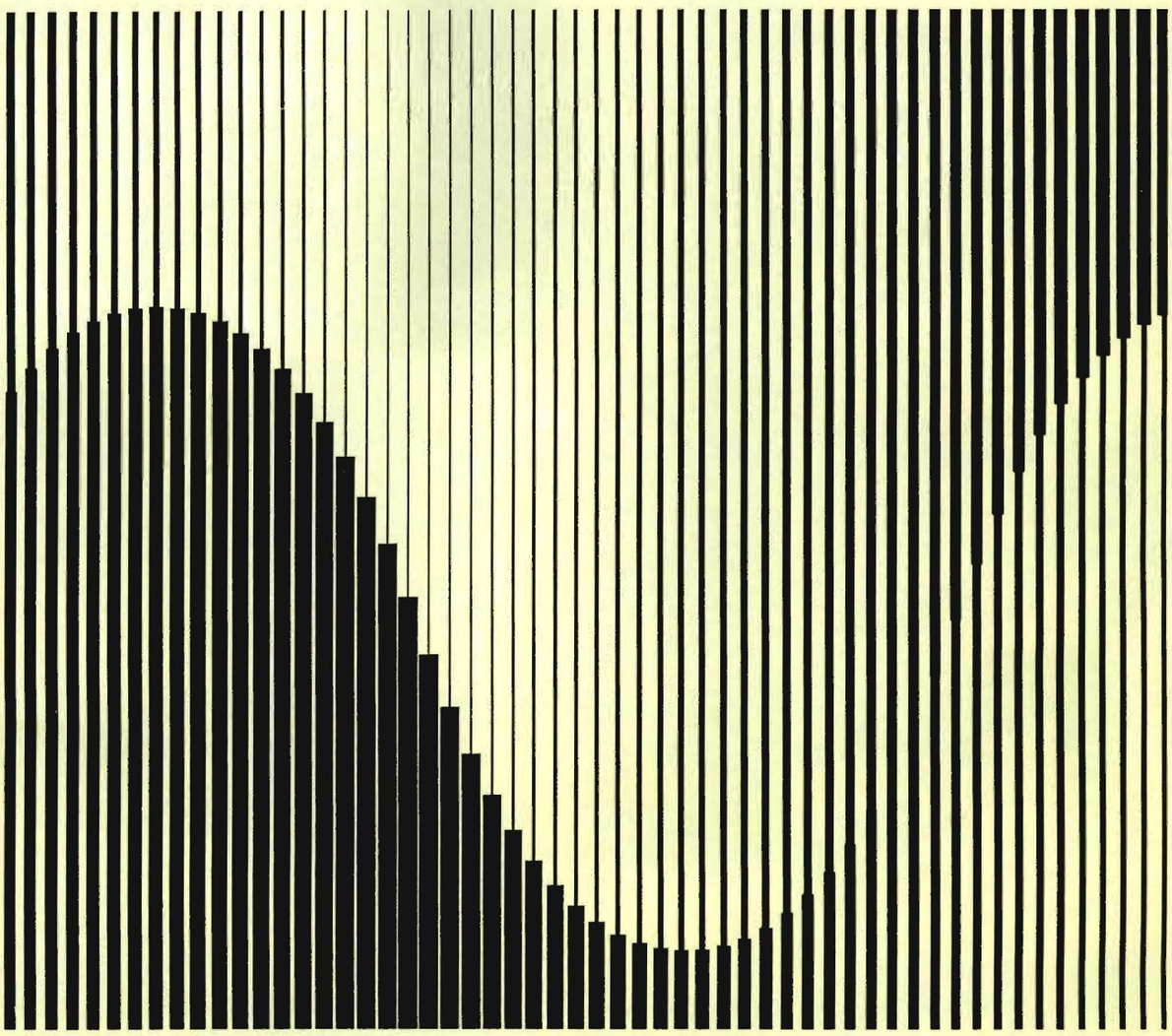
Operation & Maintenance Manual

MX-5050MKIV-2, BIII

MASTER TAPE RECORDER



ATARI

Part No. OS3-298

OTARI®

MX-5050 MKIV-2, BIII-2

MASTER TAPE RECORDER

OPERATION AND MAINTENANCE MANUAL

THIRD EDITION

Otari, Inc.

Printed: May 1992
Ed 3 (WM)

CAUTION

To prevent fire or shock hazard:

Do not expose this unit to rain or moisture.

Do not remove panels (unless instructed to do so).

There are no user-serviceable parts inside.

Refer servicing to qualified service personnel.

PLEASE READ THROUGH THE SAFETY INSTRUCTIONS ON THE NEXT PAGE.

SAFETY INSTRUCTIONS

1.	**Read Instructions**	All the safety and operating instructions should be read before the device is operated.
2.	**Retain Instructions**	The safety and operating instructions should be retained for future.
3.	**Heed Warnings**	All warnings on the device and in the operating instructions should be adhered to.
4.	**Follow Instructions**	All operating and use instructions should be followed.
5.	**Water and Moisture**	The device should not be used near water — for example, near bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.
6.	**Carts and Stands**	The device should be used only with a cart or stand that is recommended by the manufacturer.
7.	**Ventilation**	The device should be situated so that its location or position does not interfere with its proper ventilation. For example, the device should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installa-tion, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
8.	**Heat**	The device should be situated away from heat sources such as radiator, heat registers, stoves or other appliances (including amplifiers) that produce heat.
9.	**Power Sources**	The device should be connected to a power supply only of the type described in the operating instructions or as marked on the device.
10.	**Grounding or Polarization**	Precautions should be taken so that the grounding or polariza-tion means of the device is not defeated.
11.	**Power Cord Protection**	Power supply cords should be routed as they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience recep-tacles, and the point where they exit from the device.
12.	**Cleaning**	The device should be cleaned only as recommended by the manufacturer.
13.	**Non-Use Periods**	The power cord of the device should be unplugged from the out-let when left unused for a long period of time.
14	**Object and Liquid Entry**	Care should be taken so that objects do not fall and that liquids are not spilled into the enclosure through openings.
15.	**Damage Requiring Service**	The device should be serviced by qualified service personnel when: **A.** The power-supply cord or the plug has been damaged; or **B.** Objects have fallen, or liquid has been spilled into the appliance; or **C.** The appliance has been exposed to rain; or **D.** The appliance does not appear to operate normally or exhibits marked change in performance; or **E.** The appliance has been dropped, or the enclosure damaged.
16.	**Servicing**	The user should not attempt to service the device beyond that described in the operating instructions. All other service should be referred to qualified personnel.

COMMUNICATION WITH OTARI

FOR SERVICE INFORMATION AND PARTS

All Otari products are manufactured under strict quality control. Each unit is carefully inspected and tested prior to shipment.

If, however, some adjustment or technical support becomes necessary, replacement parts are required, or technical questions arise, please contact your Otari dealer or contact Otari at:

Otari, Inc.
4-33-3 Kokuryo-cho
Chofu-shi, Tokyo182
Japan

Phone : (0424) 81-8626
Telex : J26604 OTRDENKI
Fax : (0424) 81-8633
Cable : OTARIDENKI TOKYO

Otari Corporation
378 Vintage Park Drive
Foster City
California 94404
U.S.A.
Phone : (415) 341-5900
Telex : 650 302 8432 MCI UW
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Otari Deutschland GmbH.
Rudolf-Diesel-Str.12
D-4005 Meerbusch 2 (Osterath)
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Otari (U.K.) Limited
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Slough, Berkshire SL3 6EP
United Kingdom
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Telex : 849453 OTARI G
Fax : (0753) 542600

Another part of Otari's continuing technical support program for our products is the continuous revision of manuals as the equipment is improved or modified. In order for you to receive the information and support which is applicable to your equipment, and for the technical support program to function properly, please include the following information, most of which can be obtained from the Serial number label on the machine, in all correspondence with Otari:

- Model Number:
- Serial Number:
- Date of Purchase:
- Name and address of the dealer where the machine was purchased and the power requirements (voltage and frequency) of the machine.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

This Section includes a general description of the features of the MX-5050 series tape recorders and information on the structure of this manual.

1.1 The New MX-5050 Series

The features of the MX-5050 Series tape recorders are described below.

The new MX-5050 Series is divided into the following models:

MX-5050 BIII-F	Full Track, 1/4" Track Width
MX-5050 BIII-2	2 Channel, NAB 1/4" Track Width
MX-5050 BIII-2E	2 Channel, DIN 1/4" Track Width
MX-5050 BQIII	4 Channel, 1/4" Track Width
MX-5050 MKIV2	2 Channel, NAB 1/4" Track Width
MX-5050 MKIV2E	2 Channel, DIN 1/4" Track Width
MX-5050 MKIV4	4 Channel, 1/2" Track Width
MX-5050 MKIV8	8 Channel, 1/2" Track Width

This manual describes the MX-5050 MKIV-2, 2E, BIII-F, BIII-2 and BIII-2E models.

BIII MKIV-2

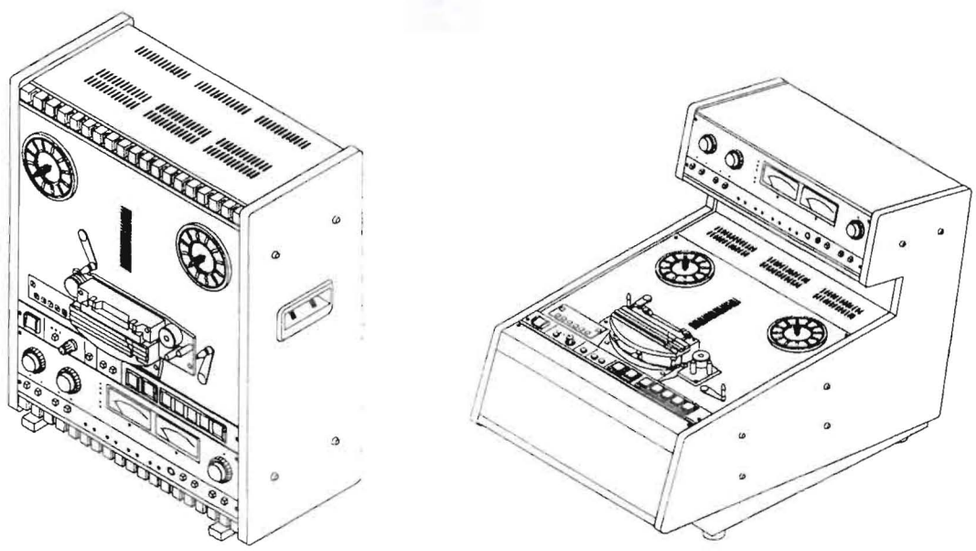


Figure 1-1
Exterior Appearance

Features of the MX-5050 Series

In addition to the usual tape recorder functions, the MX-5050 series has various additional features. All MX-5050 series tape recorders have the OTARI Standard Parallel I/O connector which allows for post production editing work with a synchronizer using time code. The tape timers include a Mini Locator for more advanced locator functions.

In addition to these functions, these machines also have the following features: Sel-Rep (Selective Reproduce), Edit mode function which permits tape spilling, CUE monitoring which enables monitoring the tape in F.FWD or RWD mode, Standby function for easy multi-channel recording, and Variable Pitch Control function (±20%).

1.2 Using This Manual

1.2.1 Organization

This manual is divided into ten sections as follows.

Section 1 Introduction
This section describes the features of the MX-5050 series tape recorders and the structure of this manual.

Section 2 Installation
This section describes the procedures for unpacking and hooking up the machine. This section also includes the DIP switch presettings.

Section 3 Controls and Indicators
This section describes the name and function of each control. The connector pin assignments are also included.

Section 4 Operation
This section explains each mode of the machine and the basic procedures for reproducing and recording a tape.

Section 5 Maintenance
This section describes procedures for daily maintenance.

Section 6 Transport Adjustment and Parts Replacement
This section describes the adjustment procedures for transport mechanisms and replacement procedures.

Section 7 Audio Alignment
This section describes the electrical adjustment of the Reproduce and Record circuits.

Section 8 Specifications
This section of the manual contains the operating specifications for MX-5050 series tape recorders.

Section 9 Exploded Views and Parts Lists
This section of the manual contains assembly drawings of the machine "exploded" to show internal parts and hardware, and the order of assembly. Each exploded view is keyed to an accompanying parts list showing Otari part numbers and descriptions for all mechanical components.

Appendix A Block Diagrams
This appendix includes block diagrams of the MX-5050 and level diagrams of the circuitry.

Appendix B Troubleshooting
This section describes some typical problems which may occur during operations, their possible causes and how to handle them.

1.2.2 Conventions within this manual

PCB Assemblies: The term PCB Assembly is used in this manual to refer to a printed circuit board which has components (resistors, connectors, etc.) mounted on it. The term PCB or Printed Circuit Board, when used alone refers to the "bare" printed circuit board without components. The term PCB is rarely used outside of the electrical and mechanical parts lists. When a PCB Assembly is referred to in the text, the name or function of that PCB Assembly will usually be given in ALL CAPITAL letters.

Type conventions

ALL UPPER CASE - Generally, this manual uses all upper case type to describe a switch or control when that item is similarly labeled on the machine (e.g., the PLAY button).

First Letter - Where a switch or button is not Upper Case labeled, or the reference is less clear, only the first letter of the item is capitalized (e.g., the Cue Wheel near the CUE button). Machine status or operating modes are described with an upper case first letter (e.g., you press the PLAY button to place the machine in Play mode).

( ), [ ] - Normal parentheses ( ) are used for examples and parenthetic comments. Square brackets **[ ]** are used to refer to certain illustrations. When used in text, the square brackets are either references to the same figure as noted in that sub-section (e.g., **[3]**, meaning the part labeled "3" in the figure noted) or are preceded by the figure number (e.g., **Fig. 2-1, [3]**, meaning "3" in **Figure 2-1**).

Section 2 Installation

This section of the manual provides information on unpacking and inspecting the tape recorder, and on power and signal connections. Refer to this section when first setting up the machine.

This section includes the following sub sections.

2.1 Unpacking and Inspection

After receiving the MX-5050, examine the case for any signs of damage. Then unpack and inspect the equipment. Take care when unpacking the equipment and removing packing materials to prevent damaging the critical components such as the capstan, head assembly, and tension arms. If there is any evidence of damage due to rough handling during transportation, a claim should be filed with the transportation company. We recommend retaining the packing material at least until proper operation of the machine has been established.

Verify that all items, as listed in **Table 2-1**, have been received. Do not connect or operate the MX-5050 until this inspection has been completed.

When sending the machine back to the local OTARI dealer or to OTARI, follow the packing directions printed on the carton.

Table 2-1
Standard Accessories

MX-5050 BIII, MKIV-2

Parts Name	Part No.	Quantity
Reel Clamp	KW0HV	2
Power Cable	PZ9D003	1
Manual	OS3-298	1
Lubrication Oil	PZ9E003	1
Fuse 1A	FH7F010	1
(Fuse 1A 200-240V only	FH9-032	1)
Fuse 2A	FH9-030	1
Fuse 2A	FH7F020	1
Fuse 3A	FH7F030	1
Fuse 4A	FH7F040	1
Fuse 5A	FH7F050	1

2.2 Audio Signal Connection

2.2.1 Audio Connectors

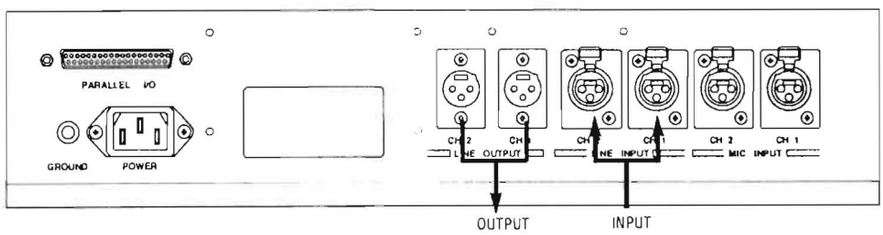
The input to the machine is transformerless and balanced with an input impedance of 10 kΩ. The input level is fixed to +4dBu.

The output from the machine is transformerless and balanced. The nominal output level is selected from +4 dBu or -16 dBu with the switch on the rear panel. The output level is set to +4 dBu at the factory.

The microphone input is balanced with an input impedance of 10 kΩ. Input level can be attenuated by 20 dB with the attenuation switch on the rear panel.

The connections to the Input/Output connectors are as shown in **Figure 2-1**.

BIII



MKIV-2

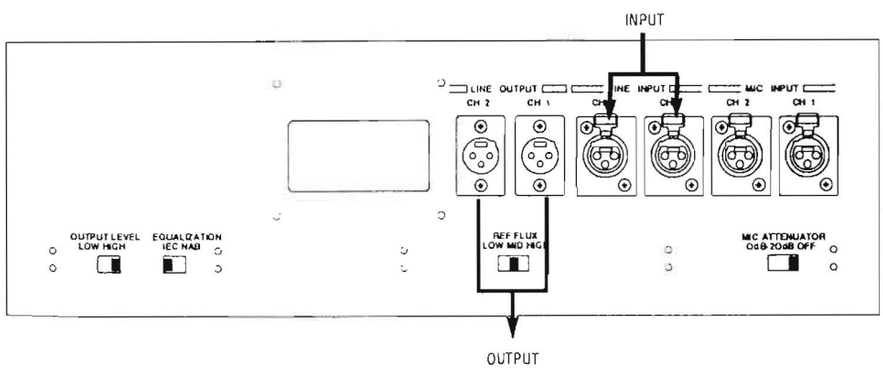


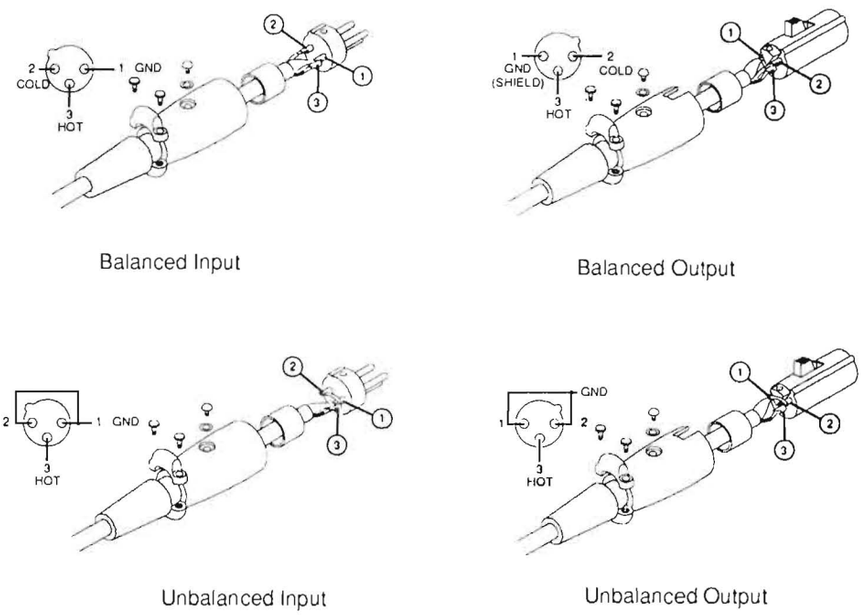
Figure 2-1
Input/Output Connectors

2.2.2 Balanced/Unbalanced Connection

The Input/Output connectors are balanced as shown in **Figure 2-2**. The pin assignment of the connectors is as follows:

Pin 1: Shield (GND)
Pin 2: Cold
Pin 3: Hot.

When connecting an unbalanced machine to the MX-5050, change the pin assignment as shown in **Figure 2-2**.



Balanced Input

Balanced Output

Unbalanced Input

Unbalanced Output

Figure 2-2
Balanced/Unbalanced Connectors

Optional Input (ZA-53T)/Output (ZA-53S) Transformers are available from OTARI. For details contact OTARI or your nearest OTARI dealer.

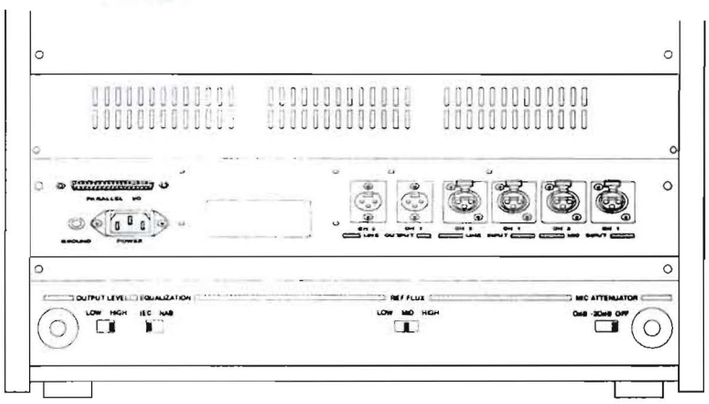
2.3 Switch Position Adjustment

If necessary, change the following switch settings on the rear panel before operating the machine.

Table 2-2
Settings on Rear Panel

Function	Switch	Setting
MIC. Attenuator	SW501	0dB/-20dB/OFF
REF FLUX	SW502	H/M/L (320/250/185nWb/m)
EQ Setting	SW503	NAB/IEC
Output Level Setting	SW504	H: +4dBu, L: -16dBu

BIII



MKIV-2

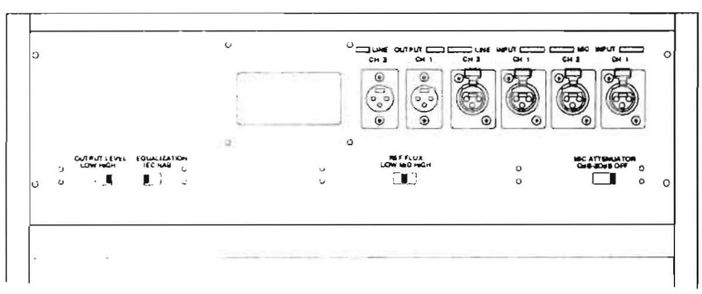


Figure 2-3
Switch Settings on Rear Panel

❑ DIP SW settings on the CONTROL PCB

Table 2-3
DIP SW Settings on the Control PCB

Note: When any of the following DIP SW settings are changed, the machine must be turned off and on for the settings to take effect.

SW1	SW2
SW1-1 Speed Version	**SW2-1** SEARCH 3 key Selection
SW1-2 Punch-In	**SW2-2** SEARCH 3 key Selection
SW1-3 Punch-Out	**SW2-3** Stop Mute Selection
SW1-4 Capstan PLL Reference	**SW2-4** Fast Wind Mute Selection
SW1-5 Capstan PLL Reference	**SW2-5** Play Start Mute
SW1-6 Punch-In Type Select	**SW2-6** Machine Type
SW1-7 REC LED Flashing Select	**SW2-7** Machine Type
SW1-8 External Control Select	**SW2-8** Not used

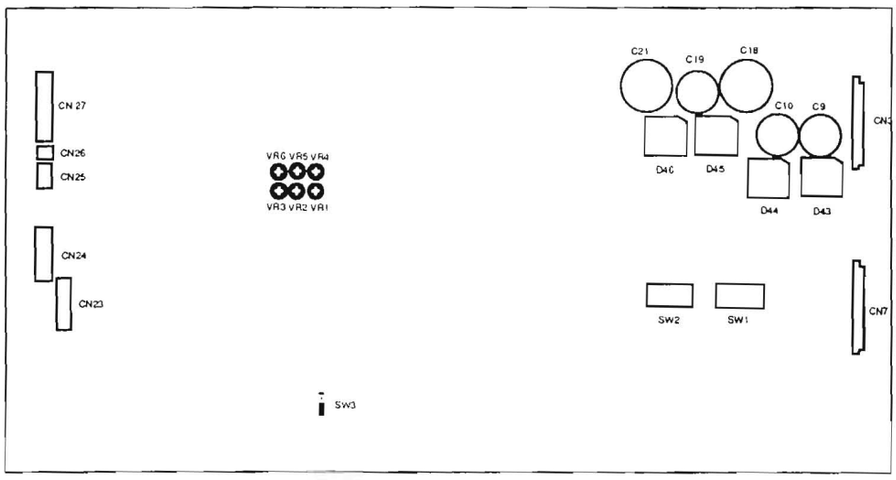


Figure 2-4
Controls on the CONTROL PCB Assembly

Refer to **Fig 2-4** for the location of these DIP switches on the CONTROL PCB Assembly.

SW1-1 Speed Version Selection (BIII-2)

ON 3.75/7.5 ips: Low Speed Version (Option)
OFF 15/7.5 ips: High Speed Version

The BIII-2 is set to High Speed at the factory. After receiving the BIII-2, it can be changed to Low Speed with this switch. Refer to §2.8 for details. The MKIV-2 cannot be changed to Low Speed.

SW1-2 Punch-In (Refer to **§ 3.2, [18]** REC button)

ON Press REC and PLAY buttons in PLAY mode to begin Punch-In
OFF Press REC button in PLAY mode to begin Punch-In

SW1-3 Punch-Out (Refer to **§ 3.2, [19]** PLAY button)

ON Press PLAY button to end the Punch-In Record
OFF Press STOP and REC button to end the Punch-In Record

SW1-4, 1-5 Capstan PLL Reference Setting

When the machine is in FIX mode, the capstan speed is adjusted with these switches (refer to **§ 6.7**).

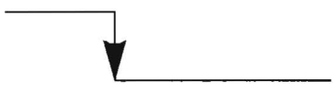
Table 2-4
Capstan PLL Reference Setting

SW1-4	SW1-5	OFF SET (%)
ON	ON	+ 0.2%
OFF	ON	– 0.2%
ON	OFF	– 0.4%
OFF	OFF	Not used

SW 1-6 Adding Punch In Type Selection

ON **Edge Type**

With this setting, the Punch In command signal is as shown above. Additional Punch-Ins are made by pressing the PLAY and REC buttons (or just the REC button) while in Ready mode.



OFF **Level Type**

With this setting, the Punch In command signal is as shown above. Additional Punch-Ins are made by changing READY/SAFE switches from the SAFE position to the READY position.

SW1-7 Flashing REC button selection

This switch selects whether the lamp on the REC button flashes when the READY/SAFE switch is set to READY.

ON Illuminates (does not flash)
OFF Flashes

SW1-8 \

SW2-1, 2-2

These switches select the function of the SEARCH 3 key.

Table 2-5
SEARCH 3 Key Function

SW2-1	2-2	Function
ON	ON	Proximity Sensor ON/OFF key *
OFF	ON	Not used
ON	OFF	Search Start (**§ 4.5.6**)
OFF	OFF	Search Cue (**§ 4.5.3**) Default Setting

* When using the optional proximity sensor, pressing the SEARCH 3 key enables/disables the Proximity Sensor Function

SW2-3

This switch selects whether the audio signal is muted during the time from when the STOP button is pressed until the machine actually stops.

ON: Not Mute
OFF: Mute

SW2-4

This switch selects whether the audio signal is muted during Fast Wind modes other than Fast Wind Cue mode.

ON: Not Mute
OFF: Mute

SW2-5

This switch selects whether the audio is muted during the time from when the PLAY button is pressed until the tape enters Play mode.

ON. Not Mute
OFF: Mute

SW2-6, 2-7

These switch settings determine the machine type. These switches are set at the factory and should not be changed.

Table 2-6
Machine Type

SW2-6	SW2-7	Type	Tape	Rehearsal	Size
ON	ON	8CH	1/2"	O	O
OFF	ON	4CH	1/2"	O	O
ON	OFF	4CH	1/4"	O	O

SW2-8

Not Used

2.4 PCB Assembly Location

2.4.1 MX-5050 BIII

The PCB Assemblies are located as shown in **Figure 2-5**. The CONTROL PCB Assembly is accessed by removing the rear panel. (Refer to **Figure 2-9**). The CONTROL PCB can be rotated to adjust parts on the COMP side. To access the REC/ REP AMP PCB Assembly, the AMP section of the MX-5050BIII must be turned face up. The rotation of the AMP section is performed as follows.

BIII

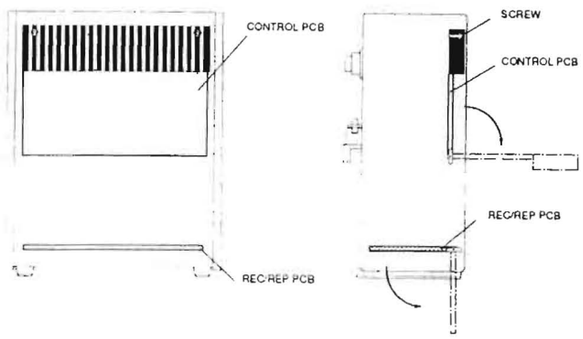


Figure 2-5
PCB Assembly Location (BIII)

❑ **AMP Section Rotation**

1. Turn off the machine. Place the machine so that the transport faces upward. Refer to Figure 2-6.
2. Remove the four screws holding the Bottom Cover. Remove the Bottom Cover from the machine.
3. Remove the four screws holding the AMP section. While lifting the AMP section slightly, rotate it to a horizontal position.

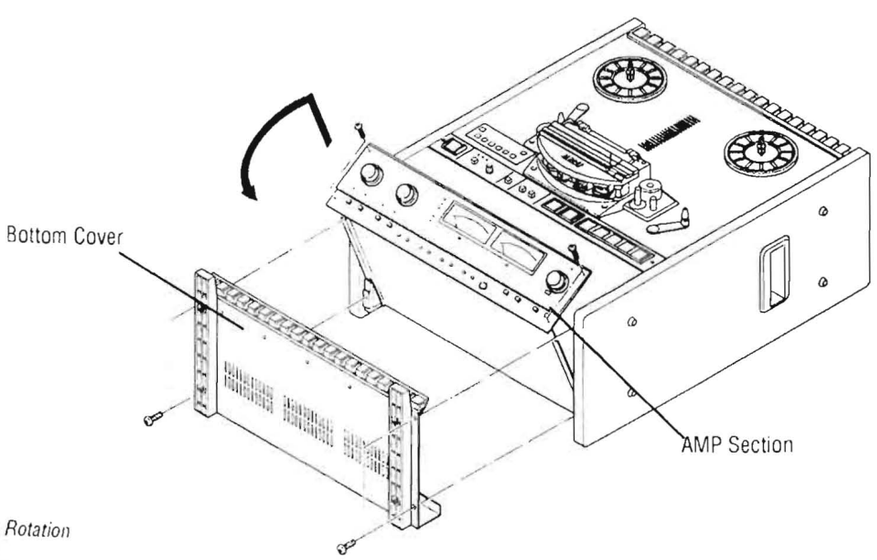


Figure 2-6
AMP Section Rotation

CONTROL PCB Assembly Rotation

1. Turn off the machine. Place the machine in the upright position. See Figure 2-7.
2. Remove the Foot and Deck Stand from the Rear Cover.
3. Remove the Rear Cover by removing the screws holding it in place.
4. Loosen the two screws holding the Heat sink. Rotate the CONTROL PCB Assembly on its side.
5. The Side Boards may need to be removed to access some controls on the CONTROL PCB Assembly.

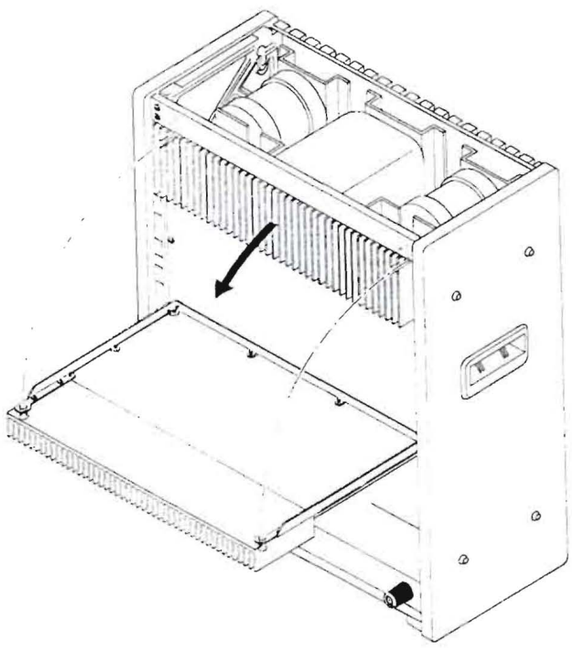


Figure 2- 7
CONTROL PCB Assembly Rotation

2.4.2 MX-5050 MKIV2

The AMP section of the MKIV-2 is adjusted after removing the Top Panel.

❑ **Accessing the AMP Section**

1. Turn off the machine. Remove the Top Panel (for MKIV-2).
2. Adjust the PCB Assemblies (REC/REP AMP PCB Assembly) located inside the AMP section.

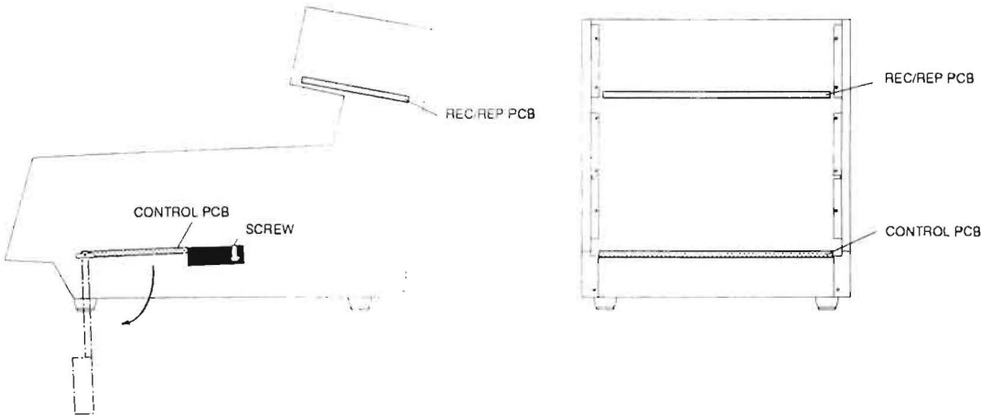


Figure 2-8
PCB Assembly Location

❑ CONTROL PCB Assembly Rotation

Follow the steps below when adjusting the CONTROL PCB Assembly and internal parts of the MKIV-2.

1. Turn off the machine. Lay the machine on its side.
2. Remove the Bottom Panel by removing the screws holding it.
3. Loosen the two screws holding the Heat Sink on the Control PCB Assembly. Rotate the CONTROL PCB Assembly.
4. Depending on the parts to be adjusted, the side panel may also need to be removed.

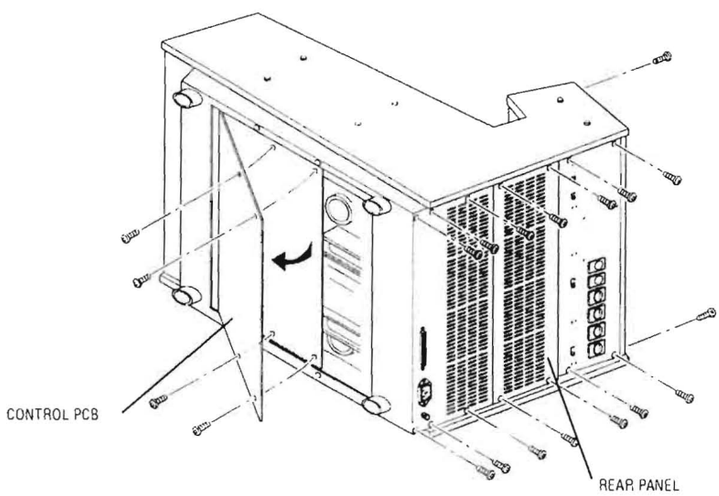


Figure 2-9
CONTROL PCB Assembly Rotation (MKIV-2)

2.5 Power Connection

Confirm that the power voltage marked on the rear panel corresponds with the line voltage being used.

❑ Turning on the machine

For power connection, use the included Power Cable. Connect the Power Cable plug to the power connector located at the rear of the machine. Make sure that the machine is turned off before connecting the other end of the power cable to the AC line outlet. The machine is now ready to be turned on.

Pressing the upper portion of the POWER Switch applies power to the machine. After power is applied to the machine, the VU meters, tape timer digits, and the indicator above the STOP button will illuminate. The Tape Timer will show the selected tape speed for several seconds after the machine is turned on, and then will change to tape time indication.

Turning on the machine while pressing the STOP button will cause the ROM version of the Control PCB Assembly to be displayed.

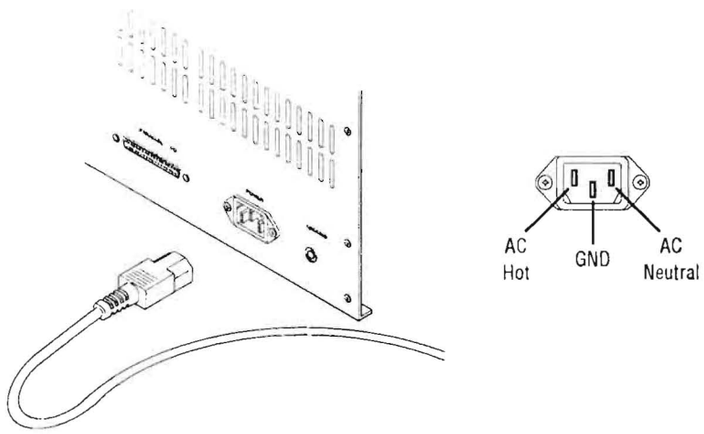


Figure 2-10
Power Connection

❑ AC Voltage Connector Replacement

When the AC Line Voltage is different from the factory setting, the Line Voltage connector should be changed to the proper one. In this case, contact OTARI or nearest OTARI dealer and order the proper Line Voltage connector. The Line Voltage connector (white) is located beside the Supply Reel Motor. First remove the rear panel and replace it. The following figure describes the wiring of the connectors.

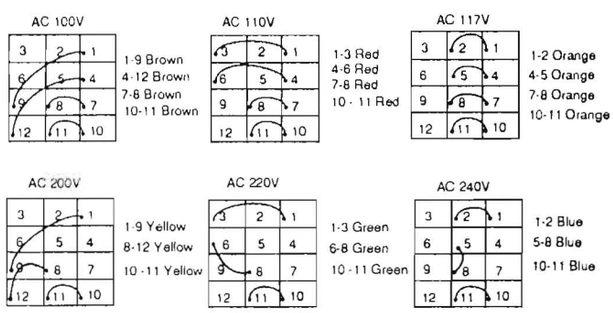


Figure 2-11
AC Line Voltage Connector

2.6 Fuse Replacement

If a fuse is blown, first check the cause of the blown fuse, then replace the fuse with a new one as follows.

CAUTION: For continued protection against fire hazard, replace only with the same type of fuse. Before replacing a fuse, disconnect the power cable from the AC line.

First refer the Table 2-1 for information on the eight fuses.

Replacement of the Main Fuses

1. Remove the left side panel by removing the screws holding it.
2. Referring to the Figure 2-11, find the fuse location.
3. Locate the blown out fuse(s).
4. Replace the blown out fuse(s) with a new one(s).

