A OB09749A OB22669A OB05743A OB09709A OB09717A OB09713A OB09737A OB09685A OB05622A OB09814A OB41386A OB09932A OB09189A OB05687A OB01400A OB09163A OB41298A OB01674A OB06325B	IC NJM4558D TR 2SC945L (P,Q) (8) TR 2SA733 (P,Q) ZD 2.7V RD2.7ESB2 SiD 1SS176 L-C Block (Blue) RK 220K 1/6W J RK 100 1/6W J RK 100K 1/6W J RK 15K 1/6W J RK 1K 1/6W J RM 2.67K 1/6W F RK 10K 1/6W J RK 1M 1/6W J RM 7.5K 1/4W F RK 27K 1/4W J RK 22K 1/6W J RK 47K 1/6W J RK 33K 1/6W J RK 330K 1/6W J RK 2.2K 1/6W J RK 2.2K 1/4W J CE 1μ 50V (KS) CP 100P 50V J CE 22μ 16V (KS) CM 2700P 50V J CM 1200P 50V J CE 100μ 16V CE 10μ 16V (BP) CF 0.1μ 50V J CE 10μ 25V Photocoupler MCD7214F 3P-T Post	IC301 Q105,205 D107,207 VR101,201 VR102,103 202,203 R113,213 R114,214 R115,118 119,215 218,219 310 R116,216 R117,217 R120,220 R121,221 R122,222 R123,223 R124,224 R136,236 R309,311 C130,230 C131,132 231,232 C133,233 C135,138 235,238 C305,306	OB11027A OB06013A OB06398A OB32062A OB32061A OB09705A OB09703A OB09701A OB09749A OB22326A OB09709A OB09689A OB09697A OB09693A OB09699A OB09713A OB09695A OB01846A OB09270A OB05681A OB05530A OB05814A OB05550A	IC TC9145P TR 2SA733 (P,Q) SiD 1SS176 Semi VR 22K Semi VR 10K RK 15K 1/6W J RK 12K 1/6W J RK 10K 1/6W J RK 1M 1/6W J RM 6.98K 1/6W F RK 22K 1/6W J RK 3.3K 1/6W J RK 6.8K 1/6W J RK 4.7K 1/6W J RK 8.2K 1/6W J RK 33K 1/6W J RK 5.6K 1/6W J RK 4.7K 1/4W J CP 470P 100V J CM 0.01μ 50V J CM 6800P 50V J CM 8200P 50V J CM 1000P 50V J
	— Rec. Cal. —							
IC301 Q105,205 D107,207 VR101,201 VR102,103 202,203 R113,213 R114,214 R115,118 119,215 218,219 310 R116,216 R117,217 R120,220 R121,221 R122,222 R123,223 R124,224 R136,236 R309,311 C130,230 C131,132 231,232 C133,233 C135,235 C305,306	OB11027A OB06013A OB06398A OB32062A OB32061A OB09705A OB09703A OB09701A OB09749A OB22326A OB09709A OB09689A OB09697A OB09693A OB09699A OB09713A OB09695A OB01846A OB09270A OB05681A OB05530A OB05814A OB05550A	IC TC9145P TR 2SA733 (P,Q) SiD 1SS176 Semi VR 22K Semi VR 10K RK 15K 1/6W J RK 12K 1/6W J RK 10K 1/6W J RK 1M 1/6W J RM 6.98K 1/6W F RK 22K 1/6W J RK 3.3K 1/6W J RK 6.8K 1/6W J RK 4.7K 1/6W J RK 8.2K 1/6W J RK 33K 1/6W J RK 5.6K 1/6W J RK 4.7K 1/4W J CP 470P 100V J CM 0.01μ 50V J CM 6800P 50V J CM 8200P 50V J CM 1000P 50V J		OB81227A	3P-T Post			
IC307 Q109,209 Q110,210	OB06217A OB06429A OB10015A	IC NJM4560D TR 2SC2655 (Y) TR 2SA1020 (O,Y)	CN28					
	— Headphone Amp. —							

