Part No. OS3-153

OTARI®

MX-55N, D

TAPE RECORDER

OPERATION AND MAINTENANCE MANUAL

FOURTH EDITION

Otari, Inc.

Printed: February 1990 (GK)

ADDENDA

This is the addenda for the following Operation Manuals.

MX-55 N, D (OS3-153: February 1990)
MX-55T-M, T, N-M (OS3-207: May 1990).
MX-55DE (OS3-205: February 1988)

Title: Error Messages

The machine indicates the Error Message when the following error occurred. If the any of the following messages appear on the Tape Timer Display, once turn off the machine and turn on again, or after turning off the machine, pull out the corresponding PCB and reinsert it into machine, or if you have the substitute PCB replace the corresponding PCB with it. Even if the these things are performed, when the message will not disappear, contact the nearest OTARI dealer or OTARI.

Error No.	Meaning of the errors
Err 00	Check Sum Error
Err 01	RAM Read/Write Error
Err 03	Transport PCB I/O Error
Err 04	Timer IC I-0112 Read Error
Err 20H	Missoperation causes Repat section exit
Err 21H	Same Points are set as Repeat points

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 installation, 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 polarization 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 receptacles, 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 outlet 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

The Otari products are manufactured under strict quality control and 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 nearest Otari dealer or contact Otari at:

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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.

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Section 1 Introduction

The Otari MX-55 Series Tape Recorders are compact high-performance 1/4" tape recorder/reproducers utilizing the latest technology in analog tape recording. The MX-55 Series is comprised of seven machines in the following configurations.

This manual is intended for use with MX-55N and MX-55D models.

Table 1-1
MX-55 Series Machine Configurations

Model	Track Configuration	Cabinet Style
MX-55N	NAB 2TR 2CH	Upright
MX-55N-M	NAB 2TR 2CH	Desktop
MX-55D	DIN 2TR 2CH	Upright
MX-55T	NAB 2TR 2CH w/Center Channel Time Code	Upright
MX-55T-M	NAB 2TR 2CH w/Center Channel Time Code	Desktop

1.1 MX-55 Series Tape Recorders

The MX-55 Series of Tape Recorders are built on die-cast aluminum alloy deck plates and side frames for maximum ruggedness and mechanical stability.

All machines in the series will accept any size reel from a 3" EIA reel to an 11.8" DIN hub. Different size reels can be used for Supply and Take-up.

The front panel Pitch control utilizes a unique rotary encoder to provide ±20% variable speed range in 0.01% increments. The capstan motor speed can also be controlled by an external source of 9600 Hz (nominal) square waves for easy interface with a synchronizer or similar controller. The speed range under external control is ±50%.

An optional Voice Edit Module allows listening at twice normal play speed without pitch shift for easy editing of lecture and interview work or for transcription.

The built-in tape timer displays the current tape position as Hours, Minutes and Seconds, or the tape speed in inches per second, or the tape speed as a percentage of change from the selected play speed.

The tape timer incorporates a four point search-to-cue locator with three cue point memories and a zero location memory. The included repeat function allows continuous repeat play between any two selected cue points. One cue point memory can be set to store the location where Play was last entered, for easy return to the beginning of a sequence.

All machines in the Series feature front panel selection of two operating speeds, with internal switch selection of either High (15/7.5 ips) or Low (7.5/3.75 ips) speed pair operation.

The MX-55 series machines provide switch selection of NAB or IEC equalization; +4 dBu or -10 dBu Input and Output levels; 185, 250 or 370 nWb/m operating level (MX-55N) or 250, 320, or 510 nWb/m operating level (MX-55D) with front panel indication of operating level and equalization. XL type

connectors are provided for Inputs and Outputs with transformerless active balanced circuitry.

1.2 Using this Manual

This manual is intended for use with MX-55N and MX-55D models. For convenience, the descriptions and references apply to the MX-55N, where any differences exist between this model and the MX-55D, those differences will be fully explained in context.

1.2.1 Organization

This manual is divided into nine sections beginning with this **Introduction** which contains general information about the MX-55 Series and about the manual.

Section 2, Controls and Indicators, contains a keyed reference guide to the operating controls, indicators and connectors on the machine. This section contains detailed information about each control and its function. Refer to this Section when you have a question about the function of a particular control, indicator, or connector.

Section 3, Operations, describes the operation of the MX-55 machines, and is divided into two parts;

1. A table of machine operating modes, which lists each mode and the controls necessary to enter that mode; and
2. Detailed operating instructions, which describe each operation and the controls and indicators associated with that operation.

Section 4, Maintenance and Alignment, provides the information necessary to perform routine maintenance operations, including head cleaning and demagnetizing and capstan motor lubrication. It also covers the audio and transport adjustments associated with normal operation of the machine.

Section 5, Installation and Setup, contains the information necessary when first unpacking and installing the machine. The information and procedures contained in this section should be followed very carefully when the machine is first unpacked and installed. Performing the inspection and checkout steps will familiarize you with the machine and its component parts if this is your first contact with the MX-55 series of tape recorders.

Section 6 lists the **Specifications** of the MX-55N and MX-55D tape recorders.

Section 7, Printed Circuit Board Layouts and Parts Lists, contains two-color "x-ray" views of many of the printed circuit boards (PCBs) showing component locations and foil traces. This section also contains Parts Lists of the electronic components associated with each PCB.

Section 8, Exploded Views and Parts Lists, contains assembly drawings of the machine "exploded" to show internal parts and hardware, and the order of assembly. Each drawing is keyed to an accompanying Parts List containing the Otari part number for each mechanical component.

The final section contains the **Schematics** for all electronics assemblies and printed circuit boards.

1.2.2 Conventions within this Manual

Generally this manual uses all capital letters to describe a control, indicator, or connector when that item is similarly labeled on the machine (e.g., INPUT level control or PARALLEL I/O connector). Where a control or indicator is not labeled on the machine, the name of that item is spelled with initial capital letters only (e.g., Mic Input connector or Cue Speaker). The six major transport control buttons are not labeled on the machine, but are labeled on the button caps with graphic symbols. This manual uses the name of the button rather than the graphic symbol whenever the buttons are referenced.

Button Symbol	Name
▶	PLAY
●	RECORD
■	STOP
▶▶	FAST FORWARD (F.FWD)
◀◀	REWIND
⟨●⟩	CUE

Section 2 Controls and Indicators

This section describes the Controls, Indicators, and Connectors on the MX-55N and MX-55D tape recorders.

2.1 Transport Control Panel

This section describes the controls and indicators on the Transport Control Panel of the MX-55N and MX-55D. Numbers in square brackets [ ] are references to **Figure 2-1**.

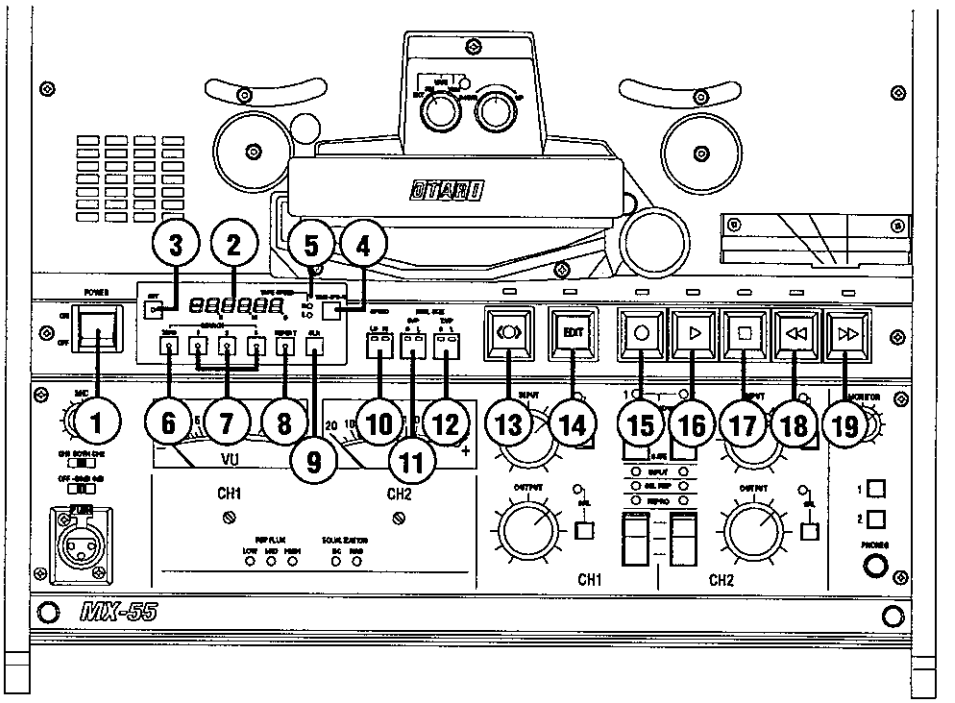


Figure 2-1
Transport Control Panel

[1] POWER switch

Pressing the upper portion of this switch causes Power to be applied to the machine. The VU Meter lamps, Tape Timer digits, and STOP indicator will become illuminated.

[2] Tape Time display

This 6-digit display shows the Tape Time in Hours, Minutes, and Seconds, or the Tape Speed in inches per second, or the Tape Speed as a percentage change from the selected play speed, as selected by the TIME·IPS·% key.

When the Tape Time display is set to show the Tape Speed as percentage change from the currently selected Play speed, the rightmost digit of the display will show "P". In this mode, 0.00 indication corresponds to nominal tape speed.

When the Tape Time display is set to show the Tape Speed in inches per second, the rightmost digit of the display will show "iP".

The Tape Time display also shows the location stored as a Search cue point when the STOP button is held pressed, and one of the SEARCH keys is pressed.

The display is set to display Tape Speed selected for several seconds when Power is first applied to the MX-55, then display is changed to show the Tape Time. When EXT position of Speed mode Selector is selected, the display shows the Tape Time when power is first applied.

[3] SET key

Initiates Set mode in which a desired tape time can be entered and stored in any selected Cue Point Memory.

Pressing this key causes the LED of the SET key to illuminate and causes the decimal points of the Tape Time display to flash, indicating that Set mode has been selected and that the function of the keys associated with the Tape Time display are changed as follows:

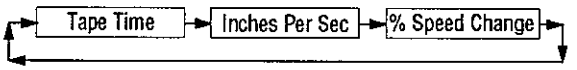
SEARCH ZERO : pressing this key alternates in turn between 0, 1, 2 and - time entry on Cue Point time Set mode.
: Pressing this key alternates between time entry and no display on % Set mode for Vari Speed mode and VEM mode.
: Pressing this key alternates between 1 and no display on VEM mode.
SEARCH 1 : pressing this key increments the hours digit by one.
SEARCH 2 : pressing this key increments the tens of minutes digit by one.
SEARCH 3 : pressing this key increments the units of minutes digit by one.
REPEAT : pressing this key increments the tens of seconds digit by one.
CLR : pressing this key increments the units of seconds digit by one.

After the desired tape time has been entered into the display, hold the SET key pressed while pressing a SEARCH key on which the LED is not illuminated (i.e., a location has not been stored) to store the entered location.

To leave Set mode press the CLR key while holding the SET key pressed. The LED of the SET key turns off.

[4] TIME·IPS·% key

Pressing this key causes the Tape Time display to show, in turn, the current Tape Time, the currently selected Tape Speed in ips, or the percent of change from the currently selected Tape Speed.



Pressing this key simultaneously with the CLR key on showing Tape Time causes the Tape Time display to be reset to 00.00.00.

Pressing this key simultaneously with the CLR key on showing IPS or % causes the Tape Time display to show the Tape Time which is reset to 00.00.00.

NOTE: When speed mode Selector is set to EXT, the Tape Time display shows only Tape Time.

[5] TAPE SPEED H/L indicators

The indicator shows the current setting of the Speed LO/HI switch. When the Speed Pair switch (SW1-1 on the TRANSPORT CONTROL PCB assembly) is Off, the H indication corresponds to 15 ips and the L indication corresponds to 7.5 ips. When the Speed Pair switch is On, the H indication corresponds to 7.5 ips, and the L indication corresponds to 3.75 ips.

[6] SEARCH ZERO key

Pressing this key causes the MX-55 to enter Search Zero mode, in which the tape will be moved at Fast Wind speed to the location corresponding to 00.00.00 on the Tape Time display and Stop.

Pressing the PLAY button during Search Zero mode causes the MX-55 to enter Play mode immediately upon reaching the zero location.

Pressing any other transport control button (F.FWD, REWIND or STOP) during Search Zero mode causes the MX-55 to leave Search Zero mode and enter the selected mode of operation.

[7] SEARCH 1, 2, 3 keys

These three keys are used to store and/or initiate a Search to one of three tape locations.

When a tape location has been stored in a memory corresponding to a SEARCH key, the indicator in that key becomes illuminated.

When the indicator in a particular SEARCH key is not illuminated, no location has been stored in the memory corresponding to that key.

Pressing any one of these keys, when its associated indicator is not illuminated, causes the Tape Time, at the instant the key was pressed, to be stored in that Cue Point memory.

Pressing any one of these keys, after a location has been stored in the Cue Point memory corresponding to that key, causes the MX-55 to move the tape at Fast Wind speed to the location stored as that cue point and then Stop.

NOTE: Search operation is disabled on Record mode.

For the first two seconds after a Search has been initiated, the Tape Time display will show the location to which the MX-55 is Searching.

While the MX-55 is Searching to a Cue Point, the indicator in the key will flash.

Pressing the PLAY button during Search mode causes the MX-55 to enter Play mode immediately upon reaching the Cue Point location.

Pressing any other transport control button (F.FWD, REWIND, or STOP) during Search mode causes the MX-55 to leave Search mode and enter the selected mode of operation.

Holding the STOP button pressed and simultaneously pressing any SEARCH key causes the tape location which was stored in that Cue Point memory to be shown on the Tape Time display for about 2 seconds.

Holding the CLR key pressed and pressing any SEARCH key having its indicator illuminated, causes the tape location stored for that Cue Point to be cleared (set to 00.00.00).

Depending on the position of switches on the TRANSPORT CONTROL PCB assembly, Search memory 3 can be used to automatically store, and search to, the last location at which either the PLAY button was pressed. Refer to **§5.3** for further information.

If Switches SW2-1 or SW2-2 (on the TRANSPORT CONTROL PCB assembly) are On, then the function of the SEARCH 3 key is changed to Fader Start, Search Start, or Foil Sense On/Off. Refer to **§5.3** for more information.

[8] REPEAT key

Pressing this key, then pressing any two illuminated SEARCH keys, or an illuminated SEARCH key and the SEARCH ZERO key and pressing PLAY button causes the MX-55 to enter Repeat mode, in which the machine plays from one selected point to another, rewinds to the first point and plays again, repeating until stopped. LEDs of the SEARCH keys selected will blink during Repeat mode and LED of the REPEAT key illuminates.

Pressing the REWIND or F.FWD button during Repeat mode causes the MX-55 to wind the tape to the corresponding Cue Point and Stop. In Repeat mode, the tape cannot be moved beyond the Cue Points.

To exit from Repeat mode, hold the CLR key pressed and press the REPEAT key.

Pressing REPEAT key again during Repeat mode causes the REPEAT key LED to blink and the LEDs of the SEARCH key selected to illuminate. In this state, re-setting for the repeat Cue points can be made. When Cue points re-setting has been finished, previous Repeat mode is defeated and new Repeat mode for the new Cue points starts.

[9] CLR key

Pressing this key together with another key cancels or resets the mode associated with that key.

CLR + SET : deactivates Set mode.
CLR + TIME·IPS·% : resets the Tape Time display to 00.00.00.
CLR + SEARCH 1–3 : clears stored Cue Point Memory.
CLR + REPEAT : deactivates Repeat mode.

If SW1-4 on the TRANSPORT CONTROL PCB assembly is Off, pressing the CLR key simultaneously with the SPEED H/L button changes the Tape Speed. If SW1-4 is On, pressing the CLR key simultaneously with either the TAPE SPEED H/L or REEL SIZE S/L buttons causes the setting of that button to change.

[10] SPEED LO/HI button

If SW1-4 on the TRANSPORT CONTROL PCB assembly is Off, pressing this button twice within one second, or holding this button pressed for more than one second, causes the Tape Speed to change. If SW1-4 is On, pressing this button simultaneously with the CLR key causes the Tape Speed to change.

The last setting of the SPEED LO/HI button will be preserved in memory for several days after the MX-55 is disconnected from AC Power. After that time, the MX-55 will enter High speed (15 or 7.5 ips as determined by the setting of SW1-1 on the TRANSPORT CONTROL PCB assembly) when power is first applied to the machine.

For information regarding changing machine Speed Pairs (15/7.5 or 7.5/3.75) refer to **§5.3**.

[11] REEL SIZE SUP S/L button
[12] REEL SIZE T.UP S/L button

These buttons select the Reel Tension to match the Reel size being used.

Set the REEL SIZE button to the L position when using 10.5" NAB reels or 11.8" AEG Hubs on the corresponding Reel Table.

Set the REEL SIZE button to the S position when using any other reel size (5", or 7") on the corresponding Reel Table.

If SW1-4 on the TRANSPORT CONTROL PCB assembly is Off, pressing either of these buttons twice within one second, or holding either button pressed for more than one second, causes the Reel Tension for that reel (Supply or Take-up) to change. If SW1-4 is On, pressing either of these buttons simultaneously with the CLR key causes the Reel Tension for that reel (Supply or Take-up) to change.

The last setting of the REEL SIZE buttons will be preserved in memory for several days after the MX-55 is disconnected from AC Power. After that time, the Reel Tension will be set to the L position when power is first applied to the machine.

[13] CUE button and indicator

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 wind speed.

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

Tapping the CUE button quickly causes the lifters to remain retracted until the next time the CUE button is pressed.

In Cue mode, the Line and Monitor audio outputs are attenuated -16 dB to prevent damage to speakers or headphones.

[14] EDIT button and indicator

Pressing this button while in Stop mode causes the MX-55 to enter Edit Ready mode, in which the take-up motor is turned off, the Safety switch for the Supply Swing Arm is deactivated, and the EDIT indicator flashes. Pressing the PLAY button while in Edit Ready mode, or pressing the EDIT button while in Play mode, causes the MX-55 to enter Dump Edit mode, in which the Take-up reel does not rotate allowing tape to be "dumped" from the transport.

Pressing the STOP button during Edit mode causes tape motion to Stop and Edit mode to be canceled.

NOTE: Even if there is slack in the tape path and the Safety switch for the Supply Swing Arm is deactivated, Edit Ready mode can be accepted and Dump Edit mode will start when PLAY button is pressed.