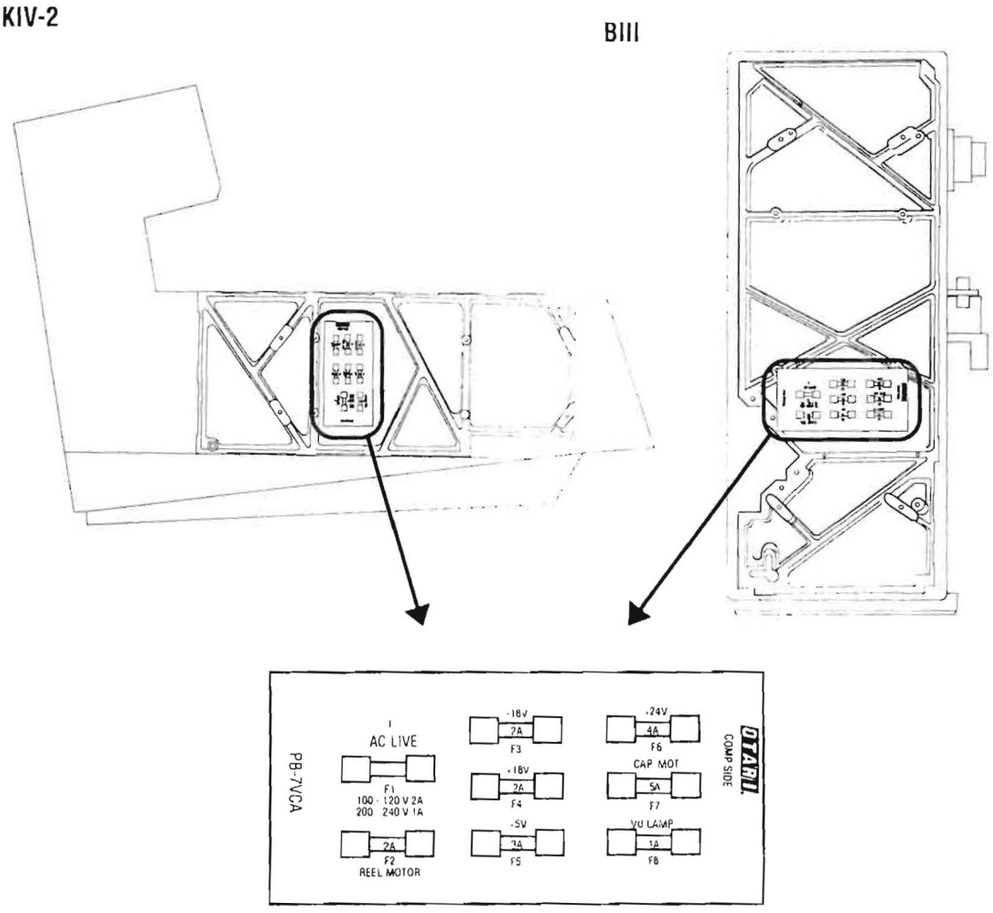


Figure 2-12
Fuse Location

Table 2-7
Fuse Specifications

Number	Rating				Otari No.	Used For
	Current	Voltage	Size	Carry		
F1	2A	125V	5.2 x 20mm	110%	FH9-030	Power Supply
F2	2A	125V	5.2 x 20mm	110%	FH7F020	Reel Motor
F3	2A	125V	5.2 x 20mm	110%	FH9-030	–18V (Slow Blow)
F4	2A	125V	5.2 x 20mm	110%	FH9-030	+18V (Slow Blow)
F5	3A	125V	5.2 x 20mm	110%	FH7F030	+5V
F6	4A	125V	5.2 x 20mm	110%	FH7F040	+24V
F7	5A	125V	5.2 x 20mm	110%	FH7F050	Capstan Motor
F8	1A	125V	5.2 x 20mm	110%	FH7F010	VU Lamp

2.7 Speed Conversion (BIII-2)

Normally, the MX-5050 BIII-2 is shipped from the factory with set at High Speed (15/7.5 ips). If you want to change this to Low Speed (7.5/3.75 ips), follow the steps below.

1. Remove the bottom panel to access the CONTROL PCB. Rotate the CONTROL PCB.
2. The Speed Version Select SW1-1 is located on the CONTROL PCB. Change the switch position to the LOW position. (Refer to § 2.3.)
3. Replace the bottom panel on the machine.
4. Make all necessary adjustments (Reproduce EQ, SRL, Bias Record EQ, Record Level) referring to the corresponding explanation in Section 7.

NOTE: The MX-5050 MKIV-2 cannot be changed to Low Speed.

2.8 Equalization Change

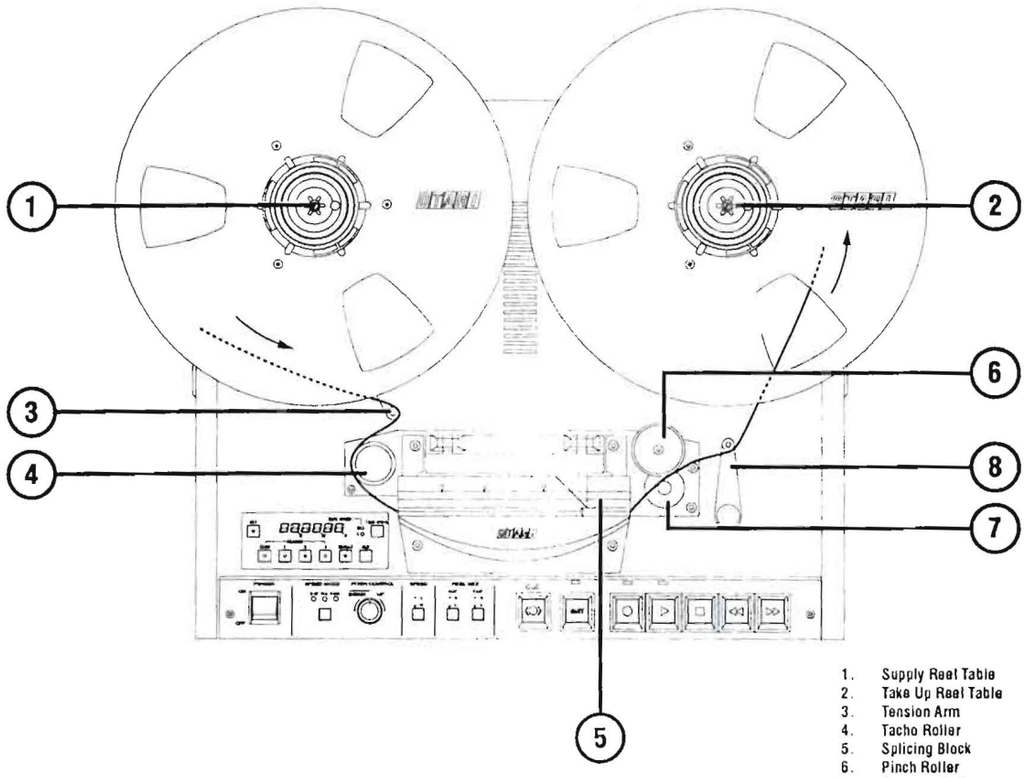
The Equalization type is set to the customer's specifications at the factory. The setting can be changed between NAB and IEC by sliding the EQUALIZER select switch on the rear panel (Refer to § 2.3). If the setting is changed, equalizer adjustments (§ 7.3.3 and 7.4.5) must be made.

Section 3 Controls and Indicators

This section describes the names and functions of the controls, indicators, and main components of the MX-5050. Drawings of the controls and indicators are used to associate the description with the real parts on the machine. When you have questions about any of the controls or their functions, please refer to this section.

This section includes the following sub sections.

3.1 Tape Transport



1. Supply Reel Table
2. Take Up Reel Table
3. Tension Arm
4. Tacho Roller
5. Splicing Block
6. Pinch Roller
7. Capstan Shaft
8. Tension Arm with Safety Switch

Figure 3-1
Tape Transport

Numbers in brackets [ ] refer to **Figure 3-1**.

[1] Supply Reel Table
[2] Take-up Reel Table

The Reel Tables are supplied with reel clamps for 5" or 7" reels. For 10.5 inch NAB reels, use the supplied reel adapter.

[3] Tension Arm

The Supply Tension Arm helps correct tape tension fluctuations due to changes in tape pack diameter or irregularities in tape pack.

[4] Tacho Roller

The Tacho Roller is turned by tape motion and generates tacho pulses which are used for the calculation of tape time and recognition of the tape direction.

[5] Splicing Block

When editing a tape, the tape is cut or spliced on this block.

[6] Pinch Roller

The tape is driven by the rotation of the Capstan Shaft against the Pinch Roller.

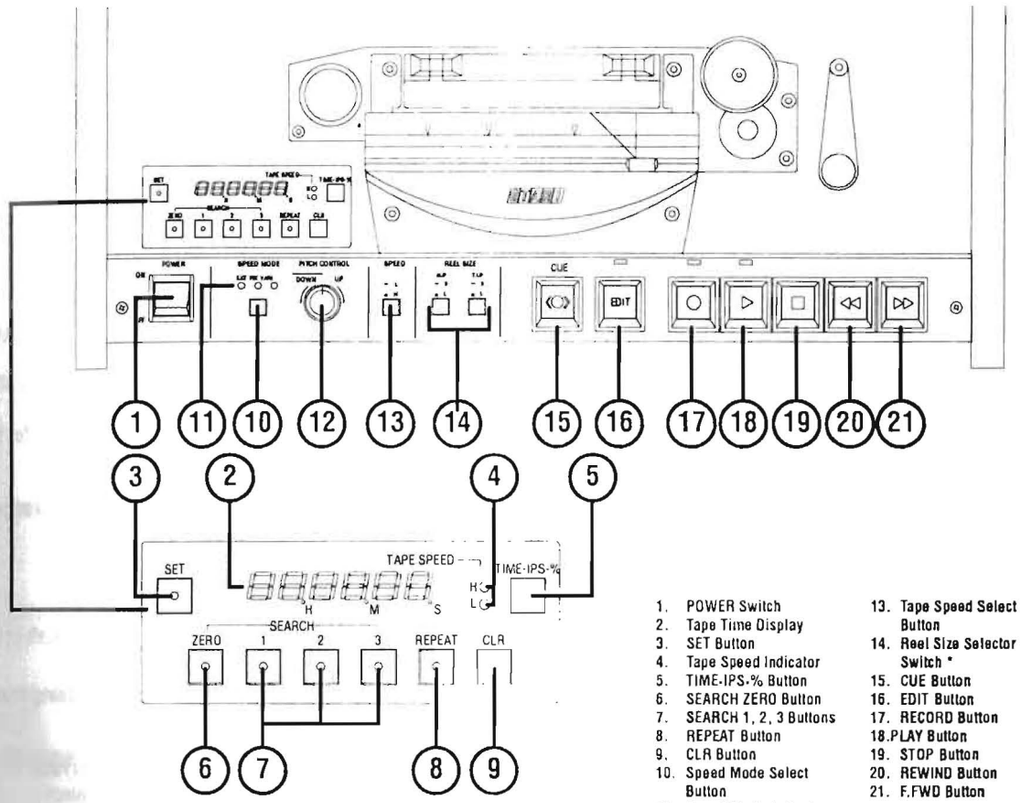
[7] Capstan Shaft

The Capstan Shaft is directly driven by a DC servo motor which is controlled by a quartz crystal reference in a phase-locked-loop circuit.

[8] Tension Arm with Safety Switch

The take-up tension arm is provided with a safety switch which stops the transport when the tape becomes unthreaded from the reel or when too much slack develops in the tape path.

3.2 Transport Control Panel



1. POWER Switch
2. Tape Time Display
3. SET Button
4. Tape Speed Indicator
5. TIME-IPS-% Button
6. SEARCH ZERO Button
7. SEARCH 1, 2, 3 Buttons
8. REPEAT Button
9. CLR Button
10. Speed Mode Select Button
11. Speed Mode Indicator
12. Pitch Control Knob
13. Tape Speed Select Button
14. Reel Size Selector Switch *
15. CUE Button
16. EDIT Button
17. RECORD Button
18. PLAY Button
19. STOP Button
20. REWIND Button
21. F.FWD Button

Figure 3-2
Transport Control Panel

Numbers in brackets [ ] refer to **Figure 3-2**.

[1] POWER Switch

Pressing the upper portion of the Switch turns on the machine.

[2] Tape Time Display

This 6-digit display shows the tape time in Hours, Minutes, and Seconds; the tape speed in ips (inches per second); or the tape speed as a percentage change from the selected play speed, as set by the TIME-IPS-% Button **[5]**.

[3] SET Button

Pressing this button initiates Set mode, in a desired value can be entered by using the SEARCH keys. There are two Set modes:

A. Cue Point Set mode: Refer to **§ 4.5.1**
B. Vari Speed Set mode: Refer to **§ 4.4.6**

[4] Tape Speed Indicator

This LED indicates the selected speed.

Hi Version	Low Version (BIII-2)		
Hi:	15 ips	Hi:	7.5 ips
Low:	7.5 ips	Low:	3.75 ips

[5] TIME·IPS·% Button

Pressing this button causes the Tape Time display to show, in turn, the current tape time, the currently selected tape speed in ips, or the percentage of change from the currently selected tape speed.

Tape Time → Tape Speed (ips) → Speed Change (%) → Tape Time → ···

When the display is showing Tape Speed, "iP" appears in the rightmost column. Similarly, when in Speed Change is being displayed, "P" appears in the rightmost column.

[6] SEARCH ZERO Button

Pressing this key places the MX-5050 into Search Zero mode. In Search Zero mode the tape is moved at Fast Wind speed to the location of 00:00:00 and is then stopped.

[7] SEARCH 1, 2, 3 Buttons

Pressing one of the illuminated SEARCH keys moves the tape to the location stored in that SEARCH key and stops.

Storing a CUE point:	Refer to **§ 4.5.1**
Search Operation:	Refer to **§ 4.5.2**
Clearing a CUE point:	Refer to **[9] CLR key**

[8] REPEAT Button

Pressing the REPEAT key, then pressing two SEARCH keys, then pressing the PLAY button enters the machine into Repeat mode. In Repeat mode, the machine repeatedly plays back the tape between two selected points. Refer to **§ 4.5.6**. for details on Repeat mode.

[9] CLR Button

Pressing the CLR key together with the one of the following keys works as follows.

CLR + SET:	Exits Set mode
CLR + T-IPS %:	Tape Timer Display resets to zero
CLR + SEARCH 1-3:	Cue Point Memory clears
CLR + REPEAT	Exits REPEAT mode

[10] Speed Mode Select Button

This button selects the tape speed for Record and Play modes. Pressing this button changes the Speed mode as follows.

- **FIX mode:** The Capstan Motor speed is controlled by the internal crystal oscillator. The speed setting (HI or LO) is selected by the Speed Select button.
- **VARI mode:** When the VARI mode is selected, the tape speed is changed by ± 20% of the nominal tape speed with the Pitch Control knob.
- **EXT mode:** Tape Speed is controlled by the external speed reference signal conveyed through the Parallel/O connector. When using a synchronizer or resolver, set the machine to this EXT mode.

NOTE: When the Speed Mode switch is set to the EXT position, the Tape Time display always shows tape time.

[11] Speed Mode Indicator

These indicators illuminate to show the speed mode selected with the Speed Mode Select Button.

[12] Pitch Control Knob

When the Speed Control mode is set to the VARI mode, the Pitch Control knob changes the tape speed in Record and Play modes. The tape speed is variable over a range of ± 20% of the selected FIX speed in 0.01 % steps.

[13] Tape Speed Select Button (HI/LO)

This button selects the speed setting of the machine. The following combinations are available. The speed version is set with SW1 on the CONTROL PCB.

Machine Type	HI	LO
Hi Version Machine	15ips	7.5 ips
Low Version Machine	7.5ips	3.75 ips

[14] Reel Size Change Switch

This switch sets the reel tension corresponding to the selected reel size. When using a 10.5" NAB Reel, set this switch to the "L" position. When using a reel smaller than 10.5", set the switch to the "S" position.

[15] CUE Button

Pressing this button during Fast Wind modes initiates Cue mode, in which the tape lifters retract allowing the tape to be in contact with the Reproduce head for audio monitoring at fast wind speed. There are two ways to enter CUE mode: tapping the CUE button or holding the CUE button down. For details, refer to **§ 4.2.1.**

[16] EDIT Button

Pressing this button while in Stop mode causes the MX-5050 to enter Edit Ready mode, in which the take-up motor is turned off and the safety switch for the Take-up tension Arm is deactivated. Pressing the PLAY button in Edit Ready mode, or pressing the EDIT button in Play mode, causes the MX-5050 to enter Dump Edit mode, in which the Take-up reel does not rotate causing tape to be "dumped" from the transport.

[17] RECORD Button

When any channel is in Record Ready mode, pressing the RECORD and PLAY buttons simultaneously enters REC mode. Unless the READY/SAFE switch is placed at the READY position, actual recording will not take place. For Punch In/Out Operation, refer to **§4.4.2**.

[18] PLAY Button

Pressing this button when the transport is in Stop mode enters the tape into Play mode, in which the tape is reproduced at the currently selected tape speed. Pressing the PLAY button with the RECORD button enters the transport into Record mode.

[19] STOP Button

Pressing this button when the transport is in Record, Play, Dump Edit, Fast Forward or Rewind mode causes the tape motion to stop.

[20] REWIND Button

Pressing this button places the transport into Rewind mode, in which the tape moves from the Take-up reel to the Supply reel at Fast Wind speed.

[21] F.FWD Button

Pressing this button places the transport into Fast Forward mode, in which the tape moves from the Supply reel to the Take-up reel at Fast Wind speed.

3.3 Head Assembly

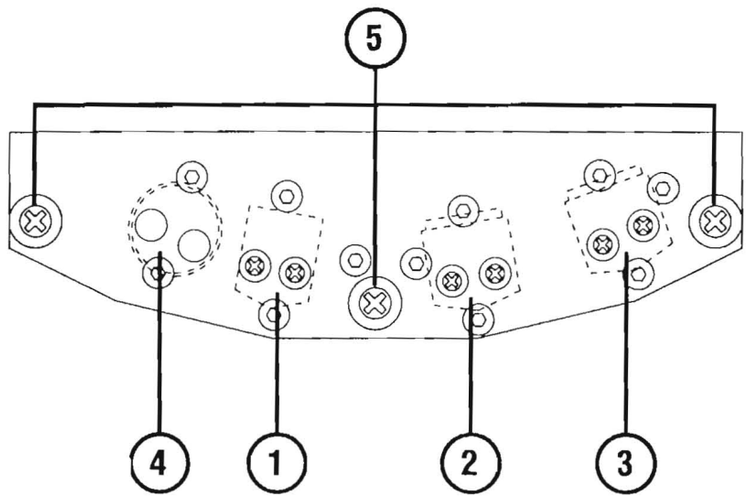


Figure 3-3
Head Assembly

Numbers in square brackets [ ] refer to **Figure 3-3**.

[1] Erase Head

The Erase Head is made of ferrite. The track width is 2 mm for the MKIV-2 and BIII2, 2.75 mm for the MKIV2E and BIII2E, and 6.3 mm for the BIII-F.

[2] Record Head

The Record Head is made of Hard Permalloy. The track width is 2 mm for the MKIV-2 and BIII2, 2.75 mm for the MKIV2E and BIII2E, and 6.3 mm for the BIII-F.

[3] Reproduce Head

The Reproduce Head is made of Hard Permalloy. The track width is 2 mm for the MKIV-2 and BIII2, 2.75 mm for the MKIV2E and BIII2E, and 6.3 mm for the BIII-F.

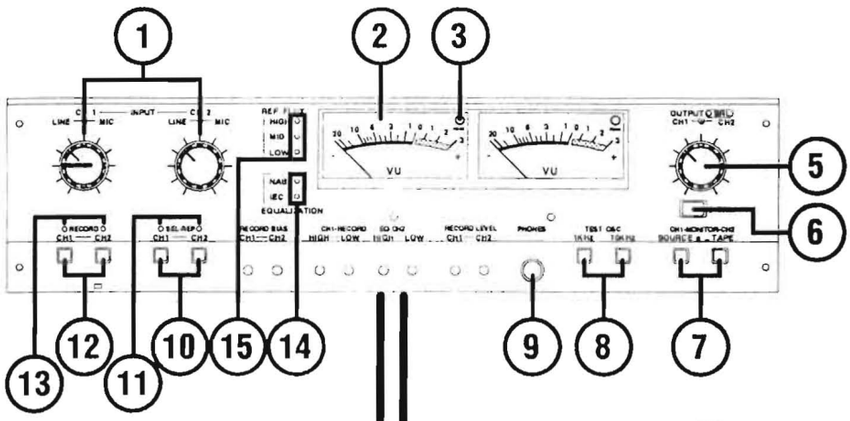
[4] Dummy Head (BQIII)

[5] Head Guides

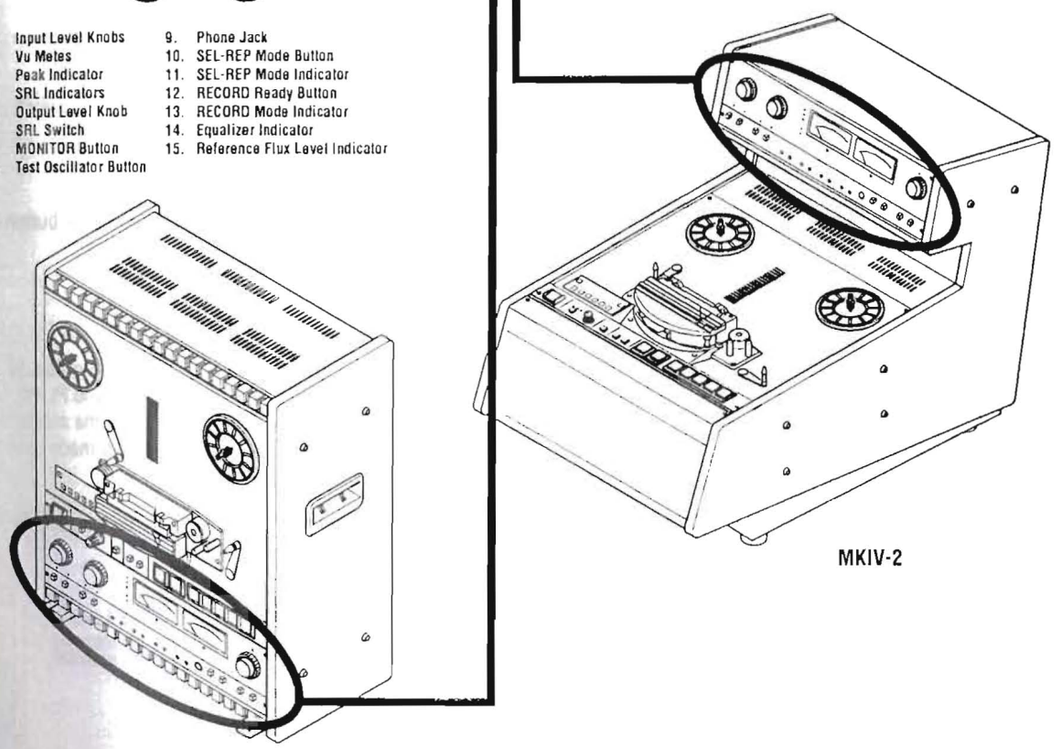
These guides regulate the tape movement across the heads.

3.4 Amplifier Panel

MKIV-8



1. Input Level Knobs
2. Vu Metes
3. Peak Indicator
4. SRL Indicators
5. Output Level Knob
6. SRL Switch
7. MONITOR Button
8. Test Oscillator Button
9. Phone Jack
10. SEL-REP Mode Button
11. SEL-REP Mode Indicator
12. RECORD Ready Button
13. RECORD Mode Indicator
14. Equalizer Indicator
15. Reference Flux Level Indicator



MKIV-2

BIII

Figure 3-4
Amplifer Panel

Numbers in square brackets [ ] refer to **Figures 3-4 and 3-5**.

[1] Input Level Knobs The outer knob adjusts the line input signal level. The inner knob adjust the microphone input signal level.

[2] VU Meters The VU meters indicate the record and reproduce levels of the associated channels. The VU meters illuminate when the machine is turned on.

[3] Peak Level Indicators (LED) Each VU meter has a PEAK level indicator which illuminates when the signal reaches a level equivalent to 1040 nWb/m.

[4] SRL Indicator This illuminates when the SRL button is pressed.

[5] Output Level Knob The outer knob adjusts CH1 output signal level. The inner knob adjusts CH2 output signal level.

[6] SRL Switch This switch selects the Standard Reference Level (SRL) of the output level. When this switch is pressed, the output level is set to the SRL (factory setting: +4dB).

[7] Monitor Button This button selects the monitor signal source. When this button is set to SOURCE position, all the OUTPUT connectors and VU Meters receive the signal present at the INPUT connector. When this button is set to TAPE position, the signal reproduced with the Repro Head is output.

[8] Test Oscillator Buttons Pressing one of these buuttons activates the test oscillator. The selectable oscillator frequencies are 1kHz and 10kHz.

[9] Monitor Phone Jack This is the monitoring Head Phone Jack. Load Impedance is 8 Ω

[10] SEL-REP Mode Button If the Monitor button is set to TAPE position and the SEL-REP Mode button is pressed, all the OUTPUT connectors and VU Meters receive signals reproduced by the Record head.

[11] SEL-REP Indicator This indicator illuminates when the SEL-REP mode is selected.

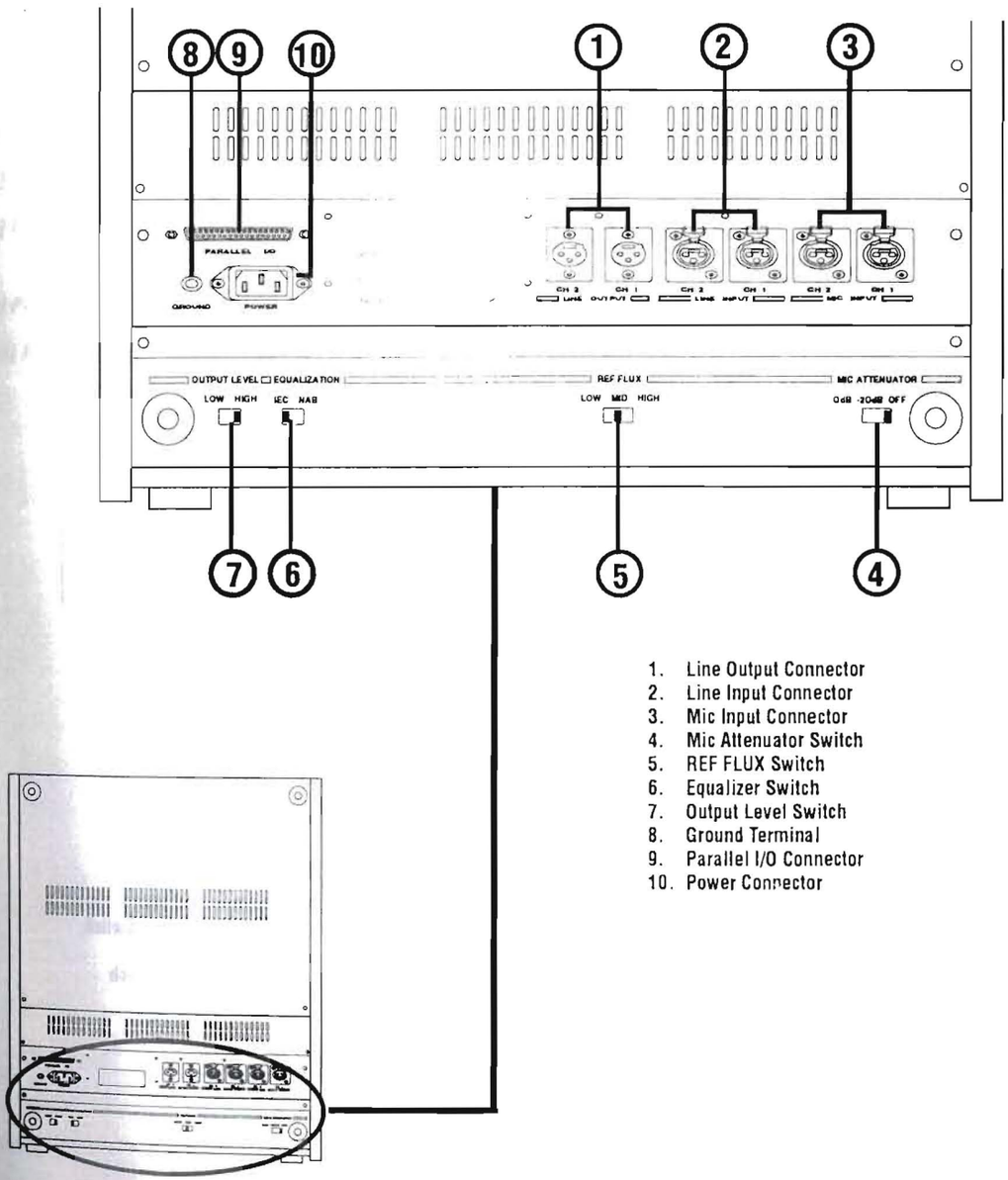
[12] RECORD READY Buttons When these buttons are pressed, the machine enters into READY mode. In READY mode, the machine enters Record mode when the REC and PLAY buttons are pressed. If these buttons have not been depressed, the machine is set to SAFE. In SAFE mode, the machine cannot enter Record mode even if the REC and PLAY buttons are pressed.

[13] RECORD Mode Indicator This indicator illuminates when the machine is set to Record Ready mode.

[14] EQ Indicator This indicator illuminates to show the selected EQ setting.

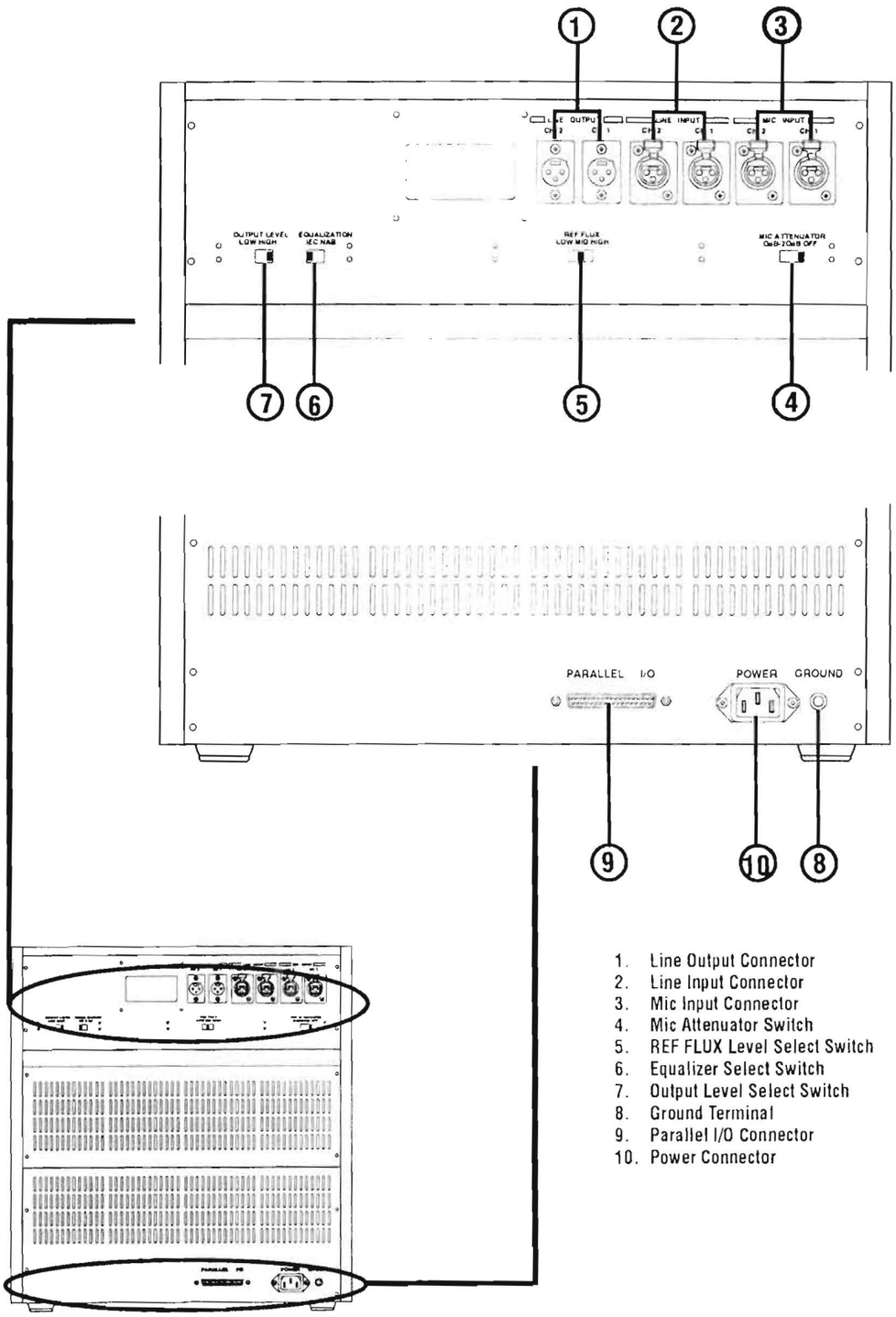
[15] REF FLUX Indicator This indicator illuminates to show the selected Reference Flux Level.

3.6 Audio Connector Panel



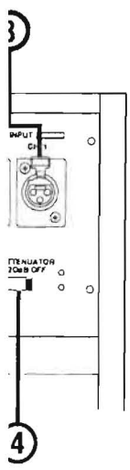
1. Line Output Connector
2. Line Input Connector
3. Mic Input Connector
4. Mic Attenuator Switch
5. REF FLUX Switch
6. Equalizer Switch
7. Output Level Switch
8. Ground Terminal
9. Parallel I/O Connector
10. Power Connector

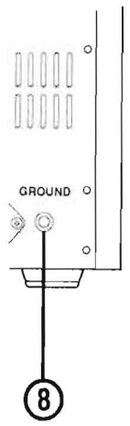
Figure 3-5
Audio Connector Panel (BIII)



1. Line Output Connector
2. Line Input Connector
3. Mic Input Connector
4. Mic Attenuator Switch
5. REF FLUX Level Select Switch
6. Equalizer Select Switch
7. Output Level Select Switch
8. Ground Terminal
9. Parallel I/O Connector
10. Power Connector

Figure 3-6
Audio Connector Panel (MKIV-2)





The numbers in bracket [ ] refer to **Figures 3-7** and **3-8**.

[1] LINE OUTPUT Connector — These XL type connectors are for audio output. See **§2.2.2** for pin assignment.

[2] LINE INPUT Connector — These XL type connectors are for audio input. See **§2.2.2** for pin assignment.

[3] Microphone Input Connector — These XL type connectors are for microphone input.

[4] Microphone Attenuator Switch — When this switch is set to the –20dB position, this switch attenuates the microphone input level by 20dB. If attenuation is not necessary, set this to 0dB. When this switch is set to the OFF position, the MIC input is not active.

[5] REF FLUX Switch — This switch selects the Reference Flux Level from L(185)/M (250)/H (320 nWb/m).

[6] Equalizer Switch — This switch changes the Equalizer setting to IEC or NAB.

[7] Output Level Switch — This switch selects the output level from +4dBu/-16dBu.

[8] GROUND Terminal — This is the auxiliary ground terminal. Connect equipment not connected to the AC earth to this terminal.

[9] POWER Connector — This connector is for the supplied AC power cable.

[10] PARALLEL I/O Connector — This is the OTARI standard Parallel I/O connector. This 37 pin connector includes ports for Transport Control Command Status Tally Signal and External Capstan Speed Control Signal. For details refer to **§ 3.7**.

3.7 Connector Pin Assignment

Table 3-1
Parallel I/O Pin Assignment

No.	Signal Name	Signal Level	IN/OUT	Function
1	RECORD SW	LOW	IN	RECORD Switch
2	PLAY SW	LOW	IN	PLAY Switch
3	STOP SW	LOW	IN	STOP Switch
4	F.FWD SW	LOW	IN	F.FWD Switch
5	REWIND SW	LOW	IN	RWD Switch
6	LIFTER DEFEAT	LOW	IN	Lifter Defeat Switch
9	SAFETY SW SHUT OFF	LOW	OUT	Safety Switch
10	RECORD TALLY	LOW	OUT	Record Tally
11	PLAY TALLY		OUT	Play Tally
12	STOP TALLY LOW		OUT	Stop Tally
13	F.FWD TALLY LOW		OUT	F.FWD Tally
14	REWIND TALLY	LOW	OUT	RWD Tally
16	SIGNAL GROUND	LOW		Signal GND
17[1]	TACHO PULSE		OUT	Tacho Pulse Output
18	FWD/REV	LOW/HI	OUT	Tape Direction
19	9.6kHz (FIX)		OUT	9.6 kHz Output
20[2]	CAP.CLOCK		IN	Ext Speed CNT Input
21[3]	SPEED A	LOW/HI	OUT	
22[3]	SPEED B	LOW/Hi	OUT	
23	PITCH ENABLE	LOW	IN	EXT. Speed CNT Command
24	PITCH TALLY	LOW	OUT	EXT CNT Tally
25	REC. READY LOW		OUT	REC READY Tally
31	SENSOR TALLY	LOW	OUT	Proximity Sensor
32	REHEARSE	LOW	IN	REC Rehearsal Command
33	5V ± 10%			5V (max 150 mA)
34	AUX. POWER			Unreg. Power Output
35	AUX. POWER			(24V ~ 40V Max. 500mA)
36	POWER GND			Power GND
37	POWER GND			Power GND

[1] Tacho pulse

Tacho Pulse Rate

15 ips	120 pulse/sec
7.5 ips	60 pulse/sec
3.75 ips	30 pulse/sec

Tacho Pulse Width
Minimum 100μsec

[2] CAP. CLOCK

Capstan Ext. Speed Control Input Clock
Rated Tape Speed: 9.6kHz

Allowable Frequency Range: 4.8 to 19.2kHz

Duty Cycle: 40 to 60 %

[3] SPEED A, SPEED B

Table 3-2
Connector Pin 21,22

TAPE SPEED	SPEED A	SPEED B
15 ips	High	Low
7.5 ips	Low	High

NR Remote Connector (MKIV-8 Option)

ıction
:ORD Switch
ıY Switch
)P Switch
VD Switch
D Switch
ɜr Defeat Switch
ɜty Switch
ord Tally
/ Tally
p Tally
VD Tally
D Tally
ıal GND
ıo Pulse Output
e Direction
kHz Output
Speed CNT Input
. Speed CNT Command
CNT Tally
; READY Tally
‹imity Sensor
: Rehearsal Command
max 150 mA)
eg. Power Output
/ ~ 40V Max. 500mA)
ɜr GND
ɜr GND

Table 3-3
Remote Control Connector (MKIV-8 Option)

CH	PIN	CH	PIN
CH1	1 - 14	CH5	5 - 18
CH2	2 - 15	CH6	6 - 19
CH3	3 - 16	CH7	7 - 20
CH4	4 - 17	CH8	8 - 21

Section 4 Operation

This section contains, first, a list and accompanying brief explanation of each of the operating conditions (or modes) of the MX-5050, and second, a detailed explanation of each operation or activity associated with the operation of the MX-5050 Tape Recorder. Please read both parts of this Section when first becoming familiar with the machine, and then refer to them whenever more information about the operation of the machine is required.