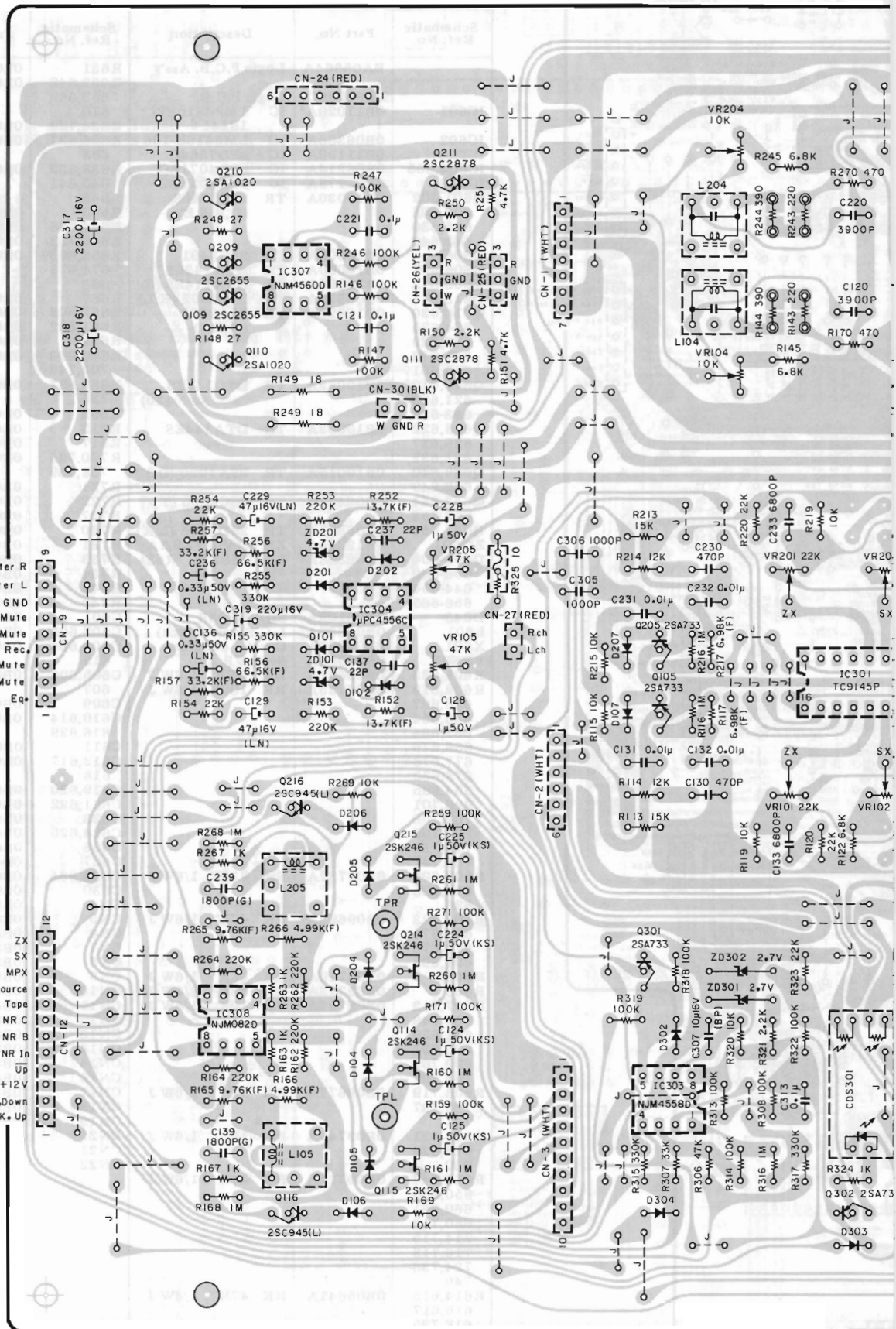


Fig. 7.13

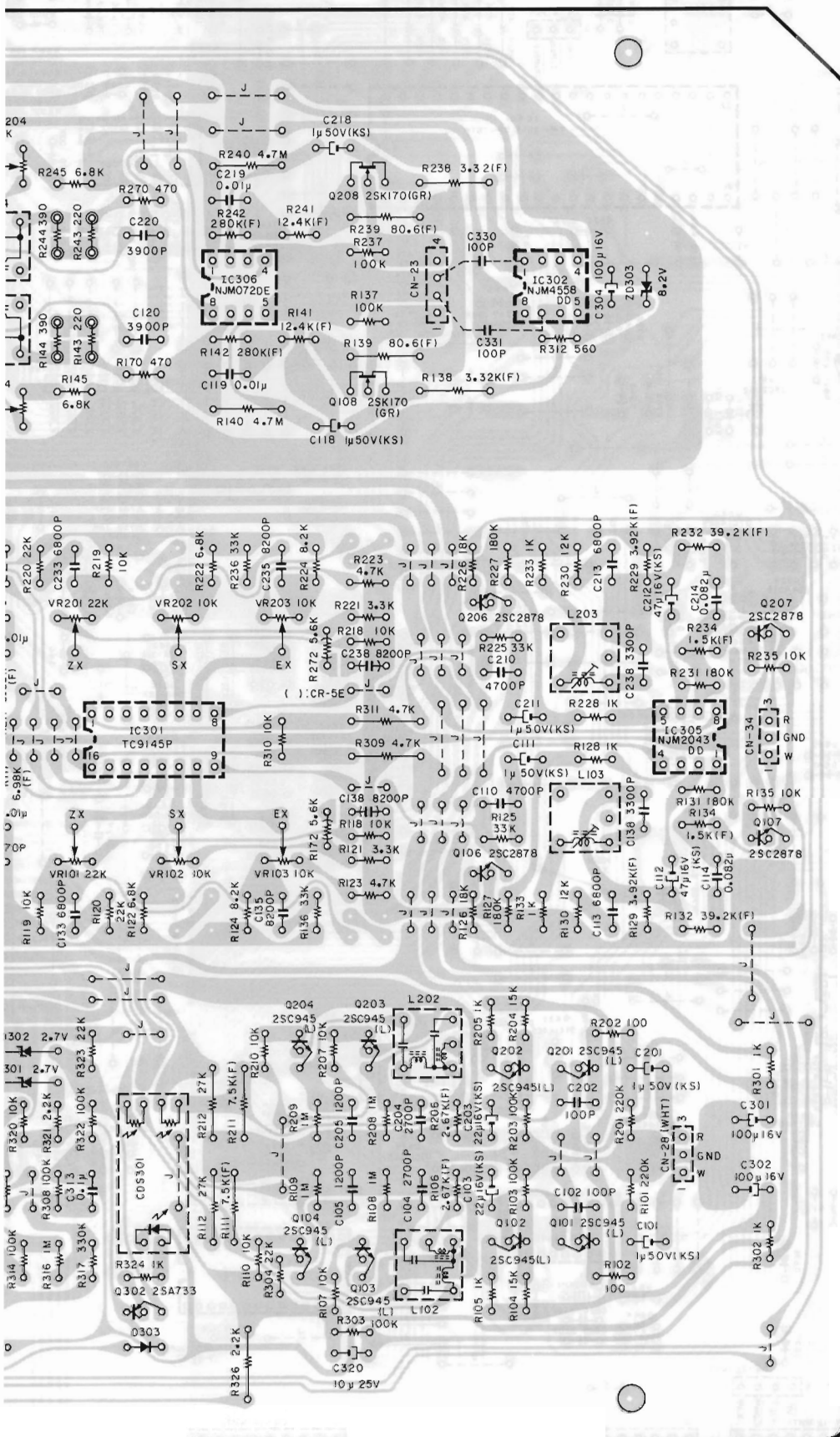
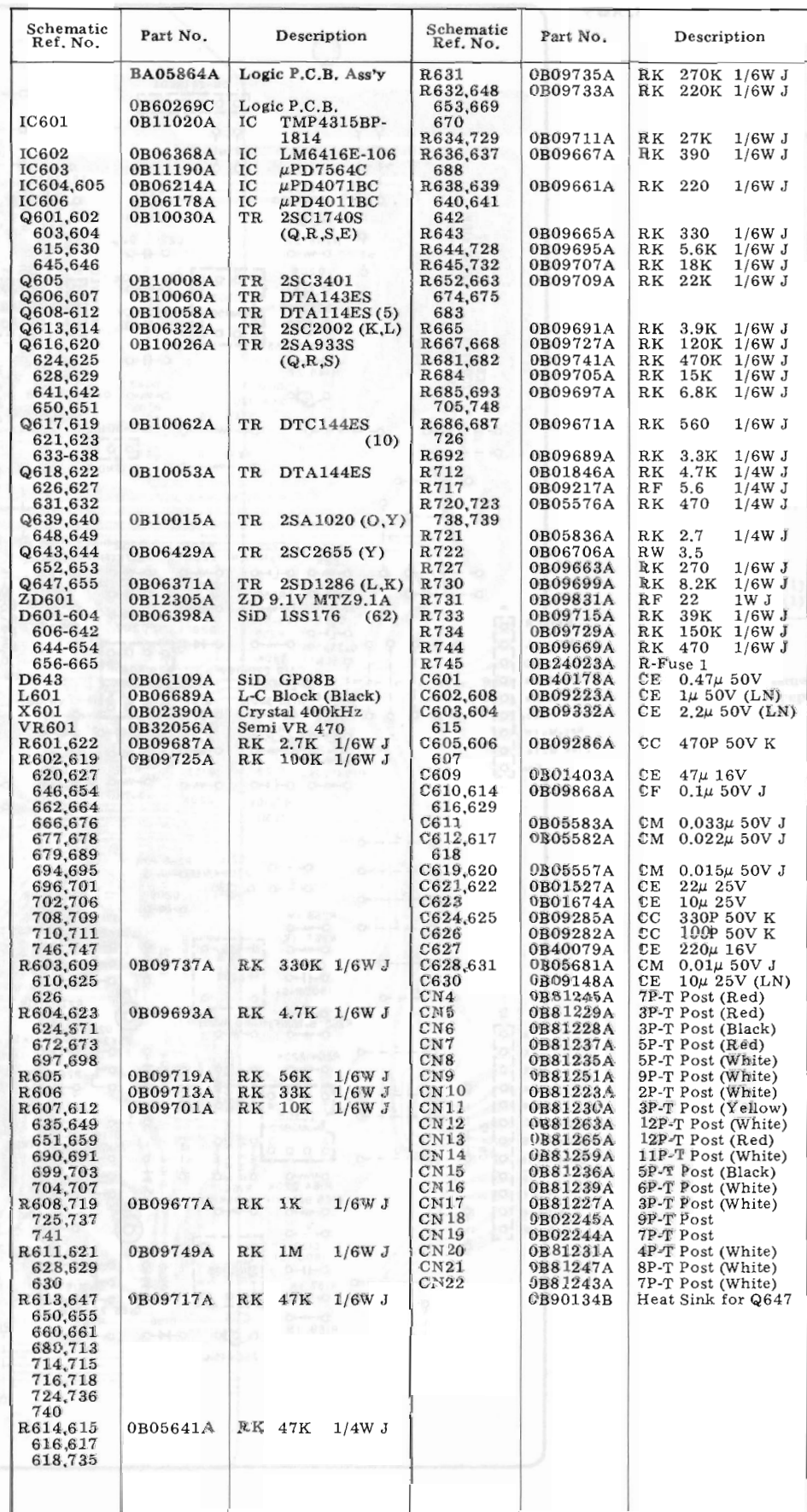
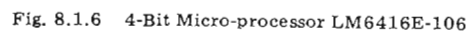
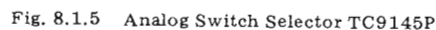
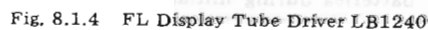
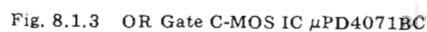
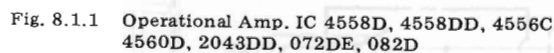


Fig. 7.13



8.1. IC Block Diagrams



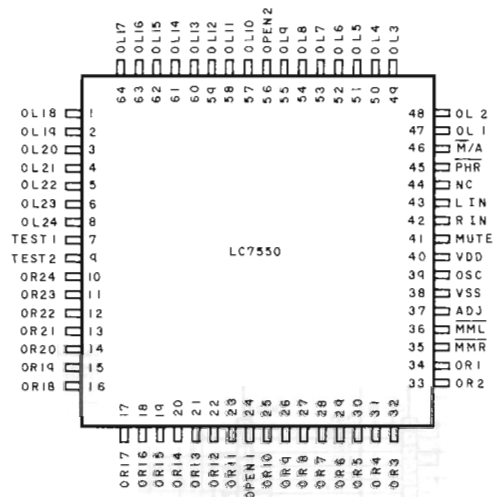
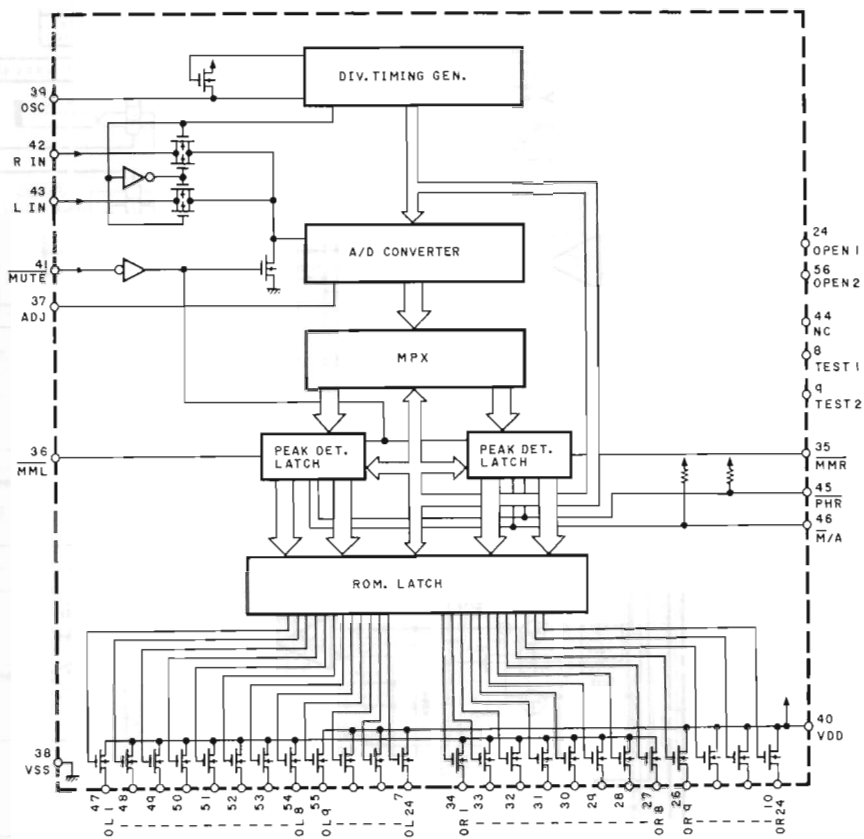