[15] RECORD button and indicator

When any channel is in Record Ready mode, the Ready indicator and the Record mode indicator flash. One of two methods of entering Record mode can be selected. The methods are:

a. Pressing this button simultaneously with the PLAY button.
b. Pressing this button while the MX-55 is in Play mode.

Similarly thee are two selectable methods of leaving Record mode while tape motion continues. The methods are:

a. Pressing the PLAY button.
b. Pressing the RECORD and STOP buttons simultaneously.

The method of entering and leaving Record mode is selected by the position of SWs 1-2 and 1-3 on the TRANSPORT CONTROL PCB assembly. Refer to **§5.3** for further information.

[16] PLAY button and indicator

Pressing this button places the transport into Play mode, in which the tape moves from the Supply Reel to the Take-up Reel at the currently selected speed.

Pressing this button while in Edit Ready mode places the transport in Dump Edit mode (refer to **[14]** EDIT button).

Pressing this button when there is slack in the tape path causes the Take-up Reel to rotate very slowly until the slack is removed, then the transport enters Play mode.

[17] STOP button and indicator

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

Pressing this button simultaneously with any illuminated SEARCH key (1,2, or 3) causes the Tape Time display to indicate the tape time stored in the Cue Point Memory for that cue number.

Pressing this button when there is slack in the tape path causes the Take-up Reel to rotate very slowly until the slack is removed.

[18] REWIND button and indicator

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 and the REWIND indicator is illuminated.

To exit from Rewind mode, press the STOP, PLAY, or F.FWD button.

[19] F.FWD button and indicator

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 and the F.FWD indicator is illuminated.

To exit from Rewind mode, press the STOP, PLAY, or REWIND button.

2.2 Tape Transport

This section describes the controls, indicators and main components of the MX-55 tape transport. Numbers in square brackets [ ] are references to **Figure 2-2**.

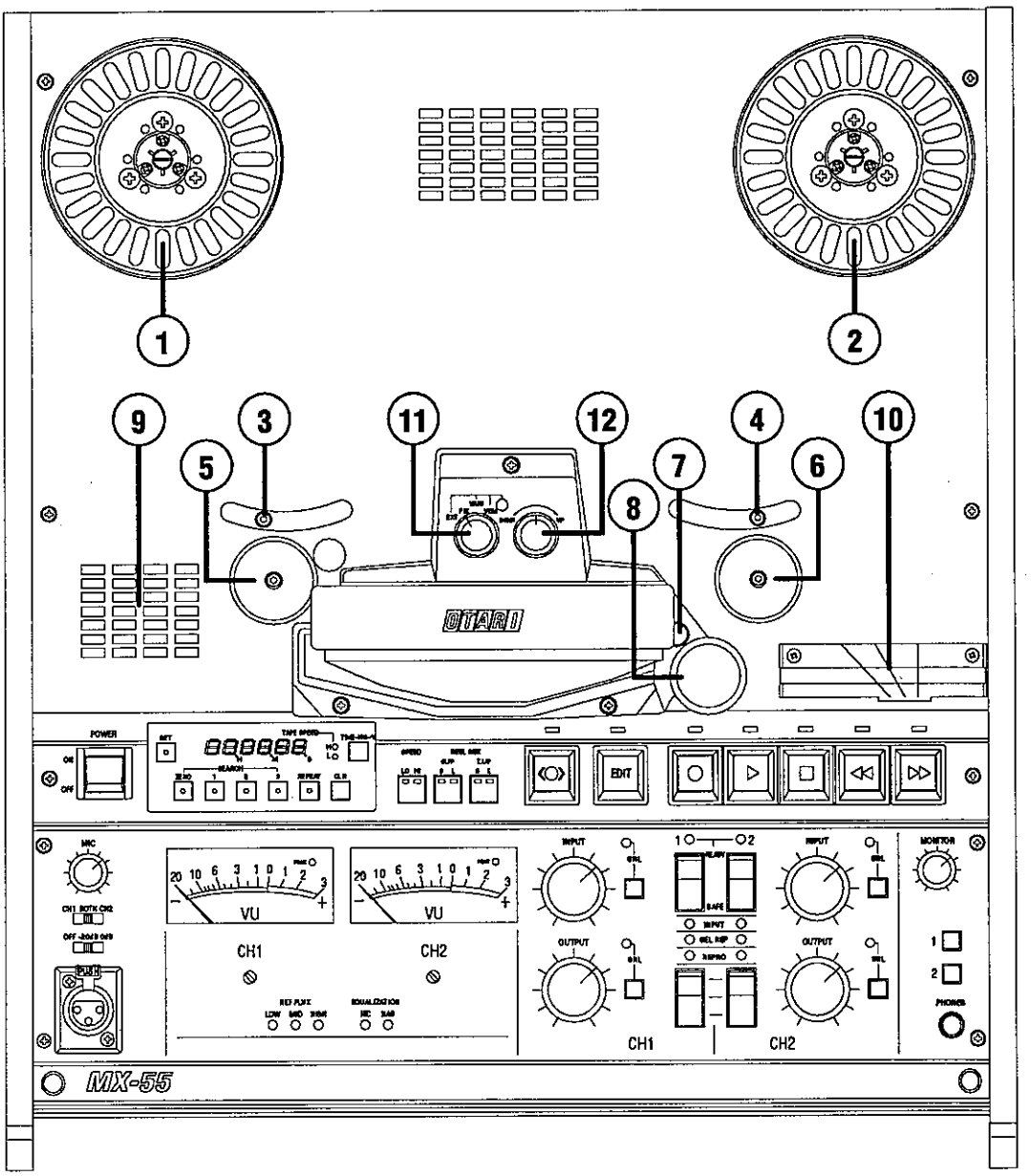


Figure 2-2
Tape Transport

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

Reel Tables with reel clamps for 5–7" reels. When using a 10.5" NAB reel or an 11.8" AEG hub use the supplied reel adapter.

Select the appropriate tape tension for the tape reels being used by pressing the REEL SIZE SUP S/L and REEL SIZE T.UP S/L buttons (**Figure 2-1, [11], [12]**). Reels of differing diameters can be accommodated on each reel table by selecting the appropriate tape tension switch position.

[3] Supply Swing Arm
[4] Take-up Swing Arm

These arms help correct tape tension fluctuations due to changes in tape pack diameter or irregularities in tape pack.

When the MX-55 is in Stop mode, the Reel brake will be released by swinging the Swing Arm toward outer side of deck plate.

The Supply Swing 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.

[5] Guide Roller

This roller provides tape guidance and helps isolate the heads from variations in tape motion caused by irregularities in tape supply.

[6] Tach Roller

The tape motion causes this roller to rotate, which generates tach pulses which are used to calculate Tape Time and tape direction.

[7] Capstan Shaft

The Capstan Shaft is directly driven by a Quartz crystal Phase Locked Loop controlled brushless DC servo capstan motor.

[8] Pinch Roller

The tape is driven by the rotation of the Capstan Shaft against this roller.

[9] Cue Speaker

The Cue Speaker is provided for monitoring the audio signals. Inserting a headphone plug into PHONES jack (**Figure 2-4, [16]**) mutes the built-in monitor speaker. The monitor level is adjustable by the MONITOR level control (**Figure 2-4, [14]**). The channel(s) to be monitored are selected by the Channel Selectors (**Figure 2-4, [15]**).

[10] Splicing Block

The built-in splicing block provides a convenient method of editing tapes.

[11] Speed Mode switch

When this switch is set to the FIX position, the capstan motor speed is controlled by the internal crystal oscillator, and the tape speed is selected by the SPEED LO/HI button (**Figure 2-1, [10]**).

When this Selector is set to the VARI position, the tape speed is controlled by the PITCH CONTROL knob.

When this switch is set to the EXT position, the tape speed is controlled by the external speed reference signal connected to the PARALLEL I/O connector on the rear panel. Set the Speed Mode switch to this position when using a synchronizer or resolver to control the MX-55. Refer to **§5.2** for additional information about controlling the tape speed using an external controller.

NOTE: Tape Time Display shows only tape time when the tape speed is controlled by the external speed reference.

When this switch is set to the VEM position, and the optional VEM PCB assembly is installed, the tape is reproduced at two times the currently selected speed, but the pitch of the signal remains constant. Turning the CONTROL knob while in Voice Edit mode causes the tape speed to only lower with an accompanying lower pitch change.

When this switch is set to any position other than FIX the indicator becomes illuminated.

[12] PITCH CONTROL knob

When the SPEED MODE switch is set to the VARI position the PITCH CONTROL changes tape speed in Record and Play mode.

The PITCH CONTROL knob is velocity sensitive, so that turning the knob a small amount quickly produces a large pitch change, while turning the knob the same amount slowly produces a small pitch change.

The tape speed is variable by +20% of the selected speed in 0.01% steps. The amount of pitch change can be displayed on the Tape Time display by pressing TIME·IPS·% key.

The amount of Vari pitch can be presetable as following.

When Speed Mode switch is at FIX position;

1. Press TIME·IPS·% key to change display to % indication.
2. Press SET key and set desired amount of vari speed in % using PITCH CONTROL knob or those key like SEARCH ZERO, and SEARCH 1–3, REPEAT as described at **Figure 2-1**, **[3]** SET key.
3. Then change Speed Mode switch to VARI position.

When you would like to get back to previous preset vari speed while the Speed Mode switch is set back to FIX position, press only SET key, then change Speed Mode switch to VARI position.

When Speed Mode switch is at VARI position;

1. Press TIME·IPS·% key to change display to % indication.
2. Press SET key and set desired amount of vari speed in % using PITCH CONTROL knob or those keys like SEARCH ZERO, SEARCH 1–3, REPEAT as described at **Figure 2-1**, **[3]** SET key.
3. Then, press SET key and TIME·IPS·% key simultaneously. Tape speed will change to desired speed set.

2.3 Head Assembly

NOTE: Numbers in square brackets [ ] are references to **Figure 2-3**.

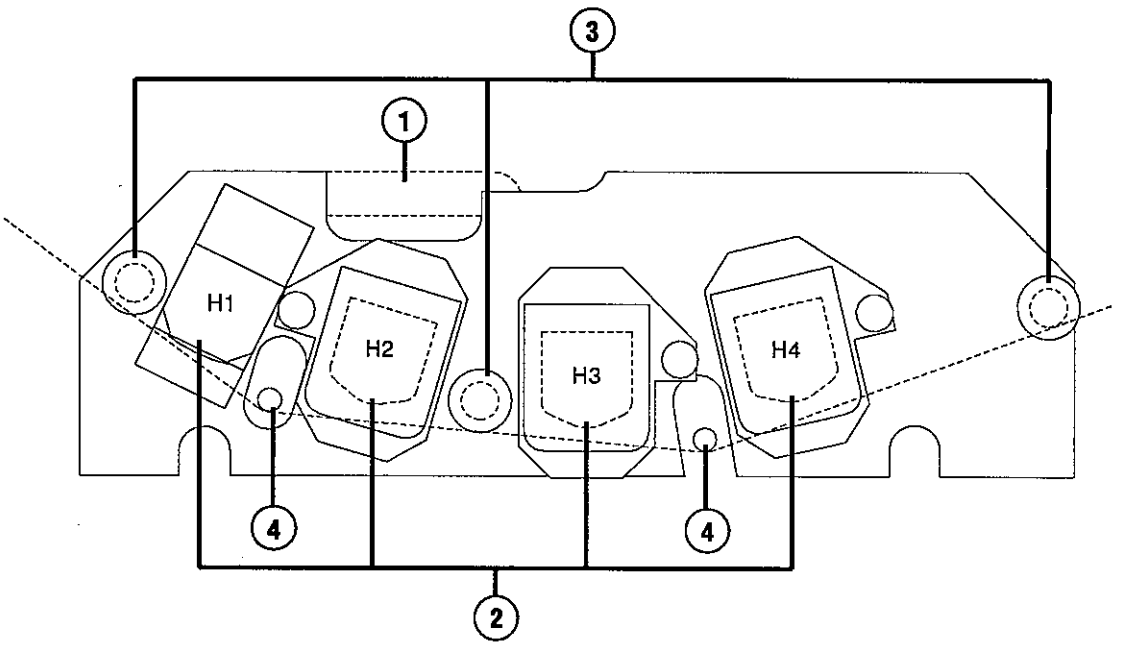


Figure 2-3
Head Assembly

[1] Head Connector

The Head connector is connected directly to the Head Amplifier.

[2] Heads

Head azimuth, height, zenith and wrap is adjustable on the Reproduce and Record Heads.

HEAD ARRANGEMENT (MX-55N and D Models)			
H1 (Erase) 2TR 2CH	H2 (Record) 2TR 2CH	H3 (Reproduce) 4TR 2CH	H4 (Reproduce) 2TR 2CH

NOTE: The Switch that selects 2TR or 4TR Reproduce Head is located on the AUDIO AMPLIFIER PCB assembly, under the fold-down front panel at the bottom of the Amplifier Panel.

[3] Tape Guide

This fixed guide directs the tape motion across the heads.

[4] Tape Lifters

The Tape Lifters are extended when the MX-55 is in Fast Forward and Rewind modes to separate the tape from the heads and retract while in Stop, Record, Play, Edit, and Cue modes.

2.4 Amplifier Panel

NOTE: Numbers in square brackets [ ] are references to **Figure 2-4.**

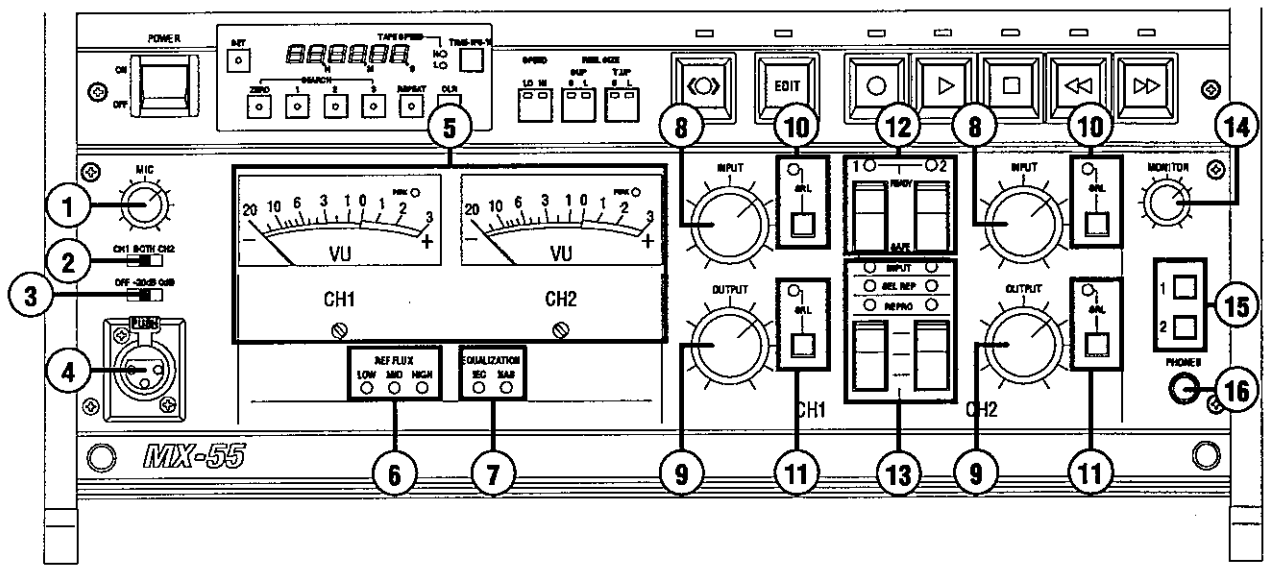


Figure 2-4
Amplifier Panel

MIC LEVEL control Adjusts the microphone input level. If the Level control does not have enough range of adjustment, change the setting of the Mic Input Sensitivity switch.

[2] Channel Assignment switch This switch selects the channel to which the microphone input signal is connected.

[3] Mic Input Sensitivity switch If the output level of microphone in use is about -70dB, set this switch to the 0 position, and to the -20 position for microphones having about -50 dB output level.

Set this switch to the Off position when MIC is not used.

[4] MIC Input connector This XL type connector accepts microphones having output impedances of 150 Ω to 10 kΩ.

Pin 1 of the connector is connected to shield (GND), pin 2 is connected to

[5] VU Meters

Each back-lit VU meter incorporates a PEAK indicator which illuminates when the signal reaches a level equivalent to 1040 nWb/m.

[6] REF FLUX indicators

These indicators show the selected reference flux level. The selection of reference flux level is made with the REF FLUX LOW/MID/HIGH switch on the Connector Panel (**Figure 2-6, [5]**).

Depending on the configuration of the machine (DIN or NAB as selected with piggyback PCBs on the AUDIO AMPLIFIER PCB assembly), the indication corresponds to the following reference levels.

NAB Version		DIN Version
HIGH = 370 nWb/m		HIGH = 510 nWb/m
MID = 250 nWb/m	or	MID = 320 nWb/m
LOW = 185 nWb/m		LOW = 250 nWb/m

For information regarding changing of the reference level settings (NAB - 185/250/370 nWb/m or DIN - 250/320/510 nWb/m), refer to **§5.3**.

[7] EQUALIZATION indicators

These indicators show the selected equalization. Selection of equalization is made with the EQUALIZATION IEC/NAB switch on the Connector Panel (**Figure 2-6, [6]**).

[8] INPUT level control
[9] OUTPUT level control

These controls adjust the line input and output levels. When the SRL switch associated with an INPUT or OUTPUT control is pressed, and its indicator illuminated, the level control has no affect.

If the Level control does not have enough range of adjustment, change the setting of the LINE LEVEL LOW/HIGH switch and perform the level matching adjustment described in **§4.3**.

[10] INPUT SRL switch and indicator
[11] OUTPUT SRL switch and indicator

When one of these switches are pressed, the 0 VU indication on the corresponding VU meter corresponds to the reference flux level selected by the REF FLUX LOW/MID/HIGH switch (**Figure 2-6, [5]**).

[12] READY/SAFE switches, READY indicators

Setting one or both of these switches to the Ready position places that channel into Record Ready mode, in which the channel will enter Record mode when the RECORD and PLAY buttons are pressed simultaneously.

Setting this switch to the Ready position while in Record mode places the channel in Record mode immediately.

Setting one or both of switches to the Safe position places that channel into Safe mode, in which recording cannot take place.

Setting this switch to the Safe position while in Record mode causes that channel to leave Record mode immediately.