This section includes the following sub sections.

4.1 Operation Mode Reference Tables

Table 4-1
Transport Modes

MODE	CONTROL	EXPLANATION
Stop	STOP	Tape motion stops.
Play	PLAY	Tape moves from Supply to Take-up at the currently selected speed.
F.Fwd	F.FWD	Tape moves from Supply to Take-up at Fast Wind speed.
Rewind	REWIND	Tape moves from Take-up to Supply at Fast Wind speed.
Record *	RECORD or RECORD + PLAY	Any channel in Record Ready begins to record.
Rehearse	REHEARSE	The track in Ready mode changes to INPUT monitor when the Punch In is performed.
Edit Ready	EDIT in Stop mode	Transport is ready for Edit or Edit Play mode.
Edit Play	PLAY in Edit Ready mode	Tape moves towards Take-up reel but Take-up reel does not turn (Dump Edit).
Cue	CUE in Rewind or F.Fwd mode	Lifters will be retracted to allow audio to be monitored.
Vari Speed	Speed Mode switch to Vari	Tape speed is controlled by the Pitch Control.

* Selected with **SW 1-2** on Transport Control PCB.

Table 4-2
Audio Channel Modes

MODE	CONTROL	EXPLANATION
Ready	READY/SAFE switch to READY	The selected channel will enter Record when the RECORD and PLAY buttons are pressed.
Safe	READY/SAFE switch to SAFE	The selected channel will not enter Record.
Input Monitor	Monitor Select switch to INPUT	The signal at the OUTPUT connector for that channel is present the signal at the INPUT connector.
Sel-Rep Monitor	Monitor Select switch to SEL-REP	The signal at the OUTPUT connector is the signal on tape reproduced by the Record Head.
Repro Monitor	Monitor Select switch to REPRO	The signal at the OUTPUT connector is the signal on tape reproduced by the Reproduce Head.

Table 4-3
Auto Locator Modes

MODE	CONTROL	EXPLANATION
Set mode	SET button	Tape locations can be entered for Cue Points using the ZERO, 1, 2, 3, REPEAT mode and CLR buttons.
Repeat mode	REPEAT + two SEARCH buttons	Tape plays from 1st to 2nd Cue Points, then rewinds to 1st and repeats.
Search stops.	SEARCH 1/2/3	Tape is moved to the Cue Point at Fast Wind speed and
Search Zero	SEARCH ZERO	Tape is moved to 0:00:00 at Fast Wind speed and Stops.
Search Play	PLAY + SEARCH 1/2/3	Tape is moved to the Cue Point at Fast Wind speed where it enters Play.

4.2 Modes of Operation

4.2.1 Transport Modes

- **Play mode:** In Play mode, the tape moves from Supply reel to Take-up reel at the currently selected tape speed. To enter Play mode, press the PLAY button. The Lamp on the PLAY button will become illuminated. Play mode can be entered from any mode except Edit Ready and Search modes.

- **Fast Forward mode:** In Fast Forward mode, the tape moves from the Supply reel to the Take-up reel at Fast Wind speed. To enter Fast Forward mode, press the F.FWD button. The Lamp on the F.FWD button will become illuminated. Fast Forward mode can be entered from Stop, Play, Rewind and Record modes.

- **Rewind mode:** In Rewind mode, the tape moves from the Take-up reel to the Supply reel at Fast Wind speed. To enter Rewind mode, press the REWIND button. The Lamp on the REWIND button will become illuminated. Rewind mode can be entered from Stop, Play, Fast Forward and Record modes.

- **Record mode:** To enter Record mode, press the RECORD and PLAY buttons when a channel is in Record Ready mode, or if it is selected to do so, press the RECORD button while the machine is in Play mode. The Lamp on the RECORD button will steadily illuminate when the MX-5050 is in Record mode.

- **Edit Ready mode:** To enter Edit Ready mode, press the EDIT button while in Stop mode. The Lamp on the EDIT button will flash when the MX-5050 is in Edit Ready mode. Edit Ready mode can be entered even if there is slack in the tape path.

- **Edit Play mode:** To enter Edit Play mode, press the PLAY button while in Edit Ready mode. The pinch roller will engage the capstan, the Take-up reel will not rotate, and the tape will be spilled from the right side of the transport. To enter Edit Play mode while in Play mode, press the EDIT button. The Take-up reel will stop rotating and the tape will be spilled from the right side of the transport.

- **Cue mode (Lifter Defeat):** In Cue (or Lifter Defeat) mode, the tape lifters will be retracted and the audio attenuated allowing the signals on the tape to be monitored while tape is moving at Fast Wind speed. To enter Cue mode, press the Cue button while in Fast Forward or Rewind mode. There are two ways to enter the CUE mode as follows.

  Tapping the CUE button causes the Tape Lifter to remain retracted until the CUE button is pressed again. This monitoring is convenient when monitoring the tape for a long time.

  Holding the CUE button pressed causes the tape lifter to remain retracted as long as the button is held pressed.

4.2.2 Audio Channel Modes

- **Record Ready mode:** When the RECORD and PLAY buttons are pressed, any channel which is in Record Ready will begin to Record. To place a channel into Record Ready mode, press the RECORD mode button for that channel. The Record mode indicator will illuminate and the indicator on the RECORD button will flash.

- **Record Safe mode:** In Record Safe mode, Record mode cannot be entered. To place a channel in Record Ready mode into Record Safe mode, press the RECORD mode button for that channel to the SAFE postion (not depressed). The Record mode indicator(s) will extinguish. When the Record mode indicator is extinguished, that channel is in Record Safe mode.

- **Input Monitor mode:** In Input Monitor mode, the signal at the OUTPUT connectors, VU Meters, PHONES connector, and Monitor Speaker is the signal present at the INPUT connector for that channel. To place a channel into Input Monitor mode, set the Monitor button for that channel to SOURCE position (not depressed).

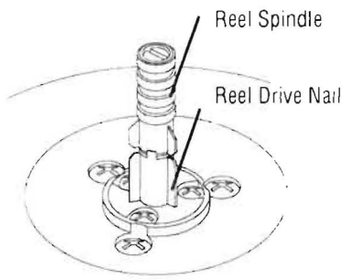
- **Sel-Rep Monitor mode:** In Sel-Rep (Selective Reproduce) Monitor mode, the signal at the OUTPUT connectors, VU Meters, PHONES connector, and Monitor Speaker is the signal on tape reproduced by the Record Head for that channel. To place a channel into Sel-Rep Monitor mode, press the SEL-REP Monitor button for that channel.

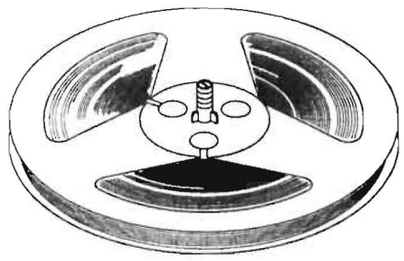
4.3 Operating the MX-5050

4.3.1 Placing Reels on the Machine

Using 5" or 7" EIA Reels

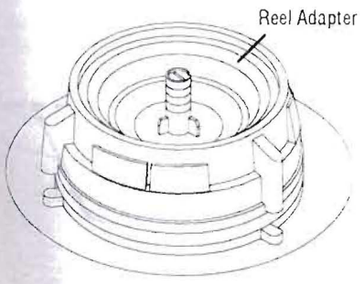
1. Turn the Reel Clamp portion of the Reel Spindle until it lines up with the three Reel Drive Pins on the Reel Table.
2. Place the reel on the Reel Table so that the Reel Drive Pins are inserted into the slots in the reel.
3. Lift and turn the Reel Clamp portion of the Reel Spindle 60 degrees (until it clamps the reel in place).

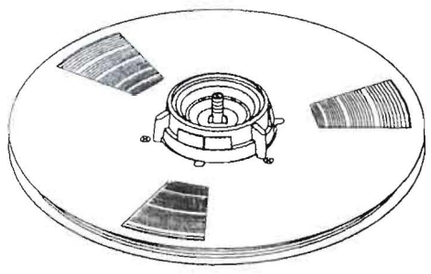




Using 10.5" NAB Hub Reels

1. Turn the Reel Clamp portion of the Reel Spindle until it lines up with the three Reel Drive Pins on the Reel Table.
2. Place the Reel Adapter on the Reel Table and lift and turn the Reel Clamp portion of the Reel Spindle 60 degrees (until it clamps the Adapter in place.)
3. Place the Reel on the Reel Adapter and lift and turn the upper portion of the Adapter until it locks the reel in place.





Using AEG (or DIN) Hubs (Optional)

1. Turn the Reel Clamp portion of the Reel Spindle until it lines up with the three Reel Drive Pins on the Reel Table.
2. Place the Reel Adapter on the Reel Table and lift and turn the Reel Clamp portion of the Reel Spindle 60 degrees (until it clamps the Adapter in place).
3. Place the hub of tape on the Adapter and rotate the Adapter 90 degrees to lock the hub in place.

4.3.2 Threading the Tape

1. Mount an empty reel on the Take-up side and mount a reel of tape on the Supply side.

   NOTE: Select the reel diameter by pressing the REEL SIZE T.UP S/L and REEL SIZE SUP S/L buttons after mounting the reels.

2. Thread the tape from the Supply reel to the Take-up reel as shown in Figure 4-1 and turn the Take-up reel clockwise to remove any slack from the tape path.

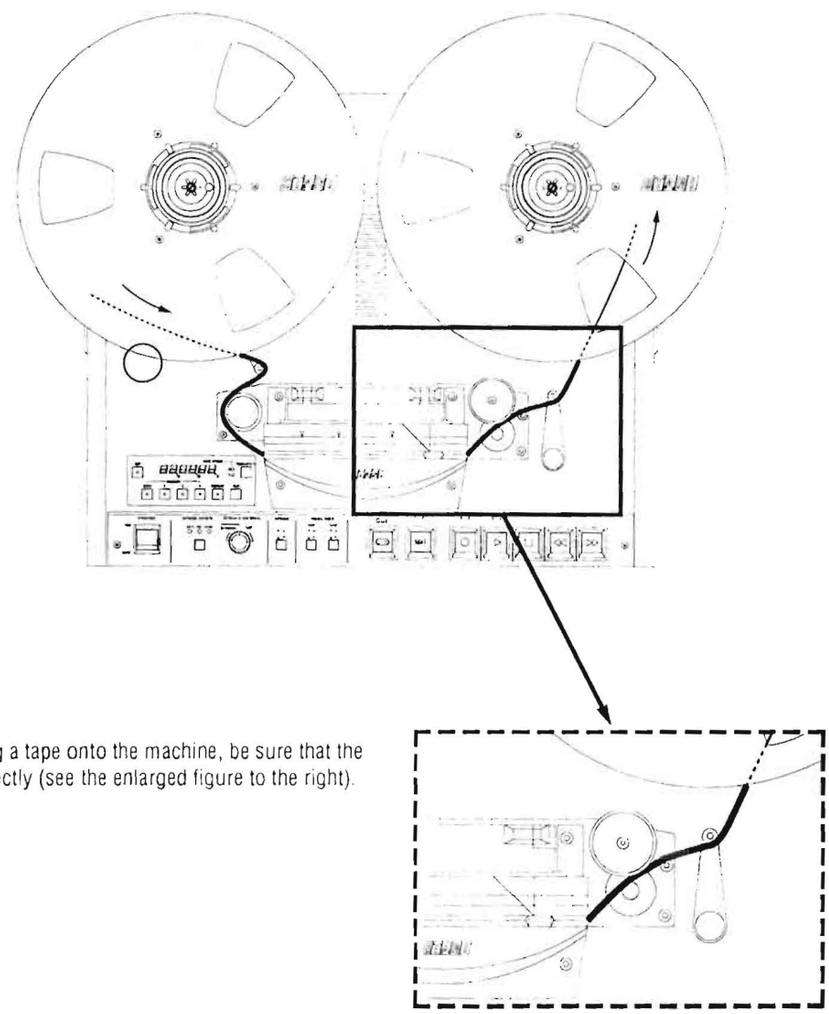


Figure 4-1
Tape Threading

Note: When threading a tape onto the machine, be sure that the tape is threaded correctly (see the enlarged figure to the right).

4.4 Operation of the Transport

4.4.1 Playing Back the Tracks

1. Set both Record mode buttons to the SAFE position (not depressed).
2. Press the Monitor button to the TAPE position.
3. Press the PLAY button to start Play mode.
4. Press the STOP button to stop Play mode.

4.4.2 Recording the Tracks

1. Press the RECORD mode button for the channels to be set to the READY position.
2. Set the MONITOR buttons of the channels to be recorded to the SOURCE position (not depressed).
3. Adjust the Input Level Control of each channel so that the VU meter indicates 0 VU at the reference input level. (With this level setting, the peak indicator will illuminate occasionally.)
4. Press the CLR and T-IPS-% keys to clear the Tape Timer display.
5. Press the PLAY and RECORD buttons together to place the transport into Record mode. The RECORD and PLAY buttons on the transport illuminate.
6. In RECORD mode, the recorded signal can be monitored by pressing the MONITOR button to the TAPE position.

NOTE: When a channel is set to SEL REP mode, the channel can not enter RECORD mode. Confirm that the SEL REP button of the recording channel is not pressed.

NOTE: While the machine is in PLAY mode, pressing the RECORD button places the machine in Record mode. This operation is called Punch In. Punch In operation is selected from the following methods with SW1-2 on the REC/REP AMP PCB Assembly.

- Pressing the RECORD button in PLAY mode enters Record mode.
- Pressing the RECORD and PLAY buttons together while in Play mode enters the Record mode.

NOTE: Pressing the PLAY button while the machine is still in Record mode exits the Record mode and enters the Play mode without stopping the machine. This operation is called Punch Out. Punch Out operation is selected from the following methods with SW1-3 on the REC/REP AMP PCB Assembly.

- Pressing the PLAY button while in RECORD mode exits the Record mode and enters the Play mode.
- Pressing the STOP button while pressing the RECORD button exits Record mode and enters Play mode.

4.4.3 SEL-REP Recording

SEL-REP operation means that the tape is reproduced with the Record Head instead of being reproduced with the Reproduce Head. With this operation, the signal reproduced with the Record head is recorded to the other track without time delay. The following is the procedure of the SEL-REP operation.

1. Rewind the tape to the starting point of the SEL-REP operation.
2. Press the RECORD READY button of the recording channel to place it in the READY position.
3. Set the MONITOR button of the channel to to be recorded to the SOURCE position (not depressed). Set the Monitor button of the channel to be monitored to TAPE.
4. Adjust the Input Level knob of each channel so that the VU meter indicates 0VU. (With this level setting, the peak indicator sometimes illuminates.)
5. Press the SEL-REP mode button of the channel being monitored to the SEL-REP position.
6. Press the PLAY button to begin playback.

   When the RECORD button is pressed at the overdubbing point, the channel set to READY is changed to INPUT mode and recording begins.
7. Press the STOP button to stop recording.

   When ready to Punch Out, press the PLAY button at the end of the recording.

4.4.4 Fast Wind and Cue Monitor

Pressing the F.FWD button places the machine into fast wind mode. Pressing the RWD button places the machine in rewind mode. The machine can enter these modes from any mode other than EDIT mode. When the machine is in F.FWD or RWD mode, the tape is normally lifted away from the heads. To monitor the signal on the tape while fast winding press the CUE button. When the CUE button is pressed the lifters are retracted and the tape comes into contact with the heads. There are two methods of operating the CUE button as described below.

- **Tapping the CUE button**

  Tapping the CUE button momentarily retracts the lifters and allows the tape to make contact with the heads so that the tape can be monitored. Tapping the CUE button again raises the lifters.

- **Holding the CUE button down**

  Holding the CUE button down retracts the lifters for as long as the button is held down.

4.4.5 Tape Editing

1. Move the tape at the beginning of the edit section. When the tape reaches to the editing point, rotate the reel by hand to accurately locate the editing point, and finally place the editing point to the reproduce head.
2. Press the EDIT button to enter the EDIT Ready mode. The EDIT button blinks to show that the machine is in Edit Ready mode.
3. Mark the point at the REPRO Head with a marker pen.
4. Draw out the tape from the Head Assembly. Place the tape on the Splicing Block. Cut the tape along with the slot on the Splicing Block.
5. While holding the unnecessary part of the tape, thread the tape between the Pinch Roller and Capstan Shaft.
6. Press the PLAY button and the tape will spill off from the right end of the transport to the floor. The EDIT and PLAY buttons illuminate to tell the machine is in EDIT mode.
7. When the tape reaches to the end of the edit section, press the STOP button to stop the machine. Repeat step 3 and 4 and splice the tape until the desirable edited tape is obtained.

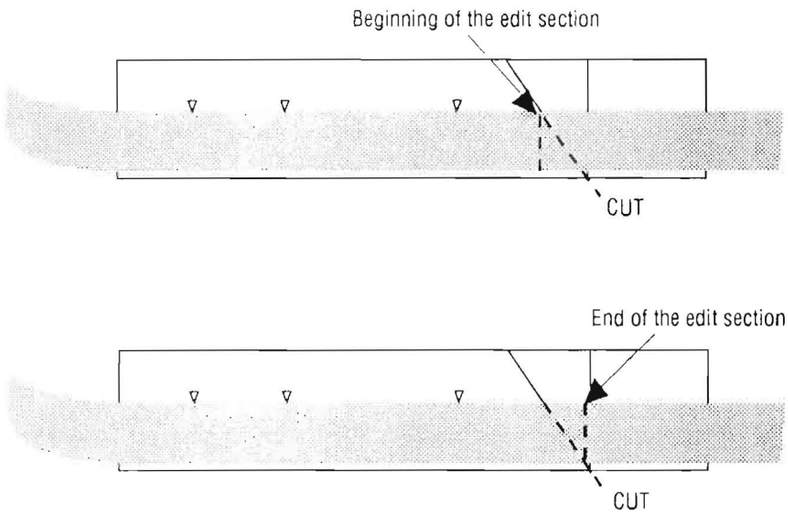


Figure 4-2
Editing a Tape

4.4.6 Using the Pitch Control Feature

The speed of the tape can be changed over a range of ± 20%as it is being recorded or played. This feature makes it possible to compress or extend material to fit it into a time slot, or to change the pitch for special effects, etc.

To manually adjust the speed of the MX-5050.

1. Press the SPEED MODE select button until the VARI mode indicator illuminates.
2. Use the Pitch Control knob to vary the capstan speed as desired. Turning the knob counterclockwise decreases the speed, turning it clockwise increases the speed. The pitch can be changed in 0.01% increments.

   The MX-5050 allows the last Vari Speed setting to be stored in memory for recall the next time the Vari Speed feature is used.

Presetting the Vari Pitch Value in FIX Speed mode

1. Change the Tape Time Display to Speed Change indication (%) by pressing the TIME IPS % button.
2. Press the SET button and display the desired vari pitch value on the display by pressing the SEARCH and CLEAR keys. The display changes as follows.

Table 4-4
Vari Pitch Preset

Key	Changing Item	Change
REPEAT	+/-	-/no display
SEARCH ZERO	10% column	no display 1 2
SEARCH 1	1% column	0-9
SEARCH 2	0 1% column	0-9
SEARCH 3	0 01% column	0-9

3. Set the Speed Mode Switch to the VARI Position. The machine starts reproducing at the set vari speed.

Recalling the Previous Vari Pitch Speed Setting

1. Change the Tape Time Display to Speed Change indication (%) by pressing the TIME IPS % button.
2. Display the previous vari pitch speed setting by pressing the SET button.
3. If no change is required, set the Speed Mode Switch to the Vari position. The capstan motor starts rotating at the vari pitch speed setting.

4.5 Locator Operation

The MX-5050 Series tape recorders feature a built-in Auto Locator which has three cue point memories, a zero location memory, and the ability to repeat play between any two selected tape locations.

4.5.1 Storing Tape Locations

There are two ways to store tape locations into the locator memory: The tape locations can be captured "on the fly", or can be entered in SET mode.

- **Capturing Tape Locations**

  Pressing an unilluminated SEARCH key while reproducing the tape causes that tape location to be stored in the cue point memory of that SEARCH key. The LED of the key illuminates to indicate that a CUE point has been stored.

  To clear the CUE point, press the CLR button and the corresponding SEARCH key.

- **Cue Point Set Mode**

  In SET mode, the desired tape location can be displayed on the display by using the SEARCH ZERO, SEARCH 1/2/3, REPEAT and CLR keys, and can be stored in the SEARCH CUE points.

1. To enter the machine into the SET mode, press the SET key. The indicator on the SET key illuminates and the decimal points on the display start to blink.
2. After placing the machine into the SET mode, enter the desired tape time with the following keys.

Table 4-5
Cue Point Set Mode

KEY	CHANGING ITEM	CHANGE
SEARCH ZERO:	10 Hour	0,1,2,-
SEARCH1:	1 Hour	0-9
SEARCH2:	10 Minute	0-5
SEARCH3:	1 Minute	0-9
REPEAT:	10 Seconds	0-5
CLR:	1 Second	0-9

3. After the desired tape time is indicated on the display, press the SEARCH key while pressing the SET key to store the tape location on the display as a CUE point.
4. To exit from the SET mode, press the CLR key while pressing the SET key.

4.5.2 Search Mode

To enter Search mode, press any illuminated SEARCH 1/2/3 button. In this mode, the machine will move the tape at Fast Wind speed to the Cue Point and stop. During Search mode, the tape location will be shown on the display briefly, and the button indicator will flash.

4.5.3 Search Play Mode

To enter Search Play mode, press the PLAY button while in Search mode. The Lamp on the PLAY button will flash, and the MX-5050 will enter Play mode when the tape reaches the Cue Point.

4.5.4 Search Zero Mode

To enter Search Zero mode, press the SEARCH ZERO button. The tape will move at Fast Wind speed to the location corresponding to 0:00:00 on the Tape Time display and stop. During the Search the indicator in the SEARCH ZERO button will flash.

4.5.5 Search Start Mode

When **SW2-1** on the Transport Control PCB Assembly is in the On position and **SW2-2** is in the Off position, the Search Start function is assigned to the SEARCH 3 key.

In this mode, whenever the PLAY button is pressed, that location is stored in Cue Point memory 3. Pressing the SEARCH 3 key moves the tape to the point where the PLAY button was last pressed.

4.5.6 Repeat Mode

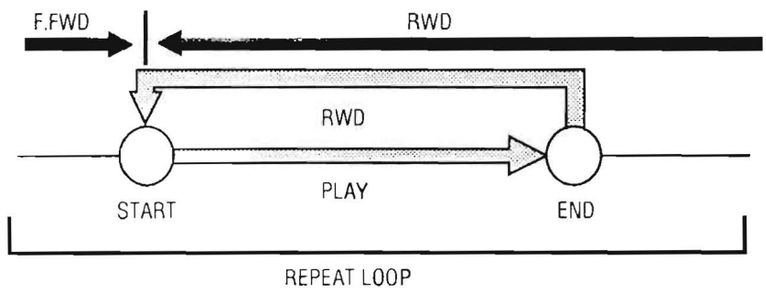
The Tape Timer has a REPEAT function which repeatedly plays back the tape between two selected points. When the tape reaches the end of the repeat loop, the machine rewinds to the beginning of the loop and starts playing back again.

To enter a Repeat Loop

1. Press the REPEAT key. (The LED on the key starts flashing.)
2. Press two SEARCH keys which have stored CUE points. (The REPEAT key illuminates steadily. The SEARCH keys start to flash.)
3. If the tape is stopped between the two CUE points, pressing the PLAY button starts Repeat mode. If the tape is stopped outside of the Repeat Loop, the machine automatically enters Fast Forward or Rewind mode and moves to the beginning of the Repeat Loop and stops.
4. To exit from the Repeat mode, press the REPEAT key while pressing the CLR key.

NOTE: In REPEAT mode, the PLAY, RECORD, STOP, RWD, F.FWD and REHEARSE buttons still function. The beginning and end points are used as Guard points beyond which the tape cannot go.

Pressing the REPEAT key again while in Repeat mode causes the REPEAT key indicator to flash, and new CUE points can be selected for the beginning and ending points of the Repeat Loop.



4.6 Test Oscillator

The MX-5050 includes a two-frequency Test Oscillator for use when recording reference tones for level matching or alignment purposes.

1. Press the desired Oscillator Frequency button (1kHz or 10kHz) to activate the internal Test Oscillator.
2. The test signal output from the oscillator is supplied to all channel inputs simultaneously. The signal input level can be adjusted by using the input level knob.

Section 5 Maintenance

The maintenance procedures described in this section should be performed at regular intervals. Cleaning and demagnetizing the heads and tape path should be performed before each recording session, and must be performed before any electronic alignments are performed. Lubrication should be performed after 1000 hours of operation or after 6 months, whichever comes first.

This section includes the following sub sections.

5.1 Maintenance Scheduling

Routine maintenance is necessary to keep the MX-5050 in peak operating condition. The following is a chart for a suggested maintenance schedule.

Table 5-1
Maintenance Time Table

Adjustment Item	Before Each Session	Every 3 to 6 months	Section
Demagnetizing	✓		§ 5.2
Cleaning	✓		§ 5.3
Lubrication		✓	§ 5.4
Pinch Roller Pressure		✓	§ 6.5
Equalizer (REP, REC)Setting	✓		§ 7.3.3, § 7.4.4
REP, REC Level	✓		§ 7.3.2, § 7.4.3
Bias Adjustment	✓		§ 7.4.1

Table 5-2
Tools Required for Maintenance

Tool Names	Parts No.	Used for
OTARI Cleaningn Kit	ZA-51B	Cleaning the Head
Isopropyl Alcohol	Included in ZA-51B	Cleaning the Tape Guide, Capstan Pinch Roller, Capstan Shaft
Head Eraser	Any	Demagnetizing the Head, Guide
Lubrication Oil	PZ9E003	Lubirication for Capstan Motor

5.2 Demagnetizing

Demagnetizing (sometimes called degaussing, although that term is more often applied to bulk tape erasure) is a necessary procedure and should be performed before every recording session and prior to performing any alignments. Demagnetizing should always be done with extreme caution.

DEMAGNETIZING CAUTION: To avoid damaging the MX-5050, always make sure the POWER switch is off before proceeding. The AC field created by the demagnetizer is extremely powerful and could seriously damage the electronics if they are on. Make sure that all recording tapes, especially alignment tapes, are removed from the vicinity of the MX-5050.

Never turn the power to the demagnetizer on or off unless it is at least 1 meter (3 feet) away from the MX-5050. When the demagnetizer is turned on or off, an extremely strong moving magnetic field is created which could possibly place a permanent magnetic charge on parts of the machine. The demagnetizer would not be powerful enough to remove these charges under normal circumstances, and the parts might have to be removed and discarded. Use only a demagnetizer with high flux density; inexpensive "Hi-Fi" type demagnetizers can leave residual fields that will cause more harm than benefit.

1. Turn off the MX-5050 POWER switch.
2. With the demagnetizer at least 1 meter (3 feet) from the MX-5050, plug the demagnetizer into the AC mains and turn it on.
3. Slowly move the demagnetizer toward the Supply Tension Arm until the tip is approximately 3 mm (1/8") away from the arm.

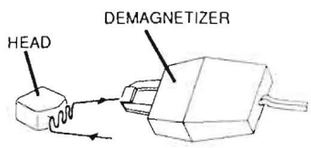


Figure 5-1
Demagnetizing the Head

4. Slowly move the tip of the demagnetizer up and down along the arm so that the entire surface is exposed to the demagnetizing field. Do not touch any part of the MX-5050 with the demagnetizer.

5. Slowly move the demagnetizer at least 1 meter (3 feet) away from the MX-5050.

6. Working from left to right repeat Steps 3, 4, and 5 for each of the following metal parts in the tape path:

   A. Supply Tension Arm
   B. Supply Tape Guide
   C. Supply Tape Lifter
   D. Erase Head
   E. Center Tape Guide
   F. Record Head
   G. Take-up Tape Lifter
   H. Reproduce Head
   I. Take-up Tape Guide
   J. Capstan Shaft
   K. Take-up Tension Arm

7. When all the above parts have been demagnetized, slowly move the demagnetizer at least 1 meter (3 feet) away from the MX-5050 and turn it off or unplug it.

5.3 Cleaning the Tape Path

It is extremely important to clean the entire tape path regularly. Oxide and dirt will be shed from the tape and accumulate on these parts, causing a build-up that can degrade audio performance, cause slippage and undue wear on the tape.

CAUTION: Never use any metallic item or abrasive to clean the heads or any other tape guidance parts. Never use spirits, lacquer thinner, acetone or other solvents on the tape heads. Rubbing alcohol should be avoided since it contains oil that will leave a residue. The entire tape path should be cleaned and demagnetized before performing any adjustments.

1. Turn off the machine.

2. Lift up the head cover.

3. Moisten a cotton swab in pure isopropyl alcohol, and wipe the entire surface of the Supply Tension Arm. Allow the Tension Arm to dry by evaporation.

4. Moisten additional swabs and clean the following parts:

   A. Supply Tension Arm
   B. Tacho Roller
   C. Supply Tape Guide
   D. Supply Tape Lifter
   E. Erase Head
   F. Center Tape Guide
   G. Record Head
   H. Take-up Tape Lifter
   I. Reproduce Head
   J. Take-up Tape Guide
   K. Capstan Shaft
   L. Pinch Roller
   M. Take-up Tension Arm

CAUTION: Do not use alcohol moistened swabs to clean the **Pinch Roller**. To avoid embedding dust and lint particles in the surface of these rollers, use only an alcohol moistened *Lint-Free* cloth to gently clean the rollers.

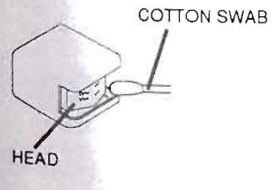


Figure 5-2
Cleaning the Head

5.4 Lubrication

The Capstan Motor in MX-5050 machines utilizes an Oilite bearing at the front end, which requires lubrication.

Use only Otari oil P/N PZ9E003.

To lubricate the Capstan Motor bearing, follow these steps:

1. Remove the pinch roller cap by removing the screw on it.
2. Remove the pinch roller from the pinch roller shaft.
3. Remove two hex socket head screws on the head housing cover.
4. Remove the Tape Guide at the take up side. Remove the two screws holding the Rear Head Escutcheon.
5. Remove the dust cap on the Capstan Motor with a pair of tweezers. Refer to Figure 5-3.
6. Apply 2 or 3 drops of oil to this felt collar. Do not over lubricate.
7. Wipe off any excess oil and install the dust cap, Rear Head Escutcheon, head housing cover, pinch roller and pinch roller cap in that order.

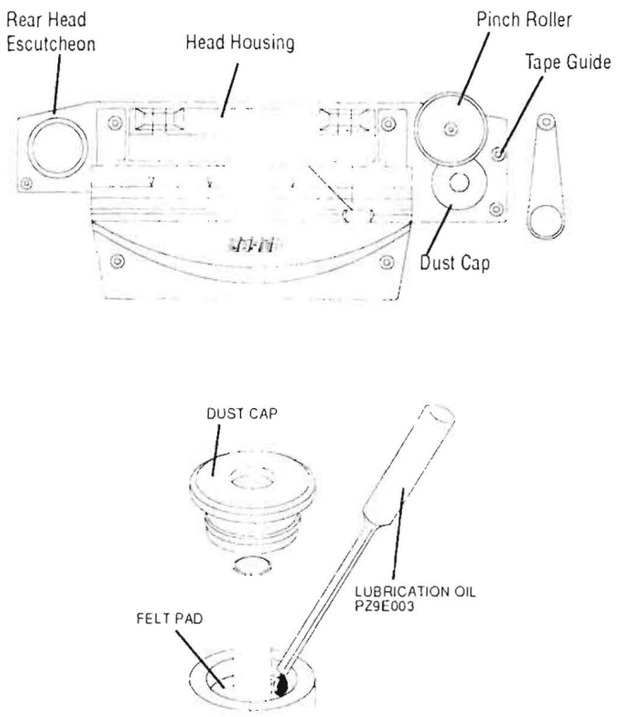


Figure 5-3
Lubrication

Oilite bearing at the

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Section 6 Transport Adjustment and Parts Replacement

This section presents information and procedures for Transport Adjustment and Parts Replacement, and Adjustment after Replacement. Some parts require adjustment after replacement.

6.1 Transport Access

The PCB Assemblies and main transport parts are located inside the machine. Therefore, to adjust these parts, certain panels must first be removed. Refer to **§ 2.4** for instructions on accessing these parts.

6.2 Brake Torque Adjustment

The brake adjustment is performed with the machine turned off.

The brake torque values are different for the supply side and take up side. Since the torque values for both sides are adjusted at one time, the adjusted torque is the best compromise for both sides.

Table 6-1
Necessary Tools

Necessary Tools
10.5" NAB Reel
String (2m)
Spring Scale (500g)

1. Turn off the power to the machine.
2. Place an empty NAB reel (10") on the Supply Reel Table.
3. Wind a piece of string a few turns counterclockwise on the hub of the NAB reel.
4. Attach the spring scale to the end of the string.
5. Hold the spring scale upright as shown in Figure 6-1.
6. Pull on the scale slowly to make the reel rotate counterclockwise (direction B in Figure 6-1). While making sure that the cable does not rub against either flange, note the scale reading.
7. Wind the string clockwise direction on the supply reel.

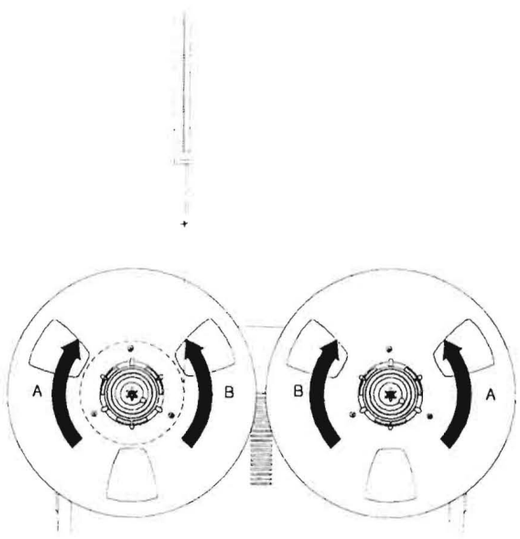

Figure 6-1
Brake Torque Measurement

8. Repeat steps 4 ~ 6 for a clockwise reading on the supply side. The readings should fall within the range listed in the table below.

Table 6-2
Brake Tension Values

MX-5050BIII	
A	100 ~ 125g (3.6 ~ 4.5 ounces)
B	225 ~ 275g (7.9 ~ 9.7 ounces)

MX-5050MKIV-2	
A	145 ~ 175g (5.1 ~ 6.2 ounces)
B	315 ~ 385g (11.1 ~ 13.6 ounces)

9. If the readings are low in both directions, detach the brake spring from the anchor hole on the brake lever and attach the spring to the next hole located further away from the brake solenoid (refer to Figure 6-2).

10. If the readings are high in both directions, move the spring anchor point closer to the brake solenoid.

11. After the spring anchor point is moved, re-check the brake torque.

12. Repeat the brake torque adjustment on the take-up reel.

NOTE: When measuring the brake torque of the take-up side, the torque of the clockwise rotation is larger than the counterclockwise torque.

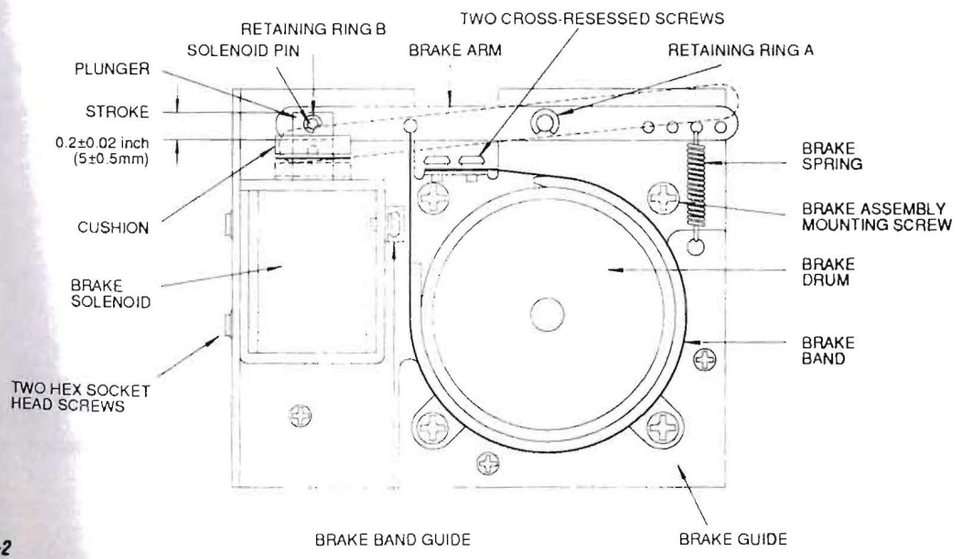

Figure 6-2
Brake Torque Adjustment

6.3 Tape Lifter Adjustment

1. Thread the machine with tape.
2. Check the gap between tape and the lifters in Stop mode. If the gap is 1 ~ 2 mm, then the following adjustment is not necessary. If the gap is out of this range, then perform the following adjustment.
3. Remove the reels on the transport panel. Referring to § 2.4, open the rear panel.
4. Adjust the Lifter Stopper position by loosening the screws on the Lifter Stopper so that the appropriate gap is obtained. Refer to Figure 6-3.
5. Close the rear panel.
6. Confirm that the tape does not touch the head when in Fast Wind mode.
7. If the tape touches the head, move the solenoid backward by loosening the screws holding the Lifter Solenoid Bracket. Refer to Figure 6-3.

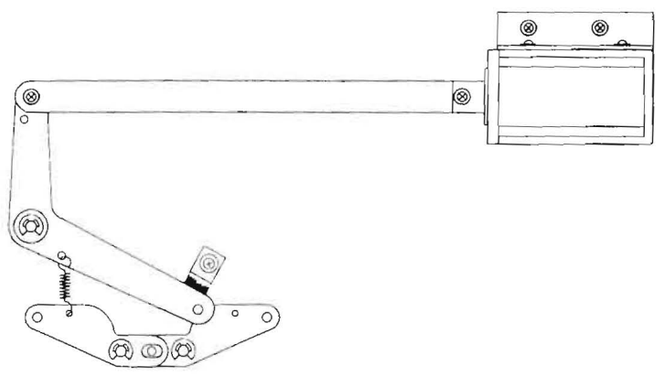

Figure 6-3
Tape Lifter Adjustment

6.4 Capstan Motor Adjustment and Pitch Control Adjustment

1. Open the rear panel by removing the screws on the rear panel.
2. Turn on the machine, and load the tape on the machine. Make sure that the Tape Speed mode is set to the FIX.
3. Set the Speed Select button to 15 ips (HI on the High Speed version). If the machine is a Low Speed version, the speed adjustment is performed for 7.5 ips and 3.75 ips.
4. Connect the oscilloscope between CP3 and CP2 (GND) on the Control PCB Assembly.
5. Press the PLAY button. Adjust the oscilloscope so that the oscilloscope indicates one complete cycle of the square wave.
6. While reproducing the tape, adjust VR1 (Gain) so that duty cycle of the square wave becomes 50%.
7. While observing the oscilloscope, pinch the capstan shaft with the thumb and forefinger for several seconds. Be careful that the fingers are not caught between the Pinch Roller and Capstan Shaft. When pinching the Capstan Shaft, the waveform displayed on the oscilloscope becomes distorted. When the capstan shaft is released, the waveform returns to normal. Adjust VR4 (Damp) to minimize the time it takes the waveform to recover after releasing the capstan shaft.
8. Change the tape speed to 7.5 ips (HI on Low Speed version or LO on High Speed version). Adjust the oscilloscope. Repeat step 6 with VR2 (Gain), and step 7 with VR5 (Damp).
9. Change the tape speed to 3.75 ips (LO on Low Speed version). Adjust the oscilloscope. Repeat step 6 with VR3, and step 7 with VR6.
10. Remove all measuring equipment. Close the rear panel.
11. Clean the Capstan Shaft and Pinch Roller.

