

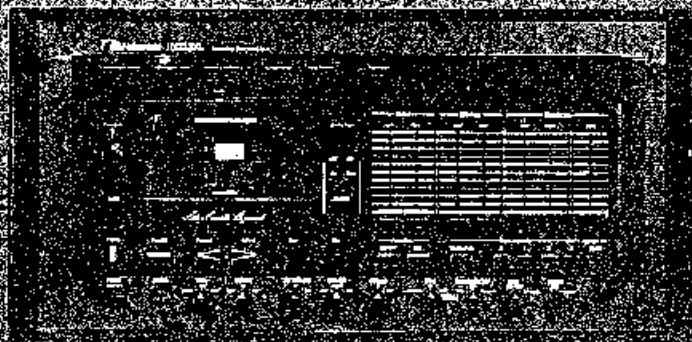


Nakamichi

# Service Manual

## Nakamichi 1000ZXL

Computing Cassette Deck



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1. GENERAL

1.1. Control Functions

The Nakamichi 1000ZXL control functions are shown below:

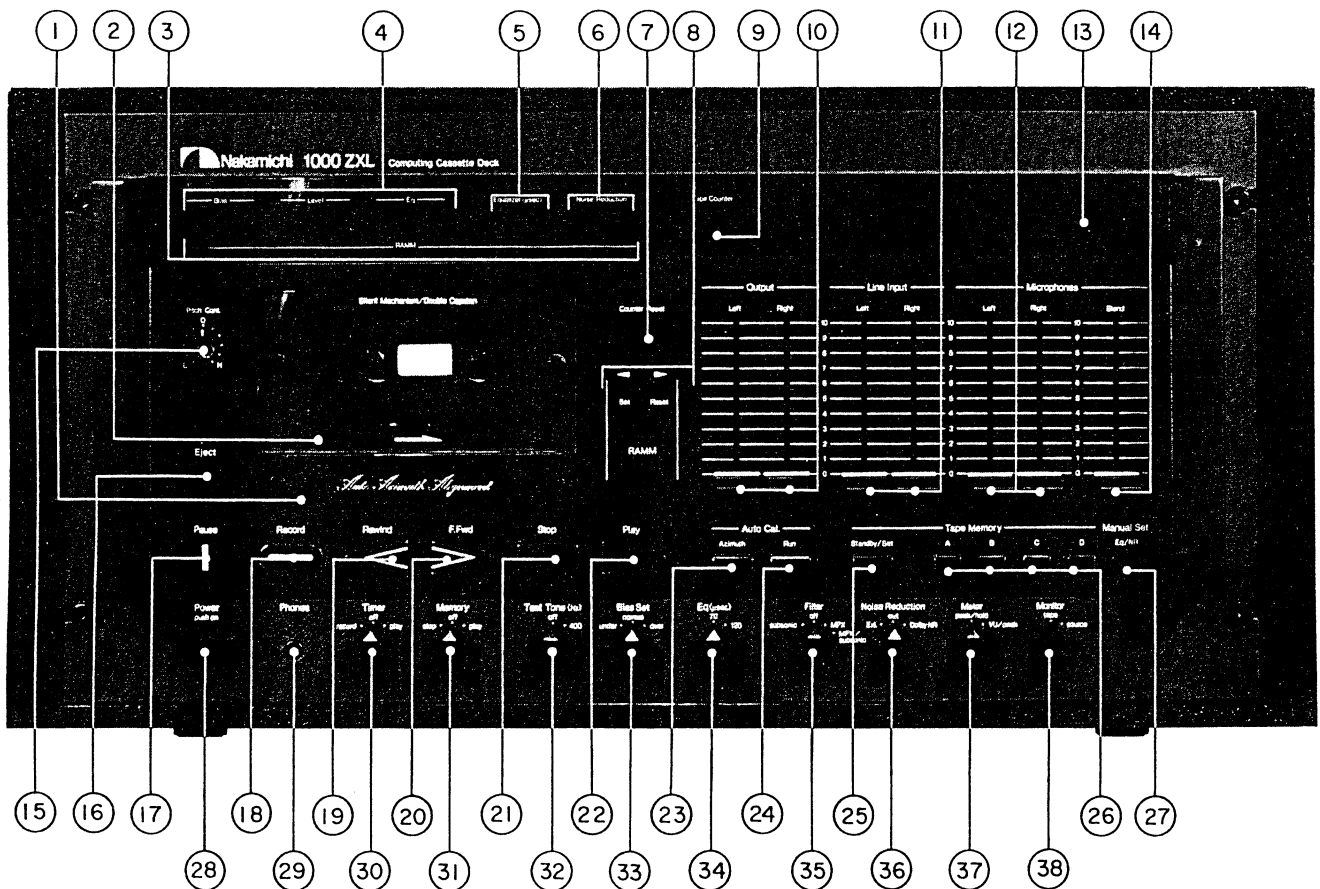


Fig. 1.1 Front View



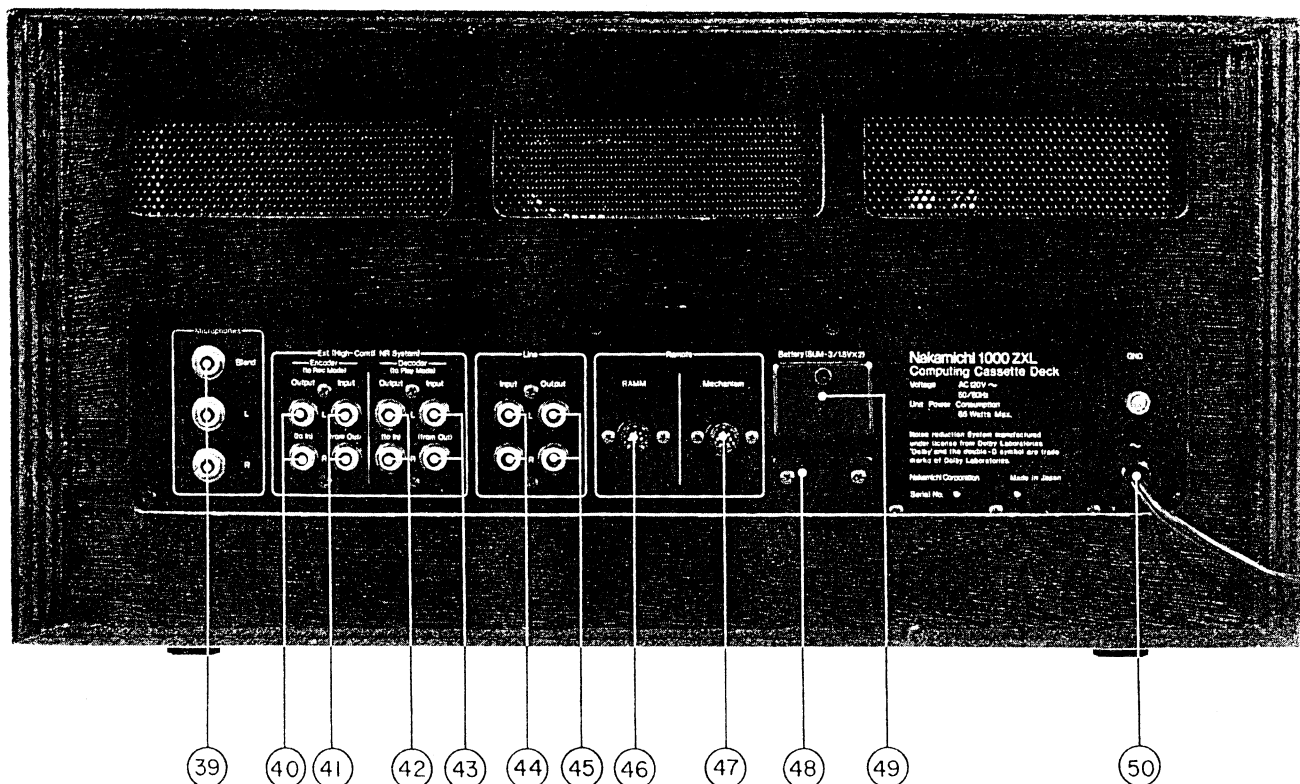


Fig. 1.2 Rear View

- |                                          |                                     |
|------------------------------------------|-------------------------------------|
| 1. Adjustment Screw Cover                | 26. Tape Memory Buttons             |
| 2. Cassette Holder                       | 27. Manual Set Button               |
| 3. RAMM Indicator Panel                  | 28. Power Switch                    |
| 4. Auto Calibration Indicator Panel      | 29. Headphone Jack                  |
| 5. Playback Equalization Indicator Panel | 30. Timer Switch                    |
| 6. Noise Reduction Indicator Panel       | 31. Memory Switch                   |
| 7. Counter Reset Button                  | 32. Test Tone Switch                |
| 8. RAMM Control Buttons                  | 33. Bias Set Switch                 |
| 9. Tape Counter                          | 34. Playback Equalization Switch    |
| 10. Output Level Controls (L, R)         | 35. Filter Switch                   |
| 11. Line Input Level Controls (L, R)     | 36. Noise Reduction Switch          |
| 12. MIC Level Controls (L, R)            | 37. Meter Switch                    |
| 13. Fluorescent (FL) Level Indicators    | 38. Monitor Switch                  |
| 14. Blend MIC Level Control              | 39. Microphone Jacks                |
| 15. Pitch Control                        | 40. Encoder Output Jacks            |
| 16. Eject Button                         | 41. Encoder Input Jacks             |
| 17. Pause Button                         | 42. Decoder Output Jacks            |
| 18. Record Button                        | 43. Decoder Input Jacks             |
| 19. Rewind Button                        | 44. Line Input Jacks                |
| 20. Fast-Forward Button                  | 45. Line Output Jacks               |
| 21. Stop Button                          | 46. RAMM Remote Control Socket      |
| 22. Play Button                          | 47. Transport Remote Control Socket |
| 23. Auto Azimuth Alignment Button        | 48. Voltage Selector                |
| 24. Auto Calibration Button              | 49. Battery Compartment             |
| 25. Standby/Set Button                   | 50. Power Cord                      |

## 1.2. Voltage Selector

Voltage selector is installed on the rear panel for Other Version of the Nakamichi 1000ZXL. This voltage selector can select either 120 V or 220-240 V at customer's disposal.

## 2. REMOVAL PROCEDURES

### 2.1. Cabinet Ass'y

Refer to Fig. 2.1.

- (1) Remove F01, F02, F03 and F04, then disassemble F05 (Synthesis Mechanism Ass'y) and F06 (Cabinet Ass'y).

### 2.2. Cassette Case Cover Ass'y and Azimuth Alignment Cover Ass'y

Refer to Fig. 2.2.

- (1) Turn fully counterclockwise two screws which are mounted on the Cassette Case Cover, then disassemble F01 (Cassette Case Cover Ass'y).
- (2) Turn fully counterclockwise two screws which are mounted on the Azimuth Alignment Cover, then disassemble F02 (Azimuth Alignment Cover Ass'y).

### 2.3. Front Panel Ass'y

Refer to Fig. 2.2.

- (1) Refer to Fig. 2.1. Remove Cabinet Ass'y referring to item 2.1.
- (2) Pull out F03 (Pitch Control Knob) and F04 (Function Switch Knob).
- (3) Remove F05, F06 and F07, then disassemble F08 (CPU P.C.B. Shield Plate).
- (4) Remove F09, then turn F10 (CPU P.C.B. Ass'y) over as an arrow head.
- (5) Remove F11 and F12, then turn F13 (Rear Panel

Ass'y) as an arrow head.

- (6) Disassemble F14 (Front Panel Ass'y including 19 connectors).

### 2.4. Mechanism Ass'y

Refer to Fig. 2.2.

- (1) Remove Front Panel Ass'y referring to item 2.3.
- (2) Remove F15 and F16, then disassemble F17 (Mechanism Ass'y including 6 connectors).

### 2.5. CPU P.C.B. Ass'y

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.
- (2) Remove F01 and F02, then disassemble F03 (CPU P.C.B. Shield Plate).
- (3) Remove F04 and F05, then disassemble F06 (CPU P.C.B. Ass'y including 6 connectors).
- (4) Remove F07 (CPU P.C.B. B Ass'y) by releasing the self-interlocking pin of the P.C.B. Supporters, then disassemble F08 (CPU P.C.B. A Ass'y).

### 2.6. RAMM P.C.B. Ass'y

Refer to Fig. 2.3.

- (1) Remove CPU P.C.B. Ass'y referring to item 2.5.
- (2) Remove F09, F10, F11 and F12 then disassemble F13 (RAMM P.C.B. Ass'y including 12 connectors).

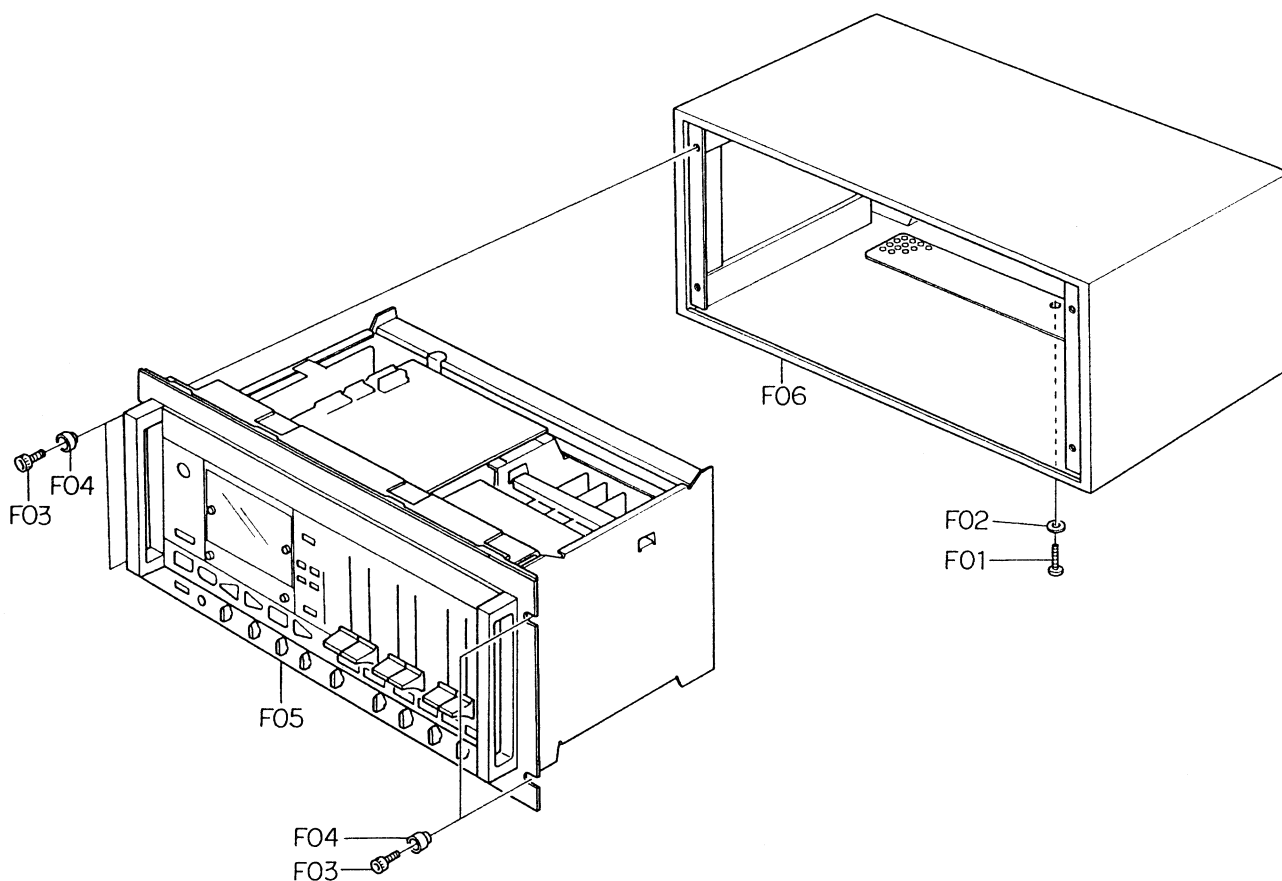


Fig. 2.1

**2.7. Record Eq. Amp. Ass'y, Detector P.C.B. Ass'y, Record Dolby NR P.C.B. Ass'y and Playback Amp. & Dolby NR P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.1. Remove Cabinet Ass'y referring to item 2.1.
- (2) Remove F14, then disassemble F15 (P.C.B. Holder Ass'y).
- (3) Pull out F16 (Record Eq. Amp. P.C.B. Ass'y), F17 (Detector P.C.B. Ass'y), F18 (Record Dolby NR P.C.B. Ass'y) and F19 (Playback Amp. & Dolby NR P.C.B. Ass'y).

**2.8. Power Switch**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.
- (2) Remove F20, then disassemble F21 (Power Switch).

**2.9. Logic P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.
- (2) Remove F22, F23 and F24, then disassemble F25 (Logic P.C.B. Ass'y including 6 connectors and wires connected by soldering).

**2.10. Main P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Remove Front Panel Ass'y referring to item 2.3.
- (2) Remove F16, F27 and F28 and F29, then disassemble F30 (Main P.C.B. Shield Plate).
- (3) Remove F31, then disassemble F32 (Main P.C.B. Ass'y including 2 connectors and wires connected by wrapping).

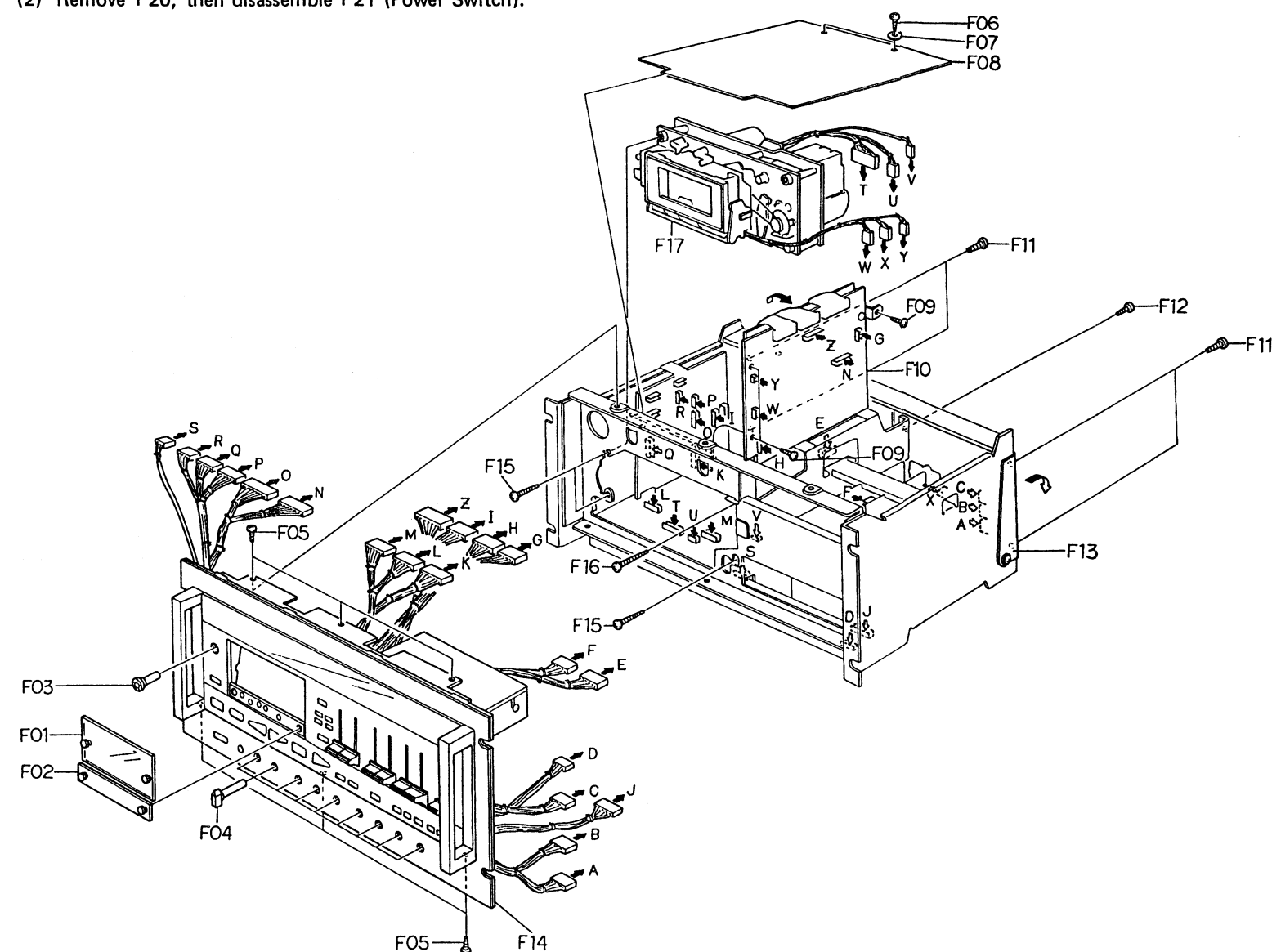


Fig. 2.2

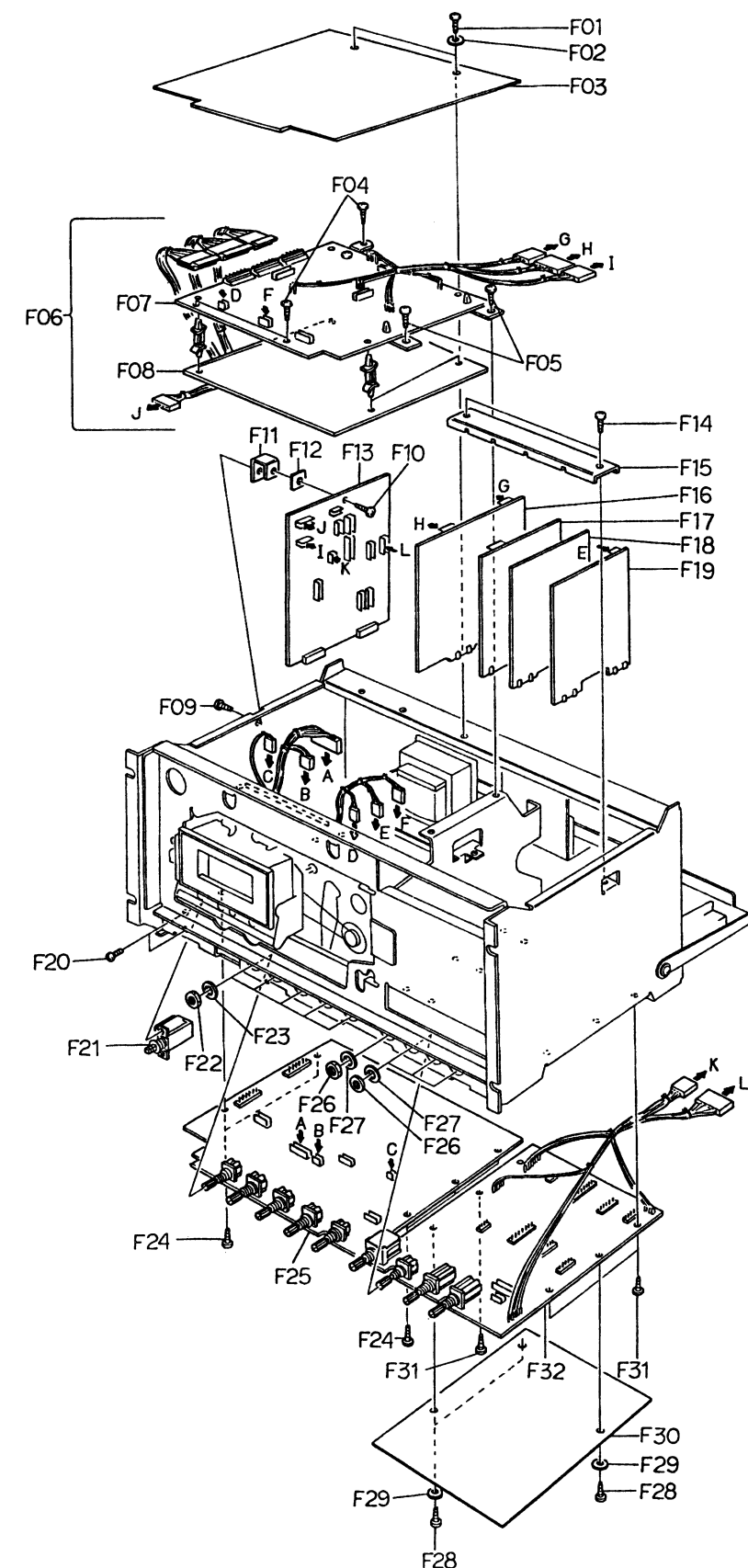


Fig. 2.3

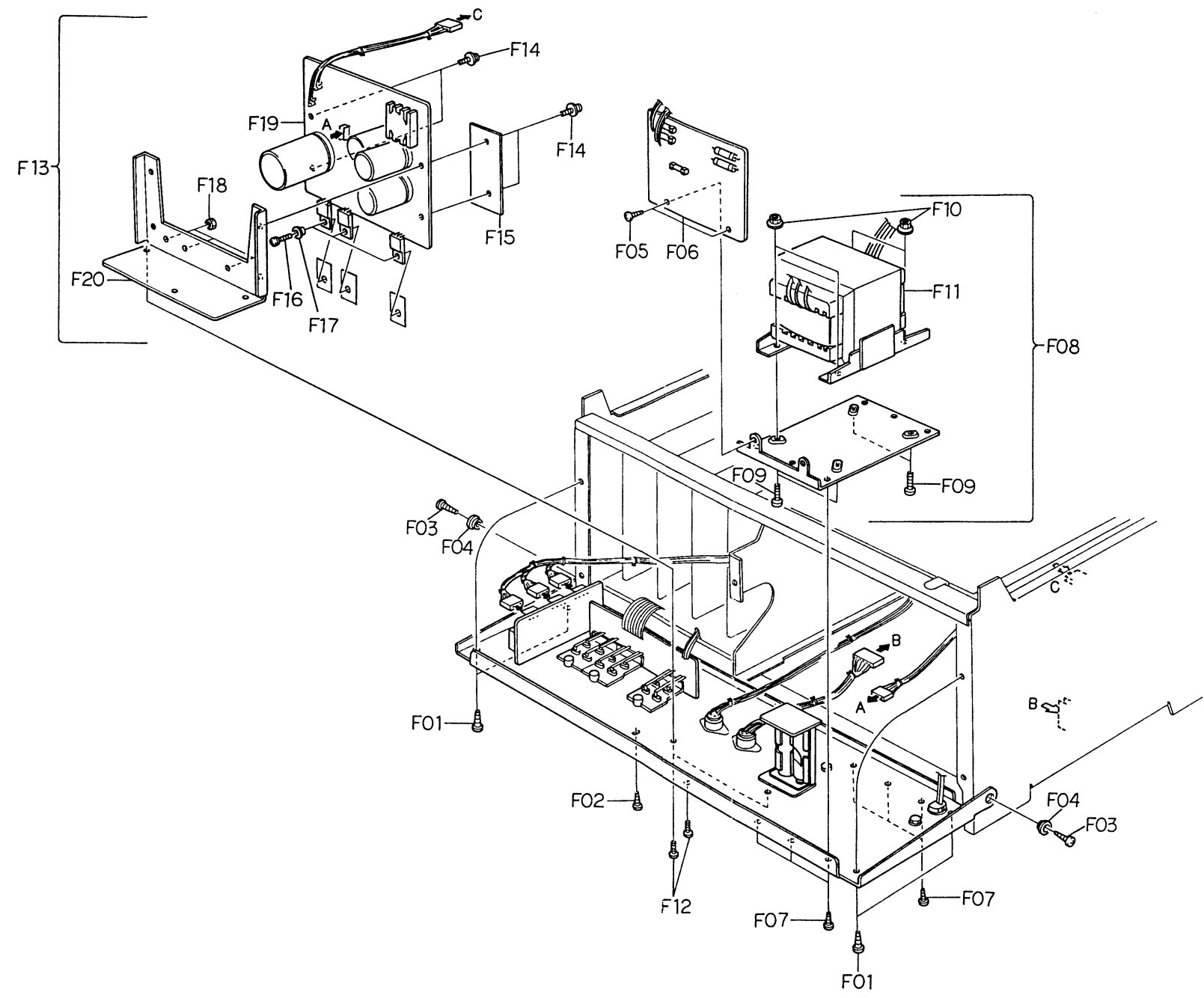


Fig. 2.4

**2.11. Rear Panel Ass'y**

Refer to Fig. 2.4.

- (1) Refer to Fig. 2.1. Remove Cabinet Ass'y referring to item 2.1.
- (2) Remove F01, F02, F03 and F04, then disassemble Rear Panel Ass'y (including 6 connectors and wires connected by wrapping).

**2.12. Fuse P.C.B. Ass'y and Power Transformer**

Refer to Fig. 2.4.

- (1) Remove Rear Panel Ass'y referring to item 2.11.
- (2) Remove F05, then disassemble F06 (Fuse P.C.B. Ass'y).
- (3) Remove F07, then disassemble F08 (Power Transformer Ass'y).
- (4) Remove F09 and F10, then disassemble F11 (Power Transformer).

**2.13. Power Supply P.C.B. Ass'y**

Refer to Fig. 2.4.

- (1) Remove Rear Panel Ass'y referring to item 2.11.
- (2) Remove F12, then disassemble F13 (Power Supply Ass'y including two connectors and wires connected by soldering on F19 Power Supply P.C.B. Ass'y).
- (3) Remove F14, then disassemble F15 (Insulator).
- (4) Remove F16, F17 and F18, then disassemble F19 (Power Supply P.C.B. Ass'y) and F20 (Heat Sink).

**2.14. FL Indicator Ass'y, Volume Holder & Front Escutcheon B Ass'y, Display House Ass'y, Front Escutcheon A Ass'y, Headphone Jack Holder Ass'y and Front Panel Sub Ass'y**

Refer to Fig. 2.5.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.
- (2) Remove F01, then disassemble F02 (FL Indicator Ass'y).
- (3) Remove F03 (Slide Volume Knob), F04, F05 and F06, then disassemble F07 (Volume Holder & Front Escutcheon B Ass'y).
- (4) Remove F08, then disassemble F09 (MIC Amp. & Volume P.C.B. Ass'y).
- (5) Remove F10, then disassemble F11 (Function P.C.B. Ass'y) and F12 (Front Escutcheon B Ass'y).
- (6) Remove F13, then disassemble F14 (Display House Ass'y).
- (7) Remove F15, then disassemble F16 (Display P.C.B. Ass'y) and F17 (Display House).
- (8) Remove F18, F19, F20 and F21, then disassemble F22 (Front Escutcheon A Ass'y).
- (9) Remove F23, then disassemble F24 (Mechanism Control Switch P.C.B. Ass'y).
- (10) Remove F25, then disassemble F26 (RAMM Control Switch P.C.B. Ass'y) and F27 (Front Escutcheon Sub A Ass'y).



## 2.15. FL Indicator P.C.B. Ass'y

Refer to Fig. 2.6.

- (1) Refer to Fig. 2.5. Remove FL Indicator Ass'y referring to item 2.14.
- (2) Remove F01, then disassemble F02 (FL Indicator

Case Cover).

- (3) Remove F03 (FL Indicator Holder L) and F04 (FL Indicator R), then disconnect 3 connectors. Disassemble F05 (FL Indicator P.C.B. A Ass'y) and F06 (FL Indicator P.C.B. B Ass'y).

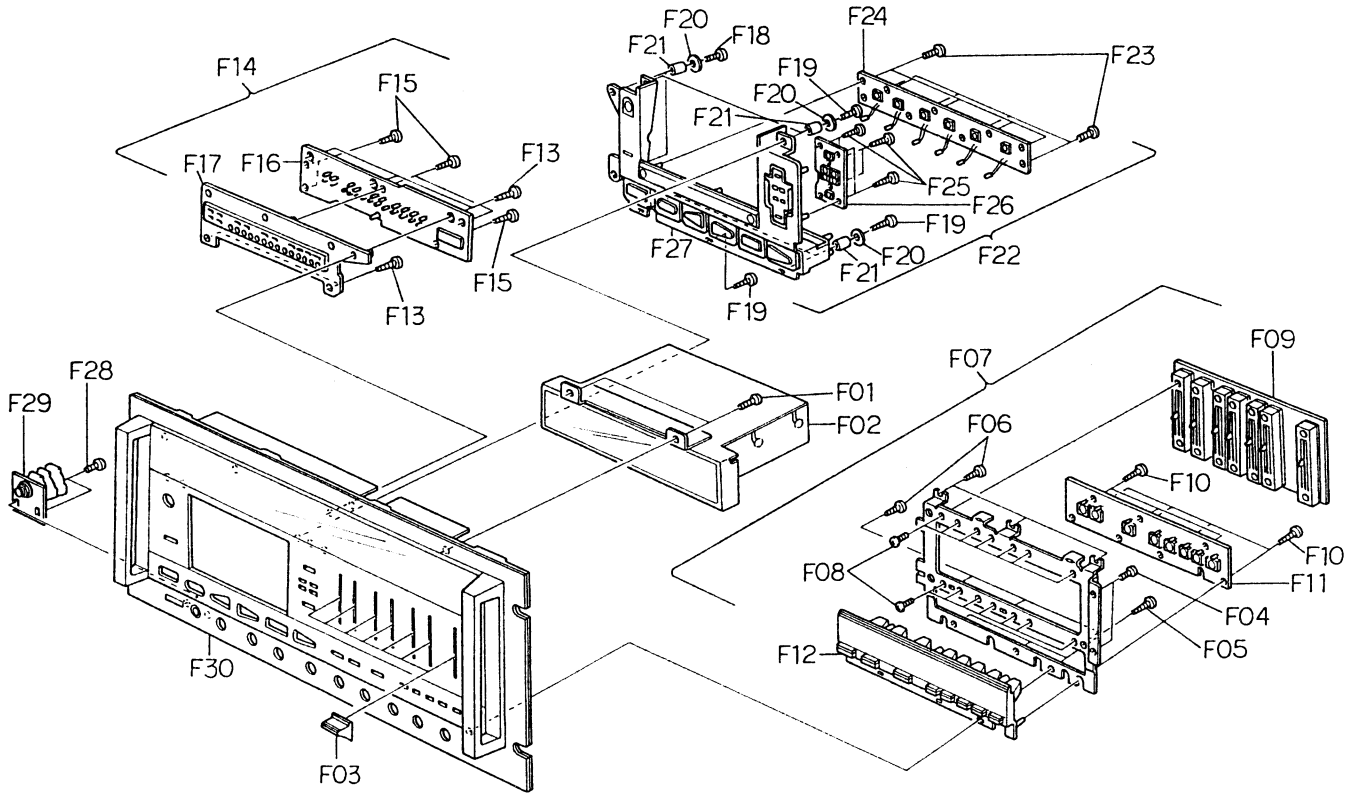


Fig. 2.5

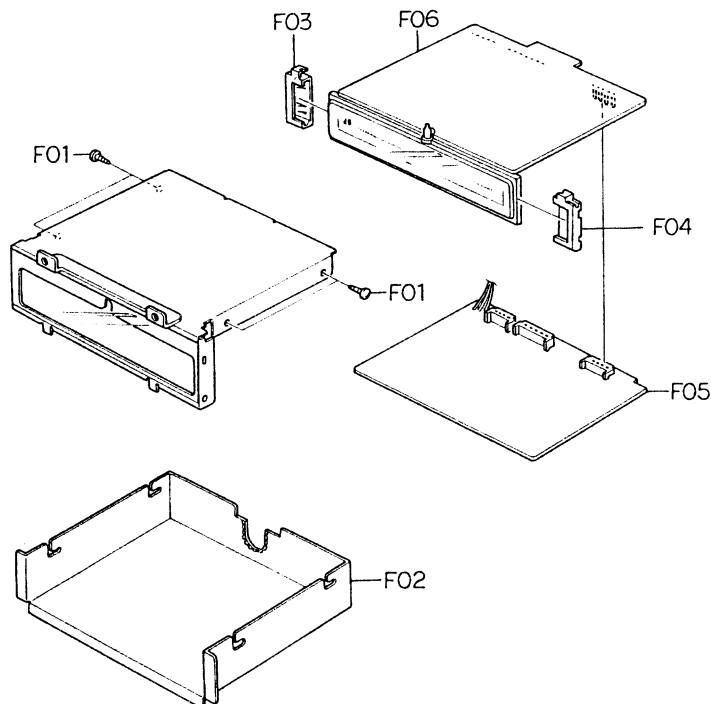


Fig. 2.6

## 2.16. Cassette Case Ass'y and Cover Plate Ass'y

Refer to Fig. 2.7.

- (1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.4.
- (2) Press the Eject Button to open the Cassette Case Ass'y.
- (3) Remove F01 and F02, then disassemble F03 (Cassette Case Holder L Ass'y) by releasing the Self-interlocking Pin of the Damper Lock Arm and F04 (Cassette Case Ass'y).
- (4) Remove F05, then disassemble F06 (Cover Plate Ass'y).

## 2.17. Capstan Motor Ass'y and Flywheel Ass'y

Refer to Fig. 2.8.

- (1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.4.
- (2) Remove F01 and F02, then disassemble F03 (Flywheel Holder Ass'y) and F08 (Capstan Belt).
- (3) Remove F04, then disassemble F05 (Capstan Motor Ass'y).
- (4) Remove F06, then disassemble F07 (Speed Cal.P.C.B. Ass'y).
- (5) Remove F09 (Supply Flywheel Ass'y), then disassemble F10 (Take-up Flywheel Ass'y).
- (6) After removing both Flywheel Assemblies, disassemble F11 (Thrust Washer 3 mm), F12 (Thrust Washer 2.6 mm), F13 (Flange Thrust Cap) and F14 (Thrust Spring).

## 2.18. Sub Mechanism Chassis Ass'y

Refer to Fig. 2.9.

- (1) Remove Flywheel Holder Ass'y referring to item 2.17.
- (2) Remove F01 and F02, then disassemble F03 (Sub Mechanism Chassis Ass'y).

## 2.19. Control Motor Ass'y and Reel Motor Ass'y

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.
- (2) Remove F04, then disassemble F05 (Control Motor Ass'y).
- (3) Remove F06, then disassemble F07 (Reel Motor Ass'y).

## 2.20. Cam Control Volume

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.
- (2) Remove F08, then disassemble F09 (Volume Coupler).
- (3) Remove F10, then disassemble F11 (Cam Control Volume).

## 2.21. Azimuth Motor Ass'y

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.
- (2) Remove F12, then disassemble F13 (Azimuth Alignment Motor Ass'y).
- (3) Remove F14, then disassemble F15 (Azimuth Motor Ass'y) and F16 (Drive Pulley Ass'y).

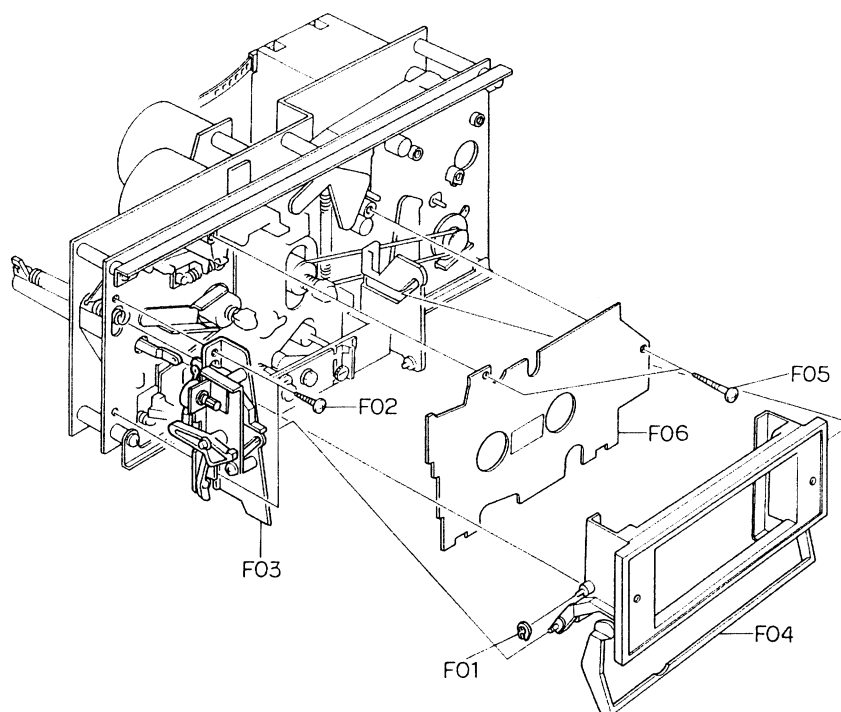


Fig. 2.7

## 2.22. Reel Hub Ass'y and Idler Ass'y

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.
- (2) Remove F17 (Reel Hub Head), then disassemble F18 (Reel Hub B Ass'y), F19 (Reel Hub Take-up Ass'y), F20 (Reel Hub Supply Ass'y), F21 (Back Tension Ass'y) and F22 (Back Tension Spring).
- (3) Remove F23, then disassemble F24 (Idler Ass'y).

## 2.23. Cam Drive Gear and Control Cam

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

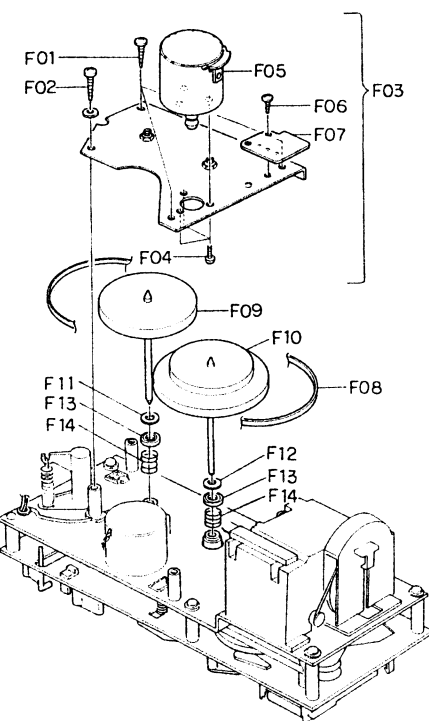


Fig. 2.8

- (2) Remove F25, then disassemble F26 (Cam Drive Gear).
- (3) Remove F27, then disassemble F28 (Counter-Load Arm Ass'y).
- (4) Remove F29, then disassemble F30 (Control Cam).

## 2.24. Counter Pulse Generator P.C.B. Ass'y

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.
- (2) Remove F31, then disassemble F32 (Counter Pulse Generator P.C.B. Ass'y).

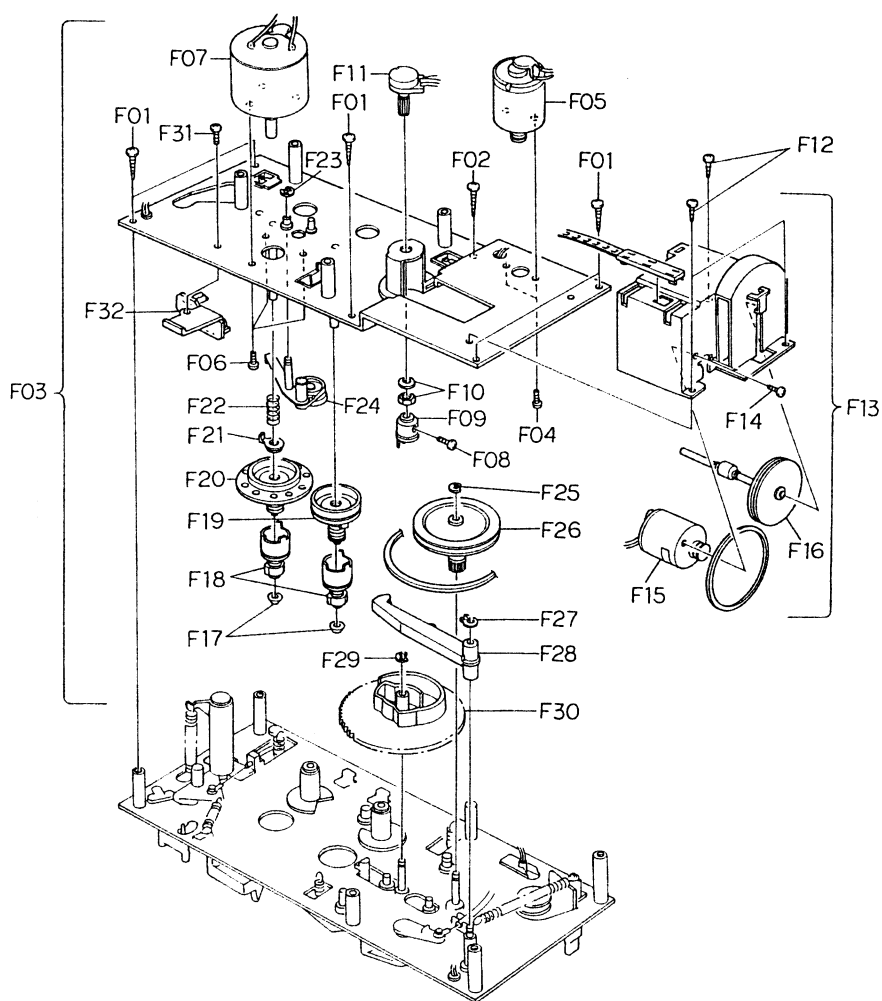


Fig. 2.9

## 2.25. Head Mount Base Ass'y

Refer to Fig. 2.10.

- (1) Refer to Fig. 2.7. Remove Cassette Case Ass'y referring to item 2.16.
- (2) Remove F01, then disassemble F02 (Head Mount Base Ass'y).

## 2.26. Pressure Roller Ass'y and Erase Head

Refer to Fig. 2.10.

- (1) Remove Head Mount Base Ass'y referring to item 2.24.
- (2) Remove F03, then disassemble F04 (Supply Pressure Roller Ass'y).
- (3) Remove F05, then disassemble F06 (Erase Head).
- (4) Remove F07, then disassemble F08 (Take-up Pressure Roller Ass'y).

## 2.27. Playback Head Ass'y and Record Head Ass'y

Refer to Fig. 2.10.

- (1) Remove Head Mount Base Ass'y referring to item 2.24.
- (2) Turn F09 by 90° by pushing it, then disassemble F10 (Playback Head Ass'y).
- (3) Turn F11 by 90° by pushing it, then disassemble F12 (Record Head Ass'y) and F13 (RH Azimuth Alignment Plate).

## 2.28. Battery

Refer to Fig. 2.11.

- (1) Turn fully counterclockwise the screw which is mounted on the Rear Panel Ass'y, then pull out Battery Case Ass'y.
- (2) Pull up the Ribbon in Battery Case. Then take out Batteries from Battery Case.

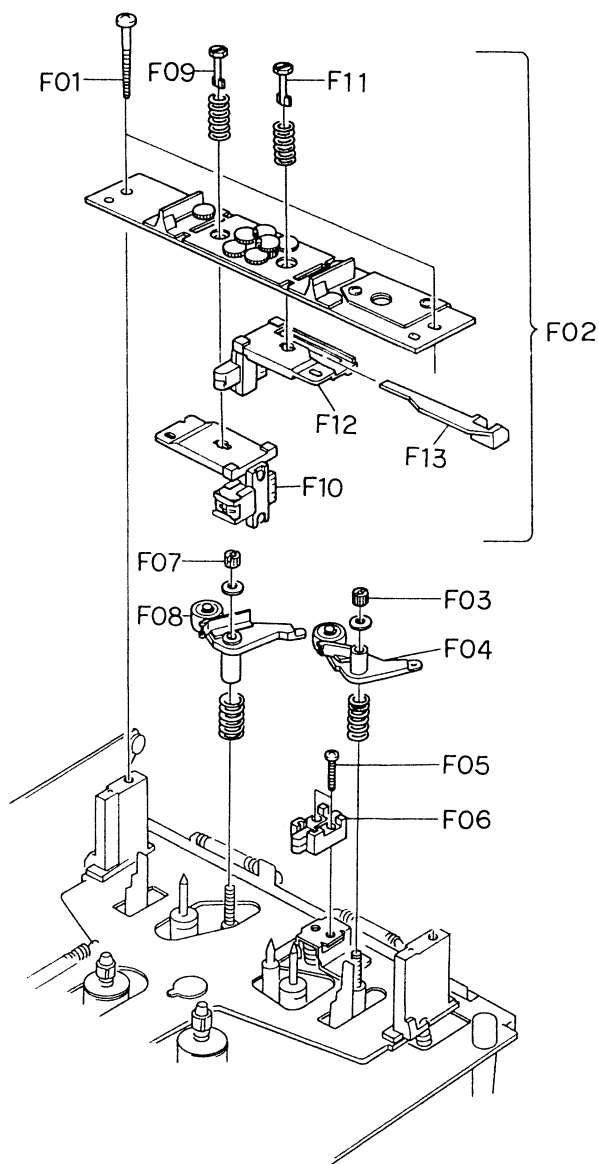


Fig. 2.10

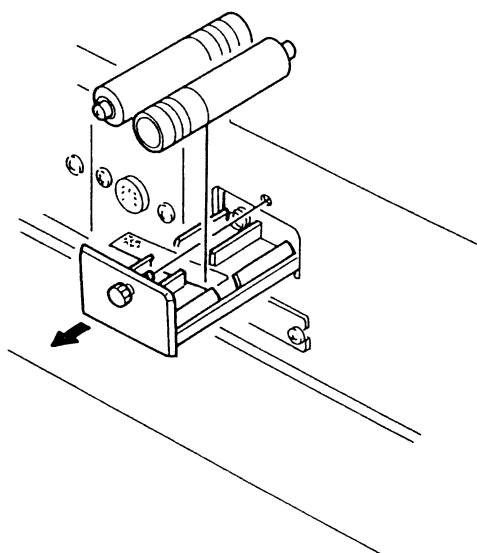


Fig. 2.11

### 3. MEASUREMENT AND MAINTENANCE INSTRUMENTS

#### 3.1. Measurement Instruments

- (1) Audio Generator (20 Hz — 200 kHz)
- (2) AC Millivolt Meter (with dB measures)
- (3) Oscilloscope (DC — 5 MHz)
- (4) Distortion Meter
- (5) Speed & Wow/Flutter Meter
- (6) Frequency Counter (DC — 10 MHz)
- (7) Ohm Meter
- (8) DC Volt Meter
- (9) AC Volt Meter
- (10) Torque Gauge (DA09013A)
- (11) 15 kHz Azimuth Tape (DA09004A)
- (12) 3 kHz Speed & Wow/Flutter Tape (DA09006A)
- (13) 1 kHz Track Alignment Tape (DA09007A)
- (14) 400 Hz Level Tape (DA09005A)
- (15) 20 kHz PB Frequency Response Tape (DA09001A)
- (16) 15 kHz PB Frequency Response Tape (DA09002A)
- (17) 10 kHz PB Frequency Response Tape (DA09003A)
- (18) Reference EXII Tape (DA09021A)
- (19) Reference SX Tape (DA09025A)
- (20) Reference ZX Tape (DA09037A)
- (21) Tilt Check Gauge M-9039 (DA09039A)
- (22) EH Tilt Check Gauge M-9040 (DA09040A)
- (23) EH Stroke Check Gauge M-9051 (DA09051A)
- (24) Stroke Check Gauge M-9047 (DA09047B)
- (25) Record Head Mounting Gauge M-9048 (DA09048A)
- (26) Back Tension Gauge (DA09055A)
- (27) Tension Arm Adjustment Cassette (DA09056A)
- (28) 5 Hz RAMM Speed Check Tape (DA09061A)
- (29) Test Unit M-9057 (DA09057A)
- (30) Extension Card M-9058 (DA09058A)
- (31) Audio Analyzer T—100  
(including Distortion, Wow/Flutter, Speed, Oscillator and dB meter)

Note: (10) — (31) are the products of Nakamichi Corporation.

## 3.2. Maintenance Instruments

### (1) Test Unit

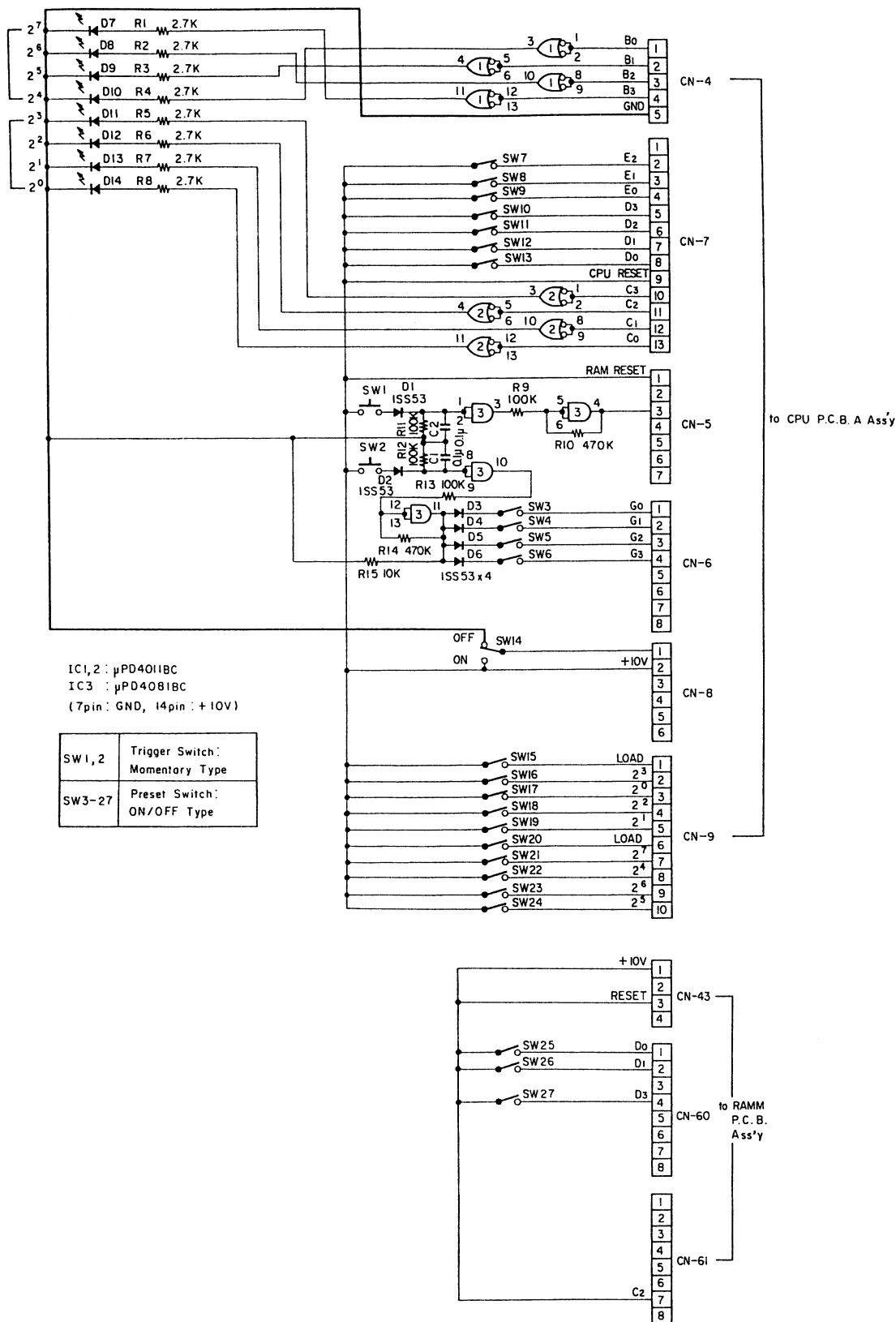


Fig. 3



## 4. MECHANICAL ADJUSTMENT

### 4.1. Mechanism Control Cam Adjustment

Before adjustment, disassemble the Front Panel Ass'y, then remove the Cover Plate Ass'y referring to items 2.3 and 2.16.

#### (1) Offset Adjustment of Control Motor Driver

- (a) Refer to Figs. 4.1 and 4.2.

Adjust VR505 and VR506 on the Logic P.C.B. Ass'y to locate approximately at the middle of the variable range. Then press the Power switch.

VR506 (for Cam position stop)

VR505 (for Cam position play)

- (b) Press the Stop button to set the N-1000ZXL in Stop mode.

Adjust VR506 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.

- (c) Press the Play button to set the N-1000ZXL in Playback mode.

(Cam will rotate, and the position marked with "PY" comes to the pointer.) Adjust VR505 (for play) so that the "PY" mark on the Cam corresponds to the pointer.

- (d) Repeat above (b) and (c) 2 – 3 times so that the "S" and "PY" marks on the Cam correspond to the pointer accurately in Stop and Playback modes respectively.

(This adjustment is required because the position adjusted by one volume will be slightly changed when the other volume is adjusted.)

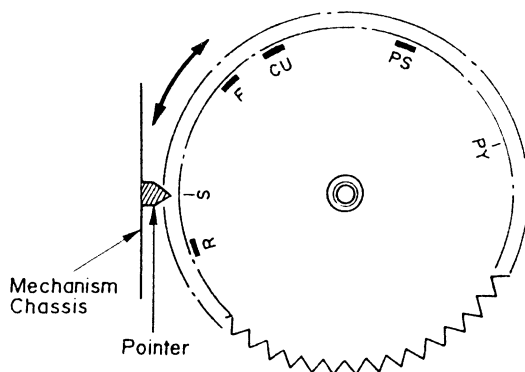


Fig. 4.1

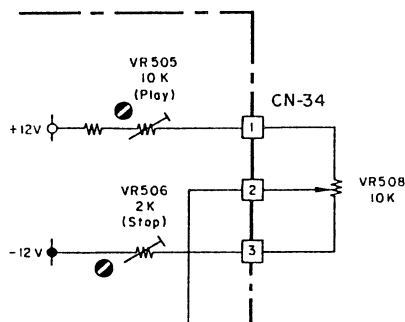


Fig. 4.2

- (e) Set the N-1000ZXL in F.F., Pause, or Cue mode by pressing each button (press F.F. and Pause buttons to set the N-1000ZXL in Cue mode) and check to insure that the pointer is in a range of "F", "PS", or "CU" mark respectively.

- (f) If out of the range, precise adjustment for each position according to "(2) Offset Fine Adjustment of Control Motor Driver" will be required.

#### (2) Offset Fine Adjustment of Control Motor Driver

Adjust only if a satisfactory result is not obtained in "(1) Offset Adjustment of Control Motor Driver". This adjustment is made by changing the value of the fixed resistors on the Logic P.C.B. Ass'y.

Note: The value of voltage is typical value.

#### (a) Observation Point of Reference Voltage

Observe the each voltage at the sliding contact of the Cam Control Volume VR508 (10 kΩ) in Stop, Fast (F.F. or Rewind), Pause and Playback modes.

#### (b) Reference Voltage

Reference voltage at the sliding contact of VR508 (Cam Control Volume) in each mode is as follows:

| Mode             | Reference Voltage (Typical Value) |
|------------------|-----------------------------------|
| Stop             | -0.4 V                            |
| Fast (F.F./Rew.) | -2.1 V                            |
| Pause            | -6.2 V                            |
| Play             | -8.8 V                            |

1.7 V  $\pm 0.25$  V  
2.6 V  $\pm 0.4$  V

#### (c) Resistors for Adjustment

| Mode             | Ref. No. | Typical Value |
|------------------|----------|---------------|
| Stop             | R518     | 316 kΩ (F)    |
| Fast (F.F./Rew.) | R519     | 33 kΩ         |
| Pause            | R522     | 51.1 kΩ (F)   |
| Play             | R520     | 71.5 kΩ (F)   |

#### (d) Adjustment Procedures

- 1) Press the Stop button to set the N-1000ZXL in Stop mode.

Adjust the value of R518 to obtain -0.4 V ( $\pm 0.6$  V) at the sliding contact of VR508.

Note: When R518 is adjusted, the reference voltage in Fast (F.F. or Rewind) mode is changed. Therefore, re-check of the reference voltage in Fast mode is required. If the reference voltage is out of the range, re-adjustment of R519 according to next step 2) is necessary.

- 2) Set the N-1000ZXL in F.F. mode, then adjust the value of R519 so that the voltage of VR508 will become lower by 1.7 V ( $\pm 0.25$  V) than in Stop mode.
- 3) Press the Pause button to set the N-1000ZXL in Pause mode.

Adjust the value of R522 to obtain -6.2 V ( $\pm 0.4$ , -0.15 V) at the sliding contact of VR508.

- 4) Set the N-1000ZXL in Playback mode, then adjust the value of R520 so that the voltage of VR508 will become lower by 2.6 V ( $\pm 0.4$  V) than in Pause mode.

### (3) Cam Timing Adjustment

- (a) Remove the wires from the Control Motor terminals to set the motor open.
- (b) Without loading a cassette tape and with pressing the record protecting switch with your finger tip, press the Record and Play buttons to set the N-1000ZXL in Record mode.
- (c) Turn the Cam and bring the "PY" mark toward the pointer by hand. Reel Motor will rotate before the "PY" mark reaches the pointer. Adjust the value of R560 and R561 so that the voltage at the sliding contact of VR508 becomes  $-7$  V ( $\pm 0.3$  V) when Reel Motor starts rotation.
- (d) Observe the mute signal at the Q523 collector. Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR508 is  $-7.2$  V ( $\pm 0.3$  V) when mute is released (mute signal changes from H to L).  
(This voltage is determined by the adjustment of R560 and R561 in above step (c).)
- (e) Upon completion of the above adjustment, re-connect wires to the motor terminals.

### 4.2. Reel Motor Speed Adjustment in Play Mode

Refer to Fig. 4.3.

- (1) Connect a DC voltmeter across the Reel Motor terminals.
- (2) Without loading a cassette tape, set the N-1000ZXL in Play mode.
- (3) Adjust VR501 on the Logic P.C.B. Ass'y to obtain 4 V on the DC voltmeter.

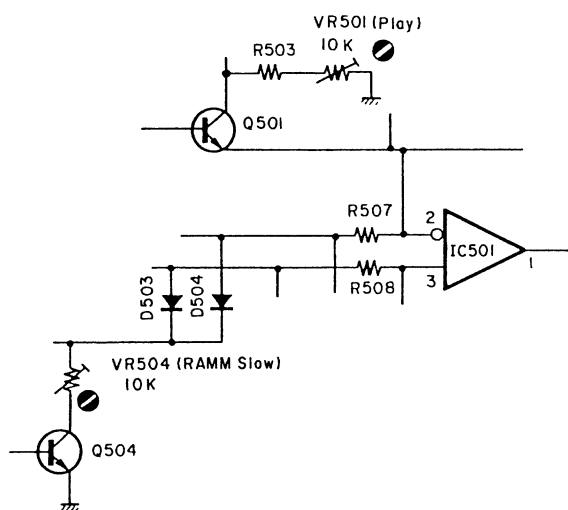


Fig. 4.3

### 4.3. RAMM Mode Adjustment

Before adjustment, disassemble the CPU P.C.B. Shield Plate, then remove 3 screws which are mounted on the CPU P.C.B. Ass'y.

Then lift the CPU P.C.B. Ass'y and insert connectors CN-43, 60 and 61 of the Test Unit into the connectors CN-43, 60 and 61 of the RAMM P.C.B. Ass'y. After the adjustment is completed, remove the Test Unit and assemble the CPU P.C.B. Shield Plate.

#### (1) Head Base Stroke Adjustment in RAMM Cue Mode

Refer to Figs. 4.4 and 4.5

- (a) Load a Stroke Check Gauge M-9047 (DA09047B) in the N-1000ZXL.
- (b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-1000ZXL in RAMM mode.  
Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
- (c) Check to insure whether the "C" pointer on the Playback Head Indicator indicates the left side line on the Indicator Plate.
- (d) If the playback head stroke is noted to be misaligned, adjust VR502 on the Logic P.C.B. Ass'y till satisfactory results are obtained.
- (e) After completion of the above adjustment, set the N-1000ZXL in Stop mode, then set in RAMM mode again to see whether the adjustment is appropriately made.  
If not, (b) through (e) will have to be repeated till satisfactory result is obtained.

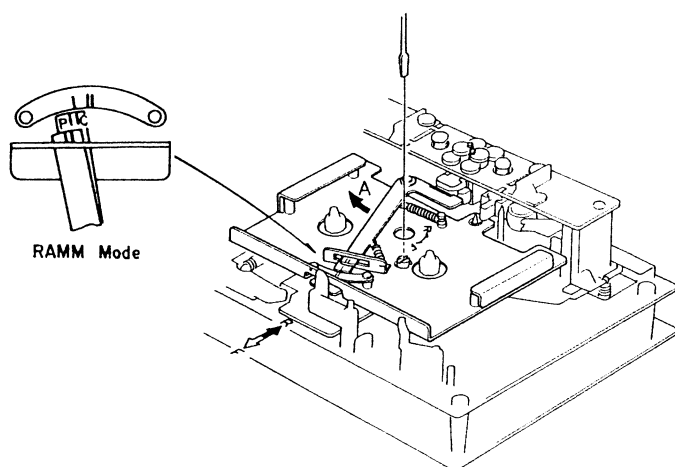


Fig. 4.4

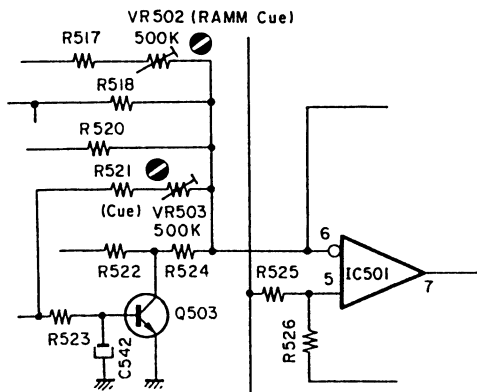


Fig. 4.5

### (2) Reel Motor Speed Adjustment in RAMM Slow Mode

Refer to Fig. 4.3.

- Load a 5 Hz RAMM Speed Check Tape (DA09061A) in the N-1000ZXL.
- Connect a Frequency Counter to TP901 on the Detector P.C.B. Ass'y.
- Set SW25, SW26 and SW27 of the Test Unit to ON.
- Set the N-1000ZXL in Fast (F.F. or Rewind) mode, then adjust VR504 on the Logic P.C.B. Ass'y so that the reading of the Frequency Counter becomes in a range of 25 – 50 Hz (typically 37.5 Hz). After the adjustment, check to insure that the reading is in a range of 25 – 50 Hz at 3 different portions (beginning, middle and end) of the tape.

- In Fast mode, by setting SW27 of the Test Unit to OFF, set the N-1000ZXL in RAMM Fast mode. In this RAMM Fast mode, check to insure that the reading of the Frequency Counter is in a range of 80 – 240 Hz. If not, repeat (b) – (e) till satisfactory result is obtained.
- Set SW25, SW26 and SW27 of the Test Unit to OFF, then set the N-1000ZXL in Stop mode.

### (3) RAMM Detector Amp. Gain Adjustment

Refer to Figs. 4.6 – 4.8.

- Load a 5 Hz RAMM Speed Check Tape (DA09061A) in the N-1000ZXL.
- Connect a Synchroscope to TP901 on the Detector P.C.B. Ass'y. Set Synchroscope to DC mode and 1 V/cm vertical gain. Check to insure that the minus level (–0.7 to –1.5 V) is observed on the Synchroscope as shown in Fig. 4.6.
- Set SW25, SW26 and SW27 of the Test Unit to ON.
- Set the N-1000ZXL in Fast (F.F. or Rewind) mode, then adjust VR901 on the Detector P.C.B. Ass'y so that the lowest plus peak value of waveforms does not lower than 2.5 V DC as shown in Fig. 4.7.

- By setting SW27 of the Test Unit to OFF (SW25 and SW26 are ON), set the N-1000ZXL in RAMM Fast mode, then check to insure that the lowest plus peak value of waveforms is higher than 0.5 V DC. If not repeat (c) – (e) till satisfactory result is obtained.
- Set SW25, SW26 and SW27 to OFF, then set the N-1000ZXL in Stop mode.