The READY indicator flashes when the channel is in Record Ready mode, and becomes steadily illuminated when the channel is in Record mode.

[13] INPUT/SEL-REP/REPRO switches and indicators

These switches select the machine output and monitor signals.

When the switch is set to the Input position, the signal at that channel's OUTPUT connector, VU Meter, and Monitor Select switch is the signal present at that channel's INPUT connector, or the Test Oscillator signal if it is activated. The Amber indicator will be illuminated.

When the switch is set to the Sel-Rep position, the signal at that channel's OUTPUT connector, VU Meter, and Monitor Select switch is the signal present on tape reproduced by that channel's Record head. The Green indicator will be illuminated.

When the switch is set to the Repro position, the signal at that channel's OUTPUT connector, VU Meter, and Monitor Select switch is the signal present on tape reproduced by that channel's Reproduce head. The Orange indicator will be illuminated.

[14] MONITOR Level knob

Adjusts the level of the signal at the monitor speaker and at the PHONES jack.

[15] Monitor Select buttons

Pressing one or more of these buttons causes the selected channel's output signal to be fed to the built-in monitor speaker and to the PHONES jack.

[16] PHONES connector

This 1/4" tip-ring-sleeve phone jack provides signal output for headphones having input impedance of 8 Ohms and greater. Inserting a headphone plug into this jack mutes the built-in monitor speaker.

2.5 Controls on AUDIO AMPLIFIER PCB Assembly

NOTE: Numbers in square brackets [ ] are references to **Figure 2-5**.

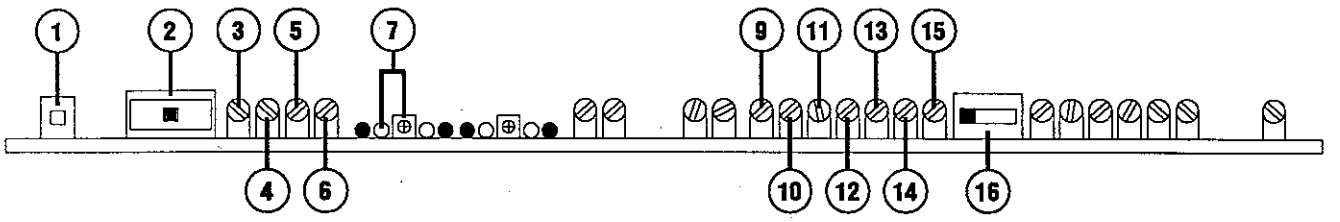


Figure 2-5
Controls on the AUDIO AMPLIFIER PCB Assembly

[1] TEST OSC Off/On button — Pressing this button causes the internal Test Oscillator to be alternately activated and deactivated.

[2] OSC FREQ switch — The setting of this switch controls the frequency of the built-in Test Oscillator (100 Hz, 1 kHz, and 10 kHz).

NOTE: The following controls (3–15) are described for Channel 1 only. Each control is duplicated for Channel 2.

[3] INPUT LEVEL trimmer — This trimmer adjusts the level of the signal input to the Record electronics.

[4] REC EQ H trimmer — This trimmer adjusts the High Speed record equalization.

[5] REC EQ L trimmer — This trimmer adjusts the Low Speed record equalization.

[6] REC LEVEL trimmer — This trimmer adjusts the level on tape of the signal being recorded.

[7] BIAS trimmer and check points — This trimmer adjusts the level of the Record bias applied to the tape during recording. The associated Check points are used when adjusting the Record Bias after replacing the Record Head.

[8] ERASE check points — These check points are used to test for the presence of Erase Bias when replacing the Erase Head and during adjustment of the Bias Dummy Load.

[9] REPRO LEVEL trimmer — This trimmer adjusts the level of the signal reproduced from the tape in Play mode.

[10] SEL-REP LEVEL trimmer This trimmer adjusts the level of the signal reproduced from the tape in Sel-Rep mode.

[11] REPRO EQ HF H trimmer This trimmer adjusts the High Frequency reproduce equalization at the High speed.

[12] REPRO EQ LF H trimmer This trimmer adjusts the Low Frequency reproduce equalization at the High speed.

[13] REPRO EQ HF L trimmer This trimmer adjusts the High Frequency reproduce equalization at the Low speed.

[14] REPRO EQ LF L trimmer This trimmer adjusts the Low Frequency reproduce equalization at the Low speed.

[15] OUTPUT LEVEL trimmer This trimmer adjusts the level of the signal at the OUTPUT connector.

[16] REPRO HEAD 2TR/4TR switch This switch selects between the 2CH 2TR reproduce head and the 2CH 4TR reproduce head for playback.

2.6 Connector Panel

NOTE: Numbers in square brackets [ ] are references to **Figure 2-6**.

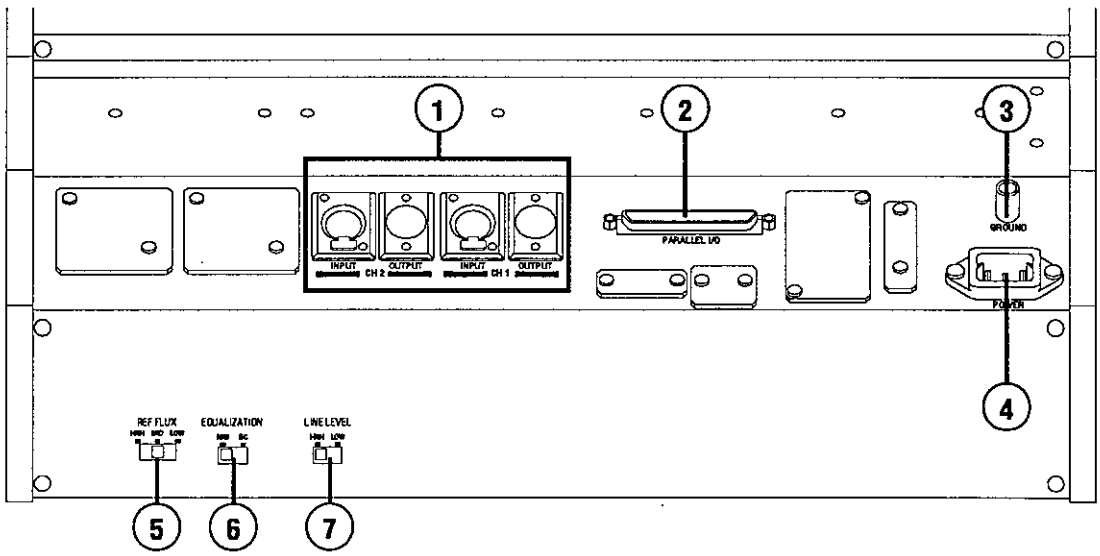


Figure 2-6
Connector Pannel

[1] INPUT and OUTPUT connectors

These XL type connectors are for audio input and output.

[2] PARALLEL I/O connector

This 37 conductor D-type connector contains Transport Control command lines, status tally signals, and external capstan speed control signals. Refer to **§5.2** for further information about connector pinout, signal levels and control requirements.

[3] GROUND terminal

This connector provides a location for connecting an external chassis ground to the MX-55.

[4] POWER Input connector

Connect the supplied AC Power cord to this connector. Refer to Section 5 for information regarding changing the selection of AC mains voltage.

[5] REF FLUX LOW/MID/HIGH switch

This switch selects the reference flux level for recording and playback. The positions correspond to the following reference levels, depending on the piggyback PCBs installed on CN45, CN46, CN47, and CN48 on the AUDIO AMPLIFIER PCB assembly.

AMERICAN		EUROPEAN
HIGH = 370 nWb/m		HIGH = 510 nWb/m
MID = 250 nWb/m	or	MID = 320 nWb/m
LOW = 185 nWb/m		LOW = 250 nWb/m

For information regarding changing of the reference level settings (American style - 185/250/370 nWb/m or European style - 250/320/510 nWb/m), refer to **§5.3**.

[6] EQUALIZATION IEC/NAB switch

This switch selects the equalization for recording and playback. This switch should be set to the NAB position when using NAB standard equalization for recording and playback. This switch should be set to the IEC position when using IEC standard equalization for recording and playback.

[7] LINE LEVEL LOW/HIGH switch

This switch selects the level for the LINE INPUT and OUTPUT connectors.

Set this switch to the High position if the studio level is close to 0 dBu (e.g., +4 dBu). If it is close to 20 dBu (e.g., -10 dBu), set the switch to the Low position.

Section 3 Operations

This section contains, first, a list and accompanying brief explanation of each of the operating conditions (or modes) of the MX-55, and second, a detailed explanation of each operation or activity associated with the operation of the MX-55 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.

Information regarding Installation, Setup and Configuration of the machine is provided in Section 6 of this manual. If you are uncrating and hooking up the machine for the first time, please refer to **Section 6** before continuing with this section.

3.1 Modes of Operation

TRANSPORT MODES

Table 3-1
Transport Operation Modes

MODE	CONTROL	EXPLANATION
Stop	STOP	Tape motion stops.
Play	PLAY	Tape moves from Supply to Take-up at the currently selected speed.
Fast Forward	F.FWD	Tape moves from Supply to Take-up at Fast Wind speed.
Rewind	RWD	Tape moves from Take-up to Supply at Fast Wind speed.
Record	*RECORD or RECORD + PLAY	Any channel in Record Ready begins to Record.
Edit Ready	(Stop) + EDIT	Transport is ready for Edit Play mode.
Edit Play (Dump Edit)	(Edit Ready) + PLAY	Tape moves towards Takeup reel but Take-up reel does not turn.
Cue	(Fast Wind) + CUE	Lifters will be retracted to allow audio to be monitored.
Vari Speed	SPEED MODE	Tape speed is controlled by the PITCH control.

* Selectable with SW1-2 on TRANSPORT CONTROL PCB assembly.

AUDIO CHANNEL MODES

Table 3-2
Audio Channel Operation Modes

MODE	CONTROL	EXPLANATION
Ready	READY/SAFE	The selected channel will enter Record when the RECORD and PLAY buttons are pressed.
Safe	READY/SAFE	The selected channel will not enter record.
Input Monitor	INPUT/SEL·REP/ REPRO switch to Input	The signal at the OUTPUT connector for that channel is the signal present at the INPUT connector.
Sel·Rep Monitor	INPUT/SEL·REP/ REPRO switch to Sel-Rep	The signal at the OUTPUTconnector is the signal on tape reproduced by the Record Head.
Repro Monitor	INPUT/SEL·REP/ REPRO switch to Repro	The signal at the OUTPUT connector is the signal on tape reproduced by the Reproduce Head.
Voice Edit Mode (VEM)	SPEED MODE switch to VEM	Tape speed is increased but audio pitch remains constant.

LOCATOR MODES

Table 3-3
Locator Operation Modes

MODE	CONTROL	EXPLANATION
Set	SET	Tape locations can be entered for Cue Points using the ZERO, 1, 2, 3, REPEAT and CLR keys.
Repeat	REPEAT + any two SEARCH key with stored cues	Tape Plays from 1st to 2ndCue Points, then Rewinds to 1st and Repeats.
Search	Any SEARCH key with stored cue	Tape is moved to the Cue Point as Fast Wind speed and Stops.
Search Zero	SEARCH ZERO	Tape is moved to 0:00:00 at Fast Wind speed and Stops.
Search Play	PLAY + any SEARCH key with stored location	Tape is moved to the Cue Point at Fast Wind speed where it enters Play.

3.2 Mounting the Reels and Threadung the MX-55

3.2.1 Placing the Reels on the Machine

3.2.1.1 Using 5–7" EIA Reels

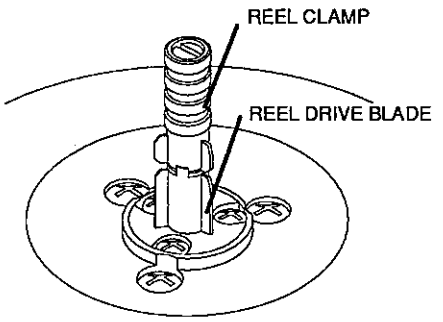


Figure 3-1
Reel Spindle

1. Turn the Reel Clamp portion of the Reel Spindle until it lines up with the three Reel Drive Blades on the Reel Table.
2. Place the reel on the Reel Table, so that the Reel Drive Blades 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).

3.2.1.2 Using 10.5" NAB Hub Reels

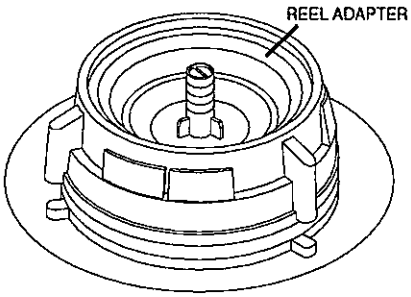


Figure 3-2
Mounting the Reel Adapter

1. Turn the Reel Clamp portion of the Reel Spindle until it lines up with the three Reel Drive Blades 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.

3.2.1.3 Using AEG (or DIN) Hubs

MX-55D Machines are supplied with a Reel Adapter allowing use of AEG (or DIN) Hubs.

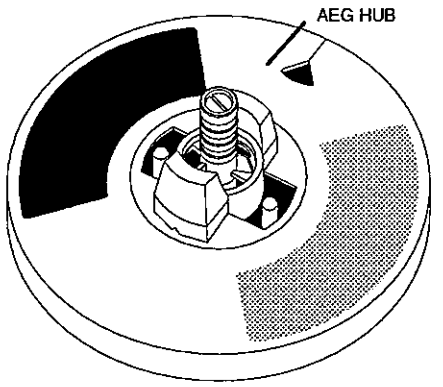


Figure 3-3
Mounting the AEG (DIN) Hub Adapter

1. Turn the Reel Clamp portion of the Reel Spindle until it lines up with the three Reel Drive Blades 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.

3.2.2 Threading the tape

1. Mount an appropriate empty reel on the machine. Place the empty reel on the Take-up Reel Table. Place the reel of tape on the Supply Reel Table.

2. Press the REEL SIZE SUP and REEL SIZE T.UP buttons twice quickly or hold them pressed a second to correspond with the size of the reels being used on each Reel Table.

NOTE: If SW1-4 on the TRANSPORT CONTROL PCB assembly is Off, you must hold the CLR key while pressing the REEL SIZE buttons to change the setting.

3. Thread the tape from the Supply Reel to the Take-up Reel as shown in **Figure 3-4** and turn the Take-up Reel clockwise to remove the slack from the tape path.

4. Press the SPEED LO/HI button twice quickly (or hold it pressed for more than one second) to change tape speed if desired.

NOTE: If SW1-4 on the TRANSPORT CONTROL PCB assembly is On, you must press the CLR key simultaneously with the TAPE SPEED button to change the tape speed.

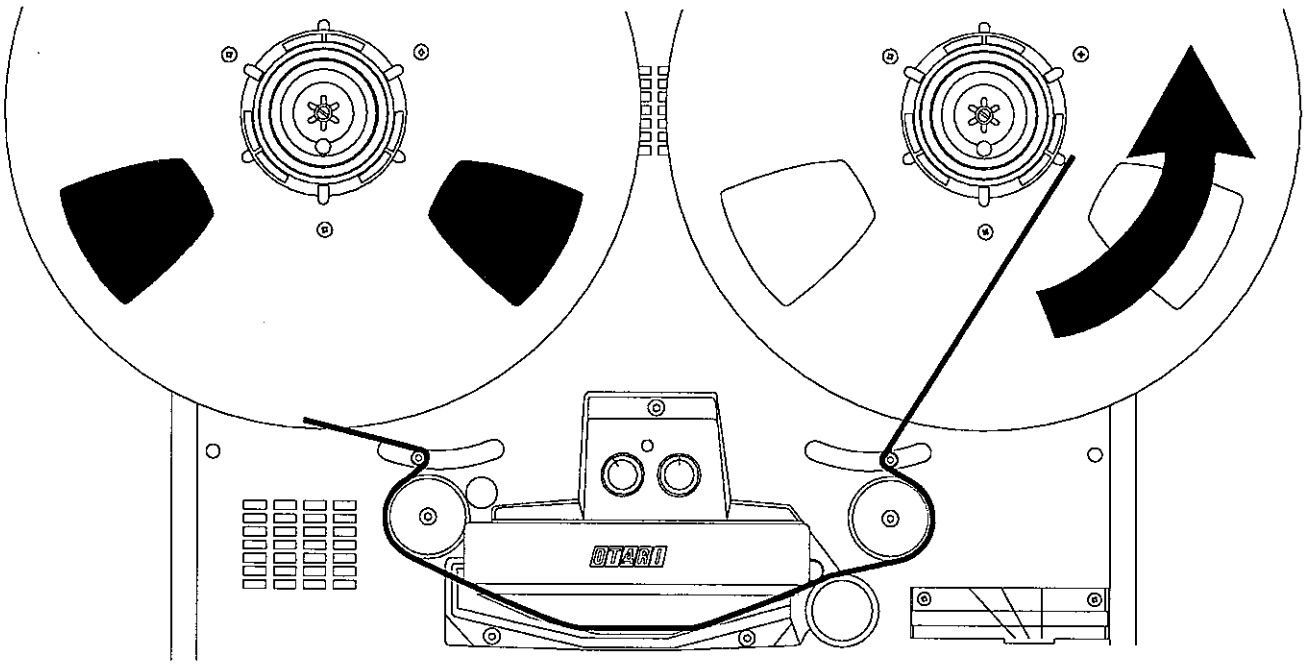


Figure 3-4
Tape Threading

3.3 Transport Modes

3.3.1 Play Mode

To enter Play mode, press the PLAY button. The tape will move from Supply reel to Take-up reel at the currently selected tape speed. The indicator above the PLAY button will become illuminated.

Play mode can be entered from any other mode except Edit Ready mode.

3.3.2 Fast Forward Mode

To enter Fast Forward mode, press the F.FWD button. The tape will move from the Supply reel to the Take-up reel at Fast Wind speed. The indicator above the F.FWD button will become illuminated.

Fast Forward mode can be entered from Stop, Play, Rewind and Record modes.

3.3.3 Rewind Mode

To enter Rewind mode, press the REWIND button. The tape will move from the Take-up reel to the Supply reel at Fast Wind speed. The indicator above the REWIND button will become illuminated.

Rewind mode can be entered from Stop, Play, Fast Forward and Record modes.

3.3.4 Record Mode

To enter Record mode, when a channel is in Record Ready mode, hold the RECORD button pressed, press the PLAY button, or if SW1-2 on the TRANSPORT CONTROL PCB assembly is Off, press the RECORD button while the machine is in Play mode. The indicator above the RECORD button will become steadily illuminated when the MX-55 is in Record mode.