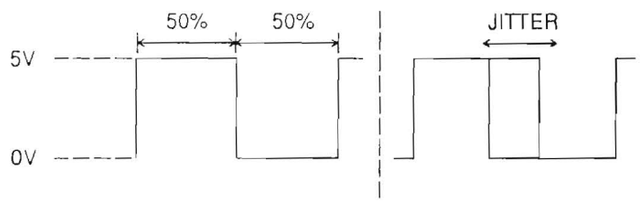

Figure 6-4
Waveform on Oscilloscope

6.5 Pinch Roller Pressure Adjustment

The pinch roller pressure against the capstan shaft is determined by the pinch roller solenoid spring. The pinch roller solenoid spring is adjusted with a nut as shown in **Figure 6-5**.

The following adjustment should be performed after the machine has been operated in Play mode at least 30 minutes to obtain a steady solenoid force because the solenoid force decreases as temperature rises.

❑ **MX-5050BIII**

1. Remove both reels from the reel tables.
2. Tie a piece of string (15 cm) together to form a continuous loop. Place one end of the loop around the capstan pinch roller shaft.
3. Press the EDIT button and then press the PLAY button. The pinch roller will move to make contact with the capstan shaft and both will rotate.
4. Hook a spring scale (3kg) to the other end of the loop.
5. Pull on the scale straight from the center of the capstan shaft as shown in Figure 6-5. Note the scale reading when the pinch roller loses contact with the capstan (the pinch roller stops rotating). The scale reading should be 2.5 ~ 2.7 kg (5.5 ~ 5.9 pounds).
6. If a proper scale reading was not obtained in step 5, loosen the locknut and adjust the nut as shown in Figure 6-6. Turning the nut toward the spring increases pinch roller pressure. Tighten the locknut.
7. After the adjustment has been completed, check that the plunger of the solenoid reaches the bottom of the the solenoid coil (pinch roller can easily be pushed away from the capstan shaft). If the plunger of the solenoid does not reach the bottom, loosen the locknut and turn the pressure nut away from the spring until the plunger just reaches the bottom. Check the pressure adjustment again and tighten the locknut.

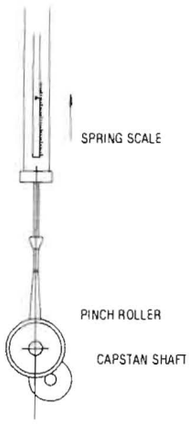

Figure 6-5
Pinch Roller Pressure Measurement

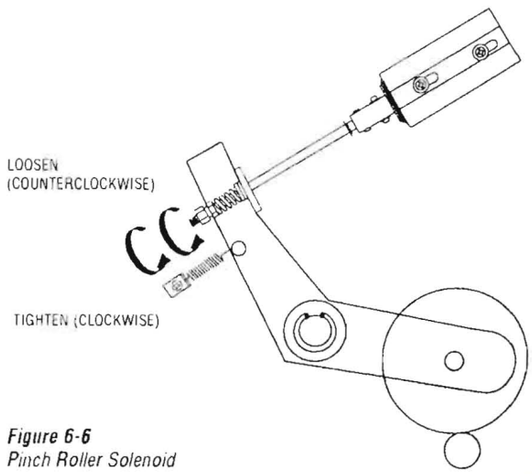

Figure 6-6
Pinch Roller Solenoid

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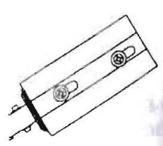
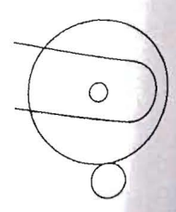




MX-5050MKIV-2

1. Remove the pinch roller cap screw and the roller cap.
2. Thread a hex socket head screw (M3, length 25~30mm) into the pinch roller.
3. Press the EDIT button and then press the PLAY button. The pinch roller will move to make contact with the capstan and both will rotate.
4. Measure the pinch roller pressure by using the Push function (piston part, not hook part) of the spring scale.

   Put the end of the piston part of the spring scale (3kg) on the hex socket head screw (M3) from the direction of the capstan shaft. Refer to Figure 6-7. Be careful that the piston part does not touch the capstan shaft.
5. Push on the scale and note the scale reading when the pinch roller just loses contact with the capstan shaft (the pinch roller stops rotating).

   The scale reading should be 2.7 ~ 2.8 kg (5.9 ~ 6.2 pounds).
6. If a proper scale reading is not obtained in step 5, adjust the nut shown in Figure 6-6. Loosen the LOCK nut and Adjust the Adjustment Nut . Turning the Nut in the spring direction increases the pinch roller pressure. Tighten the Lock Nut after adjustment.
7. Confirm that the plunger reaches the bottom when the solenoid is activated. If not, the solenoid pressure will not be strong enough so that even a slight pressure will be able to move the pinch roller away from the capstan shaft.
8. If the plunger does not reach the bottom of the solenoid, loosen the Double nut and readjust the pressure.

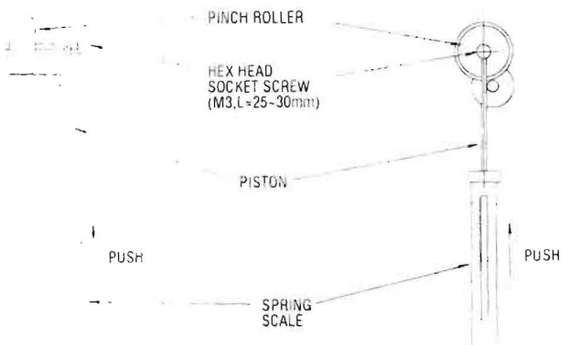


Figure 6-7
Pinch Roller Pressure Measurement

6.6 Tape Speed Adjustment

Tape speed is adjusted by measuring the tape speed using a special test tape, and then adjusting the speed to bring it into the desired range. Tape speed should be adjusted at the normally used tape speed. Also, since tape tension affects tape speed, to accurately measure tap speed, the test tape should first be played normally from the supply side, and then the reels should be reversed and the tape played near the end. In this way, the average tape speed from one end of the tape to the other can be determined.

Note: A special tape is required for this procedure. If an accurate speed tape is not available, please contact your Otari dealer for further information.

Follow the procedure below to measure and adjust the tape speed.

1. Clean the Head, Capstan Shaft and Pinch Roller before the measurement.
2. Press the Speed Mode Select button to set the FIX mode. Set the Record mode button to SAFE position (protruded position).
3. Connect the frequency counter to the output connector. Press down the Monitor button set TAPE position.
4. Set the machine to the most often used tape speed.
5. Wind the Test Tape of the selected speed around a blank of a NAB (10.5") reel. Set this Test Tape on the supply side. Thread the tape on the machine. Set the Reel Size Select switch to "L" size.
6. Press Play and read the frequency counter indication. This reading should be 2994Hz to 3006Hz (3000Hz ± 0.2 %) with a 3000Hz speed test tape. Reverse the reels on the machine and check the speed again at the other end of the tape to determine the average overall tape speed.
7. If the reading is out of range, adjust DIP SWs 1-4 and 1-5 on the CONTROL PCB Assembly for the best speed reading. The switches affect tape speed as shown in the table below.

Table 6-3
Tape Speed Settings

SW1-4	1-5	OFFSET
ON	ON	+0.1%
OFF	ON	-0.1%
ON	OFF	-0.2%
OFF	OFF	0%

6.7 Reel Table Height Adjustment

The Reel Table may be detached from the machine by removing the three cross-recessed screws accessible from the side of the transport.

1. Remove the side panel by removing the screws on the panel.
2. Loosen the height adjustment screws (hex socket head screws holding the Reel Table shaft) and adjust the height of the table. While holding the table at the appropriate height, tighten the adjustment screws.
3. Set the Reel onto the Reel Table. Make sure that the Reel Flange does not touch the transport panel.
4. Mount the side panels to the machine.

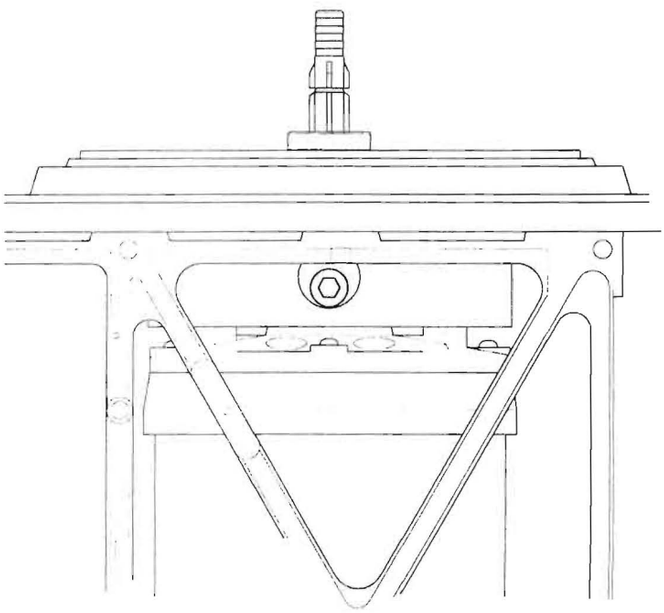


Figure 6-8
Reel Table Height Adjustment

6.8 Head Assembly Replacement

The Head Assembly is mounted on the tape guide posts and is attached to the Guide Posts with screws marked "M" (refer to **Figure 6-9**). Each Head Stack is attached to the Head Bracket with screws marked "W", and the Head Brackets are attached to the Head Base with the screws marked "H" "A" and "T". These screws are used to adjust the position of the head.

When one of the head stacks needs to be replaced, use the following procedure.

1. Raise the Head Cover
2. Remove the screws marked "M" and remove the head base from the tape guides.
3. Unsolder the lead wires coming from the Head PCB.
4. Remove the Head Stack from the Head Base by removing screws "A", "T" and "H".
5. Attach the new Head Stack to the Head Base with the screw removed in Step 4.
6. Resolder the wires removed in Step 3.
7. Mount the Head Base to the Tape Guides with the screws "M".

After replacement of the heads, perform Head Position adjustment **§ 6.9**) and Azimuth Adjustment (**§ 7.3.1** and **§ 7.4.3**)

In addition to the above adjustments, the following adjustments are necessary.

Repro Head

B	Reproduce EQ Adjustment	**§ 7.3.3**

Record Head

A	Record Bias Adjustment	**§ 7.4.1**
B	Record Level Adjustment	**§ 7.4.3**
C	Record EQ Adjustment	**§ 7.4.4**

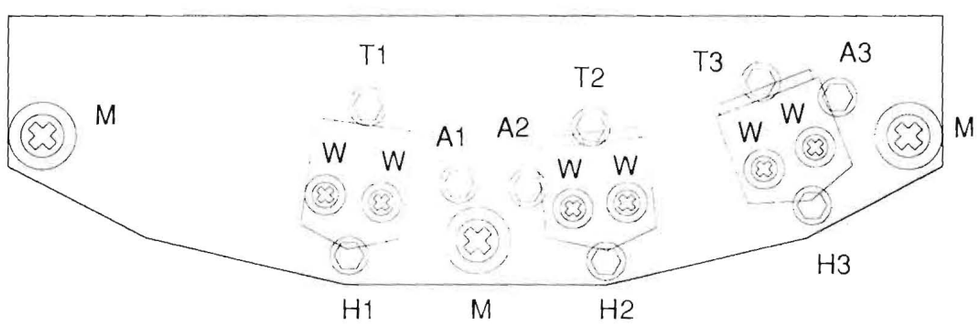


Figure 6-9
Head Assembly

6.9 Head Position Adjustment

Whenever replacing a head, the following head position adjustments are necessary. If the tape does not contact the heads properly, perform the following adjustments.

NOTE: If the tape does not contact the heads properly due to improper alignment, any one of the following problems may occur.

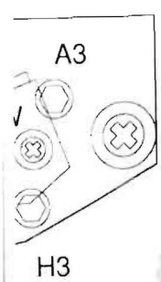
Reproduce Head Wrong Position
High Frequency Level Decreasing
Level Fluctuation

Record Head Wrong Position
High Frequency Level Decreasing
Level Fluctuation

Erase Head Wrong Position
Deterioration of the Erase Ability

- **Height /Zenith Adjustment**
  Perform the following adjustment after raising the head cover.

1. Thread the machine with a tape that can be disposed of after use.
2. Adjust the head height and zenith visually by turning the screws marked "T" and "H" in Figure 6-9 to move the tape to the middle of the head.
3. After the adjustment, mark the head surface with Head Marker Ink or a Marker Pen.
4. Play the tape for about ten seconds.
5. Inspect the face of each head where the passage of the tape has worn away the ink. If the wear pattern does not match that shown in Figure 6-10, readjust the screws " T" and " H ".
6. After reapplying the ink, play the tape as in step 4, and again inpsect the face of each head. Repeat this process until the wear pattern is correct.



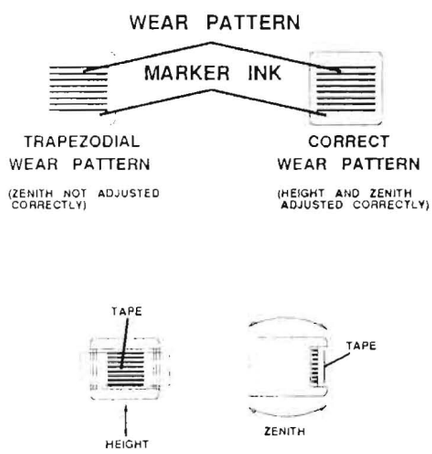


Figure 6-10
Height/Zenith Adjustment

❑ Wrap Adjustment

1. While reproducing 8kHz portion of the Low Speed Test Tape, apply pressure with a cotton swab to the left side of the head. Observe the level change. If the level increases by more than 0.5 dB, wrap adjustment is necessary. In the same way, if the level increases by 0.5 dB when applying pressure from the right side, wrap adjustment is necessary.

2. Turning the screw marked "W" in Figure 6-9, visually adjust the head so that the tape approaches and leaves the head gap at approximately the same angle. If the level increases by more than 0.5dB when pressing on the tape on the right side of the head, rotate the head clockwise. If the level increases by more than 0.5dB when pressing the tape on the left side of the head, rotate the head counterclockwise.

3. Repeat step 1 and confirm that the level increases by less than 0.5 dB.

NOTE: Refer to the **§ 7.3.2** and **§ 7.4.4** for azimuth adjustment procedures.

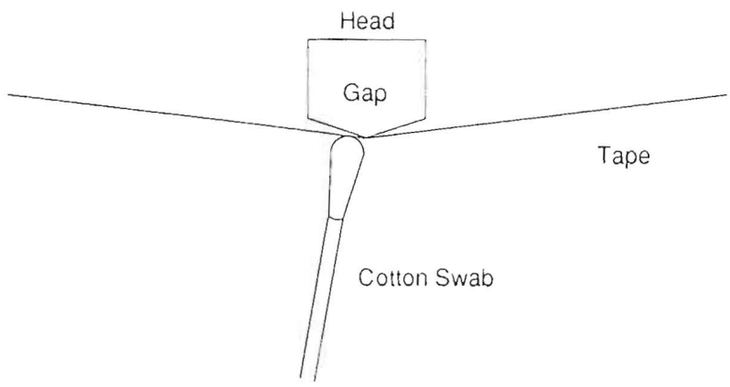


Figure 6-11
Wrap Adjustment

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djustment procedures.

Section 7 Audio Alignment

This section includes the following sub sections.

7.1 Tools and Equipment Required

- Alignment Tapes suitable for the tape speed most often used. Otari recommends the following Alignment Tapes.

Table 7-1
Reference Tapes

Tape Speed	Flux Level	MRL* Catalog No.
15 ips	250 nWb/m	21J205 (NAB)
	320 nWb/m	21J303 (IEC)
7.5 ips	250 nWb/m	21T204 (NAB)
	320 NWb/m	21T302 (IEC)
3.75ips	200 nWb/m	21F101A (NAB, IEC)

* Magnetic Reference Laboratories

- An AC voltmeter calibrated in millivolts and decibels, having a high enough input impedance so as not to load down the circuit under test, and able to display dBm (0dBm = 0.775V)
- A general purpose dual-trace oscilloscope such as those made by Tektronics, Leader, Hitachi and Hewlett Packard.
- A sweepable test oscillator capable of generating sine waves at frequencies from 20 Hz to 20 kHz at +4 dBm (or whatever standard operating level is used, e.g., –10 dBm or +6 dBm).
- A reel of tape of the type normally used for sessions.
- Hand Tools.
- A non-magnetic alignment screwdriver with a blade small enough to fit the trimmers on the PCB Assemblies.
- A tape head demagnetizer (degausser).
- Pure (90%) isopropyl alcohol, cotton swabs, and lint-free cloth for cleaning the tape path.

  CAUTION: *Do not use rubbing alcohol*, as this can leave water and oil residues, and *do not use any other solvent*, as it may delaminate the heads.

7.2 Preliminary Adjustments

These adjustments are performed when first receiving the machine, and then again only when an audio component, such as the Heads, is replaced.

7.2.1 Peak Indicator Level Adjustment

NOTE: The PEAK indicator is factory preset to illuminate at a level equivalent to 1040 nWb/m, which corresponds to approximately 3% THD.

1. Check the trigger level corresponding to the set Magnetic Reference Flux Level.

Table 7-2
Trigger Level

Magnetic Ref. Flux Level	Trigger Level
185 nWb/m	Standard Level + 15.0 dB
250 nWb/m	Standard Level + 12.4 dB
320 nWb/m	Standard Level + 11.2 dB

2. Connect an oscillator to the CH1 INPUT connector, adjust the oscillator so that it generates a sine wave (1kHz) at the trigger level. Confirm that neither of the internal Test Oscillator buttons are pressed.

   EXAMPLE: Set the oscillator to +16.4 dBu when the Magnetic Reference Level is 250 nWb/m and the Reference Level is +4 dBu.

3. Set the Monitor button to SOURCE position (not depressed).

4. Adjust VR701 for CH1 and VR801 for CH2 on the VU Meter Amp PCB which is located behind the VU meter so that the peak indicator illuminates at the trigger level.

7.2.2 Test Oscillator Waveform and Level Adjustment

Perform this adjustment after the Level Matching Adjustment (**§ 7.2.1**) has been completed.

1. Set the Monitor button of CH1 to SOURCE position.
2. Press the 1kHz TEST OSC button on the AMP Panel.
3. Adjust VR502 on the REC/REP AMP PCB Assembly (see Figure 7-1) so that the VU meter indicates 0 VU. Perform the same adjustment to the CH2 REC/REP AMP PCB Assembly.
4. Press the 10kHz OSC FREQ button.
5. Adjust VR501 so that the VU meter indicates 0VU.

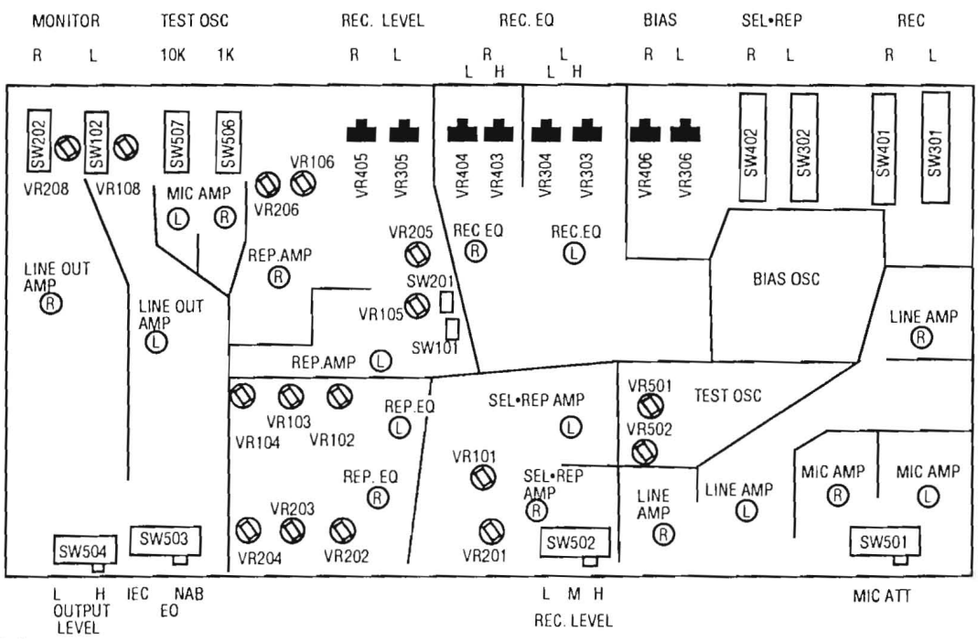


Figure 7-1
REC/REP AMP PCB (DIP Side)

Switches and Trimmers on the REC/REP AMP PCB

SW301	Record Selection L Ch	**VR303**	REC EQ High Speed L CH	**VR201**	SEL-REP Level R CH
SW401	Record Selection R Ch	**VR304**	REC EQ Low Speed L CH	**VR205**	Low F Comp. R CH
SW302	SEL/REP Selection LCh	**VR403**	REC EQ High Speed R CH	**SW201**	Low Comp. Selection R Ch
SW 402	SEL/REP Selection R Ch	**VR404**	REC EQ Low Speed R CH	**VR105**	Low F Comp. L CH
SW 506	TEST OSC 1kHz	**VR305**	REC Level L CH	**SW101**	Low Comp. Selection L Ch
SW507	TEST OSC 10kHz	**VR405**	REC Level R CH	**VR102**	15ips REP EQ L CH
SW102	Monitor Selection LCh	**VR106**	REP SRL Level LCH	**VR103**	7.5ips REP EQ L CH
SW202	Monitor Selection R Ch	**VR206**	REP SRL Level R CH	**VR104**	3.75ips REP EQ LCH
SW501	Mic. Attenuator	**VR108**	Input Level L CH	**VR202**	15ips REP EQ RCH
SW502	Record Level Selection	**VR208**	Input Level R CH	**VR203**	7.5ips REP EQ RCH
SW503	EQ(NAB/IEC) Selection	**VR501**	OSC Level (10kHz)	**VR204**	3.75ips REP EQ RCH
SW504	Output Level Selection	**VR502**	OSC Level (1kHz)		
VR306	Bias L CH	**VR101**	SEL-REP Level L CH		
VR406	Bias R CH				

7.3 Reproduce Adjustments

7.3.1 Reproduce Head Azimuth Adjustment

1. Turn off the power to the machine.
2. Clean and demagnetize the Heads, Lifters, and Tape Guides. Turn on the power to the machine.
3. Thread the machine with a 7.5 ips Reproduce Alignment Tape.
4. Set the tape speed to 7.5 ips. Set the RECORD READY button to SAFE position. Press down the Monitor button to TAPE position.

   NOTE: Insert the Headphone Plug into the Phone Jack. Adjust the Monitor Level with the Output Level Control Knob.
5. Connect one input channel of the oscilloscope to the CH 1 OUTPUT connector. Connect the other input channel of the oscilloscope to the CH 2 OUTPUT connector. Adjust the oscilloscope to display the input waveforms as a "lissajous" pattern using the X-Y display function (see Figure 7-3).
6. While reproducing the azimuth adjusting section (500 Hz) of the 7.5 ips test tape, adjust the azimuth adjustment screw A3 (see Figure 7-2) so that the lissajous figure becomes a straight line.
7. While reproducing the 16 kHz section of the Test Tape, adjust the azimuth adjustment screw A3 so that the lissajous figure becomes a straight line.

   NOTE: Less and less adjustment is required as the frequency increases to cause the oscilloscope pattern to become correctly displayed. At higher frequencies, it will be impossible to achieve a perfectly straight line, some amount of jitter is normal. Adjust the azimuth screw until the best possible result is obtained.

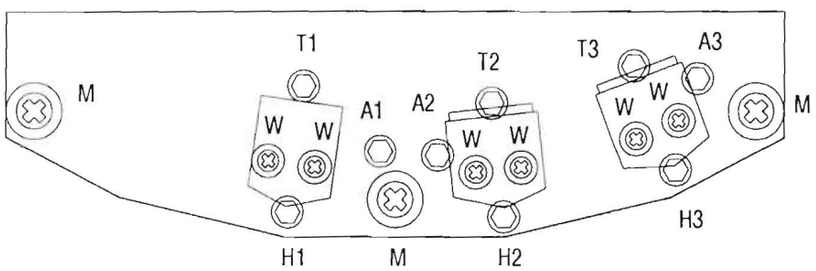
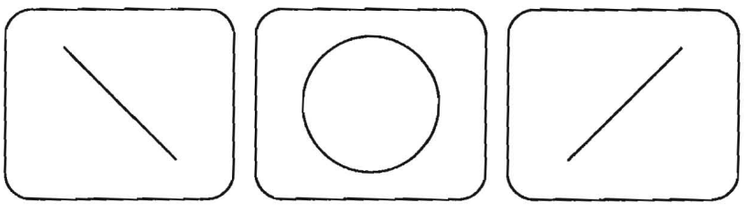


Figure 7-2
Head Adjustment Screws



Improper Adjustment (180° Out of Phase) | Improper Adjustment (90° Out of Phase) | Proper Adjustment (In Phase)

Figure 7-3
Wave shape On the Oscilloscope

7.3.2 Reproduce Level Adjustment

Perform the following adjustment at the speed most often used.

1. Thread the machine with the Reproduce Alignment Tape (Refer to § 7.1). Press down the both Monitor buttons to TAPE position.
2. Connect the AC Voltmeter to the CH 1 OUTPUT connector.
3. Set the SRL switch to SRL position. Play the 1 kHz at Reference Level portion of the Reproduce Alignment Tape.
4. Adjust VR106 (SRL LEVEL) on the REC/REP AMP PCB Assembly so that the AC voltmeter indicates +4 dBu.
5. Connect the AC voltmeter to 2 channel OUTPUT connector and repeat Steps 3 and 4 for 2 channel using VR206.

7.3.3 Reproduce Equalization Adjustment

NOTE: In this section, the Reproduce EQ is adjusted. Low Frequency Compensation will be covered in **§ 7.4.6**.

1. Set the SPEED LO/HI switch to the HI position.
2. Thread the 15 ips Reproduce Alignment tape. (For Low Version models, thread 7.5 ips Alignment tape instead.)
3. Set the both RECORD READY buttons of the all channels to the SAFE position. Press down the both Monitor buttons to TAPE position.
4. Connect the AC voltmeter to the CH1 Output connector.
5. Play the 10 kHz portion of the Reproduce Alignment tape and adjust VR 102 for High Speed models (VR103 for Low Speed models) on the REC/REP AMP PCB until the AC voltmeter indicates +4 dBu.
6. Connect the AC voltmeter to 2 channel OUTPUT connector and repeat Step 5 for 2channel by adjusting VR202 (VR203 for Low Speed models).
7. Set the SPEED LO/HI switch to the LO position.
8. Thread the machine with the 7.5 ips Reproduce Alignment tape. (3.75 ips tape for Low Speed models) .
9. Connect the AC voltmeter to the CH 1 OUTPUT connector.
10. Play the 10 kHz portion of the Alignment tape and adjust VR103 for High Speed models (VR104 for Low Speed models) until the AC voltmeter indicates -6 dBu.

    NOTE: 7.5 ips alignment tape equalization tones are recorded at 10 dB below the reference level.

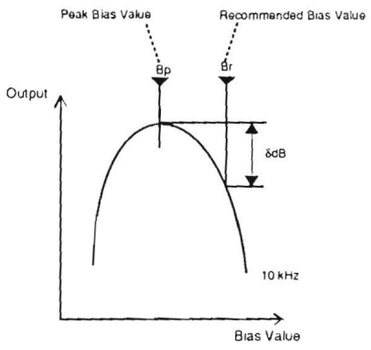
11. Connect the AC voltmeter to the channel 2 OUTPUT connector and repeat Step 10 by adjusting VR203 for High Speed models. (For Low Speed models, VR204).

7.4 Record Electronics Adjustments

7.4.1 Record Bias Level Adjustment

1. Thread the machine with the tape normally used for sessions.
2. Press down the RECORD READY button to the READY position and set the Monitor button to SOURCE position. Set the SPEED HI/LO switch to the Hi position.
3. Set the OSC FREQ button on the Amplifier Panel to 10 kHz position.
4. Adjust the Input Level Control knob so that the VU meter indicates –10VU (–20VU for 7.5 ips).
5. Press the PLAY and RECORD buttons simultaneously to place the machine in Record mode, and press down the Monitor button to TAPE position.
6. Turn VR306 fully counterclockwise. While observing the CH 1VU meter, turn VR306 clockwise until a peak in the indication on the VU meter is observed.
7. Continue turning VR306 clockwise until a decrease equal to the selected Overbias amount is observed. Refer to Table 7-2 for Overbias amounts for various tape types.
8. Repeat Steps 5 through 7 for 2 channel using VR406.

Table 7-3
Overbias Values (dB)



MKIV-2, MKIV-2E, BIII2, BIII-2E

Tape Speed (ips)	3.75	7.5	15
Frequency (Hz)	10 k	10 k	10 k
AGFA PEM 468	8.0	5.0	3.0
AGFA PEM 469	8.0	5.5	3.5
AMPEX 406/407	7.0	4.5	2.7
AMPEX 456	8.0	5.5	3.0
BASF LGR50P	7.5	5.5	3.5
BASF SM911	8.0	5.0	3.0
SCOTCH 206/207	7.0	4.5	2.7
SCOTCH 226/227	8.0	5.0	3.0

Unit: dB

BIII-F

Tape Speed (ips)	7.5	15
Frequency (Hz)	10 k	10 k
AGFA 469	3.5	2
AMPEX 456	3.5	2
SCOTCH 2265.0	3.5	2

Unit: dB

7.4.2 Record Head Azimuth Adjustment

1. Thread the machine with a reel of blank tape.
2. Set both Record Ready buttons to the READY position and set both Monitor buttons to TAPE position.
3. Connect an external oscillator to the CH 1 and CH 2 INPUT connectors. Connect one probe of the oscilloscope to CH 1 and the other probe to the CH 2 OUTPUT connectors. Set the oscilloscope to display the input signals as a lissajous pattern.
4. Set the external oscillator to produce 1 kHz sine waves at +4 dBu or at the studio level.
5. Press the RECORD and PLAY buttons to enter Record mode.
6. Adjust the Record Head Azimuth adjustment screw A2 until the display on the oscilloscope becomes a straight line at 45 degrees as shown in Figure 7-5.
7. Set the external oscillator to 10 kHz, and adjust the Record Head Azimuth adjustment screw until the display on the oscilloscope becomes a straight line at 45 degrees as shown in Figure 7-5.
8. Set the external oscillator to 16 kHz, and adjust the Record Head Azimuth adjustment screw until the display on the oscilloscope becomes a straight line at 45 degrees as shown in Figure 7-5.

NOTE: Less and less adjustment is required as the frequency increases to cause the oscilloscope pattern to become correctly displayed. At higher frequencies, it will be impossible to achieve a perfectly straight line, some amount of jitter is normal. Adjust the azimuth screw until the best possible result is obtained.

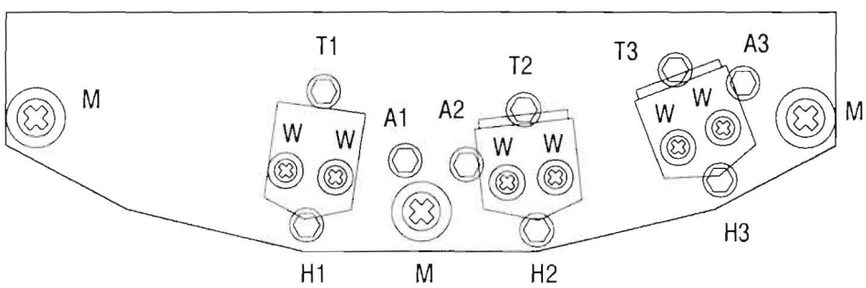
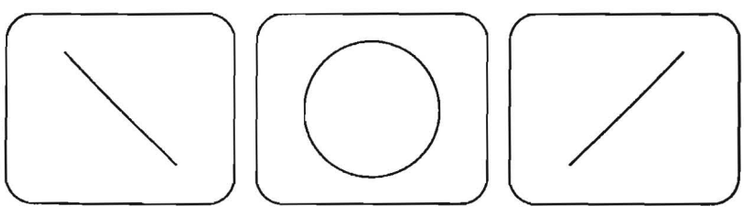


Figure 7-4
Head Assembly



Improper Adjustment (180° Out of Phase) | Improper Adjustment (90° Out of Phase) | Proper Adjustment (In Phase)

Figure 7-5
Waveshape on the Oscilloscope

7.4.3 Record Level Adjustment

1. Thread the machine with tape and set the SPEED Select Switches for the Tape Speed most often used.
2. Set both RECORD READY butons to the READY position.
3. Set both Monitor button to TAPE position.
4. Press the 1kHz Test Oscillator button on the AMP Panel. Adjust the Input Control knob so that the VU meters indicate 0VU. (Input a signal level of –10VU for 7.5 ips.)
5. Press the PLAY and RECORD buttons to begin recording.
6. Adjust VR305 on the REC/REP PCB Assembly so that the CH 1 VU meter indicates 0 VU (–10 VU if adjusting at 7.5 ips).
7. Check to see that there is no difference in the indication on the VU meters when switching between SOURCE and TAPE modes.
8. Repeat Steps 4 and 7 for Channel 2 by adjusting VR405.

7.4.4 Record Equalization Adjustment

NOTE: These adjustments should be performed after the Playback Equalization and Record Bias adjustments are completed.

1. Thread the machine with tape and set the SPEED select switch to the HI position, (15 ips for High Speed, 7.5 ips for Low Speed).
2. Press the 10kHz Oscillator Frequency button to activate the Test Oscillator.
3. For High Speed models(HI; 15ips), adjust the Input Level knob until the VU meter indicates 0VU. For Low Speed models(HI; 7.5 ips), adjust the Input Level knob until the VU meter indicates –10VU.
4. Set the Monitor button to TAPE position. Set both RECORD READY buttons to the Ready position, and press the PLAY and RECORD buttons to begin recording.
5. Adjust VR303 (REC EQ H) on the REC REP PCB Assembly until the VU meter indicates 0 VU (–10 VU for Low Speed).
6. Repeat Step 5 for Channel 2 using VR403.
7. After setting the SPEED select switch to the Lo position, repeat Steps 3 through 6 using the REC EQ L trimmer (VR304 for CH1, VR404 for CH2). For High Speed models, adjust the trimmers until the VU meter indicates –10VU at step3 and 5. For Low Speed models, adjust the trimmers until VU meter indicates -20 VU at steps 3 and steps 5.

7.4.5 Low Frequency Reproduce Equalization Adjustment

1. Thread a blank tape on the machine.
2. Connect the external oscillator to the CH1 and CH2 input connectors.
3. Set the Monitor button to SOURCE positon. Confirm that the VU meters indicate 0 VU.
4. Press down the Monitor button to TAPE position. Set the machine to the speed which is most often used. Confirm that SW201 and 101 on the REC/REP AMP PCB has been set to the ON position.
5. While Record the signal from the oscillator, adjust VR105 on the REC/REP AMP PCB Assembly so that the VU meter indicates 0 VU. Make the same adjustment for channel 2 using VR205.

7.4.6 Sel-Rep Level Adjustment

1. Thread the machine with the tape of the type normally used for sessions.
2. Press the 1kHz Oscillator button to activate the Test Oscillator.
3. Adjust the Input Level Knob so that the VU meters indicate 0VU.
4. After recording approximately 30 seconds of 1 kHz tone on the tape, rewind the tape to the starting point.
5. Set the Monitor button to TAPE position. Press down the both SEL-REP buttons to place the machine into Sel-Rep Mode.
6. Adjust VR101 (SEL-REP LEVEL) on the REC/REP AMP PCB Assembly so that the CH 1 VU meter indicates 0 VU.
7. Repeat Step 6 for 2 channel using VR201.

Section 8 Specifications

8.1 Tape Transport

Track Configuration
Tape Width

Tape Width: 1/4"

MX-5050 BIII-F	Full Track
MX-5050 BIII-2	2 Track NAB
MX-5050 BIII-2E	2 Track DIN
MX-5050 MKIV-2	2 Track NAB

Heads

BIII-F	BIII-2	BIII-2E	MKIV-2
Repro (2T) x 1	Erase x 1	Erase x 1	Erase x 1
Erase x 1	Record x 1	Record x 1	Record x 1
Record x 1	Repro x 1	Repro x 1	Repro x 1
Repro (FT) x 1			

Motor

Capstan x 1 (DC brushless PLL servo motor)
Reel x 2 (AC Induction Motor)

Reel Size

max. 10.5" NAB

Tape Speed

High Speed Version: 15 ips/7.5 ips
Low Speed Version: 7.5 ips/3.75 ips

Tape Speed Accuracy

max. ± 0.2 %

Tape Speed Deviation

max. 0.2%

Wow And Flutter

Peak Weighted Per DIN 45507

15 ips:	max. ± 0.06 b%
7.5 ips:	max. ± 0.08 %
3.75 Ips:	max. ± 0.12 %

Start Time

Time required to accelerate to double the specified Wow and Flutter value.

Speed	Start Time
15 ips	max. 0.5 sec
7.5 ips	max. 0.4 sec
3.75 ips	max. 0.3 sec

Stop Time

Time to stop from Play mode

Speed	Stop Time
15 ips	max. 0.5 sec
7.5 ips	max. 0.3 sec
3.75 ips	max. 0.3 sec

Time to Stop from Fast Wind max. 3 sec.