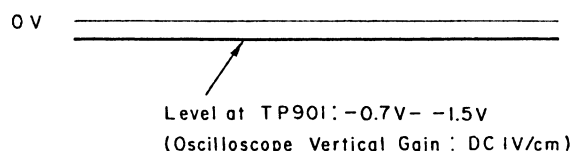


Fig. 4.6

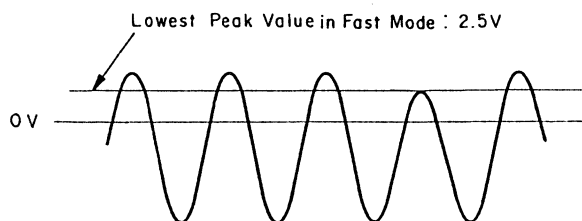


Fig. 4.7

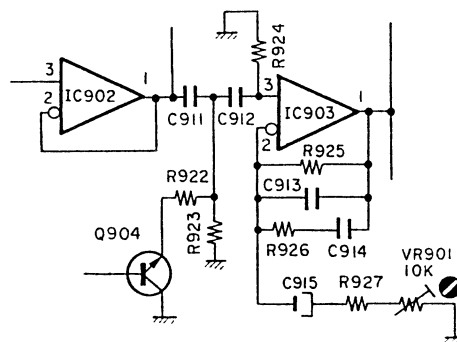


Fig. 4.8

## 4.4. Record Head and Playback Head Tilt Adjustment

Note: On items 4.4 – 4.10, refer to Fig. 4.9 flow chart.  
Refer to Figs. 4.10 and 4.11.

- (1) Load a Tilt Check Gauge M-9039 (DA09039A) in the N-1000ZXL.
- (2) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the other end to the chassis of the N-1000ZXL.
- (3) Remove both of the Height Gears.
- (4) Set the N-1000ZXL 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 the direction of arrow marks, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.
- (5) Check to insure freedom from contact between the Gauge and pad lifter.
- (6) Beacon Playback Head "Lower" will light on when height adjustment screw (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return them to the original place.
- (7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).
- (8) Set the N-1000ZXL in Stop mode and fit both of the serrated height gears. Then set the N-1000ZXL again in Play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

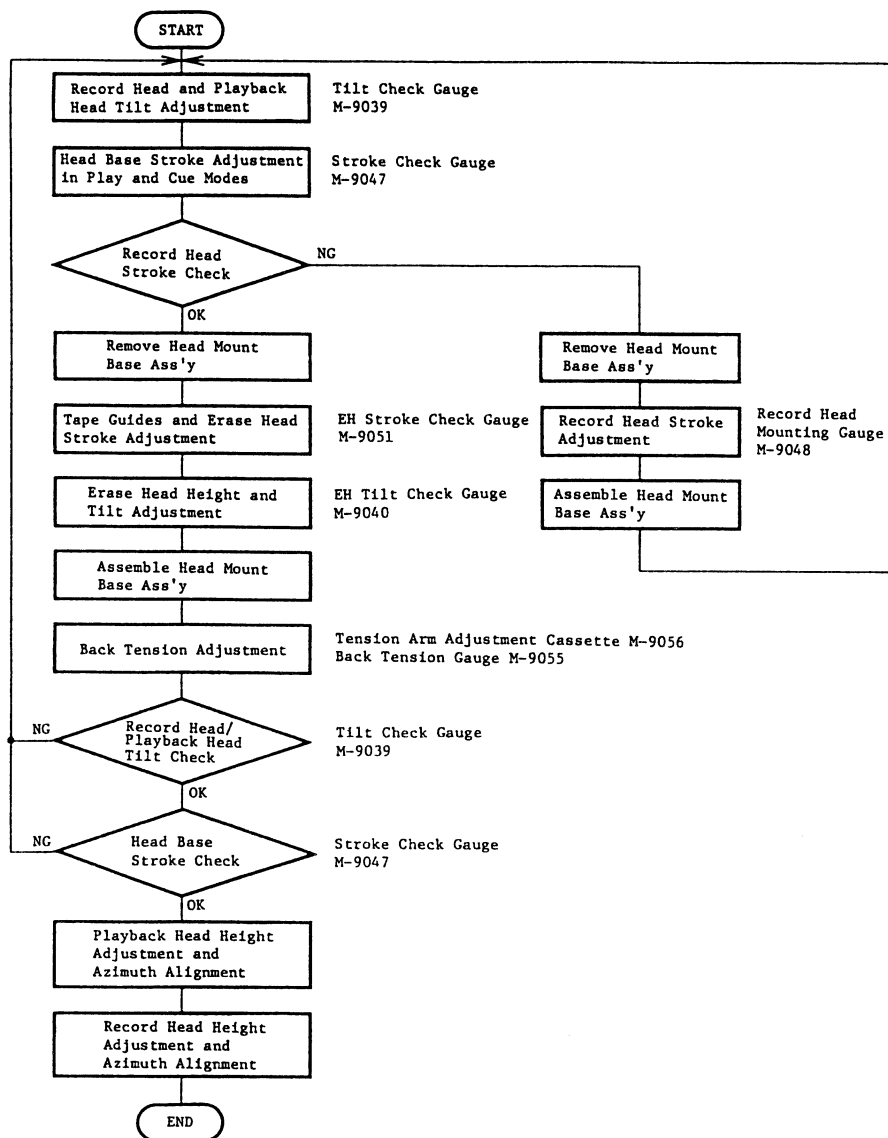


Fig. 4.9

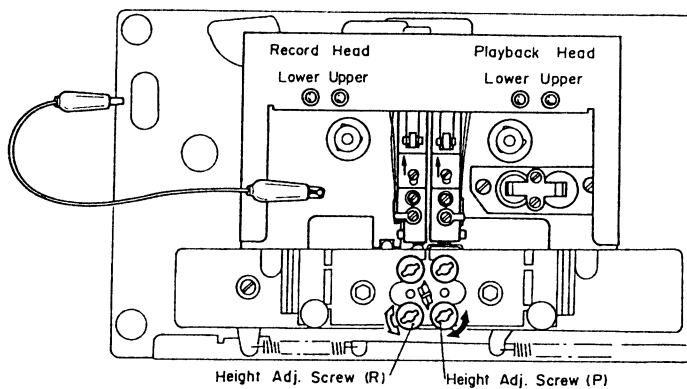


Fig. 4.10

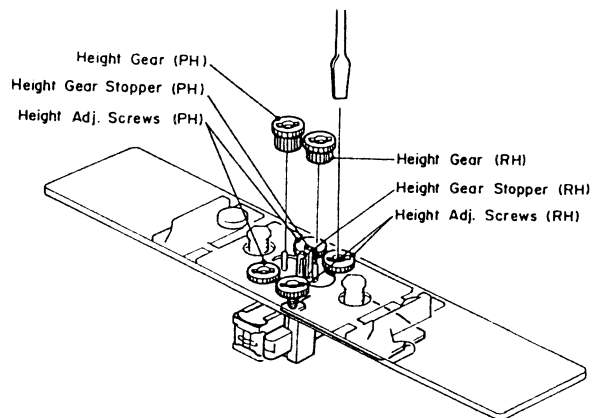


Fig. 4.11



#### 4.6. Tape Guides Adjustment and Erase Head Stroke Adjustment

Remove Head Mount Base Ass'y referring to item 2.25. Refer to Figs. 4.14 and 4.15.

##### (1) Supply Tape Guide Height Adjustment

- Load an EH Stroke Check Gauge M-9051 (DA-09051A) in the N-1000ZXL.
- Set the N-1000ZXL in Play mode.
- Slide the Supply Tape Guide Check Bar down against the supply tape guide, thus check can be made on supply tape guide height.
- If the supply tape guide is misaligned, the Supply Tape Guide Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut A till the Supply Tape Guide Check Bar is accepted by the supply tape guide.
- If the above are insured, set the N-1000ZXL in Pause mode, then in Play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

##### (2) Take-up Tape Guide Height Adjustment

- Load an EH Stroke Check Gauge M-9051 (DA-09051A) in the N-1000ZXL.

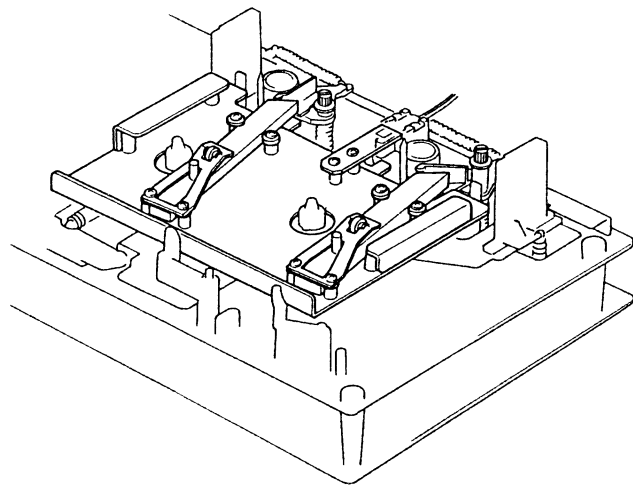


Fig. 4.14

- Set the N-1000ZXL in Play mode.
- Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, thus check can be made on take-up tape guide height.
- If the take-up tape guide is misaligned, the Take-up Tape Guide Check Bar will not come into the take-up tape guide. If such is noted, turn to adjust the height adjustment nut C till the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.
- If the above are insured, set the N-1000ZXL in Pause mode, then in Play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

##### (3) Erase Head Stroke Adjustment

- Load an EH Stroke Check Gauge M-9051 (DA-09051A) in the N-1000ZXL.
- Set the N-1000ZXL in Play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.
- 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 2 screws B that assembled erase head and erase head plate.
- After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.

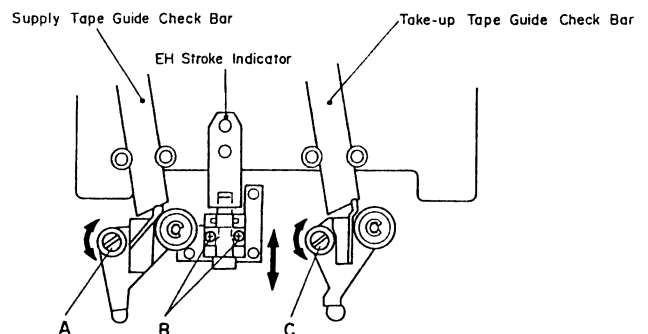


Fig. 4.15

## 4.7. Erase Head Height and Tilt Adjustment

Refer to Figs. 4.16 and 4.17.

- (1) Remove Head Mount Base Ass'y referring to item 2.25.
- (2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the N-1000ZXL.
- (3) Set the N-1000ZXL in Stop mode.
- (4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror as shown by an arrow mark 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 Beacon "1" is illuminating.
- (5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.
- (6) Turn Screw "Azimuth" counterclockwise or clockwise) to light on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust with Screw "Azimuth" until all of the 3 Beacons "1", "2" and "3" 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.

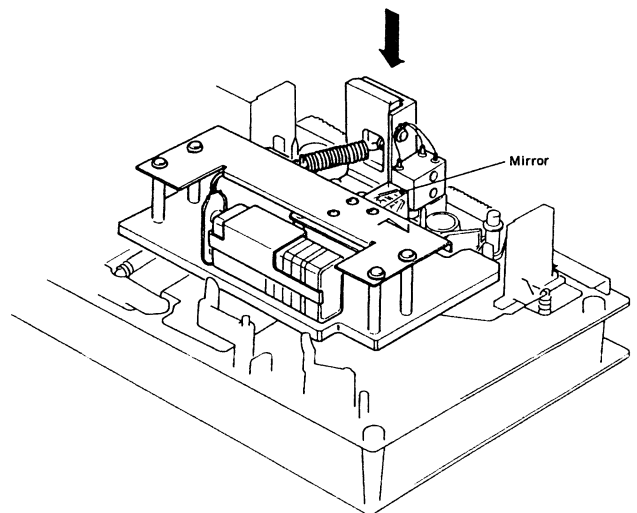


Fig. 4.16

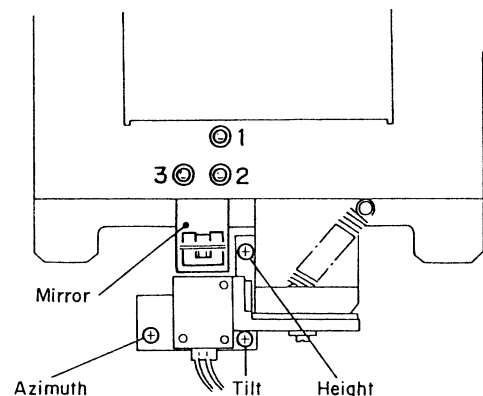


Fig. 4.17



#### 4.8. Back Tension Adjustment

Refer to Figs. 4.18 – 4.21.

- (1) Load a Tension Arm Adjustment Cassette (DA 09056A) in the N-1000ZXL referring to Fig. 4.18.
- (2) Set the N-1000ZXL in Play mode.
- (3) Bend the Back Tension Arm with pliers so that the gap between the Cassette Holding Spring assembled with the Head Base Ass'y and the Back Tension Arm becomes 0.5 mm as shown in Fig. 4.19. Do not bend the pointed end of the Back Tension Arm.
- (4) Set the N-1000ZXL in Stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the N-1000ZXL in Cue mode.  
In Cue mode, check to insure that the gap is found between the Supply Reel Hub B Ass'y and the Felt of Back Tension Ass'y as shown in Fig. 4.20.
- (5) Load the Back Tension Gauge (DA09055A) in the N-1000ZXL.
- (6) Set the N-1000ZXL in Play mode and read the torque value of Back Tension Gauge.  
If the value is in a range of 6 g-cm to 10 g-cm, adjustment is not necessary. If not, change the installation point of the Back Tension Spring as shown in Fig. 4.21, and obtain the torque of 7 g-cm to 9 g-cm range.

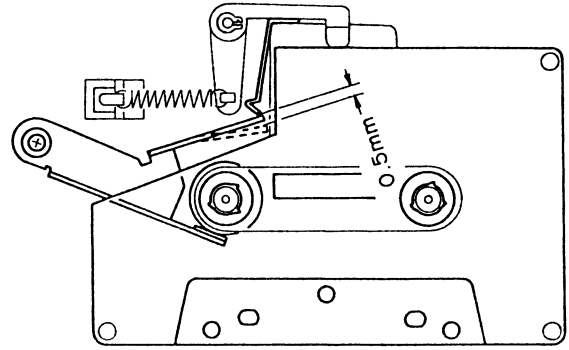


Fig. 4.19

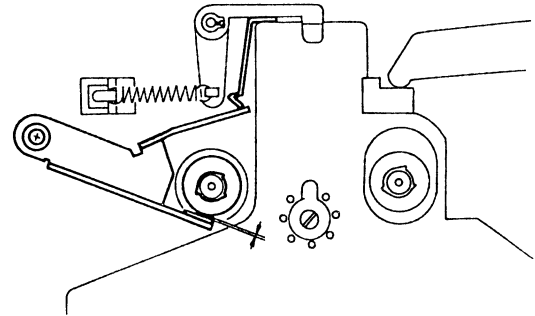


Fig. 4.20

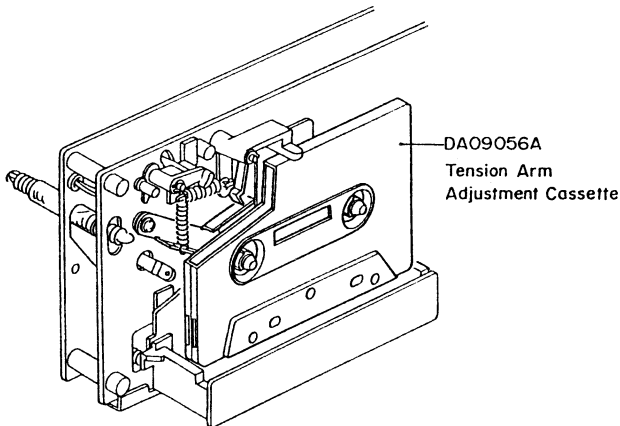


Fig. 4.18

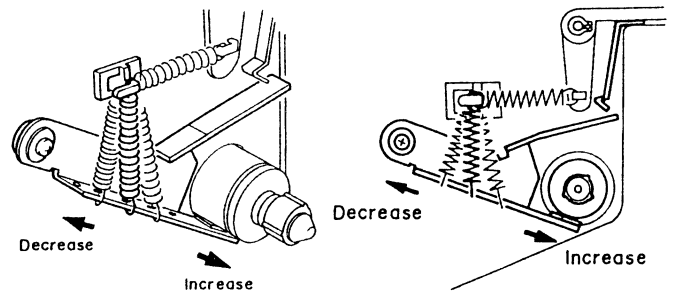


Fig. 4.21

## 4.9. Playback Head and Record Head Height Adjustment and Azimuth Alignment

### (1) Playback Head Height Adjustment and Azimuth Alignment

Refer to Fig. 4.22.

- Set the Monitor switch to Tape, then connect a VTVM to the Line Output Jacks.
- Set the Manual Set button, then set the Eq. switch to 70  $\mu$ s and Noise Reduction switch to Out.
- Load a 1 kHz Track Alignment Tape (DA09007A), then set the N-1000ZXL in Play mode.
- Turn the PH Height Gear until the outputs of both channels become minimum.
- Load a 15 kHz Azimuth Tape (DA09004A), then set the N-1000ZXL in Play mode.
- Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.
- Repeat above steps (c) through (f) one or two times to obtain optimum performance.

### (2) Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 4.22 – 4.26.

- Set the N-1000ZXL in Stop mode.  
Turn the Azimuth Motor in the Azimuth Alignment Motor Ass'y by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23. Remove the Azimuth Alignment Wire by pulling out from the Azimuth Alignment Motor Ass'y. In this case, do not move the Slide Lever of the Azimuth Alignment Wire.
- Set the Monitor switch to Tape, then connect a VTVM to the Line Output Jacks.
- Set the Eq. switch to 70  $\mu$ s and Noise Reduction switch to Out.
- Load a Reference SX Tape (DA09025A). Then set the N-1000ZXL in Record and Pause mode.
- With pressing the Auto Calibration button "Run", press the Play button to set the N-1000ZXL in Auto Calibration mode.

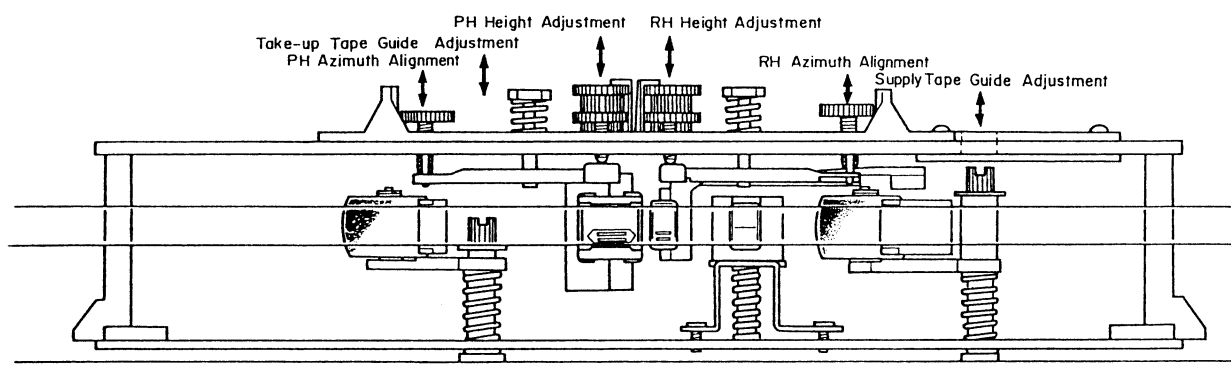


Fig. 4.22

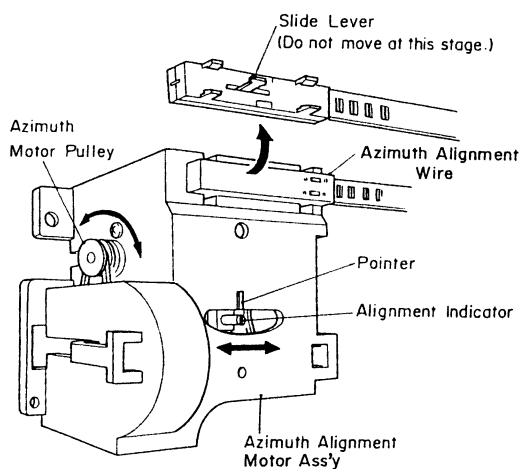


Fig. 4.23

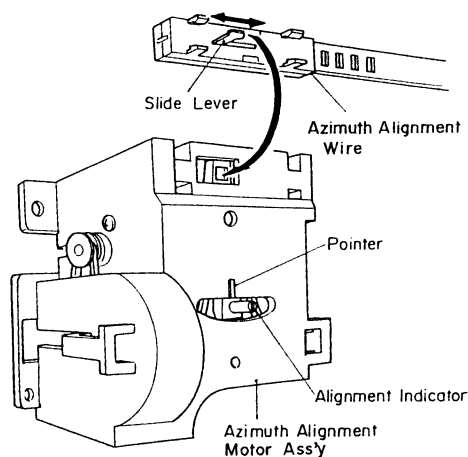


Fig. 4.24

Auto Azimuth Alignment button light starts flashing and Azimuth Alignment operation begins.

Referring to Fig. 4.25, adjust VR507 on the Logic P.C.B. Ass'y so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23.

- (f) When the Auto Azimuth Alignment operation is completed, Auto Azimuth Alignment button light goes out, then Auto Calibration of Bias, Level and Equalization is automatically carried out.
- (g) After completion of the above Auto Calibration, tape is automatically rewound to "0000" and the Standby/Set button light is illuminated.  
With pressing the Standby/Set button, press the Tape Memory button A, B, C, or D to store the information (Bias, Level and Equalization).
- (h) Set the Test Tone switch to 400 Hz, then turn the RH Height Gear until the outputs of both channels become maximum.
- (i) Feed in 15 kHz (-20 dB) and set the Test Tone switch to OFF, then set the N-1000ZXL in Record and Play mode.  
Turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.
- (j) Repeat above steps (h) and (i) one or two times to obtain optimum performance.
- (k) Set the N-1000ZXL in Stop mode, then again set in Record and Pause mode.

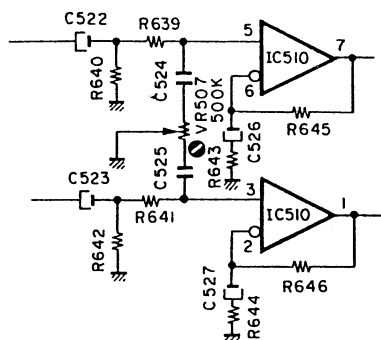


Fig. 4.25

- (l) With pressing the Auto Azimuth Alignment button "Azimuth", press the Play button to set the N-1000ZXL in Auto Azimuth Alignment mode.  
Check to insure whether the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y in the position of VR507 as adjusted in above step (e). If not, re-adjust VR507 to correspond the Alignment Indicator to the pointer of the Azimuth Alignment Motor Ass'y.
- (m) Set the N-1000ZXL in Stop mode.  
Mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.24. (Correct the position of the Slide Lever of the Azimuth Alignment Wire by sliding by hand, then insert the Slide Lever into the receptacle of the Azimuth Alignment Motor Ass'y.)
- (n) After completion of the above adjustment, record 400 Hz tone to the same portion of both sides A and B of the tape.
- (o) Immerse the recorded tape in a magnetized developing solution. In turn, check to insure that the recording head tracks across the center are separated with a distance of 0.55 to 0.75 mm (typically 0.65 mm) as illustrated in Fig. 4.26.

Note: Liquid for tape magnetized development solution

"MAGNA-SEE SOUND CRAFT a product of CBS RECORDS a division of Columbia Broadcasting System, Inc., Danbury, Conn. 06810 U.S.A., or equivalent".

After development, clean the tape otherwise pressure rollers and heads will become dirty.

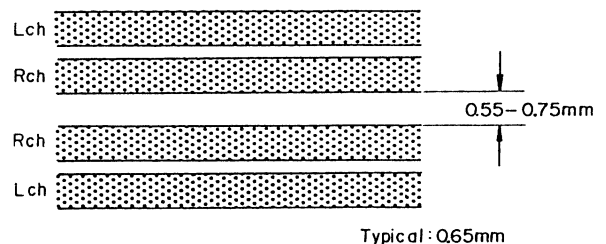


Fig. 4.26

## 4.10. Record Head Stroke Adjustment

Refer to Figs. 4.27 and 4.28.

Note: This adjustment will be required only to insure freedom from misalignment of the record head stroke in the record head stroke check mode.

- (1) Check the accuracy of the record head stroke.
- (2) Remove Head Mount Base Ass'y referring to item 2.25.
- (3) Remove the record head assembly.
- (4) Adjustment of Record Head Mounting Gauge M-9048 (DA09048A)
  - (a) Mount the Block B onto the Mounting Gauge Plate.
  - (b) Loosen the 2 screws fixing the Block A.
  - (c) As shown in Fig. 4.27 hold the Gauges (3.05 mm and 0.1 mm thickness) between the Block A and Block B, fix the Block A with screws, pushing the Block A to the 2 guide pins.
- (5) Remove the Block B from the Mounting Gauge Plate.
- (6) As shown in Fig. 4.28, mount the R-8L record head assembly onto the Mounting Gauge Plate, then check the location of the R-8L record head surface. (If record head contacts to the Block C, loosen 2 pcs. of screws that are assembled record head and R-8L record head assembly, then place the R-8L record head assembly onto the Plate.)
- (7) Remove the R-8L record head assembly from the Mounting Gauge Plate.

- (8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)

- (a) Mount the Block B onto the Mounting Gauge Plate.
- (b) Loosen the 2 screws fixing the Block A.
- (c) As shown in Fig. 4.27 hold the Gauges (3.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, fix the Block A with screw, pushing the Block A to the 2 guide pins.
- (9) Remove the Block B from the Mounting Gauge Plate.
- (10) Mount the R-8L record head assembly onto the Mounting Gauge Plate.
- (11) As shown in the Fig. 4.28, loosen the R-8L record head with 2 pcs. of screws onto the record head plate. As the location of the Block A is secured by the item (8)-(c), push the record head to the directions A and B, then tighten 2 pcs. of screws.
- (12) Check to insure freedom from gap between the Block C and record head surface, then tighten the 2 pcs. of screws on the record head plate with lock tight paint.
- (13) Assemble the record head assembly to the head mount base assembly.
- (14) Assemble the head mount base assembly to the mechanism assembly.
- (15) Check the record head stroke.

If the above are inaccurate, items (1) through (15) will have to be repeated till satisfactory results are obtained.

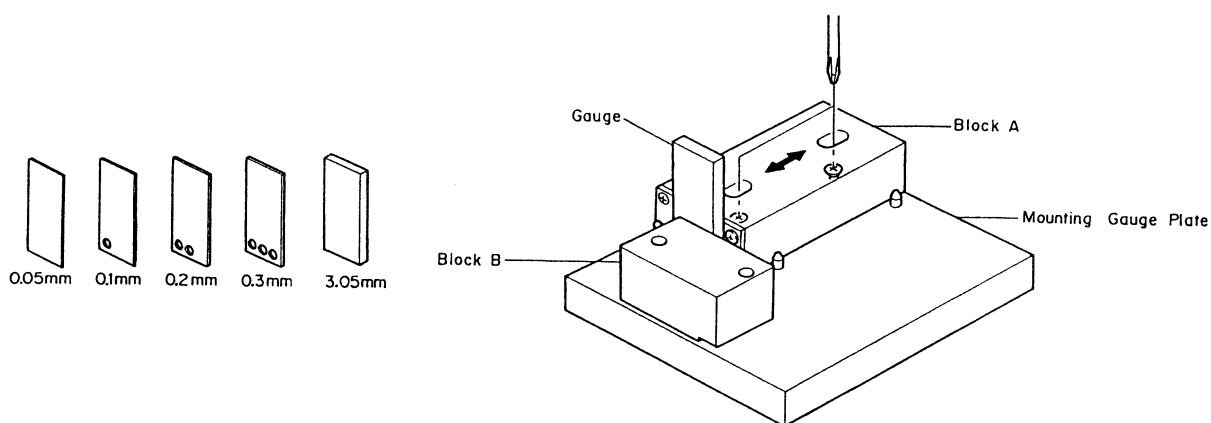


Fig. 4.27

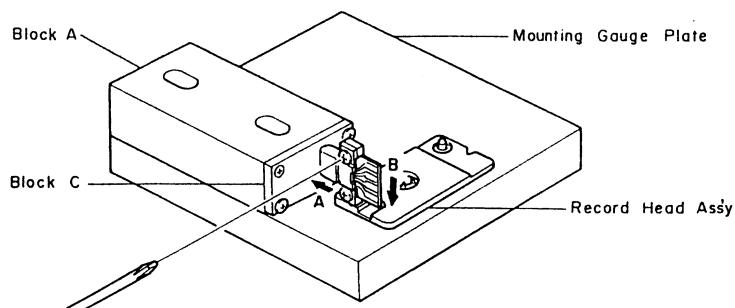


Fig. 4.28

#### 4.11. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 as shown in Fig. 4.29 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

While modifying an EXII C-90, the tape guides in the cassette housing shall be kept protected to avoid tilt. Check shall be made in the following procedures:

- (1) An EXII C-90 Tape thus modified shall be loaded onto the N-1000ZXL.
- (2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the N-1000ZXL in Play mode.
- (3) In this juncture, check to insure whether the tape is free from waving or slippage from the tape guide.
- (4) When the modified EXII C-90 is played back, check to insure whether the tape is freedom from waving from head surface or at pressure rollers.
- (5) If either of waving or slippage from the tape guide should be noted, adjustments of "4.4. Record Head and Playback Head Tilt Adjustment", "4.5. Head Base Stroke Adjustment", "4.6. Tape Guides Adjustment and Erase Head Stroke Adjustment", "4.7. Erase Head Height and Tilt Adjustment", "4.8. Back Tension Adjustment", "4.9. Playback Head and Record Head Height Adjustment and Azimuth Alignment", "4.10. Record Head Stroke Adjustment", etc. will be required.

As a case may be, the said waving or slippage may have been caused from defective Supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with capstans. If such is noted, the Pressure Roller Assemblies will have to be replaced.

Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The N-1000ZXL is intended to be an adjustment-free Model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

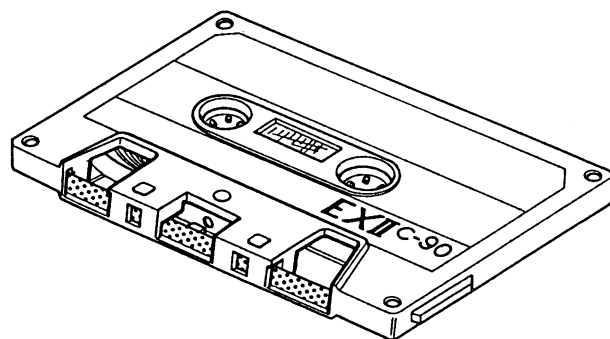


Fig. 4.29

#### 4.12. Flywheel Holder Adjustment

- (1) Refer to Fig. 4.30.

Tighten the Thrust Screws until the gap between the Flywheel Assemblies and Thrust Screws becomes minimized when both of the Capstan Shafts are moved backwardly and forwardly (the Thrust Springs between the Capstan Flanges and Flywheel Thrust Caps are in a flat state).

Excessive tightening of the Thrust Screws however will give damages on the Flywheel Assemblies, to which careful attention is invited.

- (2) Return the Thrust Screws by 1/2 turn.
- (3) Fixing the Thrust Screw with a screwdriver, lock the Lock Nut.
- (4) Apply a quantity of lock tight paint to the Thrust Screws.

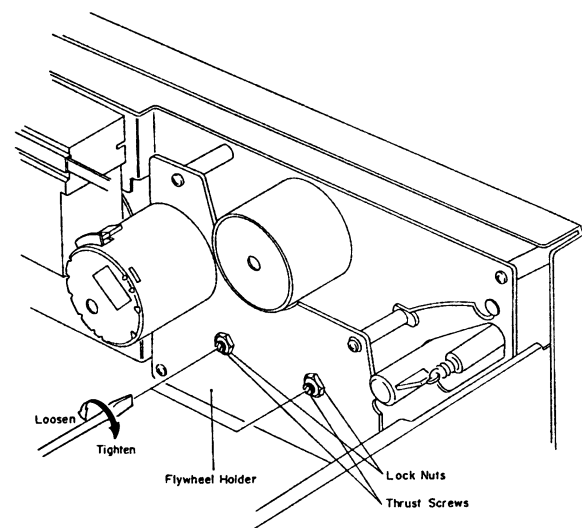


Fig. 4.30

#### 4.13. Tape Speed Adjustment

- (a) Remove the Cabinet Ass'y.
- (b) Remove the CPU P.C.B. Ass'y.
- (c) Connect a Frequency Counter to Line Output Jacks.
- (d) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.
- (e) Referring to Fig. 4.31, adjust the Tape Speed Adjustment Volume VR501 on the Speed Cal. P.C.B. Ass'y to obtain 3,000 Hz on the Frequency Counter.

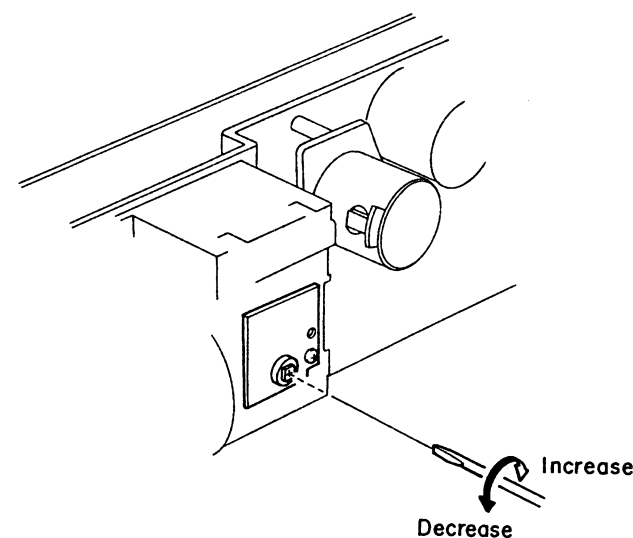


Fig. 4.31

#### 4.14. Lubrication

N-1000ZXL is a lubrication-free cassette deck except when parts are replaced. Apply the following lubricant for each replaced part:

- (1) LAUNA #100  
Capstan Shaft  
Pressure Roller Shaft  
Thrust Cap
- (2) FLOIL GB-TS-1  
Reel Hub Shaft  
Thrust portion on the Capstan Shaft  
FLOIL GB-TS-1, made by Kanto Chemicals Co., Ltd., in Japan.  
We suggest that you use the above or equivalent type. If unavailable please contact Kanto Chemicals Co., Ltd., 2-7 Kanda Suda-cho Chiyoda-ku, Tokyo 101 Japan.
- (3) Silicon Oil #3000CST  
Air Damper Piston

Note: Excessive lubrication may cause defective damper action as the 0.2φ hole at the end of the cylinder may be filled with oil.

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

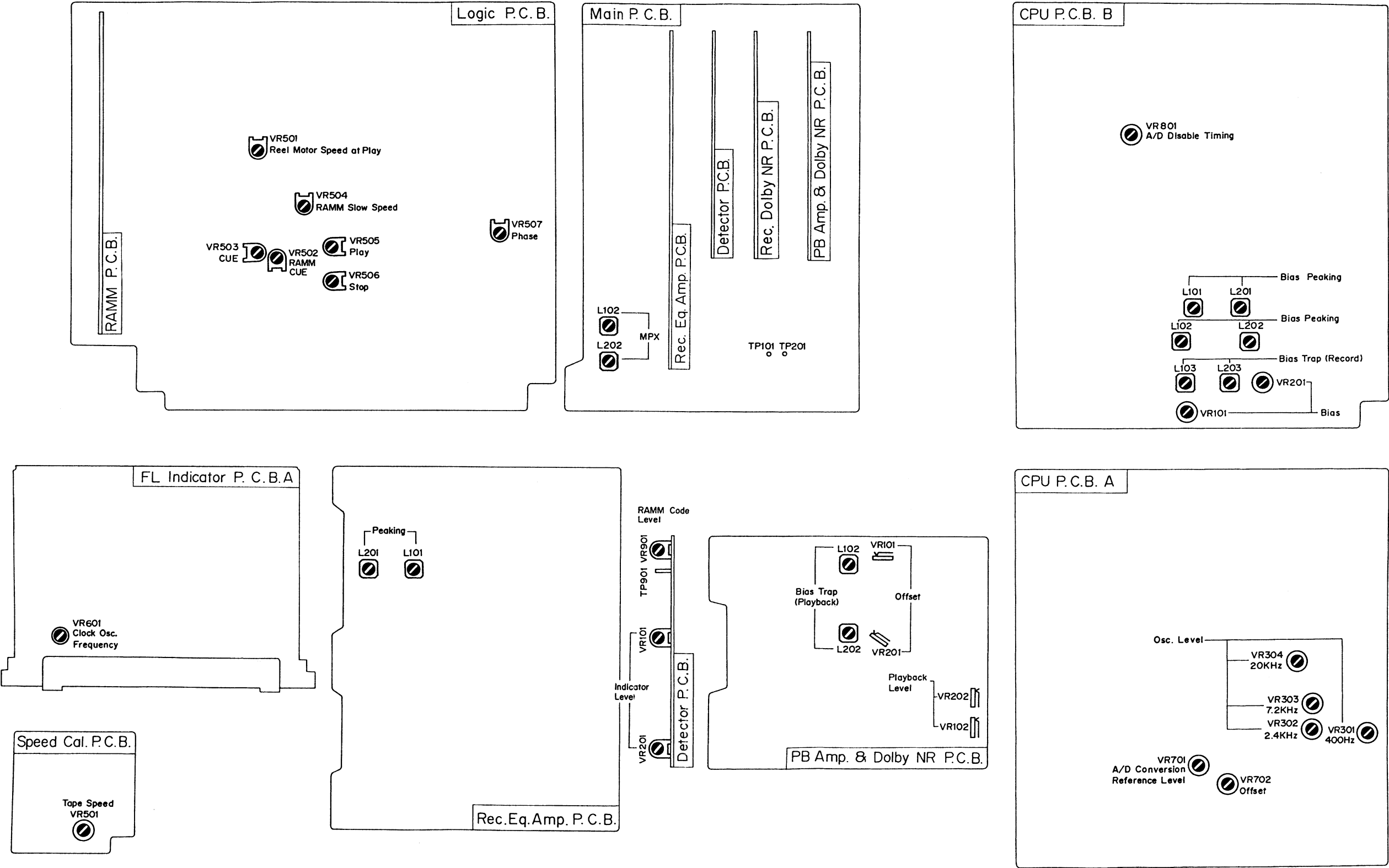


Fig. 5

## 6. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

### 6.1. Introduction

The N-1000ZXL incorporates a micro-processor which automatically calibrates the bias, level (sensitivity) and recording equalization to achieve an accurate frequency response of 20 Hz – 20 kHz when the auto calibration function is commanded.

To adjust the following steps manually, it is necessary to put the circuit to the desired adjustment condition.

The Test Unit is used for this purpose. Connect this unit with the N-1000ZXL and adjust manually the N-1000ZXL.

Step 10: Maximum Bias Current Adjustment

Step 11: Bias Trap (Record) Adjustment

Step 12: Bias Current Adjustment

Step 13: Oscillator Level Adjustment

Step 14: A/D Converter Offset Adjustment

Step 15: A/D Converter Frequency Response and Level Change Measurement

#### (1) How To Connect the Test Unit

(a) Remove the CPU P.C.B. Shield Plate referring to item 2.3-(3) on page 5, then unfasten 3 screws and turn over the CPU P.C.B. Ass'y referring to item 2.3-(4).

Thus, the CPU P.C.B. A Ass'y in the bottom of the CPU P.C.B. Ass'y becomes accessible.

(b) Connect the connectors CN-4, 5, 6, 7, 8 and 9 of the Test Unit to the test connectors CN-4, 5, 6, 7, 8 and 9 of the CPU P.C.B. A Ass'y respectively.

(c) When adjustments are completed, disassemble the Test Unit by reversing the above steps.

#### (2) How To Perform Switch Command

The Test Unit has 27 switches, SW1 – SW27. Preset switches SW3 – SW27 are of ON-OFF type, and Trigger switches SW1 and SW2 are of momentary type. Preset switches SW3 – SW24 are connected to the output ports and bidirectional ports of the micro-processor and a necessary command is set by the ON/OFF of SW3 – SW24. When the Trigger switch SW1 or SW2 is pressed, the command made by SW3 – SW24 is transmitted to the N-1000ZXL and the circuit of the N-1000ZXL is set in the required condition.

Table 6.1 shows the adjustment and the required switch condition of SW1 – SW24.

### (3) How To Read LED Display

On step 13 "Oscillator Level Adjustment", the data of LEDs is used for adjustment. Each LED corresponds to the binary bit  $2^7$ ,  $2^6$ ,  $2^5$ ,  $2^4$ ,  $2^3$ ,  $2^2$ ,  $2^1$  and  $2^0$ . Accordingly, when the LEDs display as follows, the binary data is defined to be 11001100.

(example)

LED:  $2^7$  (ON)  $2^6$  (ON)  $2^5$  (OFF)  $2^4$  (OFF)  $2^3$  (ON)  $2^2$  (ON)  $2^1$  (OFF)  $2^0$  (OFF)

Binary Data: 11001100 (Hexadecimal Data: CC)

In the adjustment, the subtraction of the fixed binary data 00010000 from the "Reference Level" data is required.

In this case, refer to the following examples (binary subtraction) and find the solution.

(example)

Reference Level: 11001001 (C9)

Fixed Data: –00010000 (10)

Subtracted Solution: 10111001 (B9)

|    |    |     |      |
|----|----|-----|------|
| 1  | 1  | 10  | 100  |
| –0 | –1 | –01 | –001 |
| 1  | 0  | 01  | 011  |

Note: The data of the lowest bit is very small with respect to the whole data, therefore it can be neglected.

Table 6.1

| ITEM                                                                   | PRESET SW |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | TRIGGER SW |    | REMARKS |   |                |
|------------------------------------------------------------------------|-----------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|------------|----|---------|---|----------------|
|                                                                        | 3         | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23         | 24 |         | 1 | 2              |
| Step 10: Maximum Bias Current Adjustment                               | 0         | 1 | 0 | 0 | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 | } Bias Osc.    |
|                                                                        | 0         | 1 | 0 | 1 | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 |                |
| Step 11: Bias Trap Adjustment (Record)                                 | 0         | 1 | 0 | 0 | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 | } Bias Osc.    |
|                                                                        | 0         | 1 | 0 | 1 | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 |                |
| Step 12: Bias Current Adjustment                                       | 1         | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 | } Bias Current |
|                                                                        | 1         | 0 | 0 | 1 | 0 | 0 | 0 | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 |                |
|                                                                        | 0         | 1 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 |                |
|                                                                        | 0         | 1 | 0 | 1 | 0 | 0 | 0 | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0       | 1 |                |
| Step 13: Oscillator Level Adjustment                                   | 0         | 0 | 0 | 0 | 0 | 1 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | Auto Eq.       |
|                                                                        | 0         | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 400 Hz 0 dB    |
|                                                                        | 0         | 0 | 0 | 0 | 0 | 0 | 1 | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 400 Hz -10 dB  |
|                                                                        | 0         | 0 | 0 | 0 | 0 | 0 | 1 | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 400 Hz -30 dB  |
|                                                                        | 0         | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 2.4 kHz -30 dB |
|                                                                        | 0         | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 7.2 kHz -30 dB |
|                                                                        | 0         | 0 | 0 | 0 | 1 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 20 kHz -30 dB  |
| Step 14: A/D Converter Offset Adjustment                               | 0         | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1          | 1  | 0       | 0 | Offset Voltage |
| Step 15: A/D Converter Frequency Response and Level Change Measurement | 0         | 0 | 0 | 0 | 0 | 0 | 1 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 8V -10 dB      |
|                                                                        | 0         | 0 | 0 | 0 | 0 | 0 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 5V -10 dB      |
|                                                                        | 0         | 0 | 0 | 0 | 0 | 0 | 1 | 1  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 1       | 0 | 8V -30 dB      |

Note: SW3 – SW24: "1" – ON, "0" – OFF

SW1 and SW2: "1" – pressed, "0" – not pressed

## 6.2. Adjustment and Measurement Instructions

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

| STEP | ITEM                                            | SIGNAL SOURCE                               | OUTPUT CONNECTION                                                                                        | MODE                                                                                                                                 | ADJUSTMENT                                               | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|-------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Tape Speed Adjustment                           | 3 kHz Speed and Wow/Flutter Tape (DA09006A) | Frequency Counter to Line Output Jacks                                                                   | Playback                                                                                                                             | Speed Cal. P.C.B. VR501                                  | Adjust VR501 to obtain 3 kHz $\pm 0.5\%$ on the frequency counter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2    | Playback Amp. Offset Adjustment                 | None                                        | DC Voltmeter to Pin Nos. 1 and 7 of IC301 on Playback Amp. & Dolby NR P.C.B.                             | Stop                                                                                                                                 | Playback Amp. & Dolby NR P.C.B. VR101, VR201             | Adjust VR101 (VR201) to obtain DC 100 mV or less on the DC voltmeter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3    | Bias Trap Adjustment (Playback)                 | None                                        | VTVM to Line Output Jacks                                                                                | Record, Playback<br>Monitor SW – Tape<br>Eq. SW – 70 $\mu$ s<br>Noise Reduction SW – OUT<br>Filter SW – OFF                          | Playback Amp. & Dolby NR P.C.B. L102, L202               | <ol style="list-style-type: none"> <li>To allow the adjustment of L102 (L202), remove the Playback Amp. &amp; Dolby NR P.C.B. Ass'y from the Main P.C.B, then connect them by an Extension Card M-9058 (DA09058A).</li> <li>Load a reference SX tape (DA09025A), then perform the auto calibration function as follows: <ol style="list-style-type: none"> <li>Press the Record and Pause buttons.</li> <li>Pressing the Auto Calibration button "RUN", press the Play button.</li> </ol> </li> <li>Load a blank tape, then press the Record and Play buttons to set in record and play mode.</li> <li>Adjust L102 (L202) to obtain a minimum reading on the VTVM.</li> <li>After completion of above adjustment, assemble the Playback Amp. &amp; Dolby NR P.C.B. Ass'y.</li> </ol>                                                                                                       |
| 4    | FL Indicator Level and Dynamic Range Adjustment | 400 Hz (0dB/-20 dB) to Line Input Jacks     | Frequency Counter to Pin No. 7 of IC605 on FL Indicator P.C.B. A and VTVM to TP101, TP201 on Main P.C.B. | Monitor SW – Source<br>Test Tone – 400 Hz/OFF<br>Meter SW – P. Hold or VU/Peak                                                       | Indicator P.C.B. A VR601<br>Detector P.C.B. VR101, VR201 | <ol style="list-style-type: none"> <li>Remove the FL Indicator Ass'y from the Front Chassis and disassemble the FL Indicator Case Cover referring to item 2.15.</li> <li>Adjust VR601 to obtain 40.44 kHz clock on the frequency counter.</li> <li>Adjust the Line Input level controls to obtain 90 mV on the VTVM.</li> <li>Adjust VR101 (VR201) to obtain 0 dB on the FL level indicator.</li> <li>Decrease the line input signal levels by 20 dB, then check whether the FL level indicators indicate -20 dB. If not, finely adjust VR601 so that the FL level indicators indicate -20 dB.</li> <li>Repeat 3 – 5 till satisfactory results are obtained.</li> <li>Assemble the FL Indicator Ass'y.</li> <li>Set the Test Tone Switch to 400 Hz, then check whether the FL indicators indicate 0 dB. If not, adjust VR101 (VR201) to obtain 0 dB on the FL level indicators.</li> </ol> |
| 5    | MPX Filter Adjustment                           | 19 kHz $\pm 100$ Hz to Line Input Jacks     | VTVM to Line Output Jacks                                                                                | Monitor SW – Source<br>Meter SW – P. Hold or VU/Peak<br>Filter SW – MPX                                                              | Main P.C.B. L102, L202                                   | <ol style="list-style-type: none"> <li>Set the Output level controls to max.</li> <li>Adjust the Line Input level controls to obtain 1 V on the VTVM.</li> <li>Set the Filter switch to MPX, then adjust L102 (L202) to obtain a minimum reading on the VTVM (the minimum reading will be less than -30 dB).</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6    | Playback Head Track Alignment                   | 1 kHz Track Alignment Tape (DA09007A)       | VTVM to Line Output Jacks                                                                                | Playback<br>Monitor SW – Tape<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 70 $\mu$ s<br>Noise Reduction SW – OUT<br>Filter SW – OFF | PH Height Gear                                           | <ol style="list-style-type: none"> <li>Press the Manual Set button.</li> <li>Adjust the PH Height Gear to obtain minimum readings of both channels on the VTVM.</li> <li>Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 4.9.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

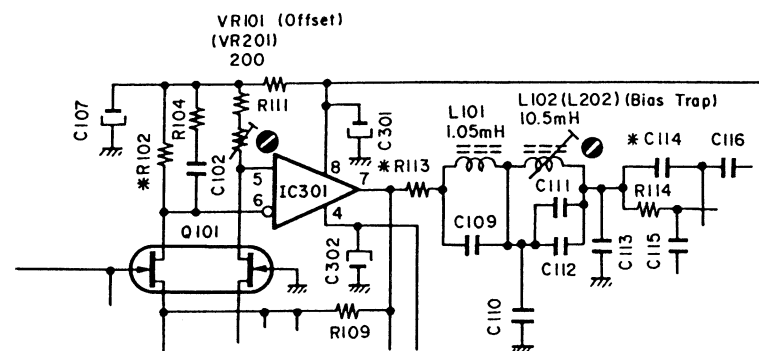
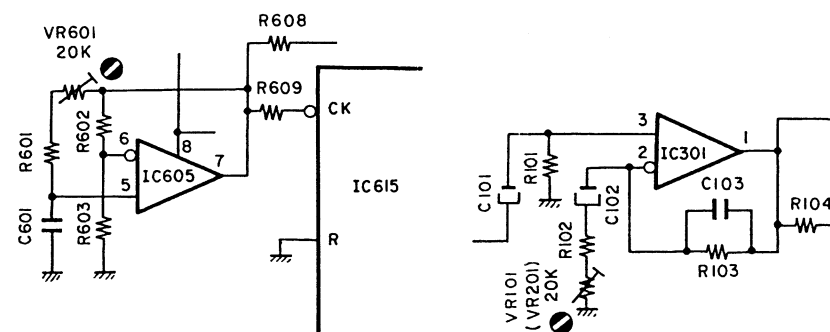


Fig. 6.2.1

2. Playback Amp. Offset
3. Bias Trap (Playback)





| STEP | ITEM                                   | SIGNAL SOURCE                                                                                                                                                                | OUTPUT CONNECTION                                    | MODE                                                                                                                                 | ADJUSTMENT                                   | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7    | Playback Head Azimuth Alignment        | 15 kHz Azimuth Tape (DA09004A)                                                                                                                                               | VTVM to Line Output Jacks                            | Playback<br>Monitor SW — Tape<br>Meter SW — P. Hold or VU/Peak<br>Eq. SW — 70 $\mu$ s<br>Noise Reduction SW — OUT<br>Filter SW — OFF | Playback Head Azimuth Alignment Screw        | 1. Press the Manual Set button.<br>2. Adjust the Playback Head Azimuth Alignment screw to obtain the maximum readings of both channels on the VTVM.<br>Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 4.9.<br>3. Repeat above steps 6 and 7 one or two times to obtain optimum performance.                                                                                                                                                                                                                                                                                                                                                                                                        |
| 8    | Playback Level Adjustment              | 400 Hz Level Tape (DA09005A)                                                                                                                                                 | VTVM to TP101, TP201 on Main P.C.B.                  | Same as above                                                                                                                        | Playback Amp. & Dolby NR P.C.B. VR102, VR202 | 1. Press the Manual Set button.<br>2. Adjust VR102 (VR202) to obtain 90 mV on the VTVM or 0 dB on the FL level indicator.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9    | Playback Frequency Response Adjustment | 400 Hz Level Tape (DA09005A)<br>10 kHz PB Frequency Response Tape (DA09003A)<br>15 kHz PB Frequency Response Tape (DA09002A)<br>20 kHz PB Frequency Response Tape (DA09001A) | VTVM to Line Output Jacks                            | Same as above                                                                                                                        |                                              | 1. Press the Manual Set button.<br>2. Load a 400 Hz level tape and play it back. Set the Output level controls to a certain level (0 dB for example).<br>3. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes, then adjust the playback head azimuth to give maximum levels on the VTVM with each tape.<br>4. Read the maximum levels with each tape and check to insure that the levels against the 400 Hz level tape are within the following ranges.<br>10 kHz: -20 dB -1 dB to +2 dB<br>15 kHz: -20 dB -1 dB to +2 dB<br>20 kHz: -20 dB -1 dB to +2 dB<br>5. Conduct step 7 "Playback Head Azimuth Alignment".<br>6. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 6.3. |
| 10   | Maximum Bias Current Adjustment        | None                                                                                                                                                                         | VTVM across R125, R225 (CN-19-1, -3) on CPU P.C.B. B | Record, Pause<br>Bias Bit — 10000000                                                                                                 | CPU P.C.B. B<br>L101, L201<br>L102, L202     | 1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1.<br>2. Perform the following procedures on the Test Unit, thus the bias bits of both channels are set to 10000000. (Refer to table 6.1.)<br>a. Set SW10 to ON.<br>b. Set SW4 to ON, then press the Trigger SW2.<br>c. Set SW4, 6 to ON, then press the Trigger SW2.<br>Note: Switch is OFF unless otherwise specified as ON.<br>3. Adjust L101 (L201) and L102 (L202) to obtain the maximum reading on the VTVM.                                                                                                                                                                                                                                  |
| 11   | Bias Trap Adjustment (Record)          | None                                                                                                                                                                         | VTVM to terminals BM1, BM2 on CPU P.C.B. B           | Record, Pause<br>Bias Bit — 10000000                                                                                                 | CPU P.C.B. B<br>L103, L203                   | 1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1.<br>2. Perform the following procedures on the Test Unit, thus the bias bits of both channels are set to 10000000.<br>a. Set SW10 to ON.<br>b. Set SW4 to ON, then press the Trigger SW2.<br>c. Set SW4, 6 to ON, then press the Trigger SW2.<br>3. Adjust L103 (L203) to obtain a minimum reading on the VTVM.                                                                                                                                                                                                                                                                                                                                   |

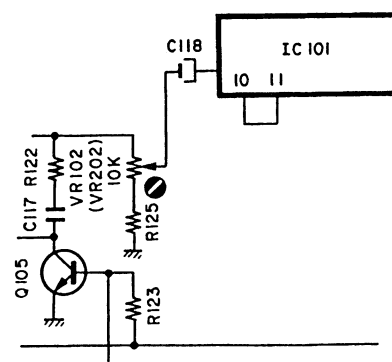


Fig. 6.2.4  
8. Playback Level

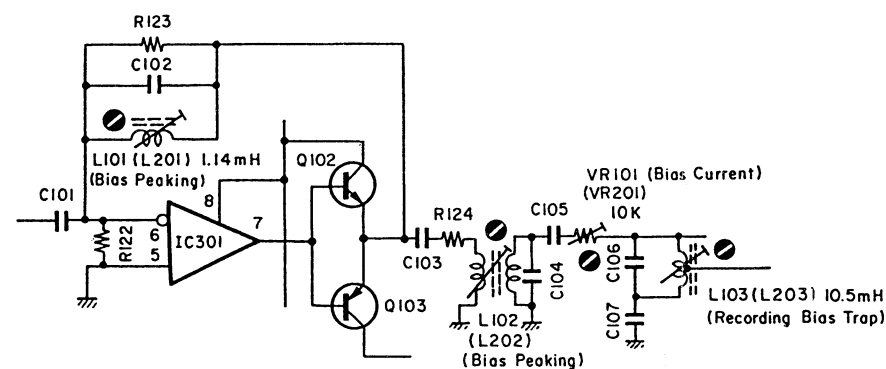


Fig. 6.2.5  
10. Maximum Bias Current  
11. Bias Trap (Record)

| STEP | ITEM                        | SIGNAL SOURCE | OUTPUT CONNECTION                                    | MODE                                 | ADJUSTMENT                                                | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|-----------------------------|---------------|------------------------------------------------------|--------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12   | Bias Current Adjustment     | None          | VTVM across R125, R225 (CN-19-1, -3) on CPU P.C.B. B | Record, Pause<br>Bias Bit — 11111111 | CPU P.C.B. B<br>VR101, VR201                              | <ol style="list-style-type: none"><li>1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1.</li><li>2. Perform the following procedures on the Test Unit, thus the bias bits of both channels are set to 11111111.<ol style="list-style-type: none"><li>a. Set SW10, 11, 12 and 13 to ON.</li><li>b. Set SW3 to ON, then press the Trigger SW2.</li><li>c. Set SW3, 6 to ON, then press the Trigger SW2.</li><li>d. Set SW4 to ON, then press the Trigger SW2.</li><li>e. Set SW4, 6 to ON, then press the Trigger SW2.</li></ol></li><li>3. Adjust VR101 (VR201) to obtain 80 mV on the VTVM.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 13   | Oscillator Level Adjustment | None          | VTVM to TP101, TP201 on Main P.C.B.                  | Record, Pause                        | CPU P.C.B. A<br>VR301<br>VR302<br>VR303<br>VR304<br>VR701 | <ol style="list-style-type: none"><li>1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1.</li><li>2. Remove the Playback Amp. &amp; Dolby NR P.C.B. Ass'y from the Main P.C.B. Ass'y referring to item 2.7, then connect the pin Nos. 4 (L ch.) and 5 (R ch.) of CN-47 on the Main P.C.B. Ass'y to the pin Nos. 3 (L ch.) and 5 (R ch.) of CN-49 on the Main P.C.B. Ass'y by jumper wires by soldering.</li><li>3. Adjustment of 400 Hz —10 dB oscillation level:<ol style="list-style-type: none"><li>a. Perform the following procedures on the Test Unit.<ol style="list-style-type: none"><li>1) Set SW8, 10 to ON, then press the Trigger SW1 (Auto Eq.).</li><li>2) Set SW7, 13 to ON, then press the Trigger SW1 (400 Hz 0 dB).</li><li>3) Set SW9, 13 to ON, then press the Trigger SW1 (400 Hz —10 dB).</li></ol></li><li>b. Adjust VR301 to obtain 28.5 mV on the VTVM.</li><li>c. Adjust VR701 so that the LEDs of the Test Unit display as follows:<br/><br/>LED: 2<sup>7</sup>(ON) 2<sup>6</sup>(ON) 2<sup>5</sup>(OFF) 2<sup>4</sup>(OFF) 2<sup>3</sup>(ON) 2<sup>2</sup>(ON) 2<sup>1</sup>(OFF) 2<sup>0</sup>(OFF)<br/>Binary: 11001100<br/><br/>Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF.</li></ol></li><li>4. Determination of the "Reference Level":<ol style="list-style-type: none"><li>a. Perform the following procedure on the Test Unit.<ol style="list-style-type: none"><li>1) Set SW9, 10, 12 and 13 to ON, then press the Trigger SW1 (400 Hz —30 dB).</li></ol></li><li>b. Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF.<br/>Note the value of 8 LEDs' display. This certain value is determined as the "Reference Level".</li></ol></li><li>5. Adjustment of 2.4 kHz —30 dB oscillation level:<ol style="list-style-type: none"><li>a. Perform the following procedure on the Test Unit.<ol style="list-style-type: none"><li>1) Set SW7, 12 to ON, then press the Trigger SW1 (2.4 kHz —30 dB).</li></ol></li><li>b. Adjust VR302 so that the LEDs' display meets the "Reference Level".<br/>Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF.</li></ol></li><li>6. Adjustment of 7.2 kHz —30 dB oscillation level:<ol style="list-style-type: none"><li>a. Perform the following procedure on the Test Unit.<ol style="list-style-type: none"><li>1) Set SW7, 11 to ON, then press the Trigger SW1 (7.2 kHz —30 dB).</li></ol></li><li>b. Adjust VR303 so that the LEDs' display meets the "Reference Level".<br/>Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF.</li></ol></li><li>7. Adjustment of 20 kHz —30 dB oscillation level:<ol style="list-style-type: none"><li>a. Perform the following procedure on the Test Unit.<ol style="list-style-type: none"><li>1) Set SW7, 10 to ON, then press the Trigger SW1 (20 kHz —30 dB).</li></ol></li><li>b. Adjust VR304 so that the LEDs' display shows less value than the "Reference Level" by 00010000.<br/>for example: Reference Level: 11001001<br/>                                          —00010000<br/>                                          LEDs' Display: 10111001<br/><br/>Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF.</li></ol></li><li>8. After completion of the above adjustment, disconnect the jumper wires between CN-47 and CN-49. And then assemble the Playback Amp. &amp; Dolby NR P.C.B. Ass'y.</li></ol> |

| STEP | ITEM                                                                                    | SIGNAL SOURCE                                                                | OUTPUT CONNECTION                                                                      | MODE                | ADJUSTMENT            | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14   | A/D Converter Offset Adjustment                                                         | None                                                                         | DC Voltmeter to Pin No. 1 of IC713 on CPU P.C.B. A                                     | Stop                | CPU P.C.B. A<br>VR702 | <ol style="list-style-type: none"> <li>1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1.</li> <li>2. Perform the following procedure on the Test Unit. <ol style="list-style-type: none"> <li>a. Set SW15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 to ON (Offset Voltage).</li> </ol> </li> <li>3. Adjust VR702 to obtain a reading of 0 V <math>\pm</math> 50 mV on the DC voltmeter.</li> <li>4. After completion of above adjustment, set the switches to OFF.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 15   | A/D Converter Frequency Response Measurement and A/D Converter Level Change Measurement | 400 Hz (−10 dB/−20 dB/−30 dB) and 20 kHz (−10 dB/−20 dB) to Line Input Jacks | VTVM to TP101 or TP201 on Main P.C.B. and DC Voltmeter to terminal CM8 on CPU P.C.B. A | Monitor SW – Source |                       | <ol style="list-style-type: none"> <li>1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1.</li> <li>2. Remove the Playback Amp. &amp; Dolby NR P.C.B. Ass'y from the Main P.C.B. Ass'y referring to item 2.7, then connect the pin Nos. 4 (L ch.) and 5 (R ch.) of CN-47 on the Main P.C.B. Ass'y to the pin Nos. 3 (L ch.) and 5 (R ch.) of CN-49 on the Main P.C.B. Ass'y by jumper wires by soldering.</li> <li>3. Perform the following procedure on the Test Unit. <ol style="list-style-type: none"> <li>a. Set SW9, 10 to ON, then press the Trigger SW1 (8 V −10 dB).</li> </ol> </li> <li>4. Feed in 400 Hz −10 dB to the Line Input jacks.</li> <li>5. Adjust the Line Input level controls to obtain 28.5 mV on the VTVM and then check to insure that the reading is 7.6 V <math>\pm</math> 1 V on the DC voltmeter.</li> <li>6. Feed in 20 kHz −10 dB and check to insure that the reading is 7.2 V <math>\pm</math> 1 V on the DC voltmeter.</li> <li>7. Feed in 400 Hz −20 dB and 20 kHz −20 dB and then check that each reading is 2.4 V <math>\pm</math> 0.4 V and 2.3 V <math>\pm</math> 0.4 V on the DC voltmeter.</li> <li>8. After completion of above frequency response check, perform the following procedure on the Test Unit for level change check. <ol style="list-style-type: none"> <li>a. Set SW9 to ON, then press the Trigger SW1 (5 V −10 dB).</li> </ol> </li> <li>9. Feed in 400 Hz −10 dB to the Line Input jacks. Adjust the Line Input level controls to obtain 28.5 mV on the VTVM and then check to insure that the reading is 4.9 V <math>\pm</math> 1 V on the DC voltmeter.</li> <li>10. Perform the following procedure on the Test Unit. <ol style="list-style-type: none"> <li>a. Set SW9, 10, 12 and 13 to ON, then press the Trigger SW1 (8 V −30 dB).</li> </ol> </li> <li>11. Feed in 400 Hz −30 dB to the Line Input jacks. Adjust the Line Input level controls to obtain 2.85 mV on the VTVM and then check to insure that the reading is 7.2 V <math>\pm</math> 1 V on the DC voltmeter.</li> <li>12. After completion of above measurement, disconnect the jumper wires between CN-47 and CN-49. And then assemble the Playback Amp. &amp; Dolby NR P.C.B. Ass'y.</li> <li>13. Remove the Test Unit from the CPU P.C.B. A Ass'y referring to item 6.1.</li> </ol> |