3.3.5 Edit Ready Mode

To enter Edit Ready mode, while in Stop mode, press the EDIT button. The indicator above the EDIT button will flash when the MX-55 is in Edit mode.

3.3.6 Edit Play Mode

To enter Edit Play mode from Edit Ready mode, press the PLAY button. 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 from 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.

3.3.7 Cue Mode

To enter Cue mode while in Fast Forward or Rewind mode, press the CUE button. 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.

Tapping the CUE button quickly causes the tape lifters to remain retracted until the next the CUE button is pressed.

Holding the CUE button causes the lifters to remain retracted only as long as the button is held pressed.

3.3.8 Vari Speed Mode

To enter Vari Speed mode, in which the tape speed is controlled by the PITCH CONTROL knob, set the SPEED MODE switch to the VARI position. The red indicator associated with the SPEED MODE switch will be illuminated whenever the MX-55 is in any Speed mode other than Fixed.

3.4 Audio Channel Modes

3.4.1 Record Ready Mode

To place either channel into Record Ready mode, set the RECORD/READY switch for that channel to the Ready position. The READY indicator and the indicator above the RECORD button will flash.

When the RECORD button, or the RECORD and PLAY buttons (depending on the position of SW1-2 on the TRANSPORT CONTROL PCB assembly), are pressed, any channel which is in Record Ready will begin to Record.

3.4.2 Record Safe Mode

To place either (or both) channel(s) in Record Safe mode, set the RECORD/SAFE switch for that channel to the Safe position. Any channel which is in Safe mode will not enter Record.

3.4.3 Input Monitor Mode

To place either or both channels in Input Monitor mode set that channel's INPUT/SEL-REP/REPRO switch to the Input position. The signal at the OUTPUT connector, VU Meter, Headphone jack, and Monitor Selector will be the signal present at that channel's Input connector. The Amber indicator will become illuminated.

3.4.4 Sel-Rep Monitor Mode

To place either or both channels in Sel-Rep Monitor mode set that channel's INPUT/SEL-REP/REPRO switch to the Sel-Rep position. The signal at the OUTPUT connector, VU Meter, Headphone jack, and Monitor Selector will be the signal on tape reproduced by that channel's Record Head. The Green indicator will become illuminated.

3.4.5 Repro Monitor Mode

To place either or both channels in Repro Monitor mode set that channel's Monitor Select switch to the Repro position. The signal at the OUTPUT connector, VU Meter, Headphone jack, and Monitor Selector will be the signal on tape reproduced by that channel's Reproduce Head. The Red indicator will become illuminated.

3.4.6 Voice Edit Mode

(Optional with installation of VEM PCB assembly)

To enter Voice Edit mode, in which the tape speed is increased to two times of normal Play speed but the pitch of the signal remains constant, set the SPEED MODE switch to the VEM position.

By turning PITCH CONTROL knob, tape speed can be only lowered with accompanying pitch change.

If the optional VEM PCB assembly has not been installed, setting the SPEED MODE switch to the VEM position causes the tape speed to be increased to two times of normal play speed, with a corresponding increase in the pitch (frequency) of the output signal.

NOTE: In above case, Tape Time Display shows 100% indication when two times of Play speed has been set. 0% indication appears on normal tape speed.

3.5 Locator Modes

3.5.1 Set Mode

To enter Set mode, in which a desired tape location can be entered into a Search Cue point using the ZERO, 1, 2, 3, REPEAT and CLR keys, press the SET key. The indicator in the SET key will be illuminated and the decimal points in the Tape Time display will flash.

To enter a tape time into a Search Cue memory, after pressing the SET key, press the ZERO, 1, 2, 3, REPEAT and CLR keys until the desired time is shown on the display. Then hold the SET key pressed while pressing a SEARCH 1, 2, or 3 key which does not have a Cue point already stored in it, i.e., the indicator in the key is not illuminated.

3.5.2 Repeat Mode

To enter Repeat mode, in which the tape Plays from one selected Cue Point to another, Rewinds to the first and enters Play, repeating until stopped, press the REPEAT key, then press the SEARCH key corresponding to the desired beginning of the Repeat loop. Then press the SEARCH key corresponding to the the desired end of the Repeat loop, then press the PLAY button to initiate the Repeat loop.

NOTE: The ZERO key can be used for either the beginning or end of a Repeat loop.

3.5.3 Search Mode

To enter Search mode, press any SEARCH 1, 2, or 3 key that has an illuminated indicator, showing that a tape location has been stored as that Cue Point. The MX-55 will move the tape at Fast Wind speed to the Cue Point and Stop. During Search mode, the location being searched to will be shown on the display briefly, and the key indicator will flash.

3.5.4 Search Zero Mode

To enter Search Zero mode, press the ZERO key. The tape will be moved at Fast Wind speed to the location corresponding to 00.00.00 on the Tape Time display, and Stop. During the Search the indicator in the ZERO key will flash.

3.5.5 Search Start Mode

When SW2-1 (on the TRANSPORT CONTROL PCB assembly) is On, and SW2-2 is Off, then each time the MX-55 is placed in Play or Record mode, that location is stored in Cue Point memory 3.

To search to the last place the MX-55 was placed in Play or Record mode, press the SEARCH 3 key, when SW2-1 is On and SW2-2 is Off.

3.6 Test Oscillator

The MX-55 includes a three-frequency Test Oscillator for use in recording reference tones for level matching, and for alignment purposes. The Test Oscillator controls are located behind the Audio Amplifier access cover at the bottom of the front panel.

1. Open the Audio Amplifier access cover by loosening the screw at each side of the panel cover.
2. Set the OSC FREQ switch to the position corresponding to the desired frequency 100 Hz, 1 kHz, or 10 kHz.
3. Press the TEST OSC switch to activate the Test Oscillator.

3.7 Tape Editing

1. Play the tape until the head (beginning) of the portion which is to be removed is reached. Rotate the reels by hand to precisely locate the edit point at the Reproduce head.
2. Press the EDIT button. The indicator above the EDIT button will flash.
3. Grasp the tape in the space between the Capstan Shaft and the Tachometer Roller and remove the tape from the head assembly. Place the tape in the splicing block with the portion which was located between the Capstan Shaft and the Tachometer Roller at the right end of the splicing block. This places the portion of the tape which was at the Repro head over the cutting slot in the splicing block.
4. Cut the tape using a sharp blade.
5. Holding the tape at the beginning of the unwanted portion, thread the tape between the Pinch Roller and Capstan Shaft.
6. Press the PLAY button. Both EDIT and PLAY indicators illuminate. The tape will dump off the right side of the transport.
7. Stop the tape when the tail (end) of the unwanted portion is reached. Repeat Steps 3 and 4 to cut the tape and join the cut portions using splicing tape.

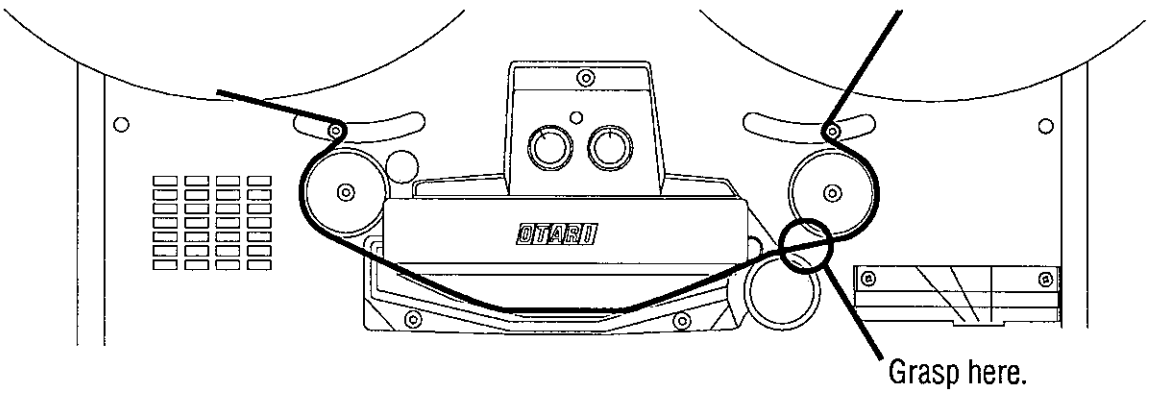


Figure 3-5
Editing the Tape

Section 4 Maintenance and Adjustment

This section describes the maintenance and adjustment procedures which are necessary to keep the MX-55 in peak operating condition, and when components are replaced for any reason.

4.1 Routine Maintenance

This section describes the maintenance procedures which 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.

4.1.1 Demagnetizing the Heads and Tape Path

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 damage to the MX-55, 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-55.

Never turn On or Off the power to the demagnetizer unless it is at least 3 feet (1 meter) away from the MX-55. This causes an extremely strong moving magnetic field 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-55 POWER switch.
2. With the demagnetizer at least 3 feet (1 meter) from the MX-55, plug the demagnetizer into the AC mains and turn it on.
3. Slowly move the demagnetizer toward the Supply Swing Arm until the tip is approximately 1/8" (3 mm) away from the arm.
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-55 WITH THE DEMAGNETIZER.
5. Slowly move the demagnetizer at least 3 feet (1 meter) away from the MX-55.

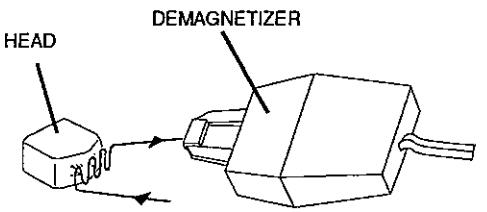


Figure 4-1
Demagnetizing the Heads

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 Swing Arm	**H.**	4TR Repro Head
B.	Guide Roller	**I.**	Take up Tape Lifter
C.	Supply Tape Guide	**J.**	2TR Repro Head
D.	Erase Head	**K.**	Take up Tape Guide
E.	Supply Tape Lifte	**L.**	Capstan Shaft
F.	Record Head	**M.**	Take up Swing Arm
G.	Center Tape Guide		

7. When all the above parts have been demagnetized, slowly move the demagnetizer at least 3 feet (1 meter) away from the MX-55 and turn it off or unplug it.

4.1.2 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 cause 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.

You should clean and demagnetize the entire tape path before performing any adjustments in this section.

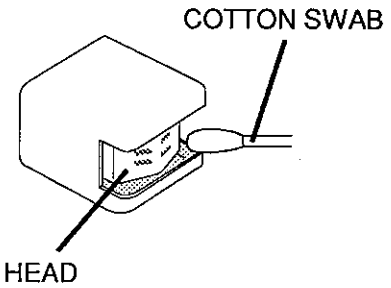


Figure 4-2
Cleaning the Heads

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

2. Moisten additional swabs and clean the following parts:

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.

A.	Supply Swing Arm	**I.**	Take up Tape Lifter
B.	Guide Roller	**J.**	2TR Repro Head
C.	Supply Tape Guide	**K.**	Take up Tape Guide
D.	Erase Head	**L.**	Capstan Shaft
E.	Supply Tape Lifter	**M.**	Pinch Roller
F.	Record Head	**N.**	Tachometer Roller
G.	Center Tape Guide	**O.**	Take-up Swing Arm
H.	4TR Repro Head		

4.1.3 Lubrication

The Capstan Motor in MX-55 machines utilize 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 Head Assembly Cover by pulling it away from the Deck Plate.
2. Remove the Pinch Roller by unscrewing its cap and removing the Pinch Roller from the shaft.
3. Remove the Head Assembly escutcheon by removing the three screws which attach it to the Deck Plate.
4. Remove the Head Assembly by removing the three socket head cap screws which attach it to the Deck Plate.
5. Remove the Deck Skin by removing the four hex socket screws (one at each corner) and lifting the panel off the machine.
6. Remove the white nylon dust cap from the Capstan Motor.
7. Remove the felt pad from on top of the bearing, and insert 3 drops of oil in the cavity surrounding the bearing.

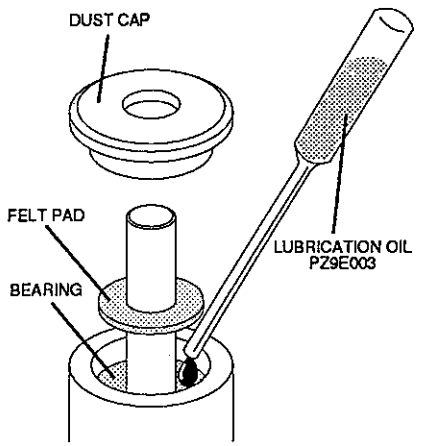


Figure 4-3
Capstan Motor Bearing Lubrication

Apply one drop of oil every 3 to 6 months depending on machine usage. Do not over lubricate, and be careful not to apply oil to the portion of the capstan shaft which contacts the tape.

4.2 Transport Alignment Procedures

Although the MX-55 Tape Transport does not require frequent alignment, re-alignment is required whenever any component is replaced.

We recommend that you check the performance of the machine at least every six months or every 2000 hours of operation, and perform adjustments if necessary.

The following is the list of tools and equipment required for transport alignment.

- ❑ 7" plastic reel with large hub
- ❑ Spring scale (0–2000 grams) Otari P/N YVP2050G
- ❑ Hand tools
- ❑ Reel of the tape type that is normally used for sessions
- ❑ 6' (2m) long piece of string
- ❑ Dual trace oscilloscope
- ❑ Otari Head Inker or marker pen for white board

4.2.1 Head Position Adjustment

IMPORTANT NOTE: Head azimuth adjustment procedures for the Repro and Record Heads are described in **§4.3**. The height, zenith and wrap of each head has already been adjusted at the factory, and do not require adjustment unless a head is replaced.

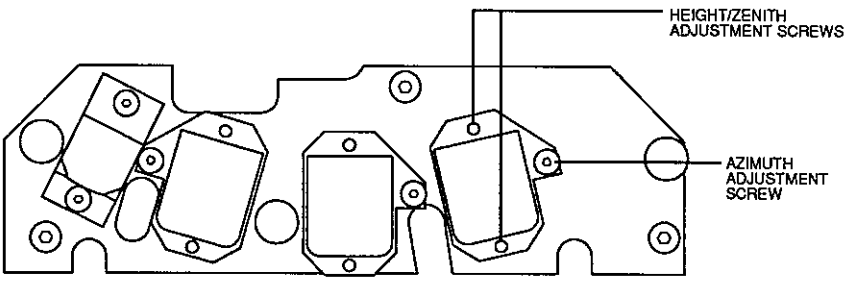


Figure 4-4
Head Position Adjustment Screws

1. Remove the Head Cover by pulling it away from the Deck Plate.
2. Thread the machine with unwanted tape, and visually adjust the head height and zenith using the 3mm set screws in front of, and behind each head.
3. After coarse adjustment visually, apply marker pen or head marking ink to the Record and Repro head surfaces. Place the machine into Play mode for approximately 2 minutes.
4. Carefully unthread the tape, and inspect the face of each head where the passage of the tape has worn away the ink.

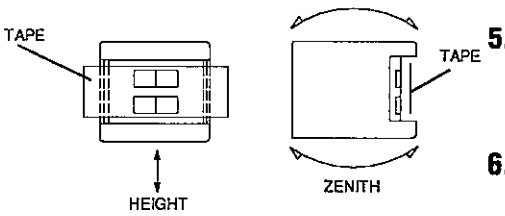


Figure 4-5
Head Height and Zenith adjustment

5. Adjust the head height and zenith and repeat steps 3 and 4 until the head gaps are exactly centered in the height of the wear pattern, and the wear pattern is rectangular rather than trapezoidal. Refer to **Figure 4-5**.
6. If adjustment of the head wrap is required, remove the head assembly by removing the Pinch Roller, Head Cover, and the Head Assembly Escutcheon. Then remove the three hex socket cap screws that attach the Head Assembly to the Deck Plate and lift the Head Assembly away from the Deck Plate.
7. Loosen the wrap adjustment screws (2 each for Record and Repro heads) slightly so that the heads can be moved by hand. Do not loosen the screws too much.

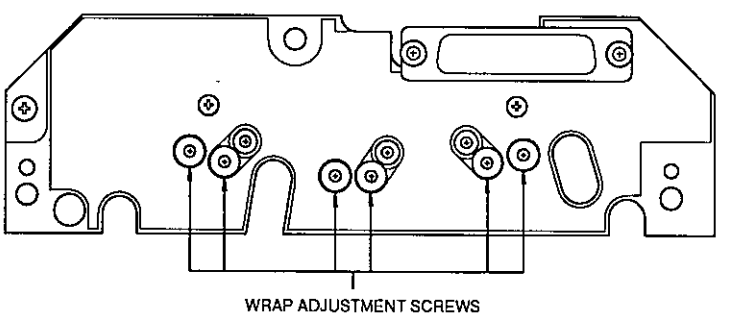


Figure 4-6
Bottom View of Head Assembly

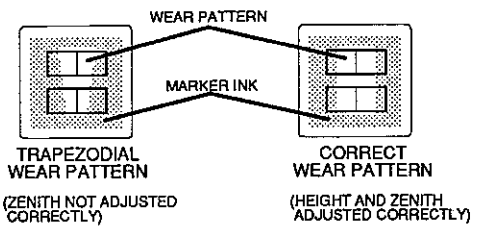


Figure 4-7
Wear Patterns

8. Replace the Head Assembly on the machine, ink the head as in Steps 3 and 4, and adjust the wrap until a suitable wear pattern is obtained.

9. When the wear pattern indicates that the wrap adjustment is correct, carefully remove the Head Assembly and tighten the wrap adjustment screws.

10. Replace the Head Assembly, mounting it with its screws, and clean and de-magnetize the Head Assembly.

NOTE: On the DIN version (MX-55D), the head height adjustment can be performed using the BASF 09800169XA or 09800169XB test tape.

4.2.2 Reel Table Height Adjustment

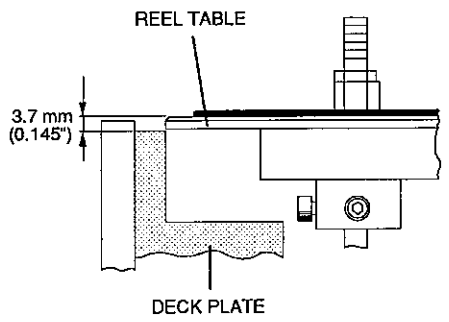


Figure 4-8
Measuring Reel Table Height

1. Remove the Head Cover and the Head Cover Escutcheon. Remove the Pinch Roller by removing the screw that secures it to its shaft, and lifting the Roller and Cap away from the shaft.