Fig. 8.1.7 Level Meter Controller LC7550

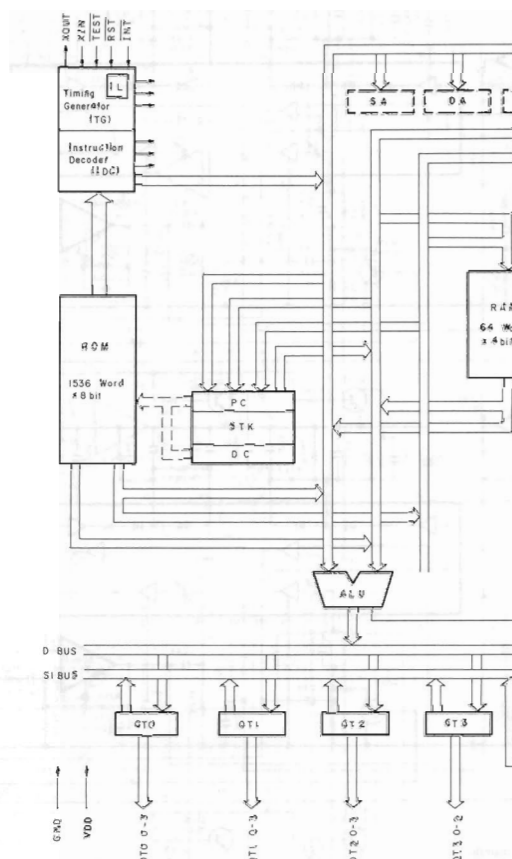
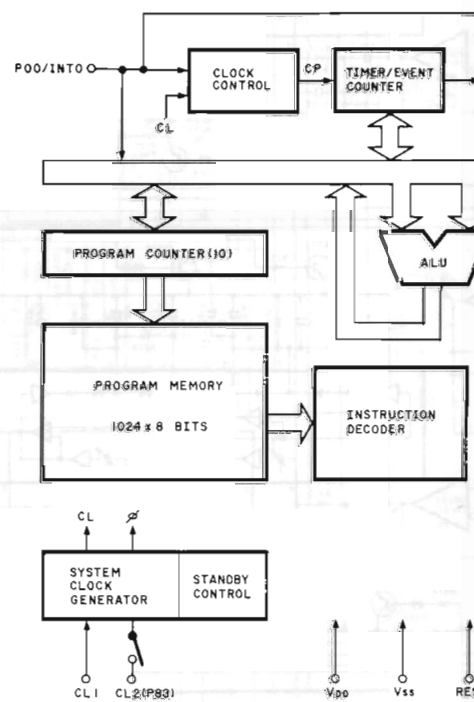