Fast Wind Time

max. 110 sec for 2500 ft (50Hz)
max. 90 sec for 2500 ft (60 Hz)

8.2 Electronics

Input

Line
Mode: Transformerless Active Balanced
Input Impedance: 100kΩ, 20Hz–20kHz
Nominal Level: +4dBu
Max. Level: +30dBu
Connectors: XLR Female type

Mic
Mode: Transformerless Active Balanced
Input Impedance: 10kΩ
Min. Level: –70dBu/–50dBu/OFF switchable
Mic. Impedance: Min. 150Ω

Output

Line
Mode: Transformerless Active Balanced
Output Impedance: Max 5Ω (20Hz–20kHz)
Load Impedance: Min. 200Ω
Nominal Level: +4dBu/–16dBu switchable
Max Level: +26dBu for 200Ω
Connectors: XLR Male type

Phone
Load Impedance: 8Ω
1/4" Standard Stereo Phone Jack

Note: 0dBu = 0.775V

Equalization
NAB/IEC Selectable

Standard Reference Flux

MX-5050 BIII-2, MKIV-2, BIII-F	185/250/320* nWb/m
MX-5050 BIII-2E, MKIV-2E	250/320/510* nWb/m

(*open circuit flux)

Frequency Response

REC/REP	Frequency Response
15 ips	30Hz - 20kHz ±2dB
7.5 ips	30Hz - 18kHz ±2dB
3.75 ips	20Hz - 10kHz ±2dB

REC/SEL-REP	Frequency Response
15 ips	250Hz - 7.5kHz ±3dB
7.5 ips	250Hz - 5kHz ±3dB
3.75 ips	250Hz - 2.5kHz ±3dB

Signal to Noise Ratio

Model		BIII-2, MKIV-2, 2E				BIII-F	
		Track (2mm)		Track (2.75mm)			
Filter		Unwtd	Wtd	Unwtd	Wtd	Unwtd	Wtd
Speed	EQ						
15ips	IEC	70	73	71	74	74	77
	NAB	69	72	70	73	73	76
7.5ips	IEC	67	70	68	71	71	74
	NAB	71	73	72	74	75	75
3.75ips	IEC	64	67	65	68	68	71
	NAB	64	67	65	68	68	71

Measured with respect to a recording level of 1,040 nWb/mat 15 and 7.5 ips, and 740 nWb/m at 3.75 ips, using AMPEX 456 or equivalent tape.

Unwtd: Using a 30Hz to 18kHz RC filter to eliminate noise outside the audio spectrum.

Wtd: Using a NAB or ANSI "A" weighting filter and a 1kHz reference.

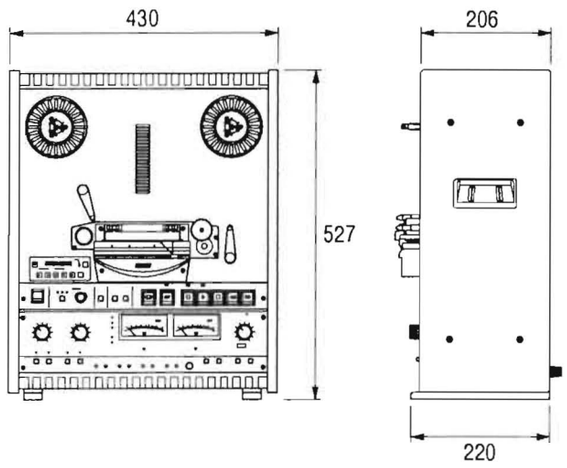
Distortion	Total Harmonic Distortion max. 0.3% (15 ips 1kHz, 250 nWb/m, AMPEX 456)	
Crosstalk	MX-5050 BIII-2, MKIV-2 MX-5050 MKIV-2E, BIII-2E	min. 55dB min. 48dB
Depth of Erasure	MX-5050 BIII-F MX-5050 BIII-2, MKIV-2 MX-5050 BIII-2E, MKIV-2E	min. 75dB min. 75dB min. 70dB
Test Oscillator	Sine wave	1kHz/10kHz
Bias Frequency	133kHz	
Erase Frequency	133kHz	
Operating Environment	5 ~ 40°C (41 ~ 104°F) 20 ~ 80% RH	
Storage Environment	–20 ~ 45°C (–4 ~ 113°F) 10 ~ 80% RH	
Dimensions	MX-5050 BIII MX-5050 MKIV-2	525 x 430 x 275 mm (H x W x D) 480 x 430 x 680 mm
Weight	MX-5050 BIII MX-5050 MKIV-2	28kg 34kg

Optional Accessories

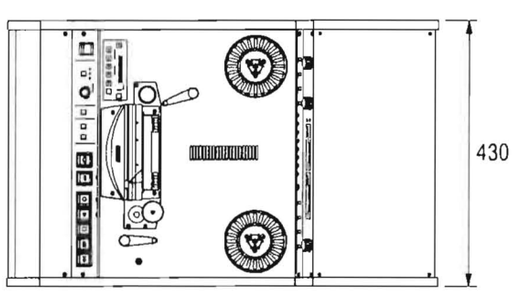
Name	Part No.	Model
Auto Locator (8-memory)	CB-119	
Auto Locator (99-memory)	CB-120	
Remote Controller (Transport)	CB-127	
Synchronizer	EC-102	
Remote Controller for EC-102	CB-131	
Resolver	EC-401	
Input Transformer (2Ch unit)	ZA-53T-T	BIII-F, 2, 2E, MKIV-2, 2E
Output Transformer (2Ch unit)	ZA-53S-T	BIII-F, 2, 2E, MKIV-2, 2E
Pedestal	ZA-52L	
Rack Mount Kit	RK-2B	BIII-F, 2, 2E, BQIII
Full Track Kit	KH-44KB	

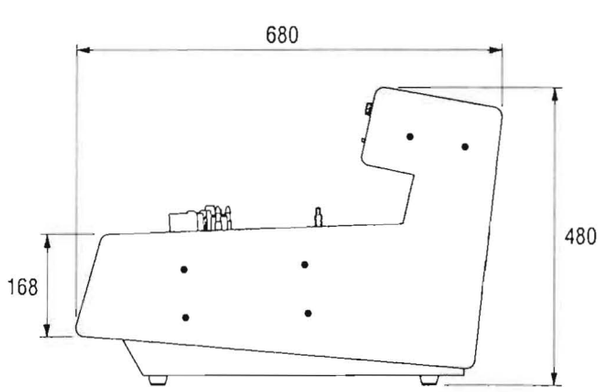
DIMENSIONS

BIII



MKIV-2





Section 9 Exploded Views and Parts List

The following exploded view drawings and parts lists are provided for service reference. Each drawing has its own parts list followed with the same key number and title.

When ordering parts, give a full description, using both the part number and the name of the part. If there seems to be a discrepancy between the drawings herein and your MX-5050, contact OTARI. We assume no liability for improper servicing due to changes and improvements which we make that subsequently render certain of these documents obsolete.

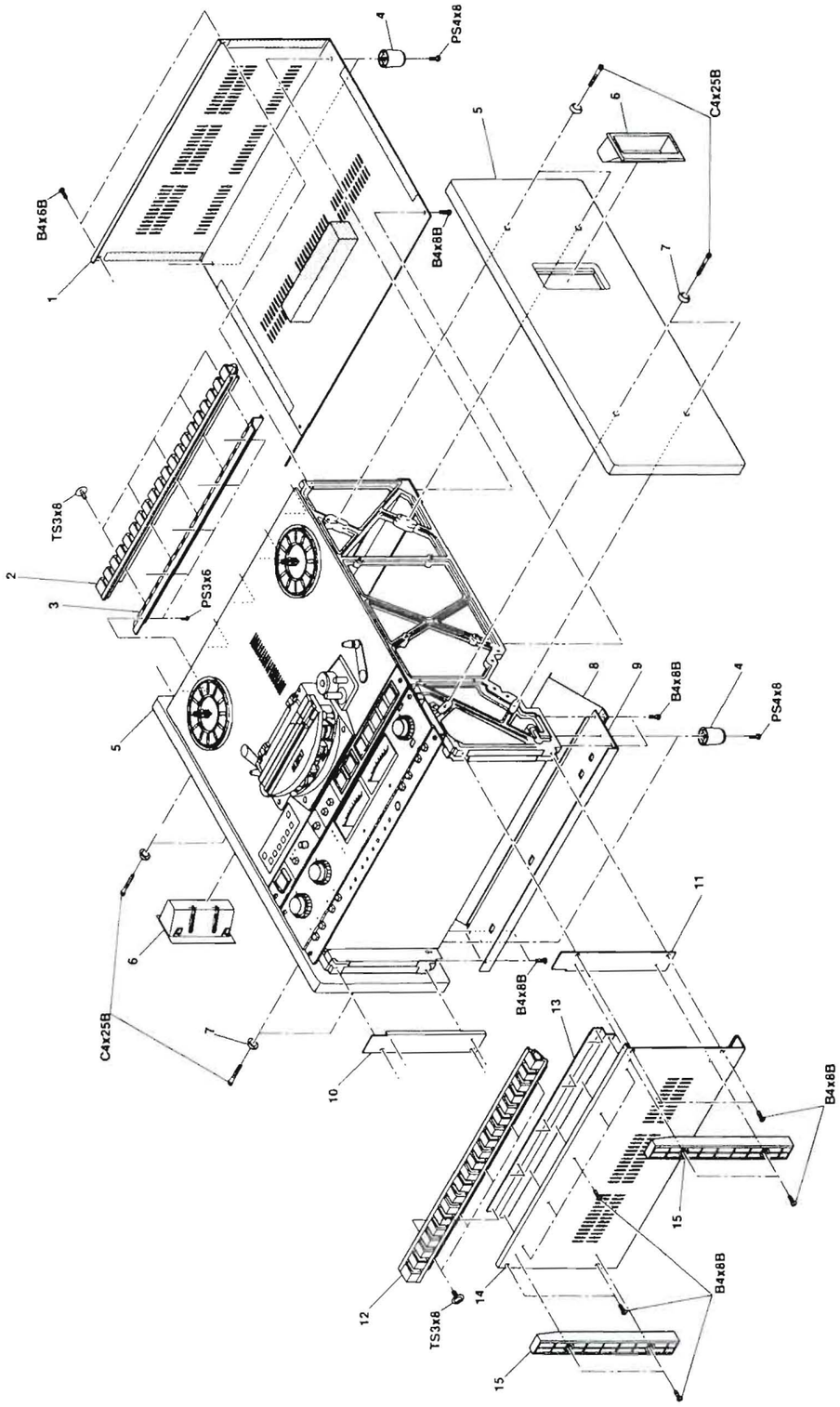
BIII

MKIV-2

BIII Case Assembly: K1168

No.	Description	Parts No.	Notes
1	Rear Cover Assembly	K1168-A	
2	Grille, Ventilation	CY5001A	
3	Plate C	K102911	
4	Foot	CY4013	
5	Panel, Side	K116802	
6	Hundle	CY1004	
7	Washer, Trim	KZ6C028	
8	Connector Panel Assembly	CB792	
9	Panel, Rear	A106204	
10	Plate, L	K102909	
11	Plate, R	K102910	
12	Grille, Ventilation	CY5001A	
13	Plate	K102907	
14	Panel, Bottom	K102906A	
15	Foot, Case	CY4011-A	

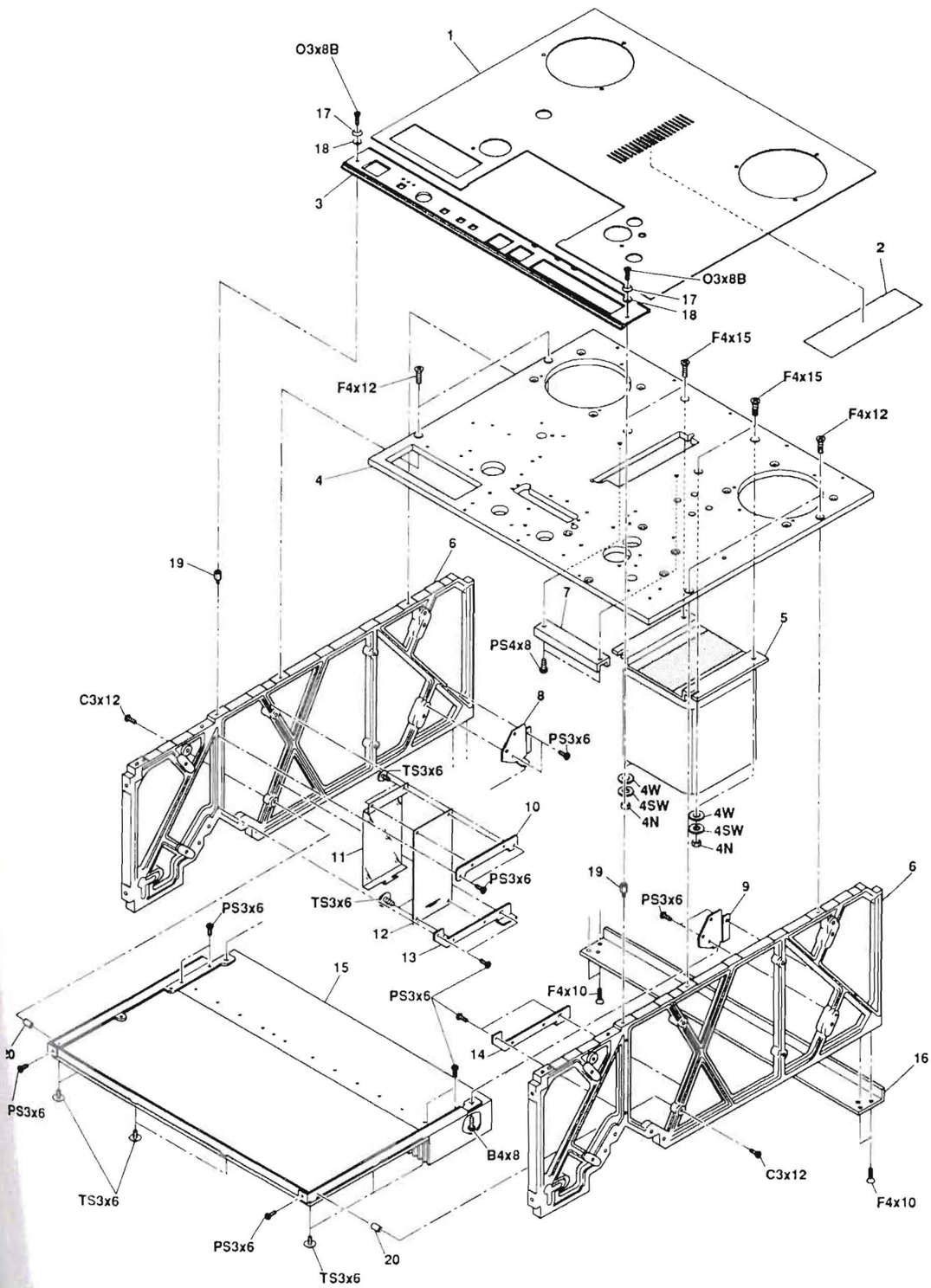
Case Assembly: K1168



Chassis Assembly: T0067

No.	Description	Parts No.	Notes
1	Panel, Deck Cover	T006702	
2	Blind	T006703	
3	Control Assembly	CB-23U	
4	Panel, Top	T006701	
5	Transformer, Power	TF11030	
6	Frame	T006708	
7	Angle	T506405	
8	Bracket L	T007104	
9	Bracket R	T007105	
10	Bracket	T006705	
11	Cover, Fuse	T005306	
12	FUSE PCB Assembly	PB-7VCA	
13	Bracket L	T006710	
14	Bracket R	T006709	
15	CONTROL PCB Assembly	PB-4RNA	
16	Angle, Frame	T506104	
17	Washer, Trim	KZ6C051	
18	Washer	KZ6C011	
19	Stud	KZ9L080A	
20	Stud	KZ9A095B	

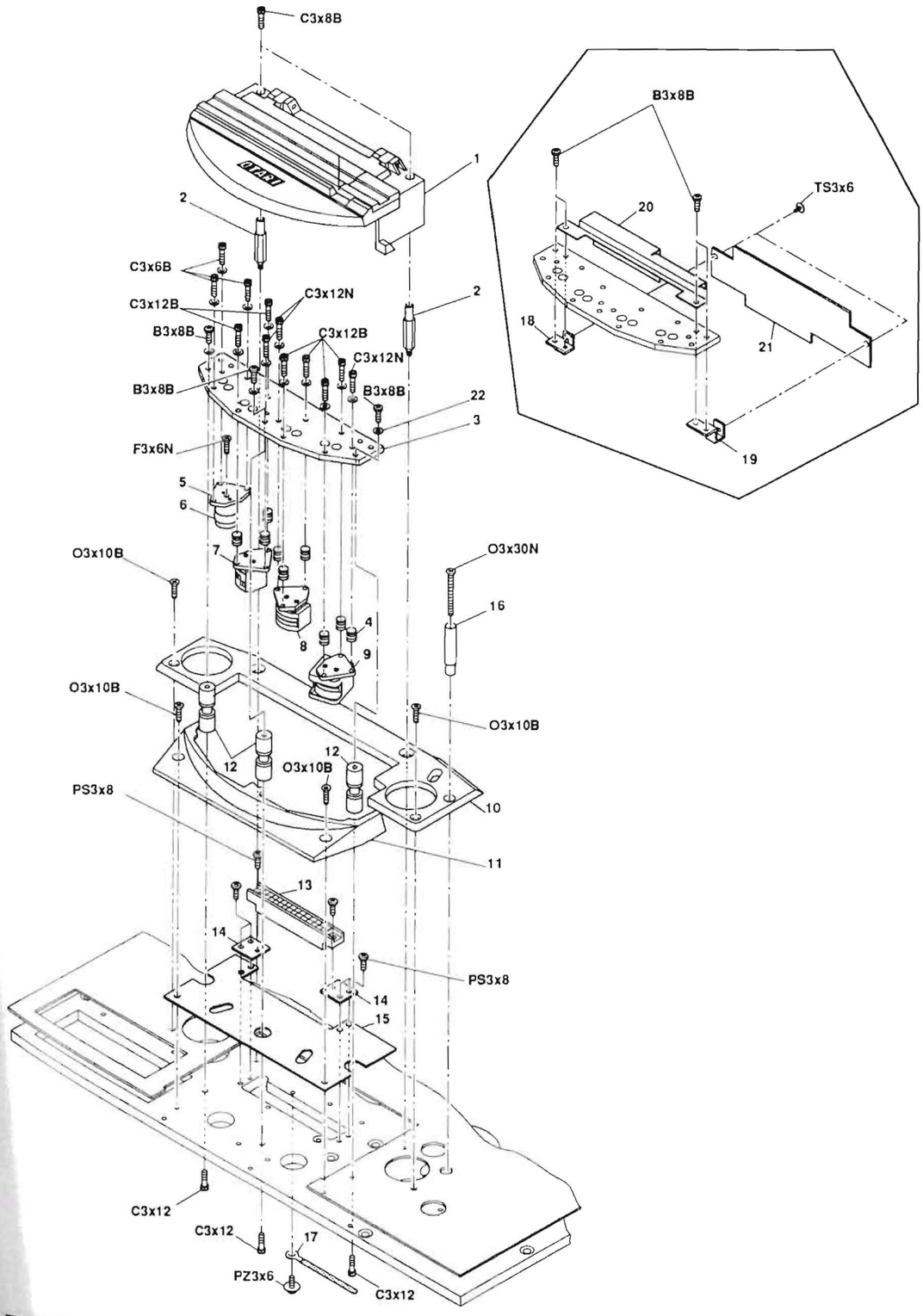
Chassis Assembly: T0067



Head Assembly: KH-44K

No.	Description	Parts No.	Notes
1	Head Housing Assembly	KH-4Y-A	
2	Stud	KH4Y009	
3	Base, Head	KH0C047	
4	Spring, Head Adjustment	GS2016	
5	Bracket, Head	KH0D178	
6	Post, Guide	KG4E001	Head Sub Assembly
7	Erase Head Assembly, 1/4" 2CH	GH4E082B	KH-44KA
8	Record Head Assembly, 1/4" 2CH	GH4R005B	
9	Reproduce Head Assembly, 1/4" 2CH	GH4P027B	
10	Cover, Housing	KH0F038	
11	Head Housing,Front	KH0F037	
12	Guide, Tape	KG4A003	
13	Connector	CN314002	
14	Bracket, Connector	KH4Y004	
15	Plate, Shield	KH4Y001A	
16	Pole, Guide	KG6E020	
17	Clamp, Cable	PZ1G053	
18	Bracket L, PCB	KH41I01	
19	Bracket R, PCB	KH41I02	Head Sub Assembly
20	Cover, Protection	KH41T02	KH-44KA
21	HEAD, RELAY PCB Assembly	PB-78IAB	
22	Washer, Polyslider	F523030	

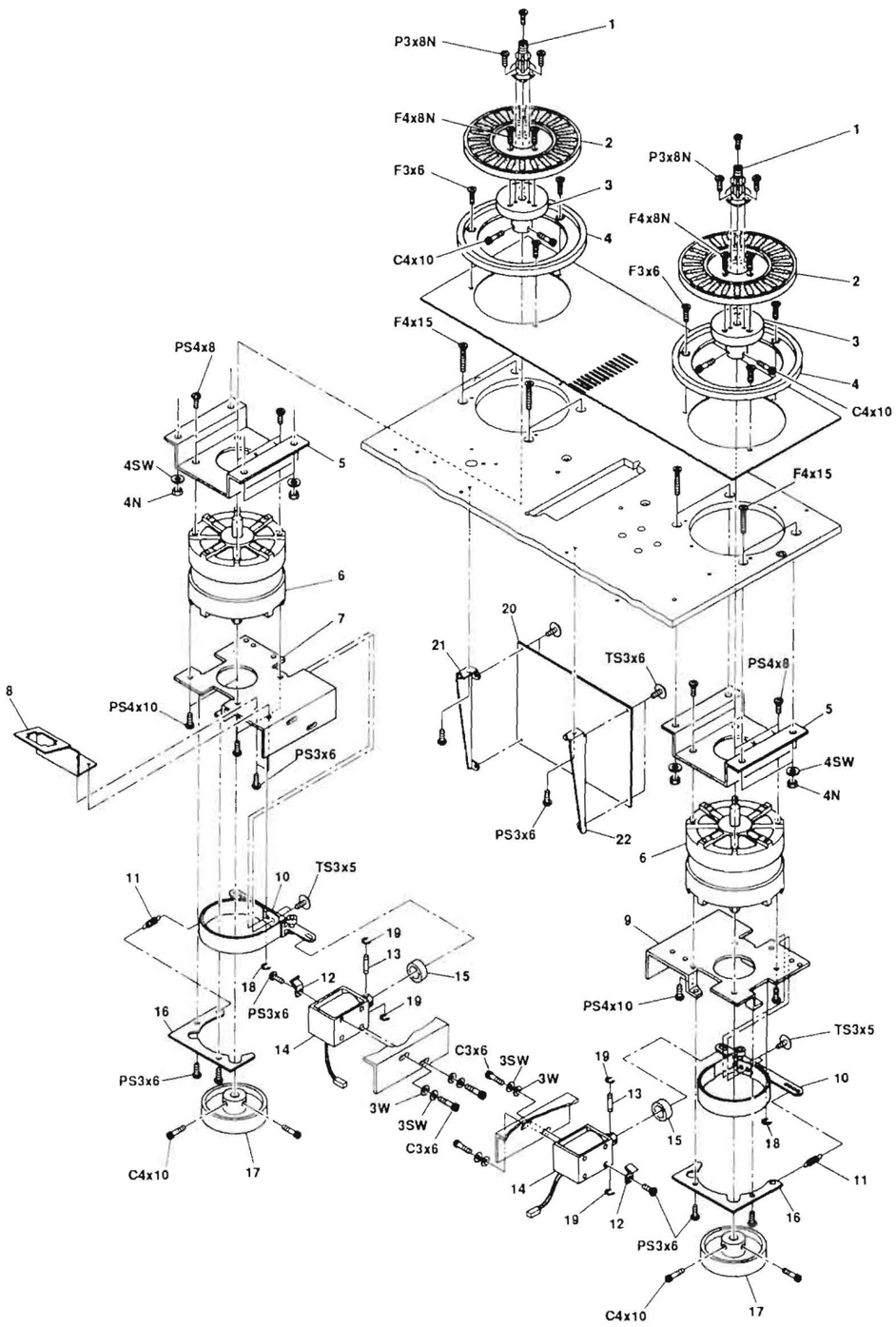
Head Assembly: KH-44K



Reel Assembly : KW-41J

No.	Description	Parts No.	Notes
1	Reel Shaft Assembly	KW-41DG	
2	Reel Table Assembly	KW-41EA	
3	Holder, Reel Table	KW0B056	
4	Protector, Reel	KW0H007A	
5	Bracket, Reel Motor	KW0G016	
6	Motor, Reel	MR1C005	
7	Base L , Brake	KW0G013	
8	Bracket, Connector	KW41J01	
9	Base R, Brake	KW0G012	
10	Brake Band Assembly	KW-4J-A	
11	Spring	GS1175	
12	Stopper, Cable	KZ3A047	
13	Pin, Solenoid	KZ5A003	
14	Solenoid	GP1F03	
15	Damper	PZ1B049	
16	Guide, Brake	KW4B001	
17	Drum, Brake	KW0A012	
18	Ring, E type	F74TE15	
19	Ring, E type	F74TE09	
20	REEL MOTOR DRIVE PCB Assembly	PB-4RNA	
21	Bracket A, Reel Motor Draive PCB	T005317	
22	Bracket B, Reel Motor Draive PCB	T005318	

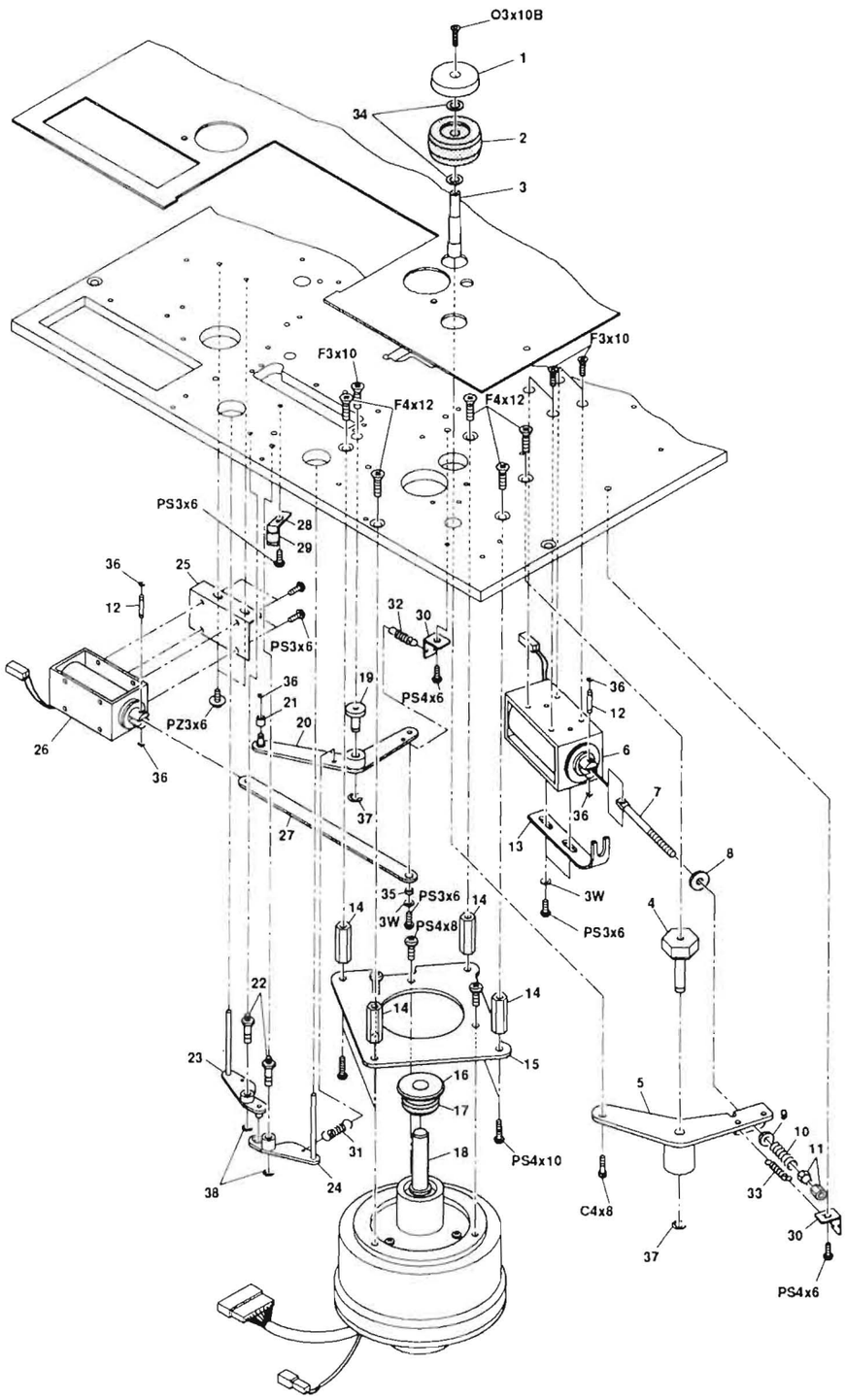
Reel Assembly: KW-41J



Pinch Roller Assembly: KP-4X
Capstan Assembly: KC-41H
Shifter Assembly: KR-4W

No.	Description	Parts No.	Notes
1	Cap, Pinch Roller	KP0C034	
2	Pinch Roller Assembly	KP-4S-B	
3	Shaft, Pinch Roller	KP0B060	
4	Shaft, Arm	KP4L001	
5	Pinch Roller Arm Assembly	KP-4X-A	
6	Solenoid	GP1B12	
7	Screw, Adjustment	KZ6A113	
8	Damper	PZ1C021	
9	Washer Spherical	KP0G004	
10	Spring	GS2163	
11	Nut, Dubble	F517-4	
12	Pin, Solenoid	KZ5A003	
13	Stopper, Solenoid	KZ2A016	
14	Stud	KZ9I250A	
15	Bracket, Motor	KC4H001	
16	Cap, Dust	KC0B029	
17	Ring	PZ1C130	
18	Motor, Capstan	MR-1L	
19	Shaft, Link Arm	KR4W005	
20	Shifter Link Assembly	KR-4W-A	
21	Collar	KZ7C109	
22	Shaft, Arm	KR4B001	
23	Arm A, Lifter	KR0B005	
24	Arm B, Lifter	KR0B006	
25	Bracket,Shifter Solenoid	KR4W007	
26	Solenoid	GP1A09	
27	Arm, Link	KR4W004	
28	Angle	KZ3A042	
29	Pipe, Rubber	PZ1C174	
30	Hook	KZ3A167	
31	Spring	GS1185	
32	Spring	GS1028-A	
33	Spring	GS1149	
34	Washer, Polyslider	F524060	
35	Stud	KZ7A823	
36	Ring, E type	F74TE09	
37	Ring, E type	F74TE20	
38	Ring, E type	F74TE15	

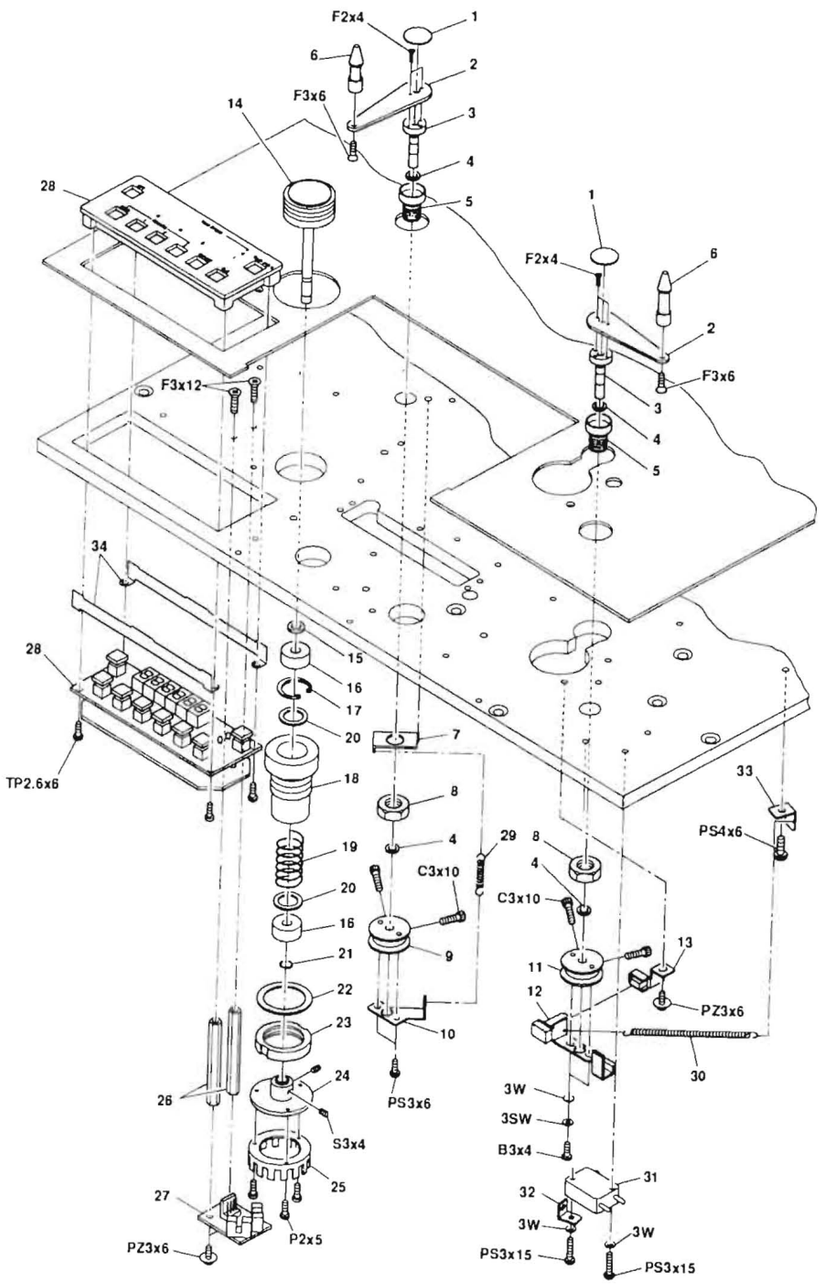
Pinch Roller Assembly: KP-4X
Capstan Assembly: KC-41H
Shifter Assembly: KR-4W



Tension Arm Assembly: KA-4X/KA-4Y
Impedance Roller Assembly: KI-4T
Timer Assembly: ZA-95G

No.	Description	Parts No.	Notes
1	Cap, Arm	KA0C005	
2	Arm, Tension	KA0A017A	
3	Shaft, Arm	KA4J001	
4	Washer, Polyslider	F524-5	
5	Holder, Arm	KA0B008	
6	Guide, Tape	KG4D007	
7	Hook, Spring	KZ3A024	
8	Nut	KZ6D004	
9	Hook A, Spring	KA0E017	
10	Stopper, Arm	KA4X001	
11	Hook B, Spring	KA0E005	
12	Switch Actuator Assembly	KA-4K-B	
13	Magnet Assembly	KA-4K-C	
14	Roller Assembly	KI-4J-B	
15	Collar	KZ7C057	
16	Bearing	BA1Z022	
17	Ring	F7017	Impedance Roller
18	Holder	KI0B014	Sub Assembly
19	Spring	GS2077	KI-4J-A
20	Washer	KZ6C057	
21	Ring, Shaft	F7206	
22	Washer	KI0H024	
23	Nut, Holder	KI0H025	
24	Boss	KI4T001	
25	Disk, Tacho	SR3Z033	
26	Stud	KZ9H480C	
27	ROLLER TACHO PCB Assembly	PB-4HCA	
28	Timer Display Assembly	ZA-95G	
29	Spring	GS1025	
30	Spring	GS1048	
31	Switch, Micro	WH51027	
32	Hook, Spring	KZ3A023	
33	Hook	KZ3A167	
34	Bracket	KZ2A165	

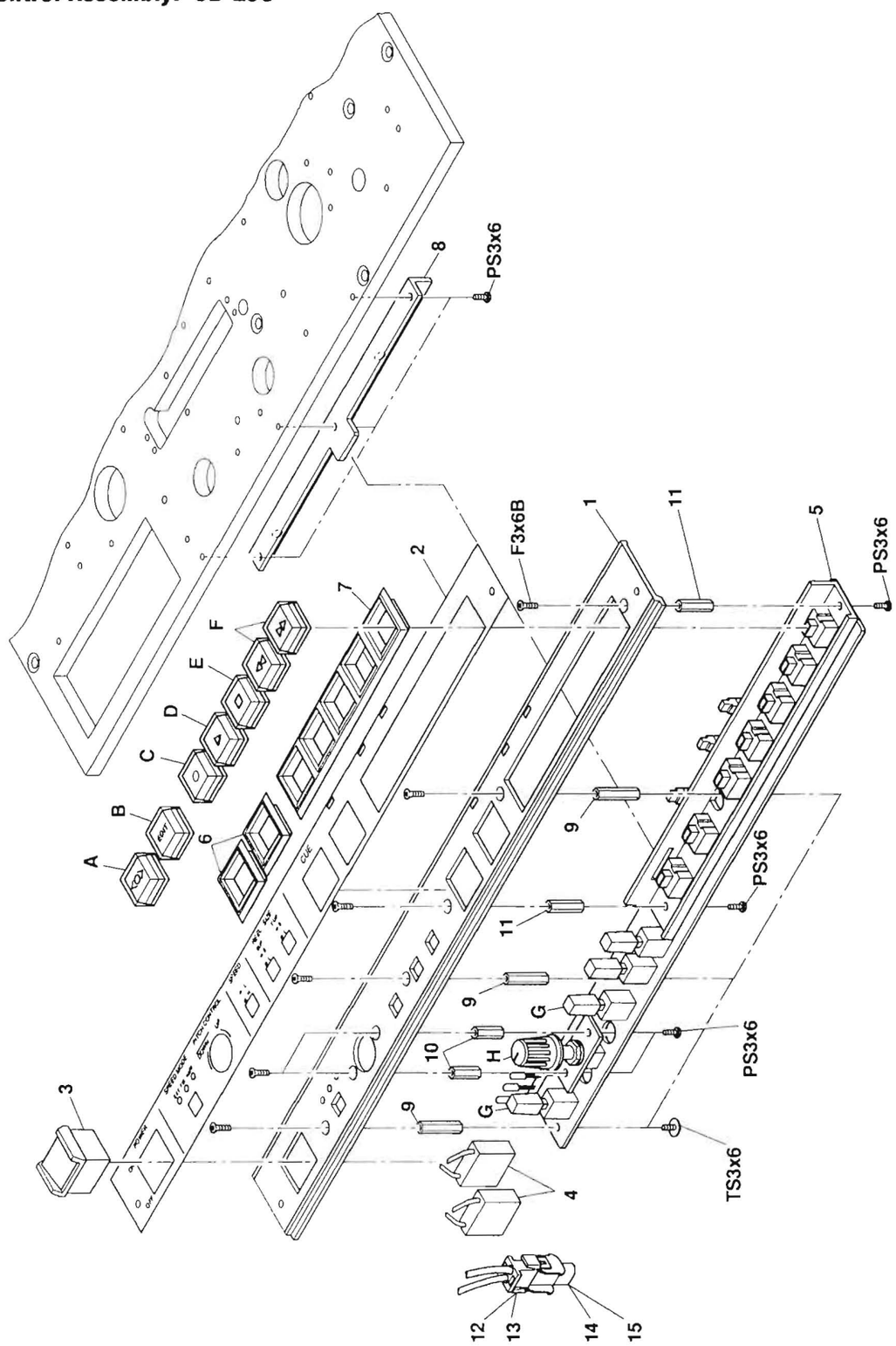
Tension Arm Assembly: KA-4X/KA-4Y
Impedance Roller Assembly: KI-4T
Timer Assembly: ZA-95G