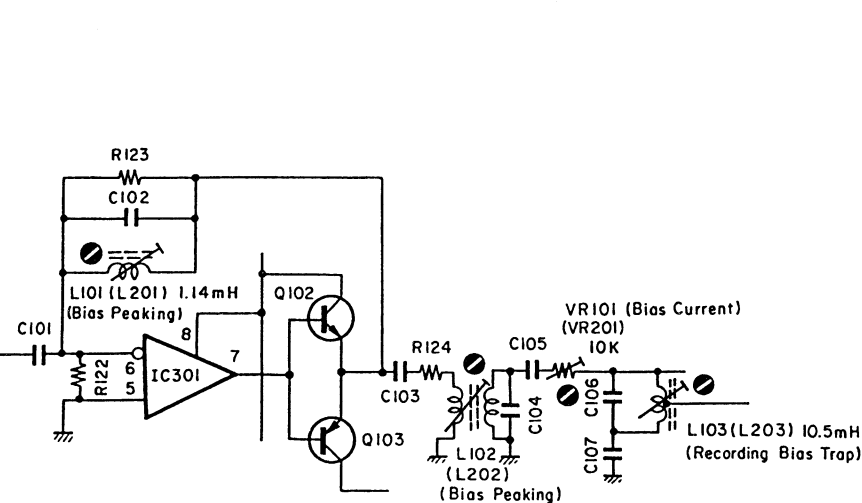


Fig. 6.2.6  
12. Bias Current

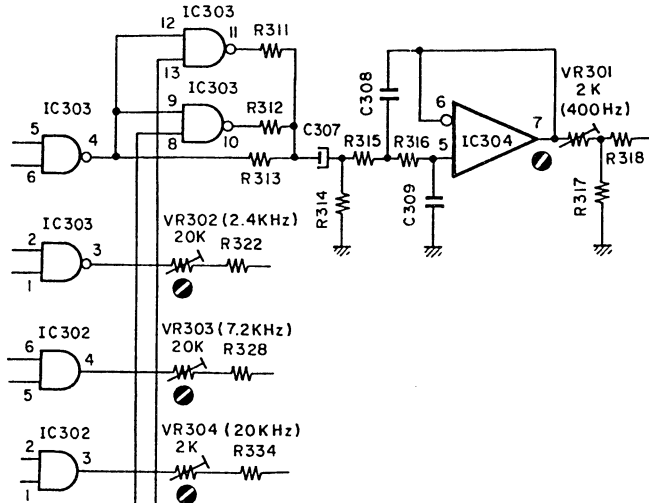


Fig. 6.2.7  
13. Oscillator Level

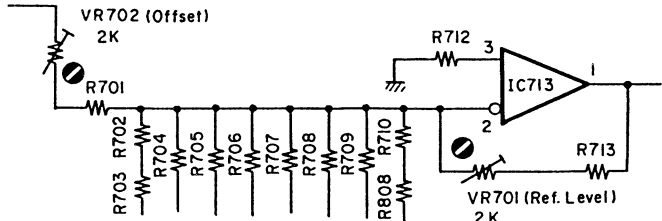


Fig. 6.2.8  
13. Oscillator Level  
14. A/D Converter Offset

| STEP | ITEM                                                | SIGNAL SOURCE                                          | OUTPUT CONNECTION                                  | MODE                                                                                                                                                                        | ADJUSTMENT                                                                                                                   | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------|-----------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16   | Record Head Height Adjustment and Azimuth Alignment | Test Tone 400 Hz and 15 kHz -20 dB to Line Input Jacks | VTVM to Line Output Jacks                          | Record, Playback<br>Monitor SW - Source<br>Test Tone SW - 400 Hz/OFF<br>Meter SW - P. Hold or VU/Peak<br>Eq. SW - 70 $\mu$ s<br>Noise Reduction SW - OUT<br>Filter SW - OFF | Head Height:<br>RH Height Gear<br><br>Azimuth Alignment:<br>Record Head Azimuth Alignment Screw<br><br>Logic P.C.B.<br>VR507 | <ol style="list-style-type: none"><li>1. In stop mode, turn the Azimuth Motor by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23. Remove the Azimuth Alignment wire by pulling out from the Azimuth Alignment Motor Ass'y.<br/>(In this case, do not move the Slide Lever of the Azimuth Alignment wire.)</li><li>2. Load a reference SX tape (DA09025A), then perform the auto calibration function as follows:<ol style="list-style-type: none"><li>a. Press the Record and Pause buttons to set in Record/Pause mode.</li><li>b. Pressing the Auto Calibration button "Run", press the Play button. Tape counter becomes "0000" and Auto Azimuth Alignment button light starts flashing. After disappearing flashing, Bias, Level and Eq. will go to performance automatically.<br/>The tape is rewound to "0000", the Standby/Set button light and the Manual Set button light come on, and the auto calibration function is completed.</li></ol></li><li>3. During the azimuth alignment operation in 2, adjust VR507 on the Logic P.C.B. so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23.</li><li>4. Record Head Height Adjustment:<ol style="list-style-type: none"><li>a. Set the Test Tone switch to 400 Hz. Record signals on the reference SX tape (DA09025A), and then play it back.</li><li>b. Adjust the RH Height Gear to obtain the maximum readings of both channels on the VTVM.</li></ol></li><li>5. Record Head Azimuth Alignment:<ol style="list-style-type: none"><li>a. Set the Test Tone switch to OFF, then feed in 15 kHz (-20 dB). Record signals on the reference SX tape (DA09025A) and then play it back.</li><li>b. Adjust the Record Head Azimuth Alignment Screw to obtain the maximum readings of both channels on the VTVM.</li><li>c. Repeat 4 and 5 one or two times to obtain optimum performance.</li></ol></li><li>6. Press the Stop button, then perform the auto azimuth alignment function as follows:<ol style="list-style-type: none"><li>a. Press the Record and Pause buttons.</li><li>b. Pressing the Auto Azimuth Alignment button "Azimuth", press the Play button.<br/>The counter becomes "0000" and Auto Azimuth Alignment button light starts flashing. When alignment is completed, the button light goes out and the tape is automatically rewound to "0000".</li></ol></li><li>7. During the auto azimuth alignment operation in 6, check to insure whether the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y at the position of VR507 as adjusted in 3.<br/>If not, re-adjust VR507 to correspond the Alignment Indicator to the pointer of the Azimuth Alignment Motor Ass'y.</li><li>8. Press the Stop button, then mount the Azimuth Alignment wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.24.</li><li>9. Perform the auto calibration function referring to 2.<br/>During the auto azimuth alignment operation, check to insure that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y.</li><li>10. Feed in 15 kHz (-20 dB). Record signals on the reference SX tape (DA09025A) and then play it back.<br/>Check to insure that the playback level is the same as the source monitor level for both channels.</li></ol> |
| 17   | A/D Converter Disable Timing Adjustment             | None                                                   | Synchroscope to Pin No. 4 of IC809 on CPU P.C.B. B | Stop                                                                                                                                                                        | CPU P.C.B. B<br>VR801                                                                                                        | <ol style="list-style-type: none"><li>1. Set the vertical gain of the synchroscope to 5 V/cm.</li><li>2. Perform the auto calibration function referring to step 16-2. During auto calibration operation, waveform in Fig. 6.2.10 is observed.</li><li>3. Adjust VR801 so that the high-level period of the waveform becomes 450 ms.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| STEP | ITEM                                  | SIGNAL SOURCE                                                 | OUTPUT CONNECTION                                    | MODE                                                                                                                                                                            | ADJUSTMENT                         | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|---------------------------------------|---------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18   | Overall Frequency Response Adjustment | 400 Hz (0 dB) and 20 Hz – 20 kHz (–20 dB) to Line Input Jacks | VTVM and Distortion Meter to Line Output Jacks       | Record, Playback<br>Monitor SW – Source/Tape<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 120 $\mu$ s (EX)<br>70 $\mu$ s (SX/ZX)<br>Noise Reduction SW – OUT<br>Filter SW – OFF | Rec. Eq. Amp. P.C.B.<br>L101, L201 | For each tape to be used, perform the auto calibration function referring to step 16-2.<br>1. Set the Monitor switch to Source.<br>2. Feed in 400 Hz (0 dB), then adjust the Line Input level controls to obtain 0 dB on the FL level indicators.<br>3. Switch the generator output level to –20 dB.<br>4. Set the Monitor switch to Tape, then record and play it back.<br>5. Feed in 20 Hz – 20 kHz (–20 dB), then check to insure that the output levels are within –20 dB $\pm$ 0.75 dB on the VTVM.<br>6. If above is not sufficient, adjust L101 (L201) to obtain –20 dB $\pm$ 0.75 dB output level on the VTVM.<br>7. If a satisfactory result is not obtained, precise re-adjustment of step 9 “Playback Frequency Response”, replacement of Playback Head or Record Head, check on item 4.11 “Tape Travelling Adjustment”, or frequency adjustment according to item 6.3 will be required. |
| 19   | Crosstalk Measurement                 | 1 kHz to Line Input Jacks                                     | 1 kHz Band Pass Filter and VTVM to Line Output Jacks | Record and Playback<br>Monitor SW – Source/Tape<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 70 $\mu$ s<br>Noise Reduction SW – OUT<br>Filter SW – OFF                          |                                    | 1. Erase a reference ZX tape (DA09037A) with a bulk eraser.<br>2. Load the tape, then perform the auto calibration function according to step 16-2.<br>3. Adjust the Line Input level controls to obtain 0 dB on the FL level indicators, then record the signals on the tape.<br>4. Turn the cassette tape the other way round and play it back.<br>5. Measure the difference between 3 and 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 20   | Channel Separation Measurement        | 1 kHz to Line Input Jacks                                     | Same as above                                        | Same as above                                                                                                                                                                   |                                    | 1. Erase a reference ZX tape (DA09037A) with a bulk eraser.<br>2. Load the tape, then perform the auto calibration function according to step 16-2.<br>3. Adjust the L ch. (R ch.) Line Input level control to obtain 0 dB on the FL level indicator, then close the R ch. (L ch.) Line Input level control.<br>4. Record and play it back, then measure the R ch. (L ch.) level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 21   | Erase Measurement                     | 1 kHz to Line Input Jacks                                     | Same as above                                        | Same as above                                                                                                                                                                   |                                    | 1. Erase a reference ZX Tape (DA09037A) with a bulk eraser.<br>2. Load the tape, then perform the auto calibration function according to step 16-2.<br>3. Adjust the Line Input level controls to obtain 0 dB on the FL level indicators, then record the signals on the tape.<br>4. Rewind the tape then close the Line Input level controls.<br>5. Record and play it back, then measure the difference between 3 and 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

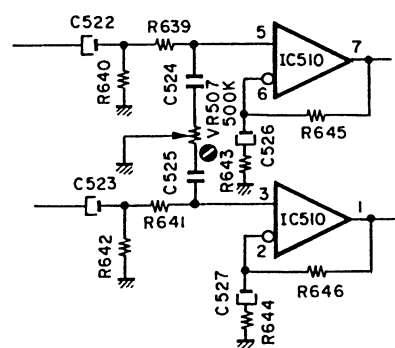


Fig. 6.2.9  
16. Record Head Azimuth

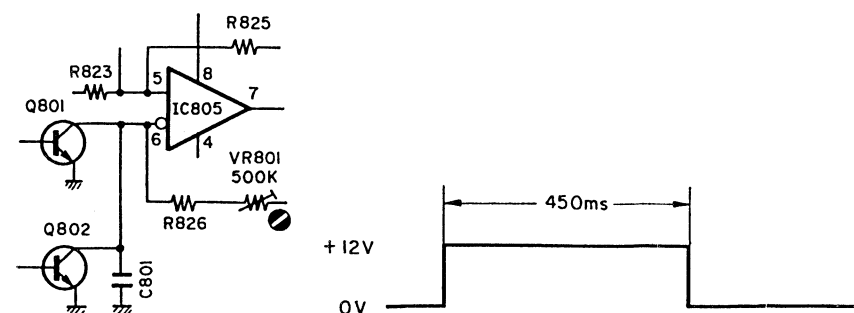


Fig. 6.2.10  
17. A/D Converter Disable Timing

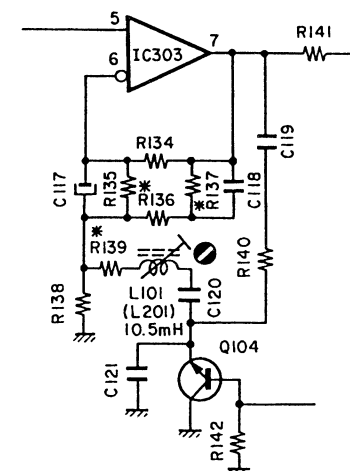


Fig. 6.2.11  
18. Overall Frequency Response

| STEP | ITEM                                  | SIGNAL SOURCE                               | OUTPUT CONNECTION                              | MODE                                                                                                                                                                               | ADJUSTMENT | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|---------------------------------------|---------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22   | Signal to Noise Ratio Measurement     | 400 Hz to Line Input Jacks                  | VTVM and Distortion Meter to Line Output Jacks | Record and Playback<br>Monitor SW – Tape<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 70 $\mu$ s<br>Noise Reduction SW – Dolby NR<br>Filter SW – OFF                               |            | 1. Load a reference ZX tape (DA09037A), then perform the auto calibration function according to step 16-2.<br>2. Feed in 400 Hz (0 dB), then record and play it back.<br>3. Adjust the Line Input level controls to obtain 3% total harmonic distortion in Playback mode.<br>4. Close the Line Input level controls then record again.<br>5. After rewind, play back and check the output level difference between 3 and 4.<br>Note: The filter of IHF-A curve shall be used in the measurements. |
| 23   | Total Harmonic Distortion Measurement | 400 Hz to Line Input Jacks                  | Distortion Meter to Line Output Jacks          | Record and Playback<br>Monitor SW – Source/Tape<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 120 $\mu$ s (EX)<br>70 $\mu$ s (SX/ZX)<br>Noise Reduction SW – OUT<br>Filter SW – OFF |            | 1. Load a reference ZX tape (DA09037A), then perform the auto calibration function according to step 16-2.<br>2. Set the Monitor switch to Source, then adjust the Line Input level controls to obtain 0 dB on the FL level indicators.<br>3. Set the Monitor switch to Tape, then record and play it back.<br>4. Read the distortion meter and check to insure that the distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes.                                                 |
| 24   | Subsonic Filter Measurement           | 10 Hz $\pm$ 0.2 Hz to Line Input Jacks      | VTVM to Line Output Jacks                      | Stop<br>Monitor SW – Source<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 70 $\mu$ s<br>Noise Reduction SW – OUT<br>Filter SW – OFF/Subsonic                                        |            | 1. Set the Output level controls to max.<br>2. Adjust the Line Input level controls to obtain 1V on the VTVM.<br>3. Set the Filter switch to Subsonic, then check to insure that the readings of both channels are less than –55 dB on the VTVM.                                                                                                                                                                                                                                                  |
| 25   | Wow/Flutter Measurement               | 3 kHz Speed and Wow/Flutter Tape (DA09006A) | Wow/Flutter Meter to Line Output Jacks         | Playback<br>Monitor SW – Tape<br>Meter SW – P. Hold or VU/Peak<br>Eq. SW – 70 $\mu$ s                                                                                              |            | 1. Press the Manual Set button.<br>2. Play back and read the wow/flutter meter.                                                                                                                                                                                                                                                                                                                                                                                                                   |

6.3. Frequency Response Adjustment

(1) Playback Frequency Response Adjustment

Refer to Figs. 6.3.1 and 6.3.2.

(a) Level Adjustment (for middle frequency response)

This adjustment will be required if playback level is not sufficient when 10 kHz PB frequency response tape is played back as referred to step 9 in 6.2 "Adjustment and Measurement Instructions".

Playback equalization level is varied by the modification of R121 (R221) and R122 (R222) for 70  $\mu$ s equalization and R110 (R210) for 120  $\mu$ s equalization on the Playback Amp. & Dolby NR P.C.B. Ass'y. Following are the details for level modifications:

For 70  $\mu$ s:

Approx. +1 dB . . . . . R121 (R221): 2.3K  
R122 (R222): 3.51K  
0 dB . . . . . R121 (R221): 2.67K  
R122 (R222): 3.16K  
Approx. -1 dB . . . . . R121 (R221): 3K  
R122 (R222): 2.67K

For 120  $\mu$ s:

Approx. +1 dB . . . . . R110 (R210): 16.2K  
0 dB . . . . . R110 (R210): 18K  
Approx. -1 dB . . . . . R110 (R210): 20.5K

(b) Peaking Adjustment (for high frequency response)

This adjustment will be required if playback level is not sufficient when 20 kHz PB frequency response tape is played back as referred to step 9 in "Adjustment and Measurement Instructions".

Peaking portion compensates the gap loss of the playback head.

Peaking level is varied by the modification of R113 (R213) on the Playback Amp. & Dolby NR P.C.B. Ass'y as shown in Fig. 6.3.2. Typical value of R113 (R213) is 1 k $\Omega$ . The maximum and the minimum value of R113 (R213) should be 1.2 k $\Omega$  and 820  $\Omega$ .

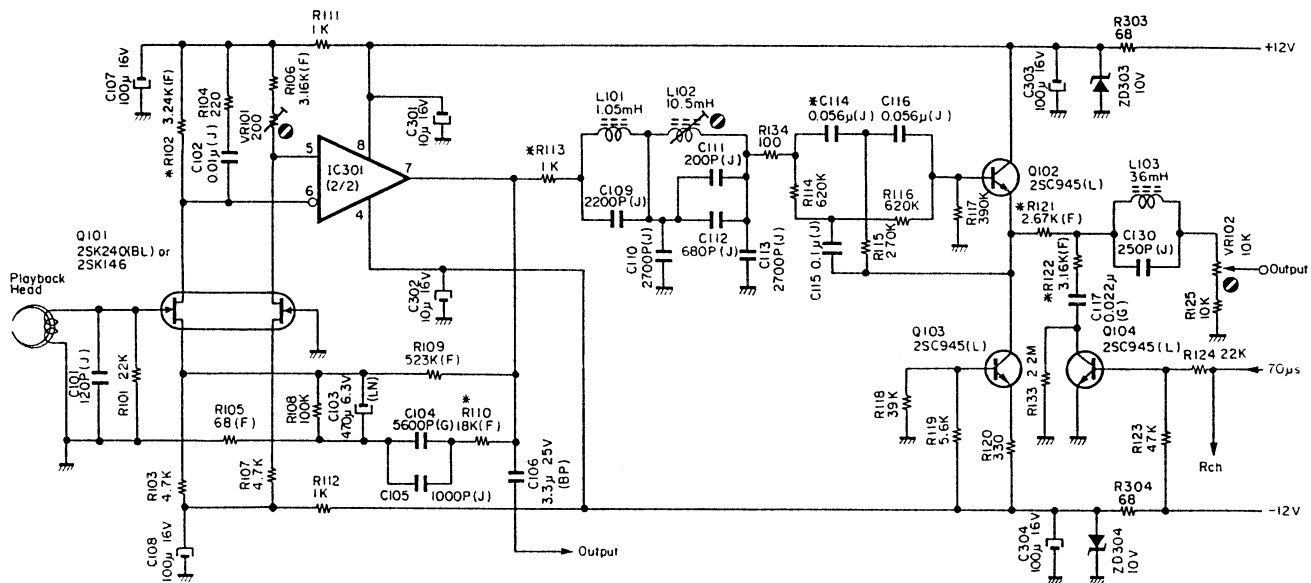


Fig. 6.3.1 Playback Amp.

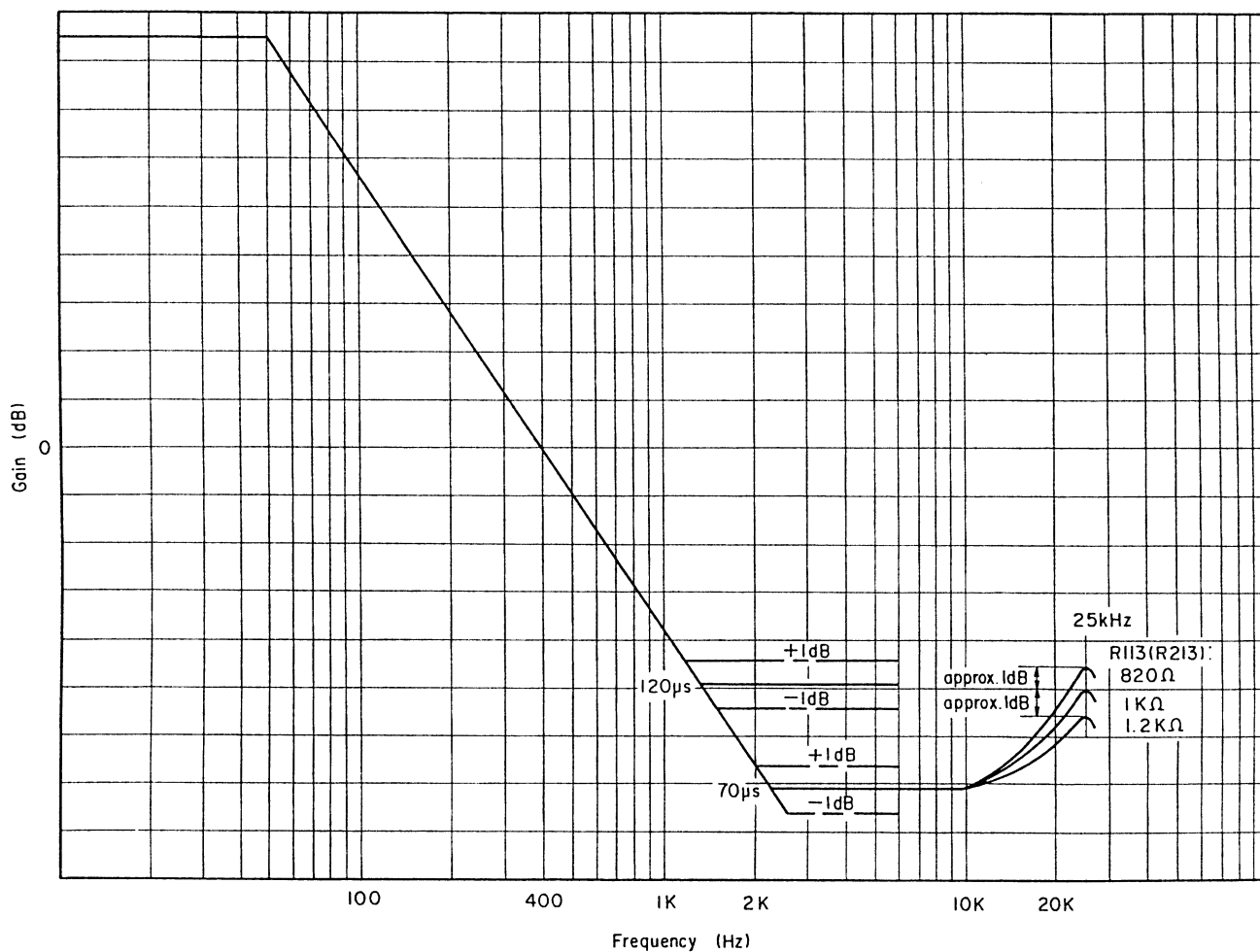


Fig. 6.3.2 Playback Equalization Curve

(2) Record Current Frequency Response

This adjustment will be made to compensate the overall frequency response after the playback frequency response adjustment is completed.

Before this adjustment, the following should be accurately adjusted.

- Oscillator level adjustment on step 13 in item 6.2  
Each oscillator level of the 400 Hz -30 dB, 2.4 kHz -30 dB, 7.2 kHz -30 dB and 20 kHz -30 dB should be accurate.
- Record head azimuth alignment on step 16 in item 6.2  
No misalignment is found when auto azimuth alignment function is completed.
- Tape travelling adjustment in item 4.11

Note: Cassette tape to be used for frequency response adjustment should satisfy the quality.

(a) High-frequency Response Adjustment

Refer to Figs. 6.3.3 – 6.3.6.

Figs. 6.3.3 and 6.3.4 show the record peaking curve. Peaking frequency is adjusted by the adjustment of L101 (L201) and the peaking level is changed by the modification of R139 (R239).

If the frequency response shows the solid line as shown in Fig. 6.3.5, change the value of the resistor R139 (R239) on the Record Eq. Amp. P.C.B. Ass'y from 820 Ω to 680 Ω. If the dotted line, change it from 820 Ω to 1 kΩ.

Notes: 1. Since the distortion is increased when the resistor R139 or R239 is changed to greater value, re-check the distortion after R139 or R239 is changed.

2. The value of the R139 or R239 may be changed for adjustment in our factory.

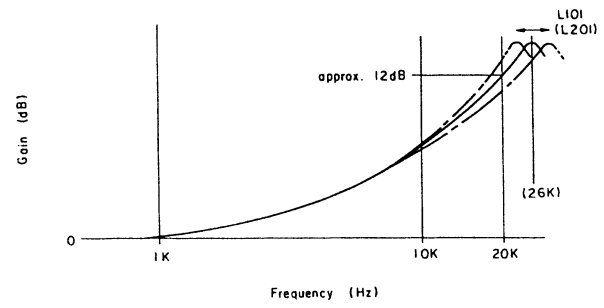


Fig. 6.3.3 Record Peaking Curve

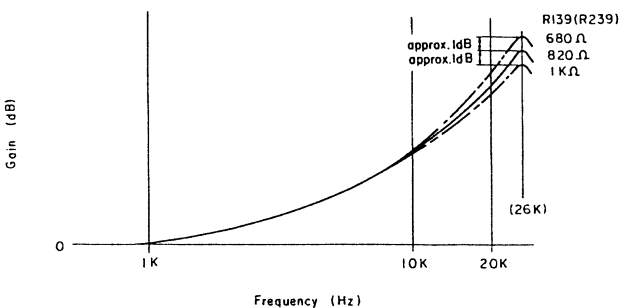


Fig. 6.3.4 Record Peaking Curve

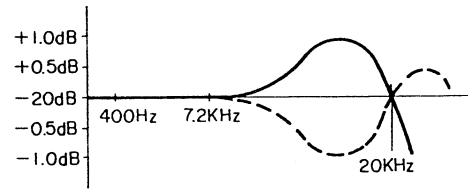
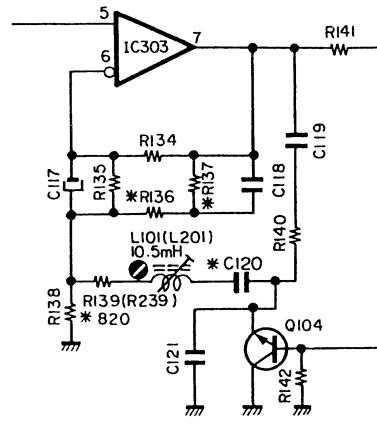


Fig. 6.3.5





### (b) Low-frequency Response Adjustment

In general, the frequency response at low shows the response in Fig. 6.3.7. When the level at 400 Hz is considered to be 0 dB, the level at 20 Hz shows the minimum value (A) and the peak of the waveform produced by contour effect shows the maximum value (B). The peak of the waveform appears around the range of 40 – 80 Hz depending upon the playback head.

Adjustment procedures are as follows:

- Check the level difference between the level at 20 Hz (A) and the peak level (B) of the waveform. If the difference is greater than 1.5 dB, perform the following adjustment 1).
- If the frequency response at low is not within  $\pm 0.75$  dB with respect to the level at 400 Hz, even though the level difference is less than 1.5 dB, perform the following adjustment 2).

#### 1) Peak-to-peak level adjustment

Adjust so that the level difference between (A) and (B) in Fig. 6.3.7 becomes less than 1.5 dB.

- a) Add capacitor C1 0.015  $\mu$ F in parallel to C114 (C214) on the Playback Amp. & Dolby NR P.C.B. Ass'y as shown in Fig. 6.3.8.

This will compensate approx. 0.2 dB.

- b) If compensation is still insufficient, add resistor R1 2.2 M $\Omega$  – 560 k $\Omega$  in parallel to R136 (R236) on the Record Eq. Amp. P.C.B. Ass'y as shown in Fig. 6.3.9. When 560 k $\Omega$  is added, approx. 0.3 dB will be compensated.

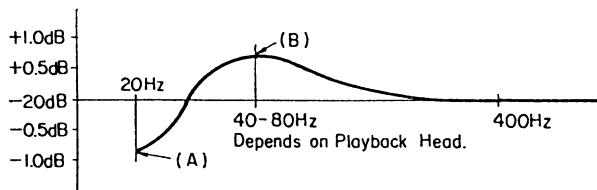


Fig. 6.3.7

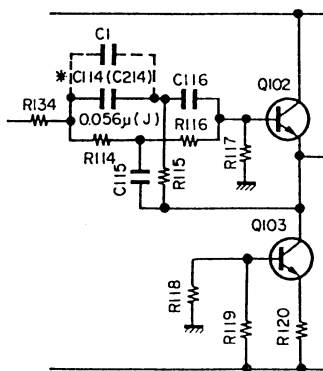


Fig. 6.3.8

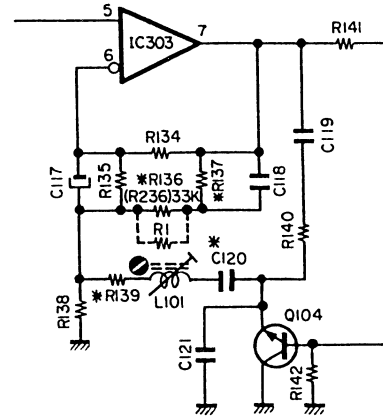


Fig. 6.3.9

#### 2) Level Adjustment

Adjust so that the level differences between 400 Hz and 20 Hz (A) and between 400 Hz and the peak value (B) of the waveform become equal. Refer to Fig. 6.3.10.

##### a) Decreasing of level

Add resistor R2 in series with R136 (R236) on the Record Eq. Amp. P.C.B. Ass'y.

| Additional R2  | Decreased level |
|----------------|-----------------|
| 3.3 k $\Omega$ | 0.5 dB          |
| 2.2 k $\Omega$ | 0.35 dB         |
| 1 k $\Omega$   | 0.15 dB         |

##### b) Increasing of Level

Add resistor R3 in parallel to R137 (R237) on the Record Eq. Amp. P.C.B. Ass'y.

| Additional R3  | Increased level |
|----------------|-----------------|
| 470 k $\Omega$ | 0.5 dB          |
| 1 M $\Omega$   | 0.2 dB          |

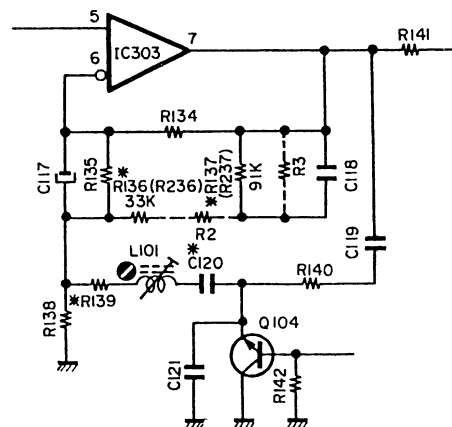


Fig. 6.3.10

6.4. Dolby NR Circuit Check

Dolby NR circuit incorporates a Dolby B-Type NR IC ( $\mu$ A7300PC) which has no adjustment point.

Perform the following checks and make sure that the IC operates accurately i.e. accuracy of frequency response through IC.

(1) Playback Dolby NR Circuit

- Signal Source: 5 kHz to pin No.12 of IC101 and IC201
- Output Connection: VTVM to the test points TP101 and TP201 on the Main P.C.B.
- Mode: Stop  
Monitor SW – Tape  
Noise Reduction SW – Out/Dolby NR

- (a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.  
Feed in 5 kHz to pin No. 12 of IC101 (IC201) and adjust the generator output control so that the VTVM may read 7.6 mV at each test point.
- (b) Set the Noise Reduction switch to Dolby NR. Check to insure that the level at TP101 (TP201) is 3 mV  $\pm$ 1.5 dB.

(2) Record Dolby NR Circuit

- Signal Source: 5 kHz to Line Input Jacks
- Output Connection: VTVM to the output side of C121 (C221) on the Record Dolby NR P.C.B.
- Mode: Stop  
Monitor SW – Source

- (a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.  
Feed in 5 kHz and adjust the Line Input level controls so that the VTVM may read 100 mV (0 dB) at each test point.  
FL level indicators will indicate 0 dB.
- (b) Remove the VTVM from TP101 (TP201) and re-connect it to the output side of C121 (C221). Check to insure that the VTVM indicates approx. 560 mV.
- (c) Decrease the input level (0 dB) by 20 dB or 30 dB. Check to insure that the level at output side of C121 (C221) corresponds to the following with Noise Reduction switch Out (Dolby NR OUT) and Dolby NR (Dolby NR IN).

| Input Level | Capacitor Output Level |                       |                               |
|-------------|------------------------|-----------------------|-------------------------------|
| (f=5 kHz)   | Dolby NR OUT           | Dolby NR IN           | Difference between IN and OUT |
| -20 dB      | -20 dB                 | -16.8 dB $\pm$ 1.5 dB | 3.2 dB $\pm$ 1.5 dB           |
| -30 dB      | -30 dB                 | -21.8 dB $\pm$ 1.5 dB | 8.2 dB $\pm$ 1.5 dB           |

## 7. MOUNTING DIAGRAMS AND PARTS LIST

Note: Mounting diagram shows a dip side view of the printed circuit board.

### 7.1. Fuse P.C.B. Ass'y

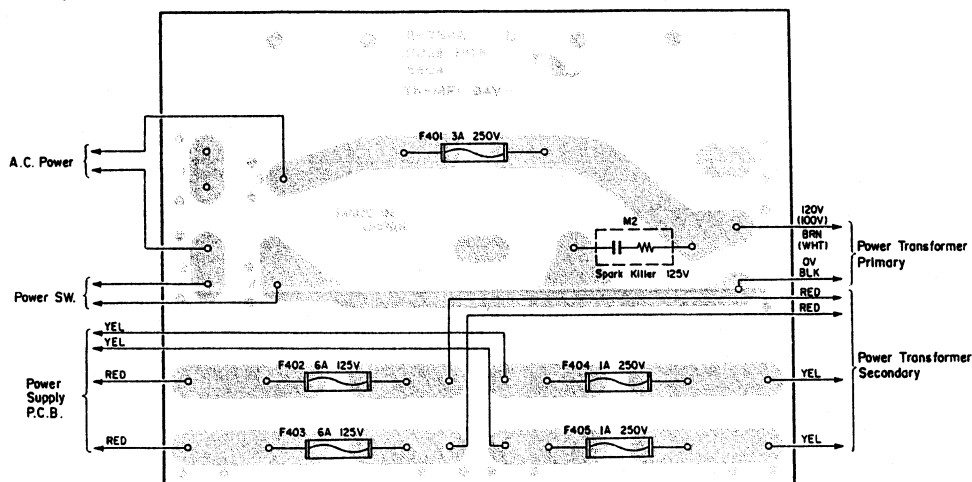


Fig. 7.1.1 U.S.A., Canada & Others

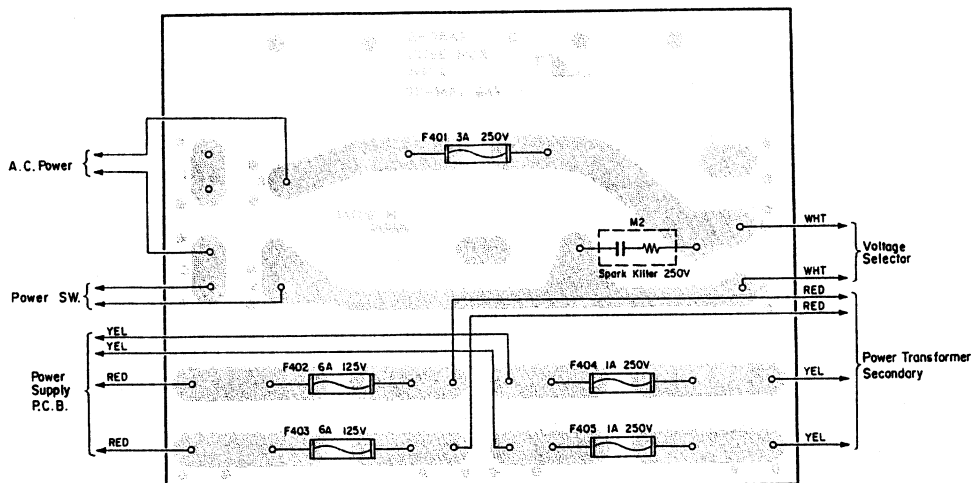


Fig. 7.1.2 Japan

| Schematic Ref. No.           | Part No. | Description                                 | Schematic Ref. No.           | Part No. | Description                 |
|------------------------------|----------|---------------------------------------------|------------------------------|----------|-----------------------------|
| F401<br>F402,403<br>F404,405 | BA04256A | Fuse P.C.B. Ass'y (U.S.A., Canada & Others) | F401<br>F402,403<br>F404,405 | BA04257A | Fuse P.C.B. Ass'y (Japan)   |
|                              | OB07842D | Fuse P.C.B.                                 |                              | OB07842D | Fuse P.C.B.                 |
|                              | OB08369A | Fuse 3A 250V                                |                              | OB08781A | Fuse 3A 250V                |
|                              | OB08371A | Fuse 6A 125V                                |                              | OB08782A | Fuse 6A 125V                |
|                              | OB08374A | Fuse 1A 250V                                |                              | OB08686A | Fuse 1A 250V                |
|                              | OB08342A | Spark Killer (1 pce.)                       |                              | OB08363A | Spark Killer (1 pce.)       |
|                              | OM04187A | Fuse Label 3A 250V (1 pce.)                 |                              | OM04187A | Fuse Label 3A 250V (1 pce.) |
|                              | OM04189A | Fuse Label 6Ax2 (1 pce.)                    |                              | OM04189A | Fuse Label 6Ax2 (1 pce.)    |
|                              | OM04078B | Fuse Label 1Ax2 (1 pce.)                    |                              | OM04078B | Fuse Label 1Ax2 (1 pce.)    |
|                              | OE00752A | Eyelet 2x3 (6 pcs.)                         |                              | OE00752A | Eyelet 2x3 (6 pcs.)         |
|                              |          |                                             |                              | OB08349A | Fuse Clip (4 pcs.)          |

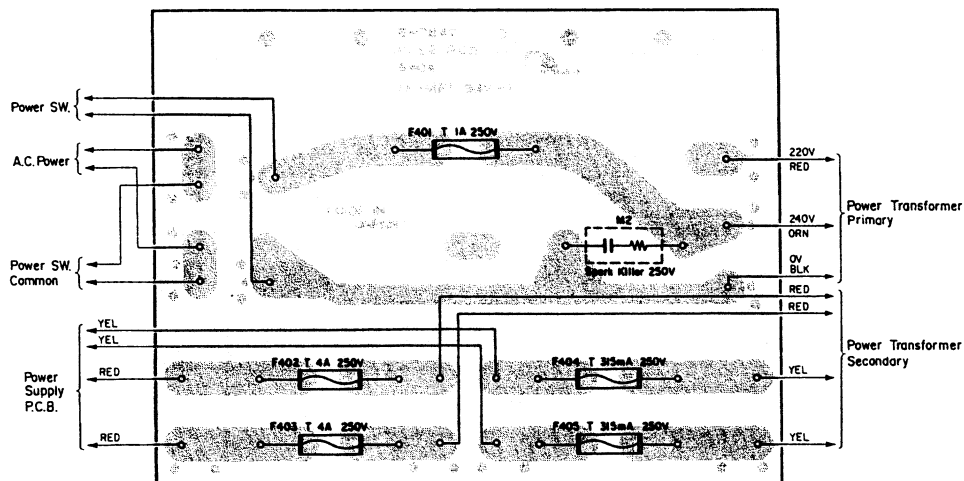


Fig. 7.1.3 UK & Australia

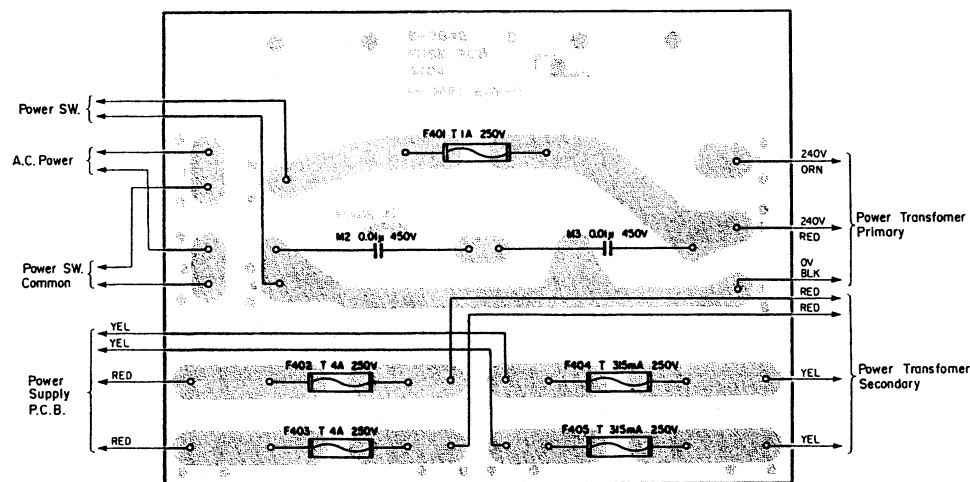


Fig. 7.1.4 220 V Class 2

| Schematic Ref. No. | Part No. | Description                        | Schematic Ref. No. | Part No. | Description                      |
|--------------------|----------|------------------------------------|--------------------|----------|----------------------------------|
|                    | BA04258A | Fuse P.C.B. Ass'y (UK & Australia) |                    | BA04259A | Fuse P.C.B. Ass'y (220V Class 2) |
| F401               | OB07842D | Fuse P.C.B.                        | F401               | OB07842D | Fuse P.C.B.                      |
| F402,403           | OB08347U | Fuse T 1A 250V                     | F402,403           | OB08347U | Fuse T 1A 250V                   |
| F404,405           | OB08609A | Fuse T 4A 250V                     | F404,405           | OB08609A | Fuse T 4A 250V                   |
|                    | OB08263U | Fuse T 315mA 250V                  |                    | OB08263U | Fuse T 315mA 250V                |
|                    | OB08240A | Spark Killer (1 pce.)              |                    | OB08445A | Spark Killer (2 pcs.)            |
|                    | OM04191A | Fuse Label T 1A 250V (1 pce.)      |                    | OM04191A | Fuse Label T 1A 250V (1 pce.)    |
|                    | OM04193A | Fuse Label T 4Ax2 (1 pce.)         |                    | OM04193A | Fuse Label T 4Ax2 (1 pce.)       |
|                    | OM04074B | Fuse Label T 315mAx2 (1 pce.)      |                    | OM04074B | Fuse Label T 315mAx2 (1 pce.)    |
|                    | OB08349A | Fuse Clip (10 pcs.)                |                    | OB08349A | Fuse Clip (10 pcs.)              |
|                    | OE00752A | Eyelet 2x3 (6 pcs.)                |                    | OE00752A | Eyelet 2x3 (6 pcs.)              |

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

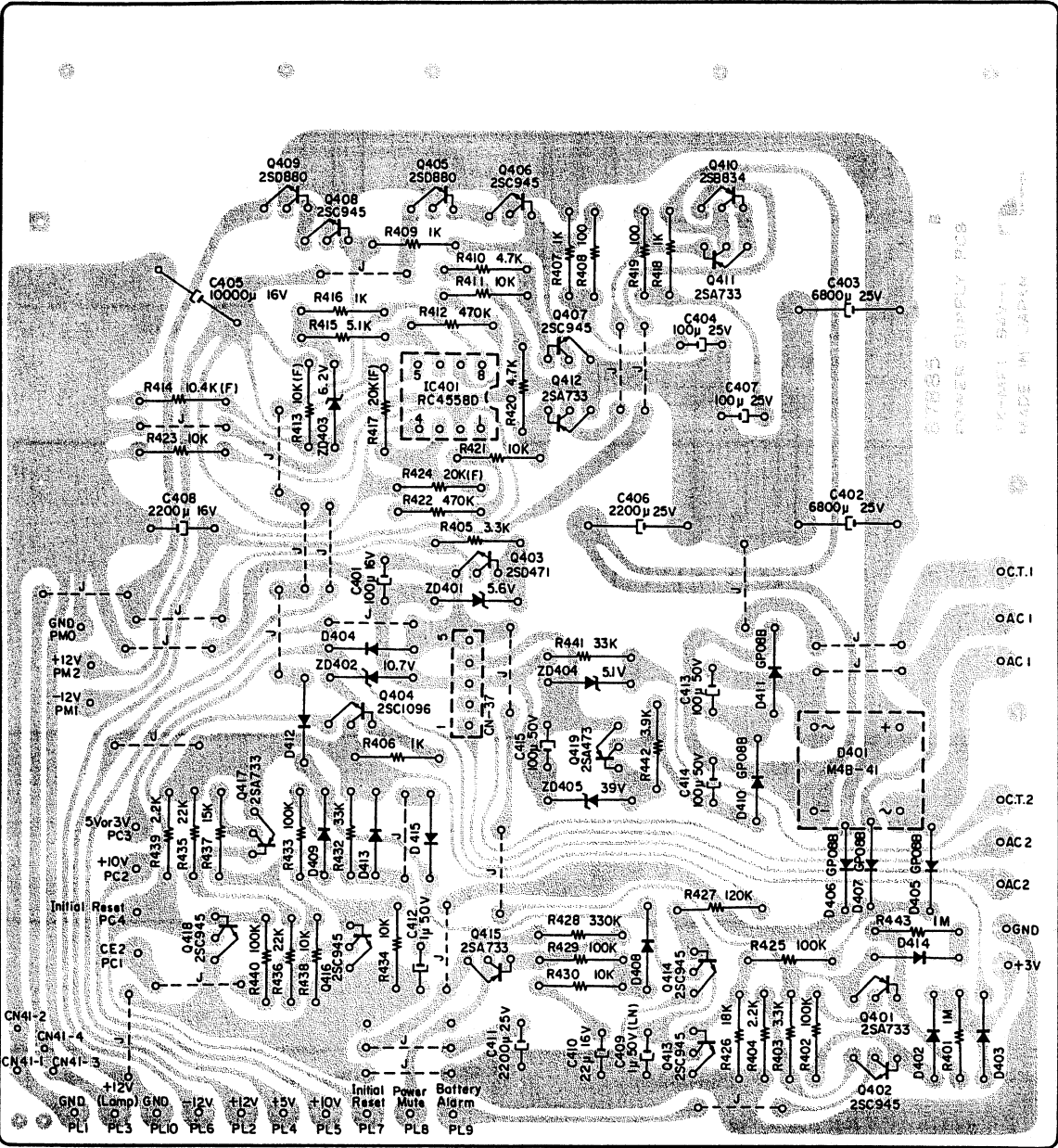


Fig. 7.2 Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No. | Part No. | Description                         | Schematic Ref. No. | Part No. | Description                     |
|--------------------|----------|-------------------------------------|--------------------|----------|---------------------------------|
|                    | BA04234A | Power Supply P.C.B. Ass'y           | C412               | OB01405A | Electrolytic Capacitor 1μ 50V   |
|                    |          |                                     | C413,414           | OB09313A | Electrolytic Capacitor 100μ 50V |
| IC401              | OB07885B | Power Supply P.C.B.                 | 415                |          |                                 |
| Q401,411           | OB06124B | IC RC4558D                          | CN37               | OB08724A | 5P-T Post                       |
| 412,415            | OB06013A | Transistor 2SA733                   | CN41               | OB08743A | 4P-H Connector 700mm            |
| 417                |          |                                     |                    |          |                                 |
| Q402,406           | OB06100A | Transistor 2SC945 (A)               |                    |          |                                 |
| 407,408            |          |                                     |                    |          |                                 |
| 413,414            |          |                                     |                    |          |                                 |
| 416,418            |          |                                     |                    |          |                                 |
| Q403               | OB06066A | Transistor 2SD471                   |                    |          |                                 |
| Q404               | OB06020A | Transistor 2SC1096                  |                    |          |                                 |
| Q405,409           | OB06255A | Transistor 2SD880 (Y)               |                    |          |                                 |
| Q410               | OB06256A | Transistor 2SB834 (Y)               |                    |          |                                 |
| Q419               | OB06060A | Transistor 2SA473 (Y)               |                    |          |                                 |
| ZD401              | OB06268A | Zener Diode 5.6V RD5.6EB3           |                    |          |                                 |
| ZD402              | OB06231A | Zener Diode 10.7V RD11EB3           |                    |          |                                 |
| ZD403              | OB06167A | Zener Diode 6.2V RD6.2EB3           |                    |          |                                 |
| ZD404              | OB06230A | Zener Diode 5.1V RD5.1EB3           |                    |          |                                 |
| ZD405              | OB06235A | Zener Diode 39V RD39EB3             |                    |          |                                 |
| D401               | OB06267A | Diode Bridge M4B-41                 |                    |          |                                 |
| D402,403           | OB06181A | Silicon Diode 1SS53 (9 pcs.)        |                    |          |                                 |
| 404,408            |          |                                     |                    |          |                                 |
| 409                |          |                                     |                    |          |                                 |
| 412-415            |          |                                     |                    |          |                                 |
| D405,406           | OB06109A | Silicon Diode GP08B                 |                    |          |                                 |
| 407,410            |          |                                     |                    |          |                                 |
| 411                |          |                                     |                    |          |                                 |
| R401,443           | OB05776A | Carbon Resistor 1M ERD-25T J        |                    |          |                                 |
| R402,425           | OB01889A | Carbon Resistor 100K ERD-25T J      |                    |          |                                 |
| 429,433            |          |                                     |                    |          |                                 |
| 440                |          |                                     |                    |          |                                 |
| R403,405           | OB01681A | Carbon Resistor 3.3K ERD-25T J      |                    |          |                                 |
| R404,439           | OB05622A | Carbon Resistor 2.2K ERD-25T J      |                    |          |                                 |
| R406,407           | OB01857A | Carbon Resistor 1K ERD-25T J        |                    |          |                                 |
| 409,416            |          |                                     |                    |          |                                 |
| 418                |          |                                     |                    |          |                                 |
| R408,419           | OB01679A | Carbon Resistor 100 ERD-25T J       |                    |          |                                 |
| R410,420           | OB01846A | Carbon Resistor 4.7K ERD-25T J      |                    |          |                                 |
| R411,421           | OB01888A | Carbon Resistor 10K ERD-25T J       |                    |          |                                 |
| 423,430            |          |                                     |                    |          |                                 |
| 434,438            |          |                                     |                    |          |                                 |
| R412,422           | OB01684A | Carbon Resistor 470K ERD-25T J      |                    |          |                                 |
| R413               | OB09203A | Metal Film Resistor 10K SN14K2E F   |                    |          |                                 |
| R414               | OB09433A | Metal Film Resistor 10.4K SN14K2E F |                    |          |                                 |
| R415               | OB09314A | Carbon Resistor 5.1K ERD-25T J      |                    |          |                                 |
| R417,424           | OB09439A | Metal Film Resistor 20K SN14K2E F   |                    |          |                                 |
| R426               | OB05560A | Carbon Resistor 18K ERD-25T J       |                    |          |                                 |
| R427               | OB05621A | Carbon Resistor 120K ERD-25T J      |                    |          |                                 |
| R428               | OB05627A | Carbon Resistor 330K ERD-25T J      |                    |          |                                 |
| R432,441           | OB05509A | Carbon Resistor 33K ERD-25T J       |                    |          |                                 |
| R435,436           | OB05615A | Carbon Resistor 22K ERD-25T J       |                    |          |                                 |
| R437               | OB01683A | Carbon Resistor 15K ERD-25T J       |                    |          |                                 |
| R442               | OB05675A | Carbon Resistor 3.9K ERD-25T J      |                    |          |                                 |
| C401               | OB01400A | Electrolytic Capacitor 100μ 16V     |                    |          |                                 |
| C402,403           | OB09374A | Electrolytic Capacitor 6800μ 25V    |                    |          |                                 |
| C404,407           | OB01272A | Electrolytic Capacitor 100μ 25V     |                    |          |                                 |
| C405               | OB09487A | Electrolytic Capacitor 10000μ 16V   |                    |          |                                 |
| C406,411           | OB05654A | Electrolytic Capacitor 2200μ 25V    |                    |          |                                 |
| C408               | OB01406A | Electrolytic Capacitor 2200μ 16V    |                    |          |                                 |
| C409               | OB09223A | Electrolytic Capacitor 1μ 50V (LN)  |                    |          |                                 |
| C410               | OB01862A | Electrolytic Capacitor 22μ 16V      |                    |          |                                 |

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

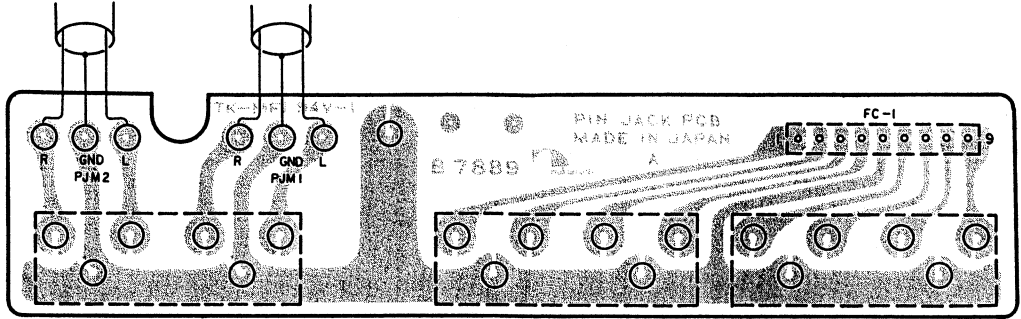


Fig. 7.3

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

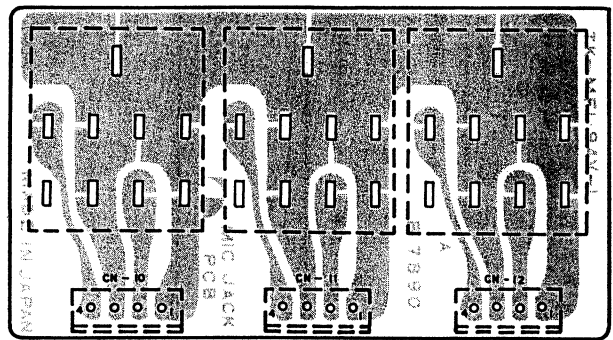


Fig. 7.4

7.5. RAMM Control Switch P.C.B. Ass'y

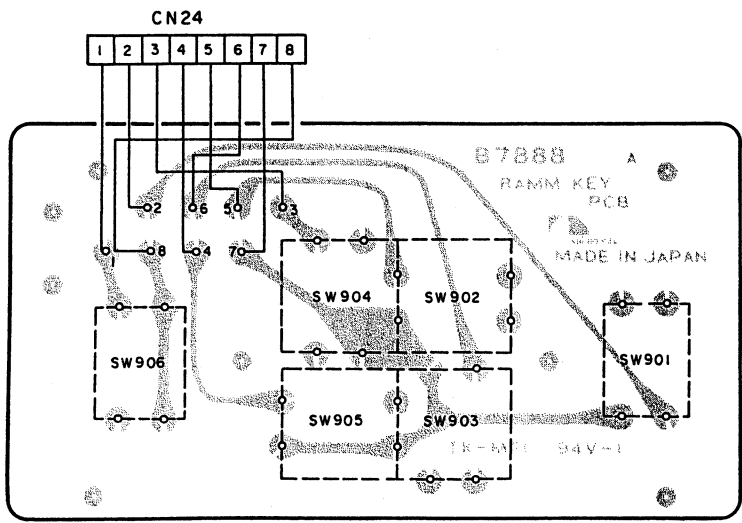


Fig. 7.5

7.6. Function Switch P.C.B. Ass'y

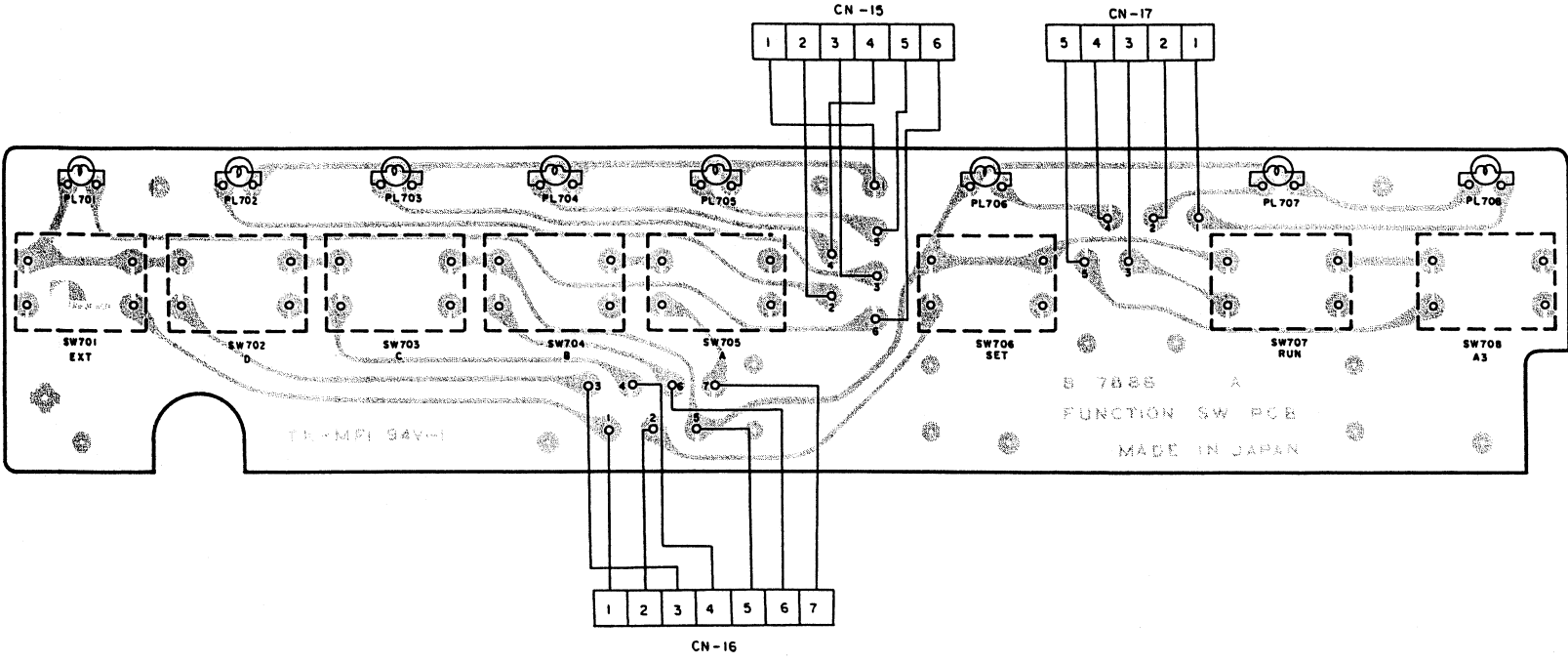


Fig. 7.6

7.7. Mechanism Control Switch P.C.B. Ass'y

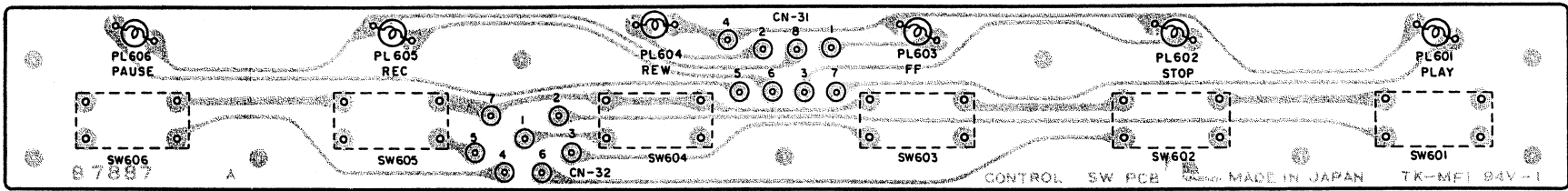


Fig. 7.7

| Schematic Ref. No. | Part No. | Description                      | Schematic Ref. No.                             | Part No. | Description                           |
|--------------------|----------|----------------------------------|------------------------------------------------|----------|---------------------------------------|
| FC1                | BA04242A | Pin Jack P.C.B. Ass'y            | PL701-708<br>SW701-708<br>CN15<br>CN16<br>CN17 | BA04240A | Function Switch P.C.B. Ass'y          |
|                    | OB07889A | Pin Jack P.C.B.                  |                                                | OB07886A | Function Switch P.C.B.                |
|                    | OB05247A | 9P Flat Cable 140mm              |                                                | OB08721A | Lamp 12V 30mA (8 pcs.)                |
| CN10,11<br>12      | OB08726A | Pin Jack Unit UA-1047 (3 pcs.)   | PL601-606<br>SW601-606<br>CN31<br>CN32         | OB07254A | Push Switch EVQ-PXR04K (8 pcs.)       |
|                    | OB08725A | MIC Jack HLJ0259-01-010 (3 pcs.) |                                                | OB08750B | 6P-H Connector 500mm                  |
|                    |          |                                  |                                                | OB08751A | 7P-H Connector 630mm                  |
| SW901-906<br>CN24  | BA04241A | RAMM Control Switch P.C.B. Ass'y |                                                | OB08749A | 5P-H Connector 600mm                  |
|                    | OB07888A | RAMM Control Switch P.C.B.       |                                                | BA04239A | Mechanism Control Switch P.C.B. Ass'y |
|                    | OB07254A | Push Switch EVQ-PXR04K (6 pcs.)  |                                                | OB07887A | Mechanism Control Switch P.C.B.       |
|                    | OB08752A | 8P-H Connector 380mm             |                                                | OB08722A | Lamp 12V 60mA                         |
|                    |          |                                  |                                                | OB07254A | Push Switch EVQ-PXR04K                |
|                    |          |                                  |                                                | OB08748A | 8P-H Connector 200mm                  |
|                    |          |                                  |                                                | OB08747A | 7P-H Connector 200mm                  |

7.8. Speed Cal. P.C.B. Ass'y

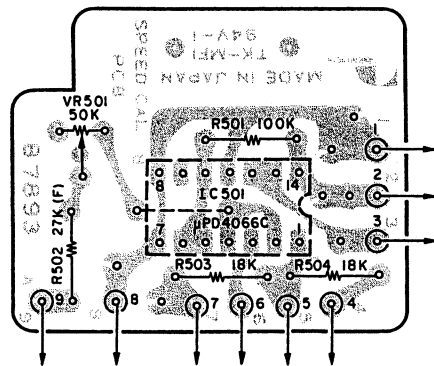


Fig. 7.8

7.9. Counter Pulse Generator P.C.B. Ass'y

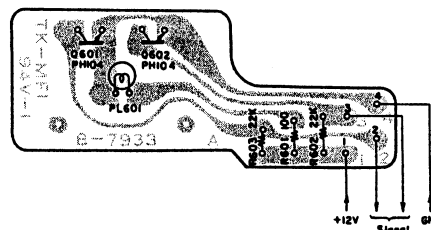


Fig. 7.9

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

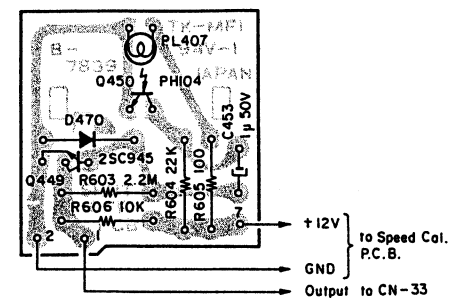


Fig. 7.10

Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No.                                                                                   | Part No.                    | Description                           | Schematic Ref. No. | Part No. | Description                         |
|------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------|--------------------|----------|-------------------------------------|
| IC501<br>VR501<br>R501<br>R502<br>R503,504                                                           | BA04238A                    | Speed Cal. P.C.B. Ass'y               | IC615              | OB06223A | IC $\mu$ PD4040C                    |
|                                                                                                      | OB07893A                    | Speed Cal. P.C.B.                     | Q601               | OB06013A | Transistor 2SA733                   |
|                                                                                                      | OB06144A                    | IC $\mu$ PD4066C                      | Q602               | OB06100A | Transistor 2SC945 (A)               |
|                                                                                                      | OB07269A                    | Semi-fixed Volume 50K                 | D601-609           | OB06181A | Silicon Diode 1SS53 (9 pcs.)        |
|                                                                                                      | OB01889A                    | Carbon Resistor 100K ERD-25T J        | VR601              | OB07270A | Semi-fixed Volume 20K               |
| Q601,602<br>R601<br>R602,603<br>PL601                                                                | BA04237B                    | Counter Pulse Generator P.C.B. Ass'y  | R601,605           | OB01888A | Carbon Resistor 10K ERD-25T J       |
|                                                                                                      | OB07933A                    | Counter Pulse Generator P.C.B.        | 607,611            |          |                                     |
|                                                                                                      | OB06228A                    | Photo Transistor PH-104               | 612,615            |          |                                     |
|                                                                                                      | OB01679A                    | Carbon Resistor 100 ERD-25T J         | 616,629            |          |                                     |
|                                                                                                      | OB05615A                    | Carbon Resistor 22K ERD-25T J         | 630                |          |                                     |
| Q449<br>Q450<br>D470<br>R603<br>R604<br>R605<br>R606<br>C453<br>PL407                                | BA04070A                    | Shut-off P.C.B. Ass'y                 | R602,603           | OB05641A | Carbon Resistor 47K ERD-25T J       |
|                                                                                                      | OB07839A                    | Shut-off P.C.B.                       | 631                |          |                                     |
|                                                                                                      | OB01872A                    | Transistor 2SC945 (L)                 | R604,622           | OB01889A | Carbon Resistor 100K ERD-25T J      |
|                                                                                                      | OB06228A                    | Photo Transistor PH104                | R608,609           | OB05615A | Carbon Resistor 22K ERD-25T J       |
|                                                                                                      | OB06181A                    | Silicon Diode 1SS53                   | 610,621            |          |                                     |
| IC601<br>IC602,604<br>611<br>IC603,613<br>IC605<br>IC606,610<br>IC607<br>IC608<br>IC609<br>IC612,614 | OB05671A                    | Carbon Resistor 2.2M ERD-25T J        | 623,624            |          |                                     |
|                                                                                                      | OB05615A                    | Carbon Resistor 22K ERD-25T J         | 625,626            |          |                                     |
|                                                                                                      | OB09215A                    | Fail Safe Type Resistor 100 RDF-25S J | 627,628            |          |                                     |
|                                                                                                      | OB01888A                    | Carbon Resistor 10K ERD-25T J         | R613               | OB09463A | Metal Film Resistor 110K SN14K2E F  |
|                                                                                                      | OB01405A                    | Electrolytic Capacitor 1 $\mu$ 50V    | R614               | OB09203A | Metal Film Resistor 10K SN14K2E F   |
| BA04245A                                                                                             | FL Indicator P.C.B. A Ass'y |                                       | R617               | OB01857A | Carbon Resistor 1K ERD-25T J        |
|                                                                                                      | OB07895A                    | FL Indicator P.C.B. A                 | R618               | OB09525A | Metal Film Resistor 70.6K SN14K2E F |
|                                                                                                      | OB06144A                    | IC $\mu$ PD4066C                      | R619               | OB09524A | Metal Film Resistor 60.4K SN14K2E F |
|                                                                                                      | OB06219A                    | IC $\mu$ PD4081C                      | R620               | OB09523A | Metal Film Resistor 13.7K SN14K2E F |
|                                                                                                      | OB06178A                    | IC $\mu$ PD4011C                      | C601               | OB09414A | PP Capacitor 560P 100V G            |
| OB06216A<br>OB06143A<br>OB06217A<br>OB06262A<br>OB06214A<br>OB06244A                                 | IC $\mu$ PC4556C            |                                       | C602               | OB05657A | Tantalum Capacitor 4.7 $\mu$ 16V    |
|                                                                                                      | IC $\mu$ PD4001C            |                                       | C603               | OB09290A | Ceramic Capacitor 0.01 $\mu$ 50V Z  |
|                                                                                                      | RC4560D                     |                                       | C604               | OB09191A | PP Capacitor 4700P 100V G           |
|                                                                                                      | $\mu$ PD4025C               |                                       | C605               | OB09285A | Ceramic Capacitor 330P 50V K        |
|                                                                                                      | $\mu$ PD4071C               |                                       | CN21               | OB08744A | 7P-H Connector Ass'y 200mm          |
| OB06244A                                                                                             | $\mu$ PD4073BC              |                                       | CN38               | OB08734A | 6P-T Connector F6P-HVQ              |
|                                                                                                      |                             |                                       | CN39               | OB08735A | 11P-T Connector F11P-HVQ            |
|                                                                                                      |                             |                                       | CN40               | OB08733A | 5P-T Connector F5P-HVQ              |

7.11. FL Indicator P.C.B. A Ass'y

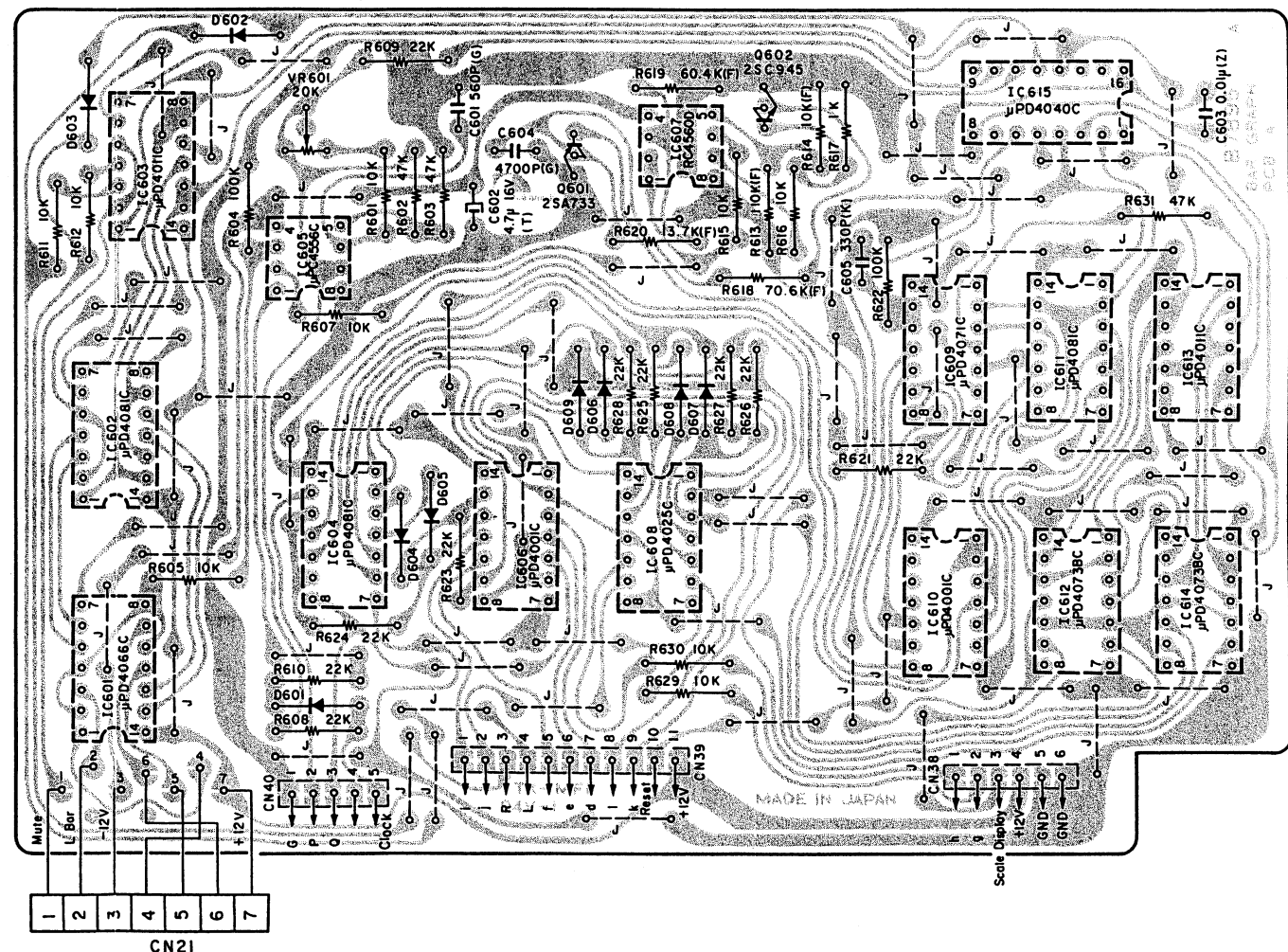


Fig. 7.11

Note: Diode is 1SS53 unless otherwise specified.