Fig. 8.1.8 4-Bit

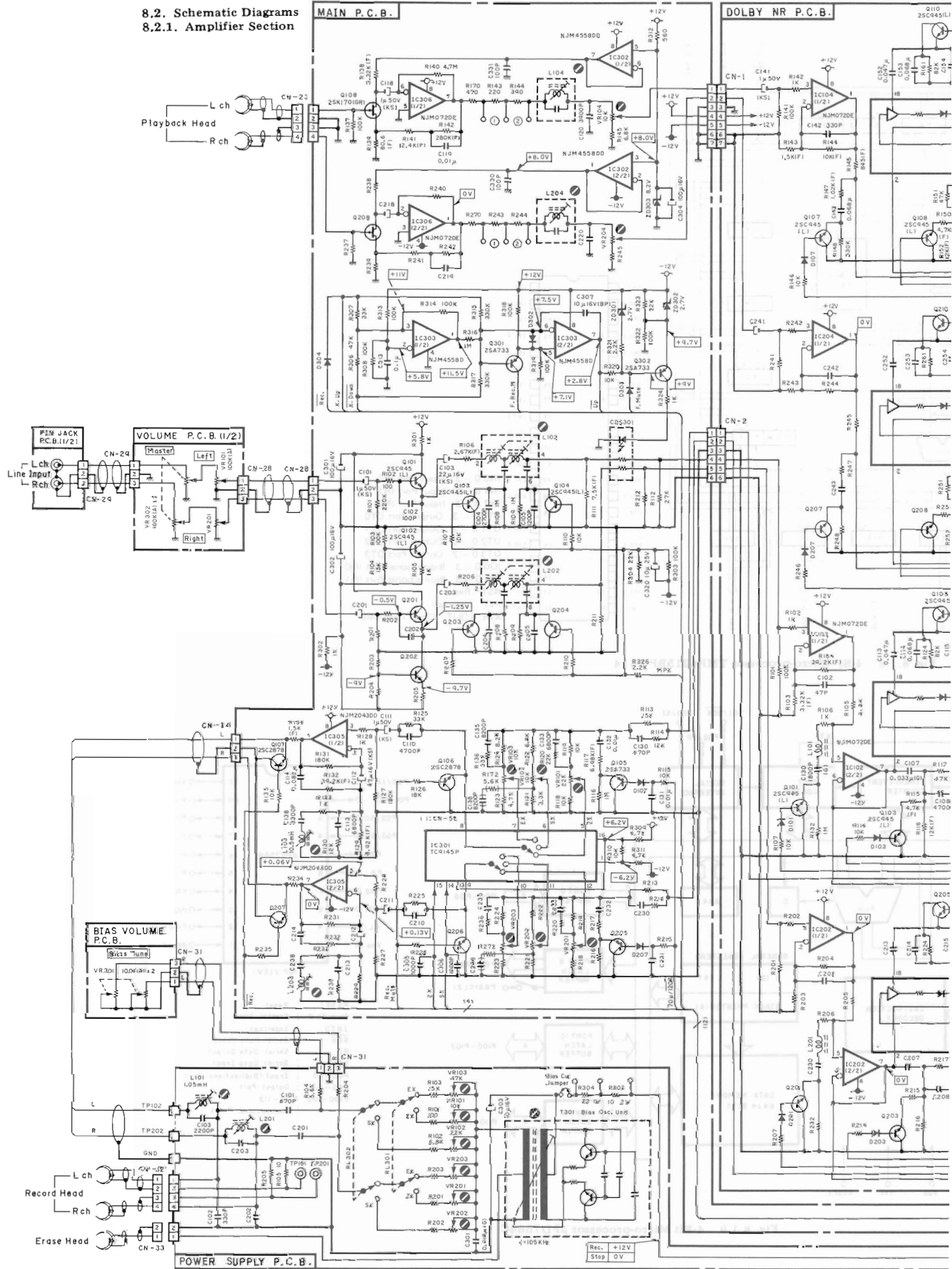


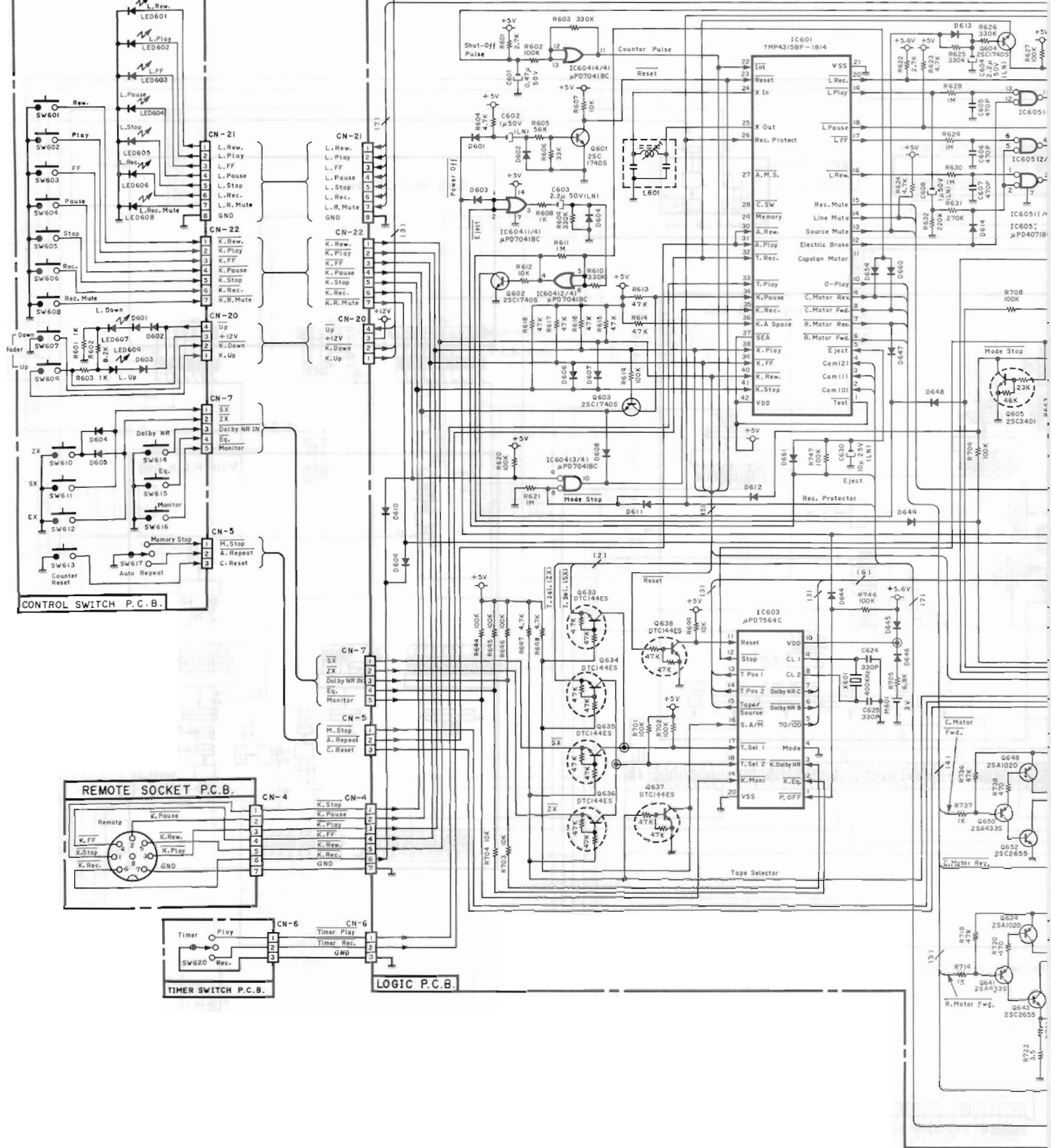
[illegible]

Fig. 8.2.1.

8.2. Schematic Diagrams

8.2.1. Amplifier Section

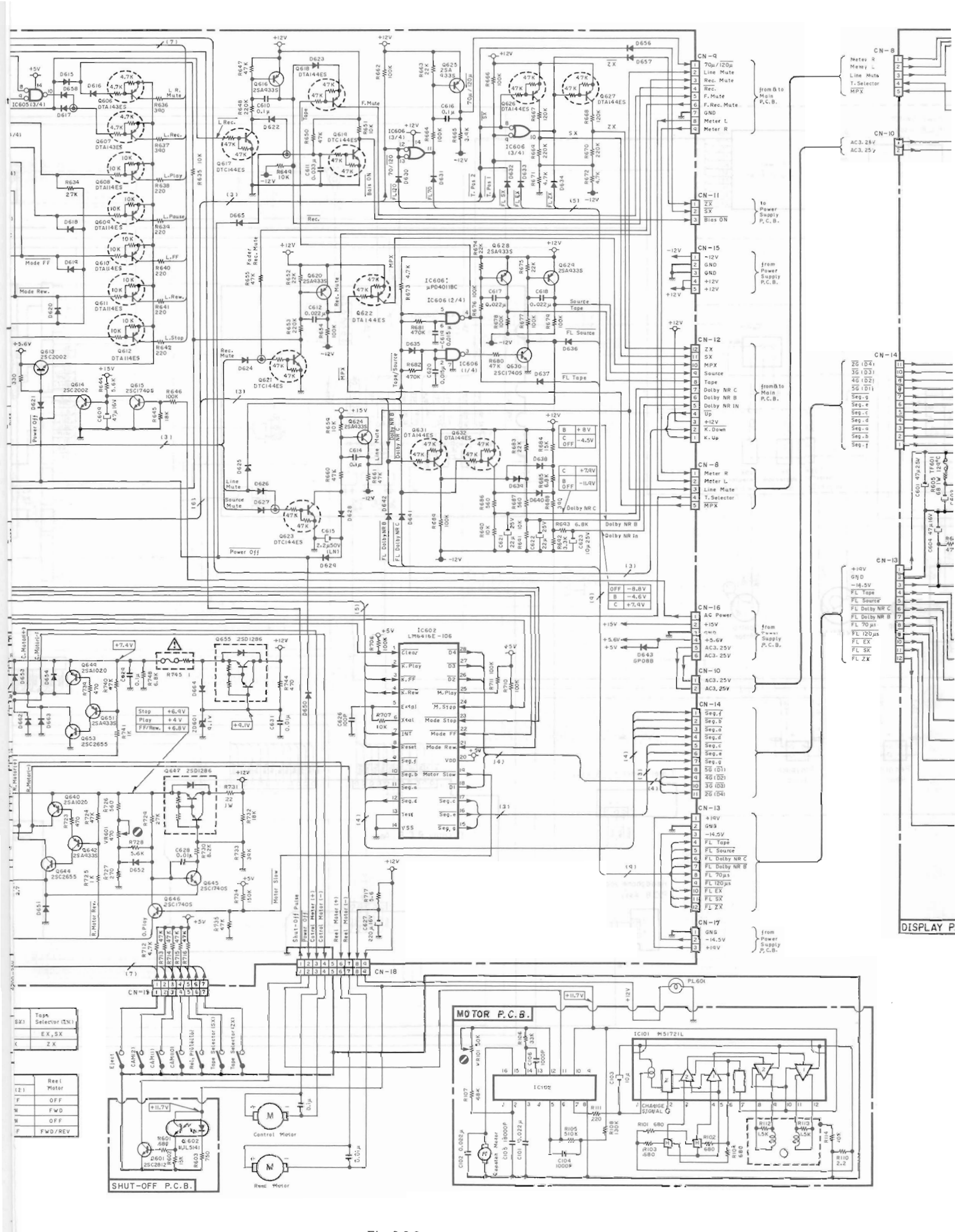


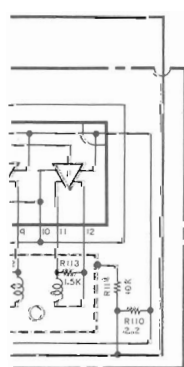
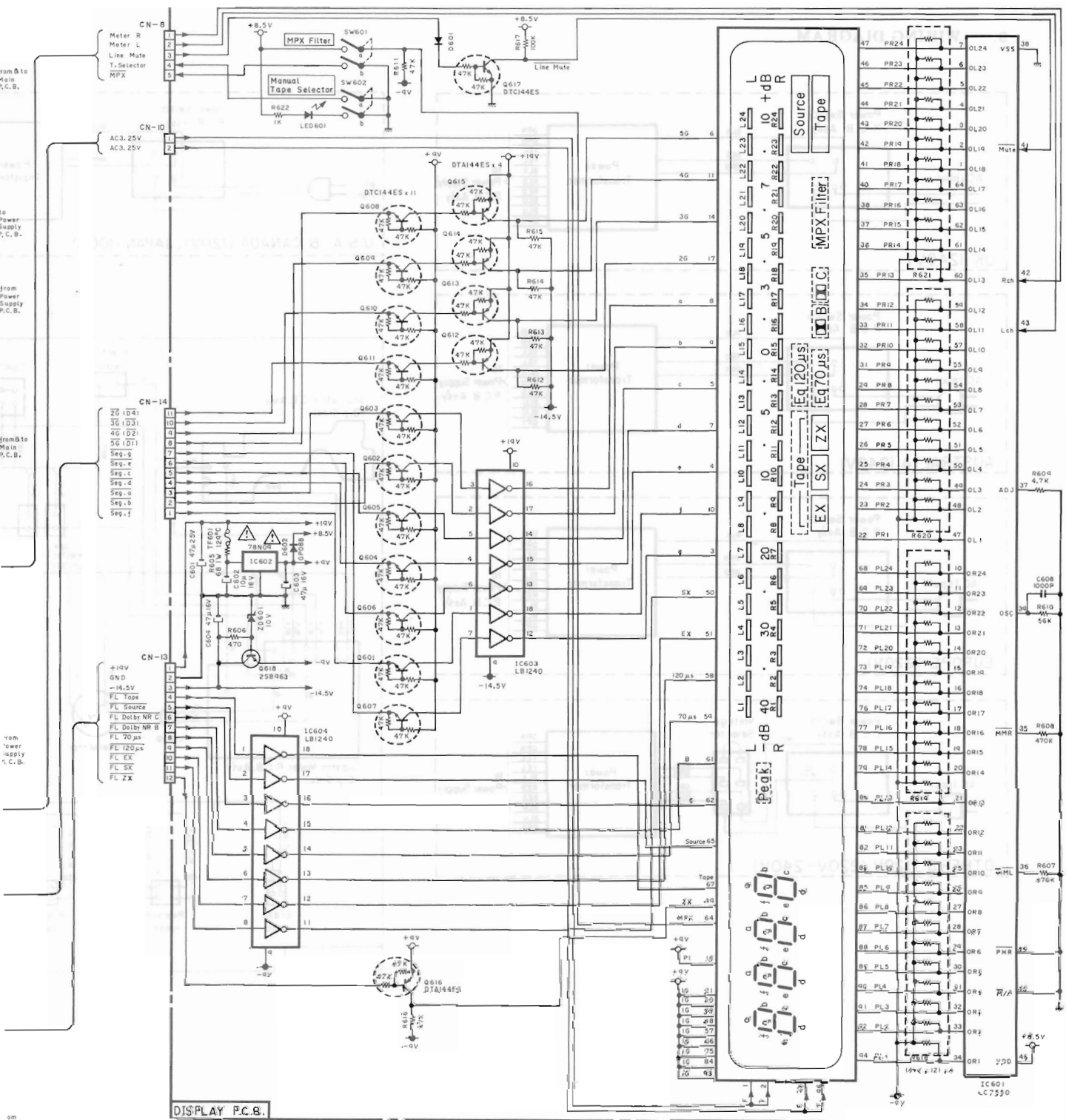