2. Remove the Deck Skin by removing the four hex socket screws (one at each corner) and lifting the panel off the machine.

3. Measure the distance from the top surface of the cast Deck Plate to the metal surface of the reel table. If the distance is 3.7 mm (0.145 in), then no adjustment is required. Refer to **Figure 4-8**.

4. If adjustment is required, take out 4 screws to remove the rear panel B (refer to **Figure 4-9**). Loosen the two M4 hex socket cap screws that hold the Reel Table to the Reel Motor Shaft using a 3 mm hex wrench inserted through the holes in the top of the machine and move the Reel Table in or out as required. Be very careful not to rotate the Reel Table in relation to the motor shaft. Tighten the screws.

5. Test the adjustment by threading the machine with tape on 7" reels, and entering Fast Forward mode (if adjusting the Take-up Reel Table) or Rewind (if adjusting the Supply Reel Table). Observe the tape as it is wound onto the Reel. If the tape winds onto the center of the reel, then the adjustment is correct.

6. Securely tighten the screws after adjustment.

CAUTION: IF YOU HAVE ANY DOUBT WHETHER THE SET SCREWS STILL ALIGNED WITH THE FLATS ON THE MOTOR SHAFT, DO NOT TIGHTEN THE SCREWS; LIFT THE REEL TABLE COMPLETELY OFF THE SHAFT AND INSPECT THE ALIGNMENT.

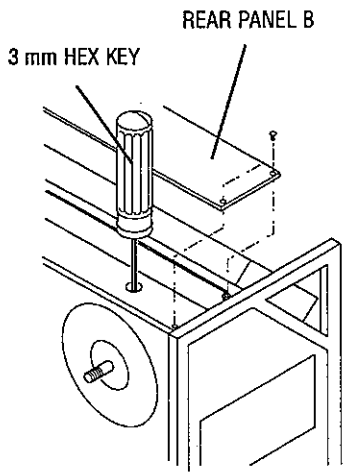


Figure 4-9
Adjusting Reel Table Height

4.2.3 Reel Brake Adjustment

1. Turn Off the Power to the machine.
2. Attach one end of a 6 feet (2 m) piece of string to the hub of a 7" large hub reel. Attach the other end of the string to the Spring Scale.
3. Place the reel on the Supply Reel Table so that the reel rotates counter-clockwise when the string is pulled. Refer to **Figure 4-10**.
4. Pull on the Spring Scale to unwind the string while noting the reading on the Spring Scale. Since the reading on the Spring Scale is dependent upon the speed with which the string is pulled, you should repeat the measurement two or three times and average the results.
5. If the average reading is 280 grams ±20 grams, then no adjustment is necessary.
6. Place the reel on the Take-up Reel Table, so the reel rotates clockwise when the string is pulled.
7. Repeat Step 4. If the average reading is 280 grams ±20 grams, then no adjustment is necessary.

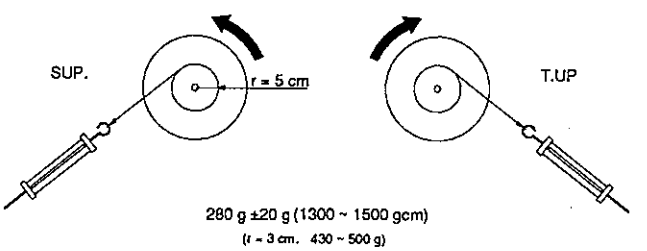


Figure 4-10
Reel Brake Tension Measurements

If the average reading obtained in Steps 4 and 7 is not correct, then the brake tension requires adjustment. Perform the following Steps only if adjustment is required.

8. Remove the Deck Skin by removing the four hex socket screws (one at each corner) and lifting the panel off the machine.
9. Remove the Reel Table Platter by removing the outer three screws around the platter.
10. Push the solenoid plunger into the solenoid, and while holding it, rotate the Reel Table. If the Brake Band rubs on the Brake Drum, loosen the two screws marked "**A**" in **Figure 4-11** and adjust the position of the Brake Solenoid so that the Band no longer rubs on the Drum.
11. To adjust the brake tension, loosen the screw marked "**B**" in **Figure 4-11**, and move the spring anchor to adjust the brake tension. Moving the Spring Anchor toward the solenoid increases the brake tension.
12. Repeat the measurements in Steps 4 and 6, and readjust if necessary.
13. Reinstall any parts removed, and tighten all screws.

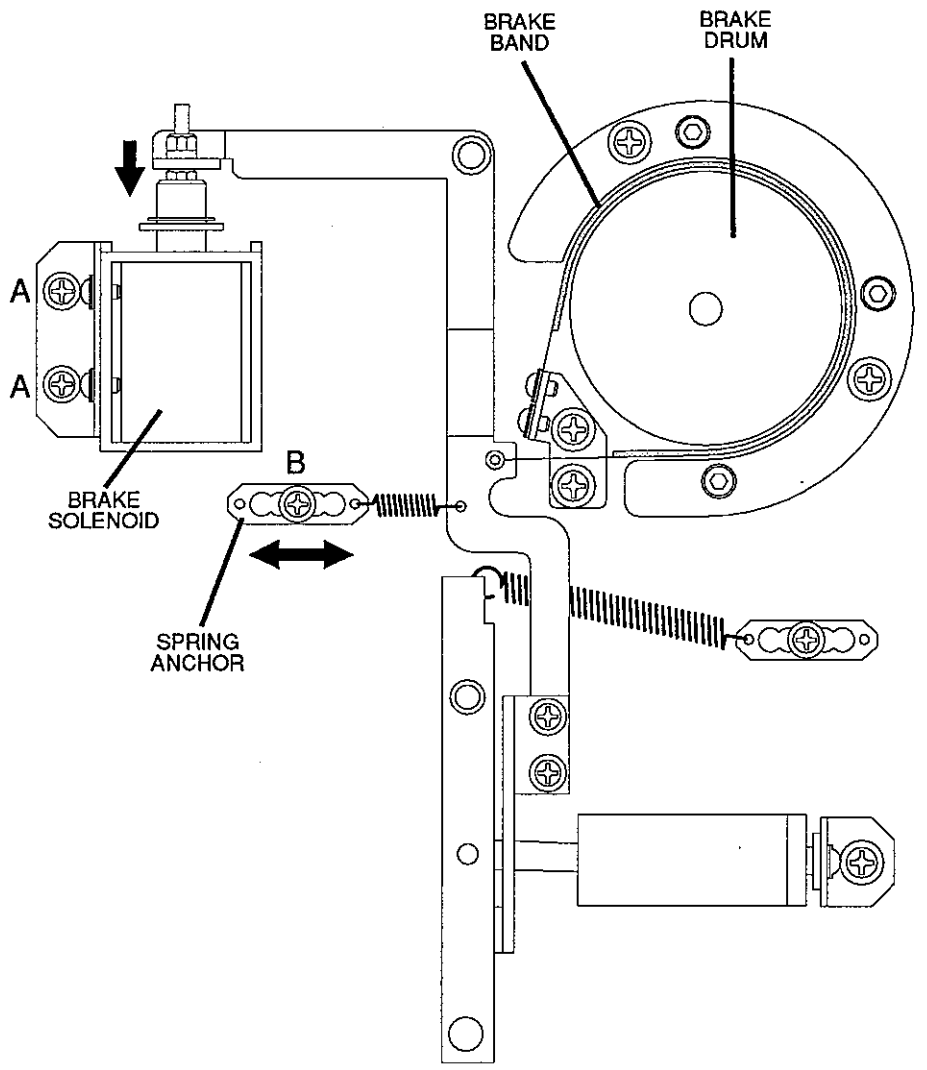


Figure 4-11
Reel Brake Adjustment

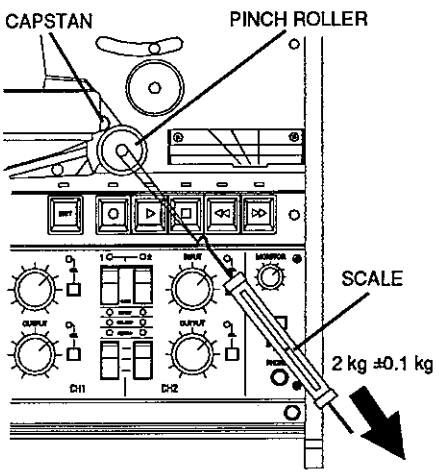


Figure 4-12
Pinch Roller Pressure Measurement

4.2.4 Pinch Roller Pressure Adjustment

1. Make a loop of string approximately 12" (30 cm) long and place it around the Pinch Roller Shaft.
2. Attach the Spring Scale to the free end of the loop.
3. Turn On the Power to the machine.
4. Press the EDIT and PLAY buttons so that the Pinch Roller engages the Capstan Shaft.
5. Pull on the Spring Scale until the Pinch Roller just becomes separated from the Capstan Shaft. Note the Spring Scale reading at that time. The Spring Scale reading should be 2000 grams ±200 grams. If the reading is correct then no adjustment is necessary.

Perform the following Steps only if adjustment is necessary.

6. Remove the Deck Skin by removing the four hex socket screws (one at each corner) and lifting the panel off the machine.
7. Adjust the Pinch Roller pressure by turning the Adjusting Nut on the Pinch Roller linkage between the Pinch Roller Solenoid and the Pinch Roller Arm. Turning the nut clockwise increases the Pinch roller pressure.
8. After adjustment is complete, reinstall any parts removed.

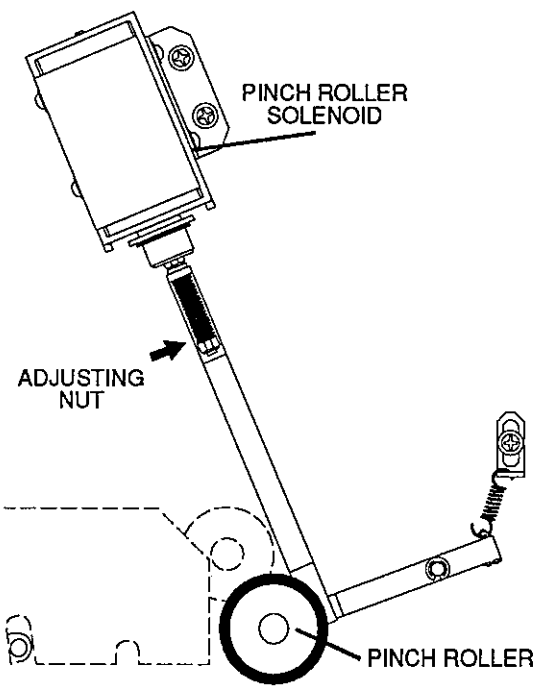


Figure 4-13
Pinch Roller Pressure Adjustment

4.2.5 Tape Lifter Adjustment

1. Remove the Head Housing.
2. Thread the machine with tape and press the F.FWD button or the REWIND button to place the machine in Fast Wind mode.
3. With the machine in Fast Wind mode, check the separation between the tape and the surface of the Tape Guide. If the separation is 1–1.5mm (0.04–0.06") then adjustment is not necessary.

Perform the following Steps only if adjustment is necessary.

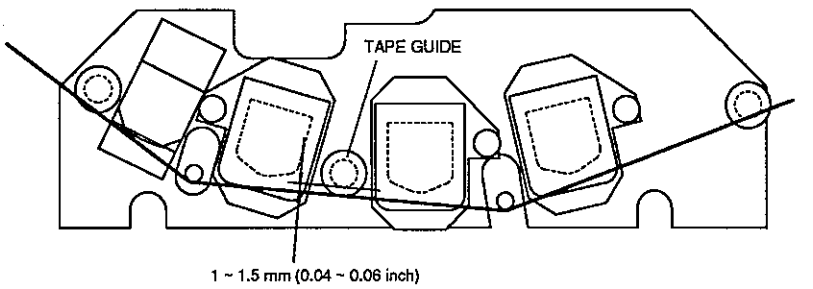


Figure 4-14
Tape Lifter Clearance Measurement

4. Remove the Deck Skin by removing the four hex socket screws (one at each corner) and lifting the panel off the machine.
5. Loosen the two screws that attach the Tape Lifter Solenoid to the Deck Plate, and adjust the Lifter clearance by sliding the Solenoid until the clearance between the tape and Tape Guide is correct (refer to **Figure 4-15**).
6. After adjustment is complete, reinstall any parts removed.

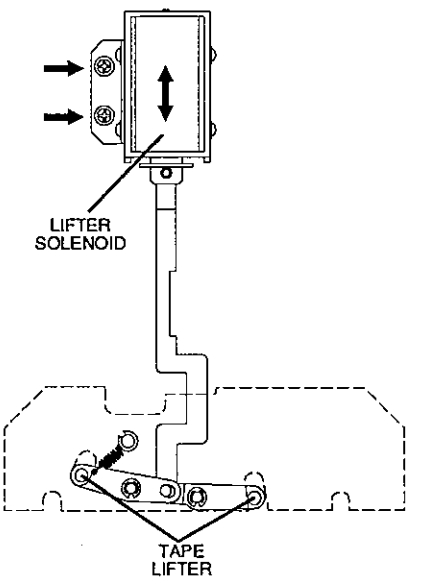


Figure 4-15
Tape Lifter Adjustment

4.2.6 Capstan Motor Servo Adjustment

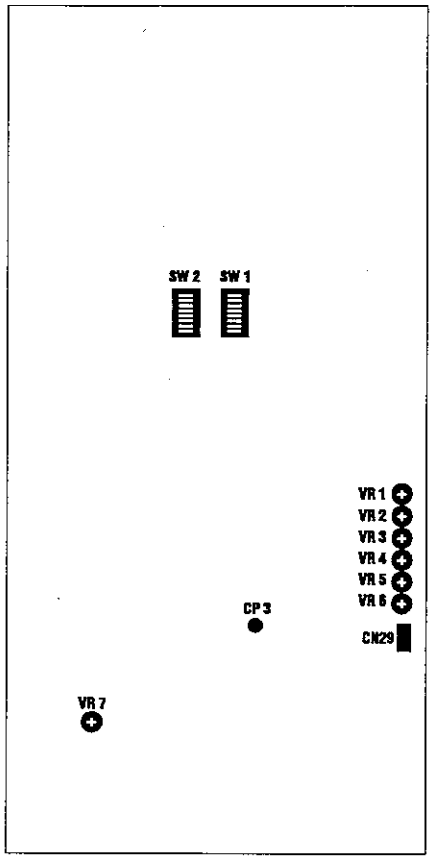


Figure 4-16
Transport Control PCB

This procedure is not necessary unless the Capstan Motor is replaced.

1. Open the Rear Panel to expose the TRANSPORT CONTROL PCB assembly (Refer to **Figure 5-2** in **Section 5**).
2. Thread the machine with tape and apply Power.
3. Set the Tape Speed to 15 ips, using the SPEED HI/LO button and, if necessary SW1-1 (Speed Pair) on the TRANSPORT CONTROL PCB assembly (Refer to **Figure 4-16**).
4. Connect the oscilloscope to Check Point CP3 and a GND point on the TRANSPORT CONTROL PCB assembly.
5. Set Jumper CN29 to the "**A**" position.
6. Press the PLAY button, and adjust the oscilloscope controls so that it shows one complete cycle of the 0–5 V square wave. Adjust VR7 so that the duty cycle of the displayed waveform is approximately 50%. After the adjustment is complete set Jumper CN29 back to the "**B**" position.
7. While still playing the tape, adjust VR6 so that the duty cycle is 50%.
8. While observing the oscilloscope, apply a load to the Capstan Motor by briefly pinching the Capstan Shaft between your thumb and forefinger. Adjust VR3 on the TRANSPORT CONTROL PCB assembly for minimum recovery time.
9. Set the Tape Speed to 7.5 ips, and repeat Step 7 using VR5, and then repeat Step 8 using VR2.
10. Set the Tape Speed to 3.75 ips, and repeat Step 7 using VR4, and then repeat Step 8 using VR1.
11. Disconnect the oscilloscope and close the Rear Panel of the machine. Clean the Capstan Shaft and Pinch Roller.

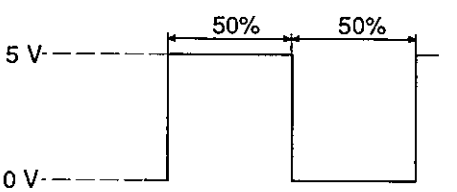


Figure 4-17
Capstan Wave Form Display

4.3 Audio Alignment

4.3.1 Tools and Equipment required

A. Reproducer Calibration Tapes suitable to the tape speed you will use most often. Otari Recommends the following Calibration Tapes.

Table 4-1
Calibration Tape for MX-55N

Tape Speed	Flux Level	MRL* Catalog No.
15 ips	250 nWb/m	21J05
7.5 ips	250 nWb/m	21T204
3.75ips	250 nWb/m	21F101-A

* Magnetic Reference Laboratories

Table 4-2
Calibration Tape for MX-55D

Tape Speed	Flux Level	EQ	BASF	Part No.Note
38 cm/s	510 nWb/m	35 µs	09800169XA	Level/Head Height
38 cm/s	320 nWb/m	35 µs	09795187XB	Calibration
19 cm/s	510 nWb/m	70 µs	09800169XB	Level/Head Height
19 cm/s	320 nWb/m	70 µs	09795187XE	Calibration
9.5cm/s	250 nWb/m	90+3180 µs	09795187XG	Calibration

B. An AC voltmeter calibrated in milliVolts and deciBels, having a high input impedance so as not to disturb the circuit under test.

C. A general purpose dual-trace oscilloscope such as those made by Tektronics, Leader, Hitachi, Hewlett-Packard, etc.

D. A sweepable test oscillator capable of generating sine waves at frequencies from 20 Hz to 20 kHz, at +4dBu (or whatever standard operating level your studio uses (such as -10 dBu, or +6 dBu, etc.).

E. A reel of tape of the type normally used for sessions.

F. Hand Tools.

G. A non-magnetic alignment screwdriver with a blade small enough to fit the trimmers on the PCBs.

H. A tape head demagnetizer (degausser).

I. Pure 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.

4.3.2 Preliminary Adjustments

These adjustments generally should be performed when first receiving the machine, and then again only when any audio component such as Heads are replaced (Refer to **Figure 4-18**).