7.13. Detector P.C.B. Ass'y

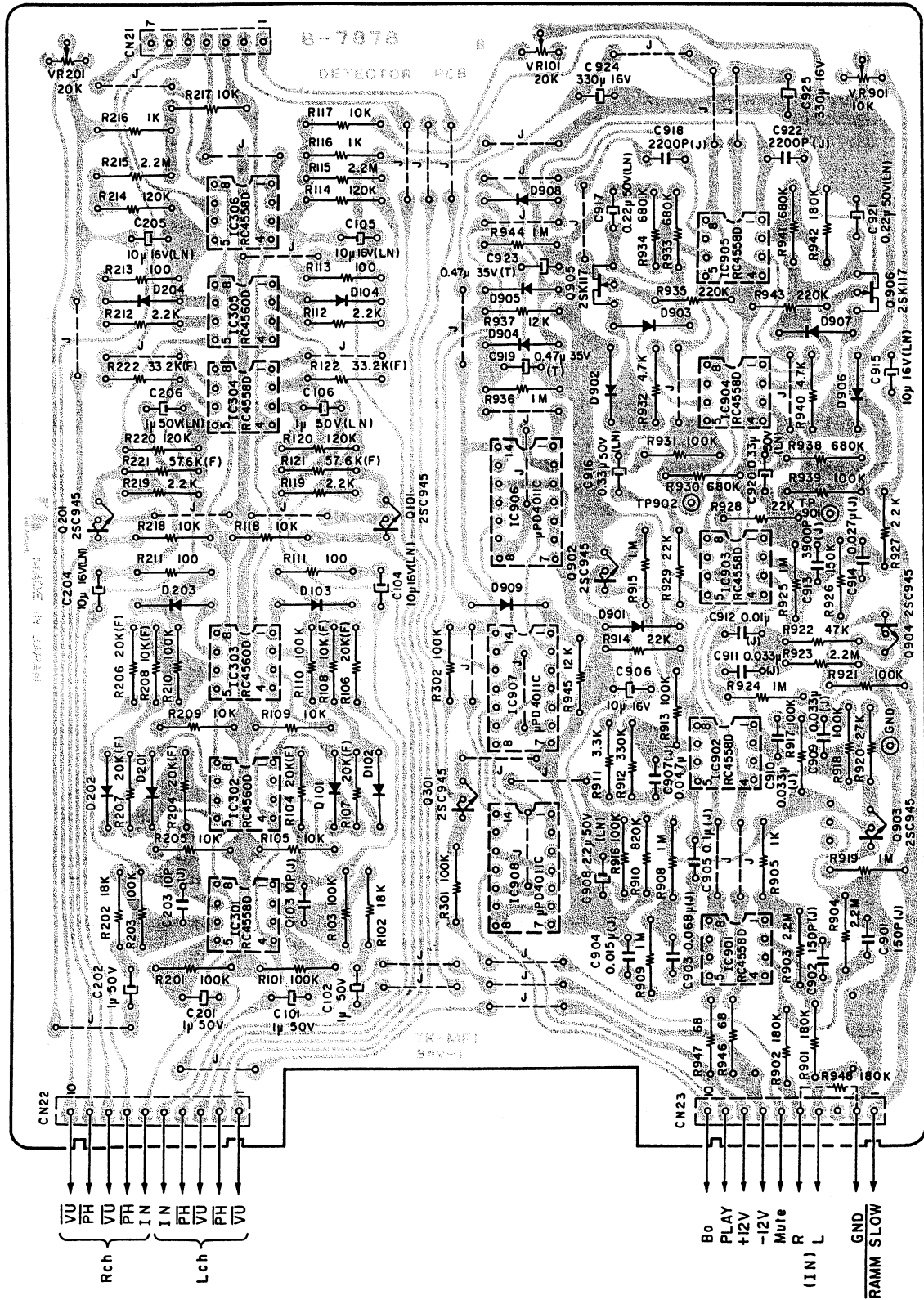


Fig. 7.13 Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No. | Part No. | Description                         | Schematic Ref. No. | Part No. | Description                                |
|--------------------|----------|-------------------------------------|--------------------|----------|--------------------------------------------|
|                    | BA04230A | Detector P.C.B. Ass'y               | R922               | OB05641A | Carbon Resistor 47K ERD-25T J              |
|                    | OB07878B | Detector P.C.B.                     | R926               | OB05626A | Carbon Resistor 150K ERD-25T J             |
|                    | OB06124B | IC RC4558D                          | R930,933           | OB09335A | Carbon Resistor 680K ERD-25T J             |
| IC301,304          |          |                                     | 934,938            |          |                                            |
| 306,901            |          |                                     | 941                |          |                                            |
| 902,903            |          |                                     | R932,940           | OB01846A | Carbon Resistor 4.7K ERD-25T J             |
| 904,905            |          |                                     | R935,943           | OB05625A | Carbon Resistor 220K ERD-25T J             |
| IC302,303          | OB06217A | IC RC4560D                          | R937,945           | OB09263A | Carbon Resistor 12K ERD-25T J              |
| 305                |          |                                     | R946,947           | OB09306A | Fail Safe Type Resistor 68 RDF-25S J       |
| IC906,907          | OB06178A | IC $\mu$ PD4011C                    | C101,102           | OB01405A | Electrolytic Capacitor 1 $\mu$ 50V         |
| 908                |          |                                     | 201,202            |          |                                            |
| Q101,201           | OB06100A | Transistor 2SC945 (A)               | C103,203           | OB09277A | Ceramic Capacitor 10P 50V J                |
| 301,902            |          |                                     | C104,105           | OB09148A | Electrolytic Capacitor 10 $\mu$ 16V (LN)   |
| 903,904            |          |                                     | 204,205            |          |                                            |
| Q905,906           | OB06129A | FET 2SK117 (Y)                      | 915                |          |                                            |
| D101-104           | OB06181A | Silicon Diode 1SS53 (17 pcs.)       | C106,206           | OB09223A | Electrolytic Capacitor 1 $\mu$ 50V (LN)    |
| 201-204            |          |                                     | C901,902           | OB09281A | Ceramic Capacitor 150P 50V J               |
| 901-909            |          |                                     | C903               | OB05682A | Mylar Capacitor 0.068 $\mu$ 50V J          |
| VR101,201          | OB07215A | Semi-fixed Volume 20K               | C904               | OB05557A | Mylar Capacitor 0.015 $\mu$ 50V J          |
| VR901              | OB07162A | Semi-fixed Volume 10K               | C905               | OB01780A | Mylar Capacitor 0.1 $\mu$ 50V J            |
| R101,103           | OB01889A | Carbon Resistor 100K ERD-25T J      | C906               | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V        |
| 110,201            |          |                                     | C907               | OB05796A | Mylar Capacitor 0.047 $\mu$ 50V J          |
| 203,210            |          |                                     | C908               | OB09332A | Electrolytic Capacitor 2.2 $\mu$ 50V (LN)  |
| 301,302            |          |                                     | C909,910           | OB05583A | Mylar Capacitor 0.033 $\mu$ 50V J          |
| 913,916            |          |                                     | 911                |          |                                            |
| 917,918            |          |                                     | C912               | OB05681A | Mylar Capacitor 0.01 $\mu$ 50V J           |
| 921,931            |          |                                     | C913               | OB01804A | Mylar Capacitor 3900P 50V J                |
| 939                |          |                                     | C914               | OB09045A | Mylar Capacitor 0.027 $\mu$ 50V J          |
| R102,202           | OB05560A | Carbon Resistor 18K ERD-25T J       | C916,920           | OB09327A | Electrolytic Capacitor 0.33 $\mu$ 50V (LN) |
| R104,106           | OB09439A | Metal Film Resistor 20K SN14K2E F   | C917,921           | OB09144A | Electrolytic Capacitor 0.22 $\mu$ 50V (LN) |
| 107,204            |          |                                     | C918,922           | OB01802A | Mylar Capacitor 2200P 50V J                |
| 206,207            |          |                                     | C919,923           | OB05792A | Tantalum Capacitor 0.47 $\mu$ 35V          |
| R105,109           | OB01888A | Carbon Resistor 10K ERD-25T J       | C924,925           | OB01502A | Electrolytic Capacitor 330 $\mu$ 16V       |
| 117,118            |          |                                     | CN21               | OB08643A | 7P-T Post                                  |
| 205,209            |          |                                     | CN22,23            | OB08731A | 10P-S Connector F10P-SHVQ                  |
| 217,218            |          |                                     |                    |          |                                            |
| R108,208           | OB09203A | Metal Film Resistor 10K SN14K2E F   |                    |          |                                            |
| R111,113           | OB01679A | Carbon Resistor 100 ERD-25T J       |                    |          |                                            |
| 211,213            |          |                                     |                    |          |                                            |
| R112,119           | OB05622A | Carbon Resistor 2.2K ERD-25T J      |                    |          |                                            |
| 212,219            |          |                                     |                    |          |                                            |
| 927                |          |                                     |                    |          |                                            |
| R114,120           | OB05621A | Carbon Resistor 120K ERD-25T J      |                    |          |                                            |
| 214,220            |          |                                     |                    |          |                                            |
| R115,215           | OB05671A | Carbon Resistor 2.2M ERD-25T J      |                    |          |                                            |
| 903,904            |          |                                     |                    |          |                                            |
| 923                |          |                                     |                    |          |                                            |
| R116,216           | OB01857A | Carbon Resistor 1K ERD-25T J        |                    |          |                                            |
| 905                |          |                                     |                    |          |                                            |
| R121,221           | OB09454A | Metal Film Resistor 57.6K SN14K2E F |                    |          |                                            |
| R122,222           | OB09446A | Metal Film Resistor 33.2K SN14K2E F |                    |          |                                            |
| R901,902           | OB05640A | Carbon Resistor 180K ERD-25T J      |                    |          |                                            |
| 942,948            |          |                                     |                    |          |                                            |
| R908,909           | OB05776A | Carbon Resistor 1M ERD-25T J        |                    |          |                                            |
| 915,919            |          |                                     |                    |          |                                            |
| 924,925            |          |                                     |                    |          |                                            |
| 936,944            |          |                                     |                    |          |                                            |
| R910               | OB09320A | Carbon Resistor 820K ERD-25T J      |                    |          |                                            |
| R911               | OB01681A | Carbon Resistor 3.3K ERD-25T J      |                    |          |                                            |
| R912               | OB05627A | Carbon Resistor 330K ERD-25T J      |                    |          |                                            |
| R914,928           | OB05615A | Carbon Resistor 22K ERD-25T J       |                    |          |                                            |
| 929                |          |                                     |                    |          |                                            |
| R920               | OB05743A | Carbon Resistor 27K ERD-25T J       |                    |          |                                            |

7.14. Record Dolby NR P.C.B. Ass'y

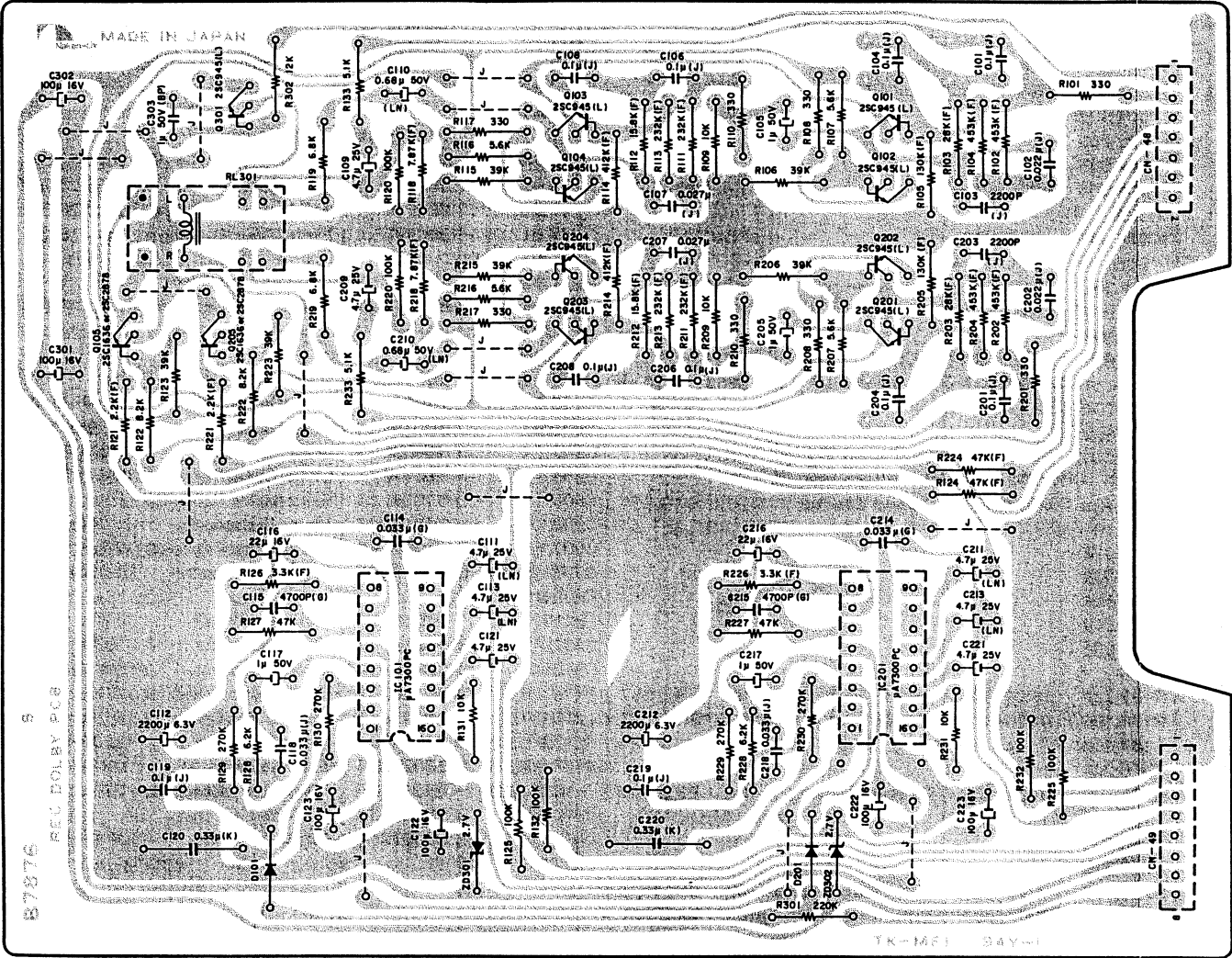


Fig. 7.14 Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No. | Part No.                                       | Description | Schematic Ref. No. | Part No.               | Description                          |
|--------------------|------------------------------------------------|-------------|--------------------|------------------------|--------------------------------------|
| BA04236A           | Record Dolby NR P.C.B. Ass'y                   |             | C111,113           | OB09333A               | Electrolytic Capacitor 4.7μ 25V (LN) |
| OB07876B           | Record Dolby NR P.C.B.                         |             | 211,213            |                        |                                      |
| OB06200A           | IC μA7300PC                                    |             | C112,212           | OB09257A               | Electrolytic Capacitor 2200μ 6.3V    |
| OB01872A           | Transistor 2SC945 (L)                          |             | C114,214           | OB09240A               | PP Capacitor 0.033μ 50V G            |
| IC101,201          |                                                |             | C115,215           | OB09191A               | PP Capacitor 4700P 50V G             |
| Q101,102           |                                                |             | C116,216           | OB01862A               | Electrolytic Capacitor 22μ 16V       |
| 103,104            |                                                |             | C118,218           | OB05583A               | Mylar Capacitor 0.033μ 50V J         |
| 201,202            |                                                |             | C120,220           | OB09399A               | Mylar Capacitor 0.33μ 100V K         |
| 203,204            |                                                |             | C122,123           | OB01400A               | Electrolytic Capacitor 100μ 16V      |
| 301                |                                                |             | 222,223            |                        |                                      |
| Q105,205           | OB06070A Transistor 2SC1636 (2SC2878)          |             | 301,302            |                        |                                      |
| ZD301,302          | OB06191A Zener Diode 2.7V 2.7EB                |             | C303               | OB09187A               | Electrolytic Capacitor 1μ 50V (BP)   |
| D101,201           | OB01909A Silicon Diode 1S1555                  |             | RL301              | OB07326A               | FBR Relay 12V                        |
| R101,108           | OB05577A Carbon Resistor 330 ERD-25T J         |             | CN48               | OB08729A               | 7P-S Connector F7P-SHVQ              |
| 110,117            |                                                |             | CN49               | OB08730A               | 8P-S Connector F8P-SHVQ              |
| 201,208            |                                                |             | OB08714A           | IC Socket 16P (2 pcs.) |                                      |
| 210,217            |                                                |             |                    |                        |                                      |
| R102,104           | OB09480A Metal Film Resistor 453K SN14K2E F    |             |                    | BA04231A               | Record Eq. Amp. P.C.B. Ass'y         |
| 202,204            |                                                |             |                    |                        |                                      |
| R103,203           | OB09445A Metal Film Resistor 28K SN14K2E F     |             |                    | OB07877A               | Record Eq. Amp. P.C.B.               |
| R105,205           | OB09466A Metal Film Resistor 130K SN14K2E F    |             |                    | OB06144A               | IC μPD4066C                          |
| R106,115           | OB01854A Carbon Resistor 39K ERD-25T J         |             |                    |                        |                                      |
| 123,206            |                                                |             | IC101,102          |                        |                                      |
| 215,223            |                                                |             | 201,202            |                        |                                      |
| R107,116           | OB01887A Carbon Resistor 5.6K ERD-25T J        |             | 304,305            |                        |                                      |
| 207,216            |                                                |             | IC103,203          | OB06261A               | IC μPD4508BC                         |
| R109,131           | OB01888A Carbon Resistor 10K ERD-25T J         |             | 306,307            |                        |                                      |
| 209,231            |                                                |             | IC301,302          | OB06146A               | IC RC4558DD                          |
| R111,113           | OB09473A Metal Film Resistor 232K SN14K2E F    |             | IC303              | OB06287A               | IC RC4558DD MC                       |
| 211,213            |                                                |             | Q101,102           | OB01872A               | Transistor 2SC945 (L)                |
| R112,212           | OB09437A Metal Film Resistor 15.8K SN14K2E F   |             | 103,104            |                        |                                      |
| R114,214           | OB09478A Metal Film Resistor 412K SN14K2E F    |             | 201,202            |                        |                                      |
| R118,218           | OB09430A Metal Film Resistor 7.87K SN14K2E F   |             | 203,204            |                        |                                      |
| R119,219           | OB01682A Carbon Resistor 6.8K ERD-25T J        |             | Q105,205           | OB06013A               | Transistor 2SA733                    |
| R120,125           | OB01889A Carbon Resistor 100K ERD-25T J        |             | L101,201           | OB00068A               | Trap Coil 10.5mH                     |
| 132,220            |                                                |             | R101,121           | OB05560A               | Carbon Resistor 18K ERD-25T J        |
| 225,232            |                                                |             | 201,221            |                        |                                      |
| R121,221           | OB09420A Metal Film Resistor 2.2K SN14K2E F    |             | R102,202           | OB05621A               | Carbon Resistor 120K ERD-25T J       |
| R122,222           | OB01856A Carbon Resistor 8.2K ERD-25T J        |             | R103,203           | OB09442A               | Metal Film Resistor 22.3K SN14K2E F  |
| R124,224           | OB09451A Metal Film Resistor 47K SN14K2E F     |             | R104,204           | OB09229A               | Metal Film Resistor 18K SN14K2E F    |
| R126,226           | OB09317A Metal Film Resistor 3.3K SN14K2E F    |             | R105,205           | OB09464A               | Metal Film Resistor 121K SN14K2E F   |
| R127,227           | OB05641A Carbon Resistor 47K ERD-25T J         |             | R106,206           | OB09454A               | Metal Film Resistor 57.6K SN14K2E F  |
| R128,228           | OB09271A Carbon Resistor 6.2K ERD-25T J        |             | R107,207           | OB09443A               | Metal Film Resistor 26.4K SN14K2E F  |
| R129,130           | OB05620A Carbon Resistor 270K ERD-25T J        |             | R108,111           | OB05508A               | Carbon Resistor 56K ERD-25T J        |
| 229,230            |                                                |             | 114,142            |                        |                                      |
| R133,233           | OB09314A Carbon Resistor 5.1K ERD-25T J        |             | 208,211            |                        |                                      |
| R301               | OB05625A Carbon Resistor 220K ERD-25T J        |             | 214,242            |                        |                                      |
| R302               | OB09263A Carbon Resistor 12K ERD-25T J         |             | R109,112           | OB05626A               | Carbon Resistor 150K ERD-25T J       |
| C101,104           | OB01780A Mylar Capacitor 0.1μ 50V J            |             | 115,119            |                        |                                      |
| 106,108            |                                                |             | 143,209            |                        |                                      |
| 119,201            |                                                |             | 212,215            |                        |                                      |
| 204,206            |                                                |             | 219,243            |                        |                                      |
| 208,219            |                                                |             | R110,113           | OB01854A               | Carbon Resistor 39K ERD-25T J        |
| C102,202           | OB05582A Mylar Capacitor 0.022μ 50V J          |             | 116,144            |                        |                                      |
| C103,203           | OB01802A Mylar Capacitor 2200P 50V J           |             | 145,210            |                        |                                      |
| C105,117           | OB01405A Electrolytic Capacitor 1μ 50V         |             | 213,216            |                        |                                      |
| 205,217            |                                                |             | 244,245            |                        |                                      |
| C107,207           | OB09045A Mylar Capacitor 0.027μ 50V J          |             | R117,217           | OB09428A               | Metal Film Resistor 5.76K SN14K2E F  |
| C109,121           | OB01402A Electrolytic Capacitor 4.7μ 25V       |             | R118,218           | OB05577A               | Carbon Resistor 330 ERD-25T J        |
| 209,221            |                                                |             | R120,220           | OB05743A               | Carbon Resistor 27K ERD-25T J        |
| C110,210           | OB09395A Electrolytic Capacitor 0.68μ 50V (LN) |             | R122,131           | OB09203A               | Metal Film Resistor 10K SN14K2E F    |
|                    |                                                |             | 222,231            |                        |                                      |
|                    |                                                |             | R123,223           | OB05620A               | Carbon Resistor 270K ERD-25T J       |

| Schematic Ref. No. | Part No. | Description                              |
|--------------------|----------|------------------------------------------|
| R124,224           | 0B09466A | Metal Film Resistor 130K SN14K2E F       |
| R125,225           | 0B09298A | Metal Film Resistor 64.9K SN14K2E F      |
| R126,226           | 0B09446A | Metal Film Resistor 33.2K SN14K2E F      |
| R127,227           | 0B09438A | Metal Film Resistor 16.5K SN14K2E F      |
| R128,228           | 0B09431A | Metal Film Resistor 8.06K SN14K2E F      |
| R129,229           | 0B09423A | Metal Film Resistor 4.02K SN14K2E F      |
| R130,230           | 0B09419A | Metal Film Resistor 2K SN14K2E F         |
| R132,232           | 0B09436A | Metal Film Resistor 14K SN14K2E F        |
| R133,233           | 0B09335A | Carbon Resistor 680K ERD-25T J           |
| R134,234           | 0B09380A | Carbon Resistor 1.5M ERD-25T J           |
| R135,235           | 0B05962A | Carbon Resistor 1.2M ERD-25T J           |
| R136,236           | 0B09357A | Metal Film Resistor 33K SN14K2E F        |
| R137,237           | 0B09391A | Carbon Resistor 91K ERD-25T J            |
| R138,238           | 0B05675A | Carbon Resistor 3.9K ERD-25T J           |
| R139,239           | 0B05974A | Carbon Resistor 680 ERD-25T J            |
| R140,240           | 0B05641A | Carbon Resistor 47K ERD-25T J            |
| R141,241           | 0B05622A | Carbon Resistor 2.2K ERD-25T J           |
| R146,246           | 0B05627A | Carbon Resistor 330K ERD-25T J           |
| R147-154           | 0B05625A | Carbon Resistor 220K ERD-25T J (24 pcs.) |
| 247-254            |          |                                          |
| 303-310            |          |                                          |
| R301,302           | 0B09049A | Fail Safe Type Resistor 22 ERD-14F J     |
| C101,201           | 0B09045A | Mylar Capacitor 0.027μ 50V J             |
| C102,202           | 0B09223A | Electrolytic Capacitor 1μ 50V (LN)       |
| C103,119           | 0B09403A | PP Capacitor 620P 100V J                 |
| 203,219            |          |                                          |
| C104,204           | 0B05687A | Mylar Capacitor 1200P 50V J              |
| C105,205           | 0B01802A | Mylar Capacitor 2200P 50V J              |
| C106,206           | 0B05636A | Tantalum Capacitor 22μ 16V               |
| C107,207           | 0B09247A | Mica Capacitor 220P 50V J                |
| C108,110           | 0B09488A | Ceramic Capacitor 30P 50V J              |
| 208,210            |          |                                          |
| C109,209           | 0B09484A | PP Capacitor 470P 100V G                 |
| C111,211           | 0B09408A | PP Capacitor 1000P 100V G                |
| C112,212           | 0B09485A | PP Capacitor 680P 100V G                 |
| C113,213           | 0B09486A | Mica Capacitor 120P 50V J                |
| C114,214           | 0B09397A | Electrolytic Capacitor 470μ 10V (LN)     |
| C115,215           | 0B09412A | PP Capacitor 0.011μ 100V G               |
| C116,216           | 0B09094A | Tantalum Capacitor 1μ 50V                |
| C117,217           | 0B09375A | Electrolytic Capacitor 47μ 10V (LN)      |
| C118,218           | 0B05909A | Mylar Capacitor 0.12μ 50V J              |
| C120,220           | 0B09189A | Mylar Capacitor 2700P 50V J              |
| C121,221           | 0B01913A | Mylar Capacitor 1800P 50V J              |
| C301,302           | 0B01502A | Electrolytic Capacitor 330μ 16V          |
| CN45,46            | 0B08727A | 5P-S Connector F5P-SHVQ                  |
| CN51               | 0B08644A | 8P-T Post                                |
| CN52               | 0B08654A | 4P-T Post                                |

7.15. Record Eq. Amp. P.C.B. Ass'y

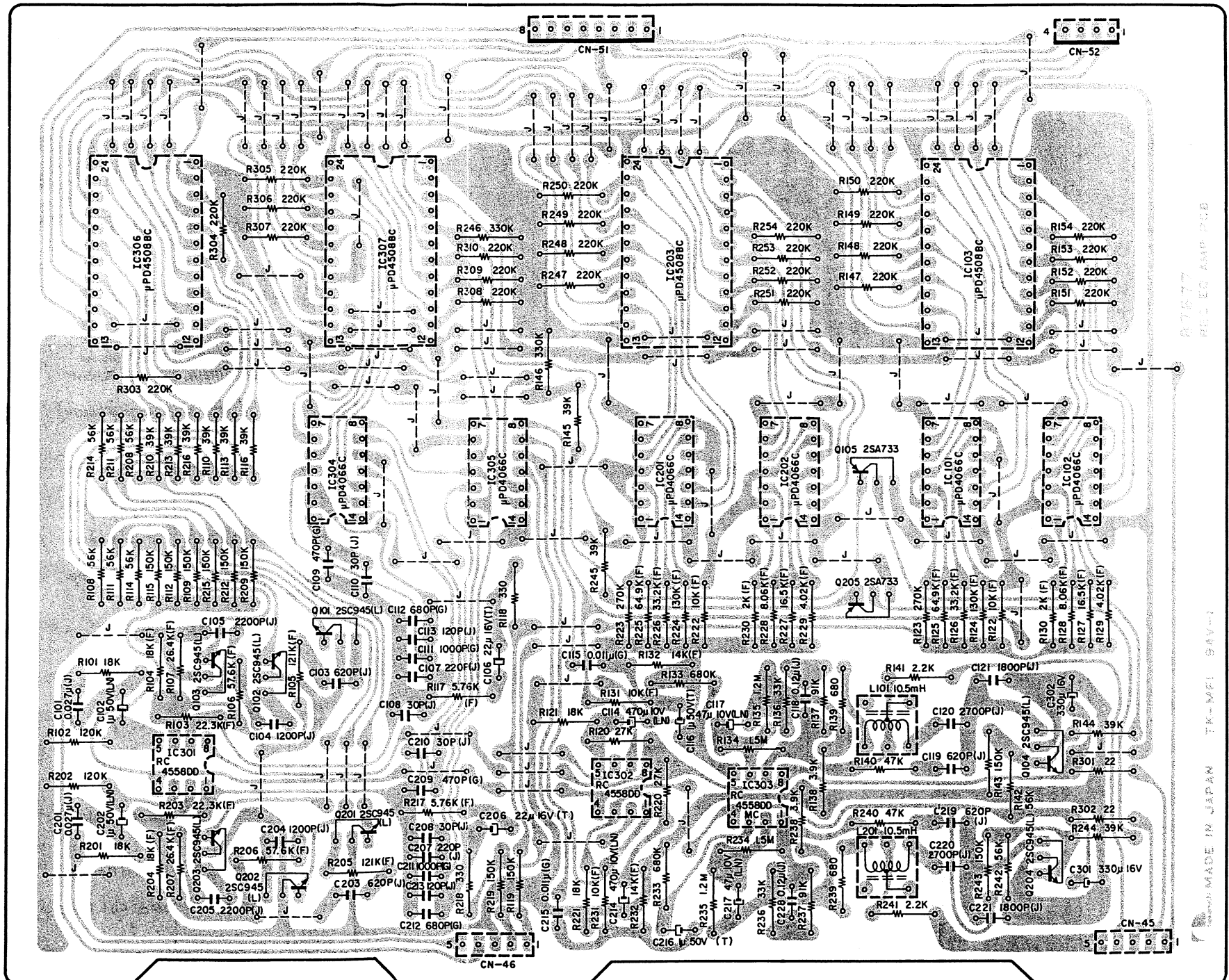


Fig. 7.15

Note: Diode is 1SS53 unless otherwise specified.



7.16. MIC Amp. and Volume P.C.B. Ass'y

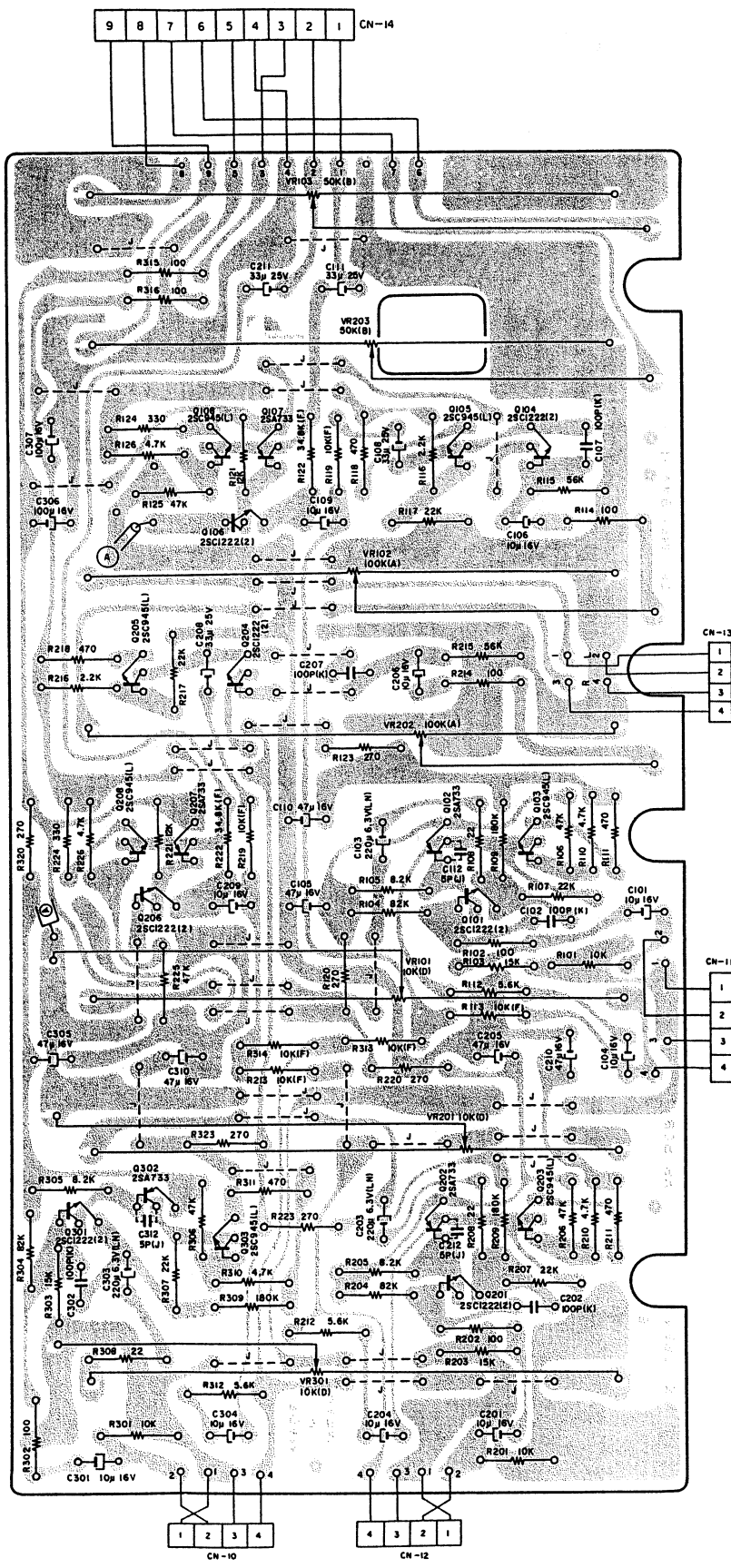


Fig. 7.16

| Schematic Ref. No. | Part No. | Description                                       | Schematic Ref. No. | Part No.   | Description                                         |
|--------------------|----------|---------------------------------------------------|--------------------|------------|-----------------------------------------------------|
|                    | BA04232A | MIC Amp. and Volume P.C.B. Ass'y                  | C102,107           | OB09282A   | Ceramic Capacitor 100P 50V K                        |
| Q101,104           | OB07884B | MIC Amp. and Volume P.C.B. Transistor 2SC1222 (2) | 202,207            |            |                                                     |
| 106,201            | OB06062A |                                                   | 302                | OB09151A   | Electrolytic Capacitor 220μ 6.3V (LN)               |
| 204,206            |          |                                                   | C103,203           |            |                                                     |
| 301                |          |                                                   | 303                | OB01403A   | Electrolytic Capacitor 47μ 16V                      |
| Q102,107           | OB06013A | Transistor 2SA733                                 | C105,110           |            |                                                     |
| 202,207            |          |                                                   | 205,210            |            |                                                     |
| 302                |          |                                                   | 305,310            | OB09251A   | Electrolytic Capacitor 33μ 25V                      |
| Q103,105           | OB01872A | Transistor 2SC945 (L)                             | C108,111           |            |                                                     |
| 108,203            |          |                                                   | 208,211            | OB09276A   | Ceramic Capacitor 5P 50V J                          |
| 205,208            |          |                                                   | C112,212           |            |                                                     |
| 303                |          |                                                   | 312                |            |                                                     |
| VR101,201          | OB07331A | Slide Volume 10K (D)                              | C306,307           | OB01400A   | Electrolytic Capacitor 100μ 16V                     |
| 301                |          |                                                   | CN10               | OB08754A   | 4P-H Connector 520mm                                |
| VR102,202          | OB07332A | Slide Volume 100K (A)                             | CN11               | OB08779A   | 4P-H Connector                                      |
| VR103,203          | OB07333A | Slide Volume 50K (B)                              | CN12               | OB08780A   | 4P-H Connector                                      |
| R101,201           | OB01888A | Carbon Resistor 10K ERD-25T J                     | CN13               | OB08755A   | 4P-H Connector 320mm                                |
| 301                |          |                                                   | CN14               | OB08753A   | 9P-H Connector 320mm                                |
| R102,202           | OB01679A | Carbon Resistor 100 ERD-25T J                     |                    | BA04235A   | Playback Amp. and Dolby NR P.C.B. Ass'y 2nd Version |
| 114,214            |          |                                                   |                    |            |                                                     |
| 302                |          |                                                   |                    |            |                                                     |
| R103,203           | OB01683A | Carbon Resistor 15K ERD-25T J                     |                    |            |                                                     |
| 303                |          |                                                   | IC101,201          | OB07875C   | Playback Amp. and Dolby NR P.C.B. IC μA7300PC       |
| R104,204           | OB05668A | Carbon Resistor 82K ERD-25T J                     | IC301              | OB06200A   | IC RC4559DD                                         |
| 304                |          |                                                   | Q101,201           | OB06205A   | FET 2SK240 (BL)                                     |
| R105,205           | OB01856A | Carbon Resistor 8.2K ERD-25T J                    |                    | (OB06300A) | (2SK146 (V))                                        |
| 305                |          |                                                   | Q102,103           | OB01872A   | Transistor 2SC945 (L)                               |
| R106,206           | OB05641A | Carbon Resistor 47K ERD-25T J                     | 104,202            |            |                                                     |
| 125,225            |          |                                                   | 203,204            |            |                                                     |
| 306                |          |                                                   | ZD301,302          | OB06191A   | Zener Diode 2.7V 2.7EB                              |
| R107,207           | OB05615A | Carbon Resistor 22K ERD-25T J                     | ZD303,304          | OB06233A   | Zener Diode 10V RD10EB3                             |
| 117,217            |          |                                                   | D101,201           | OB01909A   | Silicon Diode 1S1555                                |
| 307                |          |                                                   | L101,201           | OB06636A   | Inductor 1.05mH                                     |
| R108,208           | OB05579A | Carbon Resistor 22 ERD-25T J                      | L102,202           | OB00068A   | Trap Coil 10.5mH                                    |
| 308                |          |                                                   | L103,203           | OB03919B   | Inductor 36mH                                       |
| R109,209           | OB05640A | Carbon Resistor 180K ERD-25T J                    | VR101,201          | OB07353A   | Semi-fixed Volume 200                               |
| 309                |          |                                                   | VR102,202          | OB07162A   | Semi-fixed Volume 10K                               |
| R110,210           | OB01846A | Carbon Resistor 4.7K ERD-25T J                    | R101,124           | OB05615A   | Carbon Resistor 22K ERD-25T J                       |
| 126,226            |          |                                                   | 201,224            |            |                                                     |
| 310                |          |                                                   | R102,202           | OB09540A   | Metal Film Resistor 3.24K SN14K2E F                 |
| R111,211           | OB05576A | Carbon Resistor 470 ERD-25T J                     | R103,107           | OB01846A   | Carbon Resistor 4.7K ERD-25T J                      |
| 118,218            |          |                                                   | 203,207            |            |                                                     |
| 311                |          |                                                   | R104,204           | OB01933A   | Carbon Resistor 220 ERD-25T J                       |
| R112,212           | OB01887A | Carbon Resistor 5.6K ERD-25T J                    | R105,205           | OB09415A   | Metal Film Resistor 68 SN14K2E F                    |
| 312                |          |                                                   | R106,122           | OB09422A   | Metal Film Resistor 3.16K SN14K2E F                 |
| R113,119           | OB09203A | Metal Film Resistor 10K SN14K2E F                 | 206,222            |            |                                                     |
| 213,219            |          |                                                   | R108,132           | OB01889A   | Carbon Resistor 100K ERD-25T J                      |
| 313,314            |          |                                                   | 208,232            |            |                                                     |
| R115,215           | OB05508A | Carbon Resistor 56K ERD-25T J                     | R109,209           | OB09521A   | Metal Film Resistor 523K SN14K2E F                  |
| R116,216           | OB05622A | Carbon Resistor 2.2K ERD-25T J                    | R110,210           | OB09205A   | Metal Film Resistor 18K SN14K2E F                   |
| R120,123           | OB05645A | Carbon Resistor 270 ERD-25T J                     | R111,112           | OB01857A   | Carbon Resistor 1K ERD-25T J                        |
| 220,223            |          |                                                   | 113,211            |            |                                                     |
| 320,323            |          |                                                   | 212,213            |            |                                                     |
| R121,221           | OB09263A | Carbon Resistor 12K ERD-25T J                     | R114,116           | OB09520A   | Carbon Resistor 620K ERD-25T J                      |
| R122,222           | OB09447A | Metal Film Resistor 34.8K SN14K2E F               | 214,216            |            |                                                     |
| R124,224           | OB05577A | Carbon Resistor 330 ERD-25T J                     | R115,128           | OB05620A   | Carbon Resistor 270K ERD-25T J                      |
| R315,316           | OB09215A | Fail Safe Type Resistor 100 RDF-25S J             | 130,215            |            |                                                     |
| C101,104           | OB01412A | Electrolytic Capacitor 10μ 16V                    | 228,230            |            |                                                     |
| 106,109            |          |                                                   | R117,217           | OB05676A   | Carbon Resistor 390K ERD-25T J                      |
| 201,204            |          |                                                   | R118,218           | OB01854A   | Carbon Resistor 39K ERD-25T J                       |
| 206,209            |          |                                                   | R119,219           | OB01887A   | Carbon Resistor 5.6K ERD-25T J                      |
| 301,304            |          |                                                   |                    |            |                                                     |

| Schematic Ref. No. | Part No. | Description                           |
|--------------------|----------|---------------------------------------|
| R120,220           | 0B05577A | Carbon Resistor 330 ERD-25T J         |
| R121,221           | 0B09421A | Metal Film Resistor 2.67K SN14K2E F   |
| R123,127           | 0B05641A | Carbon Resistor 47K ERD-25T J         |
| 223,227            |          |                                       |
| R125,131           | 0B01888A | Carbon Resistor 10K ERD-25T J         |
| 225,231            |          |                                       |
| R126,226           | 0B09317A | Metal Film Resistor 3.3K SN14K2E F    |
| R129,229           | 0B09271A | Carbon Resistor 6.2K ERD-25T J        |
| R133,233           | 0B05671A | Carbon Resistor 2.2M ERD-25T J        |
| R134,234           | 0B01679A | Carbon Resistor 100 ERD-25T J         |
| R301               | 0B05625A | Carbon Resistor 220K ERD-25T J        |
| R303,304           | 0B09306A | Fail Safe Type Resistor 68 RDF-25S J  |
| C101,201           | 0B09486A | Mica Capacitor 120P 50V J             |
| C102,202           | 0B05681A | Mylar Capacitor 0.01μ 50V J           |
| C103,203           | 0B09152A | Electrolytic Capacitor 470μ 6.3V (LN) |
| C104,204           | 0B09489A | PP Capacitor 5600P 100V G             |
| C105,205           | 0B05550A | Mylar Capacitor 1000P 50V J           |
| C106,206           | 0B09345A | Electrolytic Capacitor 3.3μ 25V (BP)  |
| C107,108           | 0B01400A | Electrolytic Capacitor 100μ 16V       |
| 128,129            |          |                                       |
| 207,208            |          |                                       |
| 228,229            |          |                                       |
| 303,304            |          |                                       |
| 305,306            |          |                                       |
| C109,209           | 0B09410A | PP Capacitor 2200P 100V J             |
| C110,113           | 0B09189A | Mylar Capacitor 2700P 50V J           |
| 210,213            |          |                                       |
| C111,211           | 0B09275A | Mica Capacitor 200P 50V J             |
| C112,212           | 0B09235A | PP Capacitor 680P 100V J              |
| C114,116           | 0B05813A | Mylar Capacitor 0.056μ 50V J          |
| 214,216            |          |                                       |
| C115,126           | 0B01780A | Mylar Capacitor 0.1μ 50V J            |
| 215,226            |          |                                       |
| C117,217           | 0B09413A | PP Capacitor 0.022μ 100V G            |
| C118,122           | 0B09333A | Electrolytic Capacitor 4.7μ 25V (LN)  |
| 218,222            |          |                                       |
| C119,219           | 0B09257A | Electrolytic Capacitor 2200μ 6.3V     |
| C120,220           | 0B09240A | PP Capacitor 0.033μ 100V G            |
| C121,221           | 0B09191A | PP Capacitor 4700P 100V G             |
| C123,223           | 0B01862A | Electrolytic Capacitor 22μ 16V        |
| C124,224           | 0B01405A | Electrolytic Capacitor 1μ 50V         |
| C125,225           | 0B05583A | Mylar Capacitor 0.033μ 50V J          |
| C127,227           | 0B09399A | Mylar Capacitor 0.33μ 100V K          |
| C130,230           | 0B09400A | Mica Capacitor 250P 50V J             |
| C131,231           | 0B09270A | PP Capacitor 470P 50V J               |
| C301,302           | 0B01412A | Electrolytic Capacitor 10μ 16V        |
| CN46               | 0B08727A | 5P-S Connector F5P-SHVQ               |
| CN47               | 0B08728A | 6P-S Connector F6P-SHVQ               |
| CN53               | 0B08654A | 4P-T Post                             |
|                    | 0B08714A | IC Socket 16P (2 pcs.)                |

### 7.17. Playback Amp. and Dolby NR P.C.B. Ass'y

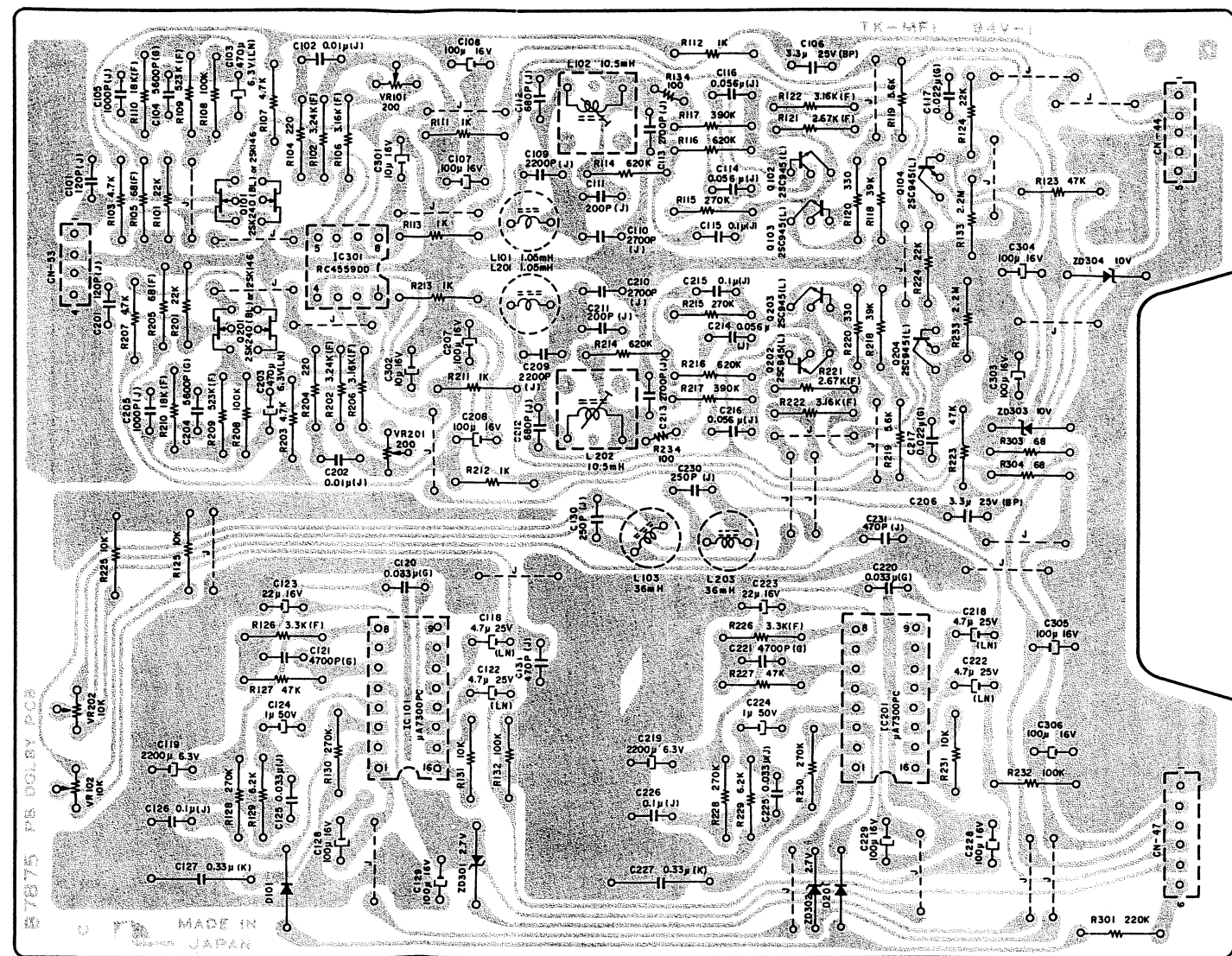


**Fig. 7.17.1 2nd Version**

**Note: Diode is 1SS53 unless otherwise specified.**

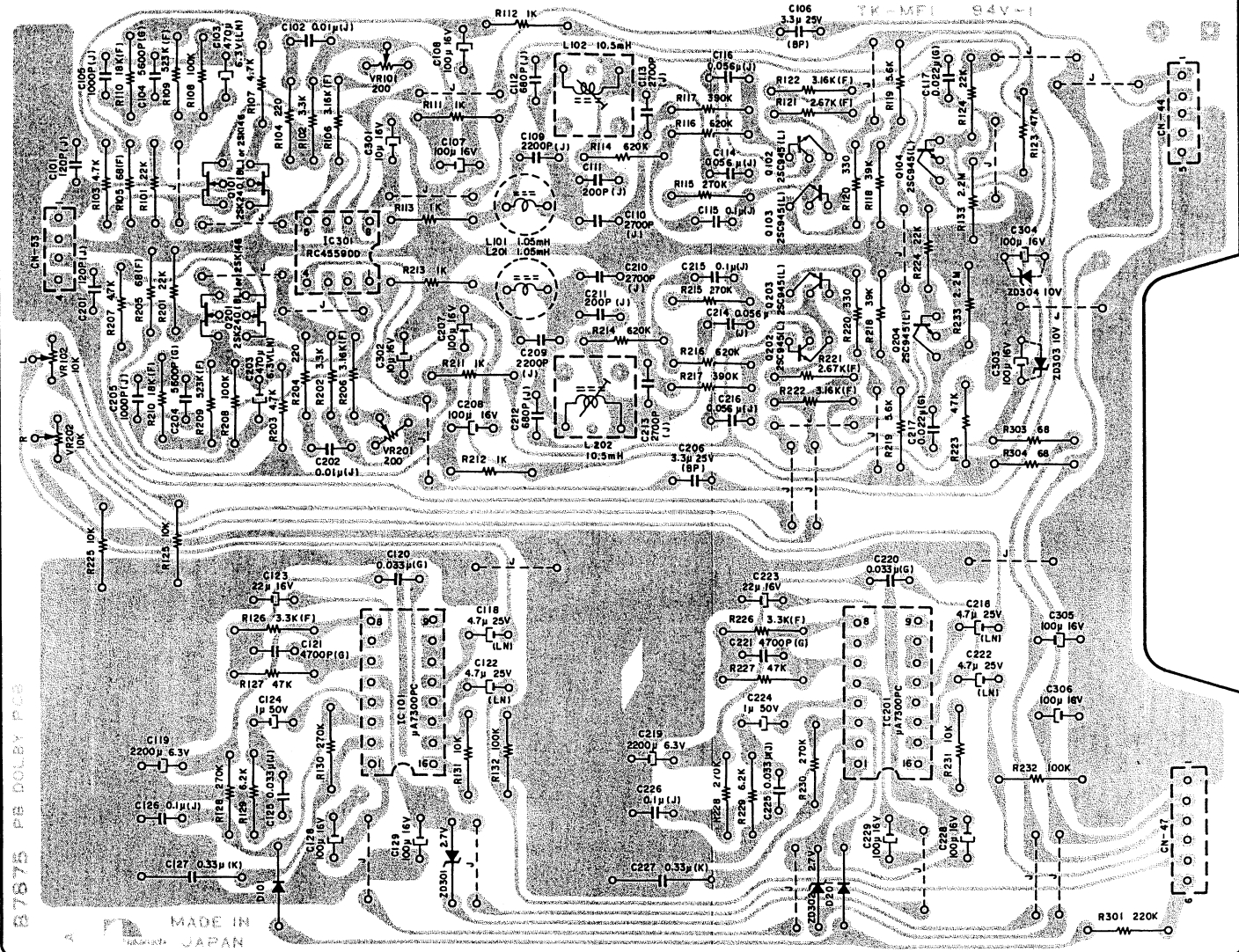


**Fig. 7.17.2 1st Version**

**Note: Diode is 1SS53 unless otherwise specified.**

| Schematic Ref. No.             | Part No.   | Description                                            |
|--------------------------------|------------|--------------------------------------------------------|
|                                | BA04235A   | Playback Amp. and Dolby NR P.C.B. Ass'y<br>1st Version |
| IC101,201                      | OB07875A   | Playback Amp. and Dolby NR P.C.B.                      |
| IC301                          | OB06200A   | IC $\mu$ A7300PC                                       |
| Q101,201                       | OB06205A   | IC RC4559DD                                            |
|                                | OB06257A   | FET 2SK240 (BL)                                        |
|                                | (OB06300A) | (2SK146 (V))                                           |
| Q102,103<br>104,202<br>203,204 | OB01872A   | Transistor 2SC945 (L)                                  |
| ZD301,302                      | OB06191A   | Zener Diode 2.7V 2.7EB                                 |
| ZD303,304                      | OB06233A   | Zener Diode 10V RD10EB3                                |
| D101,201                       | OB01909A   | Silicon Diode 1S1555                                   |
| L101,201                       | OB06636A   | Inductor 1.05mH                                        |
| L102,202                       | OB00068A   | Trap Coil 10.5mH                                       |
| VR101,201                      | OB07353A   | Semi-fixed Volume 200                                  |
| VR102,202                      | OB07162A   | Semi-fixed Volume 10K                                  |
| R101,124<br>201,224            | OB05615A   | Carbon Resistor 22K ERD-25T J                          |
| R102,202                       | OB01681A   | Carbon Resistor 3.3K ERD-25T J                         |
| R103,107<br>203,207            | OB01846A   | Carbon Resistor 4.7K ERD-25T J                         |
| R104,204                       | OB01933A   | Carbon Resistor 220 ERD-25T J                          |
| R105,205                       | OB09415A   | Metal Film Resistor 68 SN14K2E F                       |
| R106,122<br>206,222            | OB09422A   | Metal Film Resistor 3.16K SN14K2E F                    |
| R108,132<br>208,232            | OB01889A   | Carbon Resistor 100K ERD-25T J                         |
| R109,209                       | OB09521A   | Metal Film Resistor 523K SN14K2E F                     |
| R110,210                       | OB09205A   | Metal Film Resistor 18K SN14K2E F                      |
| R111,112<br>113,211<br>212,213 | OB01857A   | Carbon Resistor 1K ERD-25T J                           |
| R114,116<br>214,216            | OB09520A   | Carbon Resistor 620K ERD-25T J                         |
| R115,128<br>130,215<br>228,230 | OB05620A   | Carbon Resistor 270K ERD-25T J                         |
| R117,217                       | OB05676A   | Carbon Resistor 390K ERD-25T J                         |
| R118,218                       | OB01854A   | Carbon Resistor 39K ERD-25T J                          |
| R119,219                       | OB01887A   | Carbon Resistor 5.6K ERD-25T J                         |
| R120,220                       | OB05577A   | Carbon Resistor 330 ERD-25T J                          |
| R121,221                       | OB09421A   | Metal Film Resistor 2.67K SN14K2E F                    |
| R123,127<br>223,227            | OB05641A   | Carbon Resistor 47K ERD-25T J                          |
| R125,131<br>225,231            | OB01888A   | Carbon Resistor 10K ERD-25T J                          |
| R126,226                       | OB09317A   | Metal Film Resistor 3.3K SN14K2E F                     |
| R129,229                       | OB09271A   | Carbon Resistor 6.2K ERD-25T J                         |
| R133,233                       | OB05671A   | Carbon Resistor 2.2M ERD-25T J                         |
| R301                           | OB05625A   | Carbon Resistor 220K ERD-25T J                         |
| R303,304                       | OB09306A   | Fail Safe Type Resistor 68                             |
| C101,201                       | OB09486A   | Mica Capacitor 120P 50V J                              |
| C102,202                       | OB05681A   | Mylar Capacitor 0.01 $\mu$ 50V J                       |
| C103,203                       | OB09152A   | Electrolytic Capacitor 470 $\mu$ 6.3V (LN)             |
| C104,204                       | OB09489A   | PP Capacitor 5600P 100V G                              |
| C105,205                       | OB05550A   | Mylar Capacitor 1000P 50V J                            |
| C106,206                       | OB09345A   | Electrolytic Capacitor 3.3 $\mu$ 25V (BP)              |

| Schematic Ref. No.                                              | Part No. | Description                          |
|-----------------------------------------------------------------|----------|--------------------------------------|
| C107,108<br>128,129<br>207,208<br>228,229<br>303,304<br>305,306 | OB01400A | Electrolytic Capacitor 100μ 16V      |
| C109,209                                                        | OB09410A | PP Capacitor 2200P 100V J            |
| C110,113<br>210,213                                             | OB09189A | Mylar Capacitor 2700P 50V J          |
| C111,211                                                        | OB09275A | Mica Capacitor 200P 50V J            |
| C112,212                                                        | OB09235A | PP Capacitor 680P 100V J             |
| C114,116<br>214,216                                             | OB05813A | Mylar Capacitor 0.056μ 50V J         |
| C115,126<br>215,226                                             | OB01780A | Mylar Capacitor 0.1μ 50V J           |
| C117,217                                                        | OB09413A | PP Capacitor 0.022μ 100V G           |
| C118,122<br>218,222                                             | OB09333A | Electrolytic Capacitor 4.7μ 25V (LN) |
| C119,219                                                        | OB09257A | Electrolytic Capacitor 2200μ 6.3V    |
| C120,220                                                        | OB09240A | PP Capacitor 0.033μ 100V G           |
| C121,221                                                        | OB09191A | PP Capacitor 4700P 100V G            |
| C123,223                                                        | OB01862A | Electrolytic Capacitor 22μ 16V       |
| C124,224                                                        | OB01405A | Electrolytic Capacitor 1μ 50V        |
| C125,225                                                        | OB05583A | Mylar Capacitor 0.033μ 50V J         |
| C127,227                                                        | OB09399A | Mylar Capacitor 0.33μ 100V K         |
| C301,302                                                        | OB01412A | Electrolytic Capacitor 10μ 16V       |
| CN46                                                            | OB08727A | 5P-S Connector F5P-SHVQ              |
| CN47                                                            | OB08728A | 6P-S Connector F6P-SHVQ              |
| CN53                                                            | OB08654A | 4P-T Post                            |
|                                                                 | OB08714A | IC Socket 16P (2 pcs.)               |



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

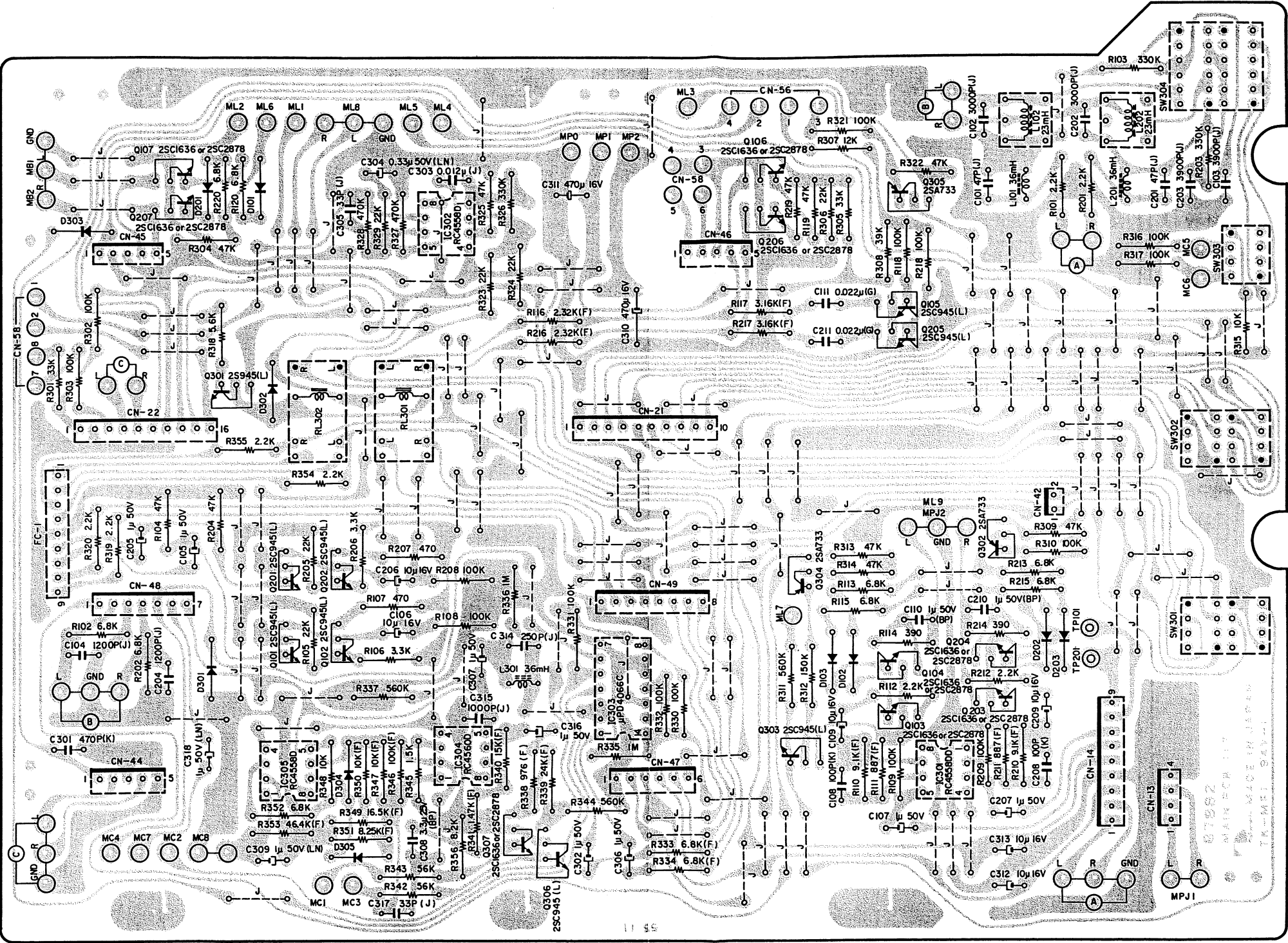


Fig. 7.18.1 2nd Version

Note: Diode is 1SS53 unless otherwise specified.