Control Assembly: CB-23U

No.	Description	Parts No.	Notes
1	Panel, Control	CB23U01	
2	Sheet, Control Panel	CB23U02	
3	Switch, Power	WH42062	
4	Capacitor, Spark Killer	CZ20001W	
5	TRANSPORT CONTROL SWITCH		
	PCB Assembly	PB-7UZA	
A	Button, CUE	KN2145	
B	Button, EDIT	KN2147	
C	Button,RECORD	KN2144	
D	Button, PLAY	KN2142	Assembly
E	Button, STOP	KN2141	
F	Button, F.FWD , RWD	KN2143	
G	Switch, Selector	KN2184	
H	Knob	KN1108	
H	Cap, Knob	KN1099	
6	Escutcheon, Switch	PZ4A026	
7	Escutcheon, Switch	PZ4A027	
8	Angle	T006704	
9	Stud	KZ7B160	
10	Stud	KZ7B158	
11	Stud	KZ7B159	
12	Connector Housing, Plug	CN402029	
13	Connector Contact, Plug	CN7B-041	
14	Connector Housing, Receptacle	CN402030	
15	Connector Contact, Receptacle	CN7B-042	

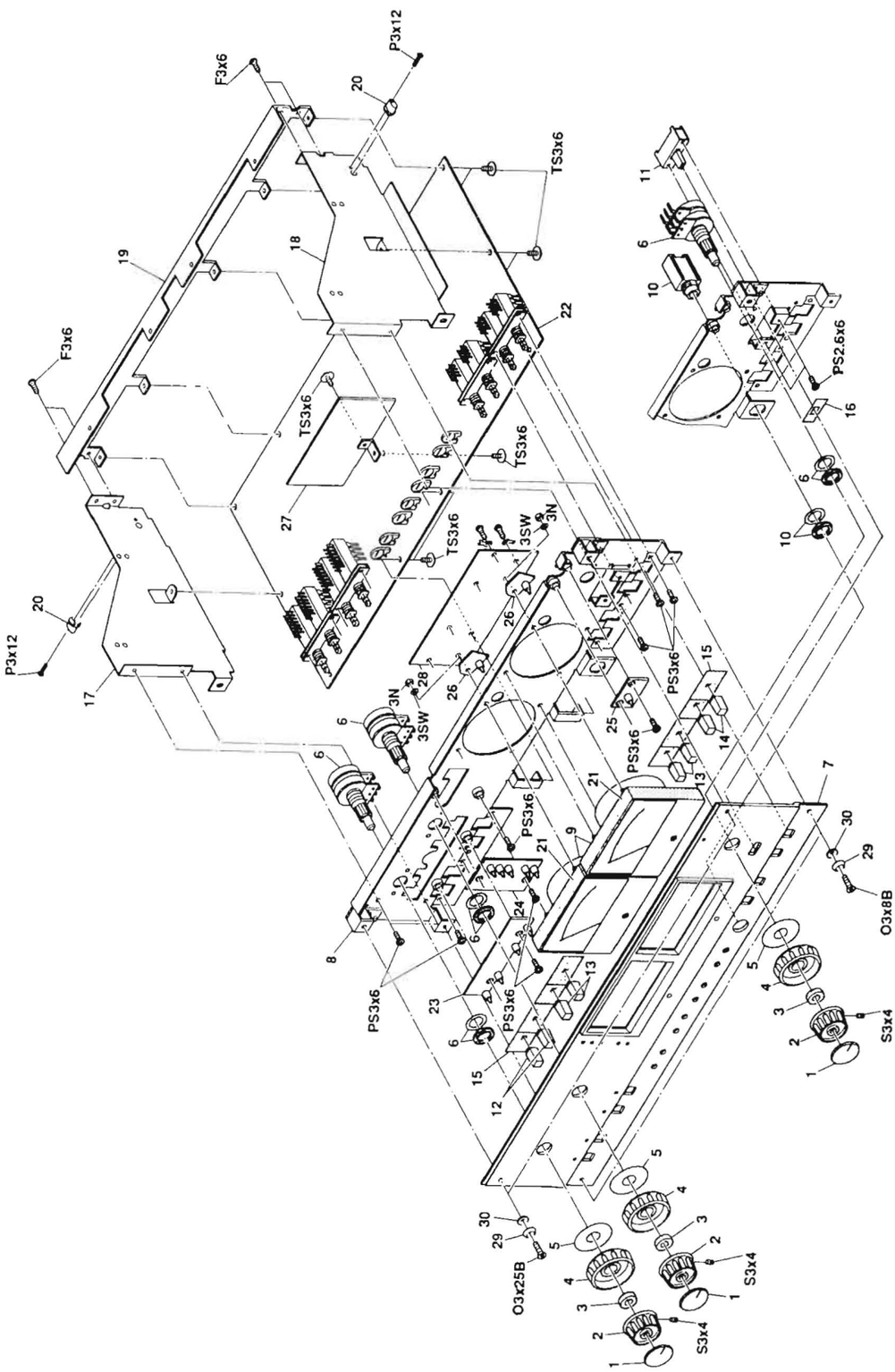
Control Assembly: CB-23U



Amplifier Assembly: A1175

No.	Description	Parts No.	Notes
1	Cap, Knob	KN1102	
2	Knob	KN1100	
3	Collar	KZ7C111	
4	Knob	KZ1063A	
5	Spacer	KZ6C017	
6	Potentiometer	RV224083	
7	Amp Trim Panel Assembly	A1062-A	
8	Panel, Amp. Top	A106201	
9	VU Meter	ME11005	
10	Jack, Phone	CN602144	
11	Switch	WH340013	
12	Button	KN2095	
13	Button	KN2094	
14	Button	KN2093	
15	Blind	PZ1B012	
16	Blind	PZ1B010	
17	Frame L, Amp	A102808	
18	Frame R, Amp	A102807	
19	Bracket, PCB	A106206	
20	Collar	A102809	
21	Shield, Illumination	PZ1B013	
22	REC/REP AMP PCB Assembly	PB-16EE (BIII-2) PB-16EJ (BIII-F) PB-16EG (BII-2E)	
23	LED PCB Assembly	PB-83AB	
24	LED PCB Assembly	PB-83BB	
25	LED PCB Assembly	PB-83CAA	
26	LED PCB Assembly	PB-81J	
27	REC EQ PCB Assembly	PB-81QA	
28	VU Meter Amp. PCB Assembly	PB-16DB	
29	Washer, Trim	KZ6C051	
30	Washer	KZ6C011	

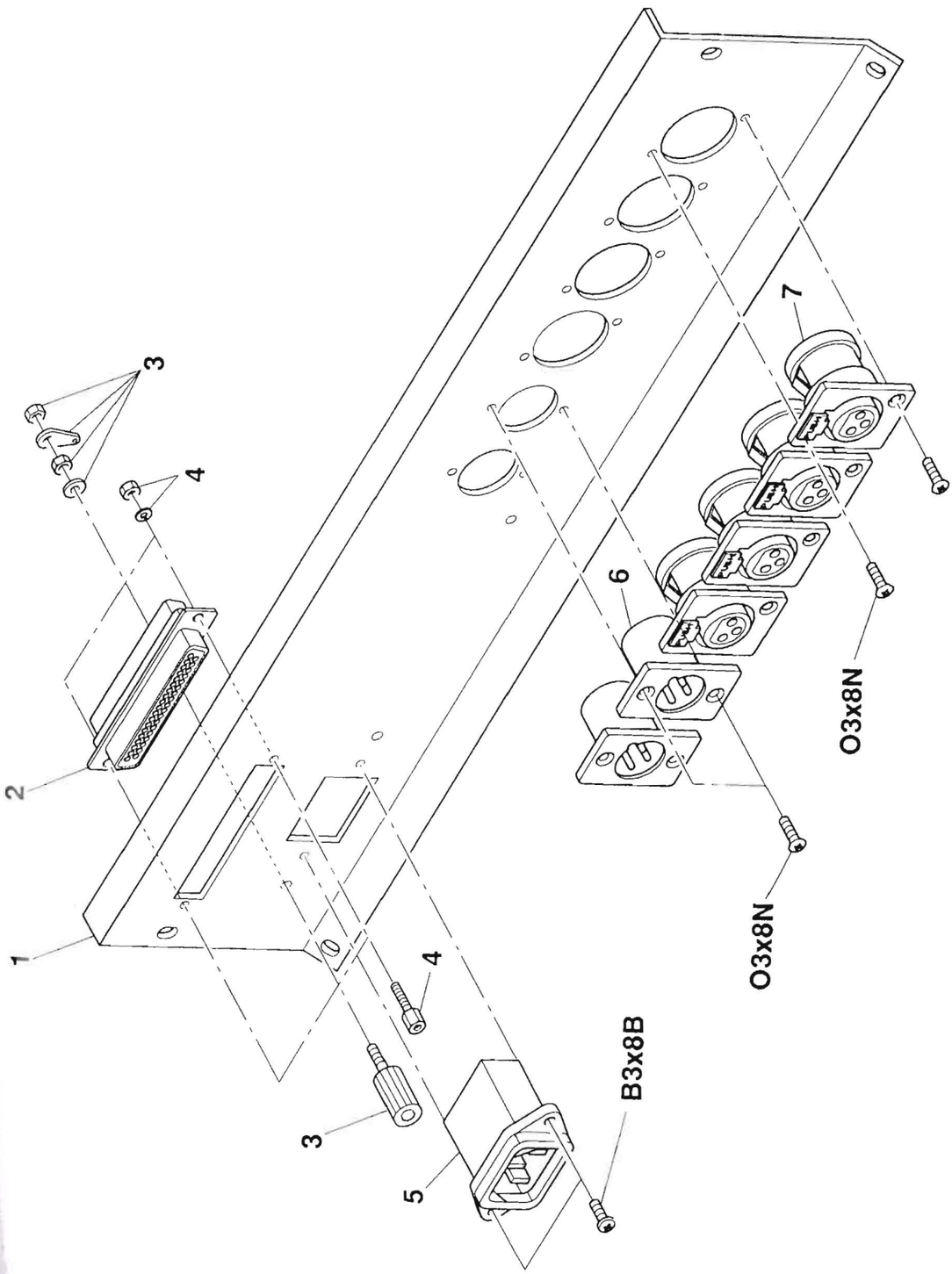
Amplifier Assembly: A1175



Connector Panel Assembly: CB-792

No.	Description	Parts No.	Notes
1	Panel, Connector	CB79201	
2	Connector, D sub 37pin	CN237326	
3	Terminal, Ground	CN901040	
4	Screw, Lock	CN7B-212	
5	AC Inlet	CN603012	
6	Connector, XL type, Male	CN103195	
7	Connector, XL type, Female	CN103194	

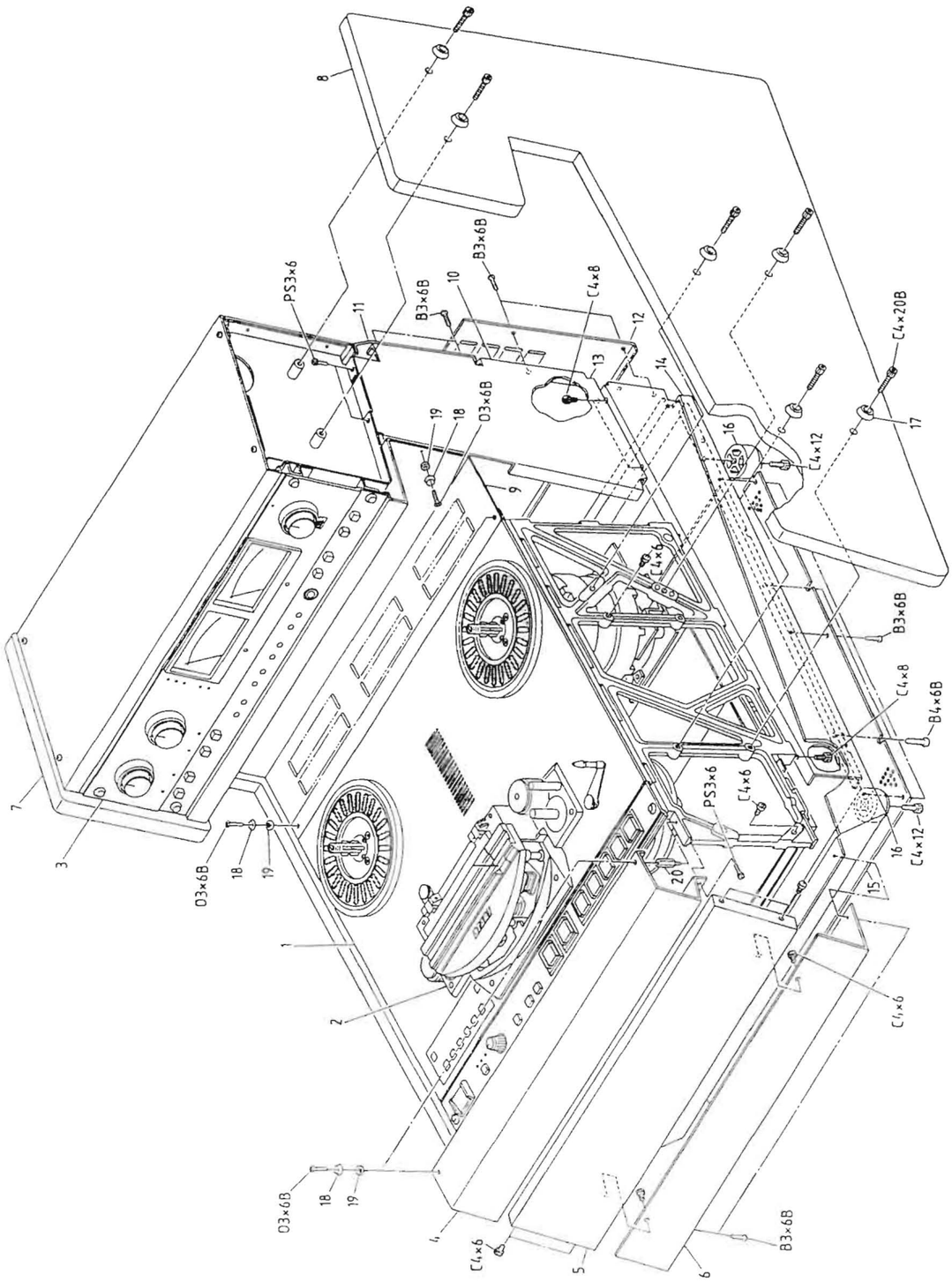
Connector Panel Assembly: CB-792



MKIV-2 *Case Assembly: K1170*

No.	Description	Parts No.	Notes
1	Tape Deck Assembly	T0069	
2	Head Assembly	KH-44K	
3	Audio Amplifier Assembly	A1177	
4	Cover, Front	K117001	
5	Cover, Front	K117002	
6	Cover, Under	K117003	
7	Panel A, Side	K117201	
8	Panel B, Side	K117202	
9	Cover, Ventilation	K117205	
10	Frame R	K117007	
10'	Frame L	K117006	
11	Panel, Rear	K117005	
12	Connector Panel Assembly	CB-794	
13	Bracket R, Chassis	K117210	
13'	Bracket L, Chassis	K117211	
14	Frame, Under	K117209	
15	Cover, Under	K117212	
16	Foot	CY4058	
17	Washer, Trim	KZ6C028	
18	Washer, Trim	KZ6C051	
19	Washer	KZ6C011	
20	Stud	KZ9L150A	

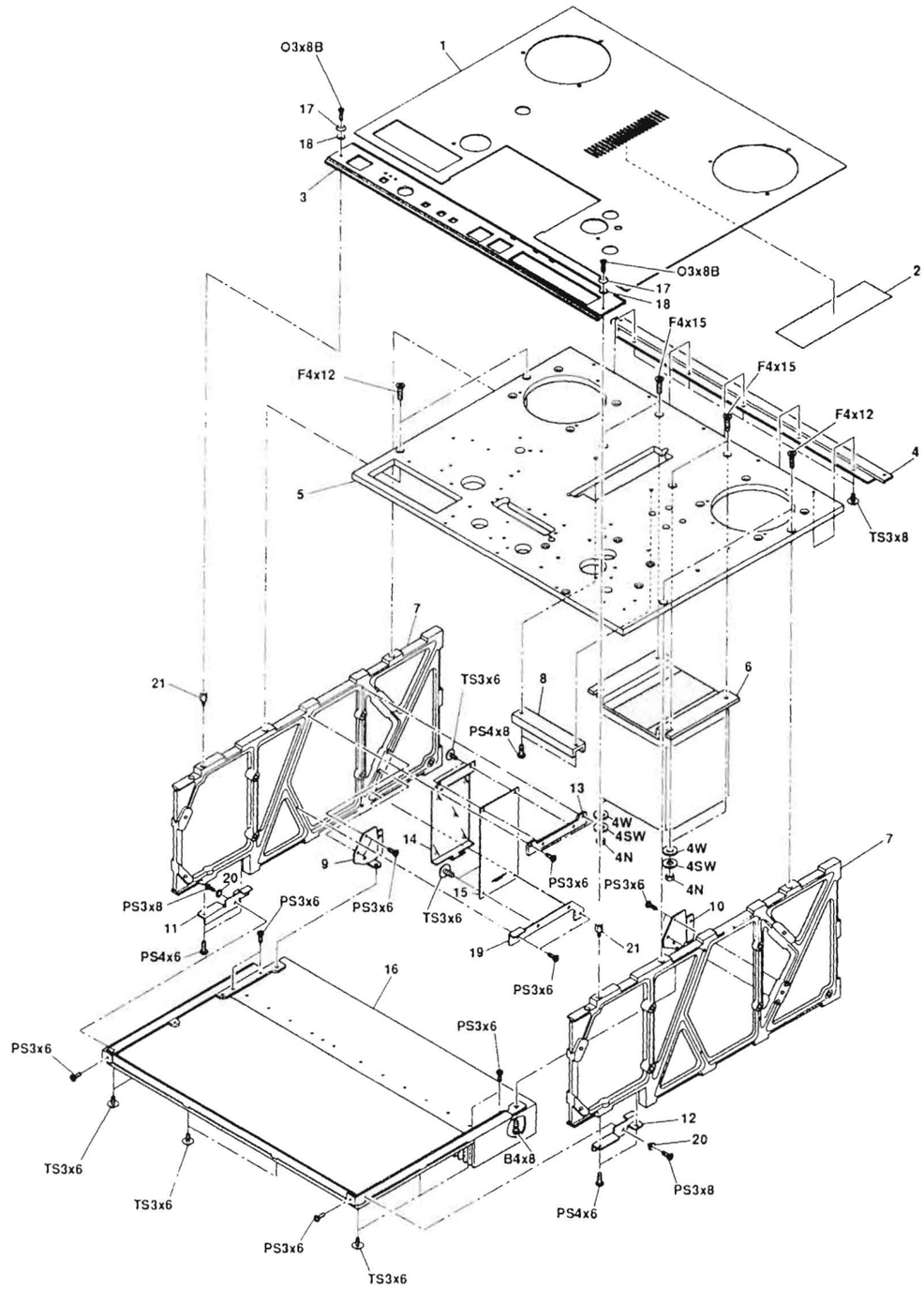
Case Assembly: K1170



Chassis Assembly: T0069

No.	Description	Parts No.	Notes
1	Panel, Deck Cover	T006711	
2	Blind	T006703	
3	Control Assembly	CB-23U	
4	Angle	T007107	
5	Panel, Deck	T006701	
6	Transformer, Power	TF11030	
7	Frame	T007101	
8	Angle	T506405	
9	Bracket L	T007104	
10	Bracket R	T007105	
11	Bracket L	T007102	
12	Bracket R	T007103	
13	Bracket	T006705	
14	Cover, Fuse	T005306	
15	FUSE PCB Assembly	PB-7VCA	
16	CONTROL PCB Assembly	PB-4RMA	
17	Washer, Trim	KZ6C051	
18	Washer	KZ6C011	
19	Bracket L	T006710	
20	Collar, Screw	KZ7C091	
21	Stud	KZ9L080A	

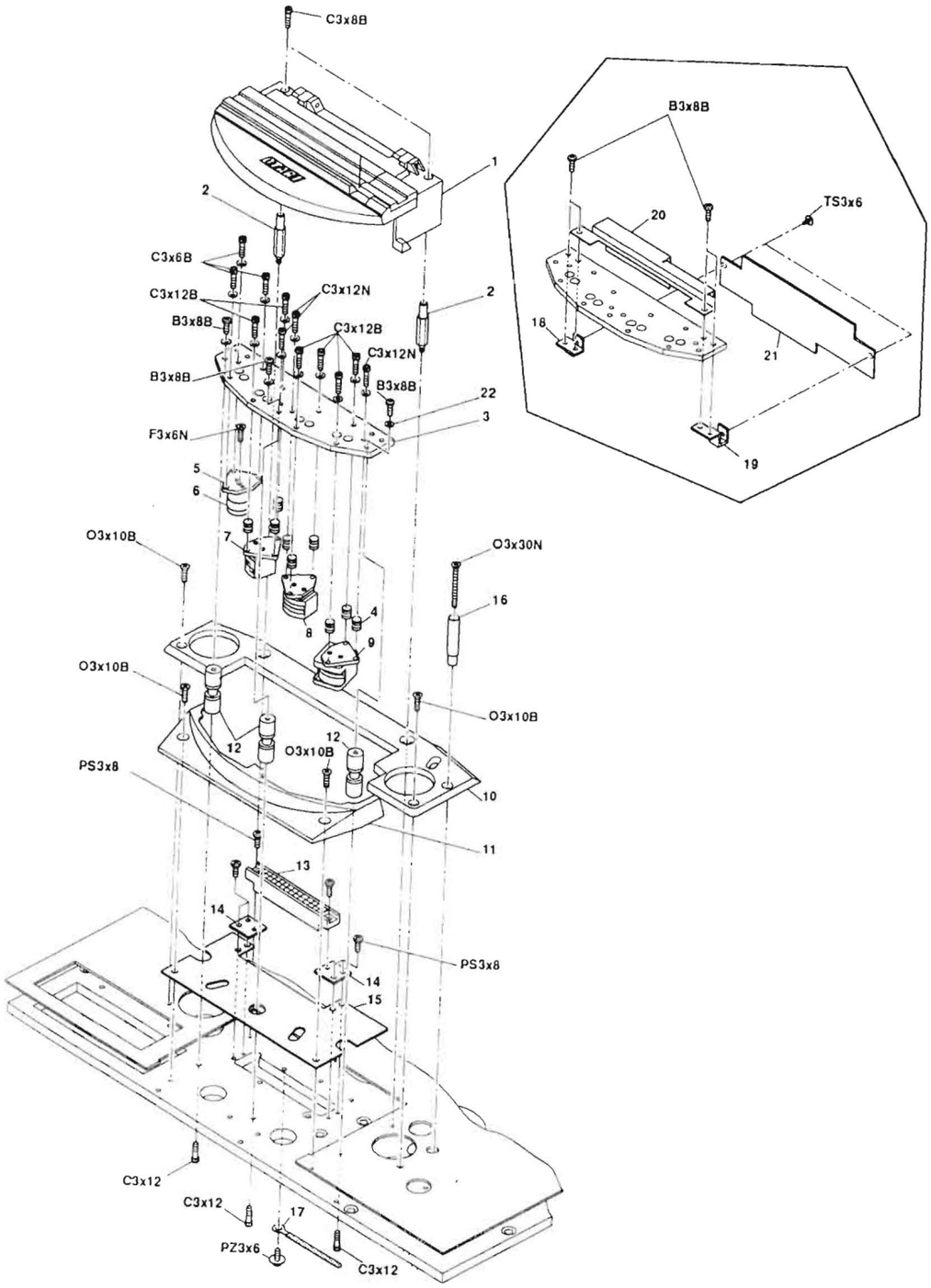
Chassis Assembly: T0069



Head Assembly: KH-44K

No.	Description	Parts No.	Notes
1	Head Housing Assembly	KH-4Y-A	
2	Stud	KH4Y009	
3	Base, Head	KH0C047	
4	Spring, Head Adjustment	GS2016	
5	Bracket, Head	KH0D178	
6	Post, Guide	KG4E001	Head Sub Assembly KH-44KA
7	Erase Head Assembly, 1/4" 2CH	GH4E082B	
8	Record Head Assembly, 1/4" 2CH	GH4R005B	
9	Reproduce Head Assembly, 1/4" 2CH	GH4P027B	
10	Cover, Housing	KH0F038	
11	Head Housing, Front	KH0F037	
12	Guide, Tape	KG4A003	
13	Connector	CN314002	
14	Bracket, Connector	KH4Y004	
15	Plate, Shield	KH4Y001A	
16	Pole, Guide	KG6E020	
17	Clamp, Cable	PZ1G053	
18	Bracket L, PCB	KH41I01	
19	Bracket R, PCB	KH41I02	Head Sub Assembly KH-44KA
20	Cover, Protection	KH41T02	
21	HEAD, RELAY PCB Assembly	PB-78IAB	
22	Washer, Polyslider	F523030	

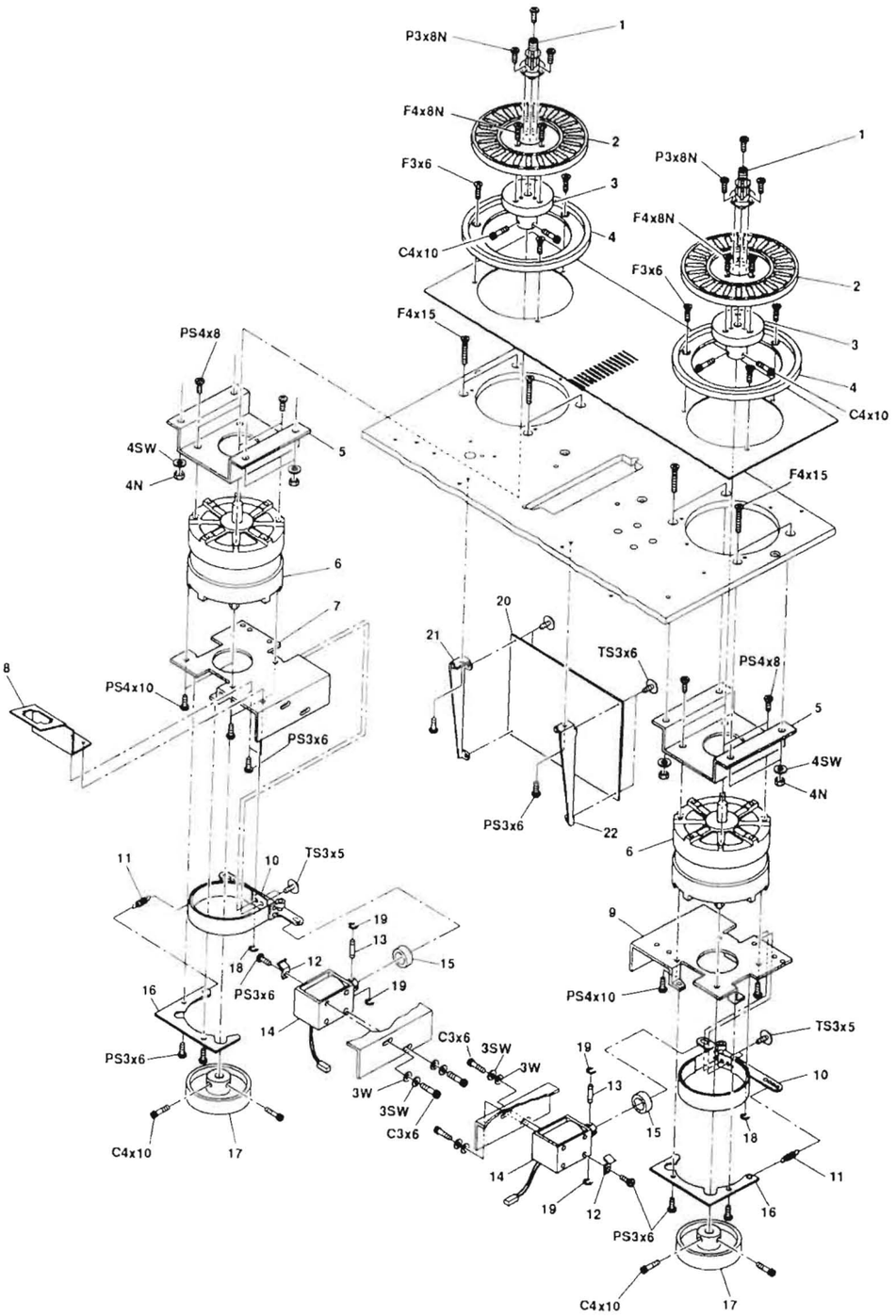
Head Assembly: KH-44K



Reel Assembly : KW-41J

No.	Description	Parts No.	Notes
1	Reel Shaft Assembly	KW-41DG	
2	Reel Table Assembly	KW-41EA	
3	Holder, Reel Table	KW0B056	
4	Protector, Reel	KW0H007A	
5	Bracket, Reel Motor	KW0G016	
6	Motor, Reel	MR1C005	
7	Base L, Brake	KW0G013	
8	Bracket, Connector	KW41J01	
9	Base R, Brake	KW0G012	
10	Brake Band Assembly	KW-4J-A	
11	Spring	GS1175	
12	Stopper, Cable	KZ3A047	
13	Pin, Solenoid	KZ5A003	
14	Solenoid	GP1F03	
15	Damper	PZ1B049	
16	Guide, Brake	KW4B001	
17	Drum, Brake	KW0A012	
18	Ring, E type	F74TE15	
19	Ring, E type	F74TE09	
20	REEL MOTOR DRIVE PCB Assembly	PB-4RNA	
21	Bracket A, Reel Motor Drive PCB	T005317	
22	Bracket B, Reel Motor Drive PCB	T005318	

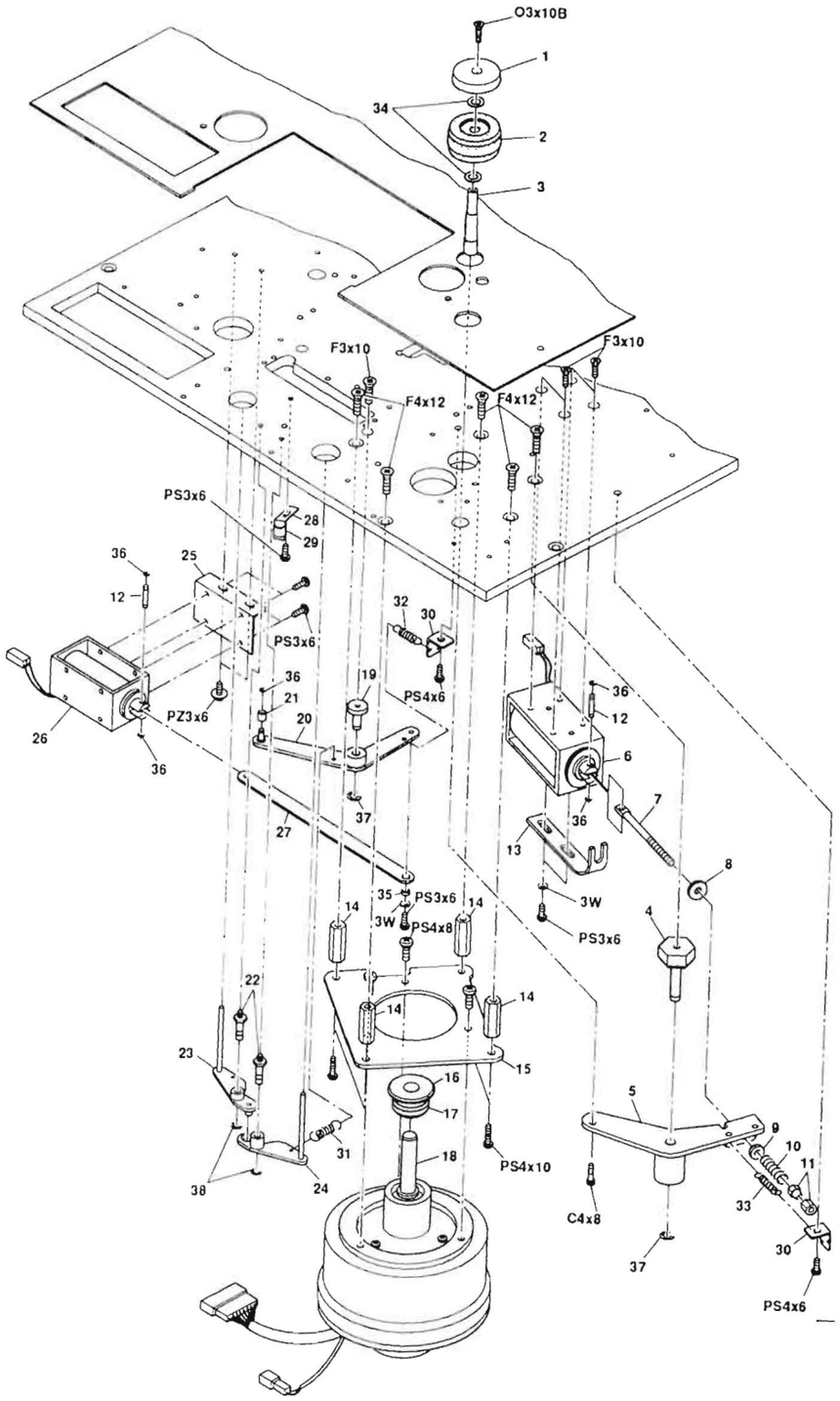
Reel Assembly: KW-41J



Pinch Roller Assembly: KP-4X
Capstan Assembly: KC-41H
Shifter Assembly: KR-4W

No.	Description	Parts No.	Notes
1	Cap. Pinch Roller	KP0C034	
2	Pinch Roller Assembly	KP-4S-B	
3	Shaft, Pinch Roller	KP0B060	
4	Shaft, Arm	KP4L001	
5	PinchRoller Arm Assembly	KP-4X-A	
6	Solenoid	GP1B12	
7	Screw, Adjustment	KZ6A113	
8	Damper	PZ1C021	
9	Washer Spherical	KP0G004	
10	Spring	GS2163	
11	Nut, Dubble	F517-4	
12	Pin, Solenoid	KZ5A003	
13	Stopper, Solenoid	KZ2A016	
14	Stud	KZ9I250A	
15	Bracket, Motor	KC4H001	
16	Cap, Dust	KC0B029	
17	Ring	PZ1C130	
18	Motor, Capstan	MR-1L	
19	Shaft, Link Arm	KR4W005	
20	Shifter Link Assembly	KR-4W-A	
21	Collar	KZ7C109	
22	Shaft, Arm	KR4B001	
23	Arm A, Lifter	KR0B005	
24	Arm B, Lifter	KR0B006	
25	Bracket, Shifter Solenoid	KR4W007	
26	Solenoid	GP1A09	
27	Arm, Link	KR4W004	
28	Angle	KZ3A042	
29	Pipe, Rubber	PZ1C174	
30	Hook	KZ3A167	
31	Spring	GS1185	
32	Spring	GS1028-A	
33	Spring	GS1149	
34	Washer, Polyslider	F524060	
35	Stud	KZ7A823	
36	Ring, E type	F74TE09	
37	Ring, E type	F74TE20	
38	Ring, E type	F74TE15	

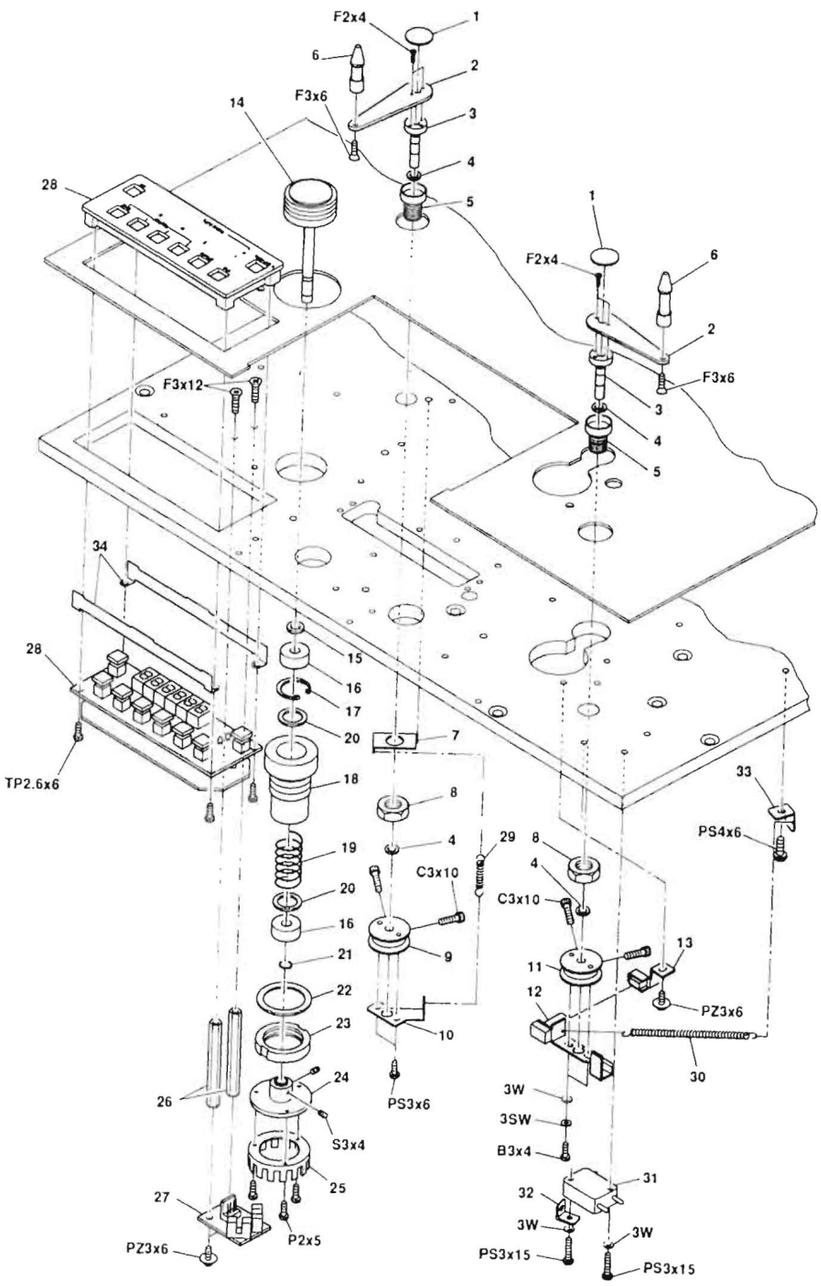
Pinch Roller Assembly: KP-4X
Capstan Assembly: KC-41H
Shifter Assembly: KR-4W