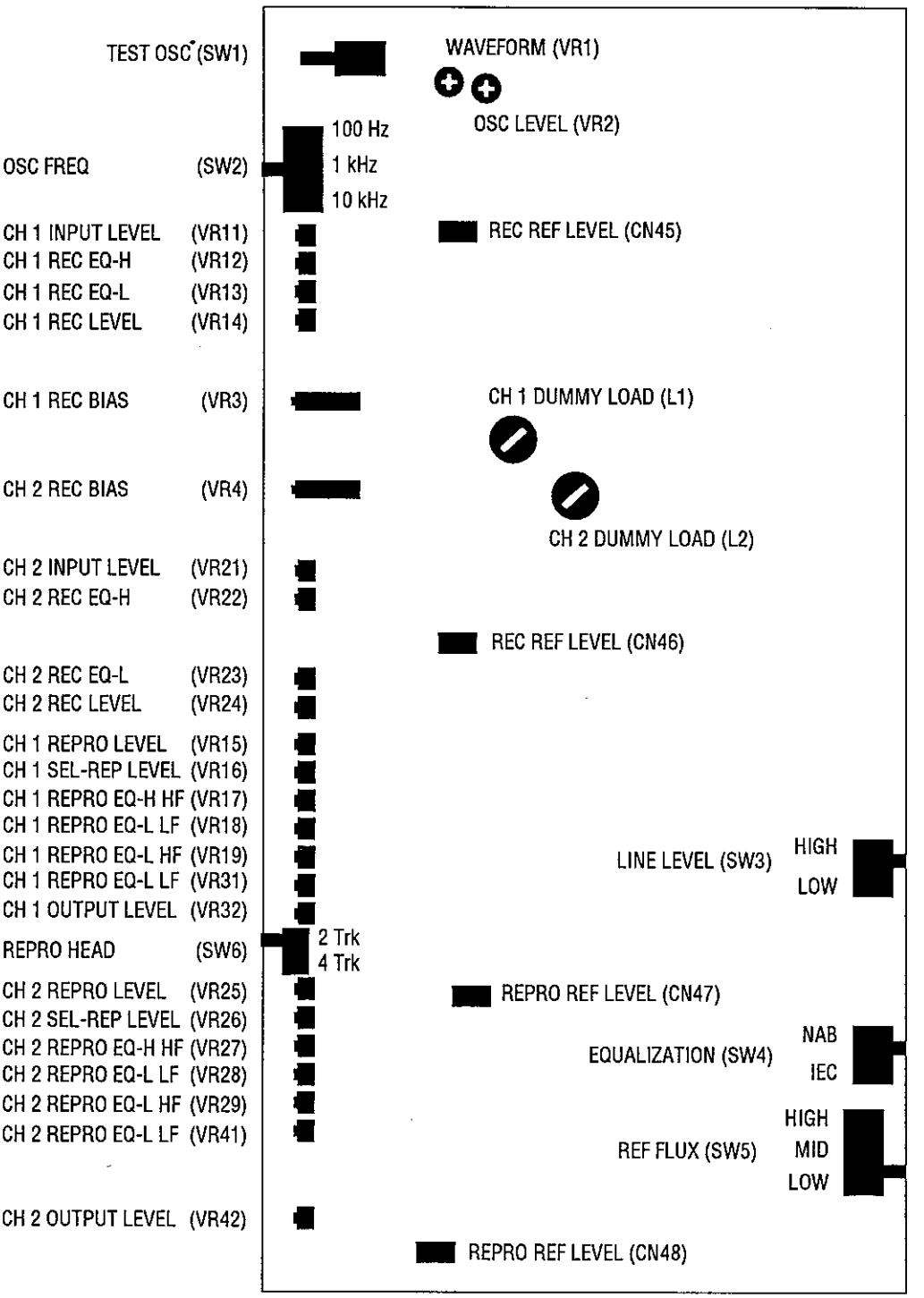


Figure 4-18
Location of Trimmers on AUDIO AMPLIFIER PCB Assembly

4.3.2.1 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.

NOTE: This adjustment should be done after level matching adjustment has been finished (Refer to **§4.3.4**).

The following adjustments are made on the OUTPUT AMPLIFIER PCB assembly. To gain access to the OUTPUT AMPLIFIER PCB assembly, open the Amplifier Panel by removing the 2 screws in the upper corners of the Amplifier Panel, and, with the machine on its back, lifting the Amplifier Panel slightly and rotating it down on its hinges.

1. In the Table below, locate the Flux level at which you operate the MX-55. The input level corresponding to 1040 nWb/m is the "Additional Level" above the level which causes the VU Meter to indicate 0 VU.

Table 4-3
Reference Level and Peak Indication Level

NAB version		DIN version	
Flux Level	Additional Level	Flux Level	Additional Level
185 nWb/m	15.0 dB	250 nWb/m	12.4 dB
250 nWb/m	12.4 dB	320 nWb/m	10.3 dB
370 nWb/m	9.0 dB	510 nWb/m	6.1 dB

2. Adjust the external test oscillator to produce 1 kHz sine waves at the "Additional Level" plus your normal operating level (e.g., for -10 dBu operating level at 250 nWb/m, set the oscillator for +2.4 dBu).
3. Connect the oscillator to the CH1 INPUT connector.
4. Press the CH1 INPUT SRL switch so the SRL indicator becomes illuminated (SRL On).
5. Adjust VR1 on the OUTPUT AMPLIFIER PCB assembly, located on the rear of the VU Meter, until the PEAK Indicator in the VU Meter just becomes illuminated.
6. Repeat Steps 3 through 5 for CH 2 using VR 2.

4.3.2.2 Test Oscillator Waveform and Level Adjustments

1. Open the drop-down door at the bottom of the front of the machine to gain access to the AUDIO AMPLIFIER PCB assembly.
2. Connect the input to one channel of the oscilloscope to the CH 1 OUTPUT connector.
3. Press the CH1 OUTPUT SRL button and set the CH 1 INPUT/SEL-REP/REPRO switch to the Input position.
4. Set the OSC FREQ switch (SW2) on the AUDIO AMPLIFIER PCB assembly to the 1K position.

5. Press the TEST OSC button (SW1) to activate the Test Oscillator.

6. Open the Amplifier Panel to gain access to the top of the AUDIO AMPLIFIER PCB assembly by removing the 2 screws in the upper corners of the Amplifier Panel, and, with the machine on its back, lifting the Amplifier Panel slightly and rotating it down on its hinges.

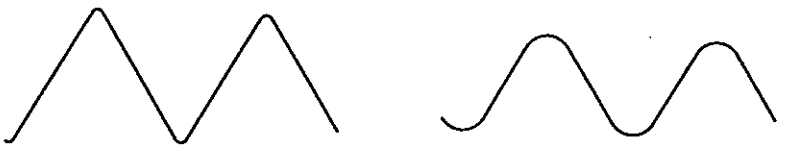


Figure 4-19
Test Oscillator Waveform

7. Adjust VR 1 on the AUDIO AMPLIFIER PCB assembly, so that the waveform displayed on the oscilloscope is most like a sine wave.

8. Adjust VR 2 so that the VU Meter indicates 0 VU.

9. After the adjustment is completed, press the TEST OSC button to deactivate the Test Oscillator.

4.3.2.3 Bias Oscillator Transformer Dummy Load Adjustment

NOTE: This adjustment is not required except when the Heads are replaced.

1. Open the Amplifier Panel to gain access to the top of the AUDIO AMPLIFIER PCB assembly by removing the 2 screws in the upper corners of the Amplifier Panel, and, with the machine on its back, lifting the Amplifier Panel slightly and rotating it down on its hinges.

2. Connect the oscilloscope between the Check Point E1 and the adjacent GND Check Point on the front of AUDIO AMPLIFIER PCB assembly.

3. Thread the machine with a reel of the tape normally used for sessions and place both channels in Record mode by setting the both READY/SAFE switches to the Ready position and then pressing PLAY and RECORD simultaneously.

4. While recording on both channels, repeatedly switch between Ready and Safe on channel 2 while observing the waveform on the oscilloscope.

5. Adjust L2 on the AUDIO AMPLIFIER PCB assembly for minimum difference in the waveform when changing modes.

6. Repeat Steps 2 through 5 for channel 1 using Check Point E2 and inductor L1 while going into and out of Record on channel 1.

4.3.3 Reproduce Electronics Adjustments

NOTE: The procedure in **§4.3.4.1** adjusts the Input and Output levels of the MX-55 to match your chosen studio operating level. In the procedures that follow, it is assumed that your chosen studio operating level is +4 dBu. If your chosen studio operating level is different, then change the references to +4 dBu to the level you have chosen.

4.3.3.1 Precautions Before Making Adjustments

These procedures should be completed before any alignment procedures are performed.

a. Check that the Level Matching procedures in **§4.3.4.1** have been performed.

b. Check to be sure that the REF FLUX, EQUALIZATION, and LINE LEVEL switches are correctly set to conform with your usual studio practices.

c. Clean and Demagnetize the tape path.

4.3.3.2 Head Azimuth Adjustment

NOTE: Reproduce Head Azimuth alignment for Full-Track machines is performed by adjusting the Full-Track Reproduce head for maximum output while playing the 10 kHz portion of the Reproduce Alignment tape, and then adjusting again using the 16 kHz portion of the tape.

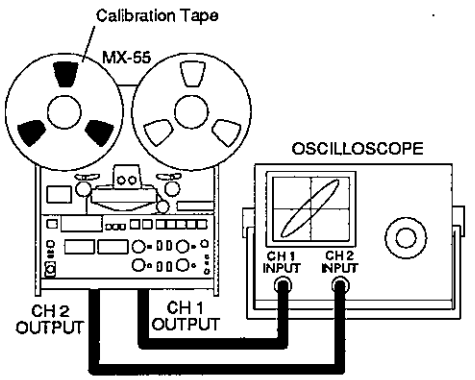


Figure 4-20
Azimuth Test Set-up

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 the 15 ips Reproducer Calibration Tape.

4. Set the REEL SIZE SUP and T.UP selectors to the Large position, set the SPEED selector to the High (15 ips) position, and set both READY/SEL-REP/REPRO switches to the Repro position.

NOTE: It is helpful to engage the built-in Monitor Speaker by pressing the Monitor buttons, immediately above the PHONES connector, and adjusting the speaker volume to a comfortable level with the MONITOR level control.

5. Connect one oscilloscope input channel to the CH 1 LINE OUTPUT connector on the rear panel. Connect the other oscilloscope input channel to the CH 2 LINE OUTPUT connector. Configure the oscilloscope to display the input waveforms as a "lissajous" pattern using the X-Y display function.

6. Adjust the oscilloscope controls so that both signals have equal amplitude when displayed.

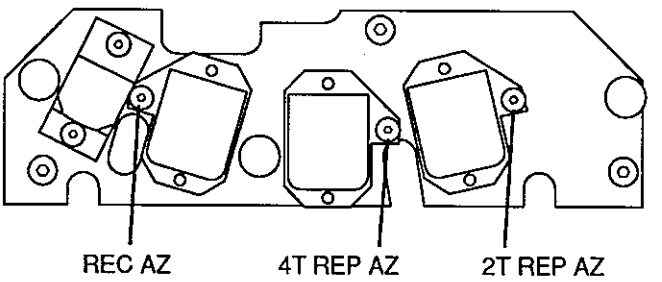


Figure 4-21
Azimuth Adjustment screws

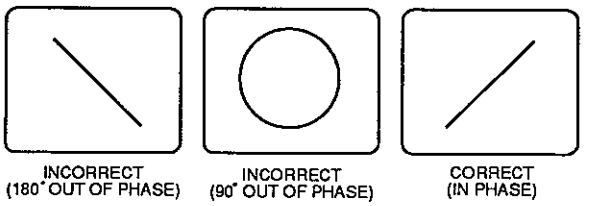


Figure 4-22
Azimuth Adjustment Displays

7. Locate and play the 1 kHz portion of the Reproducer Calibration tape and adjust the screw marked "**2T REP AZ**" (2 Tr Repro Azimuth) in **Figure 4-21**, until the pattern on the oscilloscope becomes a straight line at a 45 degree angle as shown in **Figure 4-22**.

8. Play each increasing frequency section of the Reproducer Calibration tape (2 kHz, 4 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz, and 20 kHz) and adjust the screw marked "**2T REP AZ**" until the pattern on the oscilloscope becomes a straight line at a 45 degree angle, at each frequency, as shown in **Figure 4-22**.

9. Set the REPRO HEAD switch on the AUDIO AMPLIFIER PCB assembly to the 4 Tr position.

10. Repeat Steps 7 and 8 for the 4 track Reproduce Head (the head in position 2 on the Head Assembly), using screw "**4T REP AZ**" for adjustment.

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.

4.3.3.3 Reproduce Level Adjustment

If the machine is to be used primarily at 15 ips, perform the following procedure at 15 ips. If the machine is to be used primarily at 7.5 ips then perform this procedure at 7.5 ips.

1. Connect the AC Voltmeter to the CH 1 OUTPUT connector.
2. Thread the machine with the Reproducer Calibration Tape, press the OUTPUT SRL switches for both CH1 and CH2 and set both READY/SAFE switches to the Safe position. Set both INPUT/SEL·REP/REPRO switches to the Repro position.
3. Play the 1 kHz at Reference Level portion of the Reproducer Calibration Tape.
4. Adjust the CH1 REPRO LEVEL trimmer (VR15) on the AUDIO AMPLIFIER PCB assembly so that the AC voltmeter indicates +4 dBu.
5. Repeat Steps 3 and 4 for channel 2 using the CH 2 REPRO LEVEL trimmer (VR25).

4.3.3.4 Reproduce Equalization Adjustment

NOTE: This procedure adjusts the High Frequency Reproduce Equalization. The Low Frequency Reproduce Equalization is adjusted during the Record Alignments. Due to the fringing effect which occurs at low frequencies, adjusting the Low Frequency Reproduce Equalization using the Reproduce Alignment Tape does not produce accurate results.

1. Thread the machine with the 15 ips Reproducer Calibration tape.
2. Set the SPEED LO/HI switch to the Hi position.
3. Set both READY/SAFE switches to the Safe position. Set both INPUT/SEL·REP/REPRO switches to the Repro position, and press both OUTPUT SRL buttons (SRL On).
4. Play the 10 kHz portion of the Reproducer Calibraion tape and adjust the CH 1 REP EQ HF H (VR17) trimmer until the AC voltmeter indicates +4 dBu.
5. Adjust the CH 2 REP EQ HF H trimmer (VR27) until the AC Voltmeter indicates +4 dBu.
6. Thread the machine with the 7.5 ips Reproducer Calibration tape.
7. Set the SPEED LO/HI switch to the Lo position.
8. Play the 10 kHz portion of the Reproducer Calibration tape and adjust the CH 1 REP EQ HF L (VR19) trimmer until the AC voltmeter indicates -6 dBu.

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

9. Adjust the CH 2 REP EQ HF L trimmer (VR29) until the AC voltmeter indicates -6 dBu.

4.3.4 Record Electronics Adjustments

4.3.4.1 Level Matching — Input/Output Level Adjustment

NOTE: The MX-55 is preset at the factory for +4 dBu input and output levels. Perform this procedure only if your studio input and output levels are different.

1. Set the LINE LEVEL HIGH/LOW switch on the Connector Panel to the position which corresponds to your studio operating level. If your operating level is +4 dBu or greater, then set the switch to the High position, if your studio operating level is -10 dBV then set the switch to the Low position.
2. Set the external test oscillator so that it produces 1 kHz sine waves at your chosen studio operating level (e.g., -10 dBV).
3. Set both INPUT/SEL·REP/REPRO switches to the Input position.
4. Press both INPUT SRL buttons, so that the SRL indicators become illuminated (SRL On).
5. Open the drop-down door at the bottom of the front of the machine to gain access to the AUDIO AMP PCBassembly.
6. Connect the oscillator to the CH 1 INPUT connector. Connect the external AC Voltmeter to the CH 1 OUTPUT connector.
7. Adjust the CH 1 INPUT trimmer (VR11) until the CH1 VU Meter indicates 0 VU.
8. Adjust the CH 1 OUTPUT trimmer (VR32) until the external AC Voltmeter indicates your chosen studio operating level (e.g., -10 dBV)
9. Repeat Steps 6, 7 and 8 for CH 2, using the CH 2 INPUT and OUTPUT connectors, VR21 for INPUT LEVEL and VR42 for OUTPUT LEVEL.

4.3.4.2 Record Bias Level Adjustment

1. Thread the MX-55 with the tape type that you normally use for sessions.
2. Set both READY/SAFE switches to the Ready position, set both INPUT/SEL·REP/REPRO switches to the Input position, and set the SPEED HI/LO switch to the Hi (15 ips) position.
3. Set the OSC FREQ switch on the AUDIO AMPLIFIER PCB assembly to the 10K position and press the TEST OSC button to activate the Test Oscillator.
4. If either channel INPUT SRL indicator is illuminated, then press the corresponding INPUT SRL button(s) to activate the Input Level control(s) (SRL Off).
5. Set both Input Level controls so that the VU Meters indicate approximately -10 VU.
6. Place the machine in Record mode, and set both INPUT/SEL·REP/REPRO switches to the Repro position.
7. Set the CH 1 BIAS trimmer (VR3) fully counterclockwise. While observing the CH 1 VU Meter, turn the CH 1 BIAS trimmer clockwise until a peak in the indication on the VU Meter is observed.
8. Continue turning the CH 1 BIAS trimmer clockwise until a decrease equal to the selected Overbias amount is observed. Refer to **Table 4-4** for Overbias amounts for various tape types and other tapes and other tape speeds.
9. Repeat Steps 5 through 8 for channel 2 using the CH 2 BIAS trimmer.

Table 4-4
Recommended Bias

Tape Speed (ips) **Frequency (Hz)**	**3.75** **10 k**	**7.5** **10 k**	**15** **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 SPR50LH/50LHL			
BASF SM911	8.0	5.0	3.0
SCOTCH 206/207	7.0	4.5	2.7
SCOTCH 226/227	8.0	4.0	3.5
SCOTCH 250			

4.3.4.3 Record Head Azimuth Adjustment

1. Thread the machine with a reel of the tape type usually used for sessions.

2. Set both READY/SAFE switches to the Ready position, and set both INPUT/SEL·REP/REPRO switches to the Repro position.

3. Connect an external oscillator to both rear panel INPUT connectors. Connect one channel of the dual-trace oscilloscope to each of the rear panel OUTPUT connectors as shown in **Figure 4-23**. Configure the oscilloscope to display the input signals as a lissajous pattern.