| Schematic Ref. No. | Part No.   | Description                         | Schematic Ref. No. | Part No. | Description                                |
|--------------------|------------|-------------------------------------|--------------------|----------|--------------------------------------------|
|                    | BA04227A   | Main P.C.B. Ass'y<br>2nd Version    | R311,337<br>344    | OB05784A | Carbon Resistor 560K ERD-25T J             |
|                    | OB07882C   | Main P.C.B.                         | R312               | OB05626A | Carbon Resistor 150K ERD-25T J             |
| IC301              | OB06146A   | IC RC4558DD                         | R315,348           | OB01888A | Carbon Resistor 10K ERD-25T J              |
| IC302,305          | OB06124B   | IC RC4558D                          | R318               | OB01887A | Carbon Resistor 5.6K ERD-25T J             |
| IC303              | OB06144A   | IC $\mu$ PD4066C                    | R327,328           | OB01684A | Carbon Resistor 470K ERD-25T J             |
| IC304              | OB06217A   | IC RC4560D                          | R333,334           | OB09529A | Metal Film Resistor 6.8K SN14K2E F         |
| Q101,102           | OB01872A   | Transistor 2SC945 (L)               | R335,336           | OB05776A | Carbon Resistor 1M ERD-25T J               |
| 105,201            |            |                                     | R338               | OB09416A | Metal Film Resistor 976 SN14K2E F          |
| 202,205            |            |                                     | R339               | OB09005A | Metal Film Resistor 24K SN14K2E F          |
| 301,303            |            |                                     | R340               | OB09340A | Metal Film Resistor 15K SN14K2E F          |
| 306                |            |                                     | R341               | OB09551A | Metal Film Resistor 1.47K SN14K2E F        |
| Q103,104           | OB06070A   | Transistor 2SC1636                  | R342,343           | OB05508A | Carbon Resistor 56K ERD-25T J              |
| 106,107            | (OB06299A) | (2SC2878)                           | R345               | OB05698A | Carbon Resistor 1.5K ERD-25T J             |
| 203,204            |            |                                     | R346               | OB09305A | Metal Film Resistor 100K SN14K2E F         |
| 206,207            |            |                                     | R347,350           | OB09203A | Metal Film Resistor 10K SN14K2E F          |
| 307                |            |                                     | R349               | OB09438A | Metal Film Resistor 16.5K SN14K2E F        |
| Q302,304           | OB06013A   | Transistor 2SA733                   | R351               | OB09432A | Metal Film Resistor 8.25K SN14K2E F        |
| 305                |            |                                     | R353               | OB09450A | Metal Film Resistor 46.4K SN14K2E F        |
| D101-103           | OB06181A   | Silicon Diode 1SS53 (11 pcs.)       | R356               | OB01856A | Carbon Resistor 8.2K ERD-25T J             |
| 201-203            |            |                                     | C101,201           | OB09242A | Mica Capacitor 47P 50V J                   |
| 301-305            |            |                                     | C102,202           | OB09262A | PP Capacitor 3000P 50V J                   |
| L101,201           | OB03919B   | Inductor 36mH                       | C103,203           | OB01804A | Mylar Capacitor 3900P 50V J                |
| 301                |            |                                     | C104,204           | OB05687A | Mylar Capacitor 1200P 50V J                |
| L102,202           | OB03563A   | 19K Coil 23mH                       | C105,107           | OB01405A | Electrolytic Capacitor 1 $\mu$ 50V         |
| R101,112           | OB05622A   | Carbon Resistor 2.2K ERD-25T J      | 205,207            |          |                                            |
| 201,212            |            |                                     | 302,306            |          |                                            |
| 319,320            |            |                                     | 307,316            |          |                                            |
| 354,355            |            |                                     | C106,109           | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V        |
| R102,113           | OB01682A   | Carbon Resistor 6.8K ERD-25T J      | 206,209            |          |                                            |
| 115,120            |            |                                     | 312,313            |          |                                            |
| 202,213            |            |                                     | C108,208           | OB09282A | Ceramic Capacitor 100P 50V K               |
| 215,220            |            |                                     | C110,210           | OB09187A | Electrolytic Capacitor 1 $\mu$ 50V (BP)    |
| 352                |            |                                     | C111,211           | OB09413A | PP Capacitor 0.022 $\mu$ 100V G            |
| R103,203           | OB05627A   | Carbon Resistor 330K ERD-25T J      | C301               | OB09286A | Ceramic Capacitor 470P 50V K               |
| 326                |            |                                     | C303               | OB05843A | Mylar Capacitor 0.012 $\mu$ 50V J          |
| R104,119           | OB05641A   | Carbon Resistor 47K ERD-25T J       | C304               | OB09385A | Electrolytic Capacitor 0.33 $\mu$ 50V (LN) |
| 204,219            |            |                                     | C305,317           | OB09370A | Ceramic Capacitor 33P 50V J                |
| 304,309            |            |                                     | C308               | OB09345A | Electrolytic Capacitor 3.3 $\mu$ 25V (BP)  |
| 313,314            |            |                                     | C309,318           | OB09223A | Electrolytic Capacitor 1 $\mu$ 50V (LN)    |
| 322,325            |            |                                     | C310,311           | OB01392A | Electrolytic Capacitor 470 $\mu$ 16V       |
| R105,205           | OB05615A   | Carbon Resistor 22K ERD-25T J       | C314               | OB09400A | Mica Capacitor 250P 50V J                  |
| 306,323            |            |                                     | C315               | OB05550A | Mylar Capacitor 1000P 50V J                |
| 324,329            |            |                                     | RL301,302          | OB07326A | FBR Relay 12V                              |
| R106,206           | OB01681A   | Carbon Resistor 3.3K ERD-25T J      | SW301              | OB07324A | Rotary Switch 4-2N                         |
| R107,207           | OB05576A   | Carbon Resistor 470 ERD-25T J       | SW302              | OB07322A | Rotary Switch 4-2S                         |
| R108,109           | OB01889A   | Carbon Resistor 100K ERD-25T J      | SW303              | OB07323A | Rotary Switch 2-3N                         |
| 118,208            |            |                                     | SW304              | OB07321A | Rotary Switch 4-4S                         |
| 209,218            |            |                                     | CN13               | OB08654A | 4P-T Post                                  |
| 302,303            |            |                                     | CN14               | OB08645A | 9P-T Post                                  |
| 310,316            |            |                                     | CN21,22            | OB08615A | 10P-T Post B10P-SHF-1                      |
| 317,321            |            |                                     | CN42               | OB08656A | 2P-T Post                                  |
| 330,331            |            |                                     | CN44,45            | OB08183A | 5P-T Post B5P-SHF-1                        |
| 332                |            |                                     | 46                 |          |                                            |
| R110,210           | OB09328A   | Metal Film Resistor 9.1K SN14K2E F  | CN47               | OB08182A | 6P-T Post B6P-SHF-1                        |
| R111,211           | OB09550A   | Metal Film Resistor 887 SN14K2E F   | CN48               | OB08302A | 7P-T Post B7P-SHF-1                        |
| R114,214           | OB05691A   | Carbon Resistor 390 ERD-25T J       | CN49               | OB08334A | 8P-T Post B8P-SHF-1                        |
| R116,216           | OB09468A   | Metal Film Resistor 2.32K SN14K2E F | CN56               | OB08736A | 4P-H Connector 600mm                       |
| R117,217           | OB09422A   | Metal Film Resistor 3.16K SN14K2E F | CN58               | OB08737A | 8P-H Connector 500mm                       |
| R301,305           | OB05509A   | Carbon Resistor 33K ERD-25T J       |                    |          |                                            |
| R307               | OB09263A   | Carbon Resistor 12K ERD-25T J       |                    |          |                                            |
| R308               | OB01854A   | Carbon Resistor 39K ERD-25T J       |                    |          |                                            |

| Schematic Ref. No. | Part No.   | Description                         | Schematic Ref. No. | Part No. | Description                                |
|--------------------|------------|-------------------------------------|--------------------|----------|--------------------------------------------|
|                    | BA04227A   | Main P.C.B. Ass'y<br>1st Version    | R311,337<br>344    | OB05784A | Carbon Resistor 560K ERD-25T J             |
|                    | OB07882A   | Main P.C.B.                         | R312               | OB05626A | Carbon Resistor 150K ERD-25T J             |
| IC301              | OB06146A   | IC RC4558DD                         | R315,348           | OB01888A | Carbon Resistor 10K ERD-25T J              |
| IC302,305          | OB06124B   | IC RC4558D                          | R318               | OB01887A | Carbon Resistor 5.6K ERD-25T J             |
| IC303              | OB06144A   | IC $\mu$ PD4066C                    | R327,328           | OB01684A | Carbon Resistor 470K ERD-25T J             |
| IC304              | OB06217A   | IC RC4560D                          | R333,334           | OB09529A | Metal Film Resistor 6.8K SN14K2E F         |
| Q101,102           | OB01872A   | Transistor 2SC945 (L)               | R335,336           | OB05776A | Carbon Resistor 1M ERD-25T J               |
| 105,201            |            |                                     | R338               | OB09416A | Metal Film Resistor 976 SN14K2E F          |
| 202,205            |            |                                     | R339               | OB09005A | Metal Film Resistor 24K SN14K2E F          |
| 301,303            |            |                                     | R340               | OB09340A | Metal Film Resistor 15K SN14K2E F          |
| 306                |            |                                     | R341               | OB09492A | Metal Film Resistor 1.62K SN14K2E F        |
| Q103,104           | OB06070A   | Transistor 2SC1636                  | R342,343           | OB05508A | Carbon Resistor 56K ERD-25T J              |
| 106,107            | (OB06299A) | (2SC2878)                           | 357                |          |                                            |
| 203,204            |            |                                     | R345               | OB05698A | Carbon Resistor 1.5K ERD-25T J             |
| 206,207            |            |                                     | R346               | OB09305A | Metal Film Resistor 100K SN14K2E F         |
| 307                |            |                                     | R347,350           | OB09203A | Metal Film Resistor 10K SN14K2E F          |
| Q302,304           | OB06013A   | Transistor 2SA733                   | R349               | OB09438A | Metal Film Resistor 16.5K SN14K2E F        |
| 305                |            |                                     | R351               | OB09432A | Metal Film Resistor 8.25K SN14K2E F        |
| D101-103           | OB06181A   | Silicon Diode 1SS53 (11 pcs.)       | R353               | OB09450A | Metal Film Resistor 46.4K SN14K2E F        |
| 201-203            |            |                                     | R356               | OB01856A | Carbon Resistor 8.2K ERD-25T J             |
| 301-305            |            |                                     | C101,201           | OB09242A | Mica Capacitor 47P 50V J                   |
| L101,201           | OB03919B   | Inductor 36mH                       | C102,202           | OB09262A | PP Capacitor 3000P 50V J                   |
| 301                |            |                                     | C103,203           | OB01804A | Mylar Capacitor 3900P 50V J                |
| L102,202           | OB03563A   | 19K Coil 23mH                       | C104,204           | OB05687A | Mylar Capacitor 1200P 50V J                |
| R101,112           | OB05622A   | Carbon Resistor 2.2K ERD-25T J      | C105,107           | OB01405A | Electrolytic Capacitor 1 $\mu$ 50V         |
| 201,212            |            |                                     | 205,207            |          |                                            |
| 319,320            |            |                                     | 302,306            |          |                                            |
| 354,355            |            |                                     | 307,316            |          |                                            |
| R102,113           | OB01682A   | Carbon Resistor 6.8K ERD-25T J      | C106,109           | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V        |
| 115,120            |            |                                     | 206,209            |          |                                            |
| 202,213            |            |                                     | 312,313            |          |                                            |
| 215,220            |            |                                     | C108,208           | OB09282A | Ceramic Capacitor 100P 50V K               |
| 352                |            |                                     | C110,210           | OB09187A | Electrolytic Capacitor 1 $\mu$ 50V (BP)    |
| R103,203           | OB05627A   | Carbon Resistor 330K ERD-25T J      | C111,211           | OB09413A | PP Capacitor 0.022 $\mu$ 100V G            |
| 326                |            |                                     | C301               | OB09286A | Ceramic Capacitor 470P 50V K               |
| R104,119           | OB05641A   | Carbon Resistor 47K ERD-25T J       | C303               | OB05843A | Mylar Capacitor 0.012 $\mu$ 50V J          |
| 204,219            |            |                                     | C304               | OB09385A | Electrolytic Capacitor 0.33 $\mu$ 50V (LN) |
| 304,309            |            |                                     | C305,317           | OB09370A | Ceramic Capacitor 33P 50V J                |
| 313,314            |            |                                     | C308               | OB09345A | Electrolytic Capacitor 3.3 $\mu$ 25V (BP)  |
| 322,325            |            |                                     | C309,318           | OB09223A | Electrolytic Capacitor 1 $\mu$ 50V (LN)    |
| R105,205           | OB05615A   | Carbon Resistor 22K ERD-25T J       | C310,311           | OB01392A | Electrolytic Capacitor 470 $\mu$ 16V       |
| 306,323            |            |                                     | C314               | OB09400A | Mica Capacitor 250P 50V J                  |
| 324,329            |            |                                     | C315               | OB05550A | Mylar Capacitor 1000P 50V J                |
| R106,206           | OB01681A   | Carbon Resistor 3.3K ERD-25T J      | C319               | OB09219A | Electrolytic Capacitor 6.8 $\mu$ 16V (LN)  |
| R107,207           | OB05576A   | Carbon Resistor 470 ERD-25T J       | RL301,302          | OB07326A | FBR Relay 12V                              |
| R108,109           | OB01889A   | Carbon Resistor 100K ERD-25T J      | SW301              | OB07324A | Rotary Switch 4-2N                         |
| 118,208            |            |                                     | SW302              | OB07322A | Rotary Switch 4-2S                         |
| 209,218            |            |                                     | SW303              | OB07323A | Rotary Switch 2-3N                         |
| 302,303            |            |                                     | SW304              | OB07321A | Rotary Switch 4-4S                         |
| 310,316            |            |                                     | CN13               | OB08654A | 4P-T Post                                  |
| 317,321            |            |                                     | CN14               | OB08645A | 9P-T Post                                  |
| 330,331            |            |                                     | CN21,22            | OB08615A | 10P-T Post B10P-SHF-1                      |
| 332                |            |                                     | CN42               | OB08656A | 2P-T Post                                  |
| R110,210           | OB09328A   | Metal Film Resistor 9.1K SN14K2E F  | CN44,45            | OB08183A | 5P-T Post B5P-SHF-1                        |
| R111,211           | OB09491A   | Metal Film Resistor 1K SN14K2E F    | 46                 |          |                                            |
| R114,214           | OB05691A   | Carbon Resistor 390 ERD-25T J       | CN47               | OB08182A | 6P-T Post B6P-SHF-1                        |
| R116,216           | OB09468A   | Metal Film Resistor 2.32K SN14K2E F | CN48               | OB08302A | 7P-T Post B7P-SHF-1                        |
| R117,217           | OB09422A   | Metal Film Resistor 3.16K SN14K2E F | CN49               | OB08334A | 8P-T Post B8P-SHF-1                        |
| R301,305           | OB05509A   | Carbon Resistor 33K ERD-25T J       | CN56               | OB08736A | 4P-H Connector 600mm                       |
| R307               | OB09263A   | Carbon Resistor 12K ERD-25T J       | CN58               | OB08737A | 8P-H Connector 500mm                       |
| R308               | OB01854A   | Carbon Resistor 39K ERD-25T J       |                    |          |                                            |

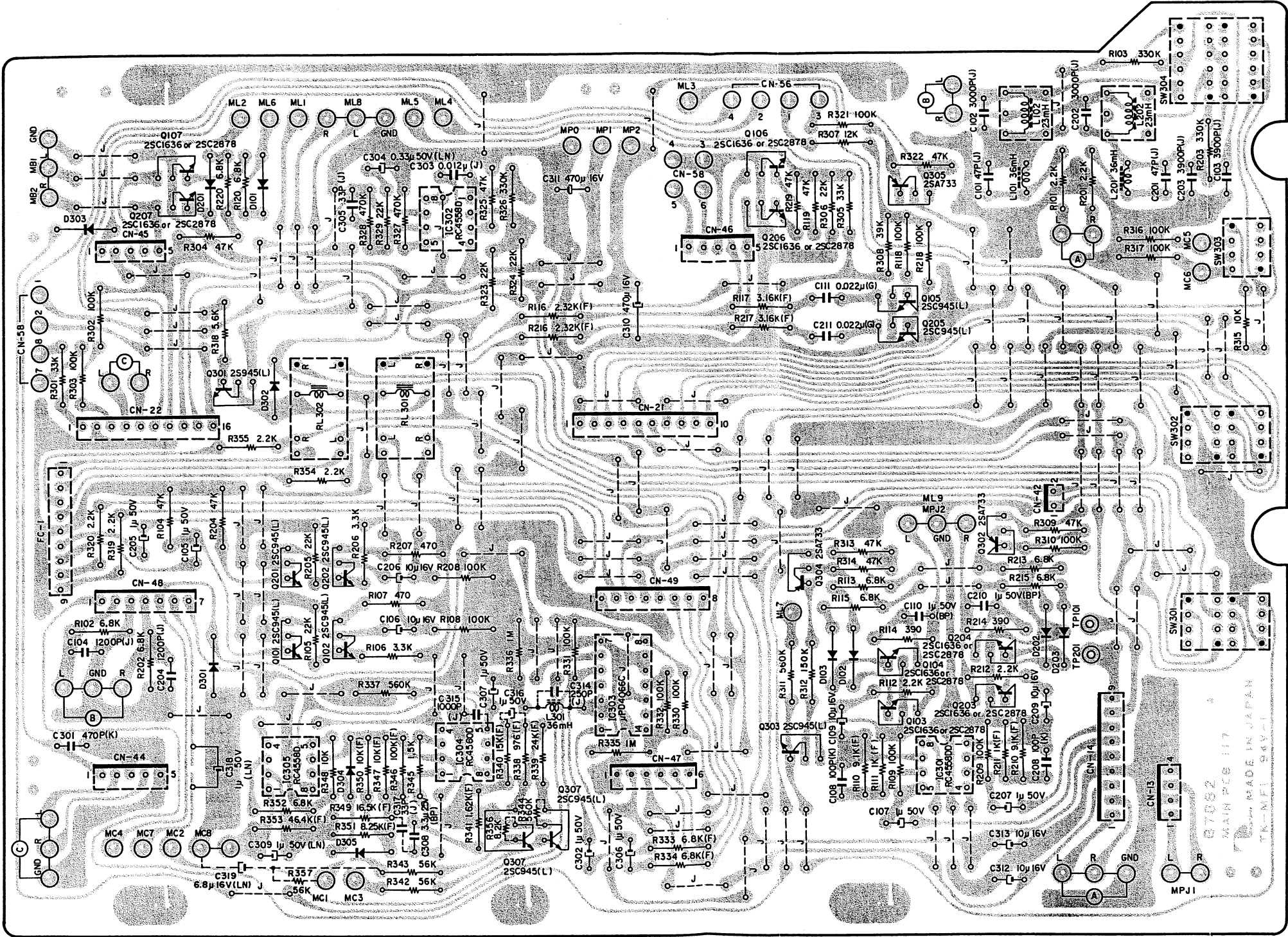


**Fig. 7.18.2 1st Version**

**Note:** Diode is 1SS53 unless otherwise specified.

### 7.19. Logic P.C.B. Ass'y

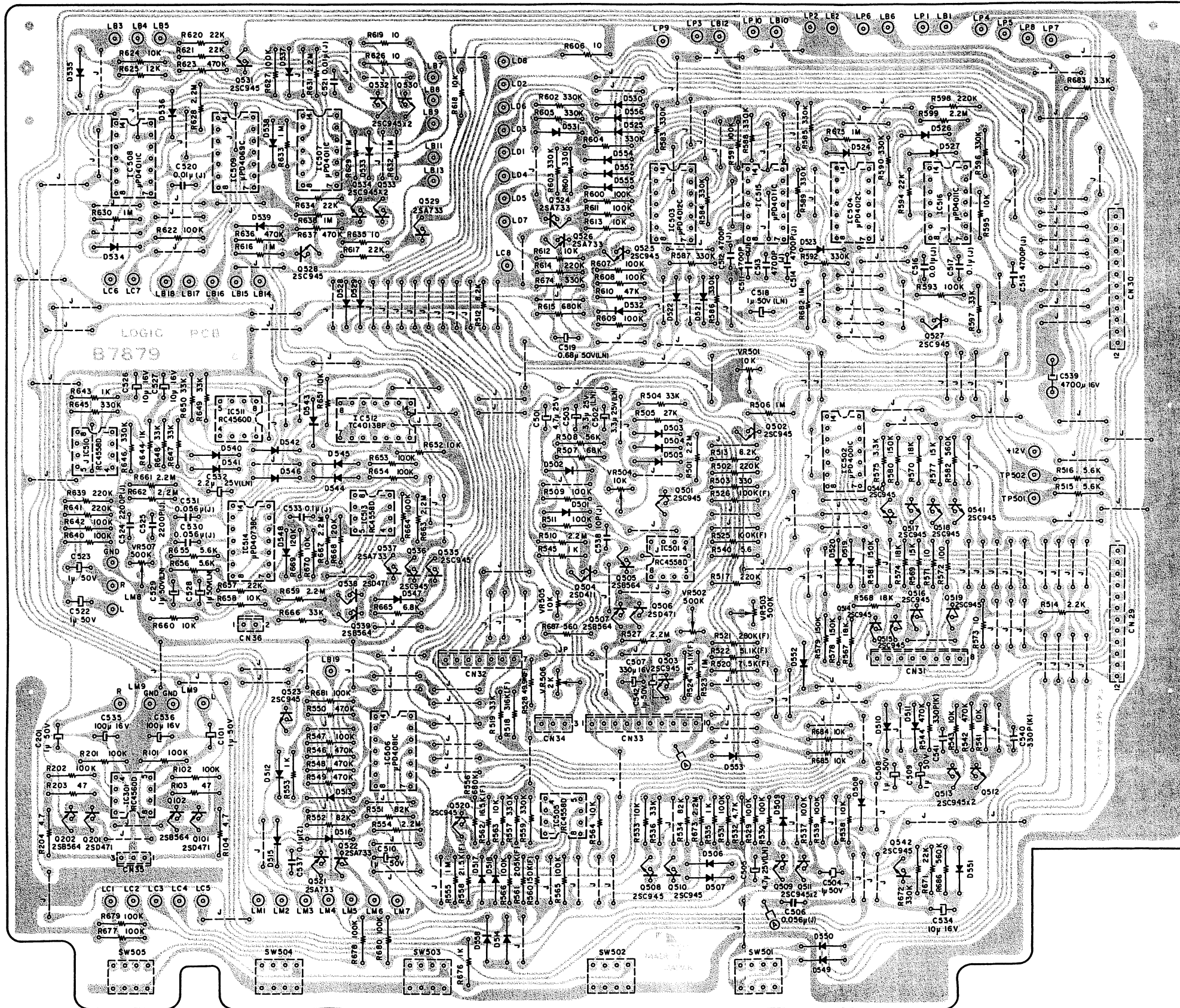


**Fig. 7.19**

**Note: Diode is 1SS53 unless otherwise specified.**

| Schematic Ref. No. | Part No. | Description                           |
|--------------------|----------|---------------------------------------|
|                    | BA04244B | Logic P.C.B. Ass'y                    |
|                    | 0B07879C | Logic P.C.B.                          |
| IC301,511          | 0B06217A | IC RC4560D                            |
| IC501,505          | 0B06124B | IC RC4558D                            |
| 510,513            |          |                                       |
| IC502              | 0B06143A | IC $\mu$ PD4001C                      |
| IC503,504          | 0B06263A | IC $\mu$ PD4012C                      |
| IC506              | 0B06219A | IC $\mu$ PD4081C                      |
| IC507,508          | 0B06178A | IC $\mu$ PD4011C                      |
| 515,516            |          |                                       |
| IC509              | 0B06270A | IC $\mu$ PD4069C                      |
| IC512              | 0B06213A | IC TC4013BP                           |
| IC514              | 0B06244A | IC $\mu$ PD4073BC                     |
| Q101,201           | 0B06066A | Transistor 2SD471                     |
| 504,506            |          |                                       |
| 538                |          |                                       |
| Q102,202           | 0B06069A | Transistor 2SB564                     |
| 505,507            |          |                                       |
| 539                |          |                                       |
| Q501-503           | 0B06100A | Transistor 2SC945 (A) (30 pcs.)       |
| 508-520            |          |                                       |
| 523,525            |          |                                       |
| 527,528            |          |                                       |
| 530-536            |          |                                       |
| 540-542            |          |                                       |
| Q521,522           | 0B06013A | Transistor 2SA733                     |
| 524,526            |          |                                       |
| 529,537            |          |                                       |
| D501-558           | 0B01909A | Silicon Diode 1S1555 (58 pcs.)        |
| VR501,504          | 0B07256A | Semi-fixed Volume 10K                 |
| 505                |          |                                       |
| VR502,503          | 0B07330A | Semi-fixed Volume 500K                |
| 507                |          |                                       |
| VR506              | 0B07329A | Semi-fixed Volume 2K                  |
| R101,102           | 0B01889A | Carbon Resistor 100K ERD-25T J        |
| 201,202            |          |                                       |
| 509,511            |          |                                       |
| 529,530            |          |                                       |
| 531,537            |          |                                       |
| 539,547            |          |                                       |
| 565,566            |          |                                       |
| 591,593            |          |                                       |
| 600,607            |          |                                       |
| 608,609            |          |                                       |
| 611,622            |          |                                       |
| 627,640            |          |                                       |
| 642,653            |          |                                       |
| 654,664            |          |                                       |
| 677,678            |          |                                       |
| 679,680            |          |                                       |
| 681                |          |                                       |
| R103,203           | 0B01706A | Carbon Resistor 47 ERD-25T J          |
| R104,204           | 0B09321A | Fail Safe Type Resistor 4.7 RDF-25S J |
| R501,510           | 0B05671A | Carbon Resistor 2.2M ERD-25T J        |
| 527,554            |          |                                       |
| 599,628            |          |                                       |
| 631,659            |          |                                       |
| 661,662            |          |                                       |
| 663,667            |          |                                       |
| 673                |          |                                       |



| Schematic Ref. No.                                                                               | Part No. | Description                                 | Schematic Ref. No.                                | Part No.             | Description                                                           |
|--------------------------------------------------------------------------------------------------|----------|---------------------------------------------|---------------------------------------------------|----------------------|-----------------------------------------------------------------------|
| R502,517<br>598,614<br>639,641                                                                   | 0B05625A | Carbon Resistor 220K ERD-25T J              | R569,577<br>R571,573<br>606,619<br>626,635        | 0B01683A<br>0B09216A | Carbon Resistor 15K ERD-25T J<br>Fail Safe Type Resistor 10 RDF-25S J |
| R503                                                                                             | 0B05577A | Carbon Resistor 330 ERD-25T J               | R572                                              | 0B09215A             | Fail Safe Type Resistor 100 RDF-25S J                                 |
| R504,519<br>536,597<br>647,648<br>649,650<br>666                                                 | 0B05509A | Carbon Resistor 33K ERD-25T J               | R575,576<br>683                                   | 0B01681A             | Carbon Resistor 3.3K ERD-25T J                                        |
| R505                                                                                             | 0B05743A | Carbon Resistor 27K ERD-25T J               | R578,579<br>580,581                               | 0B05626A             | Carbon Resistor 150K ERD-25T J                                        |
| R506,523<br>555,616<br>629,630<br>632,633<br>638,675<br>682                                      | 0B05776A | Carbon Resistor 1M ERD-25T J                | R582,686<br>R594,617<br>620,621<br>634,657<br>671 | 0B05784A<br>0B05615A | Carbon Resistor 560K ERD-25T J<br>Carbon Resistor 22K ERD-25T J       |
| R507                                                                                             | 0B05692A | Carbon Resistor 68K ERD-25T J               | R610                                              | 0B05641A             | Carbon Resistor 47K ERD-25T J                                         |
| R508                                                                                             | 0B05508A | Carbon Resistor 56K ERD-25T J               | R625                                              | 0B09263A             | Carbon Resistor 12K ERD-25T J                                         |
| R512,513                                                                                         | 0B01856A | Carbon Resistor 8.2K ERD-25T J              | R665                                              | 0B01682A             | Carbon Resistor 6.8K ERD-25T J                                        |
| R514                                                                                             | 0B05622A | Carbon Resistor 2.2K ERD-25T J              | R668,669<br>R687                                  | 0B05621A<br>0B05575A | Carbon Resistor 120K ERD-25T J<br>Carbon Resistor 560 ERD-25T J       |
| R515,516<br>655,656                                                                              | 0B01887A | Carbon Resistor 5.6K ERD-25T J              | C101,201<br>504,508<br>509,510<br>522,523<br>542  | 0B01405A             | Electrolytic Capacitor 1μ 50V                                         |
| R518                                                                                             | 0B09475A | Metal Film Resistor 316K SN14K2E F          | C501                                              | 0B01402A             | Electrolytic Capacitor 4.7μ 25V                                       |
| R520                                                                                             | 0B09457A | Metal Film Resistor 71.5K SN14K2E F         | C502,503                                          | 0B09147A             | Electrolytic Capacitor 3.3μ 25V (LN)                                  |
| R521                                                                                             | 0B09474A | Metal Film Resistor 280K SN14K2E F          | C505                                              | 0B09333A             | Electrolytic Capacitor 4.7μ 25V (LN)                                  |
| R522,524                                                                                         | 0B09453A | Metal Film Resistor 51.1K SN14K2E F         | C506,530<br>531                                   | 0B05813A             | Mylar Capacitor 0.056μ 50V J                                          |
| R525,526                                                                                         | 0B09305A | Metal Film Resistor 100K SN14K2E F          | C507                                              | 0B01502A             | Electrolytic Capacitor 330μ 16V                                       |
| R528                                                                                             | 0B09452A | Metal Film Resistor 49.9K SN14K2E F         | C511,512<br>513,514<br>515                        | 0B05652A             | Mylar Capacitor 4700P 50V J                                           |
| R532                                                                                             | 0B01846A | Carbon Resistor 4.7K ERD-25T J              | C516,520<br>521                                   | 0B05681A             | Mylar Capacitor 0.01μ 50V J                                           |
| R533,538<br>541,543<br>563,564<br>595,612<br>613,618<br>624,651<br>652,658<br>660,670<br>684,685 | 0B01888A | Carbon Resistor 10K ERD-25T J               | C517,533<br>C518,528<br>529                       | 0B01780A<br>0B09223A | Mylar Capacitor 0.1μ 50V J<br>Electrolytic Capacitor 1μ 50V (LN)      |
| R534,551<br>552                                                                                  | 0B05668A | Carbon Resistor 82K ERD-25T J               | C519                                              | 0B09395A             | Electrolytic Capacitor 0.68μ 50V (LN)                                 |
| R535,545<br>553,643<br>644,676                                                                   | 0B01857A | Carbon Resistor 1K ERD-25T J                | C524,525<br>C526,527<br>534                       | 0B01802A<br>0B01412A | Mylar Capacitor 2200P 50V J<br>Electrolytic Capacitor 10μ 16V         |
| R540                                                                                             | 0B09217A | Fail Safe Type Resistor 5.6 RDF-25S J       | C532                                              | 0B09332A             | Electrolytic Capacitor 2.2μ 25V (LN)                                  |
| R542,544<br>546,548<br>549,550<br>623,636<br>637                                                 | 0B01684A | Carbon Resistor 470K ERD-25T J              | C535,536<br>C537                                  | 0B01400A<br>0B09292A | Electrolytic Capacitor 100μ 16V<br>Ceramic Capacitor 0.1μ 50V Z       |
| R556,615                                                                                         | 0B09335A | Carbon Resistor 680K ERD-25T J              | C538                                              | 0B09277A             | Ceramic Capacitor 10P 50V J                                           |
| R557,559<br>583-590<br>592,596<br>601-605<br>645,646<br>672,674                                  | 0B05627A | Carbon Resistor 330K ERD-25T J<br>(21 pcs.) | C539                                              | 0B09377A             | Electrolytic Capacitor 4700μ 16V                                      |
| R558                                                                                             | 0B09440A | Metal Film Resistor 21.5K SN14K2E F         | C540,541<br>SW501,502<br>504                      | 0B09285A<br>0B07323A | Ceramic Capacitor 330P 50V K<br>Rotary Switch 2-3N                    |
| R560                                                                                             | 0B09300A | Metal Film Resistor 150K SN14K2E F          | SW503,505                                         | 0B07325A             | Rotary Switch 2-2N                                                    |
| R561                                                                                             | 0B09471A | Metal Film Resistor 205K SN14K2E F          | CN29,30                                           | 0B08178A             | 12P-T Post                                                            |
| R562                                                                                             | 0B09438A | Metal Film Resistor 16.5K SN14K2E F         | CN31                                              | 0B08644A             | 8P-T Post                                                             |
| R567,568<br>570,574                                                                              | 0B05560A | Carbon Resistor 18K ERD-25T J               | CN32                                              | 0B08643A             | 7P-T Post                                                             |
|                                                                                                  |          |                                             | CN33                                              | 0B08645A             | 9P-T Post                                                             |
|                                                                                                  |          |                                             | CN34,35                                           | 0B08653A             | 3P-T Post                                                             |
|                                                                                                  |          |                                             | CN36                                              | 0B08656A             | 2P-T Post                                                             |

| Schematic Ref. No. | Part No.   | Description                         | Schematic Ref. No. | Part No. | Description                           |
|--------------------|------------|-------------------------------------|--------------------|----------|---------------------------------------|
|                    | BA04228A   | CPU P.C.B. A Ass'y                  | R334,712           | OB09356A | Metal Film Resistor 4.7K SN14K2E F    |
|                    | OB07880B   | CPU P.C.B. A                        | R335               | OB09230A | Metal Film Resistor 1.5K SN14K2E F    |
| IC301              | OB06216A   | IC $\mu$ PD4556C                    | R338,717           | OB01889A | Carbon Resistor 100K ERD-25T J        |
| IC302,706          | OB06219A   | IC $\mu$ PD4081C                    | 718,719            |          |                                       |
| 707,708            |            |                                     | 768,785            |          |                                       |
| 709,710            |            |                                     | 786,787            |          |                                       |
| IC303              | OB06178A   | IC $\mu$ PD4011C                    | 788,793            |          |                                       |
| IC304,713          | OB06217A   | IC RC4560D                          | 794,795            |          |                                       |
| IC305              | OB06124B   | IC RC4558D                          | 796,802            |          |                                       |
| IC701              | OB06253A   | IC A.B.L.E. CPU $\mu$ PD546C-113    | 803,806            |          |                                       |
| IC702              | OB06265A   | IC $\mu$ PD5101LC                   | 807                |          |                                       |
| IC703              | OB06261A   | IC $\mu$ PD4508BC                   | R701               | OB09522A | Metal Film Resistor 9.53K SN14K2E F   |
| IC704,705          | OB06260A   | IC $\mu$ PD4516BC                   | R702               | OB09439A | Metal Film Resistor 20K SN14K2E F     |
| IC711              | OB06214A   | IC $\mu$ PD4071C                    | R703               | OB01679A | Carbon Resistor 100 ERD-25T J         |
| IC712              | OB06143A   | IC $\mu$ PD4001C                    | R704               | OB09448A | Metal Film Resistor 40.2K SN14K2E F   |
| Q301,302           | OB06100A   | Transistor 2SC945 (A)               | R705               | OB09459A | Metal Film Resistor 80.6K SN14K2E F   |
| 701,702            |            |                                     | R706               | OB09467A | Metal Film Resistor 162K SN14K2E F    |
| 703,704            |            |                                     | R707               | OB05627A | Carbon Resistor 330K ERD-25T J        |
| 705                |            |                                     | R708               | OB09335A | Carbon Resistor 680K ERD-25T J        |
| Q303               | OB06013A   | Transistor 2SA733                   | R709               | OB05963A | Carbon Resistor 1.3M ERD-25T J        |
| Q304               | OB06070A   | Transistor 2SC1636                  | R710               | OB09380A | Carbon Resistor 1.5M ERD-25T J        |
|                    | (OB06299A) | (2SC2878)                           | R713               | OB09429A | Metal Film Resistor 7.32K SN14K2E F   |
| D701-716           | OB06181A   | Silicon Diode 1SS53 (29 pcs.)       | R714,715           | OB09340A | Metal Film Resistor 15K SN14K2E F     |
| 718-730            |            |                                     | R716               | OB09263A | Carbon Resistor 12K ERD-25T J         |
| L301               | OB03919B   | Inductor 36mH                       | R720,721           | OB05776A | Carbon Resistor 1M ERD-25T J          |
| VR301,304          | OB07329A   | Semi-fixed Volume 2K                | 722                |          |                                       |
| 701,702            |            |                                     | R723,724           | OB05621A | Carbon Resistor 120K ERD-25T J        |
| VR302,303          | OB07270A   | Semi-fixed Volume 20K               | 725,726            |          |                                       |
| R301,302           | OB09305A   | Metal Film Resistor 100K SN14K2E F  | 727,728            |          |                                       |
| 303,304            |            |                                     | R729,801           | OB05560A | Carbon Resistor 18K ERD-25T J         |
| 305                |            |                                     | R730-735           | OB05675A | Carbon Resistor 3.9K ERD-25T J        |
| R306               | OB09472A   | Metal Film Resistor 220K SN14K2E F  | 740-747            |          |                                       |
| R307               | OB09461A   | Metal Film Resistor 90.9K SN14K2E F | 752-767            |          |                                       |
| R308               | OB09455A   | Metal Film Resistor 59K SN14K2E F   | R769,770           | OB01856A | Carbon Resistor 8.2K ERD-25T J        |
| R309,310           | OB05508A   | Carbon Resistor 56K ERD-25T J       | 771,772            |          |                                       |
| 736,737            |            |                                     | 781,782            |          |                                       |
| 738,739            |            |                                     | 783,784            |          |                                       |
| R311               | OB09469A   | Metal Film Resistor 178K SN14K2E F  | R773,774           | OB01887A | Carbon Resistor 5.6K ERD-25T J        |
| R312               | OB09458A   | Metal Film Resistor 73.2K SN14K2E F | 775,776            |          |                                       |
| R313               | OB09452A   | Metal Film Resistor 49.9K SN14K2E F | R777,778           | OB05509A | Carbon Resistor 33K ERD-25T J         |
| R314               | OB09534A   | Metal Film Resistor 12.7K SN14K2E F | 779,780            |          |                                       |
| R315               | OB09460A   | Metal Film Resistor 88.7K SN14K2E F | R804               | OB01854A | Carbon Resistor 39K ERD-25T J         |
| R316,318           | OB09462A   | Metal Film Resistor 95.3K SN14K2E F | R805               | OB05622A | Carbon Resistor 2.2K ERD-25T J        |
| 319                |            |                                     | R808               | OB05962A | Carbon Resistor 1.2M ERD-25T J        |
| R317               | OB09427A   | Metal Film Resistor 5.62K SN14K2E F | R809               | OB05671A | Carbon Resistor 2.2M ERD-25T J        |
| R320               | OB01857A   | Carbon Resistor 1K ERD-25T J        | C301               | OB09411A | PP Capacitor 3300P 50V G              |
| R321,711           | OB01888A   | Carbon Resistor 10K ERD-25T J       | C302               | OB09408A | PP Capacitor 1000P 50V G              |
| 748,749            |            |                                     | C303               | OB05950A | PP Capacitor 0.015 $\mu$ 50V G        |
| 750,751            |            |                                     | C304               | OB09409A | PP Capacitor 1800P 50V G              |
| R322,328           | OB09447A   | Metal Film Resistor 34.8K SN14K2E F | C305,318           | OB05653A | Mylar Capacitor 1500P 50V J           |
| R323,329           | OB09424A   | Metal Film Resistor 4.75K SN14K2E F | 320                |          |                                       |
| R324               | OB09434A   | Metal Film Resistor 11.5K SN14K2E F | C306               | OB09246A | Mica Capacitor 150P 50V J             |
| R325               | OB09437A   | Metal Film Resistor 15.8K SN14K2E F | C307               | OB05813A | Mylar Capacitor 0.056 $\mu$ 50V J     |
| R326,332           | OB09203A   | Metal Film Resistor 10K SN14K2E F   | C308,310           | OB05557A | Mylar Capacitor 0.015 $\mu$ 50V J     |
| 336                |            |                                     | 312,313            |          |                                       |
| R327               | OB05641A   | Carbon Resistor 47K ERD-25T J       | 316                |          |                                       |
| R330               | OB09417A   | Metal Film Resistor 1.05K SN14K2E F | C309,311           | OB05550A | Mylar Capacitor 1000P 50V J           |
| R331               | OB09426A   | Metal Film Resistor 5.36K SN14K2E F | 314,317            |          |                                       |
| R333,337           | OB05615A   | Carbon Resistor 22K ERD-25T J       | C315               | OB05652A | Mylar Capacitor 4700P 50V J           |
| 789,790            |            |                                     | C319               | OB09275A | Mica Capacitor 200P 50V J             |
| 791,792            |            |                                     | C321               | OB09364A | Tantalum Capacitor 0.22 $\mu$ 35V     |
| 797,798            |            |                                     | C701               | OB01400A | Electrolytic Capacitor 100 $\mu$ 16V  |
| 799,800            |            |                                     | C702,703           | OB01397A | Electrolytic Capacitor 1000 $\mu$ 16V |

| Schematic Ref. No. | Part No. | Description                            |
|--------------------|----------|----------------------------------------|
| C704               | 0B09290A | Ceramic Capacitor 0.01μ 50V Z          |
| C710               | 0B05681A | Mylar Capacitor 0.01μ 50V J            |
| C711               | 0B09395A | Electrolytic Capacitor 0.68μF 50V (LN) |
| C712               | 0B01405A | Electrolytic Capacitor 1μ 50V          |
| CN1,3              | 0B08760A | 10P-H Connector 100mm                  |
| CN2                | 0B08761A | 11P-H Connector 100mm                  |
| CN4                | 0B08183A | 5P-T Post                              |
| CN5                | 0B08302A | 7P-T Post B7P-SHF-1                    |
| CN6                | 0B08334A | 8P-T Post B8P-SHF-1                    |
| CN7                | 0B08506A | 13P-T Post                             |
| CN8                | 0B08182A | 6P-T Post                              |
| CN9                | 0B08615A | 10P-T Post                             |
| CN57               | 0B08746A | 6P-H Connector 930mm                   |

7.20. CPU P.C.B. A Ass'y

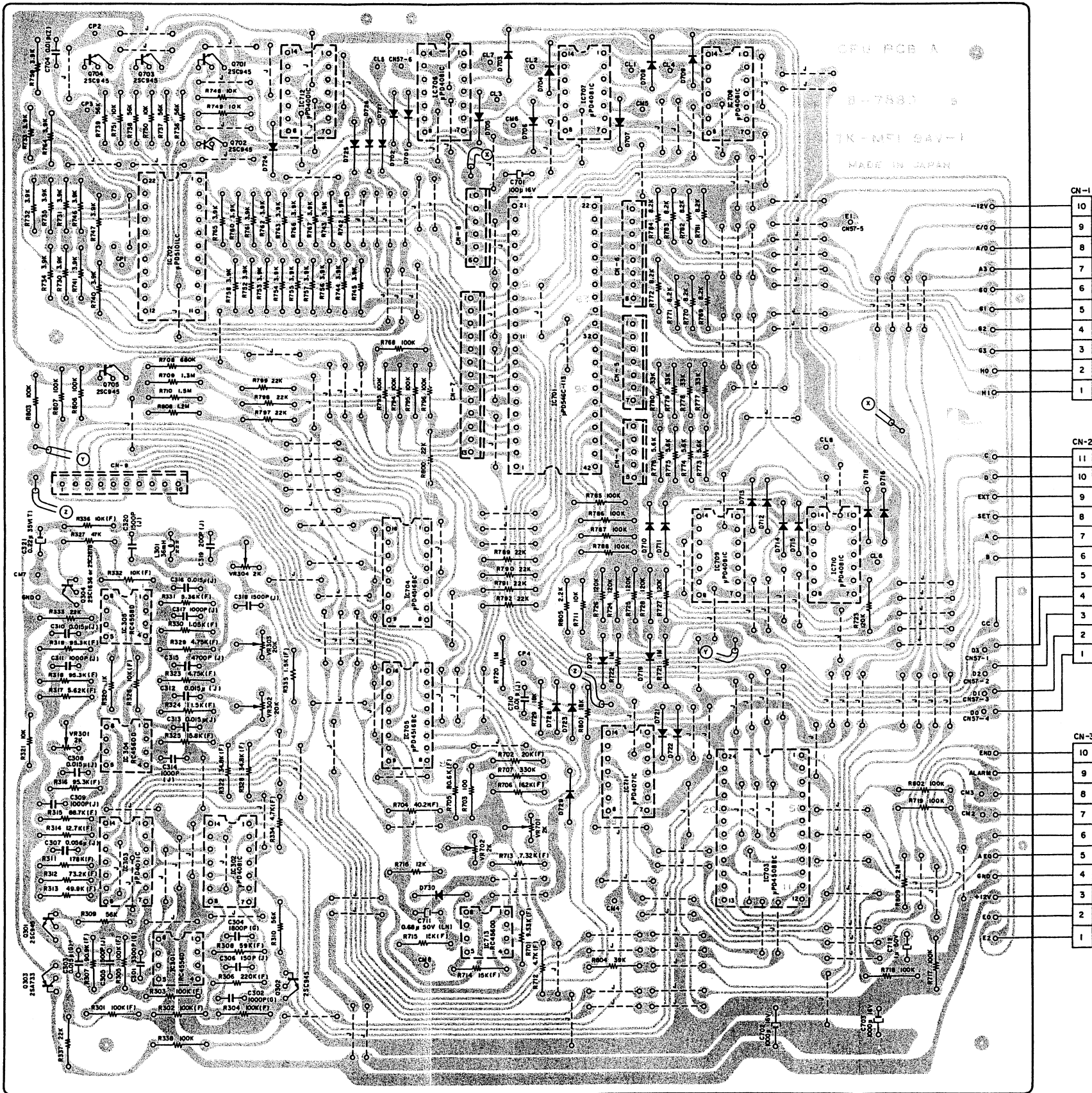


Fig. 7.20 Note: Diode is 1SS53 unless otherwise specified.

### 7.21. CPU P.C.B. B Ass'y

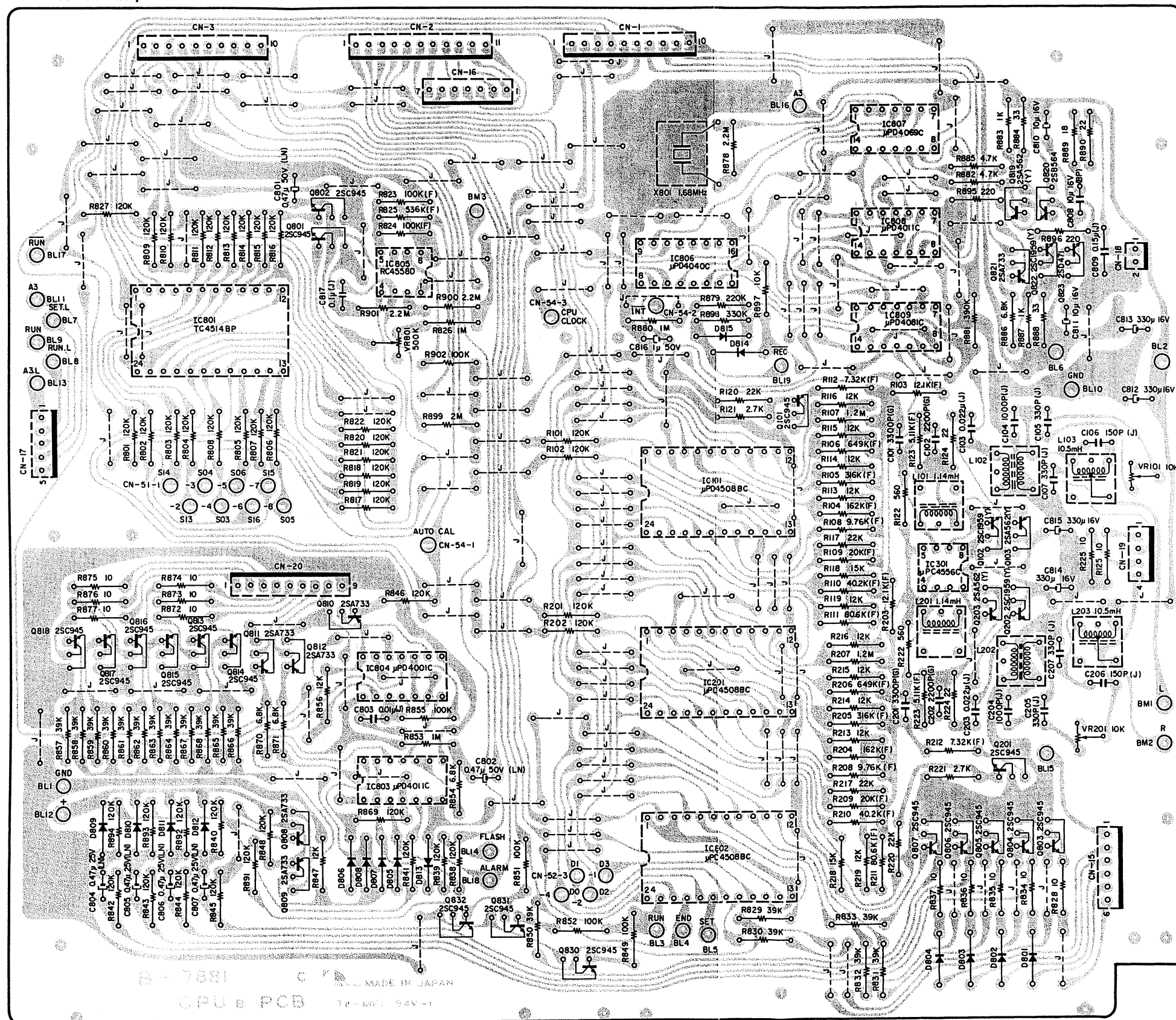


**Fig. 7.21.1 3rd Version**

**Note: Diode is 1SS53 unless otherwise specified.**



| Schematic Ref. No. | Part No. | Description                                 | Schematic Ref. No. | Part No. | Description                                |
|--------------------|----------|---------------------------------------------|--------------------|----------|--------------------------------------------|
|                    | BA04229A | CPU P.C.B. B Ass'y<br>3rd Version           | R124,224           | OB05579A | Carbon Resistor 22 ERD-25T J               |
|                    |          |                                             | R125,225           | OB05936A | Carbon Resistor 10 ERD-25T J               |
|                    | OB07881C | CPU P.C.B. B                                | R823,824           | OB09305A | Metal Film Resistor 100K SN14K2E F         |
| IC101,201          | OB06261A | IC $\mu$ PD4508BC                           | R825               | OB09481A | Metal Film Resistor 536K SN14K2E F         |
| 802                |          |                                             | R826,853           | OB05776A | Carbon Resistor 1M ERD-25T J               |
| IC301              | OB06216A | IC $\mu$ PC4556C                            | 880                |          |                                            |
| IC801              | OB06264A | IC TC4514BP                                 | R828,834           | OB09216A | Fail Safe Type Resistor 10 RDF-25S J       |
| IC803,808          | OB06178A | IC $\mu$ PD4011C                            | 835,836            |          |                                            |
| IC804              | OB06143A | IC $\mu$ PD4001C                            | 837,872            |          |                                            |
| IC805              | OB06124B | IC RC4558D                                  | 873,874            |          |                                            |
| IC806              | OB06223A | IC $\mu$ PD4040C                            | 875,876            |          |                                            |
| IC807              | OB06270A | IC $\mu$ PD4069C                            | 877                |          |                                            |
| IC809              | OB06219A | IC $\mu$ PD4081C                            | R829-833           | OB01854A | Carbon Resistor 39K ERD-25T J<br>(18 pcs.) |
| Q101,201           | OB06100A | Transistor 2SC945 (A) (18 pcs.)             | 850                |          |                                            |
| 801-807            |          |                                             | 857-868            |          |                                            |
| 813-818            |          |                                             | R849,851           | OB01889A | Carbon Resistor 100K ERD-25T J             |
| 830,831            |          |                                             | 852,855            |          |                                            |
| 832                |          |                                             | 902                |          |                                            |
| Q102,202           | OB06179A | Transistor 2SC1959 (Y)                      | R854,870           | OB01682A | Carbon Resistor 6.8K ERD-25T J             |
| 822                |          |                                             | 871,886            |          |                                            |
| Q103,203           | OB06202A | Transistor 2SA562 (Y)                       | R878,900           | OB05671A | Carbon Resistor 2.2M ERD-25T J             |
| 819                |          |                                             | 901                |          |                                            |
| Q808-812           | OB06013A | Transistor 2SA733 (6 pcs.)                  | R879               | OB05625A | Carbon Resistor 220K ERD-25T J             |
| 821                |          |                                             | R881               | OB05676A | Carbon Resistor 390K ERD-25T J             |
| Q820               | OB06069A | Transistor 2SB564                           | R882,885           | OB01846A | Carbon Resistor 4.7K ERD-25T J             |
| Q823               | OB06066A | Transistor 2SD471                           | R883,887           | OB01857A | Carbon Resistor 1K ERD-25T J               |
| D801-815           | OB06181A | Silicon Diode 1SS53 (15 pcs.)               | R884,888           | OB01713A | Carbon Resistor 33 ERD-25T J               |
| X801               | OB08723A | Crystal 1.68MHz                             | R889               | OB09536A | Fail Safe Type Resistor 18 ERD-14F J       |
| L101,201           | OB01434A | Peaking Coil 1.14mH                         | R890               | OB09049A | Fail Safe Type Resistor 22 ERD-14F J       |
| L102,202           | OB06635A | Bias Coil                                   | R895,896           | OB01933A | Carbon Resistor 220 ERD-25T J              |
| L103,203           | OB00068A | Trap Coil 10.5mH                            | R897               | OB01888A | Carbon Resistor 10K ERD-25T J              |
| VR101,201          | OB07256A | Semi-fixed Volume 10K                       | R898               | OB05627A | Carbon Resistor 330K ERD-25T J             |
| VR801              | OB07330A | Semi-fixed Volume 500K                      | R899               | OB09531A | Carbon Resistor 2M ERD-25T J               |
| R101,102           | OB05621A | Carbon Resistor 120K ERD-25T J<br>(42 pcs.) | C101,201           | OB09411A | PP Capacitor 3300P 100V G                  |
| 201,202            |          |                                             | C102,202           | OB09410A | PP Capacitor 2200P 100V G                  |
| 801-822            |          |                                             | C103,203           | OB09405A | PP Capacitor 0.022 $\mu$ 100V G            |
| 827                |          |                                             | C104,204           | OB09404A | PP Capacitor 1000P 100V J                  |
| 838-846            |          |                                             | C105,107           | OB09322A | PP Capacitor 330P 100V J                   |
| 848,869            |          |                                             | 205,207            |          |                                            |
| 891-894            |          |                                             | C106,206           | OB09246A | Mica Capacitor 150P 50V J                  |
| R103,203           | OB09435A | Metal Film Resistor 12.1K SN14K2E F         | C801,802           | OB09222A | Electrolytic Capacitor 0.47 $\mu$ 50V (LN) |
| R104,204           | OB09467A | Metal Film Resistor 162K SN14K2E F          | 804,805            |          |                                            |
| R105,205           | OB09475A | Metal Film Resistor 316K SN14K2E F          | 806,807            |          |                                            |
| R106,206           | OB09482A | Metal Film Resistor 649K SN14K2E F          | C803               | OB05681A | Mylar Capacitor 0.01 $\mu$ 50V J           |
| R107,207           | OB05962A | Carbon Resistor 1.2M ERD-25T J              | C808               | OB09163A | Electrolytic Capacitor 10 $\mu$ 16V (BP)   |
| R108,208           | OB09535A | Metal Film Resistor 9.76K SN14K2E F         | C809               | OB09407A | PP Capacitor 0.15 $\mu$ 100V J             |
| R109,209           | OB09439A | Metal Film Resistor 20K SN14K2E F           | C810,811           | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V        |
| R110,210           | OB09448A | Metal Film Resistor 40.2K SN14K2E F         | C812,813           | OB01502A | Electrolytic Capacitor 330 $\mu$ 16V       |
| R111,211           | OB09459A | Metal Film Resistor 80.6K SN14K2E F         | 814,815            |          |                                            |
| R112,212           | OB09429A | Metal Film Resistor 7.32K SN14K2E F         | C816               | OB01405A | Electrolytic Capacitor 1 $\mu$ 50V         |
| R113,114           | OB09263A | Carbon Resistor 12K ERD-25T J               | C817               | OB01780A | Mylar Capacitor 0.1 $\mu$ 50V J            |
| 115,116            |          |                                             | CN1,3              | OB08646A | 10P-T Post                                 |
| 119,213            |          |                                             | CN2                | OB08655A | 11P-T Post                                 |
| 214,215            |          |                                             | CN15               | OB08642A | 6P-T Post                                  |
| 216,219            |          |                                             | CN16               | OB08643A | 7P-T Post                                  |
| 847,856            |          |                                             | CN17               | OB08724A | 5P-T Post                                  |
| R117,120           | OB05615A | Carbon Resistor 22K ERD-25T J               | CN18               | OB08656A | 2P-T Post                                  |
| 217,220            |          |                                             | CN19               | OB08654A | 4P-T Post                                  |
| R118,218           | OB01683A | Carbon Resistor 15K ERD-25T J               | CN20               | OB08645A | 9P-T Post                                  |
| R121,221           | OB05629A | Carbon Resistor 2.7K ERD-25T J              | CN51               | OB08757A | 8P-H Connector 250mm                       |
| R122,222           | OB05575A | Carbon Resistor 560 ERD-25T J               | CN52               | OB08756A | 4P-H Connector 180mm                       |
| R123,223           | OB09425A | Metal Film Resistor 5.11K SN14K2E F         | CN54               | OB08758A | 3P-H Connector 850mm                       |

| Schematic Ref. No. | Part No. | Description                                 | Schematic Ref. No. | Part No. | Description                                |
|--------------------|----------|---------------------------------------------|--------------------|----------|--------------------------------------------|
|                    | BA04229A | CPU P.C.B. B Ass'y<br>2nd Version           | R124,224           | OB05579A | Carbon Resistor 22 ERD-25T J               |
|                    |          |                                             | R125,225           | OB05936A | Carbon Resistor 10 ERD-25T J               |
|                    |          |                                             | R823,824           | OB09305A | Metal Film Resistor 100K SN14K2E F         |
|                    |          |                                             | R825               | OB09481A | Metal Film Resistor 536K SN14K2E F         |
|                    |          |                                             | R826,853           | OB05776A | Carbon Resistor 1M ERD-25T J               |
|                    |          |                                             | 880                |          |                                            |
| IC101,201          | OB07881B | CPU P.C.B. B                                | R828,834           | OB09216A | Fail Safe Type Resistor 10 RDF-25S J       |
| 802                | OB06261A | IC $\mu$ PD4508BC                           | 835,836            |          |                                            |
| IC301              | OB06216A | IC $\mu$ PC4556C                            | 837,872            |          |                                            |
| IC801              | OB06264A | IC TC4514BP                                 | 873,874            |          |                                            |
| IC803,808          | OB06178A | IC $\mu$ PD4011C                            | 875,876            |          |                                            |
| IC804              | OB06143A | IC $\mu$ PD4001C                            | 877                |          |                                            |
| IC805              | OB06124B | IC RC4558D                                  | R829-833           | OB01854A | Carbon Resistor 39K ERD-25T J<br>(18 pcs.) |
| IC806              | OB06223A | IC $\mu$ PD4040C                            | 850                |          |                                            |
| IC807              | OB06270A | IC $\mu$ PD4069C                            | 857-868            | OB01889A | Carbon Resistor 100K ERD-25T J             |
| IC809              | OB06219A | IC $\mu$ PD4081C                            | R849,851           |          |                                            |
| Q101,201           | OB06100A | Transistor 2SC945 (A) (18 pcs.)             | 852,855            |          |                                            |
| 801-807            |          |                                             | 902                |          |                                            |
| 813-818            |          |                                             | R854,870           | OB01682A | Carbon Resistor 6.8K ERD-25T J             |
| 830,831            |          |                                             | 871,886            |          |                                            |
| 832                |          |                                             | R878,900           | OB05671A | Carbon Resistor 2.2M ERD-25T J             |
| Q102,202           | OB06179A | Transistor 2SC1959 (Y)                      | 901                |          |                                            |
| 822                |          |                                             | R879               | OB05625A | Carbon Resistor 220K ERD-25T J             |
| Q103,203           | OB06202A | Transistor 2SA562 (Y)                       | R881               | OB05676A | Carbon Resistor 390K ERD-25T J             |
| 819                |          |                                             | R882,885           | OB01846A | Carbon Resistor 4.7K ERD-25T J             |
| Q808-812           | OB06013A | Transistor 2SA733 (6 pcs.)                  | R883,887           | OB01857A | Carbon Resistor 1K ERD-25T J               |
| 821                |          |                                             | R884,888           | OB01713A | Carbon Resistor 33 ERD-25T J               |
| Q820               | OB06069A | Transistor 2SB564                           | R889               | OB09536A | Fail Safe Type Resistor 18 ERD-14F J       |
| Q823               | OB06066A | Transistor 2SD471                           | R890               | OB09049A | Fail Safe Type Resistor 22 ERD-14F J       |
| D801-815           | OB06181A | Silicon Diode 1SS53 (15 pcs.)               | R895,896           | OB01933A | Carbon Resistor 220 ERD-25T J              |
| X801               | OB08723A | Crystal 1.68MHz                             | R897               | OB01888A | Carbon Resistor 10K ERD-25T J              |
| L101,201           | OB01434A | Peaking Coil 1.14mH                         | R898               | OB05627A | Carbon Resistor 330K ERD-25T J             |
| L102,202           | OB06635A | Bias Coil                                   | R899               | OB09531A | Carbon Resistor 2M ERD-25T J               |
| L103,203           | OB00068A | Trap Coil 10.5mH                            | C101,201           | OB09411A | PP Capacitor 3300P 100V G                  |
| VR101,201          | OB07256A | Semi-fixed Volume 10K                       | C102,202           | OB09410A | PP Capacitor 2200P 100V G                  |
| VR801              | OB07330A | Semi-fixed Volume 500K                      | C103,203           | OB09405A | PP Capacitor 0.022 $\mu$ 100V G            |
| R101,102           | OB05621A | Carbon Resistor 120K ERD-25T J<br>(42 pcs.) | C104,204           | OB09404A | PP Capacitor 1000P 100V J                  |
| 201,202            |          |                                             | C105,107           | OB09322A | PP Capacitor 330P 100V J                   |
| 801-822            |          |                                             | 205,207            |          |                                            |
| 827                |          |                                             | C106,206           | OB09246A | Mica Capacitor 150P 50V J                  |
| 838-846            |          |                                             | C801,802           | OB09222A | Electrolytic Capacitor 0.47 $\mu$ 50V (LN) |
| 848,869            |          |                                             | 804,805            |          |                                            |
| 891-894            |          |                                             | 806,807            |          |                                            |
| R103,203           | OB09435A | Metal Film Resistor 12.1K SN14K2E F         | C803               | OB05681A | Mylar Capacitor 0.01 $\mu$ 50V J           |
| R104,204           | OB09467A | Metal Film Resistor 162K SN14K2E F          | C808               | OB09163A | Electrolytic Capacitor 10 $\mu$ 16V (BP)   |
| R105,205           | OB09475A | Metal Film Resistor 316K SN14K2E F          | C809               | OB09407A | PP Capacitor 0.15 $\mu$ 100V J             |
| R106,206           | OB09482A | Metal Film Resistor 649K SN14K2E F          | C810,811           | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V        |
| R107,207           | OB05962A | Carbon Resistor 1.2M ERD-25T J              | C812,813           | OB01502A | Electrolytic Capacitor 330 $\mu$ 16V       |
| R108,208           | OB09535A | Metal Film Resistor 9.76K SN14K2E F         | 814,815            |          |                                            |
| R109,209           | OB09439A | Metal Film Resistor 20K SN14K2E F           | C816               | OB01405A | Electrolytic Capacitor 1 $\mu$ 50V         |
| R110,210           | OB09448A | Metal Film Resistor 40.2K SN14K2E F         | C817               | OB01780A | Mylar Capacitor 0.1 $\mu$ 50V J            |
| R111,211           | OB09459A | Metal Film Resistor 80.6K SN14K2E F         | CN1,3              | OB08646A | 10P-T Post                                 |
| R112,212           | OB09429A | Metal Film Resistor 7.32K SN14K2E F         | CN2                | OB08655A | 11P-T Post                                 |
| R113,114           | OB09263A | Carbon Resistor 12K ERD-25T J               | CN15               | OB08642A | 6P-T Post                                  |
| 115,116            |          |                                             | CN16               | OB08643A | 7P-T Post                                  |
| 119,213            |          |                                             | CN17               | OB08724A | 5P-T Post                                  |
| 214,215            |          |                                             | CN18               | OB08656A | 2P-T Post                                  |
| 216,219            |          |                                             | CN19               | OB08654A | 4P-T Post                                  |
| 847,856            |          |                                             | CN20               | OB08645A | 9P-T Post                                  |
| R117,120           | OB05615A | Carbon Resistor 22K ERD-25T J               | CN51               | OB08757A | 8P-H Connector 250mm                       |
| 217,220            |          |                                             | CN52               | OB08756A | 4P-H Connector 180mm                       |
| R118,218           | OB01683A | Carbon Resistor 15K ERD-25T J               | CN54               | OB08758A | 3P-H Connector 850mm                       |
| R121,221           | OB05629A | Carbon Resistor 2.7K ERD-25T J              |                    |          |                                            |
| R122,222           | OB05575A | Carbon Resistor 560 ERD-25T J               |                    |          |                                            |
| R123,223           | OB09425A | Metal Film Resistor 5.11K SN14K2E F         |                    |          |                                            |

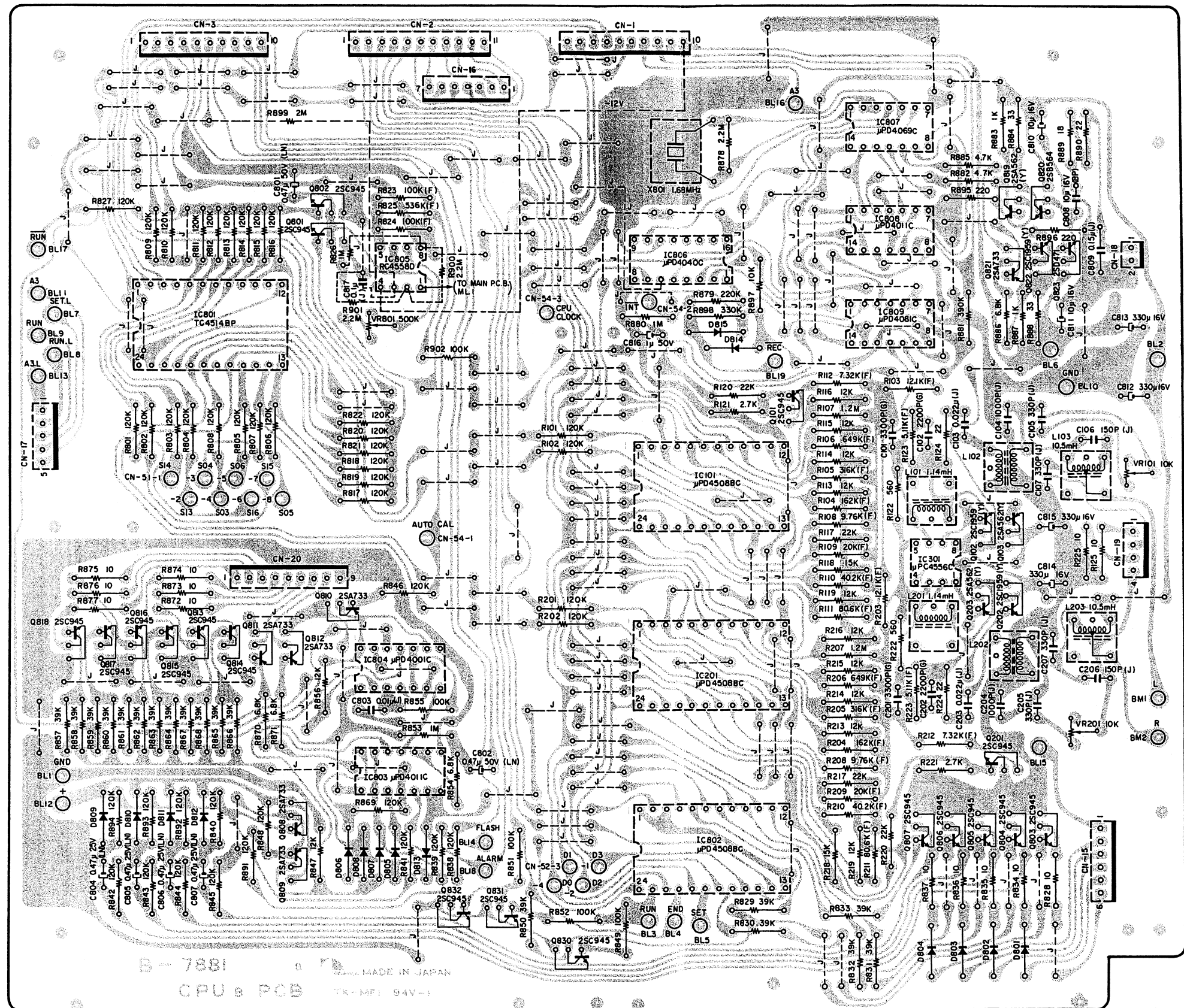


Fig. 7.21.2 2nd Version

Note: Diode is 1SS53 unless otherwise specified.