	Eject	Rec. Protect	Tape Selector
ON	Cassette Case Open	Protected	E X
OFF	Cassette Case Closed	Not Protected	S X, Z

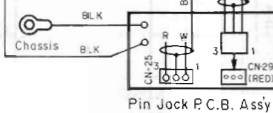
Cam Switch Operation

Modg	Cam (0)	Cam (1)	Cam
Stop	ON	ON	01
Play	ON	OFF	0
Pause	OFF	ON	0
T.F./Rev.	ON	OFF	01

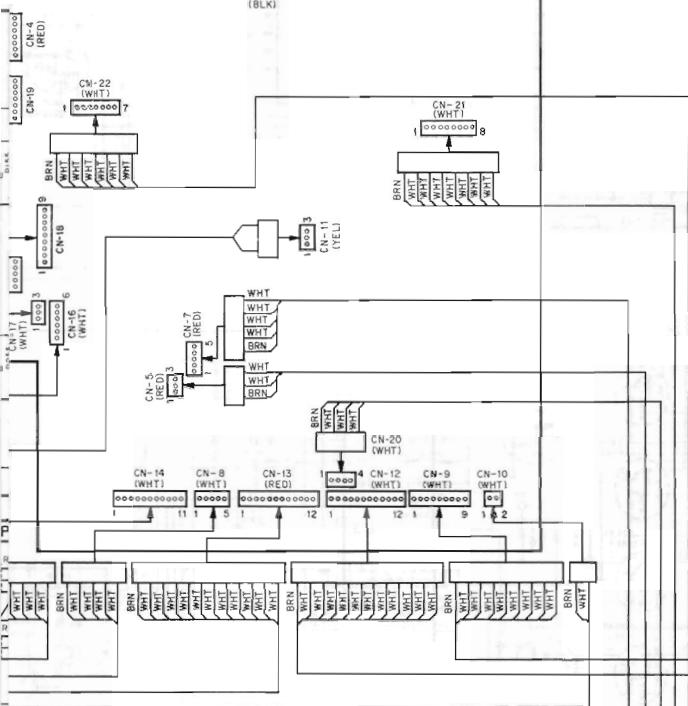




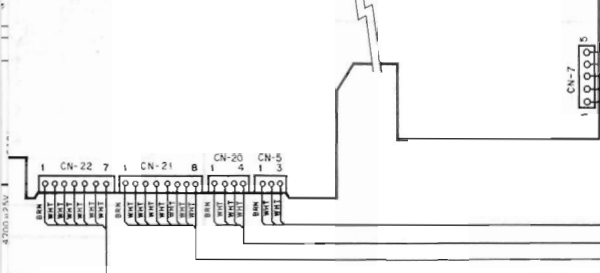
Remote Socket P.C.B. Ass'y
(Tip Side)



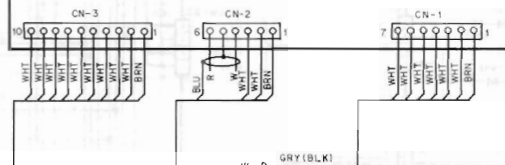
Logic P.C.B. Ass'y



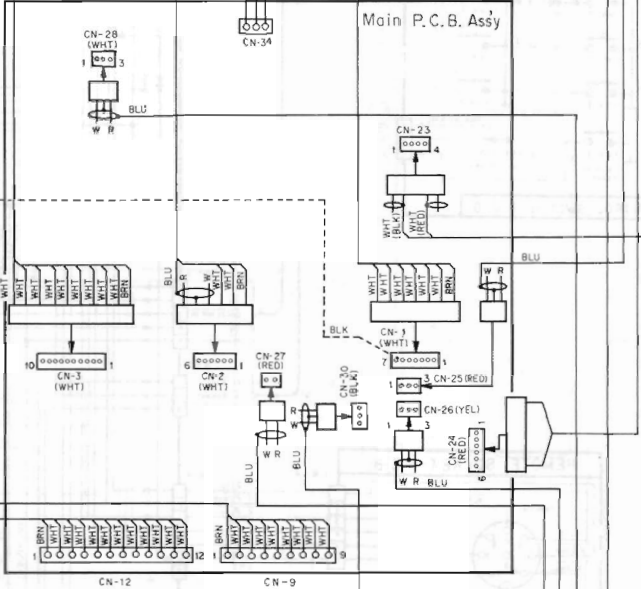
Control Switch P.C.B. Ass'y



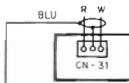
Dolby NR P.C.B. Ass'y



Main P.C.B. Ass'y



Bias Volume P.C.B. Ass'y



Volume P.C.B. Ass'y

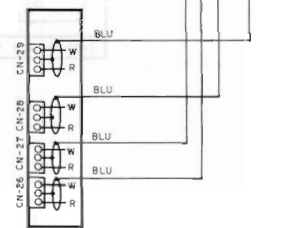
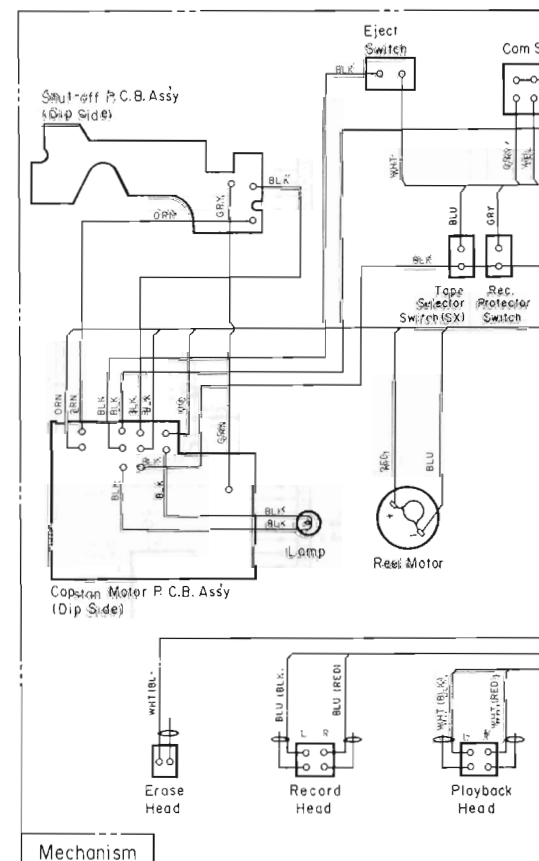
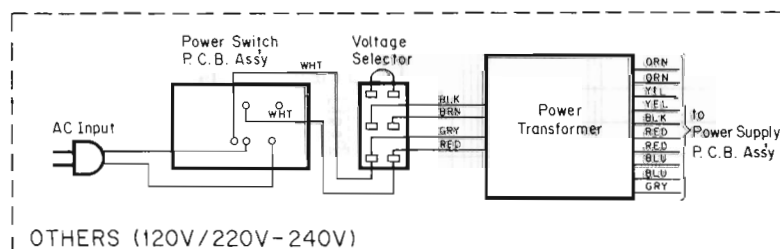
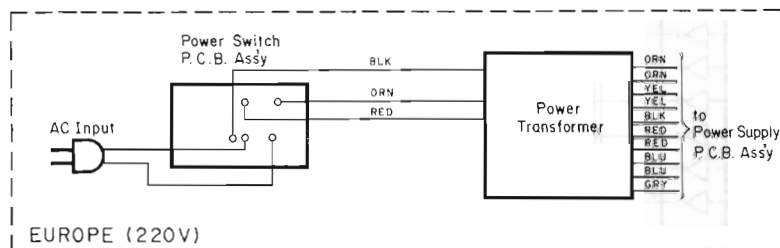
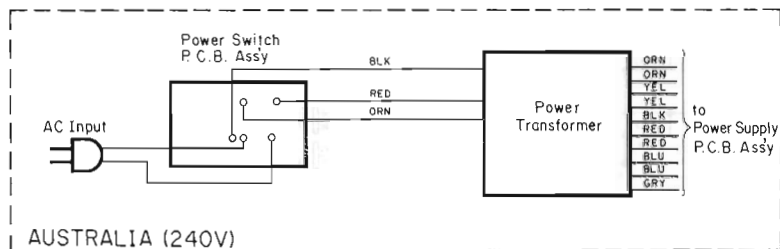
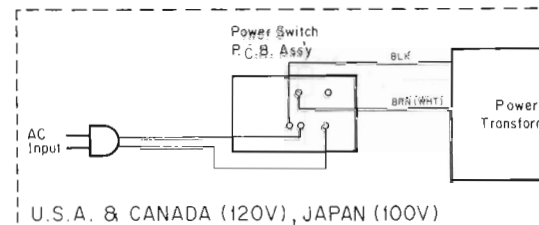
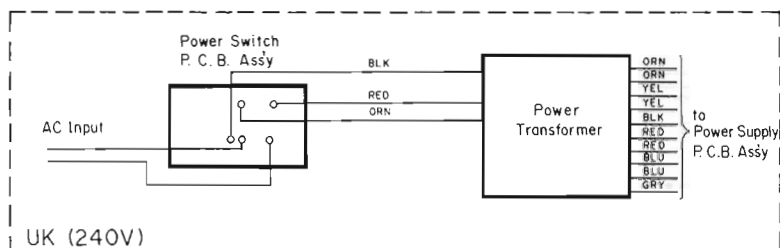