Tension Arm Assembly: KA-4X/KA-4Y
Impedance Roller Assembly: KI-4T
Timer Assembly: ZA-95G

No.	Description	Parts No.	Notes
1	Cap, Arm	KA0C005	
2	Arm, Tension	KA0A017A	
3	Shaft, Arm	KA4J001	
4	Washer, Polyslider	F524-5	
5	Holder, Arm	KA0B008	
6	Guide, Tape	KG4D007	
7	Hook, Spring	KZ3A024	
8	Nut	KZ6D004	
9	Hook A, Spring	KA0E017	
10	Arm, Stopper	KA4X001	
11	Hook B, Spring	KA0E005	
12	Switch Actuator Assembly	KA-4K-B	
13	Magnet Assembly	KA-4K-C	
14	Roller Assembly	KI-4J-B	
15	Collar	KZ7C057	
16	Bearing	BA1Z022	
17	Ring	F7017	Impedance Roller
18	Holder	KI0B014	Sub Assembly
19	Spring	GS2077	KI-4J-A
20	Washer	KZ6C057	
21	Ring, Shaft	F7206	
22	Washer	KI0H024	
23	Nut, Holder	KI0H025	
24	Boss	KI4T001	
25	Disk, Tacho	SR3Z033	
26	Stud	KZ9H480C	
27	ROLLER TACHO PCB Assembly	PB-4HCA	
28	Timer Display Assembly	ZA-95G	
29	Spring	GS1025	
30	Spring	GS1048	
31	Switch, Micro	WH51027	
32	Hook, Spring	KZ3A023	
33	Hook	KZ3A167	
34	Bracket	KZ2A165	

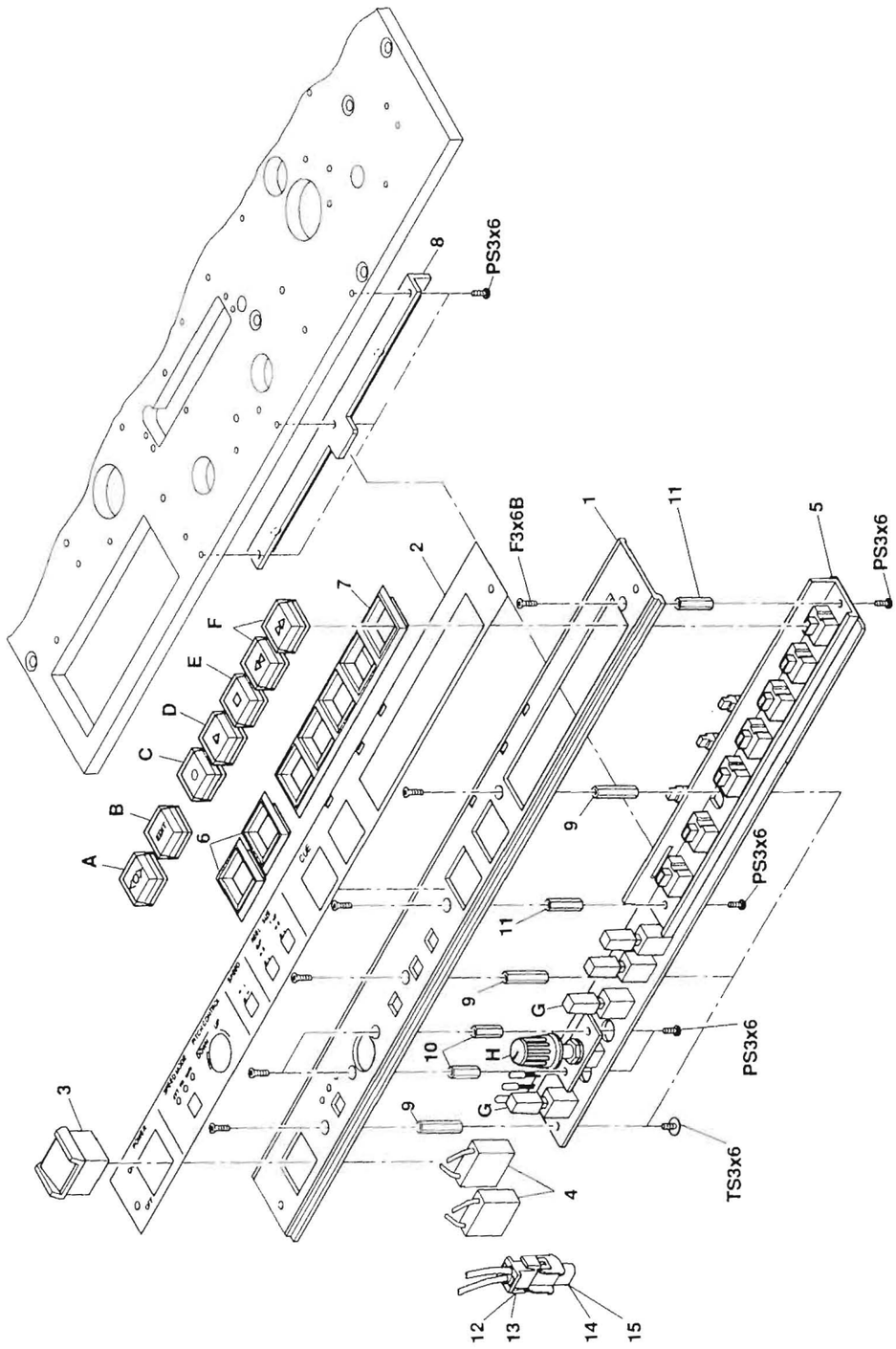
Tension Arm Assembly: KA-4X/KA-4Y
Impedance Roller Assembly: KI-4T
Timer Assembly: ZA-95G



Control Assembly: CB-23U

No.	Description	Parts No.	Notes
1	Panel, Control	CB23U01	
2	Sheet, Control Panel	CB23U02	
3	Switch, Power	WH42062	
4	Capacitor, Spark Killer	CZ20001W	
5	TRANSPORT CONTROL SWITCH PCB Assembly	PB-7UZA	
A	Button, CUE	KN2145	
B	Button, EDIT	KN2147	
C	Button,RECORD	KN2144	
D	Button, PLAY	KN2142	
E	Button, STOP	KN2141	Assembly
F	Button, F.FWD, RWD	KN2143	
G	Switch, Selector	KN2184	
H	Knob	KN1108	
H	Cap, Knob	KN1099	
6	Escutcheon, Switch	PZ4A026	
7	Escutcheon, Switch	PZ4A027	
8	Angle	T006704	
9	Stud	KZ7B160	
10	Stud	KZ7B158	
11	Stud	KZ7B159	
12	Connector Housing, Plug	CN402029	
13	Connector Contact, Plug	CN7B-041	
14	Connector Housing, Receptacle	CN402030	
15	Connector Contact, Receptacle	CN7B-042	

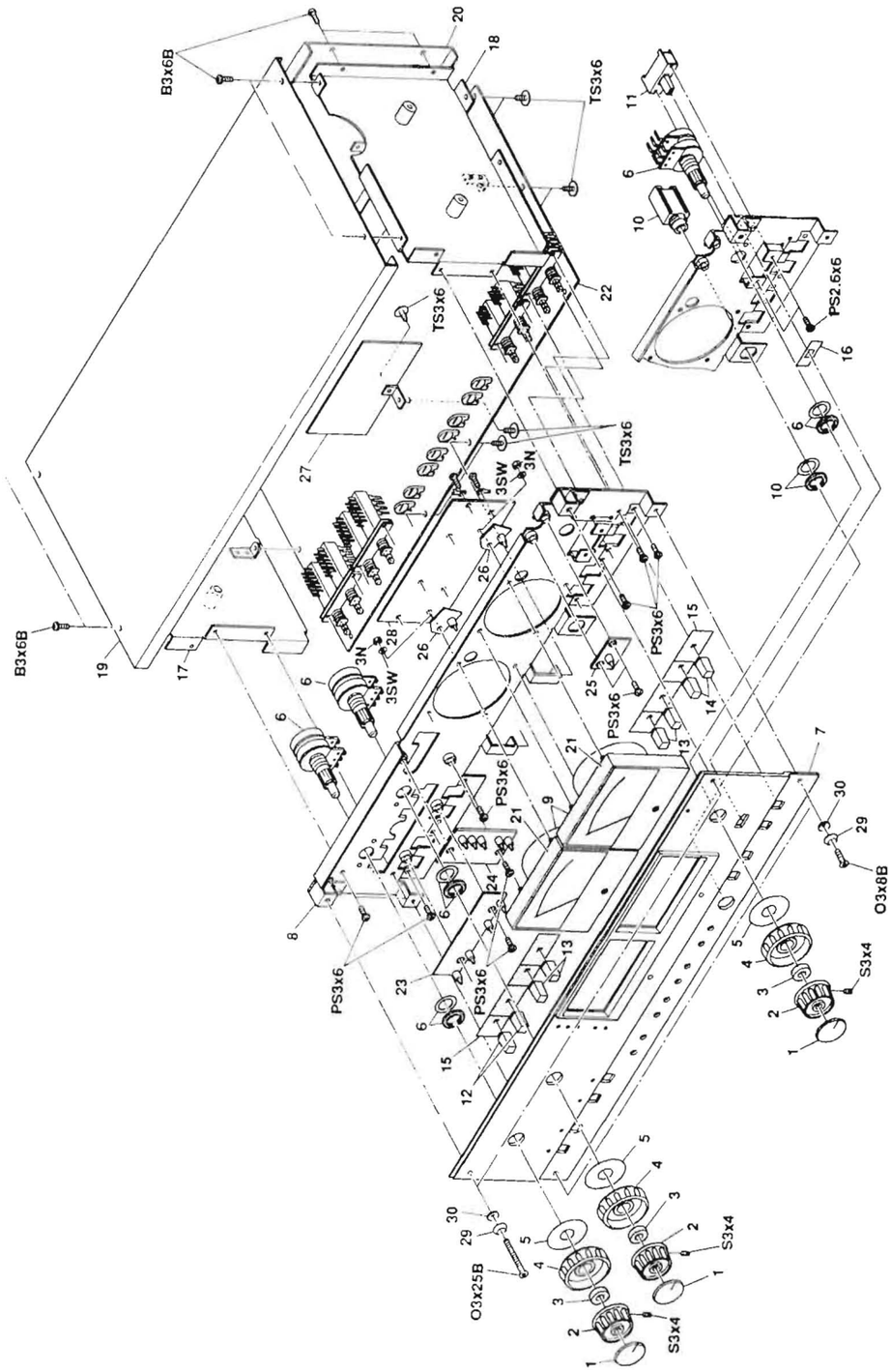
Control Assembly: CB-23U



Amplifier Assembly: A1177

No.	Description	Parts No.	Notes
1	Cap, Knob	KN1102	
2	Knob	KN1100	
3	Collar	KZ7C111	
4	Knob	KZ1063A	
5	Spacer	KZ6C017	
6	Potentiometer	RV224083	
7	Amp. Trim Panel Assembly	A1062-A	
8	Panel, Amp. Top	A106201	
9	VU Meter	ME11005	
10	Jack, Phone	CN602144	
11	Switch	WH340013	
12	Button	KN2095	
13	Button	KN2094	
14	Button	KN2093	
15	Blind	PZ1B012	
16	Blind	PZ1B010	
17	Amp. Side L Assembly	A11770C	
18	Amp. Side L Assembly	A11770B	
19	Cover, Amp.	A117705	
20	Amp. Connector Panel Assembly	A1177-A	
21	Shield, Illumination	PZ1B013	
22	REC/REP AMP. PCB Assembly	PB-16EF	
23	LED (D) PCB Assembly	PB-83AB	
24	LED (F) PCB Assembly	PB-83BB	
25	LED (E) PCB Assembly	PB-83CAA	
26	LED (C) PCB Assembly	PB-81J	
27	REC EQ PCB Assembly	PB-81QA	
28	VU METER AMP. PCB Assembly	PB-16DB	
29	Washer, Trim	KZ6C051	
30	Washer	KZ6C011	

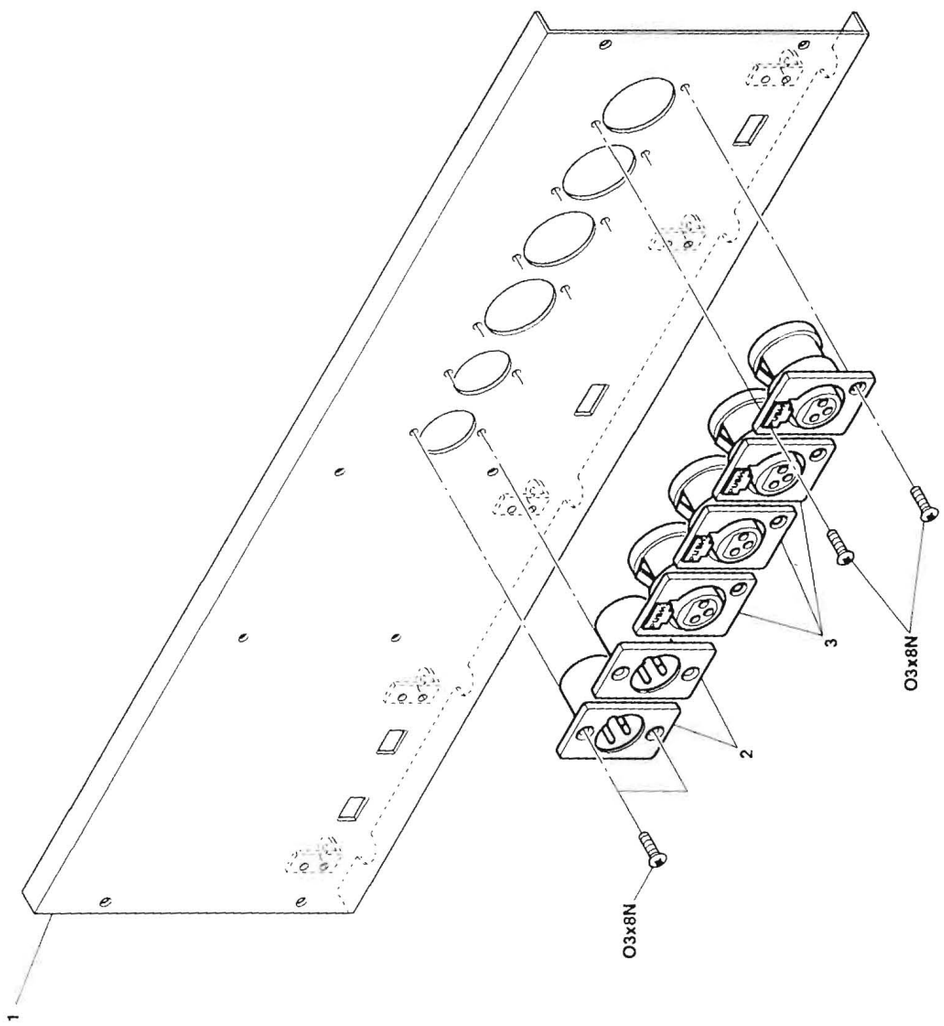
Amplifier Assembly: A1177



Amp. Connector Assembly: A1177

No.	Description	Parts No.	Notes
1	Amp. Connector Panel Assembly	A1177-A	
2	Connector, XL type, Male	CN103195	
3	Connector, XL type, Female	CN103046	

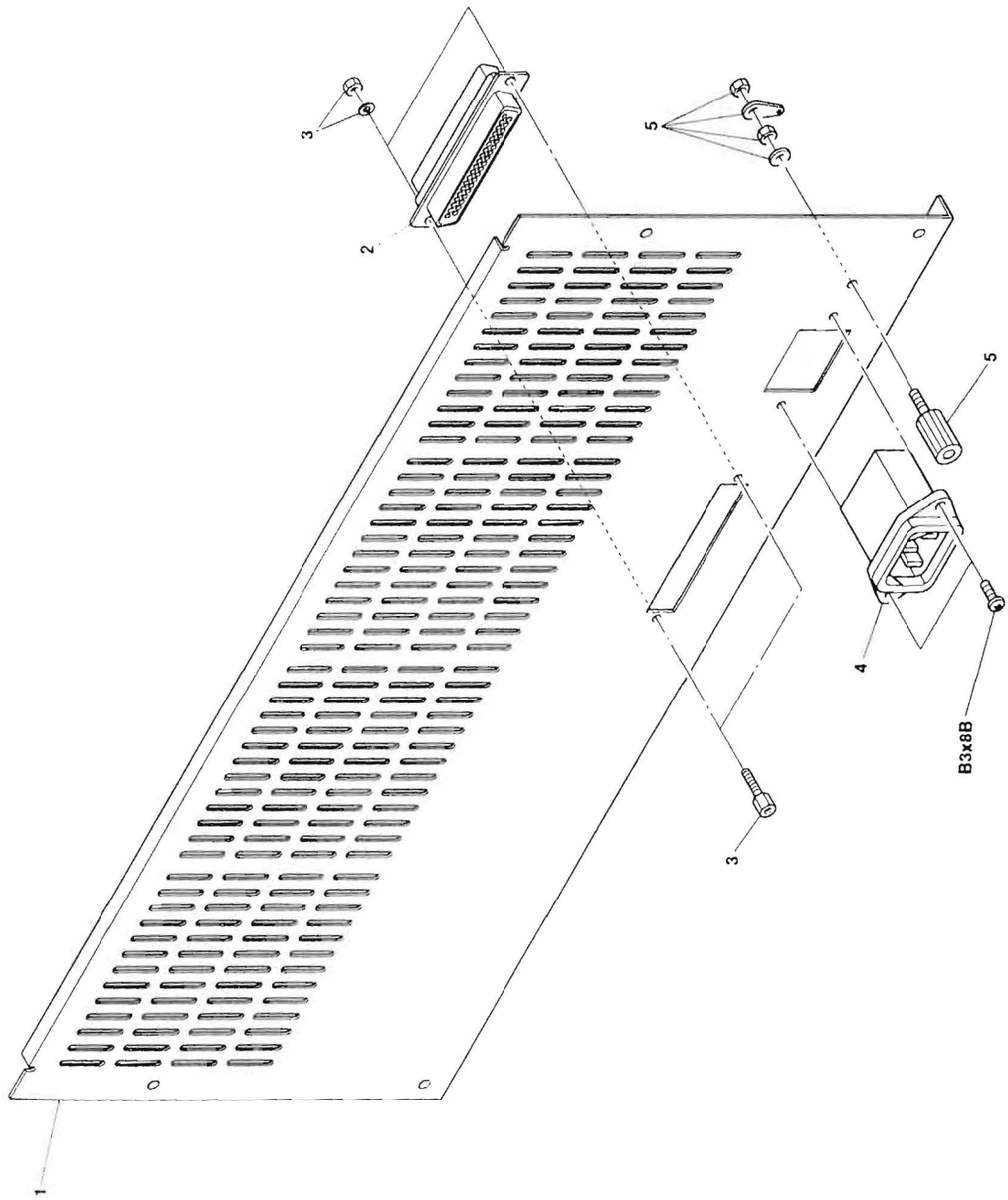
Amp. Connector Assembly: A1177



Connector Panel Assembly: CB-794

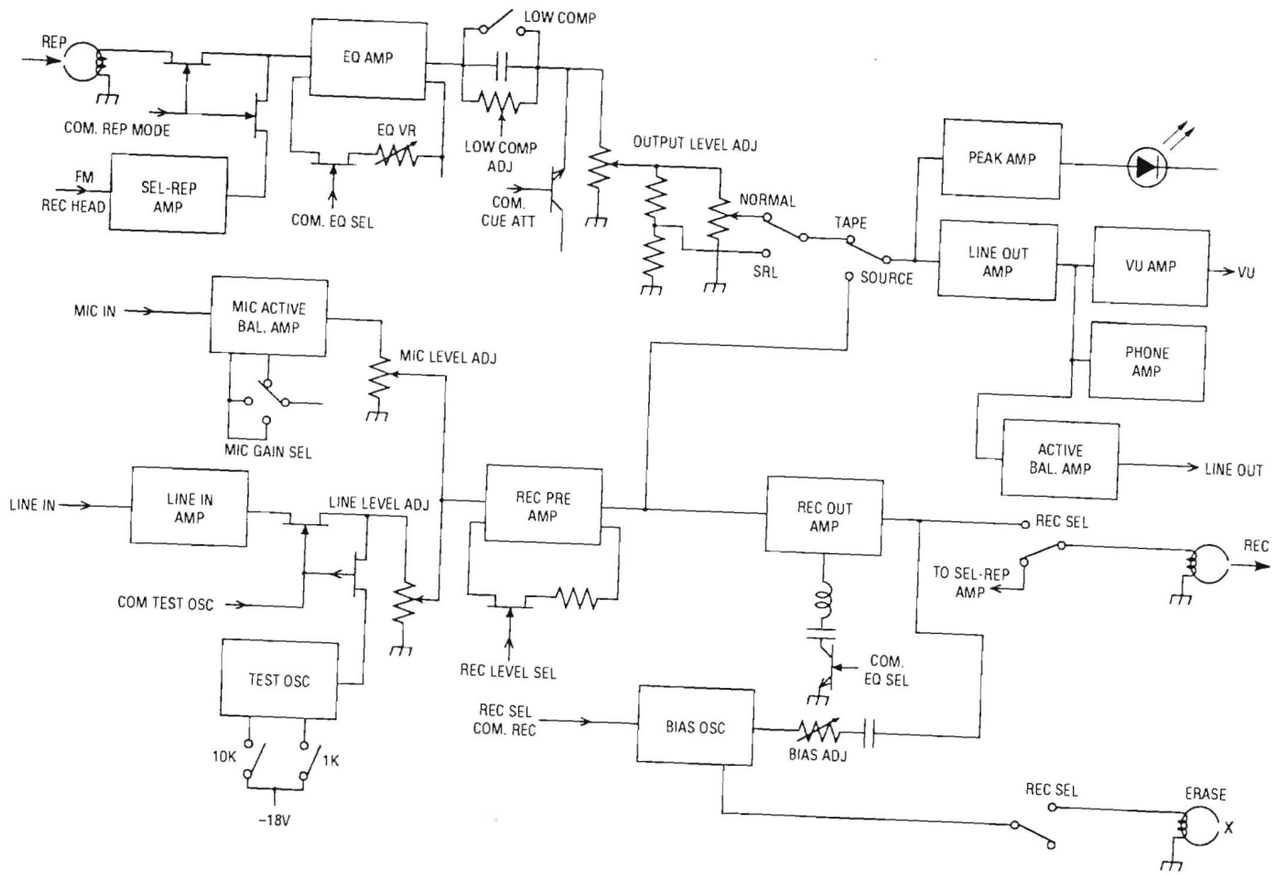
No.	Description	Parts No.	Notes
1	Panel, Connector	CN7B-212	
2	Connector, D sub 37pin	CN237326	
3	Screw, Lock	CN7B-212	
4	AC Inlet	CN603012	
5	Terminal, Ground	CN901040	

Connector Panel Assembly: CB-794

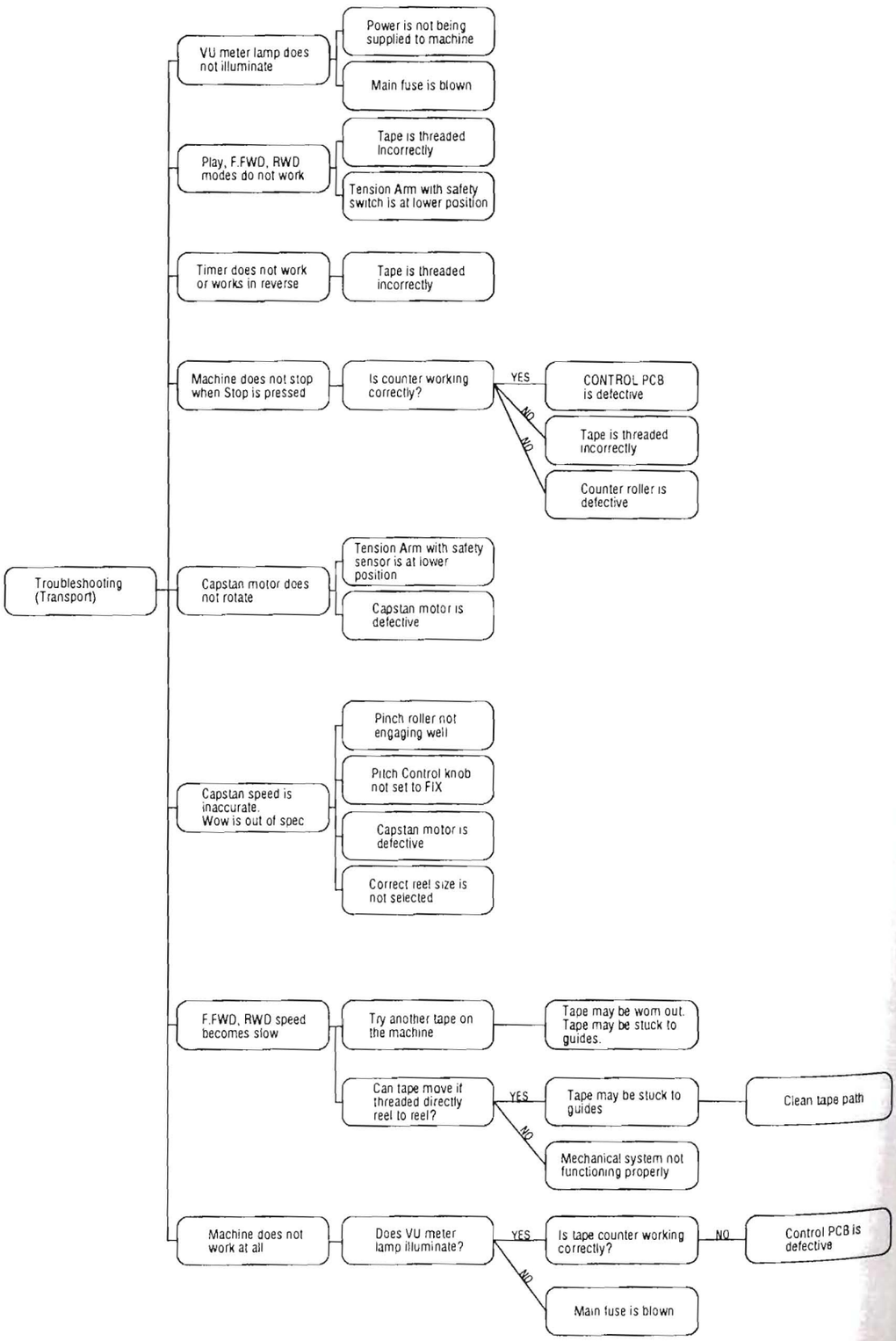


Appendix

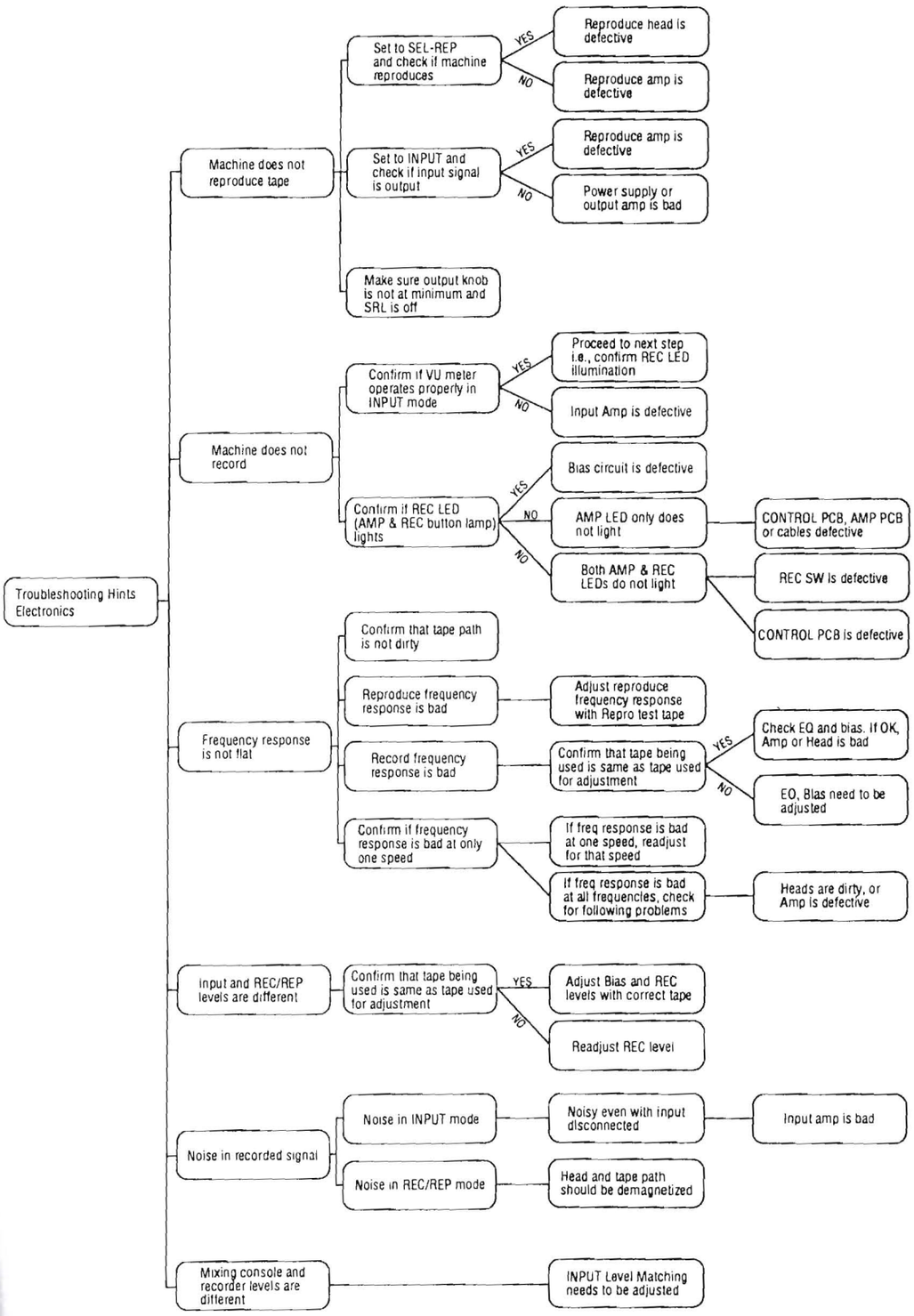
Block Diagram



Troubleshooting Hints (Transport)



Troubleshooting Hints (Electronics)



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Schematic Diagrams

BIII,MKIV-2

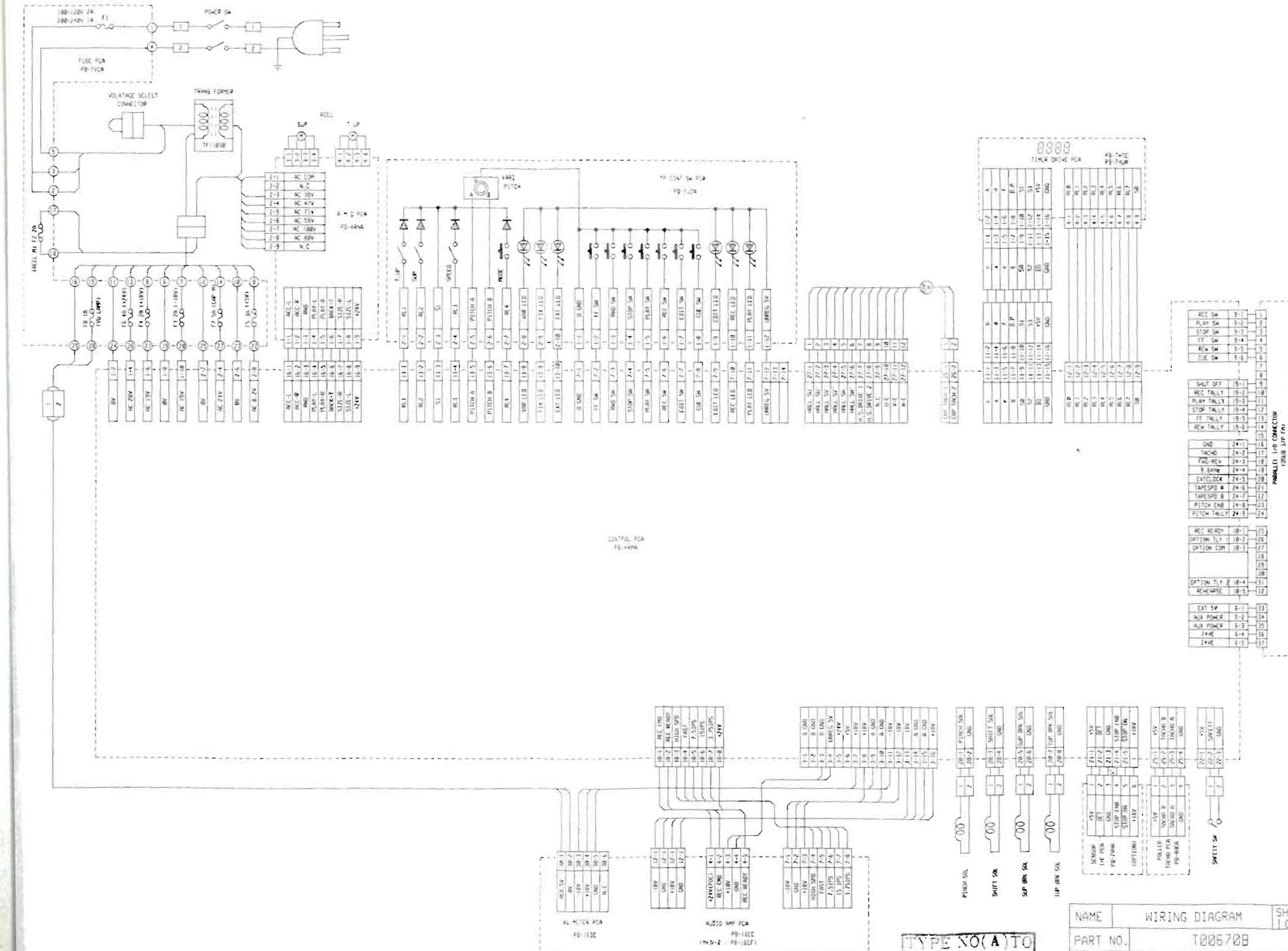
Parts No.	Description	Drawing No.
T00670B	Wiring Diagram	3-16601
T00670D	Wiring Diagram	3-16660
PB4RM0A	CONTROL PCB Assembly	3-16594 - 6
PB4RN0A	RMD PCB Assembly	3-16661
PB7UZ0A	TP CONT SW1 PCB Assembly	4-47281
PB7HT0A	TIMER IND OCB Asembly	3-14224
PB7HU0A	Timer Drive PCB Assembly	3-14220
PB4HC0A	Roller Tacho PCB Assembly	4-43800
A11750B	REC REP AMP PCB Assembly	3-16362

BIII-2E, MKIV-2E

Parts No.	Description	Drawing No.
A11850B	REC REP AMP PCB Assembly	3-16363

BIII-F

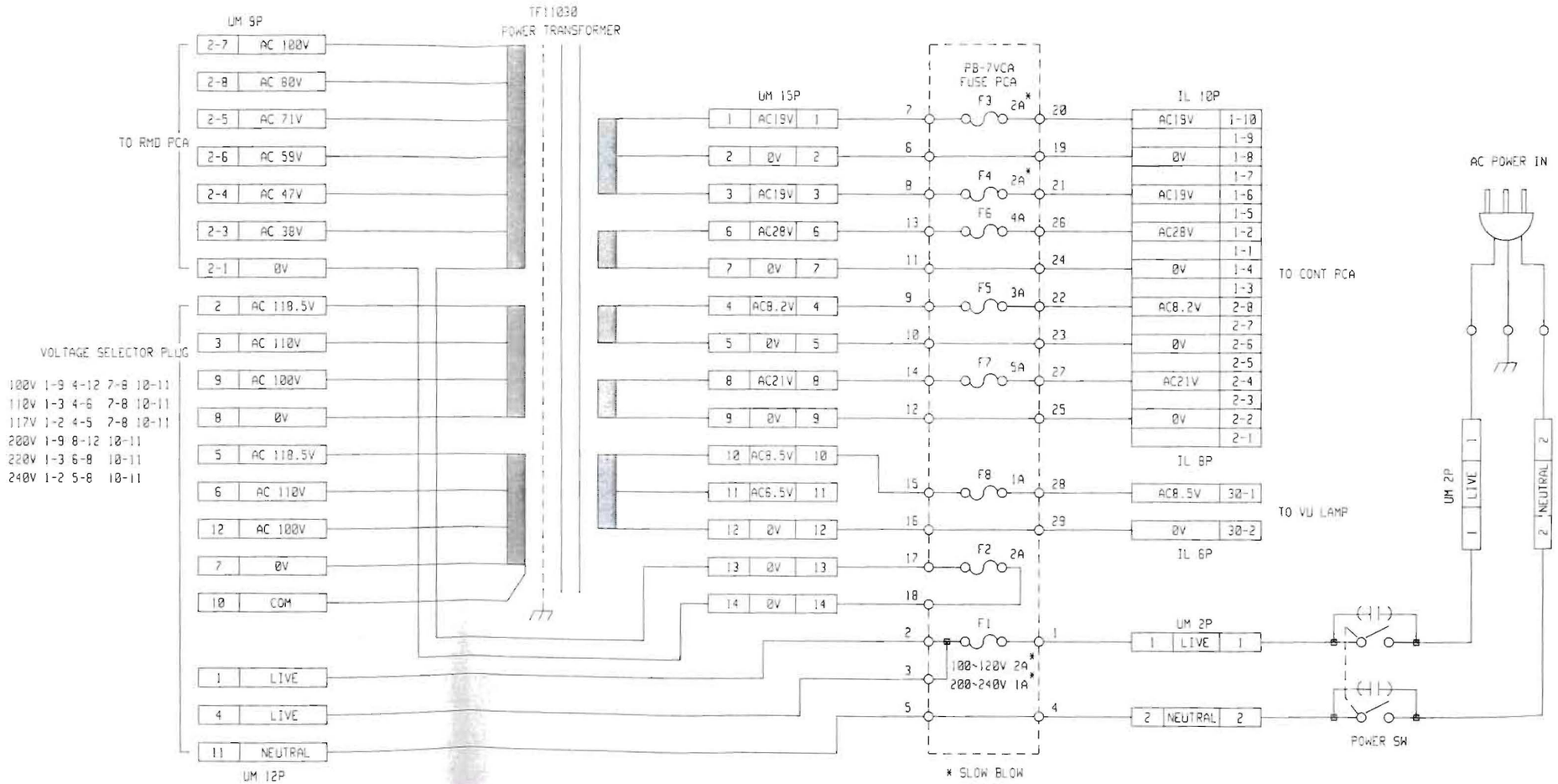
Parts No.	Description	Drawing No.
A11840B	REC REPAMP PCB Assembly	3-16364