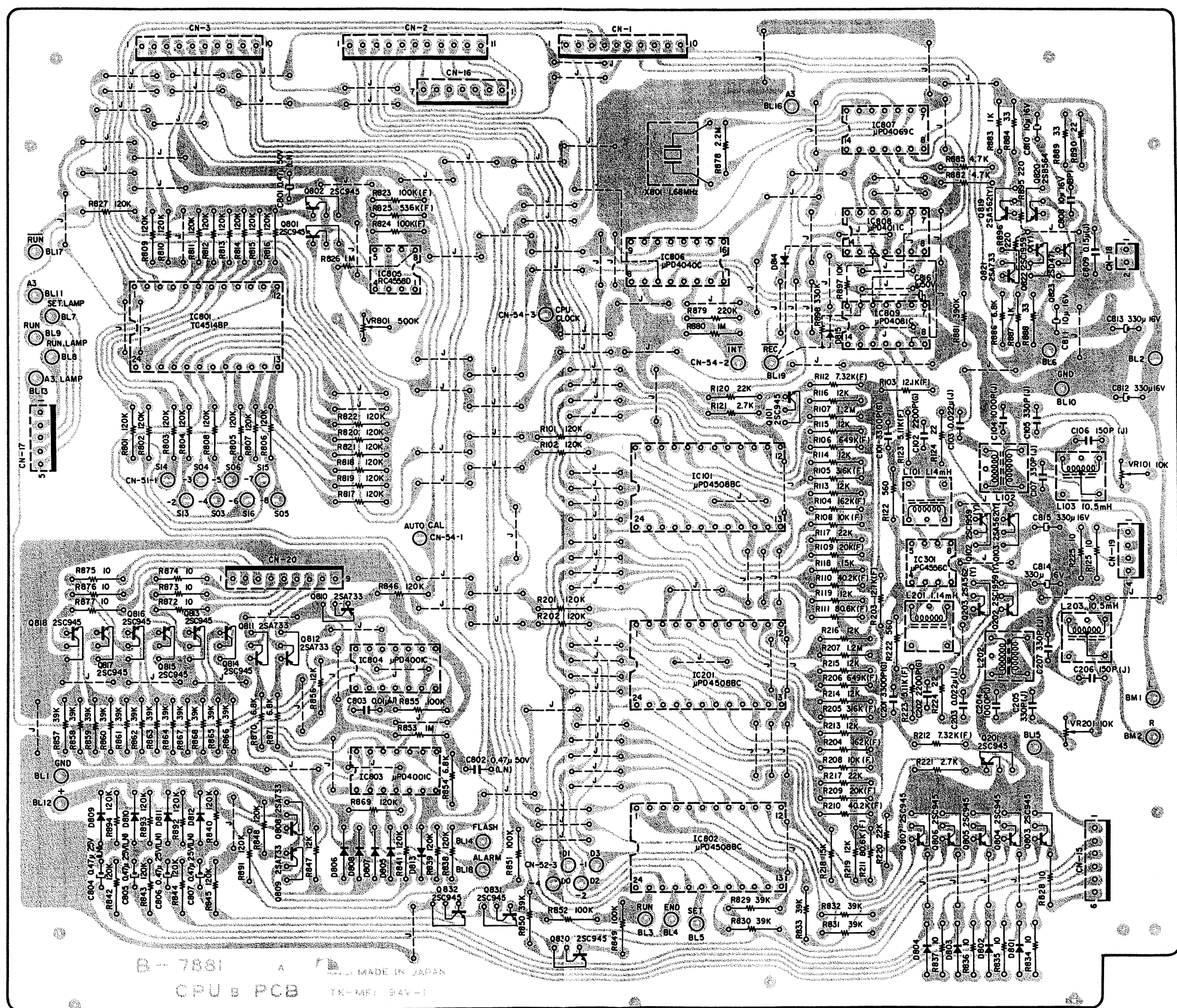


Fig. 7.21. 3 1st Version

Note: Diode is 1SS53 unless otherwise specified.



| Schematic Ref. No. | Part No. | Description                         | Schematic Ref. No. | Part No. | Description                                |
|--------------------|----------|-------------------------------------|--------------------|----------|--------------------------------------------|
|                    | BA04229A | CPU P.C.B. B Ass'y<br>1st Version   | R124,224           | OB05579A | Carbon Resistor 22 ERD-25T J               |
|                    |          |                                     | R125,225           | OB05936A | Carbon Resistor 10 ERD-25T J               |
|                    |          |                                     | R823,824           | OB09305A | Metal Film Resistor 100K SN14K2E F         |
|                    |          |                                     | R825               | OB09481A | Metal Film Resistor 536K SN14K2E F         |
| IC101,201          | OB07881A | CPU P.C.B. B                        | R826,853           | OB05776A | Carbon Resistor 1M ERD-25T J               |
| 802                | OB06261A | IC $\mu$ PD4508BC                   | 880                |          |                                            |
| IC301              | OB06216A | IC $\mu$ PC4556C                    | R828,834           | OB09216A | Fail Safe Type Resistor 10 RDF-25S J       |
| IC801              | OB06264A | IC TC4514BP                         | 835,836            |          |                                            |
| IC803,808          | OB06178A | IC $\mu$ PD4011C                    | 837,872            |          |                                            |
| IC804              | OB06143A | IC $\mu$ PD4001C                    | 873,874            |          |                                            |
| IC805              | OB06124B | IC RC4558D                          | 875,876            |          |                                            |
| IC806              | OB06223A | IC $\mu$ PD4040C                    | 877                |          |                                            |
| IC807              | OB06270A | IC $\mu$ PD4069C                    | R829-833           | OB01854A | Carbon Resistor 39K ERD-25T J              |
| IC809              | OB06219A | IC $\mu$ PD4081C                    | 850                |          | (18 pcs.)                                  |
| Q101,201           | OB06100A | Transistor 2SC945 (A) (18 pcs.)     | 857-868            |          |                                            |
| 801-807            |          |                                     | R849,851           | OB01889A | Carbon Resistor 100K ERD-25T J             |
| 813-818            |          |                                     | 852,855            |          |                                            |
| 830,831            |          |                                     | R854,870           | OB01682A | Carbon Resistor 6.8K ERD-25T J             |
| 832                |          |                                     | 871,886            |          |                                            |
| Q102,202           | OB06179A | Transistor 2SC1959 (Y)              | R878               | OB05671A | Carbon Resistor 2.2M ERD-25T J             |
| 822                |          |                                     | R879               | OB05625A | Carbon Resistor 220K ERD-25T J             |
| Q103,203           | OB06202A | Transistor 2SA562 (Y)               | R881               | OB05676A | Carbon Resistor 390K ERD-25T J             |
| 819                |          |                                     | R882,885           | OB01846A | Carbon Resistor 4.7K ERD-25T J             |
| Q808-812           | OB06013A | Transistor 2SA733 (6 pcs.)          | R883,887           | OB01857A | Carbon Resistor 1K ERD-25T J               |
| 821                |          |                                     | R884,888           | OB01713A | Carbon Resistor 33 ERD-25T J               |
| Q820               | OB06069A | Transistor 2SB564                   | 889                |          |                                            |
| Q823               | OB06066A | Transistor 2SD471                   | R890               | OB09049A | Fail Safe Type Resistor 22 ERD-14F J       |
| D801-815           | OB06181A | Silicon Diode 1SS53 (15 pcs.)       | R895,896           | OB01933A | Carbon Resistor 220 ERD-25T J              |
| X801               | OB08723A | Crystal 1.68MHz                     | R897               | OB01888A | Carbon Resistor 10K ERD-25T J              |
| L101,201           | OB01434A | Peaking Coil 1.14mH                 | R898               | OB05627A | Carbon Resistor 330K ERD-25T J             |
| L102,202           | OB06635A | Bias Coil                           | C101,201           | OB09411A | PP Capacitor 3300P 100V G                  |
| L103,203           | OB00068A | Trap Coil 10.5mH                    | C102,202           | OB09410A | PP Capacitor 2200P 100V G                  |
| VR101,201          | OB07256A | Semi-fixed Volume 10K               | C103,203           | OB09405A | PP Capacitor 0.022 $\mu$ 100V G            |
| VR801              | OB07330A | Semi-fixed Volume 500K              | C104,204           | OB09404A | PP Capacitor 1000P 100V J                  |
| R101,102           | OB05621A | Carbon Resistor 120K ERD-25T J      | C105,107           | OB09322A | PP Capacitor 330P 100V J                   |
| 201,202            |          | (42 pcs.)                           | 205,207            |          |                                            |
| 801-822            |          |                                     | C106,206           | OB09246A | Mica Capacitor 150P 50V J                  |
| 827                |          |                                     | C801,802           | OB09222A | Electrolytic Capacitor 0.47 $\mu$ 50V (LN) |
| 838-846            |          |                                     | 804,805            |          |                                            |
| 848,869            |          |                                     | 806,807            |          |                                            |
| 891-894            |          |                                     | C803               | OB05681A | Mylar Capacitor 0.01 $\mu$ 50V J           |
| R103,203           | OB09435A | Metal Film Resistor 12.1K SN14K2E F | C808               | OB09163A | Electrolytic Capacitor 10 $\mu$ 16V (BP)   |
| R104,204           | OB09467A | Metal Film Resistor 162K SN14K2E F  | C809               | OB09407A | PP Capacitor 0.15 $\mu$ 100V J             |
| R105,205           | OB09475A | Metal Film Resistor 316K SN14K2E F  | C810,811           | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V        |
| R106,206           | OB09482A | Metal Film Resistor 649K SN14K2E F  | C812,813           | OB01502A | Electrolytic Capacitor 330 $\mu$ 16V       |
| R107,207           | OB05962A | Carbon Resistor 1.2M ERD-25T J      | 814,815            |          |                                            |
| R108,208           | OB09203A | Metal Film Resistor 10K SN14K2E F   | C816               | OB01405A | Electrolytic Capacitor 1 $\mu$ 50V         |
| R109,209           | OB09439A | Metal Film Resistor 20K SN14K2E F   | CN1,3              | OB08646A | 10P-T Post                                 |
| R110,210           | OB09448A | Metal Film Resistor 40.2K SN14K2E F | CN2                | OB08655A | 11P-T Post                                 |
| R111,211           | OB09459A | Metal Film Resistor 80.6K SN14K2E F | CN15               | OB08642A | 6P-T Post                                  |
| R112,212           | OB09429A | Metal Film Resistor 7.32K SN14K2E F | CN16               | OB08643A | 7P-T Post                                  |
| R113,114           | OB09263A | Carbon Resistor 12K ERD-25T J       | CN17               | OB08724A | 5P-T Post                                  |
| 115,116            |          |                                     | CN18               | OB08656A | 2P-T Post                                  |
| 119,213            |          |                                     | CN19               | OB08654A | 4P-T Post                                  |
| 214,215            |          |                                     | CN20               | OB08645A | 9P-T Post                                  |
| 216,219            |          |                                     | CN51               | OB08757A | 8P-H Connector 250mm                       |
| 847,856            |          |                                     | CN52               | OB08756A | 4P-H Connector 180mm                       |
| R117,120           | OB05615A | Carbon Resistor 22K ERD-25T J       | CN54               | OB08758A | 3P-H Connector 850mm                       |
| 217,220            |          |                                     |                    |          |                                            |
| R118,218           | OB01683A | Carbon Resistor 15K ERD-25T J       |                    |          |                                            |
| R121,221           | OB05629A | Carbon Resistor 2.7K ERD-25T J      |                    |          |                                            |
| R122,222           | OB05575A | Carbon Resistor 560 ERD-25T J       |                    |          |                                            |
| R123,223           | OB09425A | Metal Film Resistor 5.11K SN14K2E F |                    |          |                                            |

| Schematic Ref. No. | Part No. | Description                                    | Schematic Ref. No. | Part No. | Description                               |
|--------------------|----------|------------------------------------------------|--------------------|----------|-------------------------------------------|
|                    | BA04226A | RAMM P.C.B. Ass'y                              | R995               | OB05626A | Carbon Resistor 150K ERD-25T J            |
|                    | OB07894D | RAMM P.C.B.                                    | R996               | OB01681A | Carbon Resistor 3.3K ERD-25T J            |
| IC901              | OB06245A | IC RAMM CPU $\mu$ PD546C-114                   | C901,902           | OB09187A | Electrolytic Capacitor 1 $\mu$ 50V (BP)   |
| IC902,903          | OB06261A | IC $\mu$ PD4508BC                              | 903                |          |                                           |
| IC904,905          | OB06213A | IC TC4013BP                                    | C904,905           | OB01412A | Electrolytic Capacitor 10 $\mu$ 16V       |
| 913                |          |                                                | C906               | OB05681A | Mylar Capacitor 0.01 $\mu$ 50V J          |
| IC906-910          | OB06219A | IC $\mu$ PD4081C                               | C907               | OB09223A | Electrolytic Capacitor 1 $\mu$ 50V (LN)   |
| 916,918            |          |                                                | C908               | OB09393A | Ceramic Capacitor 68P 50V K               |
| IC911              | OB06124B | IC RC4558D                                     | C909               | OB09282A | Ceramic Capacitor 100P 50V K              |
| IC912              | OB06212A | IC TC4510BP                                    | C910,911           | OB09286A | Ceramic Capacitor 470P 50V K              |
| IC914              | OB06214A | IC $\mu$ PD4071C                               | C912               | OB05582A | Mylar Capacitor 0.022 $\mu$ 50V J         |
| IC915              | OB06224A | IC TC4023BP                                    | C913               | OB09333A | Electrolytic Capacitor 4.7 $\mu$ 25V (LN) |
| IC917              | OB06270A | IC $\mu$ PD4069C                               | CN24,58            | OB08644A | 8P-T Post                                 |
| Q901-927           | OB06100A | Transistor 2SC945 (A) (27 pcs.)                | 59                 |          |                                           |
| D901-932           | OB06181A | Silicon Diode 1SS53 (32 pcs.)                  | CN25,57            | OB08642A | 6P-T Post                                 |
| L901               | OB06636A | Inductor 1.05mH                                | CN26               | OB08655A | 11P-T Post                                |
| R901,902           | OB09216A | Fail Safe Type Resistor 10 RDF-25S J (21 pcs.) | CN27               | OB08724A | 5P-T Post                                 |
| 904,905            |          |                                                | CN28               | OB08643A | 7P-T Post                                 |
| 001-017            |          |                                                | CN29,30            | OB08732A | 12P-S Connector F12P-SHVQ                 |
| R903               | OB05675A | Carbon Resistor 3.9K ERD-25T J                 | CN41,56            | OB08654A | 4P-T Post                                 |
| R906-908           | OB05560A | Carbon Resistor 18K ERD-25T J (25 pcs.)        | CN43               | OB08236A | 4P-T Post B4P-SHF-1                       |
| 967-971            |          |                                                | CN50               | OB08183A | 5P-T Post B5P-SHF-1                       |
| 018-034            |          |                                                | CN54               | OB08653A | 3P-T Post                                 |
| R909,919           | OB01888A | Carbon Resistor 10K ERD-25T J                  | CN55               | OB08656A | 2P-T Post                                 |
| 940,941            |          |                                                | CN60,61            | OB08334A | 8P-T Post B8P-SHF-1                       |
| 942,943            |          |                                                |                    |          |                                           |
| 973,977            |          |                                                |                    |          |                                           |
| 986,998            |          |                                                |                    |          |                                           |
| R910,911           | OB01683A | Carbon Resistor 15K ERD-25T J                  |                    |          |                                           |
| R912-917           | OB01889A | Carbon Resistor 100K ERD-25T J (28 pcs.)       |                    |          |                                           |
| 920-925            |          |                                                |                    |          |                                           |
| 927,928            |          |                                                |                    |          |                                           |
| 930-933            |          |                                                |                    |          |                                           |
| 960,963            |          |                                                |                    |          |                                           |
| 979,980            |          |                                                |                    |          |                                           |
| 983,984            |          |                                                |                    |          |                                           |
| 988,990            |          |                                                |                    |          |                                           |
| 992,037            |          |                                                |                    |          |                                           |
| R918,926           | OB05776A | Carbon Resistor 1M ERD-25T J                   |                    |          |                                           |
| 935,972            |          |                                                |                    |          |                                           |
| 981,982            |          |                                                |                    |          |                                           |
| 987,989            |          |                                                |                    |          |                                           |
| 991,993            |          |                                                |                    |          |                                           |
| 035,036            |          |                                                |                    |          |                                           |
| R929,961           | OB05615A | Carbon Resistor 22K ERD-25T J                  |                    |          |                                           |
| R934,962           | OB05625A | Carbon Resistor 220K ERD-25T J                 |                    |          |                                           |
| R936,937           | OB05622A | Carbon Resistor 2.2K ERD-25T J                 |                    |          |                                           |
| 938,939            |          |                                                |                    |          |                                           |
| 997                |          |                                                |                    |          |                                           |
| R944-955           | OB01856A | Carbon Resistor 8.2K ERD-25T J (12 pcs.)       |                    |          |                                           |
| 035,036            |          |                                                |                    |          |                                           |
| R956,957           | OB05508A | Carbon Resistor 56K ERD-25T J                  |                    |          |                                           |
| 958                |          |                                                |                    |          |                                           |
| R964               | OB09392A | Carbon Resistor 200K ERD-25T J                 |                    |          |                                           |
| R965,966           | OB05676A | Carbon Resistor 390K ERD-25T J                 |                    |          |                                           |
| R974               | OB05641A | Carbon Resistor 47K ERD-25T J                  |                    |          |                                           |
| R975               | OB05620A | Carbon Resistor 270K ERD-25T J                 |                    |          |                                           |
| R976,994           | OB01857A | Carbon Resistor 1K ERD-25T J                   |                    |          |                                           |
| 999                |          |                                                |                    |          |                                           |
| R978               | OB05627A | Carbon Resistor 330K ERD-25T J                 |                    |          |                                           |
| R985               | OB05509A | Carbon Resistor 33K ERD-25T J                  |                    |          |                                           |

## 7.22. RAMM P.C.B. Ass'y

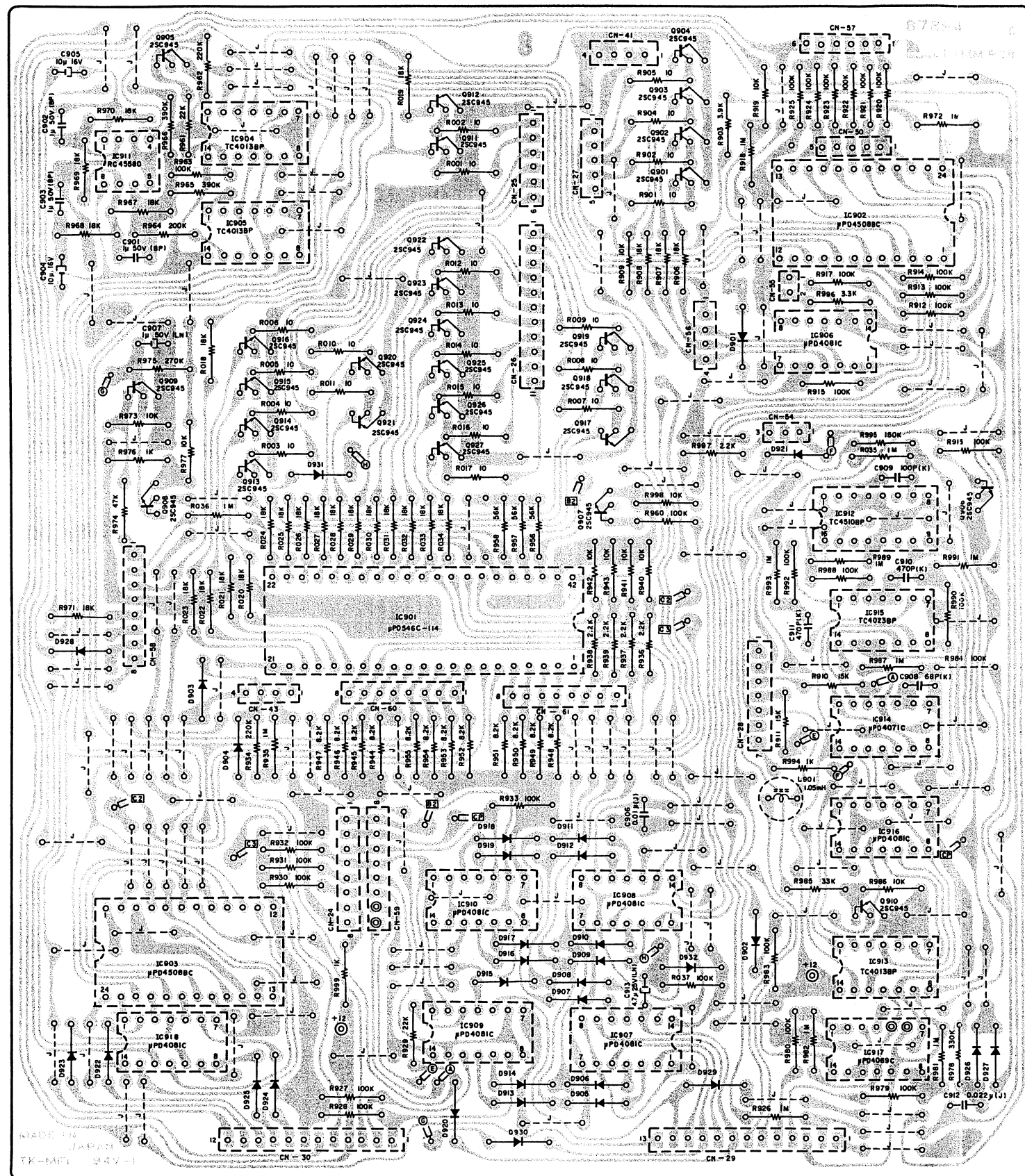


Fig. 7.22

Note: Diode is 1SS53 unless otherwise specified.



7.23. Display P.C.B. Ass'y

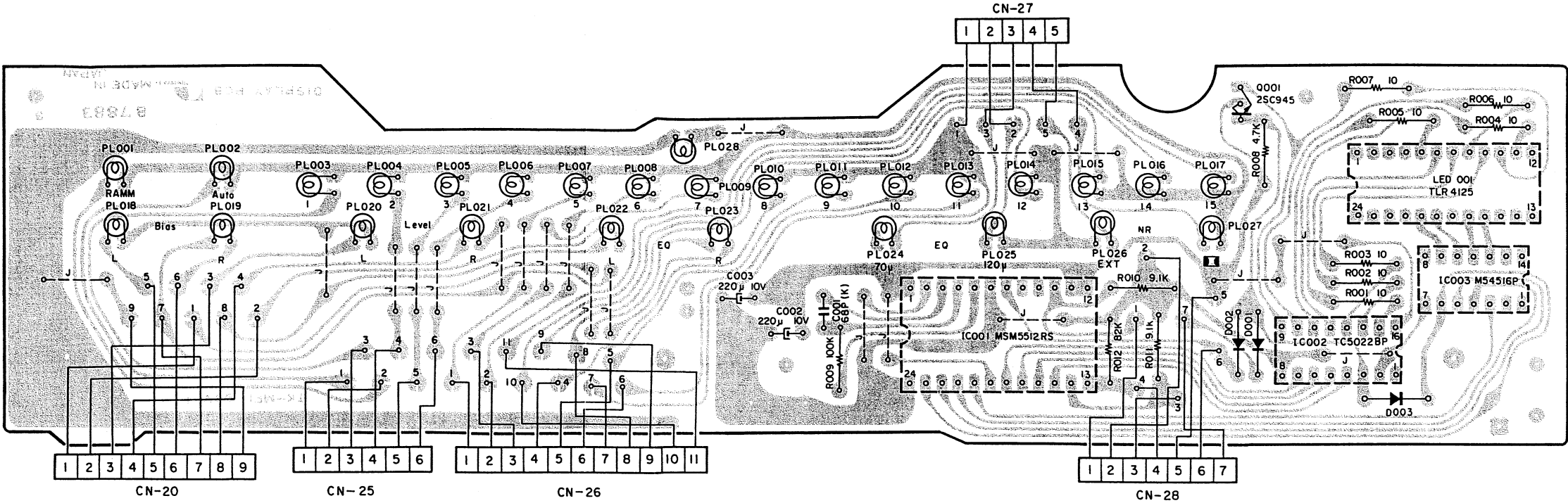


Fig. 7.23

Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No. | Part No. | Description                           |
|--------------------|----------|---------------------------------------|
|                    | BA04233A | Display P.C.B. Ass'y                  |
| IC001              | OB07883B | Display P.C.B.                        |
| IC002              | OB06259A | IC MSM5512RS                          |
| IC003              | OB06211A | IC TC5022BP                           |
| Q001               | OB06258A | IC M54516P                            |
| D001,002           | OB06100A | Transistor 2SC945 (A)                 |
| 003                | OB06181A | Silicon Diode 1SS53                   |
| LED001             | OB06266A | LED TLR4125                           |
| R001-007           | OB05936A | Carbon Resistor 10 ERD-25T J (7 pcs.) |
| R008               | OB01846A | Carbon Resistor 4.7K ERD-25T J        |
| R009               | OB01889A | Carbon Resistor 100K ERD-25T J        |
| R010,011           | OB05694A | Carbon Resistor 9.1K ERD-25T J        |
| R012               | OB05668A | Carbon Resistor 82K ERD-25T J         |
| C001               | OB09393A | Ceramic Capacitor 68P 50V K           |
| C002,003           | OB05899A | Electrolytic Capacitor 220μ 10V       |
| PL001-027          | OB08721A | Lamp 12V 30mA (27 pcs.)               |
| PL028              | OB08822A | Lamp 14V 60mA                         |
| CN20               | OB08741A | 9P-H Connector 550mm                  |
| CN25               | OB08740A | 6P-H Connector 340mm                  |
| CN26               | OB08742A | 11P-H Connector 360mm                 |
| CN27               | OB08738A | 5P-H Connector 390mm                  |
| CN28               | OB08739A | 7P-H Connector 420mm                  |
|                    | OB08772A | Filter Cap (1 pce.)                   |

## 8. MECHANISM ASS'Y AND PARTS LIST

## 8.1. Synthesis

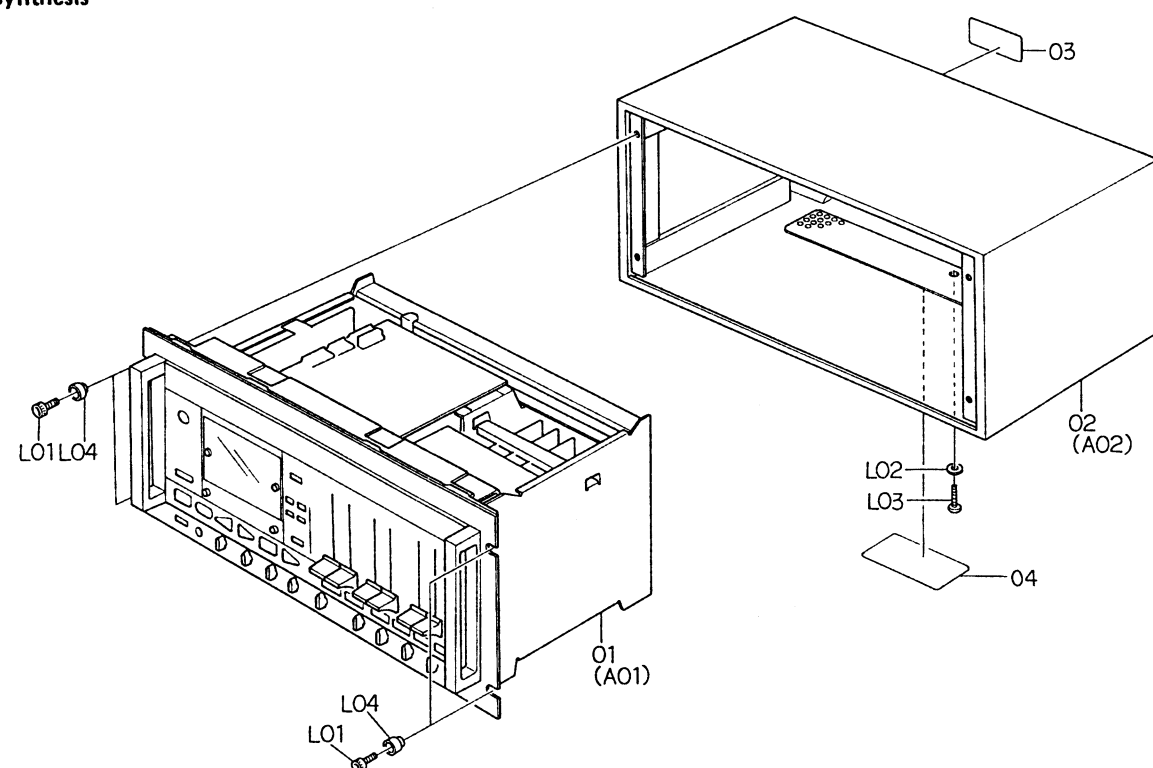


Fig. 8.1

## 8.2. Synthesis Mechanism Ass'y (A01)

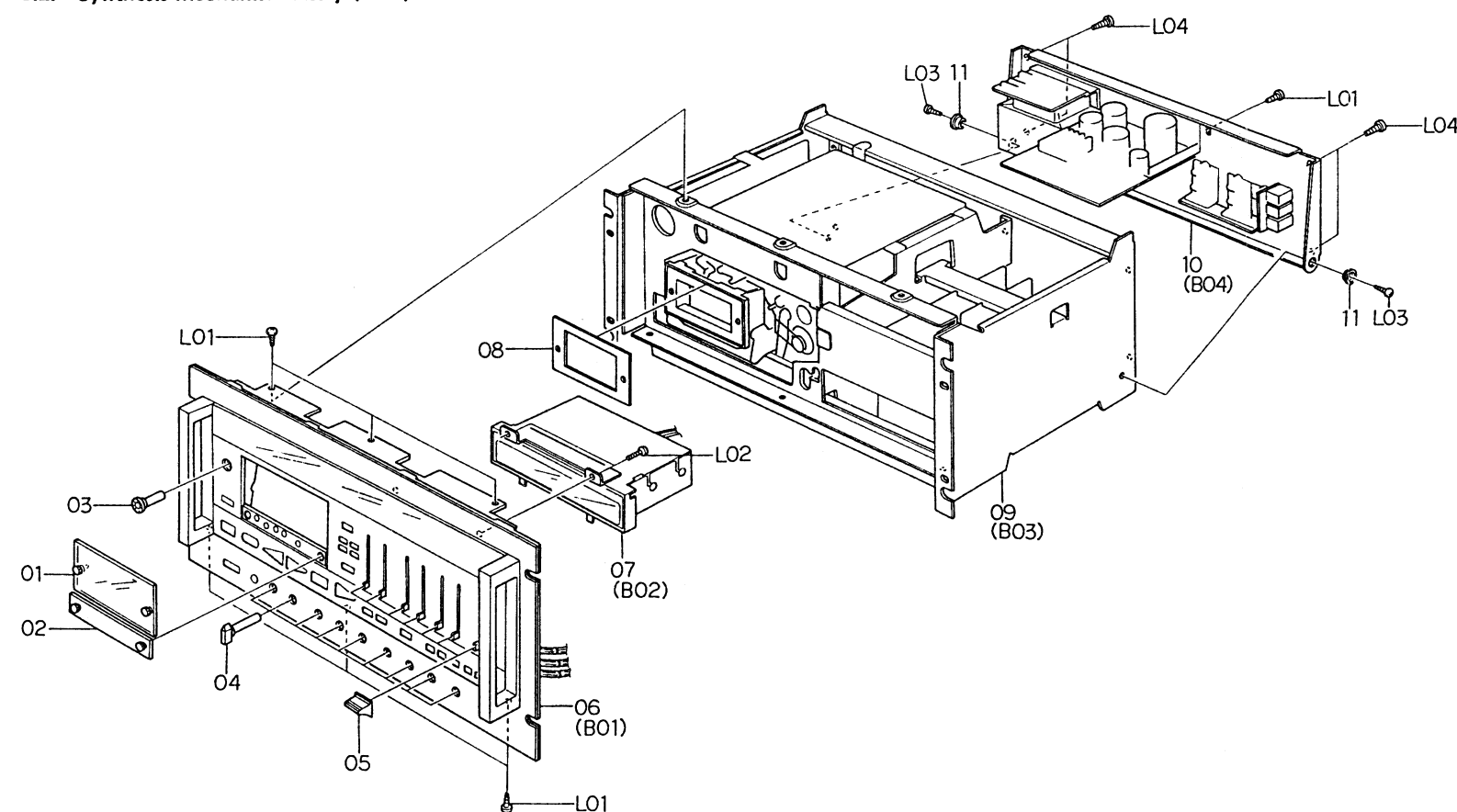


Fig. 8.2

| Schematic Ref. No. | Part No. | Description                                   | Q'ty | Schematic Ref. No. | Part No. | Description                                                          | Q'ty |
|--------------------|----------|-----------------------------------------------|------|--------------------|----------|----------------------------------------------------------------------|------|
| 01                 | HA04008A | Synthesis Mechanism Ass'y (U.S.A. & Canada)   | 1    | A01                | HA04008A | Synthesis Mechanism Ass'y (U.S.A. & Canada)                          | 1    |
|                    | HA04025A | Synthesis Mechanism Ass'y (Japan)             | 1    |                    | HA04025A | Synthesis Mechanism Ass'y (Japan)                                    | 1    |
|                    | HA04026A | Synthesis Mechanism Ass'y (Others)            | 1    |                    | HA04026A | Synthesis Mechanism Ass'y (Others)                                   | 1    |
|                    | HA04027A | Synthesis Mechanism Ass'y (220V Class 2)      | 1    |                    | HA04027A | Synthesis Mechanism Ass'y (220V Class 2)                             | 1    |
|                    | HA04028A | Synthesis Mechanism Ass'y (UK)                | 1    |                    | HA04028A | Synthesis Mechanism Ass'y (UK)                                       | 1    |
|                    | HA04029A | Synthesis Mechanism Ass'y (Australia)         | 1    |                    | HA04029A | Synthesis Mechanism Ass'y (Australia)                                | 1    |
|                    |          | Serial No.: A11701001—                        |      |                    |          | Serial No.: A11701001—                                               |      |
|                    |          |                                               |      |                    |          |                                                                      |      |
| 02                 | HA04000A | Cabinet Ass'y                                 | 1    | 01                 | HA04001A | Cassette Case Cover Ass'y                                            | 1    |
| 03                 | 0M03458A | PASS Label                                    | 1    | 02                 | HA03981A | Azimuth Alignment Cover Ass'y                                        | 1    |
| 04                 | 0M04101A | Caution Label                                 | 1    | 03                 | 0H03846A | Pitch Control Knob                                                   | 1    |
| L01                | 0E00932A | Screw M5x10 Hex. Socket Head (Black Chromate) | 4    | 04                 | 0H03860A | Function Switch Knob                                                 | 9    |
| L02                | 0E00930A | Washer 5mm (Black Chromate)                   | 1    | 05                 | 0H03844A | Slide Volume Knob                                                    | 3    |
| L03                | 0E00931A | Screw M4x18 Philips Binding Head (Bronze)     | 1    | 06                 | HA04009A | Front Panel Ass'y                                                    | 1    |
| L04                | 0H03847A | Set Washer                                    | 4    | 07                 | HA04011A | FL Indicator Ass'y                                                   | 1    |
|                    |          |                                               |      | 08                 | 0H03838A | Cassette Case Plate                                                  | 1    |
|                    |          |                                               |      | 09                 | HA04012A | Synthesis Mechanism Sub Ass'y (U.S.A. & Canada)                      | 1    |
|                    |          |                                               |      |                    | HA04030A | Synthesis Mechanism Sub Ass'y (Japan)                                | 1    |
|                    |          |                                               |      |                    | HA04031A | Synthesis Mechanism Sub Ass'y (220V Class 2, UK, Australia & Others) | 1    |
|                    |          |                                               |      | 10                 | HA04010A | Rear Panel Ass'y (U.S.A. & Canada)                                   | 1    |
|                    |          |                                               |      |                    | HA04035A | Rear Panel Ass'y (Japan)                                             | 1    |
|                    |          |                                               |      |                    | HA04036A | Rear Panel Ass'y (Others)                                            | 1    |
|                    |          |                                               |      |                    | HA04037A | Rear Panel Ass'y (220V Class 2)                                      | 1    |
|                    |          |                                               |      |                    | HA04038A | Rear Panel Ass'y (UK)                                                | 1    |
|                    |          |                                               |      |                    | HA04039A | Rear Panel Ass'y (Australia)                                         | 1    |
|                    |          |                                               |      | 11                 | 0J04154A | Rear Panel Collar                                                    | 2    |
|                    |          |                                               |      | —                  | 0B08515A | Insh-Lock                                                            | 5    |
|                    |          |                                               |      | L01                | 0E00860A | BT Screw M3x6 Philips Binding Head (Black Chromate)                  | 7    |
|                    |          |                                               |      | L02                | 0E00521A | Screw M3x8 Philips Pan Head                                          | 2    |
|                    |          |                                               |      | L03                | 0E00857A | BT Screw M3x6 Philips Binding Head                                   | 2    |
|                    |          |                                               |      | L04                | 0E00858A | BT Screw M4x6 Philips Binding Head (Bronze)                          | 4    |

8.3. Cabinet Ass'y (A02)

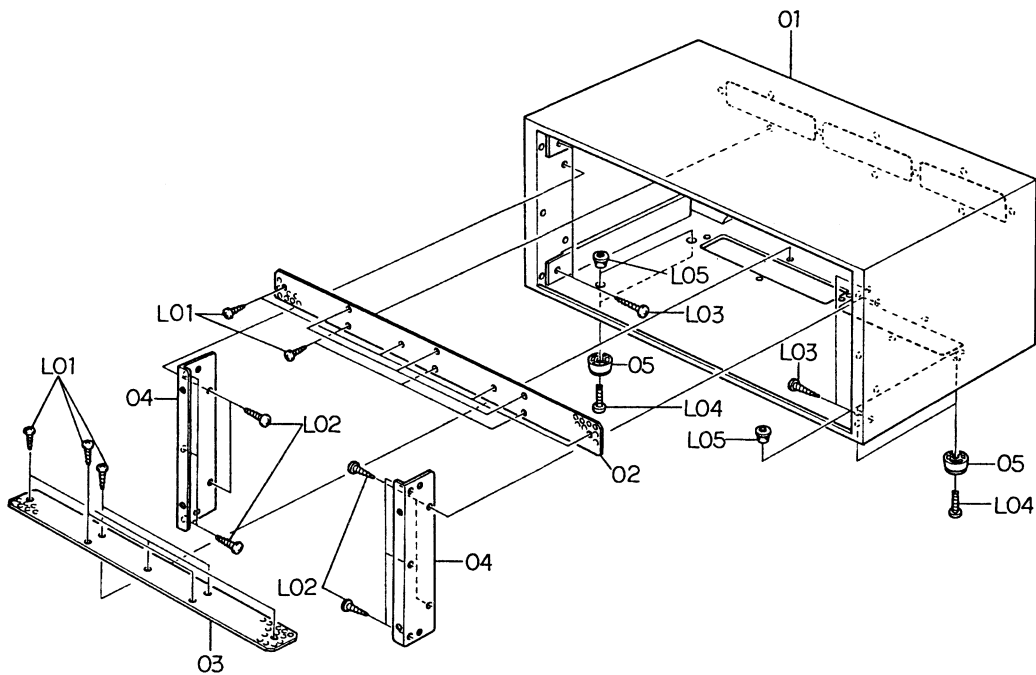


Fig. 8.3

8.4. Front Panel Ass'y (B01)

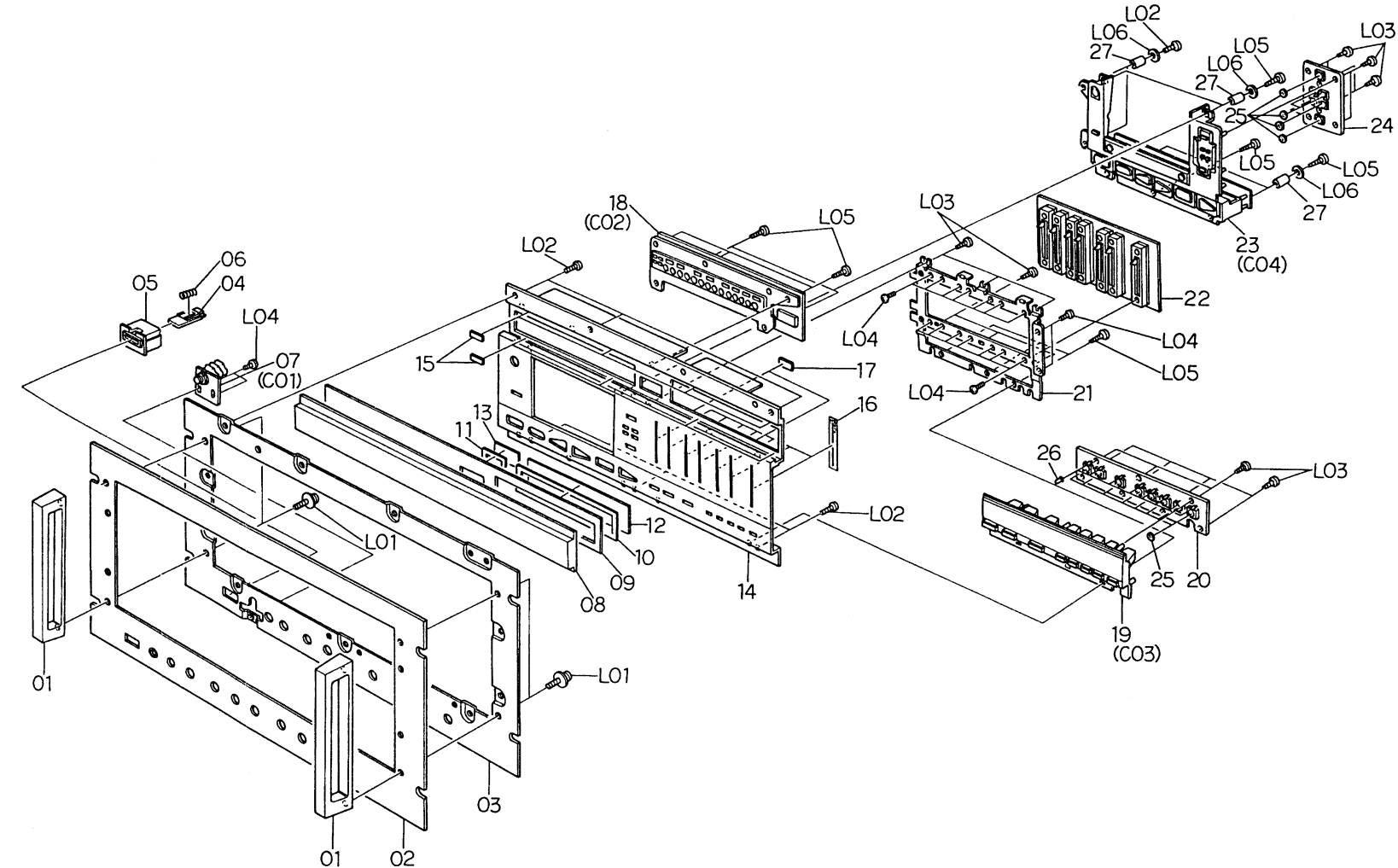


Fig. 8.4

| Schematic Ref. No. | Part No. | Description                                      | Q'ty |
|--------------------|----------|--------------------------------------------------|------|
| A02                | HA04000A | Cabinet Ass'y<br>Serial No.:<br>A11701001—       | 1    |
| 01                 | 0A03286A | Cabinet                                          | 1    |
| 02                 | 0H03878A | Punching Plate A                                 | 1    |
| 03                 | 0H03879A | Punching Plate B                                 | 1    |
| 04                 | 0H03880A | Cabinet Side Plate                               | 2    |
| 05                 | 0J03825A | Leg S                                            | 4    |
| L01                | 0E01022A | Wood Screw 2.7x8 Philips<br>Round Head           | 17   |
| L02                | 0E01023A | Wood Screw 3.1x13 Philips<br>Round Head          | 10   |
| L03                | 0E01024A | Wood Screw 3.1x25 Philips<br>Round Head          | 4    |
| L04                | 0E00937A | Screw M4x16 Philips Pan Head<br>(Black Chromate) | 4    |
| L05                | 0E01025A | Nut 4mm (Self Tightened)                         | 4    |

| Schematic Ref. No. | Part No. | Description                                    | Q'ty | Schematic Ref. No. | Part No. | Description                           | Q'ty |
|--------------------|----------|------------------------------------------------|------|--------------------|----------|---------------------------------------|------|
| B01                | HA04009A | Front Panel Ass'y<br>Serial No.:<br>A11701001— | 1    | 17                 | 0J04129A | FL Indicator Cushion                  | 2    |
| 01                 | 0H03867A | Handle                                         | 2    | 18                 | HA04018A | Display House Ass'y                   | 1    |
| 02                 | 0H03871A | Front Panel B                                  | 1    | 19                 | HA04016A | Front Escutcheon B Ass'y              | 1    |
| 03                 | 0J04121A | Panel Chassis                                  | 1    | 20                 | BA04240A | Function P.C.B. Ass'y                 | 1    |
| 04                 | 0H03863A | Power Switch Button                            | 1    | 21                 | 0J04118A | Volume Holder                         | 1    |
| 05                 | 0H03864A | Power Switch Escutcheon                        | 1    | 22                 | BA04232A | MIC Amp. & Volume P.C.B. Ass'y        | 1    |
| 06                 | 0J04114A | Power Switch Spring                            | 1    | 23                 | HA04015A | Front Escutcheon A Ass'y              | 1    |
| 07                 | JA03737A | Headphone Jack Ass'y                           | 1    | 24                 | BA04241A | RAMM Control Switch P.C.B. Ass'y      | 1    |
| 08                 | 0H03870A | Indicator Cover                                | 1    | 25                 | 0J04290B | Switch Cushion                        | 14   |
| 09                 | 0H03869B | Indicator Plate                                | 1    | 26                 | 0B08847A | Filter Cap G-50                       | 8    |
| 10                 | 0J04288A | Adhesive Tape A                                | 1    | 27                 | 0J04329A | Front Escutcheon Collar               | 6    |
| 11                 | 0J04289B | Adhesive Tape B                                | 1    | L01                | 0E00933A | Screw M4x12 Philips Pan Head<br>(3A)  | 4    |
| 12                 | 0H03842A | FL Indicator Filter                            | 1    | L02                | 0E00589A | Screw M3x6 Philips Pan Head           | 18   |
| 13                 | 0H03856B | Counter Filter                                 | 1    | L03                | 0E00857A | BT Screw M3x6 Philips Binding<br>Head | 19   |
| 14                 | 0H03875B | Front Panel                                    | 1    | L04                | 0E00502A | Screw M3x5 Philips Pan Head           | 18   |
| 15                 | 0J04112B | Indicator Cushion                              | 8    | L05                | 0E00868A | BT Screw M3x8 Philips Binding<br>Head | 13   |
| 16                 | 0J04128A | Volume Cover                                   | 7    | L06                | 0E00178A | Washer 3mm                            | 6    |

8.5. FL Indicator Ass'y (B02)

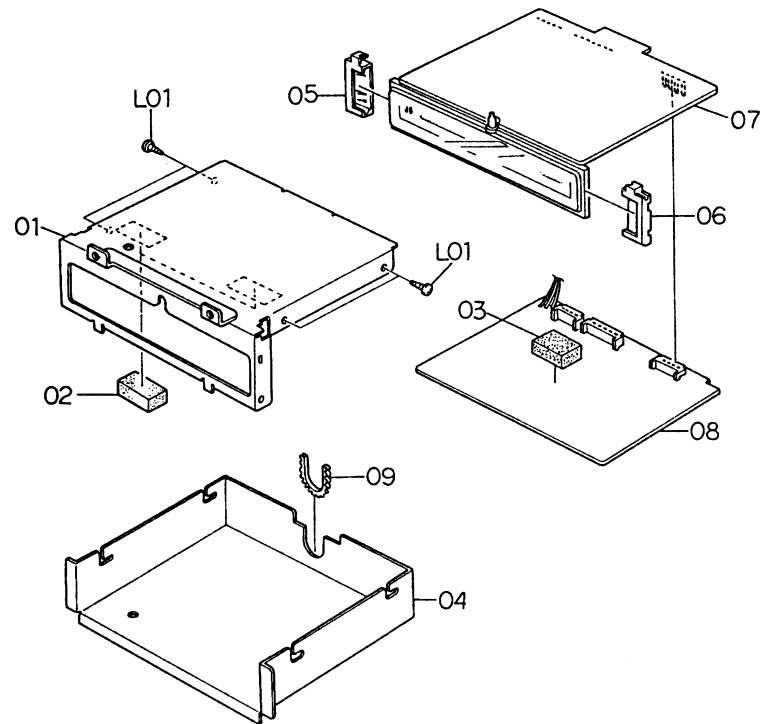


Fig. 8.5

8.6. Synthesis Mechanism Sub Ass'y (B03)

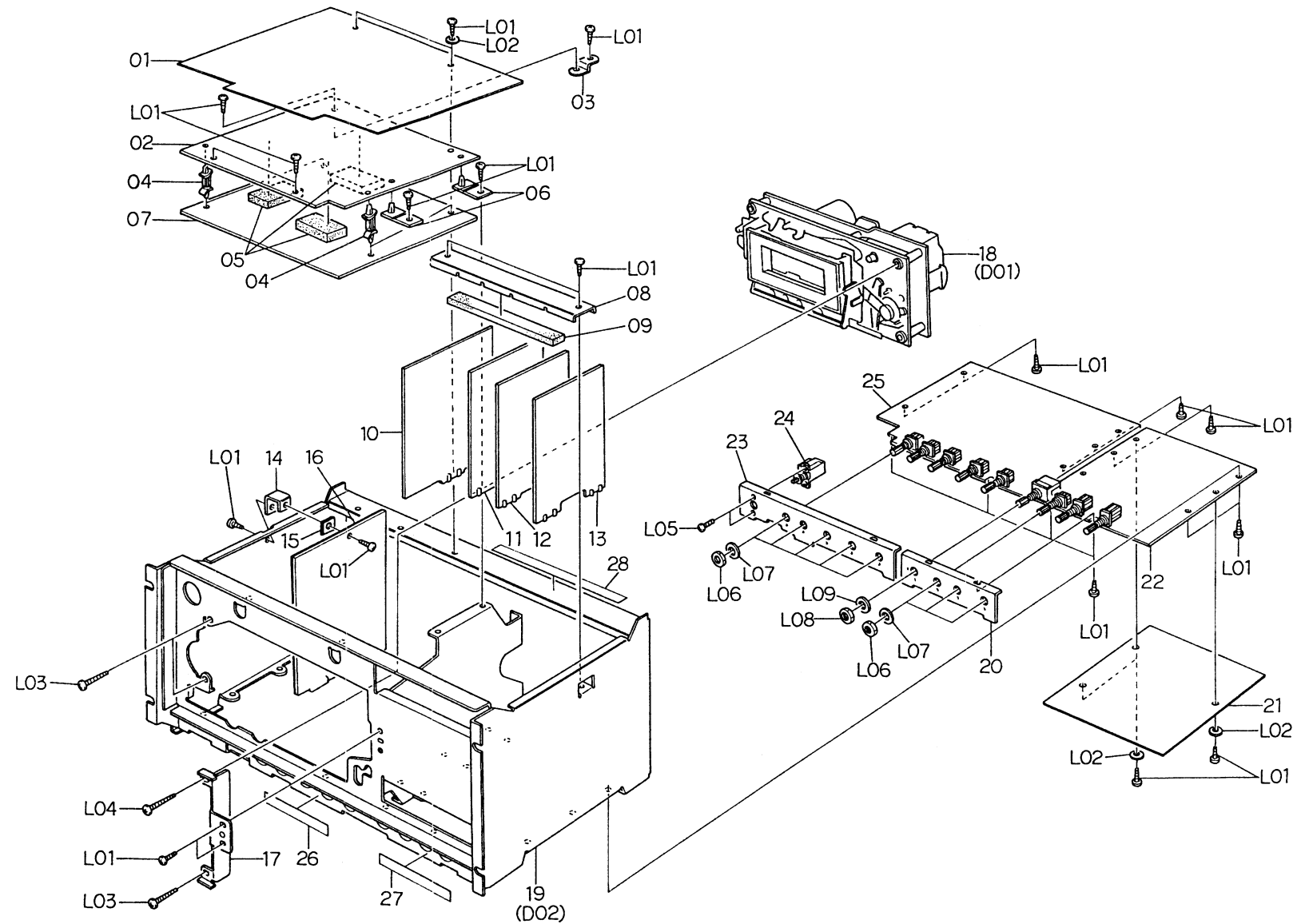


Fig. 8.6

| Schematic Ref. No. | Part No. | Description                                     | Q'ty | Schematic Ref. No. | Part No. | Description                                                | Q'ty | Schematic Ref. No. | Part No. | Description                              | Q'ty | Schematic Ref. No. | Part No. | Description                                             | Q'ty |
|--------------------|----------|-------------------------------------------------|------|--------------------|----------|------------------------------------------------------------|------|--------------------|----------|------------------------------------------|------|--------------------|----------|---------------------------------------------------------|------|
| B02                | HA04011A | FL Indicator Ass'y<br>Serial No.:<br>A11701001— | 1    | B03                | HA04012A | Synthesis Mechanism Sub Ass'y<br>Serial No.:<br>A11701001— | 1    | 13                 | BA04235A | Playback Amp. & Dolby NR<br>P.C.B. Ass'y | 1    | 27                 | 0M04177A | Function Switch Seal R                                  | 1    |
| 01                 | JA03683A | FL Indicator Case Ass'y                         | 1    | 01                 | 0B08824B | CPU P.C.B. Shield Plate                                    | 1    | 14                 | 0J04151B | P.C.B. Holder A                          | 1    | 28                 | 0M04179A | Module P.C.B. Indicator Label                           | 1    |
| 02                 | 0J04263B | Cushion B                                       | 2    | 02                 | BA04229A | CPU P.C.B. B Ass'y                                         | 1    | 15                 | 0J04264A | Insulator                                | 1    | —                  | 0M04170A | Amplifier Serial No. Seal                               | 1    |
| 03                 | 0J04262B | Cushion A                                       | 1    | 03                 | 0J04153A | P.C.B. Holder C                                            | 1    | 16                 | BA04226A | RAMM P.C.B. Ass'y                        | 1    | —                  | 0B08515A | Insh-Lock                                               | 30   |
| 04                 | 0J04127A | FL Indicator Case Cover                         | 1    | 04                 | 0J04255A | P.C.B. Supporter                                           | 4    | 17                 | 0J04135C | Mechanism Bracket                        | 1    | L01                | 0E00857A | BT Screw M3x6 Philips Binding<br>Head                   | 28   |
| 05                 | 0J04119A | FL Indicator Holder L                           | 1    | 05                 | 0J04262A | Cushion A                                                  | 3    | 18                 | CA08243B | Mechanism Ass'y 1000ZXL                  | 1    | L02                | 0E00178A | Washer 3mm                                              | 5    |
| 06                 | 0J04120A | FL Indicator Holder R                           | 1    | 06                 | 0B08771A | Hinge                                                      | 2    | 19                 | JA03734A | Chassis Sub Ass'y                        | 1    | L03                | 0E00944A | BT Screw M4x15 Philips Binding<br>Head (Block Chromate) | 3    |
| 07                 | BA04246A | FL Indicator P.C.B. B Ass'y                     | 1    | 07                 | BA04228A | CPU P.C.B. A Ass'y                                         | 1    | 20                 | 0J04146A | Switch Plate MB                          | 1    | L04                | 0E00924A | BT Screw M4x16 Philips Binding<br>Head                  | 1    |
| 08                 | BA04245A | FL Indicator P.C.B. A Ass'y                     | 1    | 08                 | 0J04152A | P.C.B. Holder B                                            | 1    | 21                 | 0B08825A | Main P.C.B. Insulator                    | 1    | L05                | 0E00502A | Screw M3x5 Philips Pan Head                             | 2    |
| 09                 | 0B08776A | Free Bushing 36mm                               | 1    | 09                 | 0J04155B | P.C.B. Cushion                                             | 1    | 22                 | 0J04145A | Switch Plate LB                          | 1    | L06                | —        | Switch Nut A                                            | (8)  |
| L01                | 0E00857A | BT Screw M3x6 Philips Binding<br>Head           | 4    | 10                 | BA04231A | Record Eq. Amp. P.C.B. Ass'y                               | 1    | 23                 | 0B07253A | Power Switch                             | 1    | L07                | —        | Switch Washer A                                         | (8)  |
|                    |          |                                                 |      | 11                 | BA04230A | Detector P.C.B. Ass'y                                      | 1    | 24                 | 0B07252A | Power Switch                             | 1    | L08                | —        | Switch Nut B                                            | (1)  |
|                    |          |                                                 |      | 12                 | BA04236A | Record Dolby NR P.C.B. Ass'y                               | 1    | 25                 | BA04244B | Logic P.C.B. Ass'y                       | 1    | L09                | —        | Switch Washer B                                         | (1)  |
|                    |          |                                                 |      |                    |          |                                                            |      | 26                 | 0M04178A | Function Switch Seal L                   | 1    |                    |          |                                                         |      |

8.7. Rear Panel Ass'y (B04)

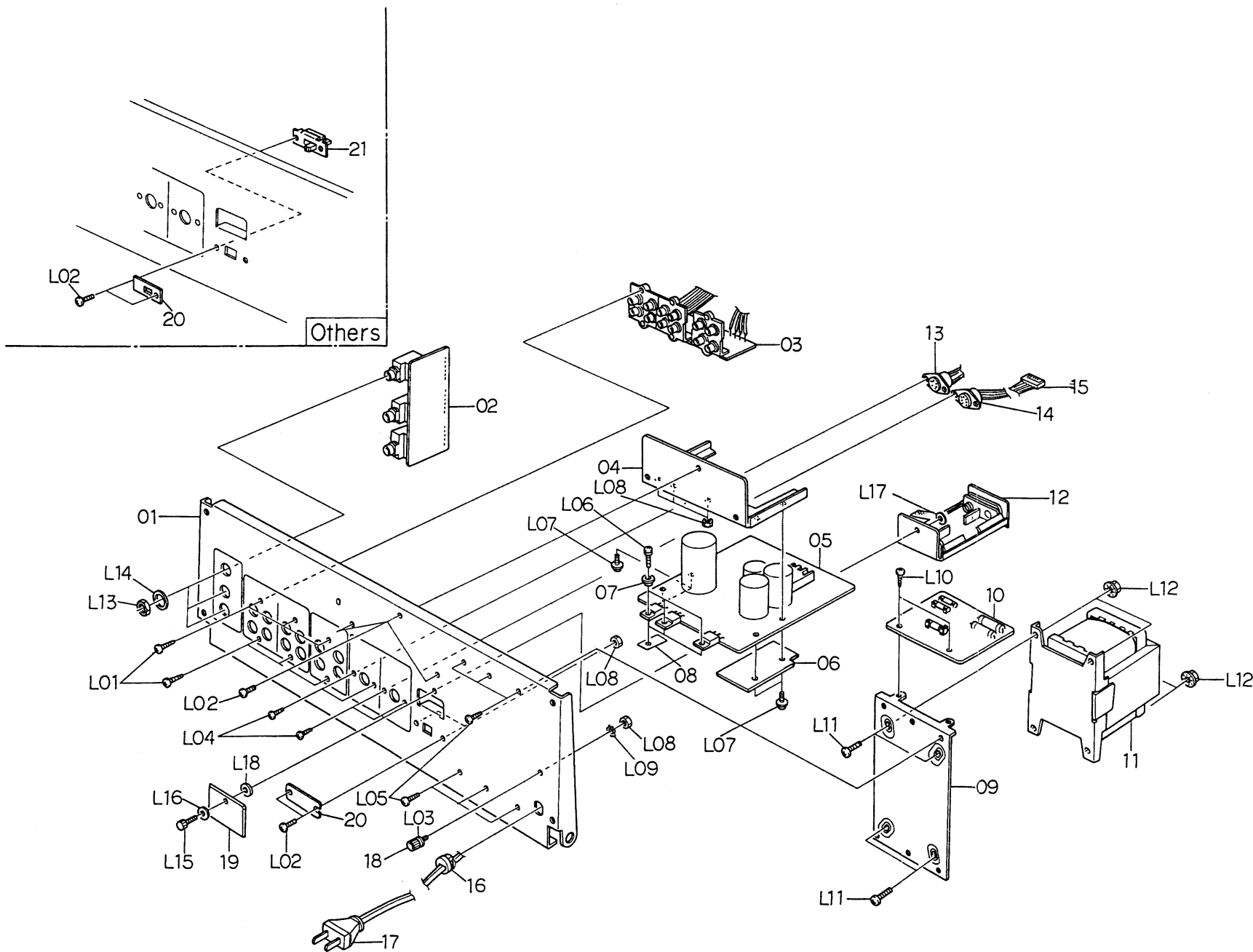


Fig. 8.7

8.8. Headphone Jack Ass'y (C01)

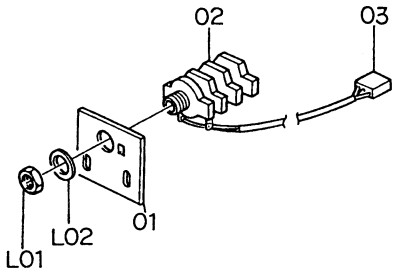


Fig. 8.8

8.9. Display House Ass'y (C02)

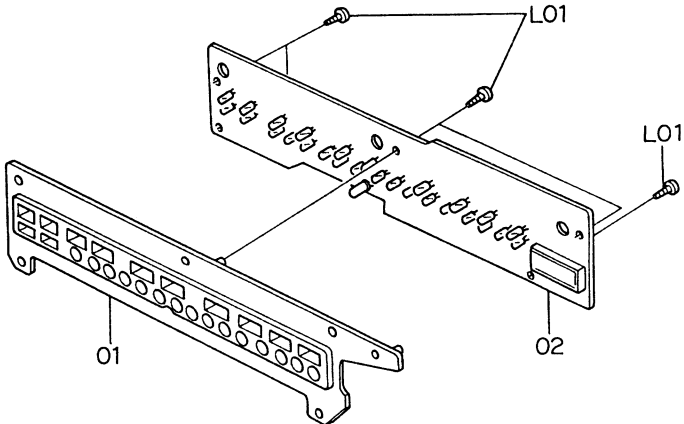


Fig. 8.9

8.10. Front Escutcheon B Ass'y (C03)

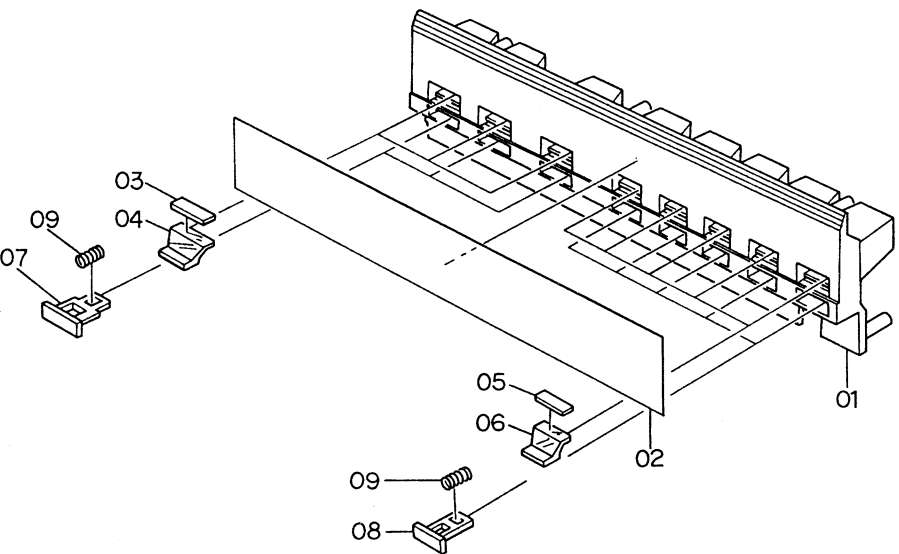


Fig. 8.10

| Schematic Ref. No. | Part No. | Description                                                            | Q'ty | Schematic Ref. No. | Part No.               | Description                                         | Q'ty |
|--------------------|----------|------------------------------------------------------------------------|------|--------------------|------------------------|-----------------------------------------------------|------|
| B04                | HA04010A | Rear Panel Ass'y (U.S.A. & Canada)                                     | 1    | L01                | 0E00921A               | BT Screw M3x8 Philips Binding Head (Black Chromate) | 6    |
|                    | HA04035A | Rear Panel Ass'y (Japan)                                               | 1    | L02                | 0E00593A               | Screw M3x6 Philips Binding Head                     | 5    |
|                    | HA04036A | Rear Panel Ass'y (Others)                                              | 1    | L03                | 0E00732A               | Washer 3mm                                          | 1    |
|                    | HA04037A | Rear Panel Ass'y (220V Class 2)                                        | 1    | L04                | 0E00714A               | Screw M2.6x6 Philips Binding Head (Bronze)          | 4    |
|                    | HA04038A | Rear Panel Ass'y (UK)                                                  | 1    | L05                | 0E00860A               | BT Screw M3x6 Philips Binding Head (Bronze)         | 6    |
|                    | HA04039A | Rear Panel Ass'y (Australia)                                           | 1    | L06                | 0E00510A               | Screw M3x8 Philips Pan Head                         | 3    |
|                    |          | Serial No.: A11701001—                                                 |      | L07                | 0E00606A               | Screw M3x6 Philips Pan Head                         | 4    |
|                    |          |                                                                        |      | L08                | 0E00507A               | Nut Hex. M3                                         | 6    |
|                    | 01       | 0H03881D                                                               | 1    | L09                | 0E00172A               | Washer 3mm Toothed Lock                             | 1    |
|                    | 02       | BA04243A                                                               | 1    | L10                | 0E00857A               | BT Screw M3x6 Philips Binding Head                  | 2    |
| 03                 | BA04242A | Pin Jack P.C.B. Ass'y                                                  | 1    | L11                |                        |                                                     |      |
| 04                 | 0B08759C | Heat Sink                                                              | 1    |                    | 0E00929A               | Screw M4x8 Philips Binding Head                     | 4    |
| 05                 | BA04234A | Power Supply P.C.B. Ass'y                                              | 1    | L12                | 0E00928A               | Nut Hex. M4 Flange                                  | 4    |
| 06                 | 0B08826B | Insulator                                                              | 1    | L13                | —                      | MIC Jack Nut                                        | (3)  |
| 07                 | 0B08602A | Transistor Bushing TO220                                               | 3    | L14                | —                      | MIC Jack Washer                                     | (3)  |
| 08                 | 0B08601A | Insulator Mica TO220                                                   | 3    | L15                | 0H03825B               | Screw M3x5 Sylinder Head                            | 1    |
| 09                 | 0J04147B | Transformer Holder                                                     | 1    | L16                | 0H03760B               | Washer A                                            | 1    |
| 10                 | BA04256A | Fuse P.C.B. Ass'y (U.S.A., Canada & Others)                            | 1    | L17                | 0J04067A               | Washer FT40                                         | 1    |
|                    | BA04257A | Fuse P.C.B. Ass'y (Japan)                                              | 1    | L18                | 0E00157A               | Washer 3mm (Black Plastics)                         | 1    |
|                    | BA04259A | Fuse P.C.B. Ass'y (220V Class 2)                                       | 1    | C01                | JA03737A               | Headphone Jack Ass'y                                | 1    |
|                    | BA04258A | Fuse P.C.B. Ass'y (UK & Australia)                                     | 1    |                    | Serial No.: A11701001— |                                                     |      |
| 11                 | 0B06630A | Power Transformer (U.S.A. & Canada)                                    | 1    | 01                 | 0J04110A               | Headphone Jack Holder                               | 1    |
|                    | 0B06631A | Power Transformer (Japan)                                              | 1    | 02                 | 0B08511A               | Headphone Jack                                      | 1    |
|                    | 0B06633A | Power Transformer (Others)                                             | 1    | 03                 | 0B08765A               | 3P-H Connector                                      | 1    |
|                    | 0B06632A | Power Transformer (220V Class 2, UK & Australia)                       | 1    | L01                | —                      | Headphone Jack Nut                                  | (1)  |
|                    |          |                                                                        |      | L02                | —                      | Headphone Jack Washer                               | (1)  |
| 12                 | JA03733A | Battery Box Ass'y                                                      | 1    | C02                | HA04018A               | Display House Ass'y                                 | 1    |
| 13                 | 0B08584A | 8P DIN Socket                                                          | 1    |                    | Serial No.: A11701001— |                                                     |      |
| 14                 | 0B08495A | 8P DIN Socket                                                          | 1    | 01                 | 0H03866B               | Display House                                       | 1    |
| 15                 | 0B08770A | 8P-H Connector                                                         | 1    | 02                 | BA04233A               | Display P.C.B. Ass'y                                | 1    |
| 16                 | 0B08037U | Cord Bushing (U.S.A., Canada, 220V Class 2, Others, Australia & Japan) | 1    | L01                | 0E00857A               | BT Screw M3x6 Philips Binding Head                  | 5    |
|                    | 0B08351A | Cord Bushing (UK)                                                      | 1    | C03                | HA04016A               | Front Escutcheon B Ass'y                            | 1    |
| 17                 | 0B08533A | Power Cord (U.S.A., Canada & Others)                                   | 1    |                    | Serial No.: A11701001— |                                                     |      |
|                    | 0B08219B | Power Cord (Japan)                                                     | 1    | 01                 | 0H03872B               | Front Escutcheon B                                  | 1    |
|                    | 0B08093U | Power Cord (220V Class 2)                                              | 1    | 02                 | 0J04117A               | Light Intercepting Reflector                        | 1    |
|                    | 0B08348A | Power Cord (UK)                                                        | 1    | 03                 | 0H03840A               | Filter Blue A                                       | 3    |
|                    | 0B05241A | Power Cord (Australia)                                                 | 1    | 04                 | 0H03849B               | Indicator B                                         | 3    |
| 18                 | 0B03920B | Ground Terminal                                                        | 1    | 05                 | 0H03841A               | Filter Blue B                                       | 5    |
| 19                 | 0H03882A | Battery Cover                                                          | 1    | 06                 | 0H03848B               | Indicator A                                         | 5    |
| 20                 | 0J03663C | Switch Cover C (U.S.A., Canada, 220V Class 2, Australia & Japan)       | 1    | 07                 | 0H03862A               | Function Button B                                   | 3    |
|                    | 0M03946A | Voltage Lock Plate (Others)                                            | 1    | 08                 | 0H03861A               | Function Button A                                   | 5    |
| 21                 | 0B07092U | Voltage Selector                                                       | 1    | 09                 | 0J04115B               | Function Switch Spring                              | 8    |
| —                  | 0M03955A | Voltage Label B (Others)                                               | 1    |                    |                        |                                                     |      |
| —                  | 0M03794A | Voltage Label 100V (Japan)                                             | 1    |                    |                        |                                                     |      |
| —                  | 0M03796A | Voltage Label 220V (220V Class 2)                                      | 1    |                    |                        |                                                     |      |
| —                  | 0M03797A | Voltage Label 240V (UK & Australia)                                    | 1    |                    |                        |                                                     |      |
| —                  | 0M03798A | Nakamichi Label (Japan)                                                | 1    |                    |                        |                                                     |      |
| —                  | 0M03844B | Power Cord Label (UK)                                                  | 1    |                    |                        |                                                     |      |
| —                  | 0F01071A | Free-Up Belt                                                           | 1    |                    |                        |                                                     |      |
| —                  | 0M04203A | ABLE Level (U.S.A.)                                                    | 1    |                    |                        |                                                     |      |