Fig. 9

9. 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 ().

10. BLOCK DIAGRAMS

10.1. Amplifier Section

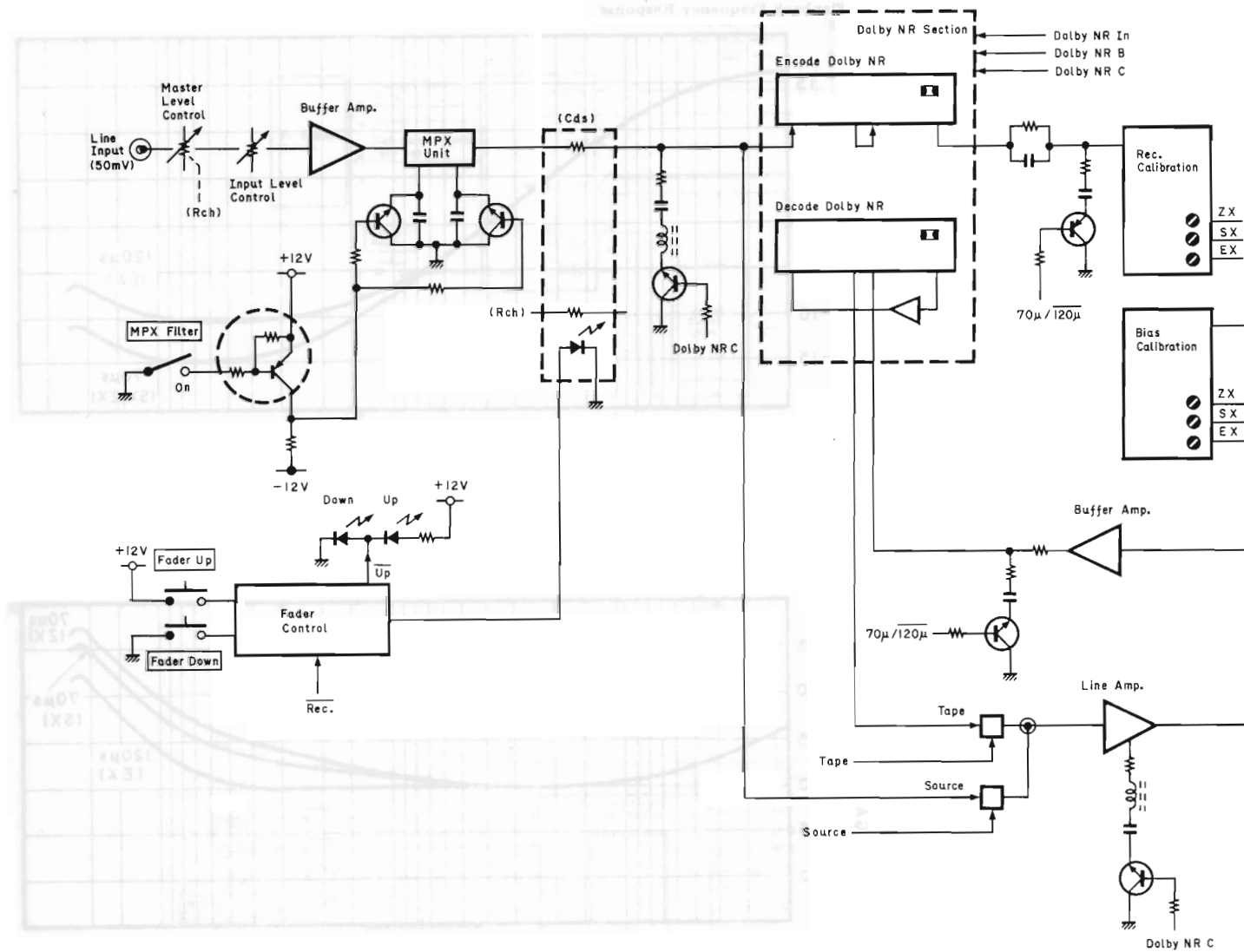
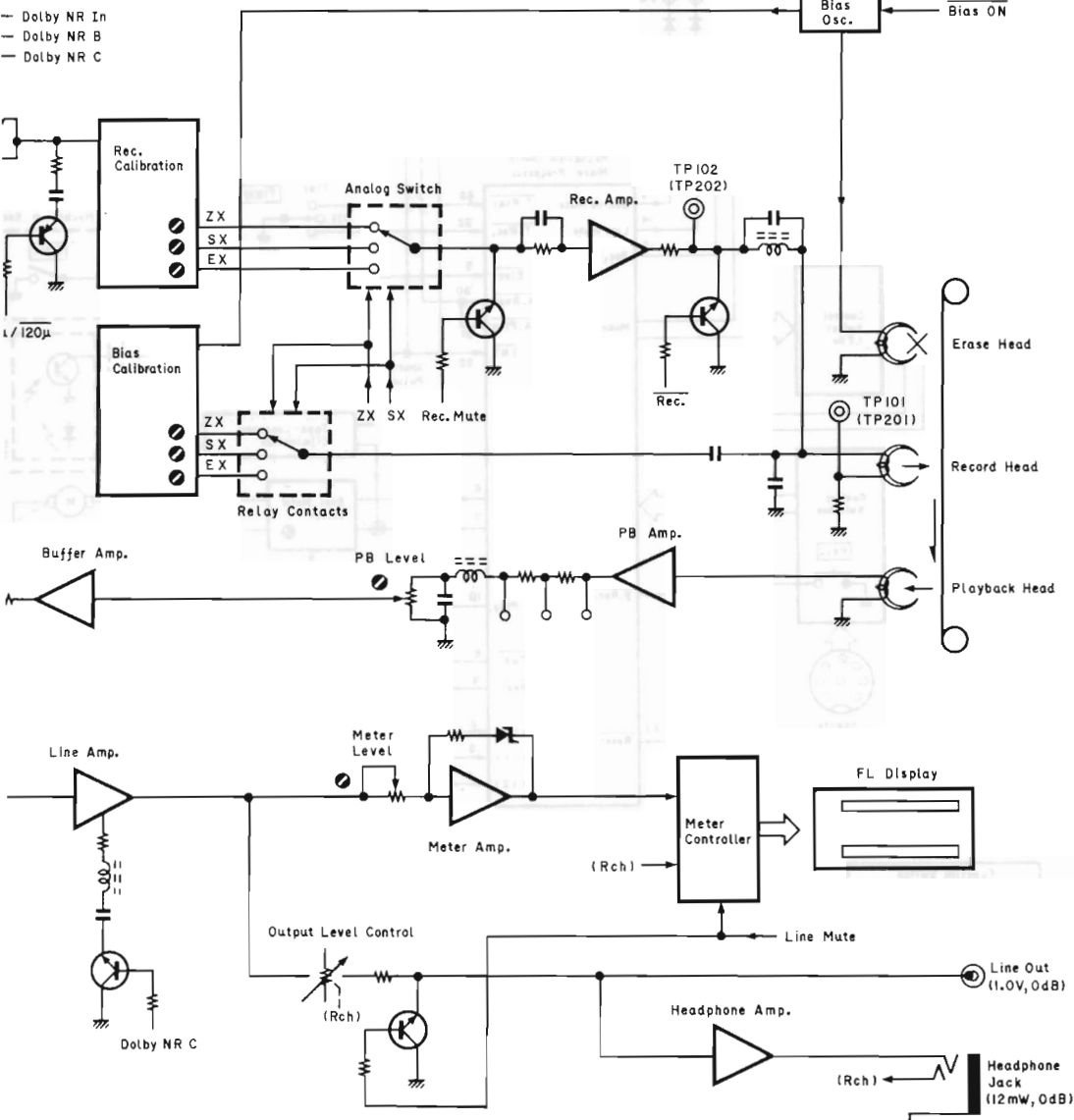