TYPE NO(A)TO
( )AT THE END

NAME	WIRING DIAGRAM	SHEET 1 OF 1
PART NO.	T00670B	
APPLIED		

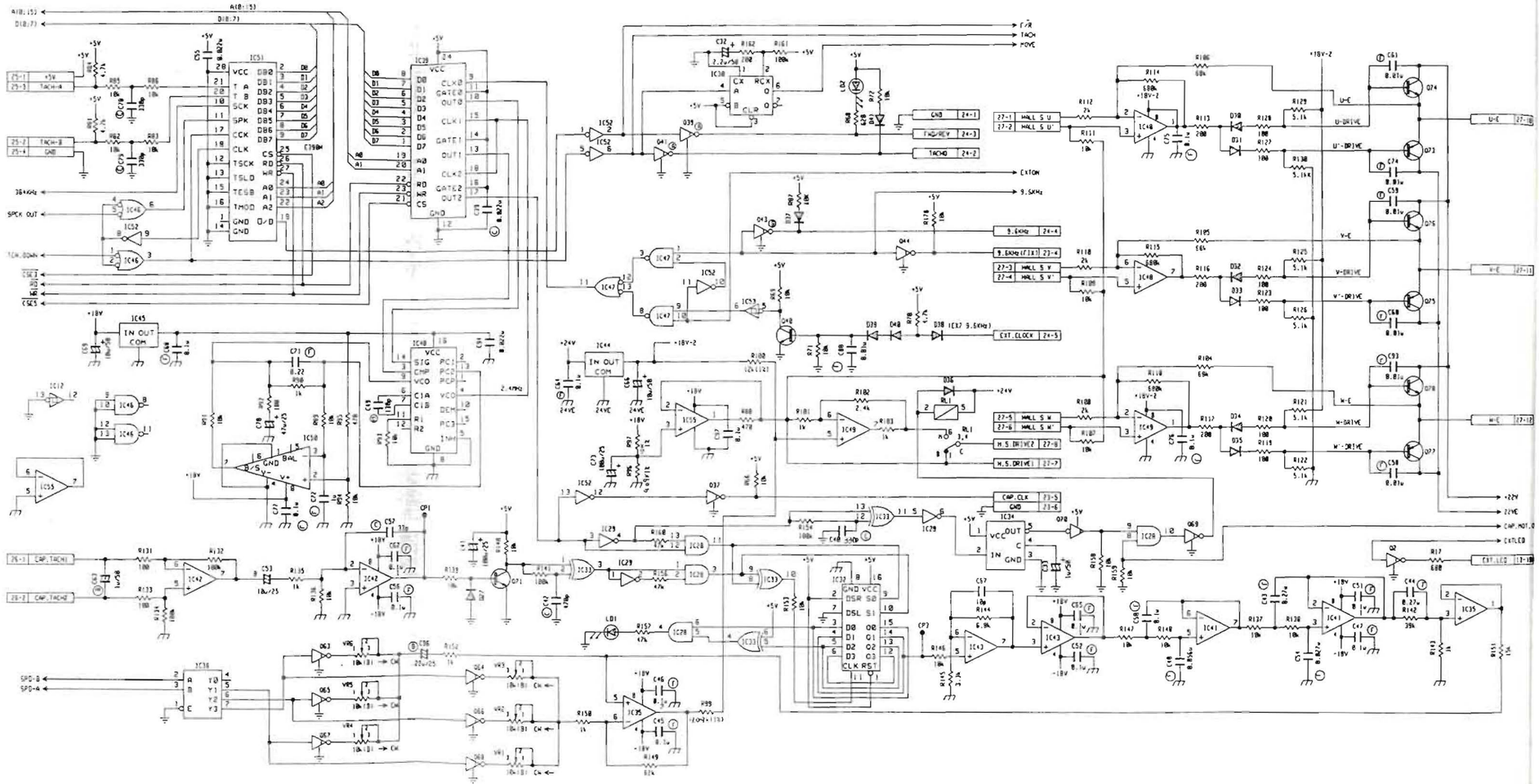
DWG. NO. 3 .16601



TYPE NO(A)TO
( )AT THE END

NAME	WIRING DIAGRAM	SHEET 1OF1
PART NO.	T00670D	DWG. NO. 3..16660
APPLIED	T-0067	

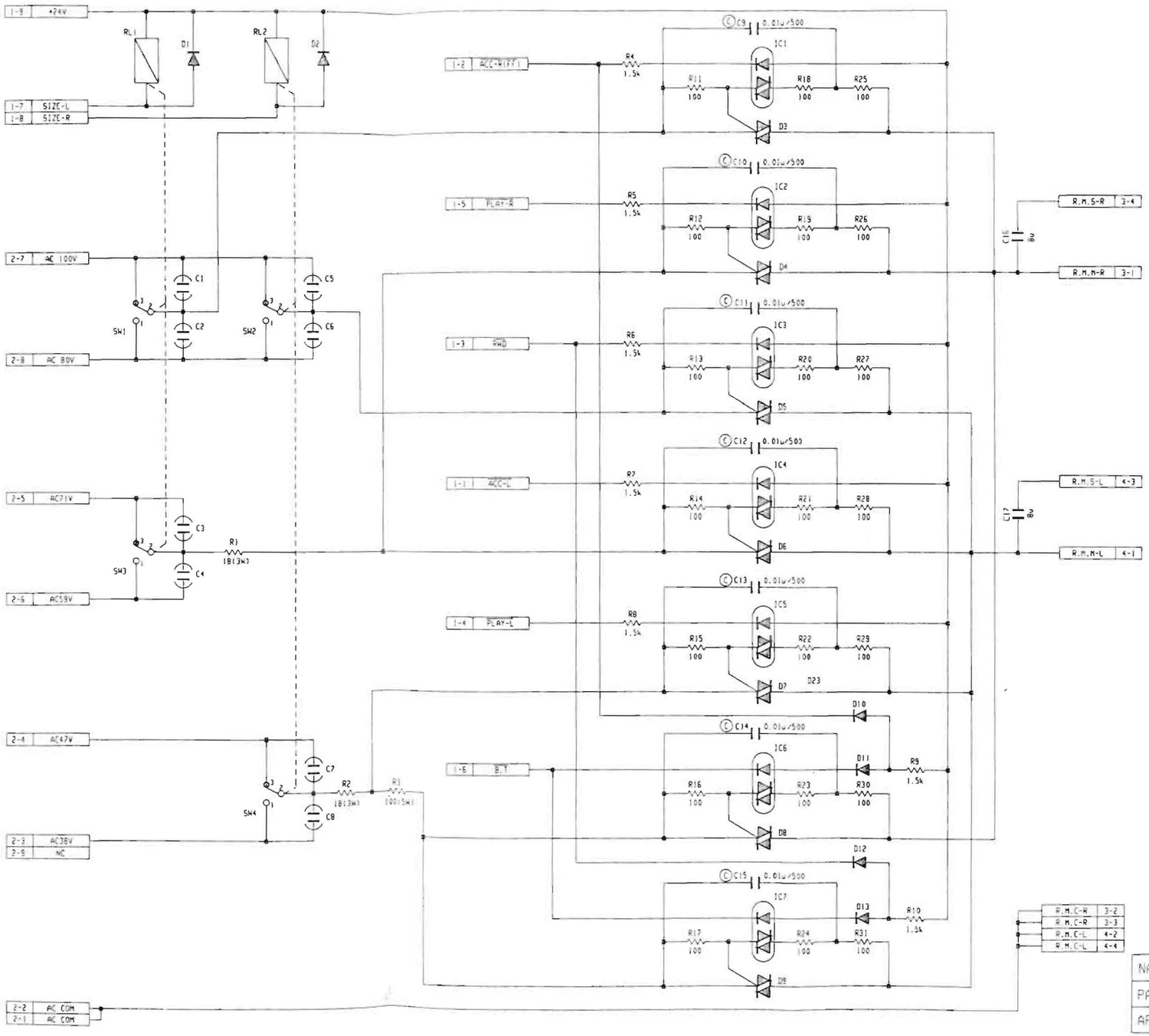
DWG. NO. 3 .16660
SHEET 1 OF 1
2 NEUTRAL 2
C POWER IN
DWG. NO. 3 .16594
SHEET 1 OF 3
NAME
CONTROL PCA
PART NO.
PB4RM0A
APPLIED
PB-4RMA



REFER TO A
AT THE END

NAME	CONTROL PCA	SHEET 2 OF 3
PART NO.	PB4RM0A	DWG. NO. 3.16595
APPLIED	PB-4RMA	

SHEET 2 OF 3
DWG. NO. 3 .16595
AT THE END
NAME
CONTROL PCA
PART NO.
PB4RM0A
APPLIED
PB-4RMA
SHEET 3 OF 3
DWG. NO. 3 .16596

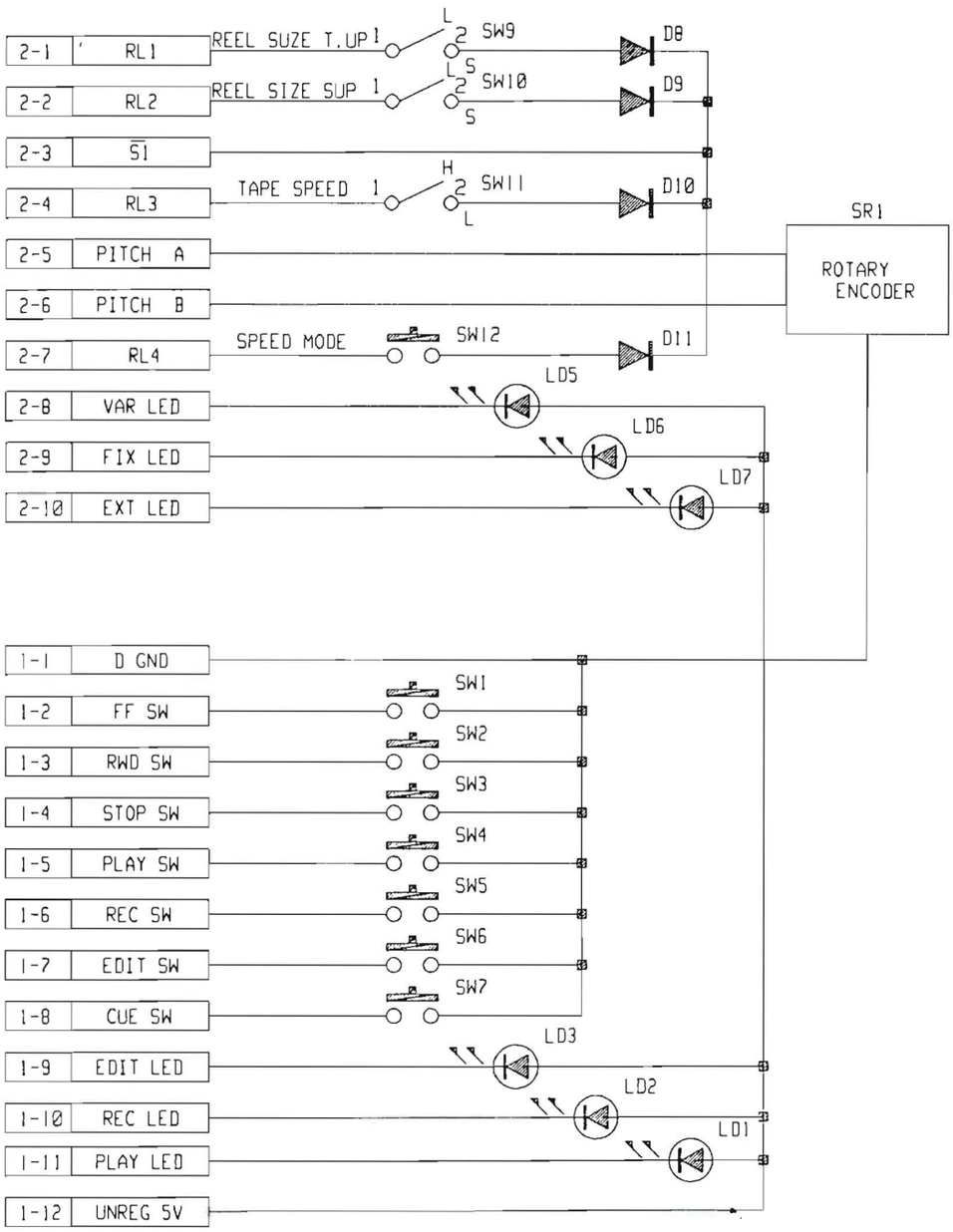


NOTES : UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, 5%.
2. CAPACITANCE VALUES ARE IN FARADS, 50V.
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS.
   - : ALUMINUM ELECTROLYTIC CAPACITOR.
   - : BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR.
   - : MYLAR FILM CAPACITOR (5%, 50V)
   - : POLYSTYRENE FILM CAPACITOR (5%, 50V)
   - : CERAMIC CAPACITOR.
   - : MICA CAPACITOR (5%)
   - : TANTALUM ELECTROLYTIC CAPACITOR.
   - : POLYPROPYLENE FILM CAPACITOR (5%)
   - : LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR
   - : METALLIZED PAPER CAPACITOR (10%)
   - : SPARK KILLER.
4. △ : SAFETY COMPONENT ; REPLACE ONLY WITH THE SPECIFIED COMPONENT FOR SAFETY REASON

TYPE NO(B)TO ( )AT THE END

MX5050BQ-B

NAME	RMD PCA	SHEET 1 OF 1
PART NO.	PB4RN0A	DWG. NO. 3-16896
APPLIED	PB-4RNA	



REF	NO.	OTARI PART NO.	DESCRIPTION
LD	1,3	PNTLG208	TLG208
	2	PNTLR208	TLR208
	5	PNTLO124	TLR124
	6	PNTLG124	TLG124
	7	PNTLY124	TLY124

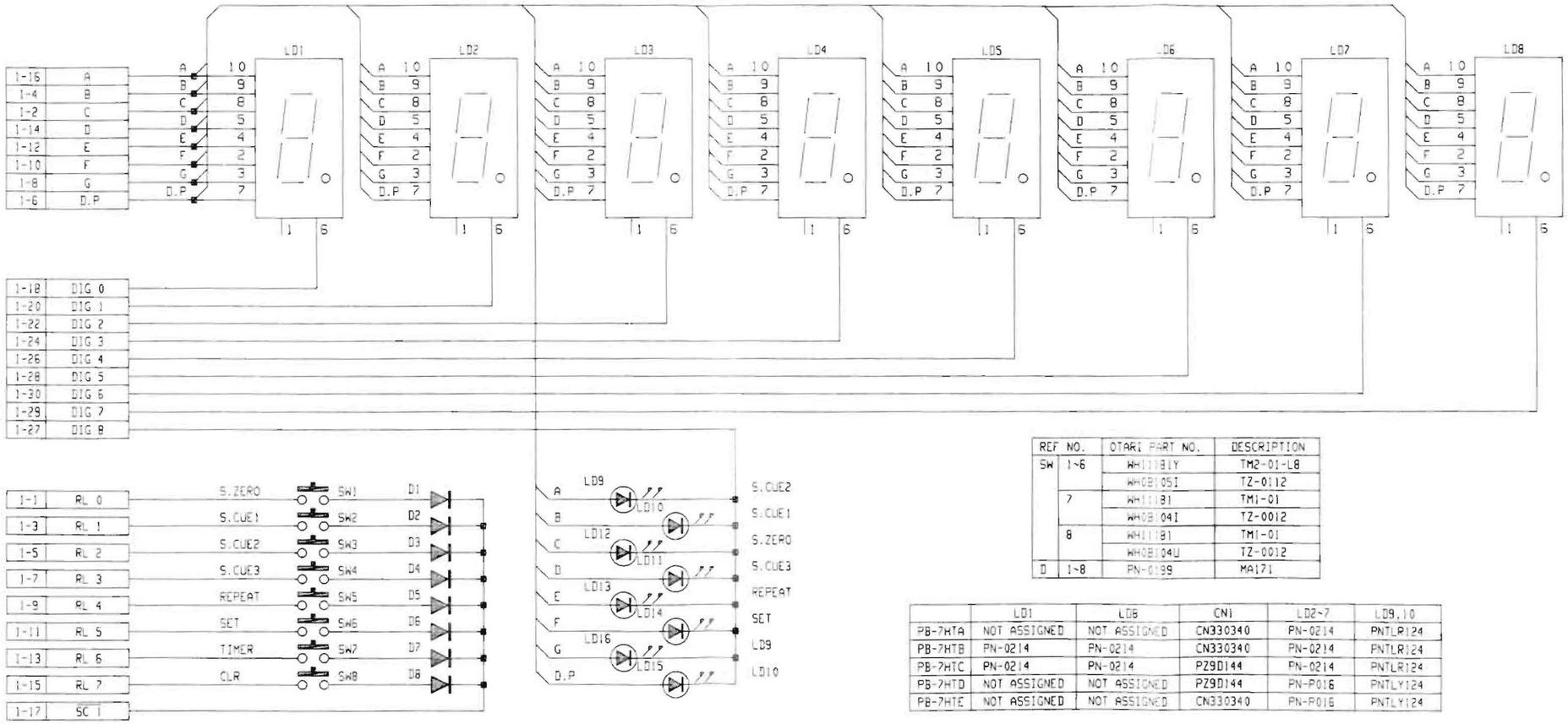
NAME	TP CONT SW1 PCA
PART NO.	PB7UZ0A
APPLIED	PB-7UZA

SHEET 1 OF 1

DWG. NO. 4 .47281

SHEET 1 OF 1

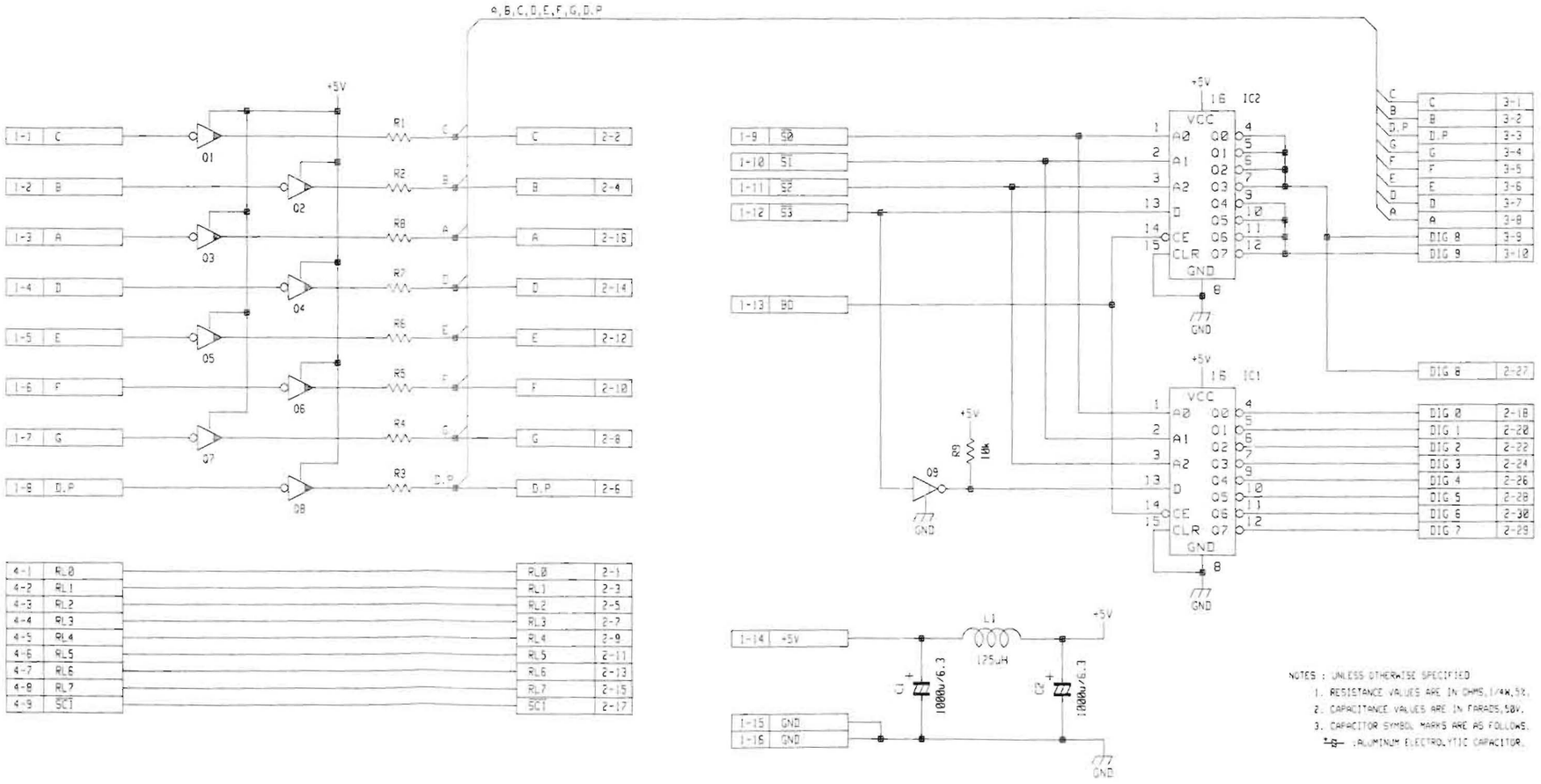
DWG. NO. 3 .16896



REF NO.		OTARI PART NO.	DESCRIPTION
SW	1~6	WH1118IY	TM2-01-L8
		WH0810SI	TZ-0112
	7	WH111811	TM1-01
		WH0810 4I	TZ-0012
	8	WH111811	TM1-01
		WH0810 4U	TZ-0012
D	1~8	PN-0199	MA171

	LD1	LD6	CN1	LD2~7	LD9,10
PB-7HTA	NOT ASSIGNED	NOT ASSIGNED	CN330340	PN-0214	PNTLR124
PB-7HTB	PN-0214	PN-0214	CN330340	PN-0214	PNTLR124
PB-7HTC	PN-0214	PN-0214	PZ9D144	PN-0214	PNTLR124
PB-7HTD	NOT ASSIGNED	NOT ASSIGNED	PZ9D144	PN-P016	PNTLY124
PB-7HTE	NOT ASSIGNED	NOT ASSIGNED	CN330340	PN-P016	PNTLY124

NAME	TIMER IND. PCA	SHEET 1 OF 1	3.14224
PART NO.	PB7HT0A		
APPLIED	PB-7HTA		DWG. NO.



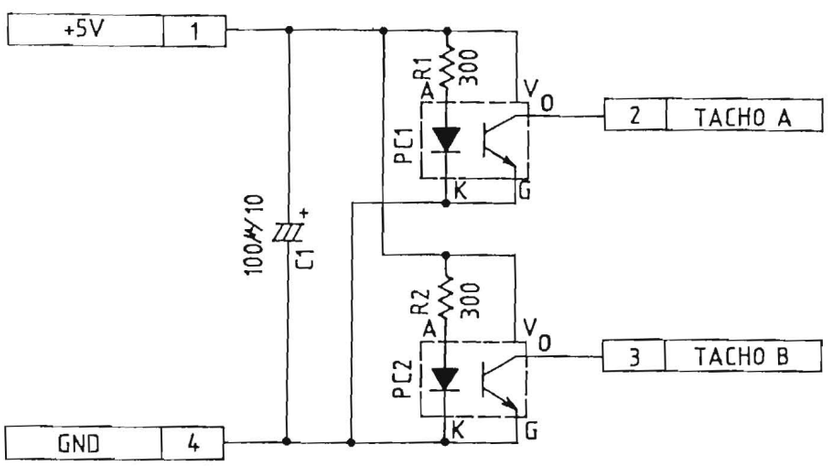
NOTES : UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, 5%.
2. CAPACITANCE VALUES ARE IN FARADS, 50V.
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS.
⊣⊢ : ALUMINUM ELECTROLYTIC CAPACITOR.

REF. NO.		ATARI PART NO.	DESCRIPTION
IC	1,2	I-NE590N	NE590N
Q	1~8	Q-0004	UN1111
	9	Q-0008	UN1211

	R1~R8	CN2
PB-7HUA	RIVJ101-	CN330292
PB-7HUB	RIVJ101-	ZA-6RQ
PB-7HUC	RIVJ470-	CN330292

NAME	TIMER DRIVE PCA
PART NO.	PB7HU0A
APPLIED	PB-7HUA~C

SHEET 1 OF 1
DWG. NO. 3.14220



REFERENCE NO.		OTARI PART NO.	DESCRIPTION
PC	1,2	PN-0212	EE-SX401

NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, 5 %
2. CAPACITANCE VALUES ARE IN FARADS, 50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS.
   - ⊣(+)⊢ : ALUMINUM ELECTROLYTIC CAPACITOR.
   - (B) : BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR.
   - (C) : MYLAR FILM CAPACITOR(±5%, 50V)
   - (S) : POLYSTYRENE FILM CAPACITOR(±5%, 50V)
   - (C) : CERAMIC CAPACITOR.
   - (M) : MICA CAPACITOR(±5%)
   - (T) : TANTALUM ELECTROLYTIC CAPACITOR.
   - (P) : POLYPROPYLENE FILM CAPACITOR(±5%)
   - (LL) : LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR.
   - (MP) : METALLIZED PAPER CAPACITOR(±10%)
   - ⊣(SK)⊢ : SPARK KILLER.
4. △ : SEFETY COMPONENT : REPLACE ONLY WITH THE SPECIFIED COMPONENT FOR SAFETY REASON.

TYPE NO.(A)TO
( )AT THE END

NAME	ROLLER TACHO PCA	SHEET OF
PART NO.	PB4HC0A	
APPLIED	PB-4HCA	

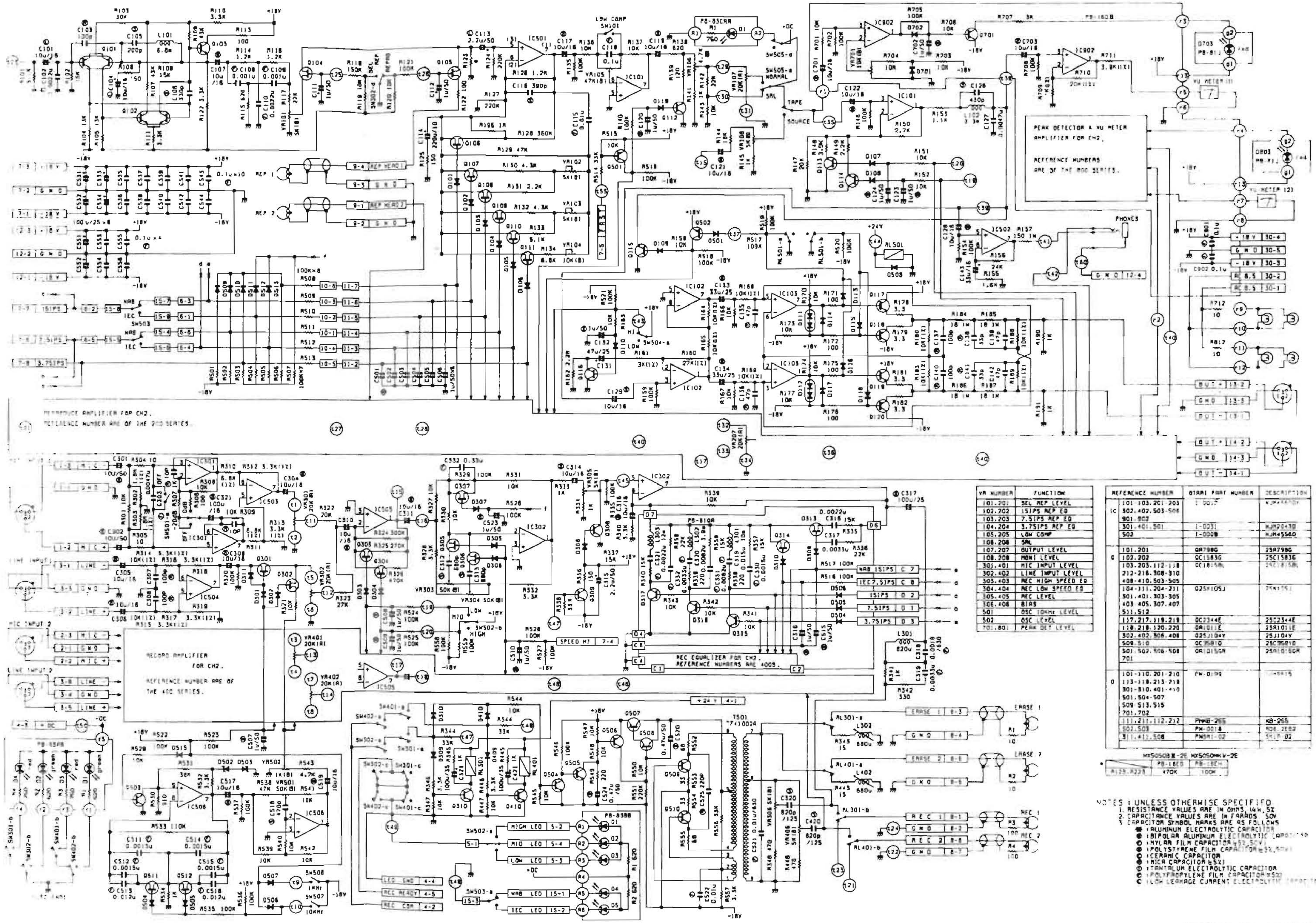
DWG. NO. 4-43800

SHEET 1 OF 1

DWG. NO. 3-14220

NOTES: 1. UNLESS OTHERWISE SPECIFIED
RESISTANCE VALUES ARE IN OHMS (Ω) 1/4W 5%
2. CAPACITANCE VALUES ARE IN FARADS 50V
3. ELECTROLYTIC CAPACITORS
ALUMINUM ELECTROLYTIC CAPACITOR
TANTALUM ELECTROLYTIC CAPACITOR
FILM DIELECTRIC CAPACITOR
POLYSTYRENE FILM CAPACITOR ±2.5% 50V
MICA CAPACITOR ±2% 50V
CERAMIC CAPACITOR ±2% 50V
FILM DIELECTRIC CAPACITOR ±2% 50V
TANTALUM ELECTROLYTIC CAPACITOR
LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR

NAME	REC. & REPRO AMP. P.C.B. ASS'Y
PART NO.	A11750B
LOT	
DWG. NO.	3 .17299



VR NUMBER	FUNCTION
101.201	SEL REP LEVEL
102.202	15IPS REP EQ
103.203	7.5IPS REP EQ
104.204	3.75IPS REP EQ
105.205	LOW COMP
106.206	SAL
107.207	OUTPUT LEVEL
108.208	MONI LEVEL
301.401	MIC INPUT LEVEL
302.402	LINE INPUT LEVEL
303.403	REC HIGH SPEED EQ
304.404	REC LOW SPEED EQ
305.405	REC LEVEL
306.406	BIAS
501	OSC 10KHz LEVEL
502	OSC LEVEL
701.801	PEAK DET LEVEL

	REFERENCE NUMBER	OTARI PART NUMBER	DESCRIPTION
IC	101-103.201-203 302.402.503-506 901.902	I-0017	[illegible]
	301.401.501	I-0031	NJM2043D
	502	I-0008	NJM4556D
Q	101.201	QA798G	2SA798G
	102.202	QC1583G	2SC1583G
	103.203.112-116 212-216.306-310 406-410.503-505	QC1815BL	[illegible]
	104-111.204-211 301.401.303-305 403-405.307.407 511.512	Q2SK105J	[illegible]
	117.217.119.219	QC2344E	2SC2344E
	118.218.120.220	QA1011E	2SA1011E
	302.402.306.406	Q2SJ104Y	2SJ104Y
	509.510	QC3581O	2SC3581O
	501.502.506-508 701	QA1015GR	2SA1015GR
D	101-110.201-210 113-118.213-218 301-310.401-410 501.504-507 509-513.515 701.702	FN-0199	[illegible]
	111.211.112.212	PNKB-265	KB-265
	502.503	PN-0018	RD8.2EB2
	311.411.508	PNSMI-02	SKIP-02

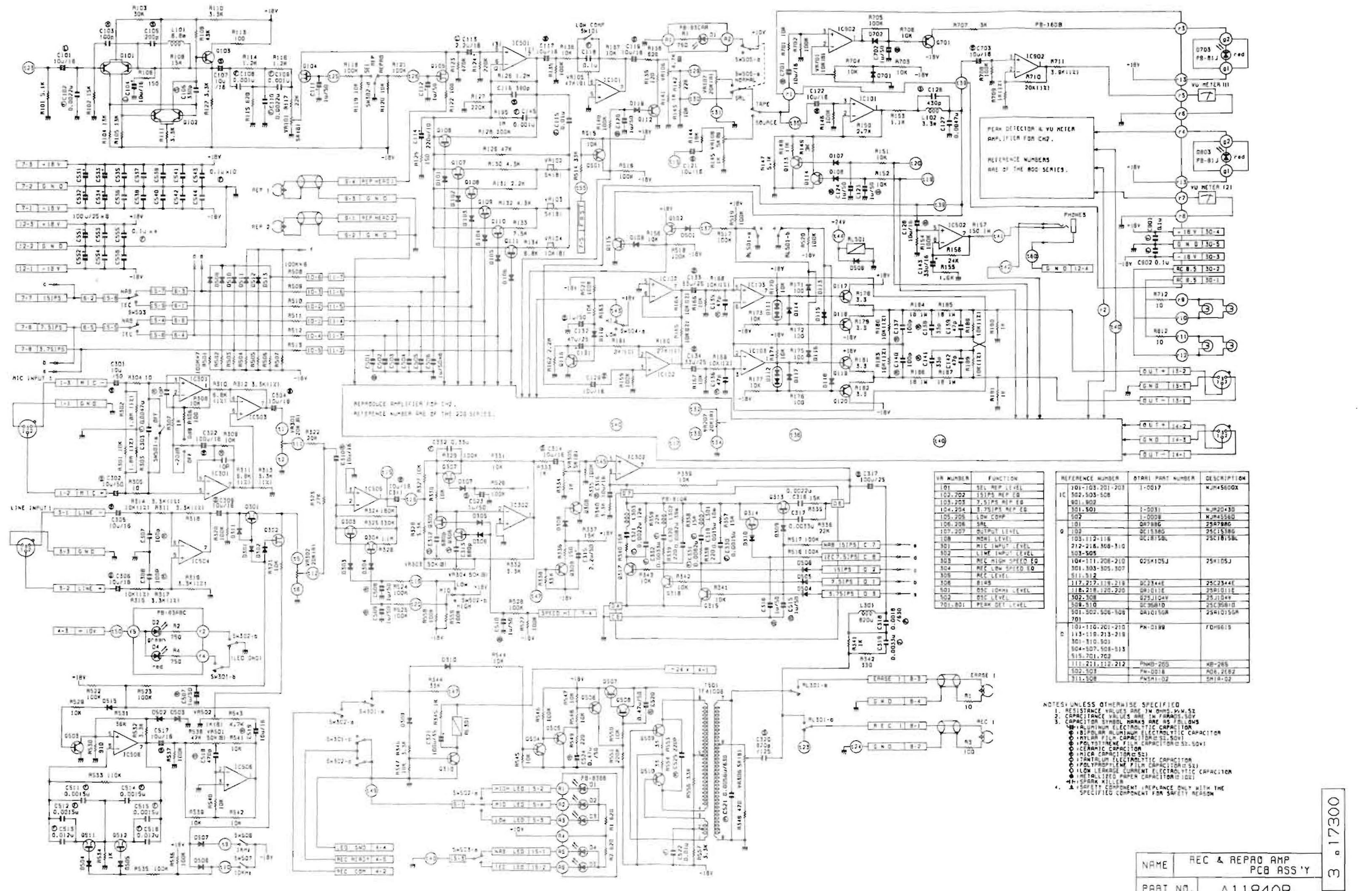
MX5050B II-2E MX5050MK V-2E

	PB-16ED	PB-16EH
R123.R223	470K	100K

NOTES : UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, 5%
2. CAPACITANCE VALUES ARE IN FARADS 50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS
- : ALUMINUM ELECTROLYTIC CAPACITOR
- : BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR
- : MYLAR FILM CAPACITOR (±5%, 50V)
- : POLYSTYRENE FILM CAPACITOR (±5%, [illegible])
- : CERAMIC CAPACITOR
- : MICA CAPACITOR (±5%)
- : TANTALUM ELECTROLYTIC CAPACITOR
- : POLYPROPYLENE FILM CAPACITOR (±5%)
- : LOW LEAKAGE CURRENT ELECTROLYTIC [illegible]

NAME	REC. & REPRO AMP. P.C.B. ASS'Y
PART NO.	A11850B
LOT	

DWG. NO. 1[illegible]7301



VR NUMBER	FUNCTION
101	SEL REP LEVEL
102,202	15IPS REP EQ
103,203	7.5IPS REP EQ
104,204	3.75IPS REP EQ
105,205	LOW COMP
106,206	SRL
107,207	OUTPUT LEVEL
108	MONI LEVEL
301	MIC INPUT LEVEL
302	LINE INPUT LEVEL
303	REC HIGH SPEED EQ
304	REC LOW SPEED EQ
305	REC LEVEL
306	BIAS
501	OSC (OHM) LEVEL
502	OSC LEVEL
701,801	PEAK DET LEVEL

REFERENCE NUMBER		OTARI PART NUMBER	DESCRIPTION
IC	101-103,201-203 302,503-508 801,802	1-0017	NJM4560DX
	301,501	1-0031	NJM2043D
	502	1-0008	NJM4556D
Q	101	QA798G	2SA798G
	102	QC1538G	2SC1538G
	103,112-116 212-216,308-310 503-505	QC1815GL	2SC1815GL
	104-111,208-210 301,303-305,307 511,512	Q2SK105J	2SK105J
	117,217,119,219	QC2344E	2SC2344E
	118,218,120,220	QA1011E	2SA1011E
	302,306	Q2SJ104V	2SJ104V
	508,510	QC3581D	2SC3581D
	501,502,506-508 701	QA1015GR	2SA1015GR
D	101-110,201-210 113-118,213-218 301-310,501 504-507,508-513 515,701,702	PN-0199	FDH9615
	111,211,112,212	PNWB-265	WB-265
	502,503	PW-0018	RD6.2EB2
	311,508	PWSMI-02	SMIA-02

NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS,¼W,5%
2. CAPACITANCE VALUES ARE IN FARADS,50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS
: ALUMINUM ELECTROLYTIC CAPACITOR
: BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR
: MYLAR FILM CAPACITOR(±5%,50V)
: POLYSTYRENE FILM CAPACITOR(±5%,50V)
: CERAMIC CAPACITOR
: MICA CAPACITOR(±5%)
: TANTALUM ELECTROLYTIC CAPACITOR
: POLYPROPYLENE FILM CAPACITOR(±5%)
: LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR
: METALLIZED PAPER CAPACITOR(±10%)
: SPARK KILLER
4. : SAFETY COMPONENT (REPLANCE ONLY WITH THE SPECIFIED COMPONENT FOR SAFETY REASON

NAME	REC & REPRO AMP PCB ASS'Y
PART NO.	A11840B
APPLIED	

DWG. NO. 3 .17300

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