## 8.11. Front Escutcheon A Ass'y (C04)

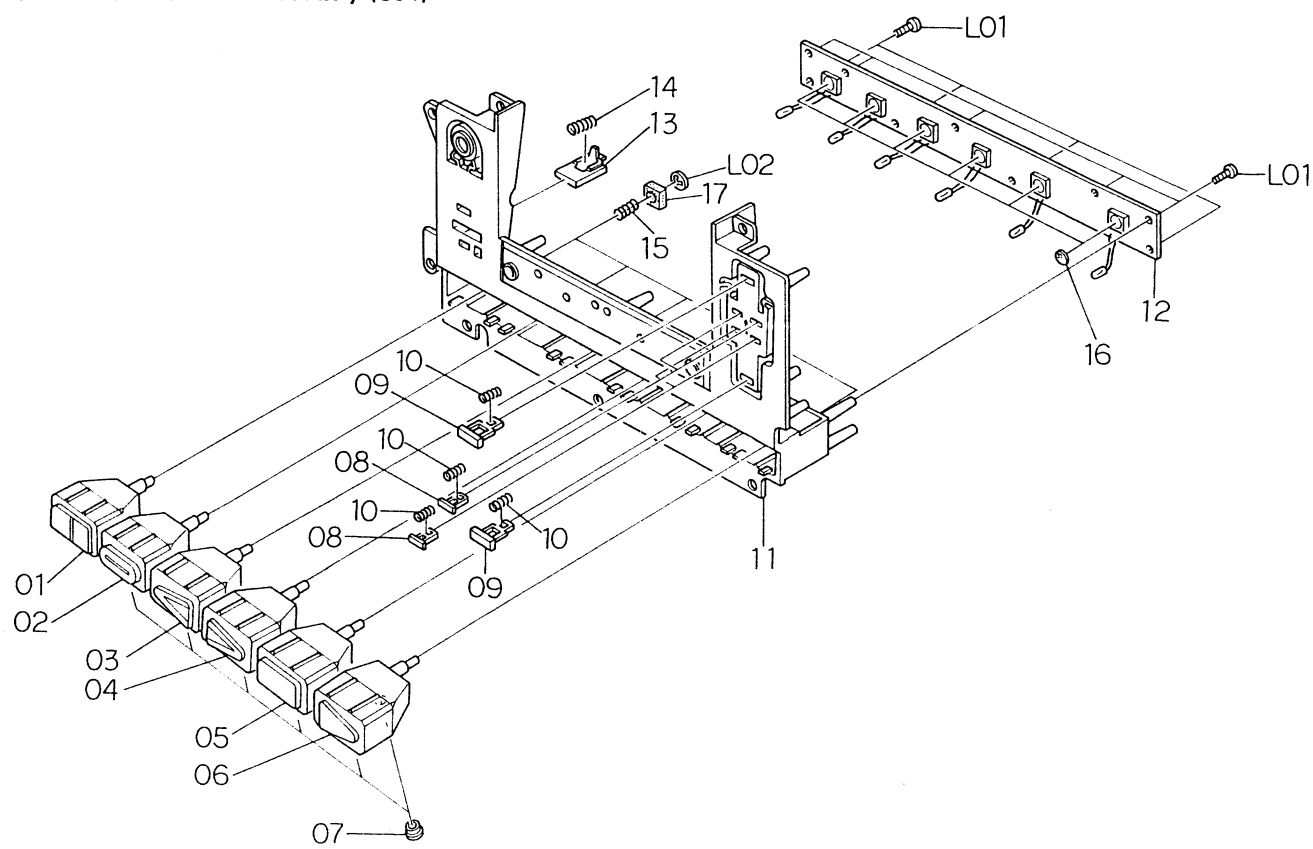


Fig. 8.11

| Schematic Ref. No. | Part No. | Description                                           | Q'ty |
|--------------------|----------|-------------------------------------------------------|------|
| C04                | HA04015A | Front Escutcheon A Ass'y<br>Serial No.:<br>A11701001— | 1    |
| 01                 | HA04002A | Pause Button Ass'y                                    | 1    |
| 02                 | HA04003A | Record Button Ass'y                                   | 1    |
| 03                 | HA04004A | Rewind Button Ass'y                                   | 1    |
| 04                 | HA04005A | F.F. Button Ass'y                                     | 1    |
| 05                 | HA04006A | Stop Button Ass'y                                     | 1    |
| 06                 | HA04007A | Play Button Ass'y                                     | 1    |
| 07                 | OJ04109A | Lamp Holder                                           | 6    |
| 08                 | OH03861A | Function Button A                                     | 4    |
| 09                 | OH03862A | Function Button B                                     | 2    |
| 10                 | OJ04115B | Function Switch Spring                                | 6    |
| 11                 | HA03998B | Front Escutcheon A Sub Ass'y                          | 1    |
| 12                 | BA04239A | Mechanism Control Switch P.C.B.<br>Ass'y              | 1    |
| 13                 | OH03865A | Eject Button                                          | 1    |
| 14                 | OJ04114A | Power Switch Spring                                   | 1    |
| 15                 | OJ04113B | Control Switch Spring                                 | 6    |
| 16                 | OJ04290B | Switch Cushion                                        | 6    |
| 17                 | OJ04296A | Button Cushion                                        | 6    |
| L01                | 0E00857A | Screw M3x6 Philips Binding Head                       | 9    |
| L02                | 0E00926A | Stopper Ring CS 4mm                                   | 6    |

# 8.12. Mechanism Ass'y 1000ZXL (D01)

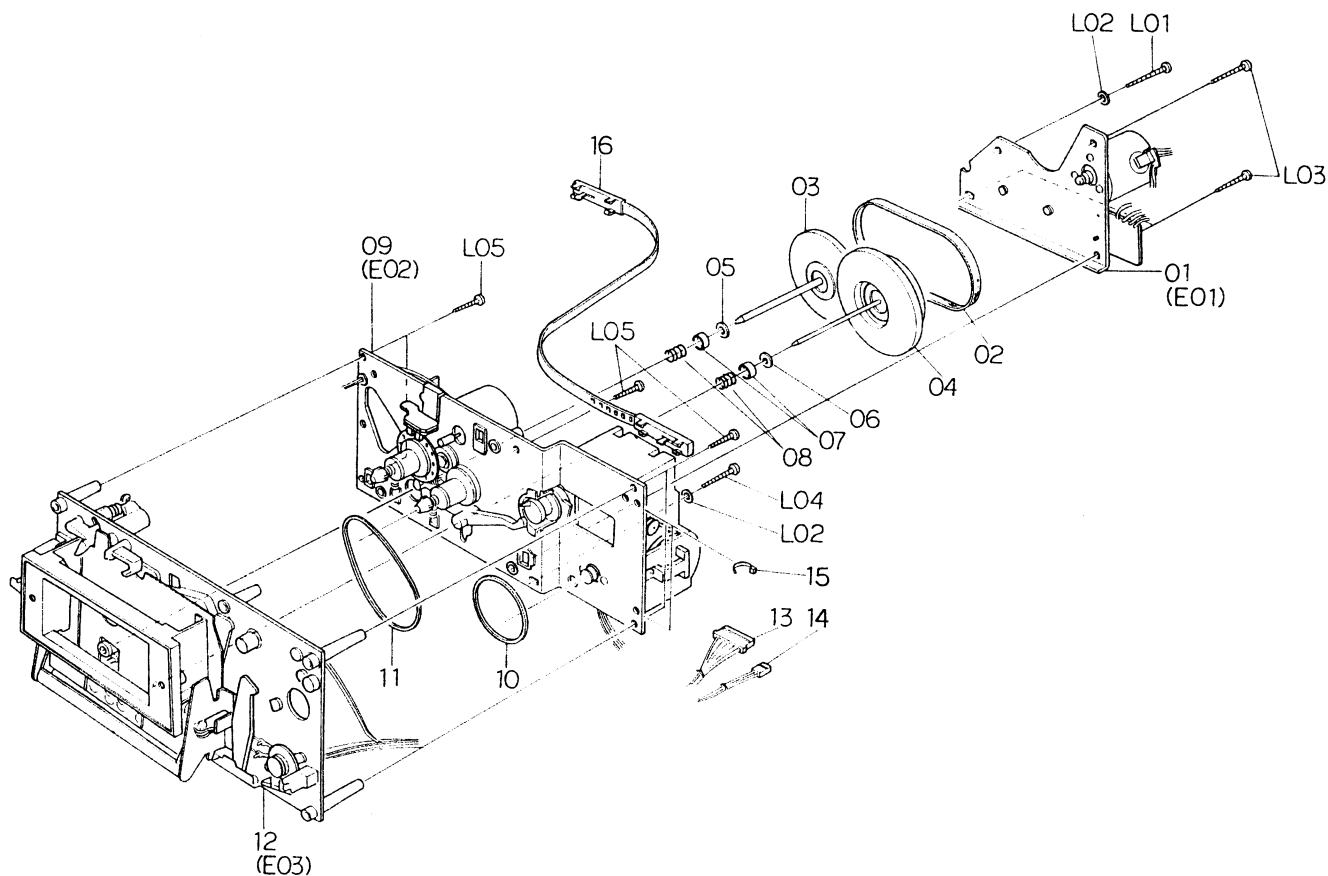


Fig. 8.12

| Schematic Ref. No. | Part No. | Description                                          | Q'ty | Schematic Ref. No. | Part No. | Description                     | Q'ty |
|--------------------|----------|------------------------------------------------------|------|--------------------|----------|---------------------------------|------|
| D01                | CA08243B | Mechanism Ass'y 1000ZXL<br>Serial No.:<br>A11701001— | 1    | L03                | 0E00833A | BT Screw M3x20 Philips Pan Head | 3    |
| 01                 | CA08247A | Flywheel Holder Ass'y                                | 1    | L04                | 0E00835A | BT Screw M3x25 Philips Pan Head | 1    |
| 02                 | 0C08096C | Capstan Belt                                         | 1    | L05                | 0E00883A | BT Screw M3x18 Philips Pan Head | 5    |
| 03                 | CA08173A | Supply Flywheel Ass'y                                | 1    |                    |          |                                 |      |
| 04                 | CA08015A | Take-up Flywheel Ass'y                               | 1    |                    |          |                                 |      |
| 05                 | 0C08021B | Thrust Washer 3.1                                    | 1    |                    |          |                                 |      |
| 06                 | 0C08020B | Thrust Washer 2.6                                    | 1    |                    |          |                                 |      |
| 07                 | 0C08244A | Flange Thrust Cap                                    | 2    |                    |          |                                 |      |
| 08                 | 0C08243A | Flange Thrust Spring                                 | 2    |                    |          |                                 |      |
| 09                 | CA08245A | Sub Mechanism Chassis Ass'y                          | 1    |                    |          |                                 |      |
| 10                 | 0C08099B | Control Motor Belt                                   | 1    |                    |          |                                 |      |
| 11                 | 0C08098B | Counter Belt B                                       | 1    |                    |          |                                 |      |
| 12                 | CA08241A | Main Mechanism Chassis Ass'y                         | 1    |                    |          |                                 |      |
| 13                 | 0B08844A | 10P-H Connector                                      | 1    |                    |          |                                 |      |
| 14                 | 0B08652C | 3P-H Connector                                       | 1    |                    |          |                                 |      |
| 15                 | 0B08515A | Insh-Lock                                            | 16   |                    |          |                                 |      |
| 16                 | 0C08237A | Azimuth Alignment Wire                               | 1    |                    |          |                                 |      |
| —                  | 0M04169A | Mechanism Serial No. Seal                            | 1    |                    |          |                                 |      |
| L01                | 0E00834A | BT Screw M3x30 Philips Pan Head                      | 1    |                    |          |                                 |      |
| L02                | 0E00178A | Washer 3mm                                           | 2    |                    |          |                                 |      |

## 8.13. Chassis Sub Ass'y (D02)

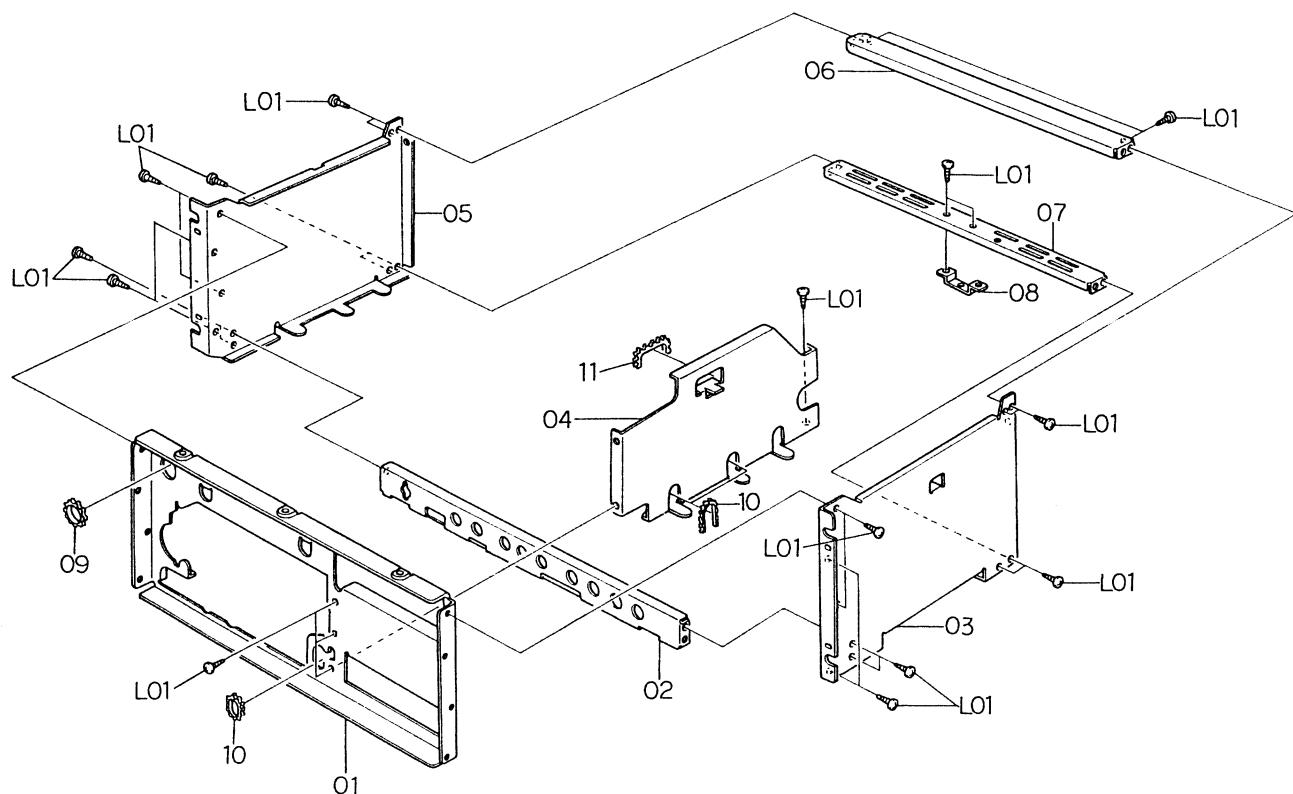


Fig. 8.13

| Schematic Ref. No. | Part No. | Description                                        | Q'ty |
|--------------------|----------|----------------------------------------------------|------|
| D02                | JA03734A | Chassis Sub Ass'y<br>Serial No.:<br>A11701001—     | 1    |
| 01                 | 0J04138B | Front Chassis                                      | 1    |
| 02                 | 0J04143A | Switch Plate Holder                                | 1    |
| 03                 | 0J04140C | Side Chassis R                                     | 1    |
| 04                 | 0J04144C | Center Chassis                                     | 1    |
| 05                 | 0J04139C | Side Chassis L                                     | 1    |
| 06                 | 0J04142B | Top Plate                                          | 1    |
| 07                 | 0J04141A | Bottom Plate                                       | 1    |
| 08                 | 0J04150A | Cabinet Holder                                     | 1    |
| 09                 | 0B08774A | Free Bushing 74mm                                  | 1    |
| 10                 | 0B08775A | Free Bushing 67mm                                  | 3    |
| 11                 | 0B08773A | Free Bushing 91mm                                  | 1    |
| L01                | 0E00857A | BT Screw M3x6 Philips Binding Head                 | 28   |
| E01                | CA08247A | Flywheel Holder Ass'y<br>Serial No.:<br>A11701001— | 1    |
| 01                 | 0C08013I | Flywheel Holder                                    | 1    |
| 02                 | 0C08271A | Capstan Motor                                      | 1    |
| 03                 | 0C08079G | Capstan Motor Pulley                               | 1    |
| 04                 | BA04238A | Speed Cal. P.C.B. Ass'y                            | 1    |
| L01                | 0E00226A | Screw M2.6x4 Philips Pan Head                      | 3    |
| L02                | 0C08068C | Thrust Screw                                       | 2    |
| L03                | 0C03857A | Lock Nut                                           | 2    |
| L04                | 0E00843A | Screw M3x5 Philips Pan Head                        | 1    |

## 8.14. Flywheel Holder Ass'y (E01)

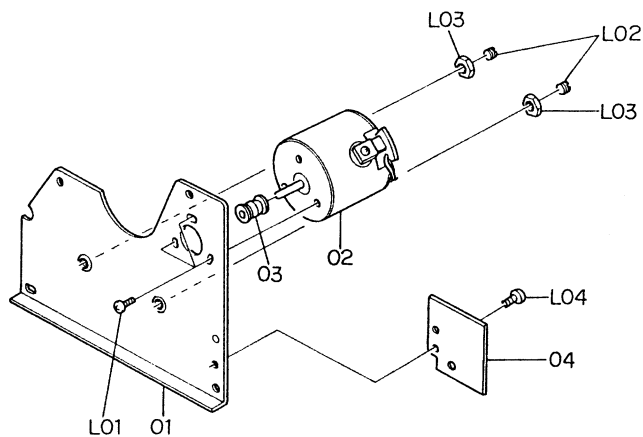


Fig. 8.14

# 8.15. Sub Mechanism Chassis Ass'y (E02)

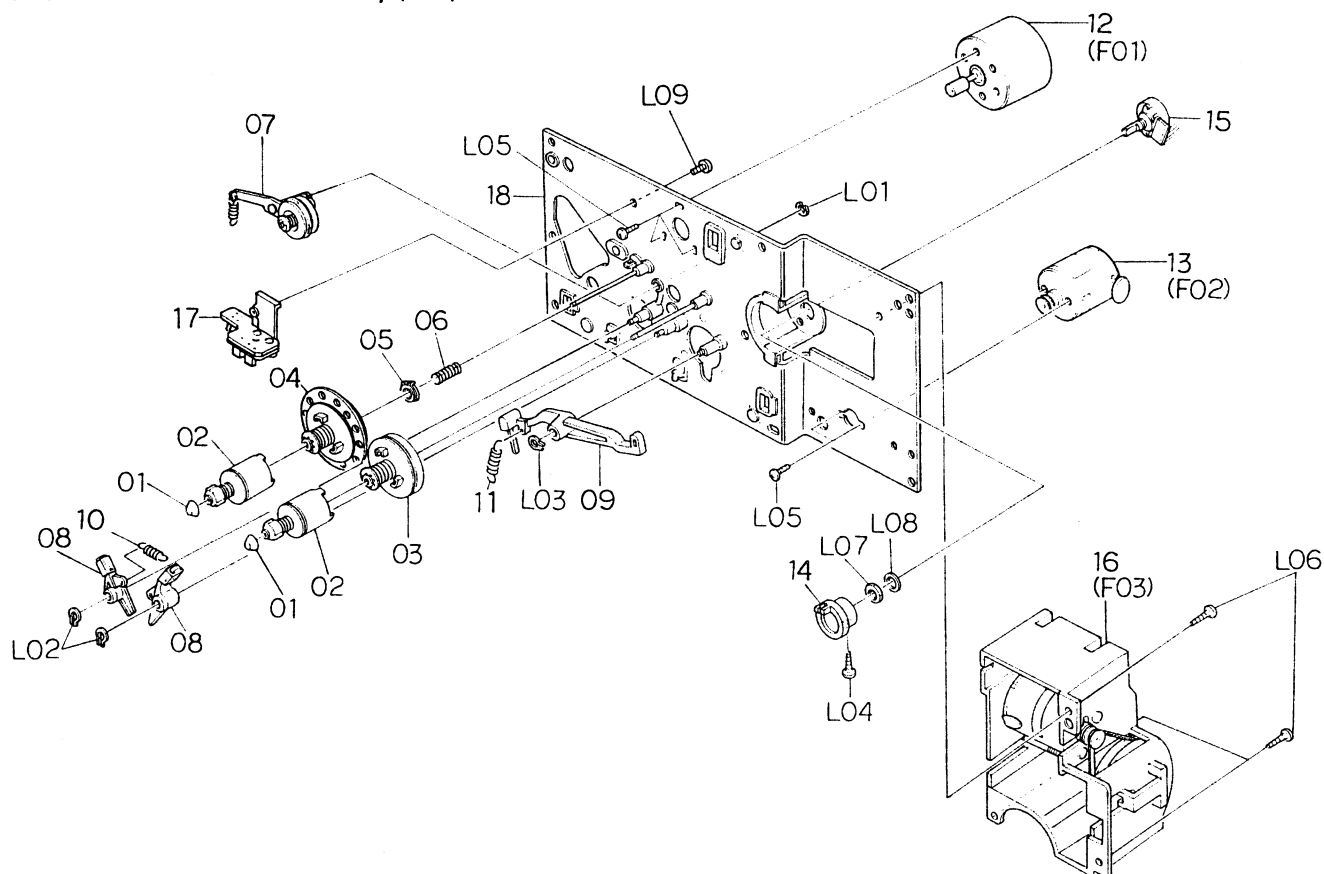


Fig. 8.15

| Schematic Ref. No. | Part No. | Description                                              | Q'ty | Schematic Ref. No. | Part No. | Description                          | Q'ty |
|--------------------|----------|----------------------------------------------------------|------|--------------------|----------|--------------------------------------|------|
| E02                | CA08245A | Sub Mechanism Chassis Ass'y<br>Serial No.:<br>A11701001— | 1    | L04                | 0E00859A | BT Screw M2.6x6 Philips Binding Head | 1    |
| 01                 | 0C08039B | Reel Hub Head                                            | 2    | L05                | 0E00226A | Screw M2.6x4 Philips Pan Head        | 5    |
| 02                 | CA08038C | Reel Hub B Ass'y                                         | 2    | L06                | 0E00846A | BT Screw M3x8 Philips Pan Head       | 3    |
| 03                 | CA08037A | Reel Hub Take-up Ass'y                                   | 1    | L07                | —        | Volume Nut                           | (1)  |
| 04                 | CA08236A | Reel Hub Supply Ass'y                                    | 1    | L08                | —        | Volume Washer                        | (1)  |
| 05                 | CA08039A | Back Tension Ass'y                                       | 1    | L09                | 0E00792A | BT Screw M2.6x6 Philips Pan Head     | 1    |
| 06                 | 0C08269A | Back Tension Spring                                      | 1    |                    |          |                                      |      |
| 07                 | CA08193A | Idler Ass'y                                              | 1    |                    |          |                                      |      |
| 08                 | CA08042A | Brake Ass'y                                              | 2    |                    |          |                                      |      |
| 09                 | 0C08030C | Brake Drive Arm                                          | 1    |                    |          |                                      |      |
| 10                 | 0C08129A | Brake Arm Spring                                         | 1    |                    |          |                                      |      |
| 11                 | 0C08128A | Brake Drive Arm Spring                                   | 1    |                    |          |                                      |      |
| 12                 | CA08242A | Reel Motor Ass'y                                         | 1    |                    |          |                                      |      |
| 13                 | CA08034A | Control Motor Ass'y                                      | 1    |                    |          |                                      |      |
| 14                 | 0C08053B | Volume Coupler                                           | 1    |                    |          |                                      |      |
| 15                 | 0B07240A | Volume Control 10kΩ (B)                                  | 1    |                    |          |                                      |      |
| 16                 | CA08148A | Azimuth Alignment Motor Ass'y                            | 1    |                    |          |                                      |      |
| 17                 | BA04237B | Counter Pulse Generator P.C.B. Ass'y                     | 1    |                    |          |                                      |      |
| 18                 | CA08194A | Sub Chassis Ass'y                                        | 1    |                    |          |                                      |      |
| L01                | 0E00698A | E-Ring 2.5mm                                             | 1    |                    |          |                                      |      |
| L02                | 0E00837A | Stopper Ring 3mm                                         | 2    |                    |          |                                      |      |
| L03                | 0E00838A | Stopper Ring 4mm                                         | 1    |                    |          |                                      |      |

| Schematic Ref. No. | Part No. | Description                                               | Q'ty | Schematic Ref. No. | Part No. | Description                          | Q'ty |
|--------------------|----------|-----------------------------------------------------------|------|--------------------|----------|--------------------------------------|------|
| E03                | CA08241A | Main Mechanism Chassis Ass'y<br>Serial No.:<br>A11701001— | 1    | L14                | 0E00859A | BT Screw M2.6x6 Philips Binding Head | 1    |
|                    |          |                                                           |      | L15                | 0E00255A | Washer 2.6mm                         | 1    |
| 01                 | CA08239A | Cassette Case Holder L Ass'y                              | 1    |                    |          |                                      |      |
| 02                 | 0C08151A | Lid Arm Spring Tube                                       | 1    |                    |          |                                      |      |
| 03                 | CA08022A | Cassette Case Holder R Ass'y                              | 1    |                    |          |                                      |      |
| 04                 | CA08240A | Cassette Case Ass'y                                       | 1    |                    |          |                                      |      |
| 05                 | CA08259A | Cover Plate Ass'y                                         | 1    |                    |          |                                      |      |
| 06                 | CA08248A | Head Mount Base Ass'y                                     | 1    |                    |          |                                      |      |
| 07                 | 0C08121A | Supply Pressure Roller Spring                             | 1    |                    |          |                                      |      |
| 08                 | 0C08250A | Supply Pressure Roller Spring B                           | 1    |                    |          |                                      |      |
| 09                 | CA08053B | Supply Pressure Roller Ass'y                              | 1    |                    |          |                                      |      |
| 10                 | 0C08122B | Supply Pressure Roller Thrust Spring                      | 1    |                    |          |                                      |      |
| 11                 | CA08079B | Take-up Pressure Roller Ass'y                             | 1    |                    |          |                                      |      |
| 12                 | 0C08183B | Take-up Pressure Roller Thrust Spring                     | 1    |                    |          |                                      |      |
| 13                 | CA08250A | Head Base Ass'y E                                         | 1    |                    |          |                                      |      |
| 14                 | 0C08182A | Pressure Roller Drive Bar B                               | 1    |                    |          |                                      |      |
| 15                 | 0C08086B | Head Base Roller                                          | 3    |                    |          |                                      |      |
| 16                 | 0C08050B | Record Sensor                                             | 1    |                    |          |                                      |      |
| 17                 | 0C08051E | Cassette Hold Arm                                         | 1    |                    |          |                                      |      |
| 18                 | 0C08120A | Cassette Hold Spring                                      | 1    |                    |          |                                      |      |
| 19                 | CA08196A | Back Tension Arm Ass'y                                    | 1    |                    |          |                                      |      |
| 20                 | 0C08254A | Tension Arm Collar                                        | 1    |                    |          |                                      |      |
| 21                 | CA08027A | Head Base Drive Arm Ass'y                                 | 1    |                    |          |                                      |      |
| 22                 | 0C08143C | Head Base Drive Arm Spring                                | 1    |                    |          |                                      |      |
| 23                 | CA08026A | Pressure Roller Drive Arm Ass'y                           | 1    |                    |          |                                      |      |
| 24                 | CA08237A | Auto Shut-off Ass'y                                       | 1    |                    |          |                                      |      |
| 25                 | 0C08119A | Record Protector                                          | 1    |                    |          |                                      |      |
| 26                 | 0C08194C | Damper Lock Arm                                           | 1    |                    |          |                                      |      |
| 27                 | 0C08153A | Damper Lock Arm Spring Tube                               | 1    |                    |          |                                      |      |
| 28                 | 0C08116A | Record Arm Spring                                         | 2    |                    |          |                                      |      |
| 29                 | CA08030A | Pneumatic Damper Ass'y                                    | 1    |                    |          |                                      |      |
| 30                 | CA08291A | Supply Capstan Flange Ass'y                               | 1    |                    |          |                                      |      |
| 31                 | CA08292A | Take-up Capstan Flange Ass'y                              | 1    |                    |          |                                      |      |
| 32                 | 0C08186A | Cam Drive Gear                                            | 1    |                    |          |                                      |      |
| 33                 | 0C08029H | Control Cam                                               | 1    |                    |          |                                      |      |
| 34                 | 0C08117A | Counter-Load Arm Spring                                   | 1    |                    |          |                                      |      |
| 35                 | 0C08152A | Counter-Load Arm Spring Tube                              | 1    |                    |          |                                      |      |
| 36                 | CA08028A | Counter-Load Arm Ass'y                                    | 1    |                    |          |                                      |      |
| 37                 | CA08183A | Main Chassis Ass'y                                        | 1    |                    |          |                                      |      |
| L01                | 0E00837A | Stopper Ring 3mm                                          | 9    |                    |          |                                      |      |
| L02                | 0E00832A | BT Screw M3x14 Philips Pan Head                           | 2    |                    |          |                                      |      |
| L03                | 0E00834A | BT Screw M3x30 Philips Pan Head                           | 2    |                    |          |                                      |      |
| L04                | 0E00831A | BT Screw M3x10 Philips Pan Head                           | 3    |                    |          |                                      |      |
| L05                | 0E00254A | Washer 3.1mm (Plastics)                                   | 2    |                    |          |                                      |      |
| L06                | 0E00222A | E-Ring 2mm                                                | 2    |                    |          |                                      |      |
| L07                | 0E00876A | BT Screw M2.6x8 Philips Pan Head                          | 8    |                    |          |                                      |      |
| L08                | 0C08060B | Height Adjustment Nut                                     | 2    |                    |          |                                      |      |
| L09                | 0E00142A | Washer 2.6mm                                              | 2    |                    |          |                                      |      |
| L10                | 0E00879A | BT Screw M2x15 Philips Pan Head                           | 1    |                    |          |                                      |      |
| L11                | 0E00838A | Stopper Ring 4mm                                          | 3    |                    |          |                                      |      |
| L12                | 0E00846A | BT Screw M3x8 Philips Pan Head                            | 3    |                    |          |                                      |      |
| L13                | 0E00895A | Earth Lug 3mm                                             | 2    |                    |          |                                      |      |

## 8.16. Main Mechanism Chassis Ass'y (E03)

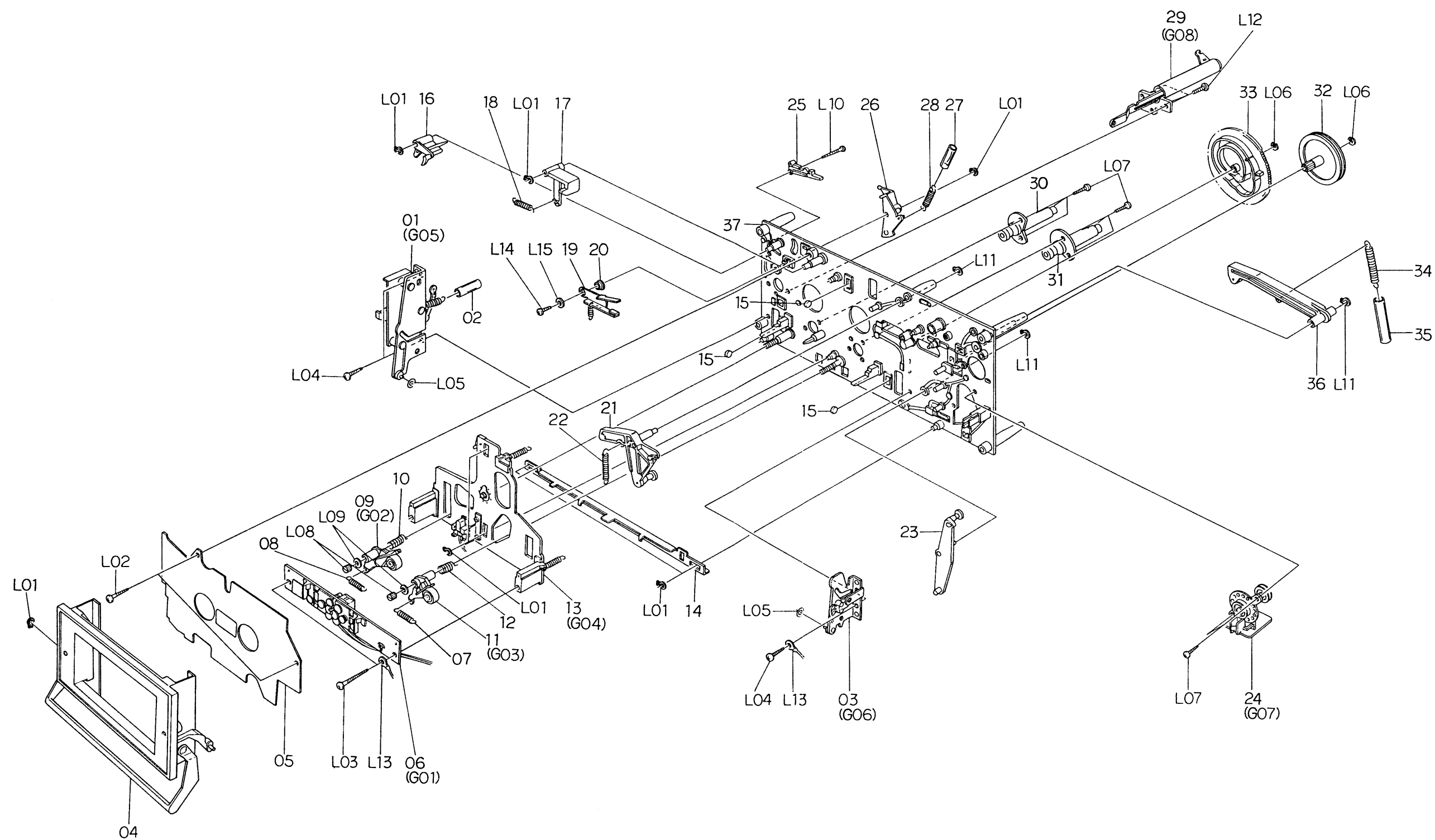


Fig. 8.16



8.17. Reel Motor Ass'y (F01)

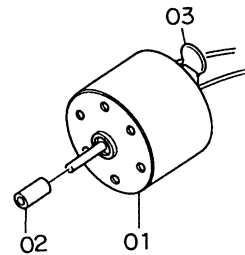


Fig. 8.17

8.18. Control Motor Ass'y (F02)

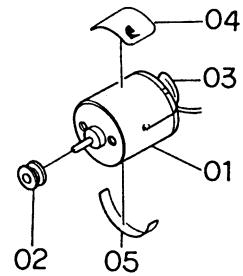


Fig. 8.18

8.19. Azimuth Alignment Motor Ass'y (F03)

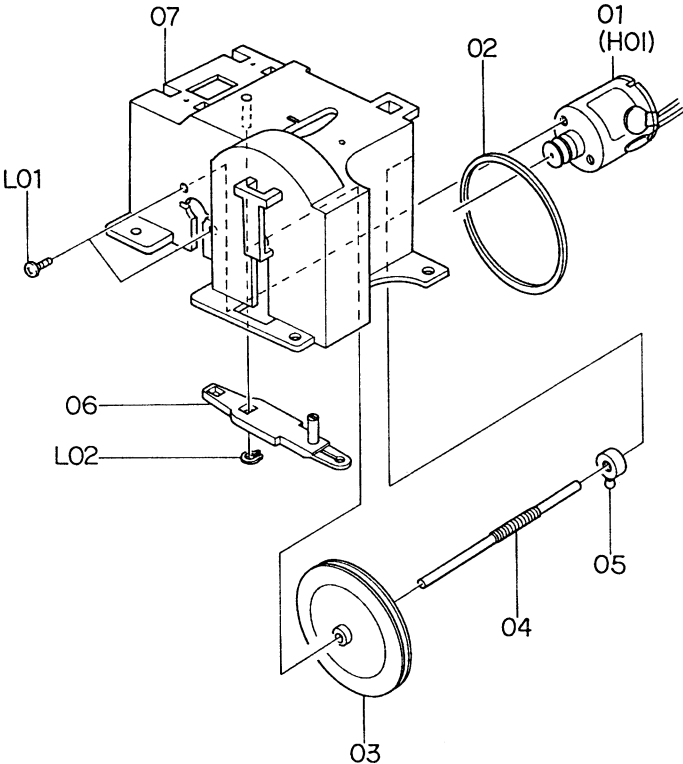


Fig. 8.19

8.20. Head Mount Base Ass'y (G01)

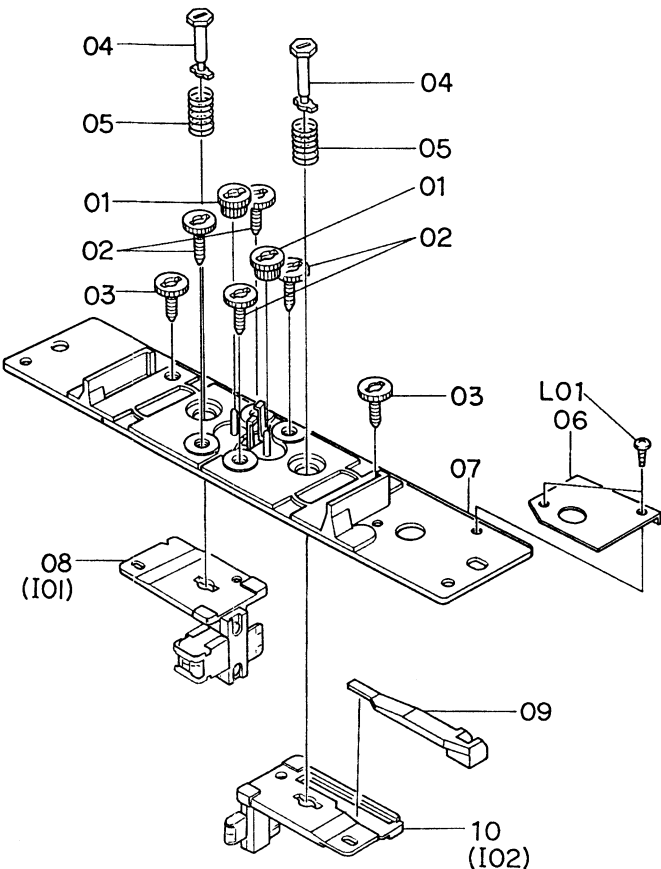


Fig. 8.20

8.21. Supply Pressure Roller Ass'y (G02)

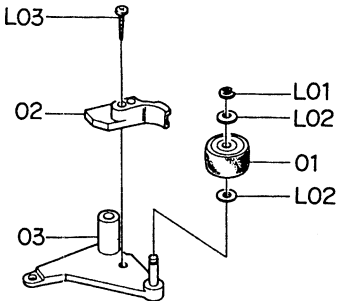


Fig. 8.21

8.22. Take-up Pressure Roller Ass'y (G03)

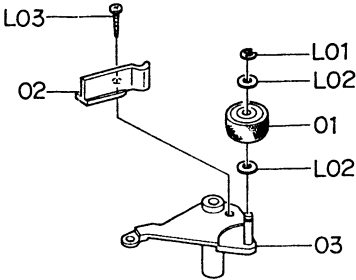


Fig. 8.22

8.23. Head Base Ass'y E (G04)

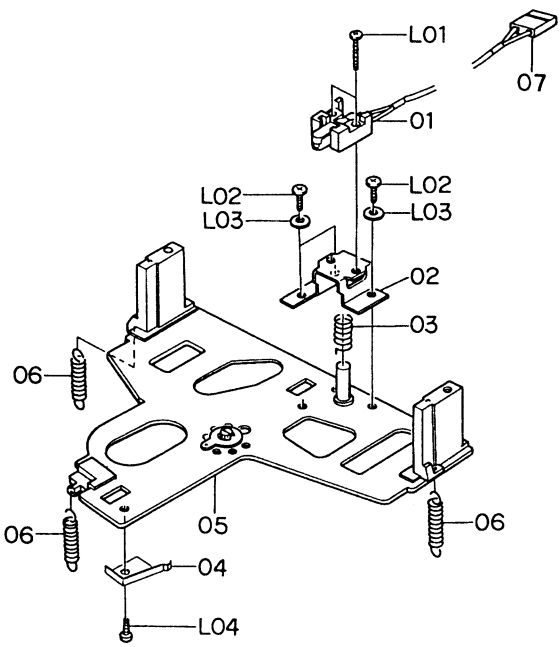


Fig. 8.23

8.24. Cassette Case Holder L Ass'y (G05)

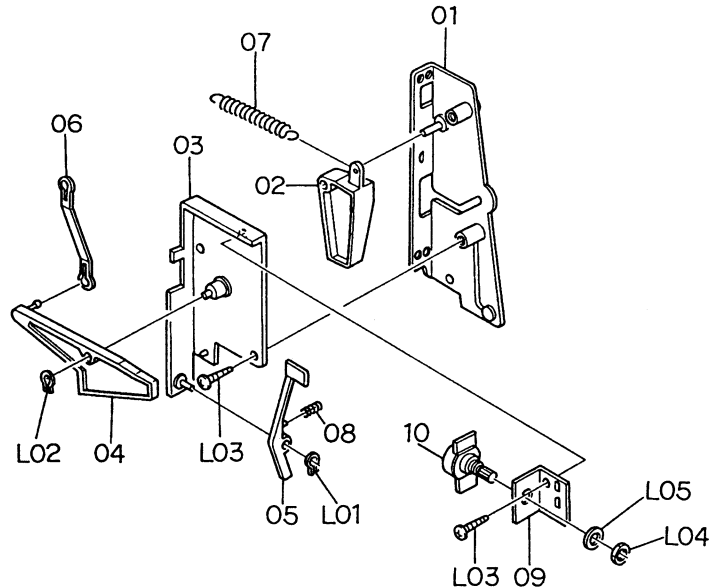


Fig. 8.24

8.25. Cassette Case Holder R Ass'y (G06)

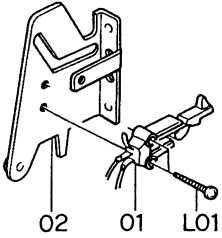


Fig. 8.25

| Schematic Ref. No. | Part No. | Description                                                | Q'ty | Schematic Ref. No. | Part No. | Description                                                | Q'ty |
|--------------------|----------|------------------------------------------------------------|------|--------------------|----------|------------------------------------------------------------|------|
| F01                | CA08242A | Reel Motor Ass'y<br>Serial No.:<br>A11701001—              | 1    | G03                | CA08079A | Take-up Pressure Roller Ass'y<br>Serial No.:<br>A11701001— | 1    |
| 01                 | 0C08272A | Reel Motor                                                 | 1    | 01                 | 0C08164G | Pressure Roller                                            | 1    |
| 02                 | 0C08063F | Reel Motor Pulley                                          | 1    | 02                 | 0C08181C | Take-up Tape Guide                                         | 1    |
| 03                 | 0B09290A | Ceramic Capacitor 0.01μ 50V Z                              | 1    | 03                 | CA08073B | Take-up Pressure Roller Arm Ass'y                          | 1    |
| F02                | CA08034A | Control Motor Ass'y<br>Serial No.:<br>A11701001—           | 1    | L01                | 0E00042A | E-Ring 1.5mm                                               | 1    |
| 01                 | 0C08137A | Control Motor                                              | 1    | L02                | 0C08024A | Washer 2mm                                                 | 2    |
| 02                 | 0C08064A | Control Motor Pulley                                       | 1    | L03                | 0E00788A | BT Screw M2x8 Philips Pan Head                             | 1    |
| 03                 | 0B09292A | Ceramic Capacitor 0.1μ 50V Z                               | 1    | G04                | CA08250A | Head Base Ass'y E<br>Serial No.:<br>A11701001—             | 1    |
| 04                 | 0M03985A | Motor Label 730                                            | 1    | 01                 | GA02083A | E-8LH Erase Head                                           | 1    |
| 05                 | 0M03988A | Motor Seal B                                               | 1    | 02                 | 0C08158D | EH Hold Plate                                              | 1    |
| F03                | CA08148A | Azimuth Alignment Motor Ass'y<br>Serial No.:<br>A11701001— | 1    | 03                 | 0C08166A | EH Hold Plate Spring                                       | 1    |
| 01                 | CA08149A | Azimuth Motor Ass'y                                        | 1    | 04                 | 0C08174C | Cassette Hold Spring                                       | 1    |
| 02                 | 0C08099B | Control Motor Belt                                         | 1    | 05                 | CA08003P | Head Base Ass'y                                            | 1    |
| 03                 | 0C08229B | Drive Pulley                                               | 1    | 06                 | 0C08175A | Head Base L Spring                                         | 3    |
| 04                 | 0C08230B | Drive Pulley Shaft                                         | 1    | 07                 | 0B08764A | 2P-H Connector                                             | 1    |
| 05                 | 0C08231C | Drive Nut                                                  | 1    | L01                | 0E00889A | Screw M1.7x8 Philips Pan Head                              | 2    |
| 06                 | 0C08232C | Drive Bar                                                  | 1    | L02                | 0E00909A | Screw M2x6 Philips Pan Head                                | 3    |
| 07                 | 0C08233G | Drive Unit Base                                            | 1    | L03                | 0E00117A | Washer 2mm                                                 | 3    |
| L01                | 0E00226A | Screw M2.6x4 Philips Pan Head                              | 2    | L04                | 0E00853A | BT Screw M2x3 Philips Pan Head                             | 1    |
| L02                | 0E00837A | Stopper Ring 3mm                                           | 1    | G05                | CA08239A | Cassette Case Holder L Ass'y<br>Serial No.:<br>A11701001—  | 1    |
| G01                | CA08248A | Head Mount Base Ass'y<br>Serial No.:<br>A11701001—         | 1    | 01                 | CA08090F | Cassette Case L Sub Ass'y                                  | 1    |
| 01                 | 0C08028C | Head Height Adjustment Gear                                | 2    | 02                 | 0C08073C | Lid Arm A                                                  | 1    |
| 02                 | 0C08027E | Head Height Adjustment Screw                               | 4    | 03                 | 0C08195G | Arm Holder                                                 | 1    |
| 03                 | 0C08026D | Azimuth Alignment Screw                                    | 2    | 04                 | 0C08245A | Eject Arm A                                                | 1    |
| 04                 | 0C08161B | Spring Stopper                                             | 2    | 05                 | 0C08197C | Eject Arm B                                                | 1    |
| 05                 | 0C08187B | Head Plate Spring                                          | 2    | 06                 | 0C08199B | Eject Arm Joint                                            | 1    |
| 06                 | 0C08236A | Azimuth Alignment Wire Hold Plate                          | 1    | 07                 | 0C08114A | Lid Arm Spring                                             | 1    |
| 07                 | CA08083C | Head Mount Base Sub Ass'y                                  | 1    | 08                 | 0C08211C | Eject Arm Spring                                           | 1    |
| 08                 | CA08244A | P-8L Playback Head Ass'y                                   | 1    | 09                 | 0C08248B | Pitch Control Volume Holder                                | 1    |
| 09                 | 0C08235A | Azimuth Alignment Plate                                    | 1    | 10                 | 0B07282A | Volume Control 20kΩ (B)                                    | 1    |
| 10                 | CA08238A | R-8L Record Head Ass'y                                     | 1    | L01                | 0E00837A | Stopper Ring 3mm                                           | 1    |
| L01                | 0E00917A | BT Screw M2.6x5 Philips Pan Head                           | 2    | L02                | 0E00838A | Stopper Ring 4mm                                           | 1    |
| G02                | CA08053B | Supply Pressure Roller Ass'y<br>Serial No.:<br>A11701001—  | 1    | L03                | 0E00865A | BT Screw M3x10 Philips Binding Head                        | 2    |
| 01                 | 0C08164G | Pressure Roller                                            | 1    | L04                | —        | Volume Nut                                                 | (1)  |
| 02                 | 0C08189B | Supply Tape Guide                                          | 1    | L05                | —        | Volume Washer                                              | (1)  |
| 03                 | CA08061A | Supply Pressure Roller Arm Ass'y                           | 1    | G06                | CA08022A | Cassette Case Holder R Ass'y<br>Serial No.:<br>A11701001—  | 1    |
| L01                | 0E00042A | E-Ring 1.5mm                                               | 1    | 01                 | 0C08133A | Eject Sensor                                               | 1    |
| L02                | 0C08024A | Washer 2mm                                                 | 2    | 02                 | CA08044A | Cassette Case Holder R Sub Ass'y                           | 1    |
| L03                | 0E00788A | BT Screw M2x8 Philips Pan Head                             | 1    | L01                | 0E00840A | BT Screw M2x8 Philips Pan Head                             | 2    |

## 8.26. Auto Shut-off Ass'y (G07)

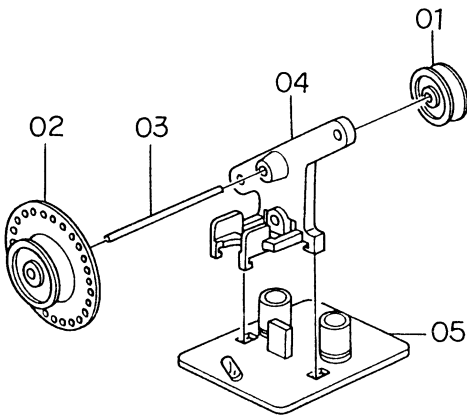


Fig. 8.26

## 8.27. Pneumatic Damper Ass'y (G08)

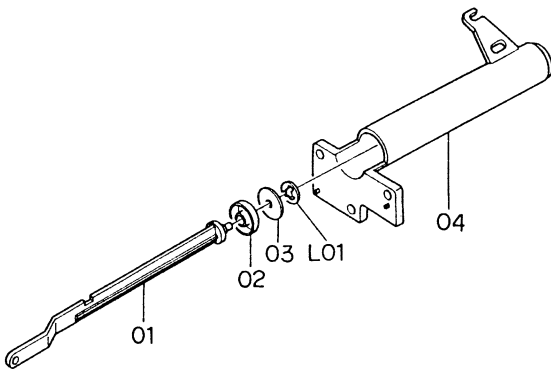


Fig. 8.27

## 8.28. Azimuth Motor Ass'y (H01)

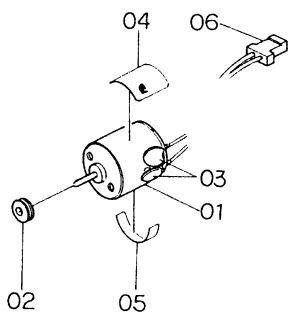


Fig. 8.28

## 8.29. P-8L Playback Head Ass'y (I01)

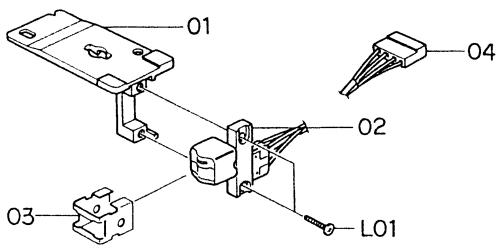


Fig. 8.29

## 8.30. R-8L Record Head Ass'y (I02)

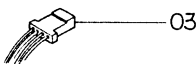
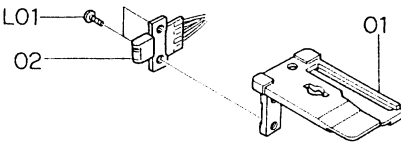


Fig. 8.30

| Schematic Ref. No. | Part No. | Description                                           | Q'ty |
|--------------------|----------|-------------------------------------------------------|------|
| G07                | CA08237A | Auto Shut-off Ass'y<br>Serial No.:<br>A11701001—      | 1    |
| 01                 | 0C08047A | Shut-off Pulley A                                     | 1    |
| 02                 | 0C08206B | Shut-off Pulley B                                     | 1    |
| 03                 | 0C08088B | Shut-off Pulley Shaft                                 | 1    |
| 04                 | 0C08207B | Shut-off Pulley Holder                                | 1    |
| 05                 | BA04070A | Shut-off P.C.B. Ass'y                                 | 1    |
| G08                | CA08030A | Pneumatic Damper Ass'y<br>Serial No.:<br>A11701001—   | 1    |
| 01                 | 0C08058C | Damper Piston                                         | 1    |
| 02                 | 0C08102C | Damper Ring                                           | 1    |
| 03                 | 0C08010C | Damper Plate                                          | 1    |
| 04                 | 0C08059D | Sylinder                                              | 1    |
| L01                | 0E00874A | Stopper Ring CS 2mm                                   | 1    |
| H01                | CA08149A | Azimuth Motor Ass'y<br>Serial No.:<br>A11701001—      | 1    |
| 01                 | 0C08137A | Control Motor                                         | 1    |
| 02                 | 0C08064A | Control Motor Pulley                                  | 1    |
| 03                 | 0B09292A | Ceramic Capacitor 0.1 $\mu$ 50V Z                     | 2    |
| 04                 | 0M03985A | Motor Label 730                                       | 1    |
| 05                 | 0M03988A | Motor Seal B                                          | 1    |
| 06                 | 0B08708A | 2P Connector                                          | 1    |
| I01                | CA08244A | P-8L Playback Head Ass'y<br>Serial No.:<br>A11701001— | 1    |
| 01                 | 0C08160F | Head Plate                                            | 1    |
| 02                 | GA02101A | P-8LZ Playback Head                                   | 1    |
| 03                 | 0C08169D | Pad Lifter 54                                         | 1    |
| 04                 | 0B08767A | 4P-H Connector                                        | 1    |
| L01                | 0E00886A | Screw M1.7x6.5 Philips Pan Head                       | 2    |
| I02                | CA08238A | R-8L Record Head Ass'y<br>Serial No.:<br>A11701001—   | 1    |
| 01                 | 0C08234B | Head Plate                                            | 1    |
| 02                 | GA02102A | R-8LZ Record Head                                     | 1    |
| 03                 | 0B08768A | 4P-H Connector                                        | 1    |
| L01                | 0E00887A | Screw M1.7x4 Philips Pan Head                         | 2    |

## 9. TIMING CHART AND FLOW CHART

### 9.1. Overall Timing Chart

| Mode           | Playback |       |      | Record |           |            |           |       | Cue  |                    |      |
|----------------|----------|-------|------|--------|-----------|------------|-----------|-------|------|--------------------|------|
| Control Button | Stop     | Play  | Stop | Rec.   | Rec./Play | Rec./Pause | Rec./Play | Stop  | Stop | F.F. or Rew./Pause | Stop |
| Tape           |          | 370ms |      |        | 370ms     |            | 140ms     |       |      | 160ms              |      |
|                |          | 300ms | 70ms |        | 300ms     | 70ms       | 70ms      | 70ms  |      |                    | 60ms |
| Output         |          |       |      |        |           |            |           |       |      |                    |      |
|                |          | 280ms |      |        | 280ms     |            | 50ms      |       |      | 160ms              |      |
| Bias           |          |       |      |        |           |            |           |       |      |                    |      |
|                |          |       |      |        | 240ms     |            |           | 330ms |      |                    |      |

Fig. 9.1

### 9.2. Auto Calibration and RAMM Control

#### (1) Auto Calibration Timing Chart

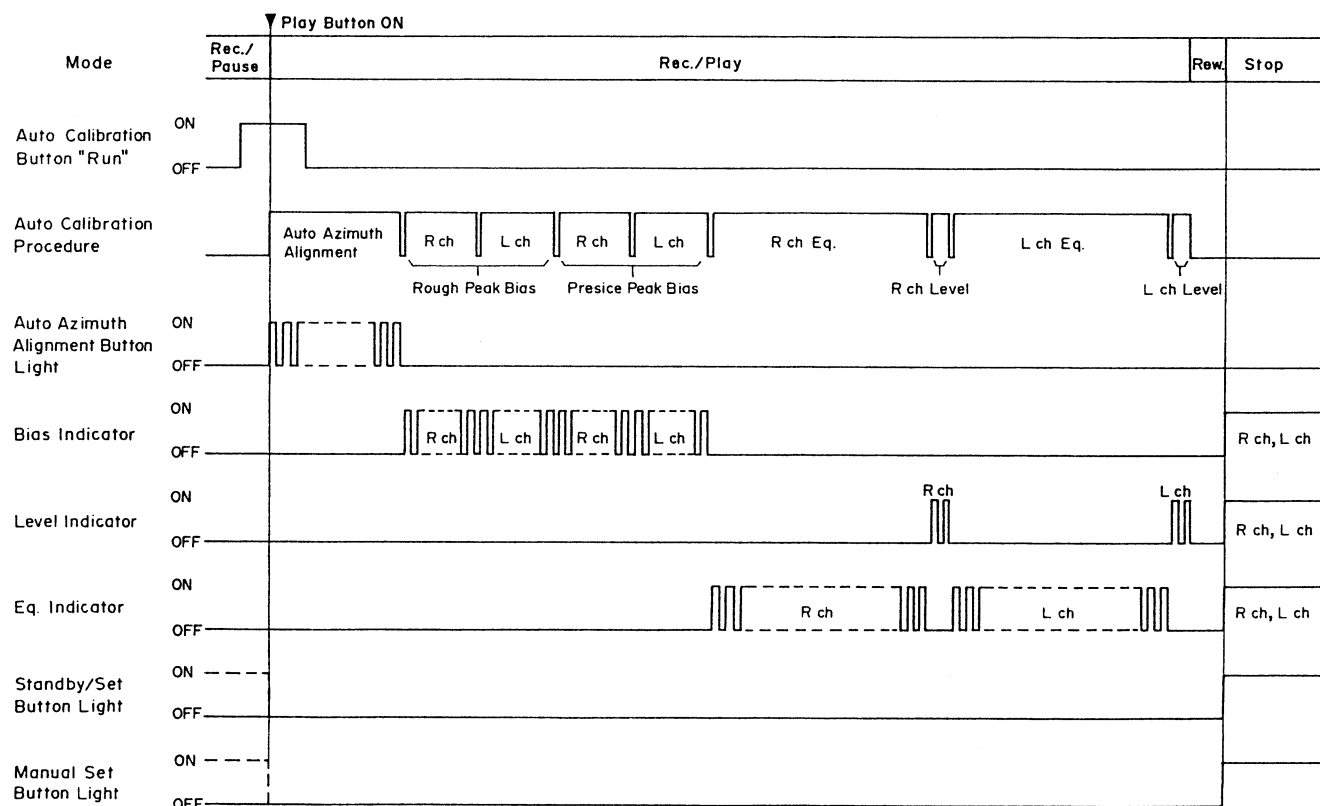


Fig. 9.2

## (2) Auto Calibration Flow Chart

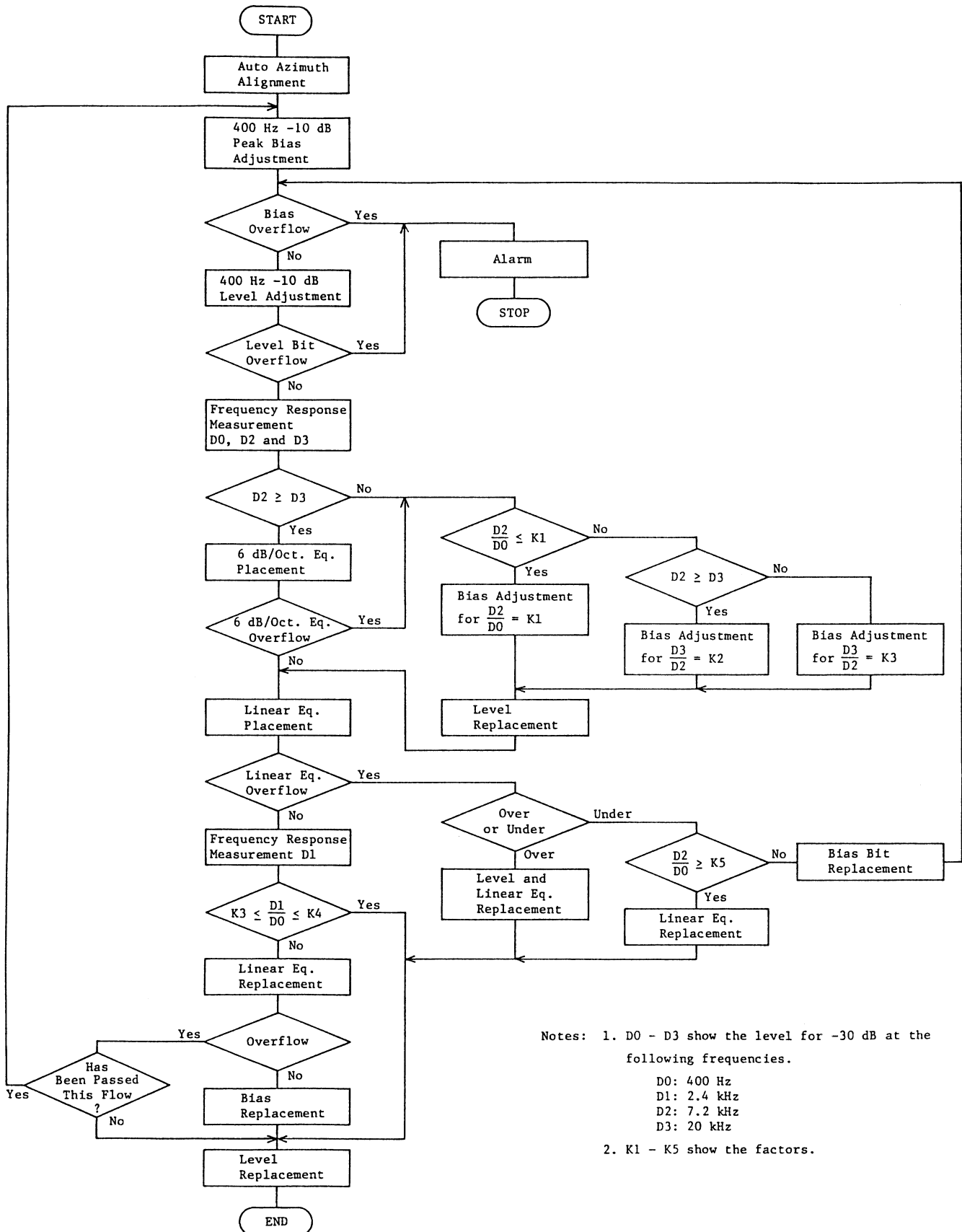


Fig. 9.3

## (3) RAMM Coding Timing Chart

### (a) Automatic Coding

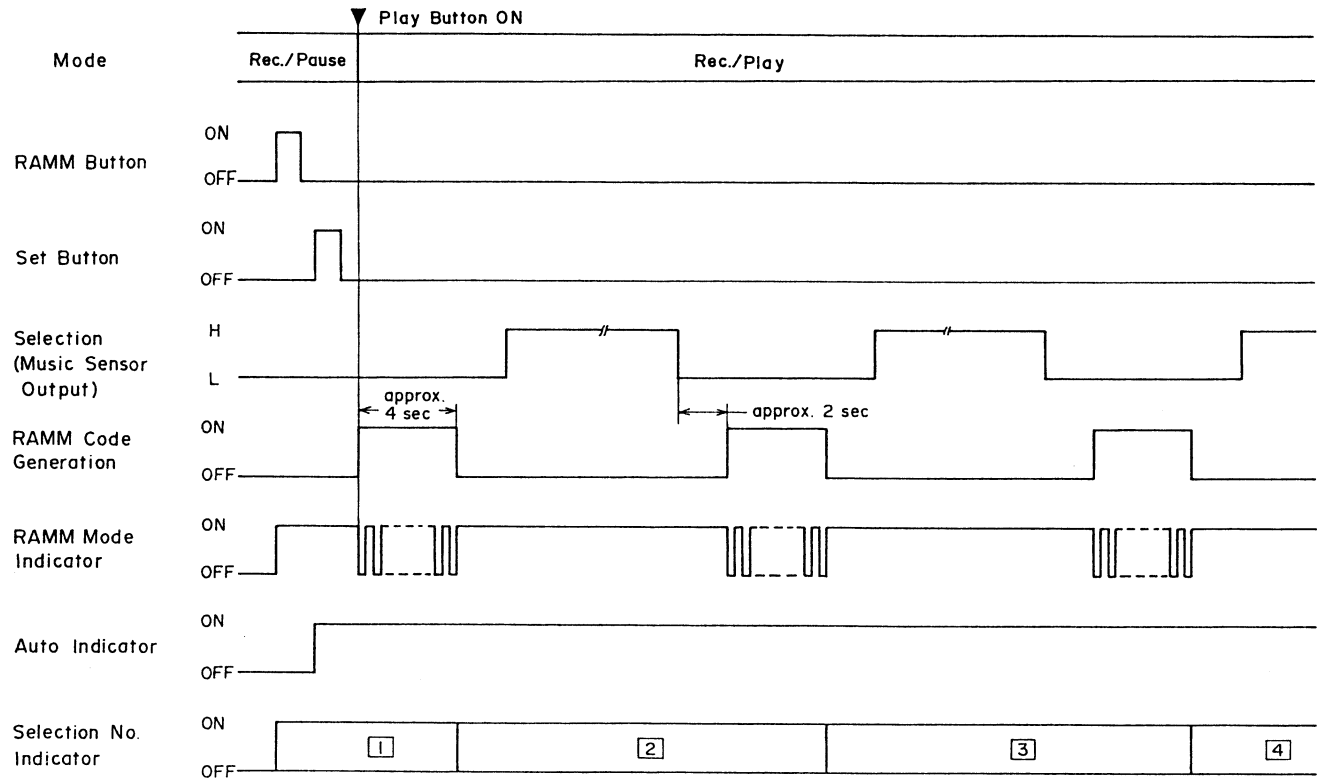


Fig. 9.4

### (b) Manual Coding

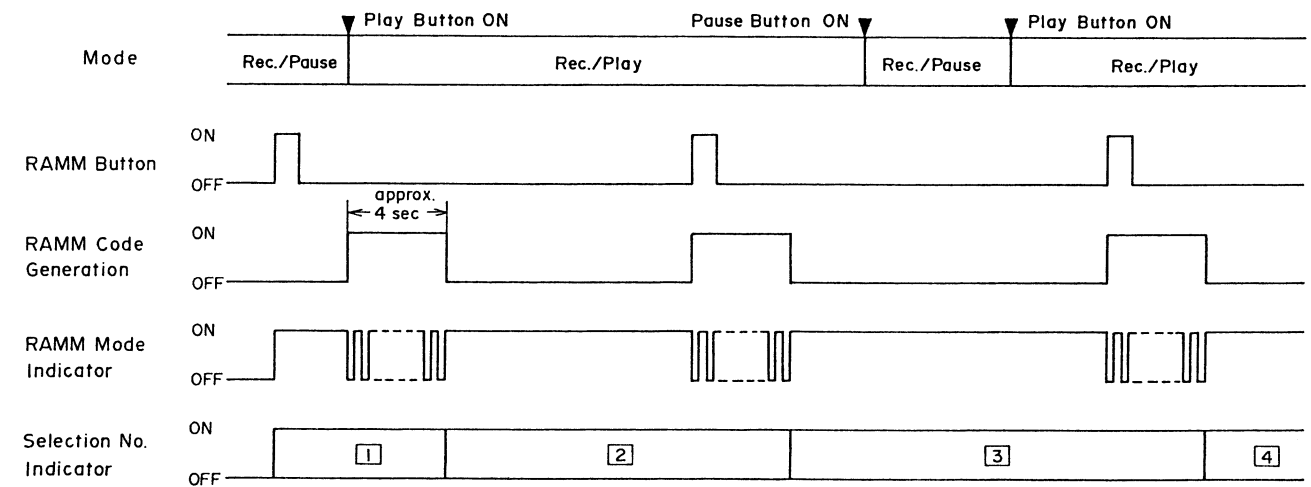


Fig. 9.5



(4) RAMM Code Tape Playback Flow Chart and Timing Chart

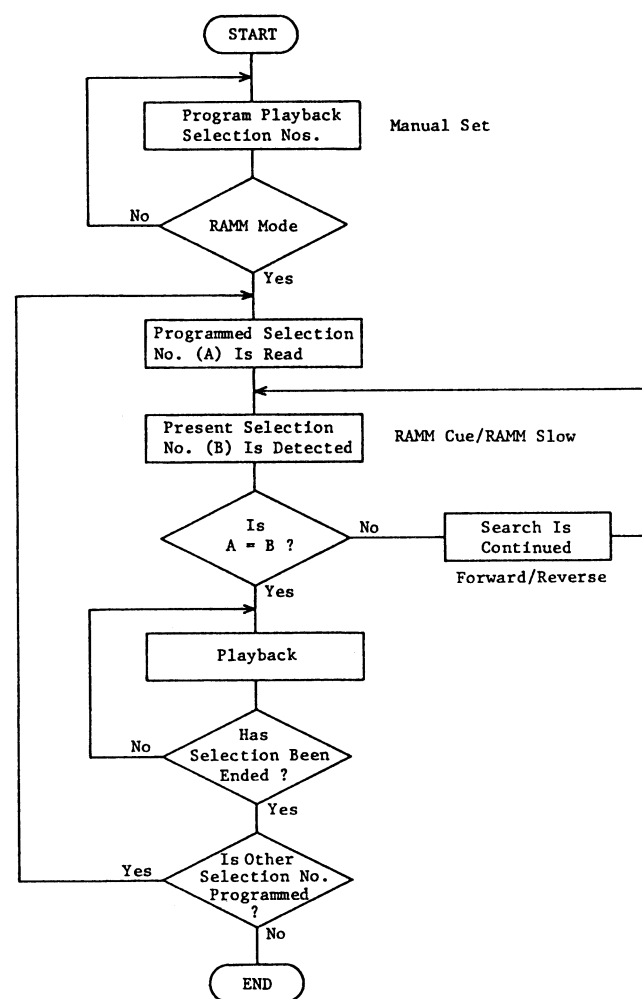
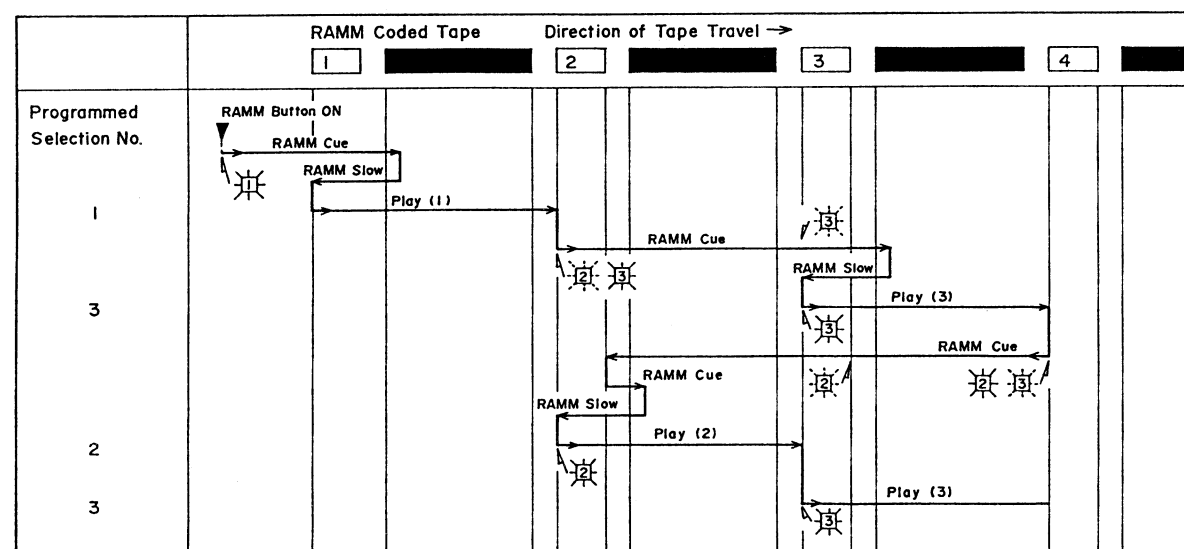


Fig. 9.6



Note: RAMM Code: - Eq, Noise Reduction  
Selection:

Fig. 9.7

10. EQ. AMP. FREQUENCY RESPONSE

10.1. Playback Frequency Response

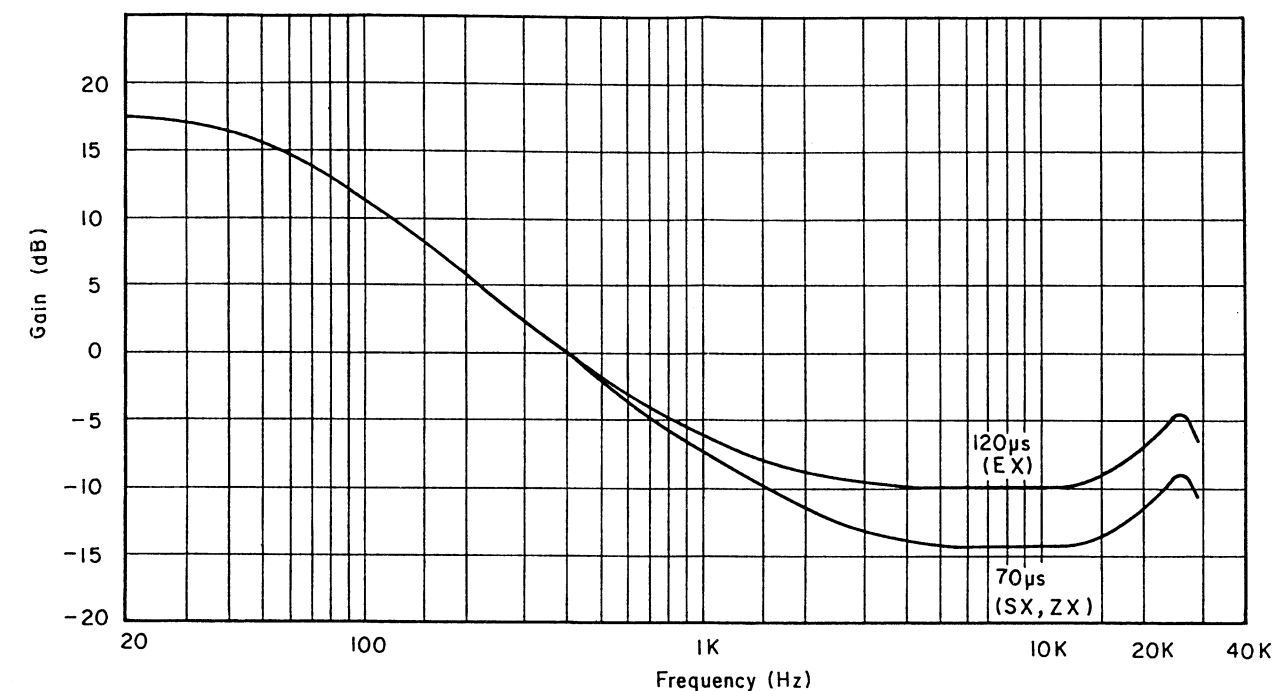


Fig. 10.1

10.2. Record Current Frequency Response

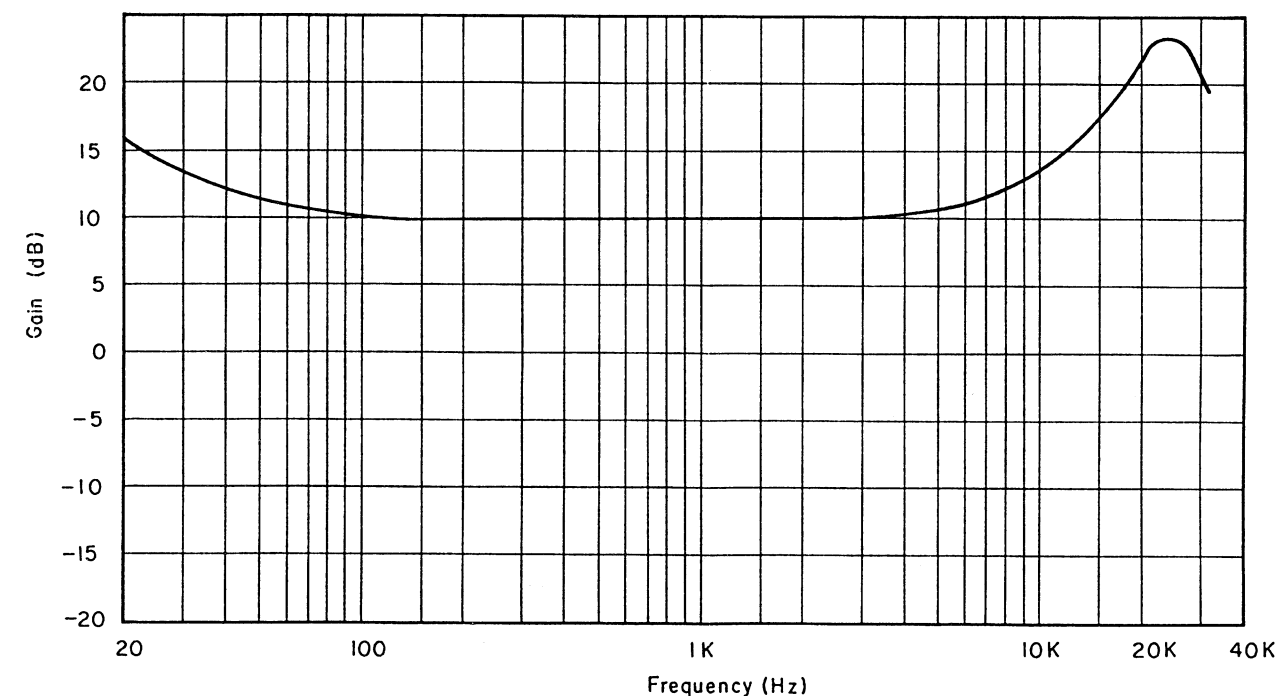


Fig. 10.2

Note: The curve shows the fixed record current frequency response before auto calibration is made in the N-1000ZXL without memory back-up batteries.