Fig. 10.1



11. TIMING CHART AND EQ. AMP. FREQUENCY RESPONSE

11.1. Eq. Amp. Frequency Response

(1) Playback Frequency Response

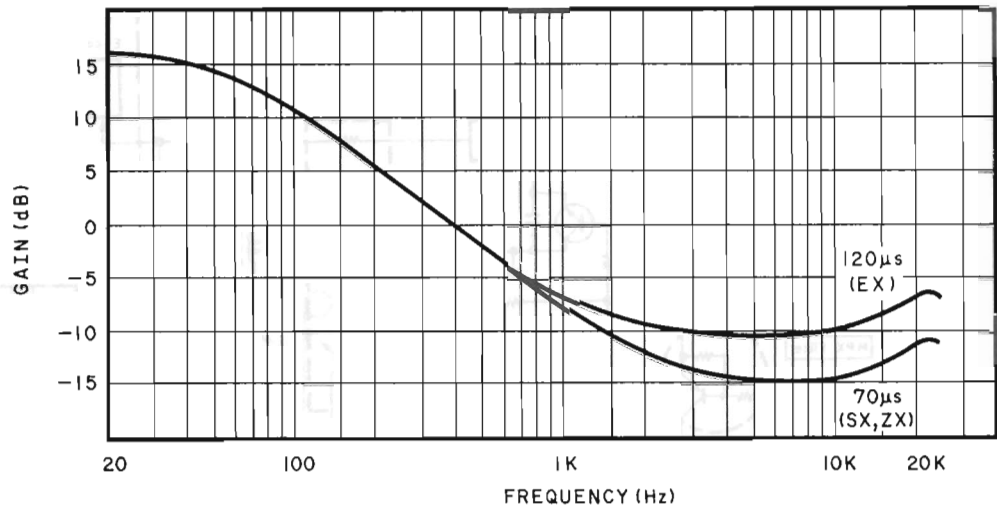


Fig. 11.1.1

(2) Record Current Frequency Response

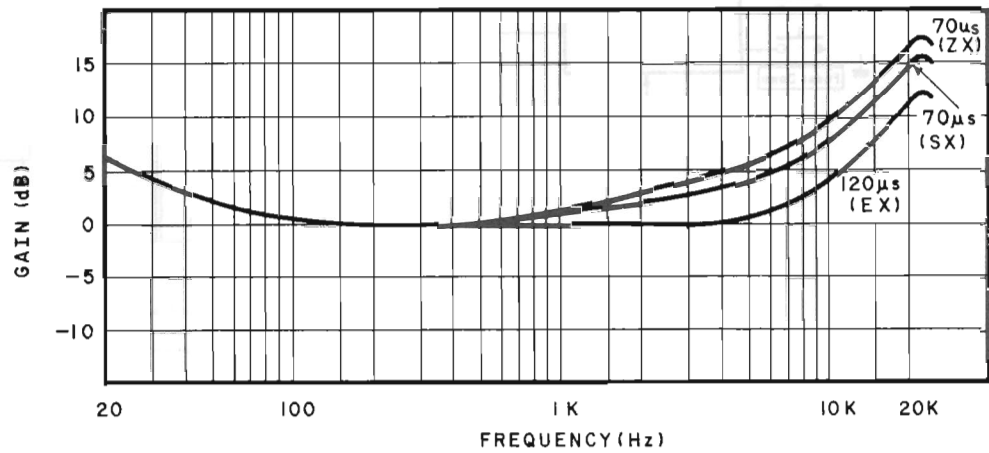
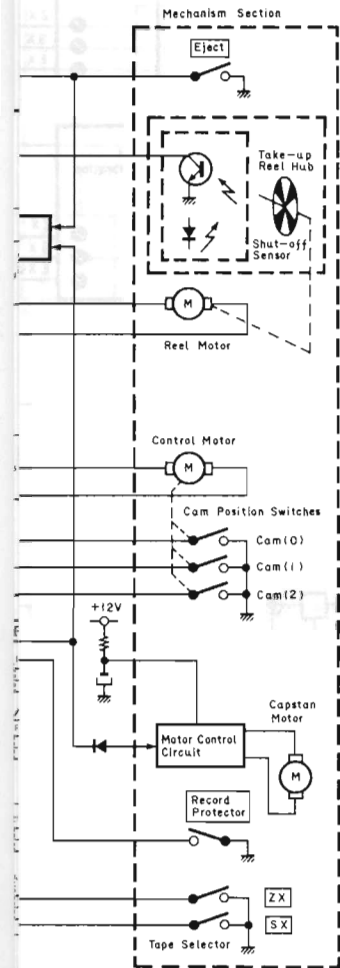