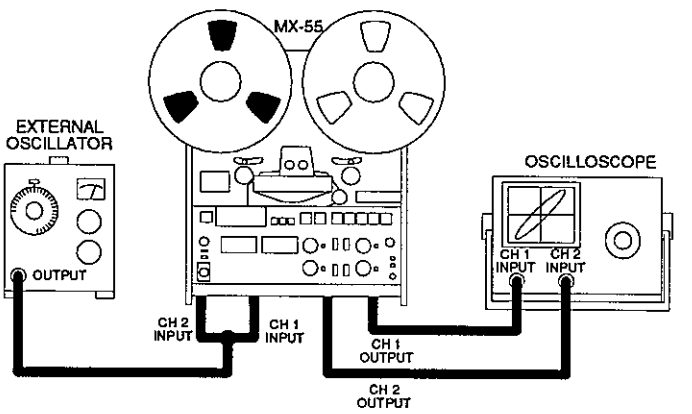


Figure 4-23
Record Azimuth Adjustment Setup

4. Set the external oscillator to produce 1 kHz sine waves +4 dBu or at your chosen studio level.

5. Place the machine in Record mode.

6. Adjust the Record Head Azimuth adjustment screw until the display on the oscilloscope becomes a straight line at 45 degrees as shown in **Figure 4-24**.

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 4-24**.

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 4-24**.

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.

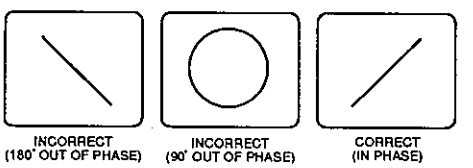


Figure 4-24
Record Head Azimuth Oscilloscope Displays

4.3.4.4 Record Level Adjustment

1. Thread the machine with tape and set the Speed Pair and SPEED select switches for the Tape Speed that you most often use.

2. Set both channel's READY/SAFE switches to the Ready position, select Repro monitor, and check to make sure both OUTPUT SRL switches are engaged (SRL indicators illuminated).

NOTE: If you are performing this adjustment at 7.5 ips, then disengage both INPUT SRL switches, select Input monitor, and set the INPUT level controls so the VU Meters indicate -10 VU. Then switch back to Repro monitor mode.

3. Set the OSC FREQ switch (SW2) on the AUDIO AMPLIFIER PCB assembly to the 1K position, and press the TEST OSC button (SW1) to activate the Test Oscillator.

4. Press the PLAY and RECORD buttons simultaneously to begin Recording.

5. Adjust the CH 1 REC LEVEL trimmer (VR14) and the CH 2 REC LEVEL trimmer (VR24) so that both VU Meters indicate 0 VU (-10 VU if you are aligning at 7.5 ips).

6. Check to see that there is no difference in the indication on the VU Meters when switching between Input and Repro monitor modes.

4.3.4.5 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.
2. Set the OSC FREQ switch to the 10 kHz position, and press the TEST OSC button to activate the internal Test Oscillator.
3. If this procedure is being performed at 15 ips, then press the CH 1 INPUT SRL button to engage the SRL. If this procedure is being performed at 7.5 ips then disengage the CH 1 INPUT SRL button and set the CH 1 Input Level control so that the CH 1 VU Meter indicates 10 VU.
4. Set both INPUT/SEL-REP/REPRO switches to the Repro position. Set both READY/SAFE switches to the Ready position, and press the PLAY and RECORD buttons simultaneously to begin Recording.
5. Adjust the CH 1 REC EQ-H trimmer (VR12) on the AUDIO AMPLIFIER PCB assembly until the VU Meter indicates 0 VU (-10 VU at 7.5 ips).
6. Adjust the CH 2 REC EQ-H trimmer (VR22) until the VU Meter indicates 0 VU (-10 VU at 7.5 ips).
7. Set the SPEED select switch to the Lo position, and repeat Steps 3 through 6 using the CH 1 REC EQ-L trimmer (VR13) and CH 2 REC EQ-L trimmer (VR23).

NOTE: If High Speed Equalization was performed at 15 ips then reset the levels to -10 VU when changing to Lo Speed. If High Speed Equalization was performed at 7.5 ips then reset the levels to -20 VU when performing Equalization adjustment at 3.75 ips.

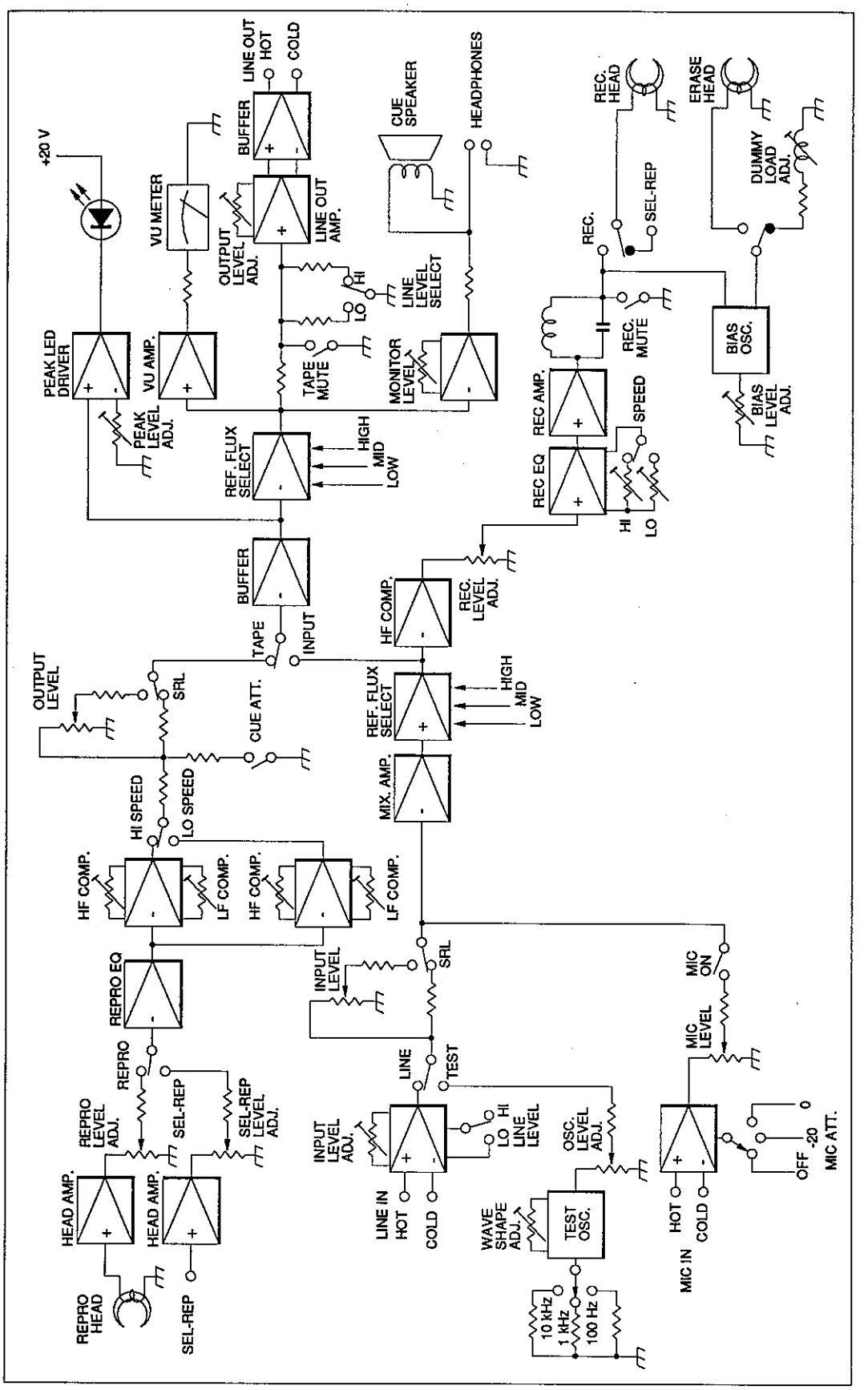
4.3.4.6 Low Frequency Reproduce Equalization Adjustment

1. Set the OSC FREQ switch to the 100 Hz position, and press the TEST OSC button to activate the internal Test Oscillator.
2. Press both INPUT SRL and both OUTPUT SRL buttons to engage the SRL circuits (indicators illuminated). If you are performing this adjustment at 7.5 ips then disengage both INPUT SRL buttons, and adjust the INPUT level controls for -10 VU. Select Repro monitor mode.
3. Set the SPEED selector to the Hi position.
4. Press PLAY and RECORD simultaneously to begin recording.
5. Adjust CH 1 REP EQ H-LF (VR18) until the CH 1 VU Meter indicates 0 VU (-10 VU at 7.5 ips).
6. Adjust the CH 2 REP EQ H-LF (VR28) until the CH 2 VU Meter indicates 0 VU (-10 VU at 7.5 ips).

7. Set the SPEED select to the Lo position.
8. Press PLAY and RECORD simultaneously to begin recording.
9. Adjust CH 1 REP EQ L-LF (VR31) until the CH 1 VU Meter indicates 0 VU (-10 VU at 7.5 ips).
10. Adjust the CH 2 REP EQ L-LF (VR41) until the CH 2 VU Meter indicates 0 VU (-10 VU at 7.5 ips).
11. If you are using an external oscillator, sweep it from 30 Hz to 250 Hz and verify that the frequency response is within +2 dB.

4.3.4.7 Sel-Rep Level Adjustment

1. Thread the machine with the tape type normally used for sessions, and place both channels into Record mode.
2. Set the TEST OSC FREQ SELECT switch to the 1K position, and press the TEST OSC button to activate the test oscillator.
3. Press both INPUT SRL buttons so that the indicators become illuminated (SRL On).
4. After recording approximately 30 seconds of 1 kHz tone on the tape, rewind the tape to the starting point.
5. Set both READY/SEL·REP/REPRO switches to the Sel·Rep position.
6. Adjust the CH 1 SEL·REP LEVEL trimmer (VR16) on the AUDIO AMPLIFIER PCB assembly so that the CH 1 VU Meter indicates 0 VU.
7. Adjust the CH 2 SEL·REP LEVEL trimmer (VR26) so that the CH 2 VU Meter indicates 0 VU.


+20 V
PEAK LED DRIVER
PEAK LEVEL ADJ.
VU METER
VU AMP.
BUFFER
LINE OUT HOT
COLD
LINE OUT AMP.
OUTPUT LEVEL ADJ.
HI
LO
LINE LEVEL SELECT
TAPE MUTE
MONITOR LEVEL
CUE SPEAKER
HEADPHONES
REC. HEAD
ERASE HEAD
REC.
SEL-REP
DUMMY LOAD ADJ.
REC. MUTE
BIAS OSC.
BIAS LEVEL ADJ.
REC AMP.
REC EQ
SPEED
REF. FLUX SELECT
HIGH
MID
LOW
BUFFER
TAPE
INPUT
HF COMP.
REC. LEVEL ADJ.
OUTPUT LEVEL
SRL
CUE ATT.
REF. FLUX SELECT
HIGH
MID
LOW
MIX. AMP.
HI SPEED
LO SPEED
HF COMP.
LF COMP.
HF COMP.
LF COMP.
REPRO EQ
INPUT LEVEL
SRL
MIC ON
MIC LEVEL
REPRO
SEL-REP
SEL-REP LEVEL ADJ.
REPRO LEVEL ADJ.
LINE
TEST
INPUT LEVEL ADJ.
LO HI LINE LEVEL
OSC. LEVEL ADJ.
HEAD AMP.
HEAD AMP.
LINE IN
HOT
COLD
WAVE SHAPE ADJ.
TEST OSC.
MIC IN
HOT
COLD
0
OFF -20
MIC ATT.
REPRO HEAD
SEL-REP
10 kHz
1 kHz
100 Hz

Section 5 Installation and Setup

5.1 Uncrating and Inspection

5.1.1 Uncrating

We recommend that you open the carton carefully and retain the packing materials at least until proper operation of the machine has been established. When sending the machine back to Otari or to your Otari dealer, follow the packing directions printed on the carton.

CAUTION: The MX-55 weighs approximately 30 kg (67 lb.). Although uncrating and installation can be done by one person, it is recommended that you do these procedures with an another person.

NOTE: Machines delivered in the United States are uncrated and inspected by Otari Corporation before shipment to the dealer making these inspection steps necessary only if the machine has been recrated for delivery to your facility. Even so it recommended that the checks and inspections in this Section be performed to become familiar with the machine.

The carton contains the following standard accessories:

Table 5-1
Standard Accessories

Item	Parts No.	Quantity	Notes
Reel Adapter	KW0HV	2	
AEG Hub Adapter	ZA-5AW	2	MX-55D only
10.5" Empty Reel	ZA-51A	1	MX-55N only
Power Cord	PZ9D003	1	
Fuse 1A	FH7F010	2	
Fuse 2A	FH7F020	4	
Fuse 5A	FH7F050	1	
Fuse 5A	FH9-007	1	slow blow
Foot	CY-4108	2	for horizontal Installation
Lubrication Oil	PZ9E003	1	PZ9E003

5.1.2 Inspection

Before making any electrical connections, inspect the machine visually. If there is any evidence of damage due to rough handling during transportation, a claim should be filed with the transportation company. Do not connect or operate the MX-55 until the inspection has been completed, and any damage identified and corrected if necessary.

5.1.2.1 AUDIO AMPLIFIER PCB Assembly

1. Open the Amplifier Panel as shown in **Figure 5-1**, and inspect the AUDIO AMPLIFIER PCB assembly. Check to make sure that all the connectors on the PCB are firmly seated.

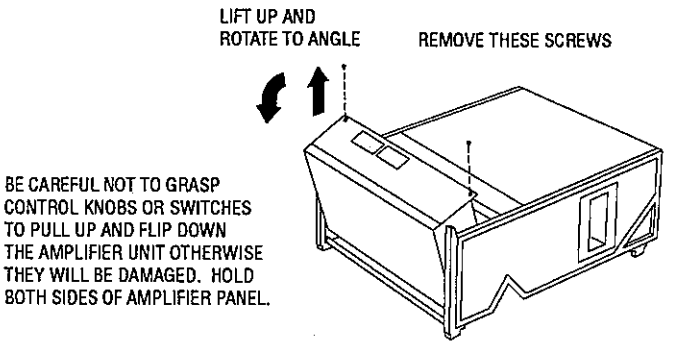


Figure 5-1
Opening the Amplifier Panel

2. Check that the piggy back PCB connected at CN45, CN46, CN47, and CN48 are appropriate for the reference flux levels selected. If your machine is an MX-55N, the piggyback PCBs are PB-7NAA and PB-7MZA and should have NAB labels. If your machine is an MX-55D, the piggyback PCBs are PB-7NAB and PB-7MZB and should have DIN labels.

3. Check the position of each of the five switches on the PCB.

	MX-55N	MX-55D
SW1	Off	Off
SW2	1K	1K
SW3	H	H
SW4	NAB	DIN
SW5	M	M

4. Check the connection to the OUTPUT AMPLIFIER PCB assembly (PB-1AFA) which is located behind the VU Meter Panel.

5. Check the position of each UNBAL/BAL switch on the OUTPUT AMPLIFIER PCB assembly.

6. Check the connection to the MONITOR AMPLIFIER PCB assembly (PB-19XA) behind the Amplifier Panel.

7. Check the HEAD AMPLIFIER PCB assembly located immediately behind the Head Assembly.

8. When the inspection is successfully completed, close the Amplifier Panel.

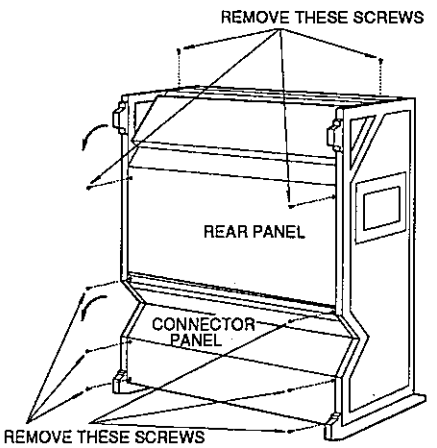


Figure 5-2
Opening the Rear Panel

5.1.2.2 TRANSPORT CONTROL PCB Assembly

1. Open the Rear Panel of the machine as shown in **Figure 5-2** to inspect the TRANSPORT CONTROL PCB assembly (PB-4HHA).
2. Check all the connectors leading to the PCB assembly.
3. Check the settings of the DIP Switches on the PCB assembly.

Table 5-2
DIP Switch Positions

SW1-1: Speed Pair Select (Factory Setting = off)
- **ON** Low Speed Pair (7.5/3.75 ips)
- **off** High Speed Pair (15/7.5 ips)

SW1-2: Record Punch In (Factory Setting = off)
- **ON** Press PLAY with RECORD held pressed to enter Record
- **off** Press RECORD to enter Record

SW1-3: Record Punch Out (Factory Setting: off)
- **ON** Press STOP with RECORD held pressed to leave Record
- **off** Press PLAY to leave Record mode

SW1-4: Tape Speed/Reel Size Select method (Factory Setting: ON)
- **ON** Press TAPE SPEED/REEL SIZE key twice within one second, or hold the key pressed for more than one second to change Tape Speed/Reel Size
- **off** Press TAPE SPEED/RREL SIZE with CLR held pressed to change Tape Speed/Reel

SW1-5: IEC or NAB-J Equalization Select — When off, IEC is selected by Rear Panel EQ switch)
- **ON** NAB-J Equalization
- **off** IEC Equalization

SW1-6–SW1-8: Not Used

SW2-1, SW2-2: SEARCH 3 key Function Select* (Factory Setting: off/off)
- **ON/ON** Foil Sensor On/Off
- **ON/off** Search Start
- **off/ON** Fader Control
- **off/off** Normal Search 3 operation

SW2-3, SW2-4: Foot Switch Function Select — when SW2-1 and SW2-2 are off/off (Factory Setting: off/off)
- **ON/ON** VEM On/Off
- **ON/off** Reel Brake Release
- **off/ON** Search Start**
- **off/off** Punch In/Out

SW2-3, SW2-4: Fader Control Function Select — when SW2-1 is off and 2-2 is ON (Factory Setting: off/off)
- **ON/ON** Fader Controls only Stop mode
- **ON/off** Same as above
- **off/ON** Record cannot be entered by Fader Control
- **off/off** Fader Controls on any mode

SW2-5: Fader Control Logic Level*** (Factory Setting: off)
- **ON** Active High or normally closed contact
- **off** Active Low or normally open contact

SW2-6: Special Fader Control Mode Select (Factory Setting: off)
- **ON** Transport Controls Enabled in Fader Control mode
- **off** Transport Controls Disabled in Fader Control mode

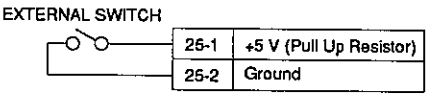
SW2-7, SW2-8: Not Used

NOTE

*When SW2-1 and SW2-2 are both off then the SEARCH 3 key functions to store and search to any selected tape location. When SW2-1 is off and SW2-2 is ON then the SEARCH 3 key functions as Fader Control Enable/Disable switch. When Fader Control is Enabled, the normal Transport Control buttons are disabled unless SW2-6 is ON.