11. BLOCK DIAGRAMS

11.1. Amplifier and A.B.E.L. CPU Control

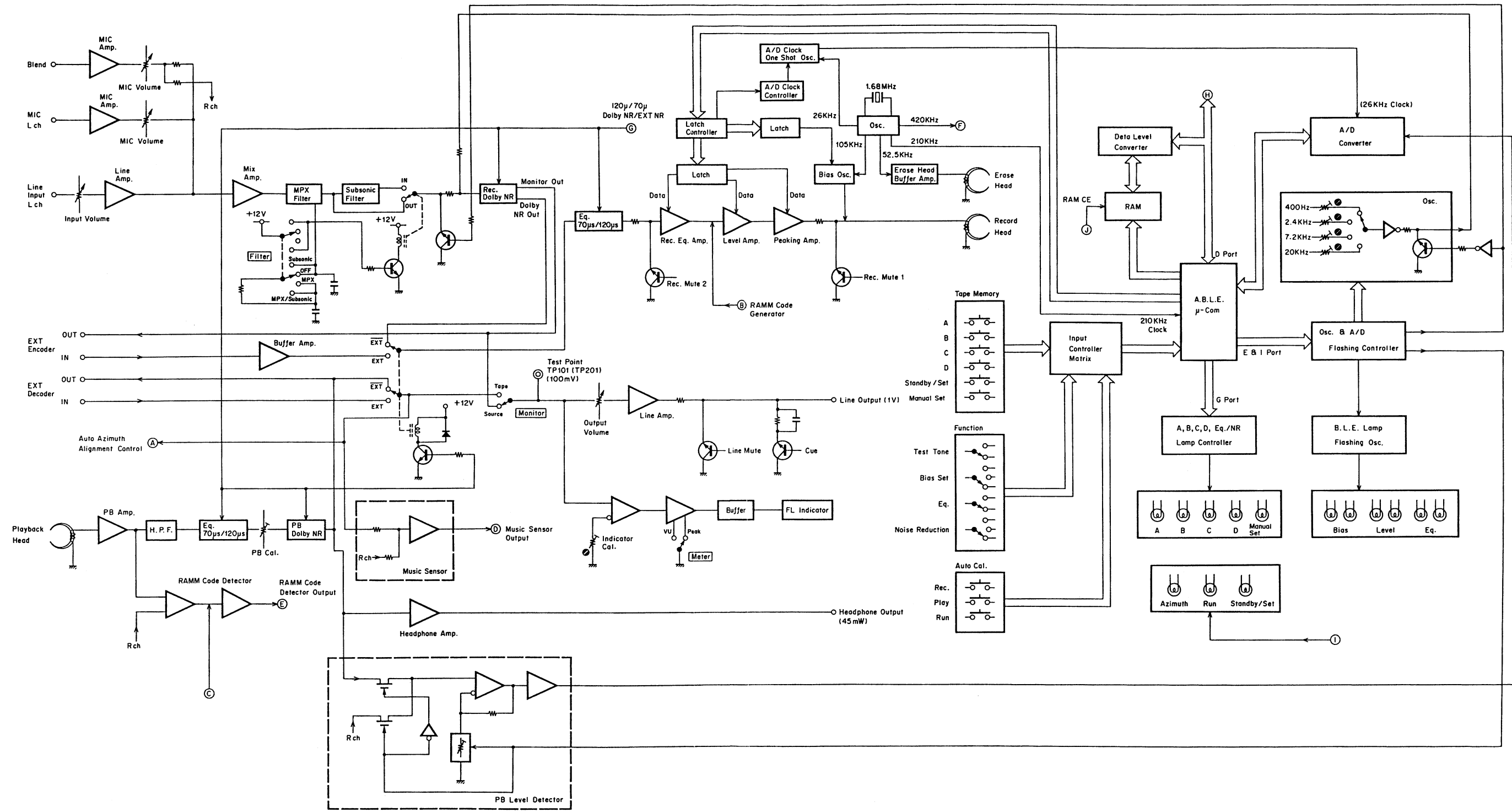


Fig. 11.1

## 11.2. Mechanism Control and RAMM Control

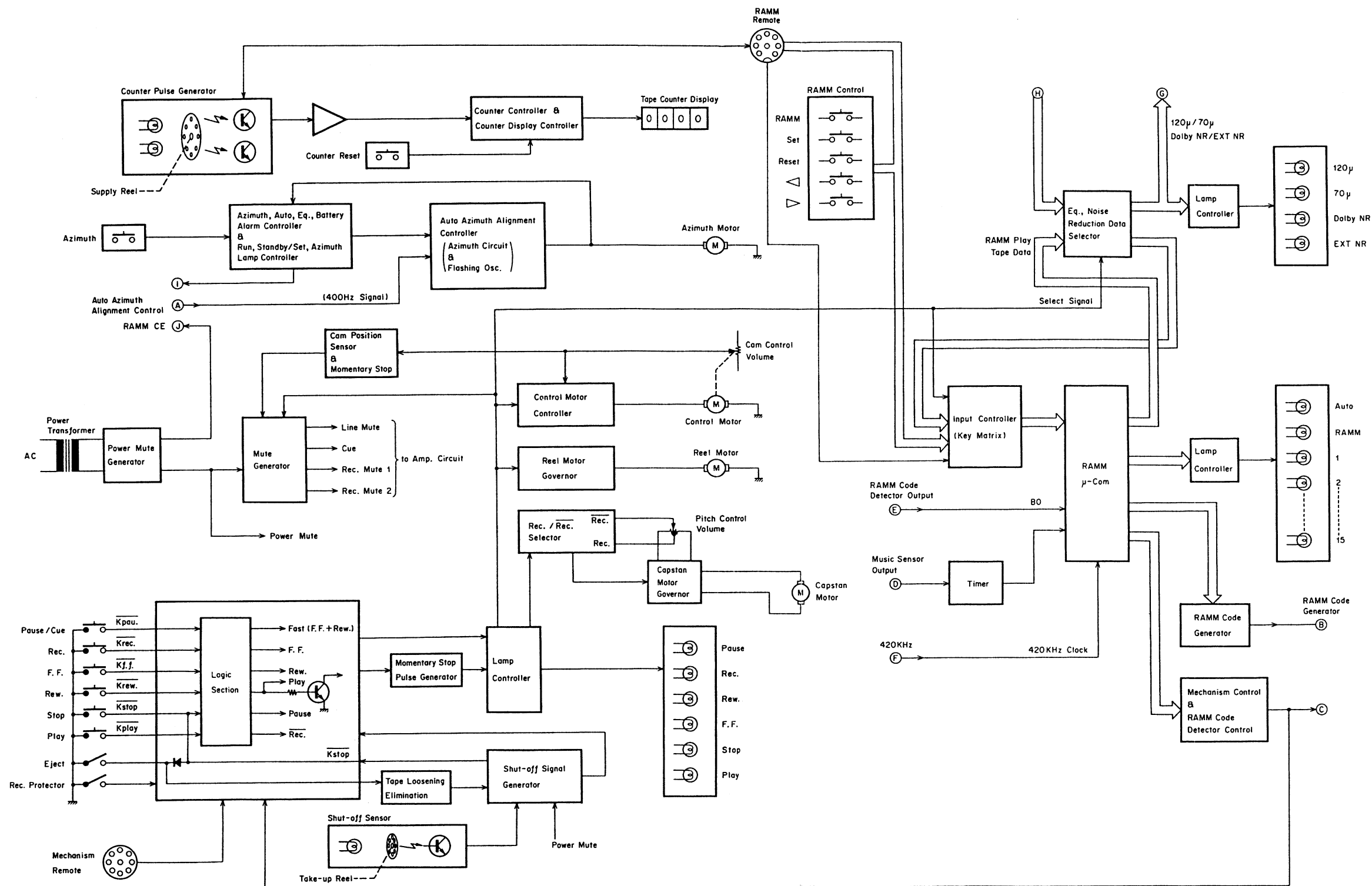


Fig. 11.2

12. WIRING DIAGRAM

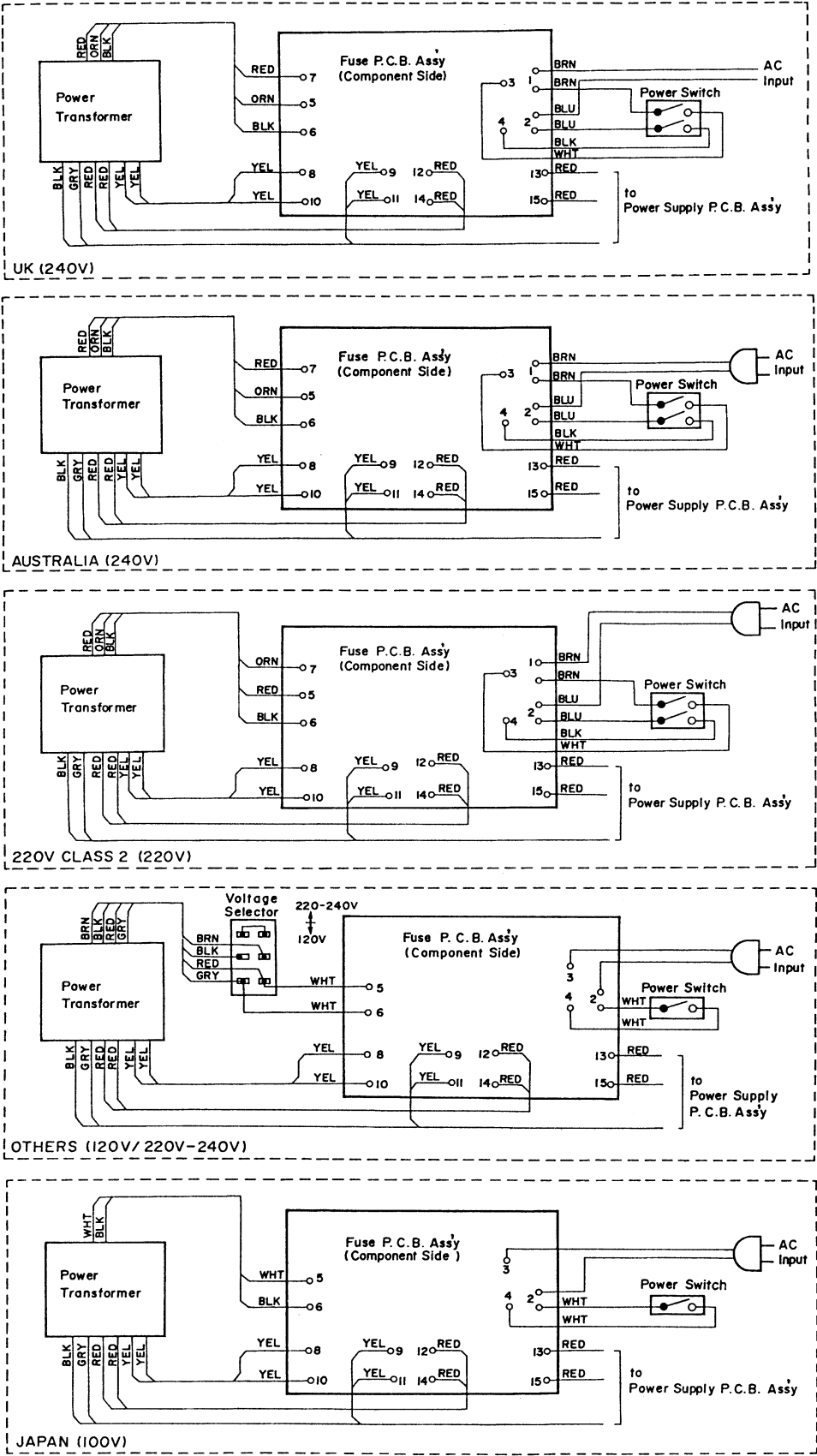


Fig. 12.1

Note: Table of wire colors  
 BLK - Black  
 BLU - Blue  
 GRN - Green  
 RED - Red  
 WHT - White  
 ORN - Orange  
 GRY - Gray  
 BRN - Brown  
 YEL - Yellow  
 VIO - Violet

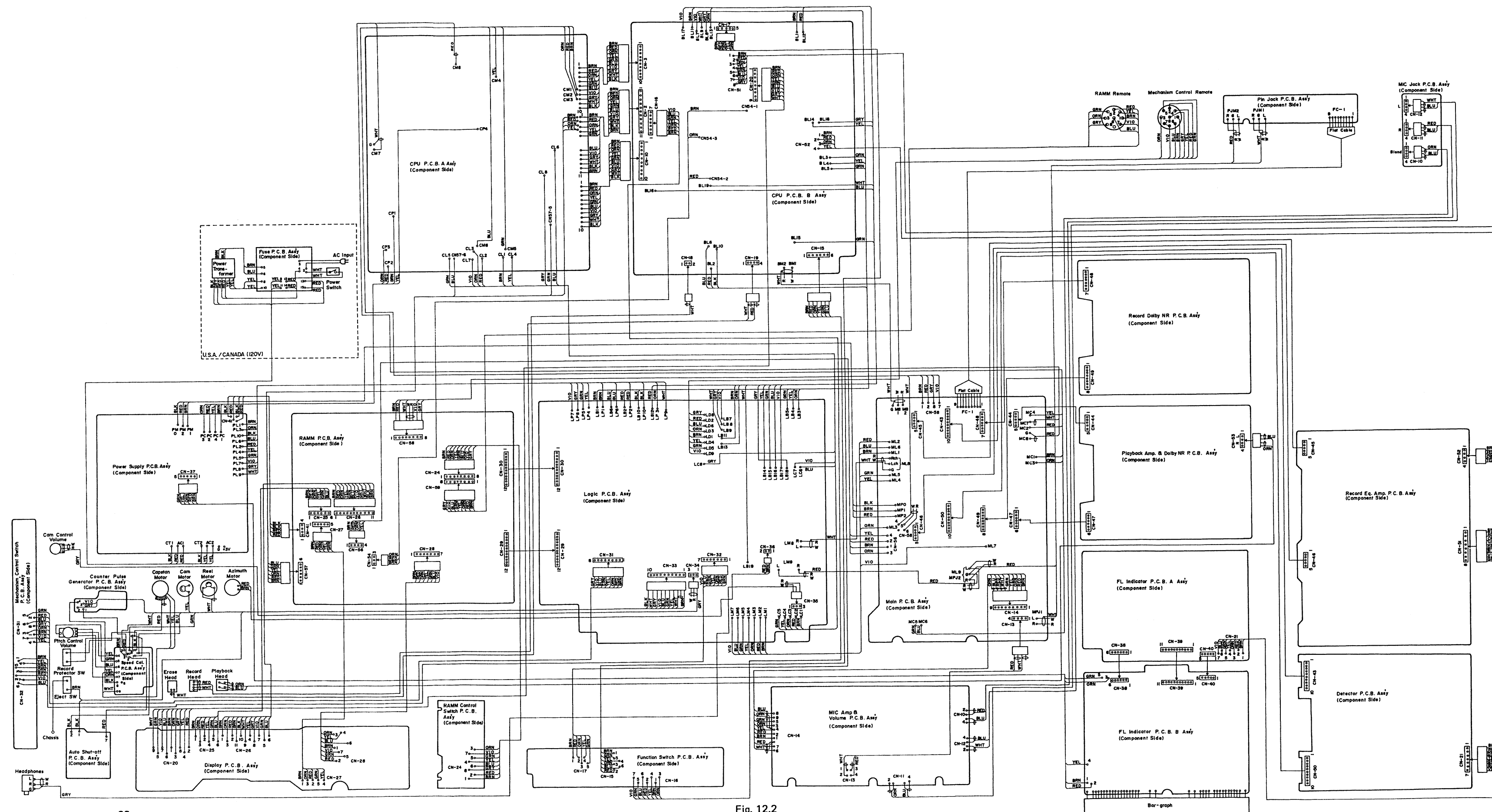
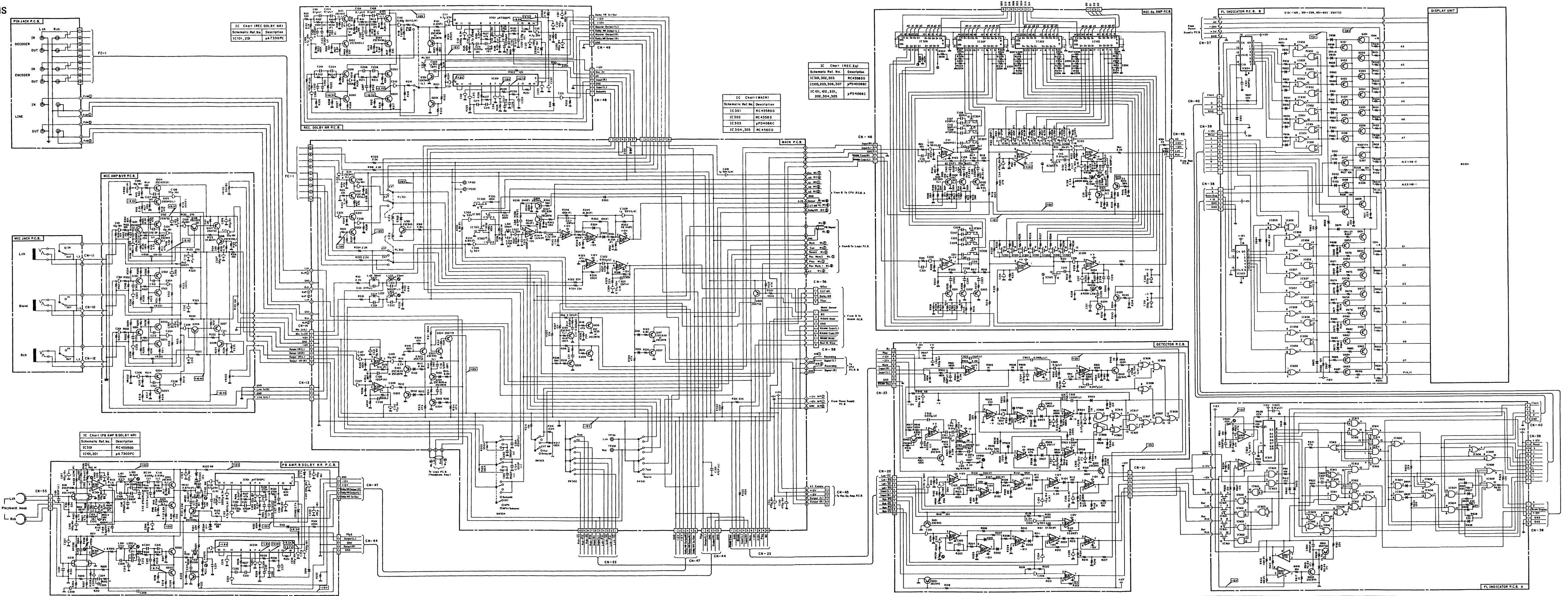


Fig. 12.2



13. SCHEMATIC DIAGRAMS

13.1. Amplifier Section

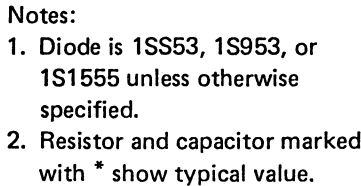


Notes:

1. Diode is 1S553, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with \* show typical value.

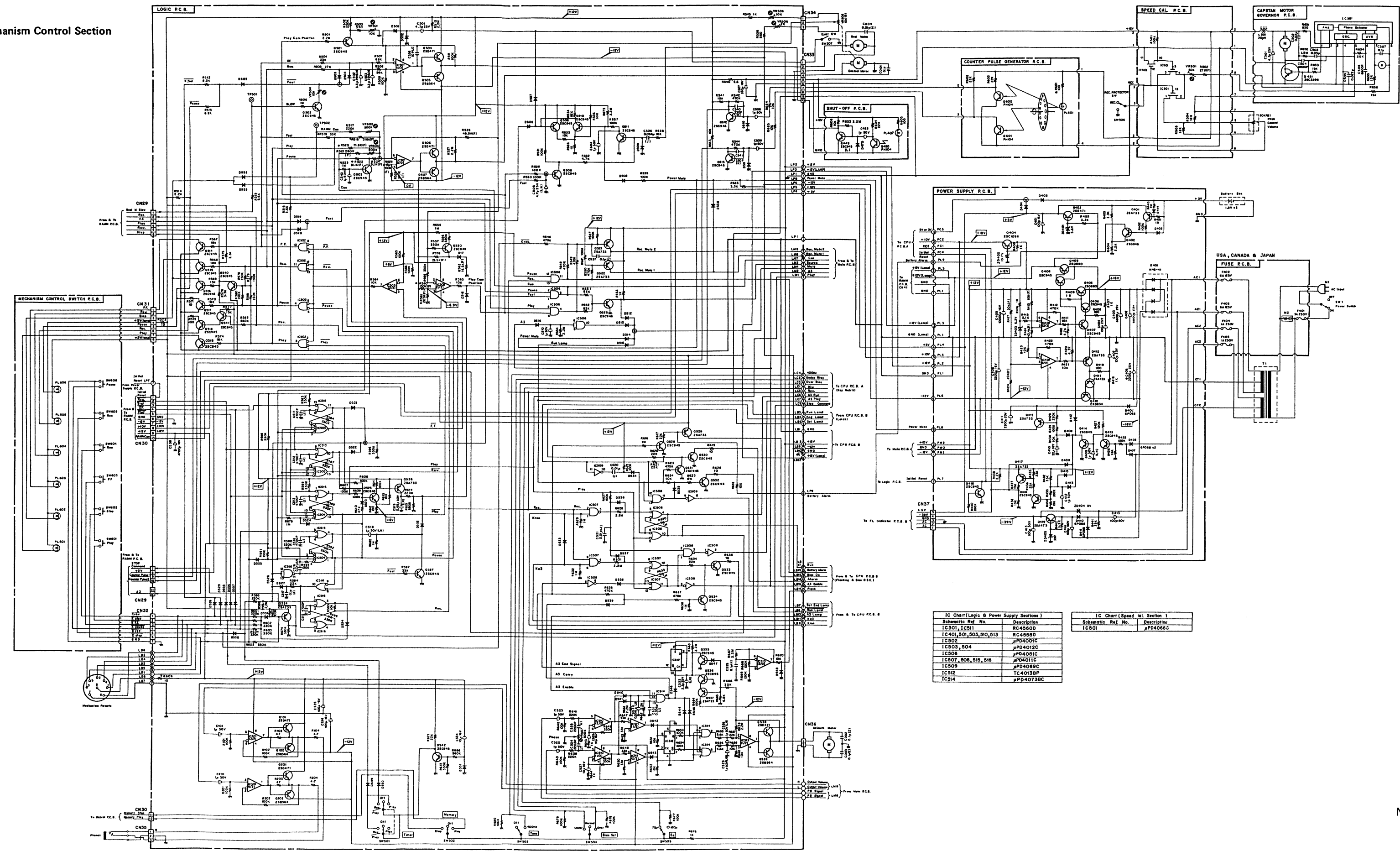
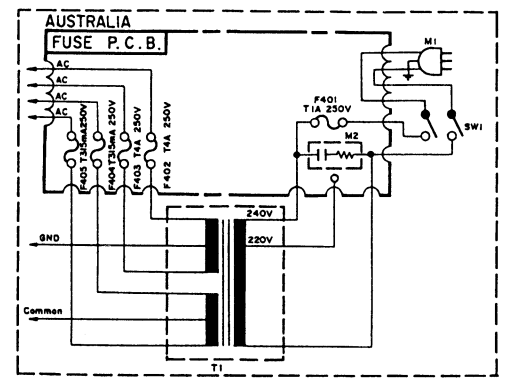
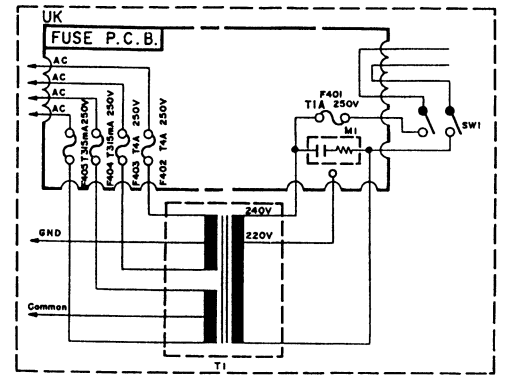
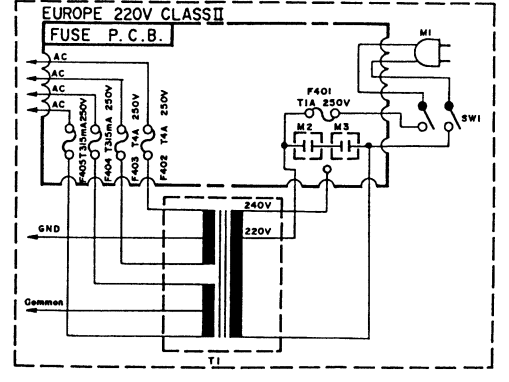
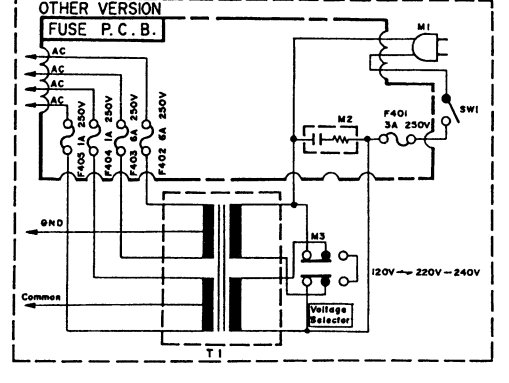
Fig. 13.1







13.3. Mechanism Control Section



| IC Chart (Logic & Power Supply Sections) |             | IC Chart (Speed Cal Section) |             |
|------------------------------------------|-------------|------------------------------|-------------|
| Schematic Ref. No.                       | Description | Schematic Ref. No.           | Description |
| IC301, IC311                             | RL4560D     | IC501                        | μPD4066C    |
| IC401, 501, 505, 510, 513                | RL4560D     |                              |             |
| IC502                                    | μPD4001C    |                              |             |
| IC503, 504                               | μPD4012C    |                              |             |
| IC508                                    | μPD4010C    |                              |             |
| IC507, 508, 515, 516                     | μPD4011C    |                              |             |
| IC509                                    | μPD4069C    |                              |             |
| IC512                                    | TC4013BP    |                              |             |
| IC514                                    | μPD4073BC   |                              |             |

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.  
2. Resistor and capacitor marked with \* show typical value.

Fig. 13.3

### 13.4. IC Block Diagrams

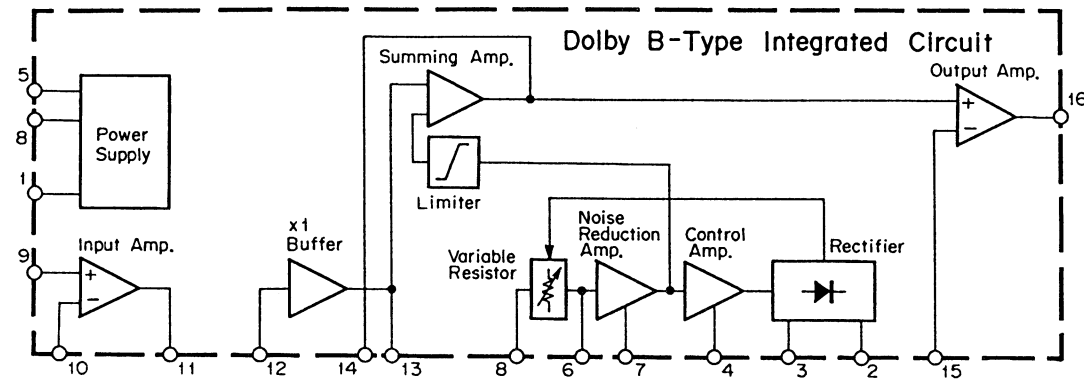


Fig. 13.4 Dolby NR IC  $\mu$ A7300PC

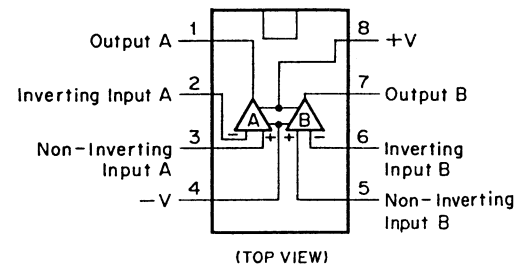


Fig. 13.5 OP Amp. IC 4558, 4559, 4560, 4556

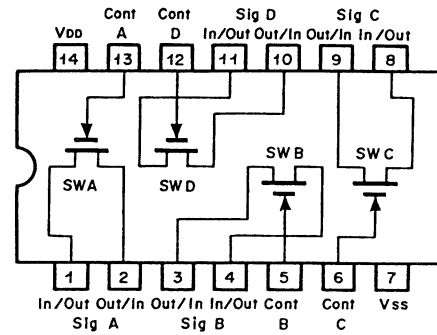


Fig. 13.6 Bilateral Switch C-MOS IC  $\mu$ PD4066C

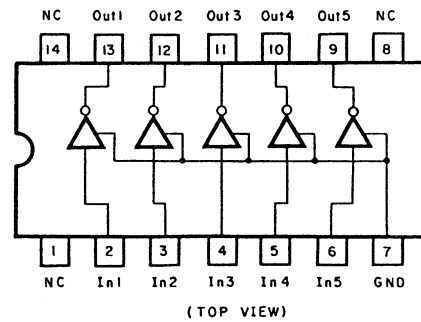


Fig. 13.7 Transistor Array M54516P

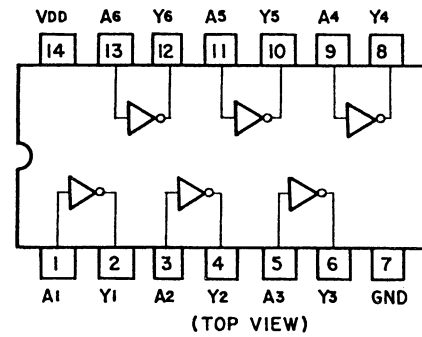


Fig. 13.8 Inverter C-MOS IC  $\mu$ PD4049C

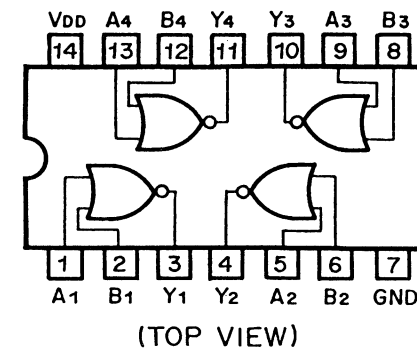


Fig. 13.9 NOR Gate C-MOS IC  $\mu$ PD4001C

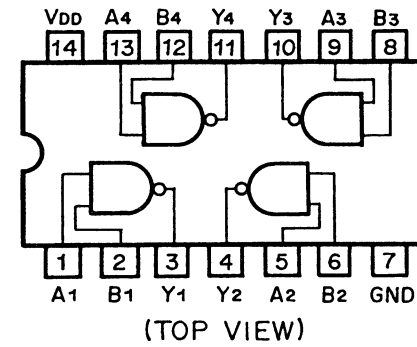


Fig. 13.10 NAND Gate C-MOS IC  $\mu$ PD4011C

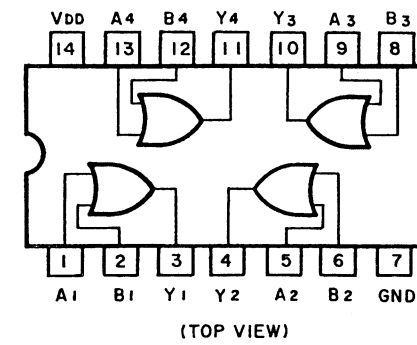


Fig. 13.11 OR Gate C-MOS IC  $\mu$ PD4071C

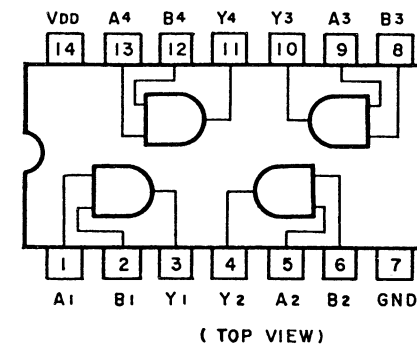


Fig. 13.12 AND Gate C-MOS IC  $\mu$ PD4081C

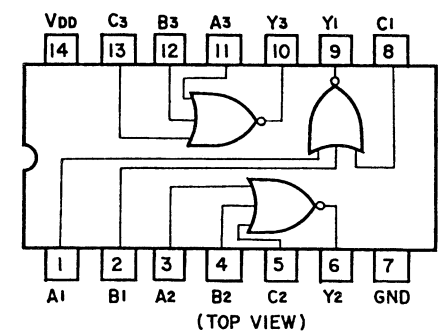


Fig. 13.13 NOR Gate C-MOS IC  $\mu$ PD4025C

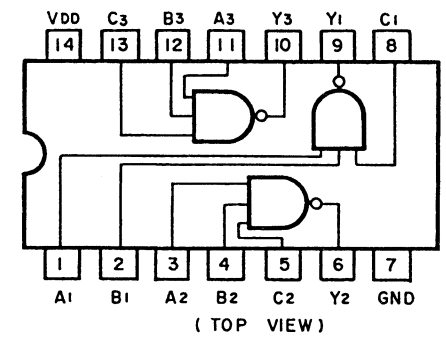


Fig. 13.14 NAND Gate C-MOS IC TC4023BP

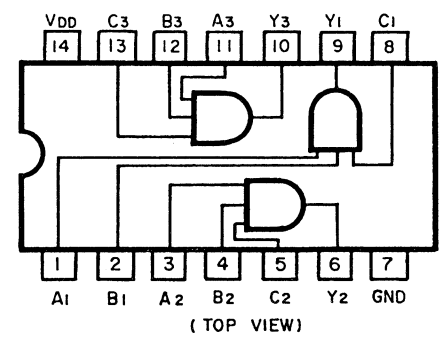


Fig. 13.15 AND Gate C-MOS IC  $\mu$ PD4073BC (TC4073BP)

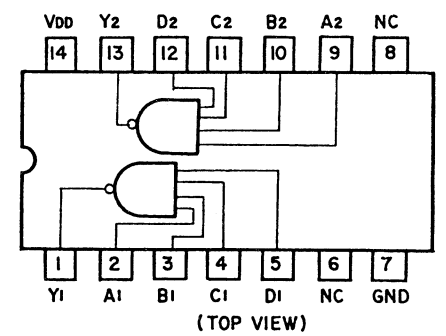


Fig. 13.16 NAND Gate C-MOS IC  $\mu$ PD4012C



**Fig. 13.17 D-Type Flip-Flop C-MOS IC TC4013BP**



**Fig. 13.18 BCD Up/Down Counter C-MOS IC TC4510BP**

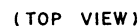


**Fig. 13.19 Binary Up/Down Counter C-MOS IC TC4516BP**



**Fig. 13.20 BCD to 7-Segment Decoder/Driver  
C-MOS IC TC5022BP**



**Fig. 13.21 12-Stage Binary Counter C-MOS IC TC4040BP**



**Fig. 13.22 Octal Counter/Driver C-MOS IC TC4022BP**



**Fig. 13.23 4-Bit Latch C-MOS IC TC4508BP ( $\mu$ PD4508BC)**



**Fig. 13.24 4-to-16 Line Decoder C-MOS IC TC4514BP**

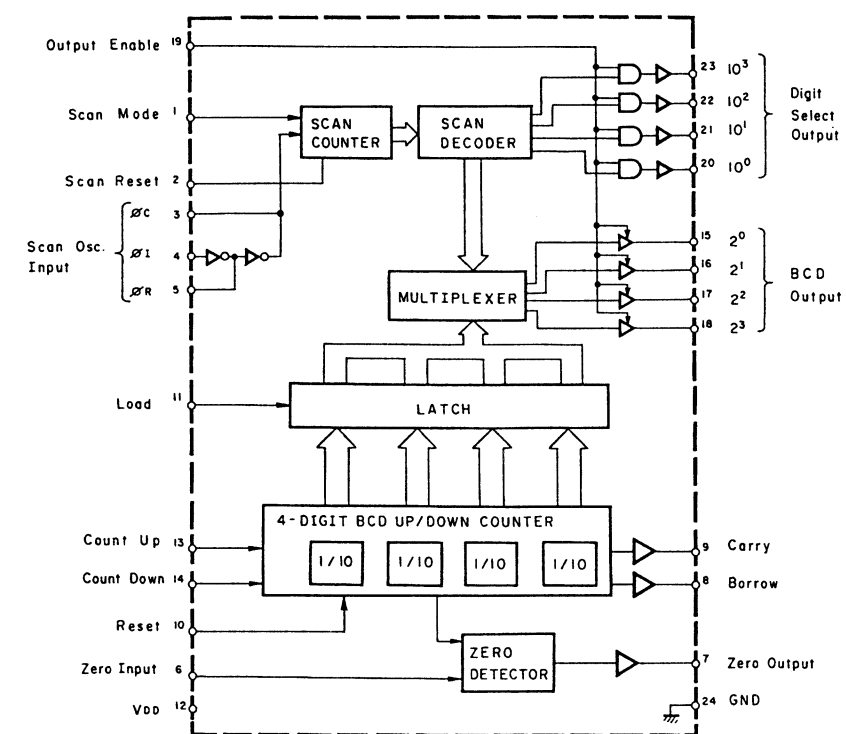


**Fig. 13.25 4-Digit BCD Up/Down Counter C-MOS IC MSM5512RS**

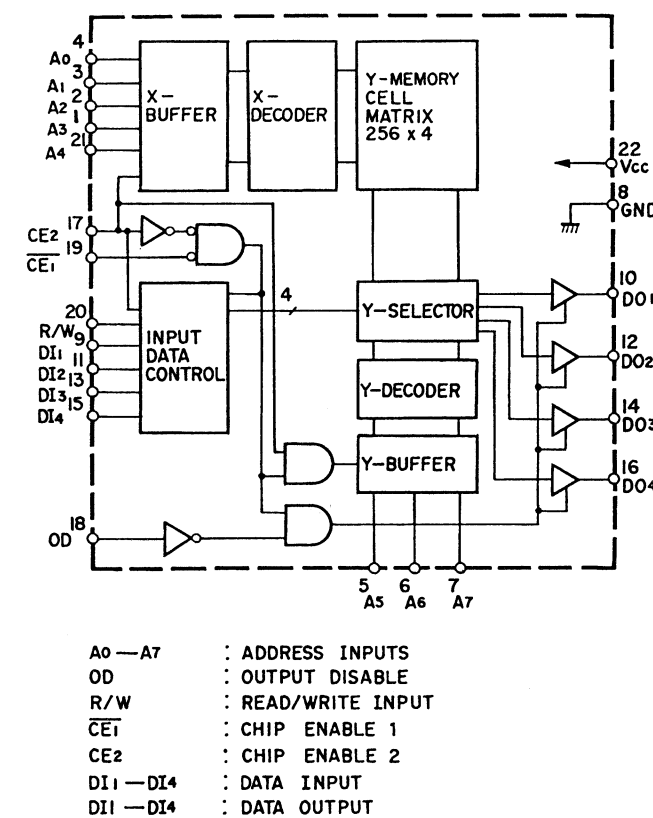
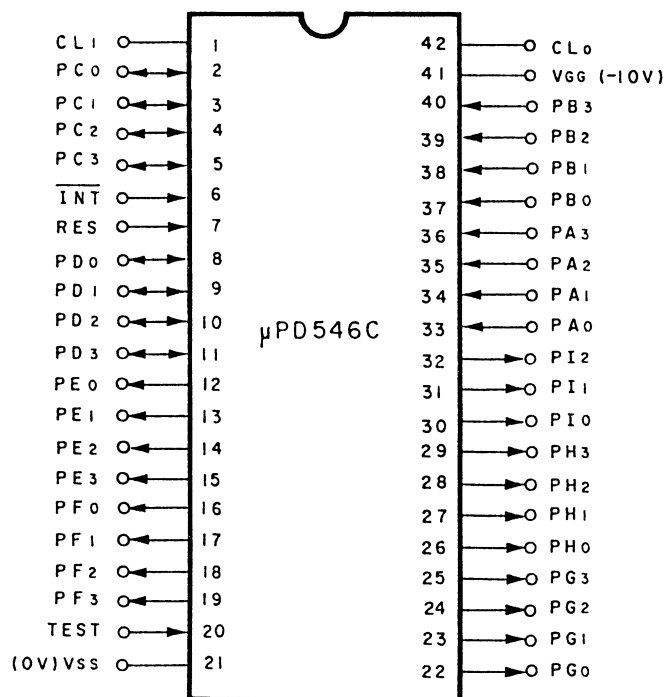


**Fig. 13.26 1024 (256 x 4) Bit Static RAM IC  $\mu$ PD5101LC**



(TOP VIEW)

$\text{CL}_{0,1}$  : Crystal, inductor, or resistor input for internal oscillator

$\text{INT}$  : Interrupt

$\text{RES}$  : Reset

$\text{PA}_{3-0}$  : Input port A3-0

$\text{PB}_{3-0}$  : Input port B3-0

$\text{PC}_{3-0}$  : Bidirectional port C3-0

$\text{PD}_{3-0}$  : Bidirectional port D3-0

$\text{PE}_{3-0}$  : Output port E3-0

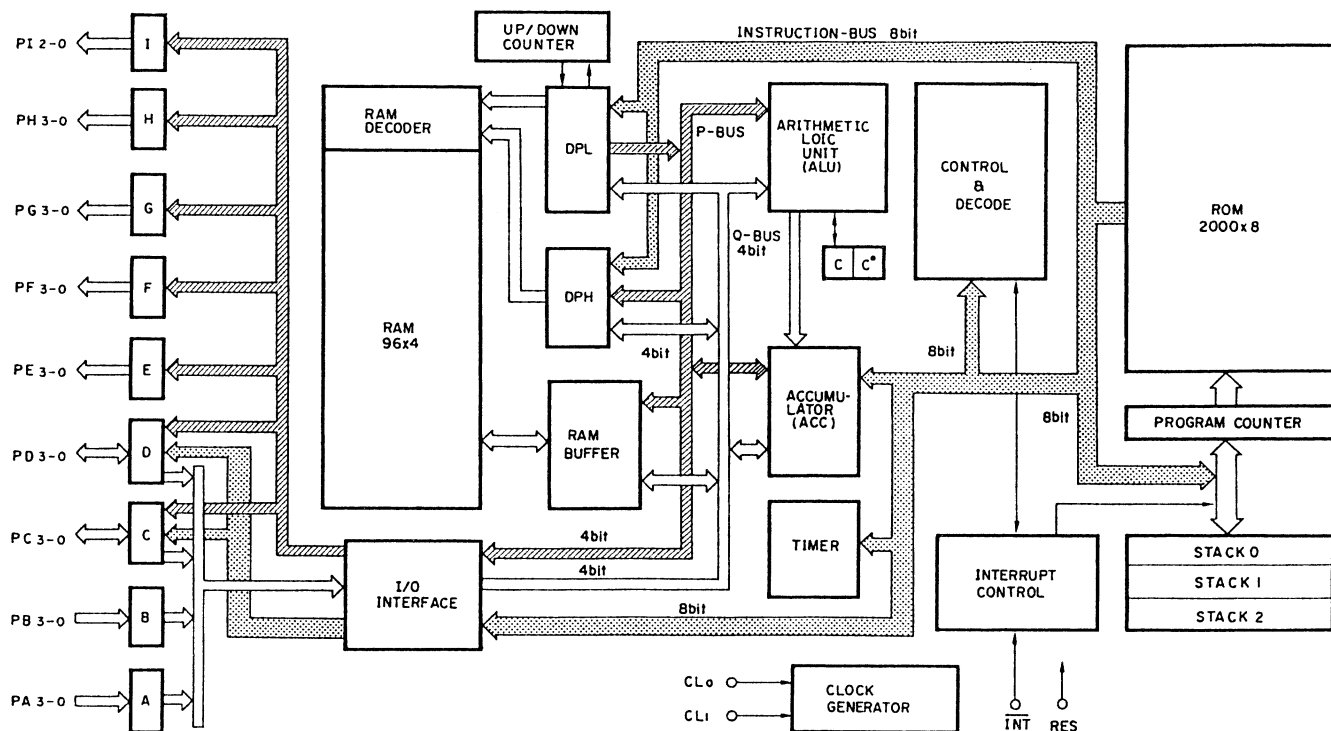
$\text{PF}_{3-0}$  : Output port F3-0

$\text{PG}_{3-0}$  : Output port G3-0

$\text{PH}_{3-0}$  : Output port H3-0

$\text{PI}_{2-0}$  : Output port I2-0

$\text{TEST}$  : Test



DP : DATA POINTER  
C : CARRY Flip-Flop  
C\* : CARRY STRAGE Flip-Flop

Fig. 13.27 4-Bit Micro-processor  $\mu\text{PD546C-113/114}$

14. REMOTE CONTROLLER RM-300

14.1. Schematic Diagram

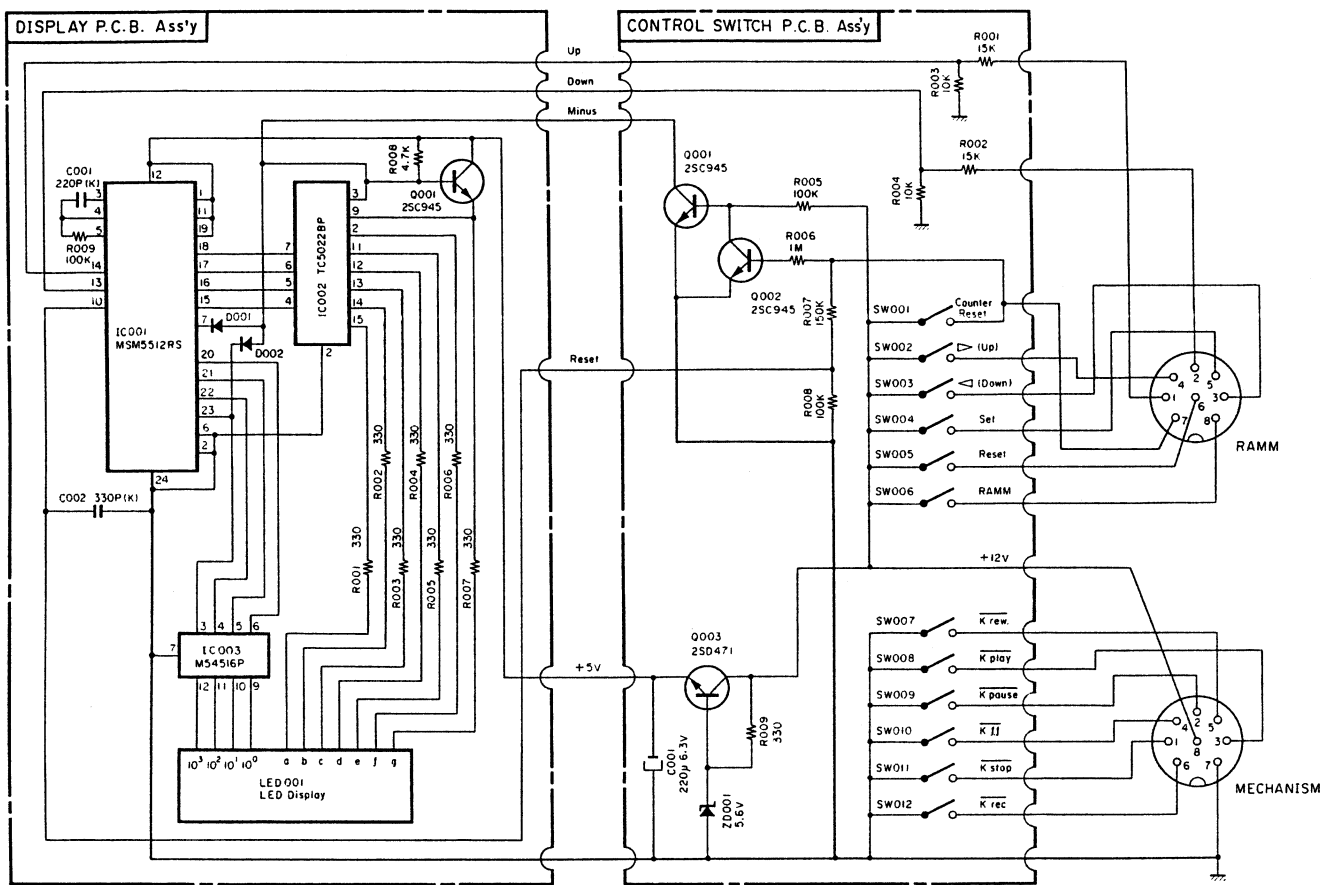


Fig. 14.1 Note: Diode is 1SS53 unless otherwise specified.

## 14.2. Mounting Diagrams and Parts List

Note: Mounting diagram shows a dip side view of the printed circuit board.

### (1) Control Switch P.C.B. Ass'y

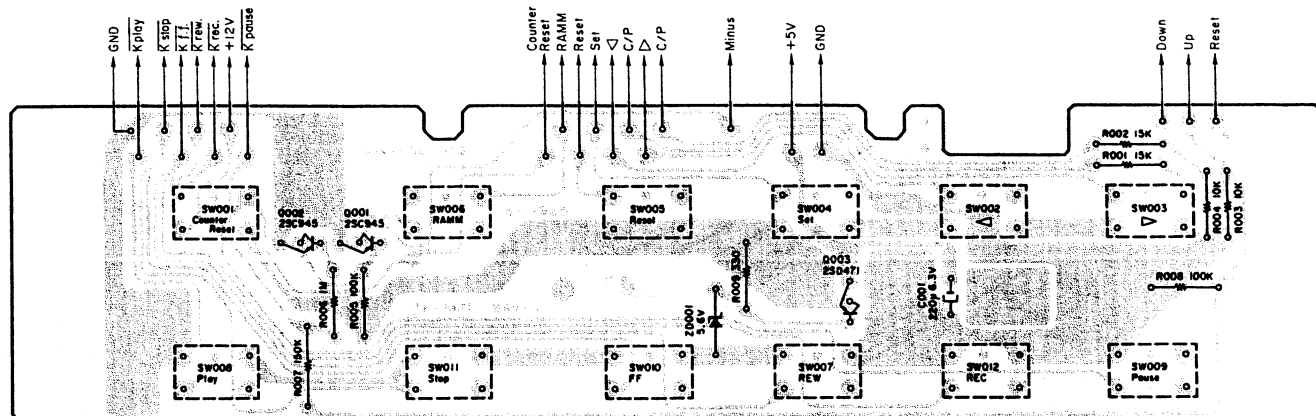


Fig. 14.2

### (2) Display P.C.B. Ass'y

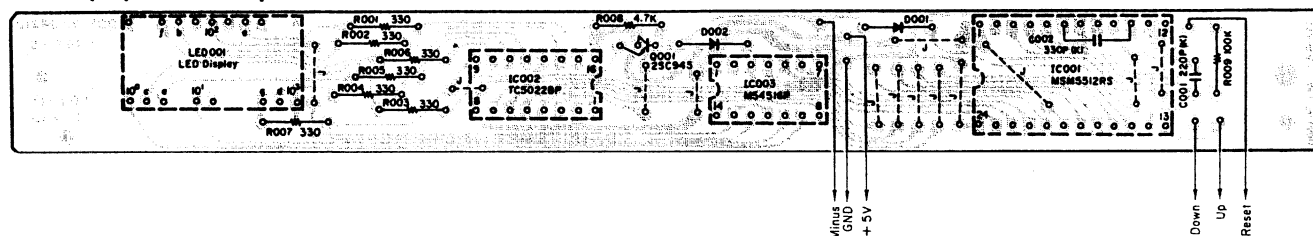


Fig. 14.3

Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No. | Part No. | Description                      | Schematic Ref. No. | Part No. | Description                            |
|--------------------|----------|----------------------------------|--------------------|----------|----------------------------------------|
|                    | BA04307A | Control Switch P.C.B. Ass'y      |                    | BA04306A | Display P.C.B. Ass'y                   |
| Q001,002           | OB07925A | Control Switch P.C.B.            |                    | OB07924A | Display P.C.B.                         |
| Q003               | OB06100A | Transistor 2SC945 (A)            | IC001              | OB06259A | IC MSM5512RS                           |
| ZD001              | OB06066A | Transistor 2SD471                | IC002              | OB06211A | IC TC5022BP                            |
| R001,002           | OB01683A | Carbon Resistor 15K ERD-25T J    | IC003              | OB06258A | IC M45516P                             |
| R003,004           | OB01888A | Carbon Resistor 10K ERD-25T J    | Q001               | OB06100A | Transistor 2SC945 (A)                  |
| R005               | OB01889A | Carbon Resistor 100K ERD-25T J   | D001,002           | OB06181A | Silicon Diode 1SS53                    |
| R006               | OB05776A | Carbon Resistor 1M ERD-25T J     | R001-007           | OB05577A | Carbon Resistor 330 ERD-25T J (7 pcs.) |
| R007,008           | OB05626A | Carbon Resistor 150K ERD-25T J   | R008               | OB01846A | Carbon Resistor 4.7K ERD-25T J         |
| R009               | OB05577A | Carbon Resistor 330 ERD-25T J    | R009               | OB01889A | Carbon Resistor 100K ERD-25T J         |
| C001               | OB09151A | Electrolytic Capacitor 220μ 6.3V | C001               | OB09283A | Ceramic Capacitor 220P 50V K           |
| SW001-012          | OB07354A | Push Switch KHG10901 (12 pcs.)   | C002               | OB09285A | Ceramic Capacitor 330P 50V K           |
|                    |          |                                  | LED001             | OB06289A | LED Display Unit (1 pce.)              |
|                    |          |                                  |                    | OJ04237A | Counter Himelon                        |

14.3. Mechanism Ass'y and Parts List

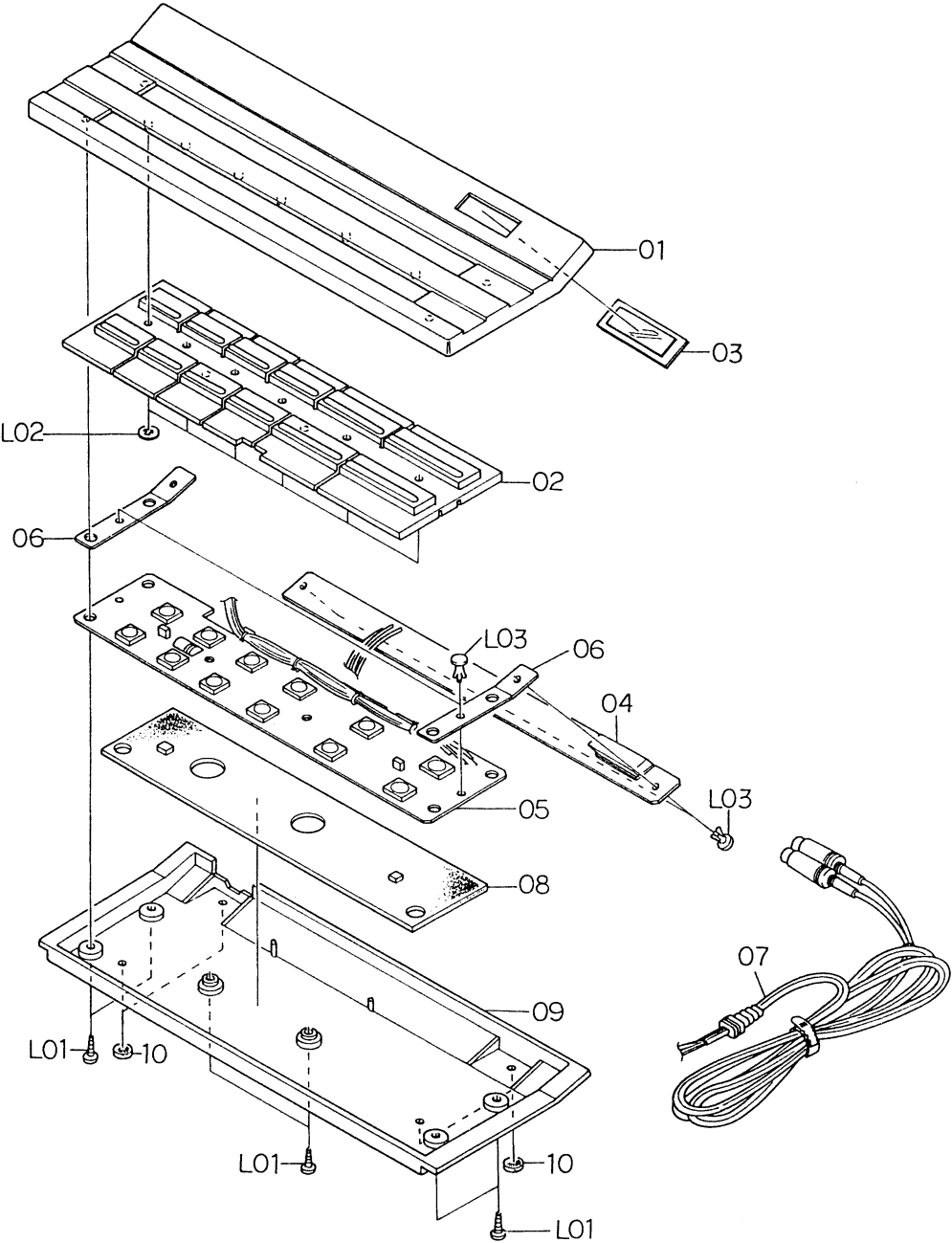


Fig. 14.4

| Schematic Ref. No. | Part No. | Description                 | Q'ty | Schematic Ref. No. | Part No. | Description                                         | Q'ty |
|--------------------|----------|-----------------------------|------|--------------------|----------|-----------------------------------------------------|------|
|                    |          | RM-300 Mechanism Ass'y      |      |                    |          |                                                     |      |
| 01                 | 0H03917A | Top Case                    | 1    |                    | 0B08831A | Cord Stopper                                        | (1)  |
| 02                 | 0H03918A | Switch Knob                 | 1    |                    | 0B08865A | 8P DIN Plug (RAMM)                                  | (1)  |
| 03                 | 0H03922A | Counter Lens                | 1    | 08                 | 0B08866A | 8P DIN Plug (Mechanism)                             | (1)  |
| 04                 | BA04306A | Display P.C.B. Ass'y        | 1    | 09                 | 0J04287A | Bottom Case Rubber                                  | 1    |
| 05                 | BA04307A | Control Switch P.C.B. Ass'y | 1    | 10                 | 0H03918A | Bottom Case                                         | 1    |
| 06                 | 0J04266A | P.C.B. Holder               | 2    |                    | 0H03920A | Leg                                                 | 4    |
| 07                 | BA04309A | Remote Cord Ass'y           | 1    | L01                | 0E00938A | BT Screw M3x8 Philips Binding Head (Black Chromate) | 6    |
|                    | 0B08827A | Cord Bushing                | (1)  | L02                | 0E00252A | Stopper Ring CS 3mm                                 | 6    |
|                    | 0B08828A | 8Px2 Cord                   | (1)  | L03                | 0B08539A | Plastic Rivet                                       | 4    |



## 15. SPECIFICATIONS

|                                                       |                                                                                                                     |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Power Source . . . . .                                | 100, 120, 120/220-240, 220 or 240 V AC ; 50/60 Hz<br>(According to country of sale)                                 |
| Power Consumption . . . . .                           | 65 W max.                                                                                                           |
| Tape Speed . . . . .                                  | 1-7/8 ips (4.75 cm/sec.)                                                                                            |
| Wow and Flutter . . . . .                             | Less than 0.04% Wrms Less than 0.08% Wpeak                                                                          |
| Frequency Response<br>(w. auto calibration) . . . . . | 20–20,000 Hz $\pm 0.75$ dB (18–25,000 Hz $\pm 3$ dB)<br>Nakamichi EX, EXII, SX, ZX tape<br>Recording level –20 dB   |
| Signal to Noise Ratio . . . . .                       | Better than 66 dB (3% THD)<br>Better than 60 dB (0 dB)<br>(IHF-A, Wrms, 400 Hz, w. Dolby NR, ZX tape, 70 $\mu$ sec) |
| Total Harmonic Distortion . . . . .                   | Less than 0.8% (ZX tape)<br>Less than 1.0% (SX, EXII tape) (400 Hz, 0 dB)                                           |
| Erase . . . . .                                       | Better than 60 dB (100 Hz)                                                                                          |
| 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 50 k ohms                                                                                                     |
| (Microphone) . . . . .                                | 0.2 mV, 10 k ohms                                                                                                   |
| (Noise Reduction) . . . . .                           | 100 mV, 50 k ohms                                                                                                   |
| Output (Line) . . . . .                               | 1 V (400 Hz, 0 dB, output control at max.)                                                                          |
| (Headphone) . . . . .                                 | 45 mW (400 Hz, 0 dB, output control at max.)                                                                        |
| (Noise Reduction) . . . . .                           | 100 mV, 2.2 k ohms                                                                                                  |
| Dimensions . . . . .                                  | 527 (W) x 258 (H) x 322 (D) millimeters<br>20-3/4 (W) x 10-5/32 (H) x 12-43/64 (D) inches                           |
| Approximate Weight . . . . .                          | 19 kg<br>41 lb. 14 oz                                                                                               |

- Specifications and appearance design are subject to change for further improvement without notice.
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