Fig. 11.1.2



10.2. Mechanism Control Section

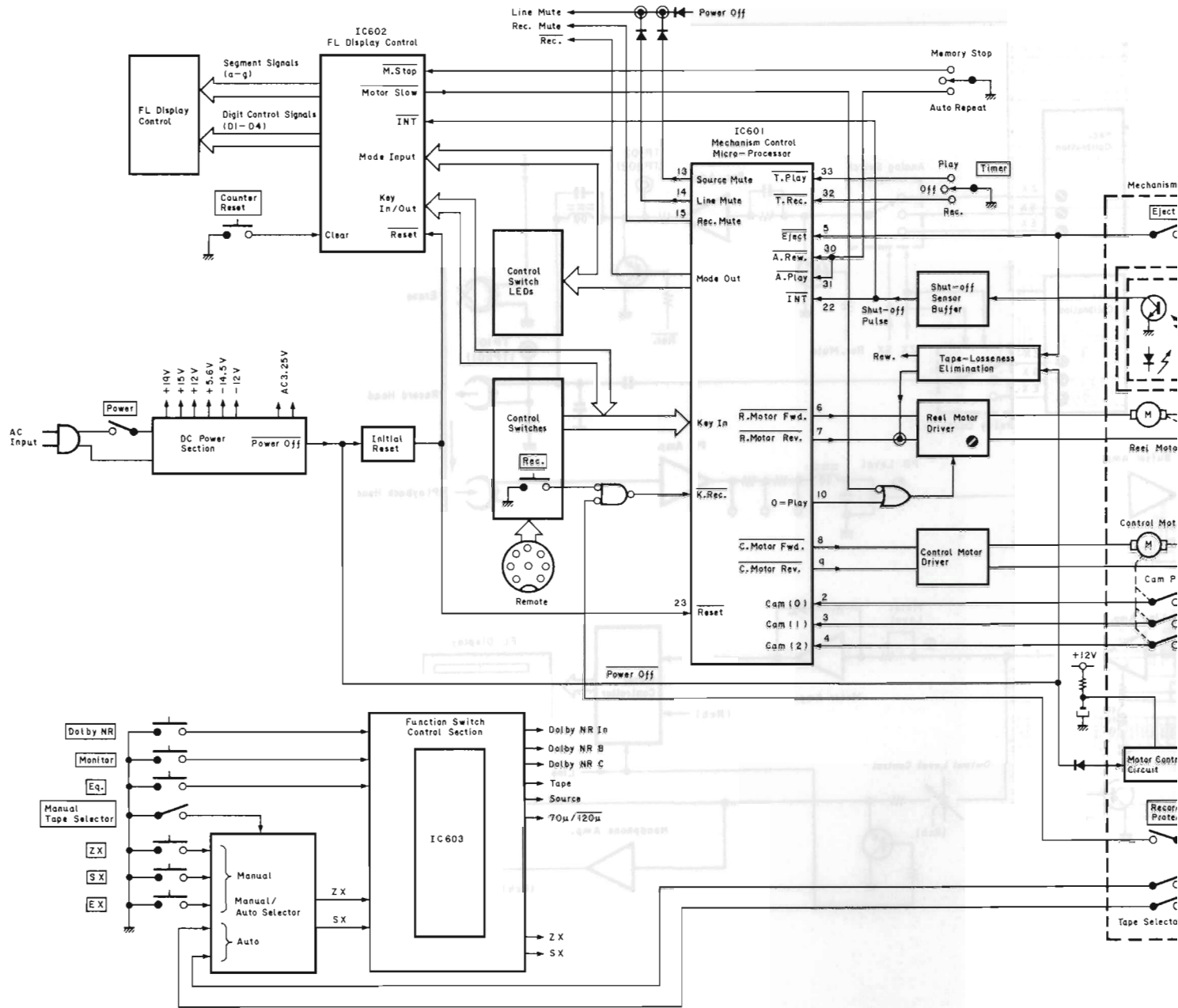


Fig. 10.2

11.2. Timing Chart

(1) Overall Timing Chart

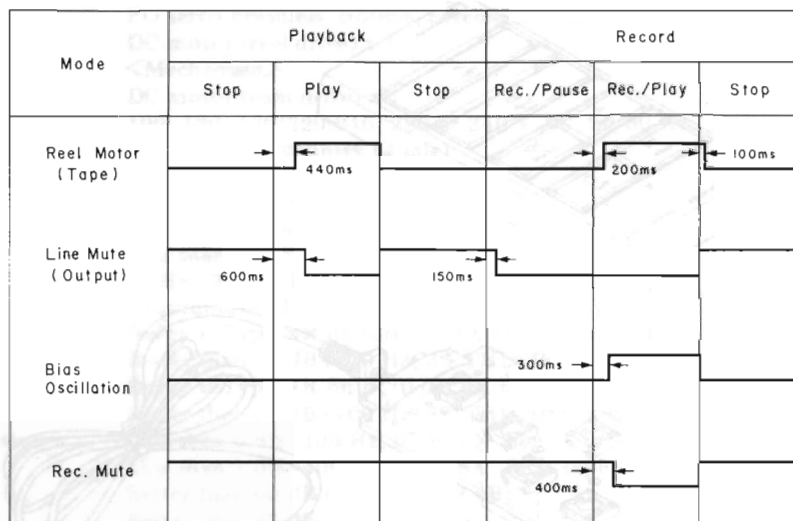


Fig. 11.2.1

(2) Mechanism Control Timing Chart

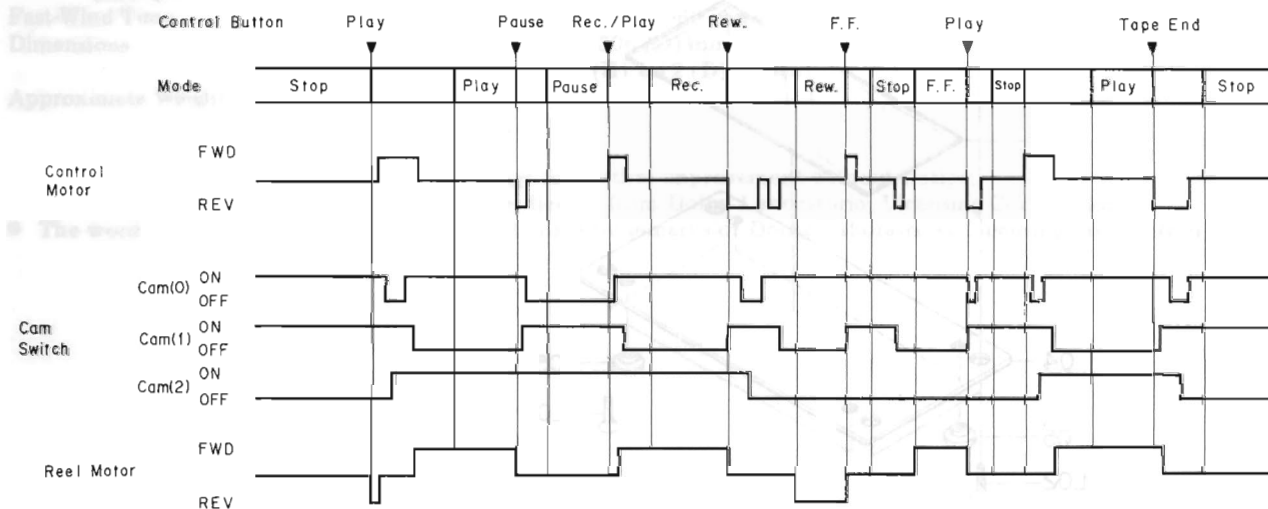


Fig. 11.2.2

12. REMOTE CONTROL UNIT RM-5 (Option)

(1) Mechanism Ass'y and Parts List

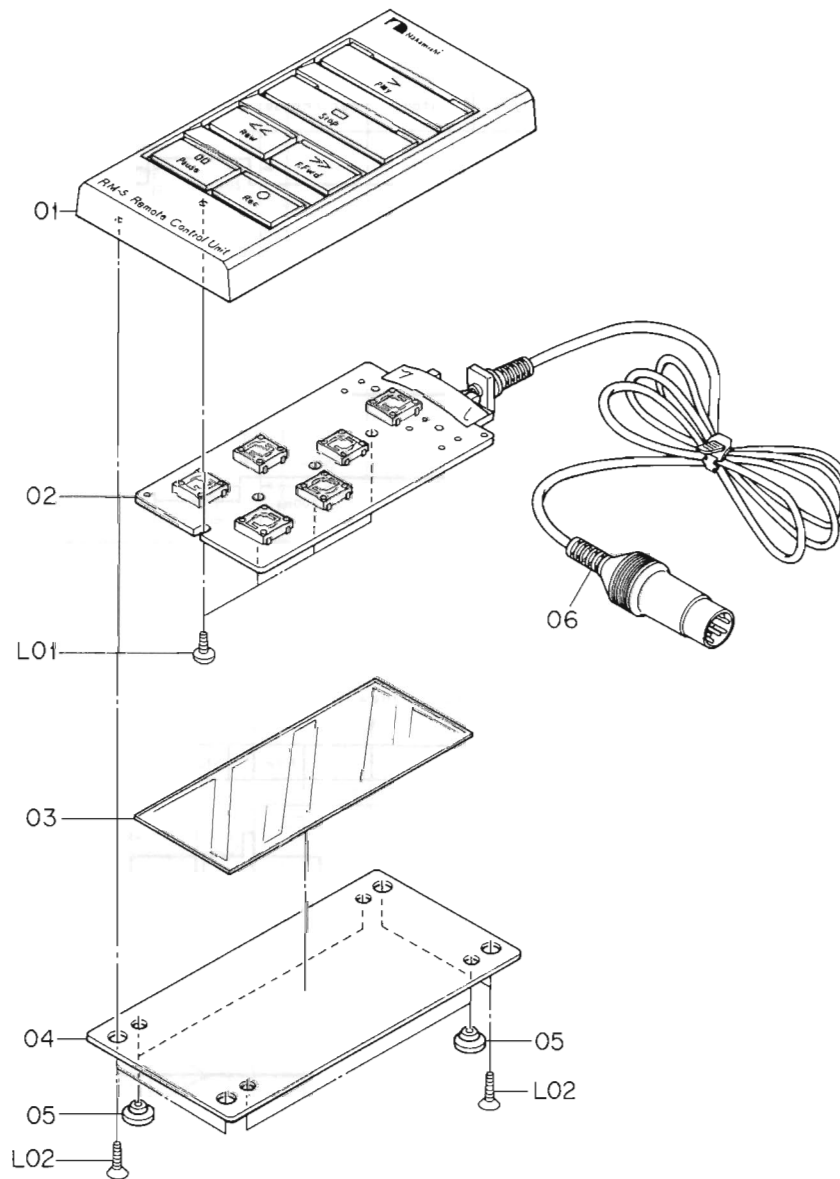


Fig. 12

Schematic Ref. No.	Part No.	Description	Q'ty
	HA04955A	Remote Control Unit RM-5	
01	0H04225B	Upper Case	1
02	BA05971A	Remote P.C.B. Ass'y (Consisting of the followings)	1
	(0B60001A)	Remote P.C.B.	(1)
	(0B07354A)	Push Switch	(6)
03	0J04700A	Insulator	1
04	0H04226A	Bottom Cover	1
05	0H03920A	Leg	4
06	BA04959A	8-Pin Cord Ass'y	1
L01	0E00857A	BT3x6 ⌀ Binding	4
L02	0E03115A	BT3x8 ⌀ Countersunk (Black Chromate)	4

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> FG servo brushless, slotless, coreless DD motor (capstan drive) x 1 DC motor (reel drive) x 1 <Mechanism> DC motor (cam drive) x 1
Power Source	100, 120, 120/220-240, 220 or 240 V AC, 50/60 Hz (According to country of sale)
Power Consumption	45 W max.
Tape Speed	1-7/8 ips. (4.8 cm/sec.) $\pm 0.5\%$
Wow and Flutter	Less than $\pm 0.048\%$ WTD Peak Less than 0.027% WTD RMS
Frequency Response	20 Hz—20,000 Hz ± 3 dB (recording level —20 dB, ZX, SX, EXII tape)
Signal to Noise Ratio	Dolby C-Type NR on <70 μ s, ZX tape> Better than 72 dB (400 Hz, 3% THD, IHF A-WTD RMS) Dolby B-Type NR on <70 μ s, ZX tape> Better than 66 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Total Harmonic Distortion	Less than 0.8% (400 Hz, 0 dB, ZX tape) Less than 1.0% (400 Hz, 0 dB, SX, EXII tape)
Erasure	Better than 60 dB (100 Hz, +10 dB)
Separation	Better than 37 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV/40 kohms
Output (Line)	1.0 V (400 Hz, 0 dB, output level control at max.) 2.2 kohms
(Headphones)	12 mW into 8 ohms (400 Hz, 0 dB, output level control at max.)
Fast-Wind Time	Approx. 80 seconds (with C-60 cassette)
Dimensions	435 (W) x 135 (H) x 306 (D) mm 17-1/8 (W) x 5-5/16 (H) x 12 (D) inches
Approximate Weight	8.5 kg 18 lb., 12 oz.

- Specifications and design are subject to change for further improvement without notice.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- The word "DOLBY" and the Double-D-Symbol are trademarks of Dolby Laboratories Licensing Corporation.

Service Manual

Nakamichi CR-5, CR-5A, CR-5E

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