**When SW2-3 is off and SW2-4 is ON, or when SW2-1 is ON and SW2-2 is off, then pressing the SEARCH 3 key, or closing the foot switch contact, causes the MX-55 to search to the last location at which the machine was placed in Play mode.

***Selection of Logic Level for external control signal: Connector CN25 on the TRANSPORT CONTROL PCB assembly is wired as shown below.



5.1.2.3 Power Supply Voltage Selector inspection

After checking the position of the switches on the TRANSPORT CONTROL PCB assembly, check that the setting of the Power Supply Voltage Select is correct for the power supply in your area. Refer to **§5.2.2** for further information regarding procedures for changing the Supply Voltage. After completing the preceding inspections, close the Rear (Bottom) Panel.

5.2 Connections

5.2.1 Power Connection

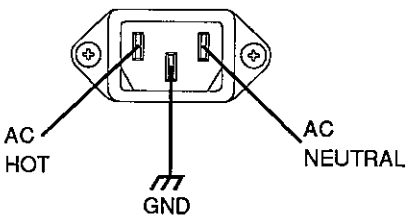


Figure 5-3
Pin Assignment of Power Connector

Insure that the voltage and frequency supplied to the machine agree with the machine's power requirement printed on the label on the rear panel or on the carton.

Making sure that the POWER switch of the machine is turned off, connect the supplied power cord from the AC mains to the machine.

If the machine's power requirement is different from the AC mains supply, perform the following procedure.

5.2.2 Changing the Supply Voltage Requirement

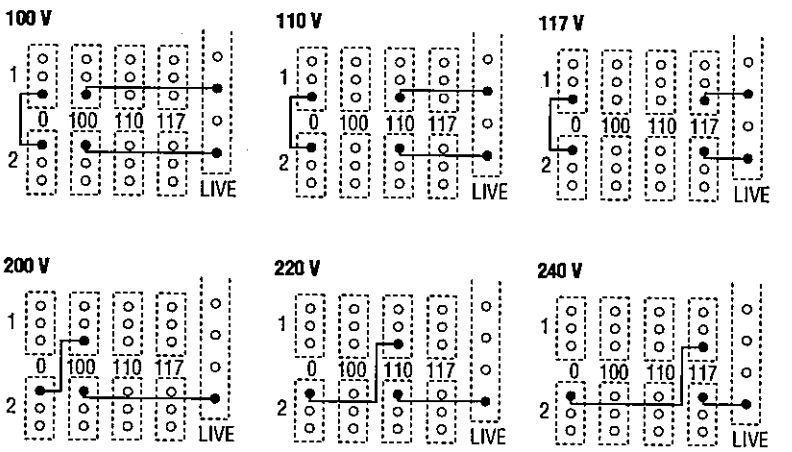


Figure 5-4
Voltage Select Wiring

1. Open the Rear Panel of the machine by removing the four phillips head screws which secure the panel, and swinging it down on its hinges.
2. Connect the jumper wires on the VOLTAGE SELECT PCB assembly in accordance with **Figure 5-2** to select the appropriate Power Supply voltage.
3. Change the label on the Rear Panel to correspond to the new supply voltage requirement.

5.2.3 Connection of Audio Signal

Each Input and Output connector of the MX-55 is wired as follows.

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

When connecting the unbalanced equipment to the MX-55, the connector wiring should be as shown below.

NOTE: Otari recommend that UNBAL/BAL switch on the OUTPUT AMPLIFIER PCB assembly should be set to UNBAL position on the case of Unbalanced Output operation (Refer to **§5.1.2.1**).

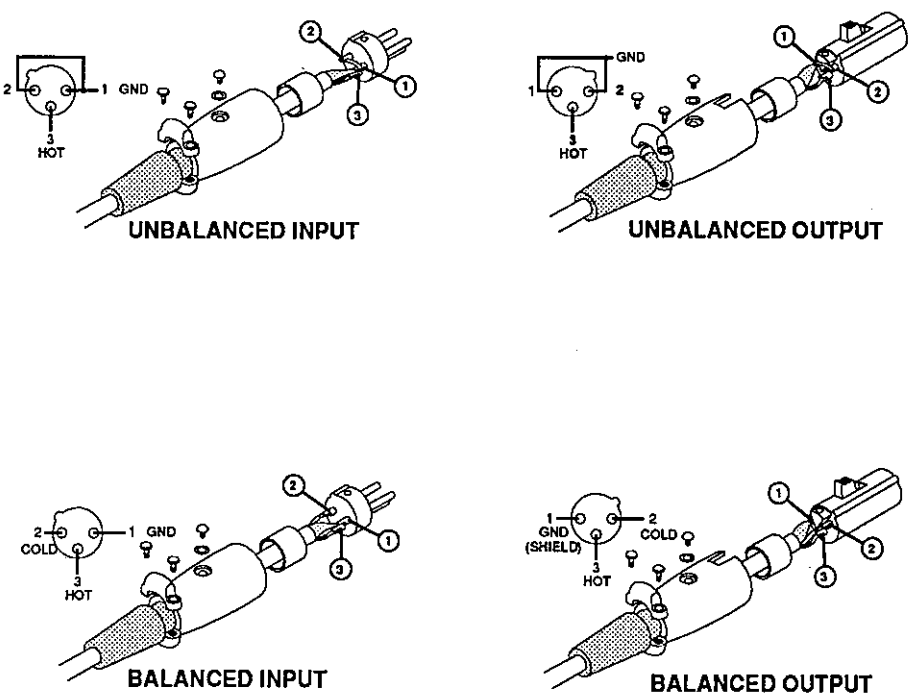


Figure 5-5
Audio Connector Wiring

5.2.4 Connection of Remote Control Unit

Connect the optional Remote Control Unit CB-127 to the PARALLEL I/O connector of the MX-55. Before connecting the Remote Control Unit, turn the power off to the machine.

Table 5-3
PARALLEL I/O Connector Pin Assignment

No.	Function	Level	In/Out
1	RECORD switch	Low	In
2	PLAY switch	Low	In
3	STOP switch	Low	In
4	F.FWD switch	Low	In
5	REWIND switch	Low	In
6	Lifter defeat	Low	In
9	Safety switch shut off tally	Low	Out
10	Record mode tally	Low	Out
11	Play mode tally	Low	Out
12	Stop mode tally	Low	Out
13	Fast Forward mode tally	Low	Out
14	Rewind mode tally	Low	Out
16	Signal Ground		
17	Tach. pulse		Out*1
18	Tape direction Rev/Fwd (Fwd=Low)	H/L	Out
19	Capstan clock 9.6 kHz (fixed)		Out
20	Capstan speed control clock		In*2
21	Tape Speed A	H/L	Out*3
22	Tape Speed B	H/L	Out*3
23	External pitch control enable	Low	In
24	External pitch control tally	Low	Out
25	Record Amp Ready mode tally	Low	Out
33	+5 V ±10% Regulated power supply (max 150 mA)		
34	Unregulated Power Supply 24–0 V (max 500 mA)		
35	Unregulated Power Supply 24–40 V (max 500 mA)		
36	Power Ground		
37	Power Ground		

NOTES:

1. Tach Pulse rate: (pulse/sec)

Speed (ips)	Pulse Rate
3.75	30
7.5	60
15	120

2. Capstan Control frequency:
9.6 kHz = nominal tape speed
Acceptable external frequency range = 4.8 kHz–19.2 kHz

3. Definition of tape speed:

Tape Speed	Speed A	Speed B
3.75 ips	Low	Low
7.5 ips	Low	High
15 ips	High	Low

4. Connector type: D-sub 37 pin (female)

5. Output Signal:

Output Type	: Open Collector
V_{OL}	: 0–0.5 V
I_{OL}	: 20 mA (max)
V_{IL}	: TTL Level
Leak Current	: 20 µA
Pull Up	: 10 kohms (terminated to +5 V)
V_{OH} (High Level)	: +30 V (max)

6. Input Signal:

Fan-in	: 1.5
V_{IL}	: 0–0.5 V (2.4 mA)
V_{IH}	: 2.5–5.25 V (60 µA)

7. Cable Length: max 10 m (32 feet)

8. Input Command Pulse: 100 ms (min)

9. Tach Pulse: 50 µs (min)

10. Capstan Clock Duty Cycle: 40–60%

5.3 Prior to Operation

5.3.1 User-Selectable Functions

Some of the MX-55 functions are user-selectable. These user-selectable functions allows you to change the configuration to suit your preferences.

5.3.1.1 SEARCH 3 Key Functions

The SEARCH 3 button can be selected for use as one of four functions, determined by the settings of SW2-1 and SW2-2 on the TRANSPORT CONTROL PCB assembly.

Normal Cue Point Search — SW2-1 off, SW2-2 off
Search to the point where the PLAY button was last pressed — SW2-1 On, SW2-2 Off
Fader Start Function — SW2-1 Off, SW2-2 On
Foil Sensor On/Off — SW2-1 On, SW2-2 On
(Refer to **§5.3.1.5** for Further Information about Fader Start Operations)

5.3.1.2 Punch In Method Selection

The method of entering Record mode when the Transport is already in Play mode can be selected between pressing the RECORD button only (one-button punch in), or pressing the RECORD and PLAY buttons simultaneously (two-button Punch In). The selection is made with SW1-2 on the TRANSPORT CONTROL PCB assembly.

One-button Punch-In — SW1-2 Off
Two-button Punch-In — SW1-2 On

5.3.1.3 Punch Out Method Selection

The method of leaving Record mode without stopping the Transport can be selected between pressing the PLAY button only (one-button Punch Out), or pressing the RECORD and STOP buttons simultaneously (two-button Punch Out). The selection is made with SW1-3 on the TRANSPORT CONTROL PCB assembly.

One-button Punch Out — SW1-3 Off
Two-button Punch Out — SW1-3 On

5.3.1.4 Foot Switch Function Selection (Option)

The SEARCH 3 key can be used to activate and deactivate the Foot Switch Function. When this function is active, four transport control function can be obtained by foot switch as following.

When both SW2-3 and SW2-4 are On, the VEM mode can be abled/disabled remotely by foot switch.
When SW2-3 is On and SW2-4 is Off, Reel Brake is disengaged/engaged by the switch.
When SW2-3 is Off and SW2-4 is On, special search function can be done by the switch as described at NOTE 2 of **§5.1.2.2**.
When both SW2-3 and SW2-4 are Off, only Punch In/Out control can be done by the switch.

5.3.1.5 Fader Start Selection (Option)

The SEARCH 3 key can be used to activate and deactivate the Fader Start function. When the Fader Start function is active, the control of Play and Stop functions is transferred to the external controls, and the Transport Controls on the MX-55 are disabled.

When SW2-1 is Off and SW2-2 is On, the SEARCH 3 key functions as Fader Control Enable/Disable. When Fader Control is Enabled the normal Transport Control buttons are Disabled unless SW2-6 is On.

The logic level (high or low) of the Fader Start signal can be selected with SW2-5 on the TRANSPORT CONTROL PCB assembly.

Logic Level Low — SW 2-5 Off
Logic Level High — SW 2-5 On

5.3.1.6 Tape Speed and Reel Size Change

The method of changing Tape Speed and Reel Size is selectable between either pressing the TAPE SPEED or REEL SIZE button twice quickly (or continuously keep pressing), or pressing the CLR button simultaneously with the TAPE SPEED or REEL SIZE button. The selection is made with switch SW1-4 on the TRANSPORT CONTROL PCB assembly.

Press SIZE or SPEED with CLR button — SW1-4 Off
Press SIZE or SPEED button twice or continuously keep pressing — SW1-4 On

5.3.1.7 Selection of Reference Flux Level

The initial setting of the Reference Flux levels is determined by whether the machine is an MX-55N (NAB) or MX-55D (DIN).

Selection between the American (NAB) reference flux combination and the European (DIN) combination is made by replacement of piggy-back PCBs plugged onto headers on the AUDIO AMPLIFIER PCB assembly.

American style (185/250/370 nWb/m) — Change CN 45 and CN 46 with piggy-back PCBs PB-7NAA and change CN 47 and CN 48 with piggy-back PCBs PB-7MZA.

European style (250/320/510 nWb/m) — Change CN 45 and CN 46 with piggy-back PCBs PB-7NAC and change CN 47 and CN 48 with piggy-back PCBs PB-7MZB.

5.3.1.8 Changing of Speed Version

The MX-55 is preset at the factory to the High Speed pair (15/7.5 ips). Selection between the High Speed pair and Low Speed pair (7.5/3.75 ips) is made by switch SW1-1 on the TRANSPORT CONTROL PCB assembly.

High Speed pair — SW 1-1 Off
Low Speed pair — SW 1-1 On

After changing the speed version, it is necessary to re-align the audio electronics.

5.3.2 Hooking Up the Machine

5.3.2.1 Hooking up the AC Power

Make sure that voltage supplied to the machine agrees with its power requirements printed on the label on the rear panel. If the power supply voltage needs to be changed, refer to the instructions in **§5.2.2.**

Use the supplied power cord only.

5.3.2.2 Hooking up the Audio Inputs and Outputs

The Audio Input to and Output from each channel of the MX-55 is transformerless active balanced. Input and Output connectors are wired with Pin 1 connected to the shield, Pin 2 connected to the signal cold and Pin 3 connected to the signal hot. If the unbalanced equipment is connected to the machine, the connectors should be wired as shown in **Figure 5-6.**

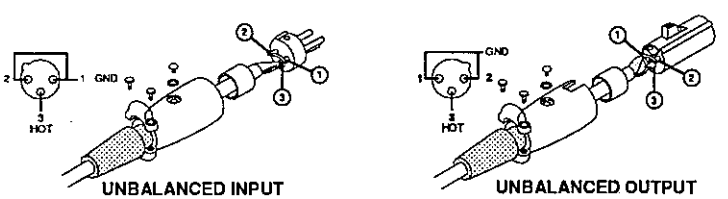


Figure 5-6
Connector wiring for unbalanced operation

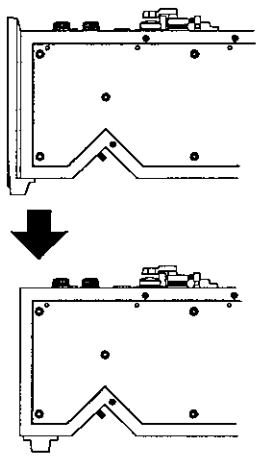


Figure 5-7
Installing Rear Legs

5.4 Optional Accessories

5.4.1 Installing the Accessories

5.4.1.1 Changing the Machine Feet for Horizontal Operation

If the MX-55 is to be used in a horizontal position, the feet might be in the operator's way. In that case, remove the lower feet, and install the Rear legs, as shown in **Figure 5-7**.

5.4.1.2 Installing the Optional 19" Rack Mount Kit

1. Remove the bottom feet from the MX-55.
2. Attach the Rack Mount Adapters to the sides of the machine using the M4x20 screws supplied as shown in **Figure 5-8**.
3. Install the machine in the rack.

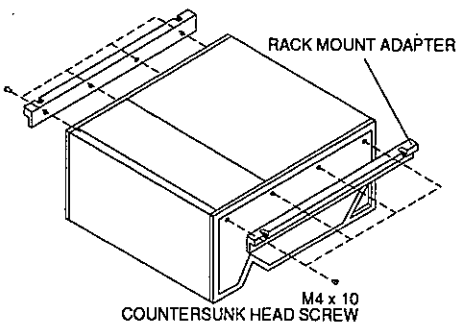


Figure 5-8
Mounting the Rack Adapters

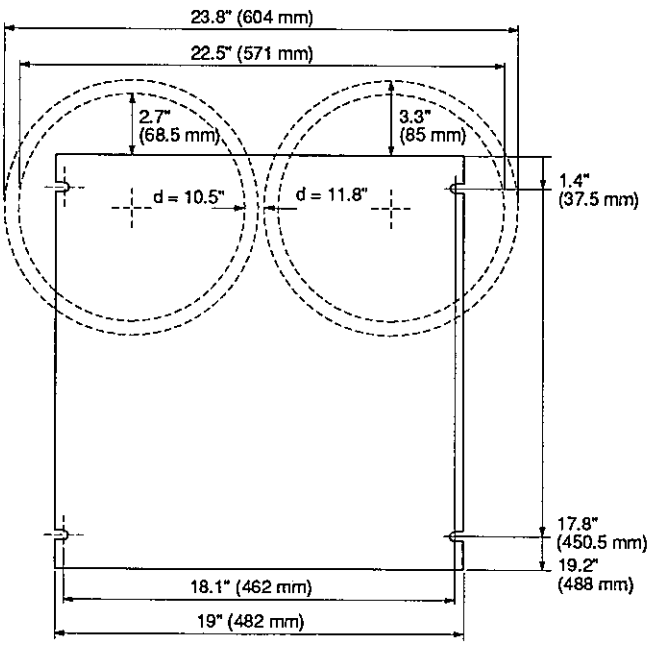


Figure 5-9
Mounting Hole Spacing

5.4.1.3 Optional Stands for the MX-55

There are two stands available for the MX-55, the ZA-81B-T stand, on which the angle of the machine is adjustable in steps by changing the bolt position between the top and bottom portion of the stand, and the ZA-81C-S stand, on which the angle is continuously adjustable by releasing a brake under the front of the stand.

An optional Spacer (ZA-81D-S) is available for use with the ZA-81B-T in those situations when the MX-55 may be located close to an obstruction which may interfere with the 10.5" or 11.8" reels.

NOTE: When releasing the adjusting brake on the ZA-81C-S, be sure to support the machine carefully.

5.4.1.3.1 Assembling the ZA-81B-T without Spacer

(Refer to **Figure 5-10**)

1. Remove the bottom feet from the MX-55.
2. Attach the Rack Mount adapters to the sides of the machine using the M4x10 flathead screws as shown in **Figure 5-8**.
3. Assemble the stand using the M5x10 Cap screws as shown in **Figure 5-10**.
4. Assemble the MX-55 to the stand with the M5x15 Cap Screws and Washers as shown in **Figure 5-10**.

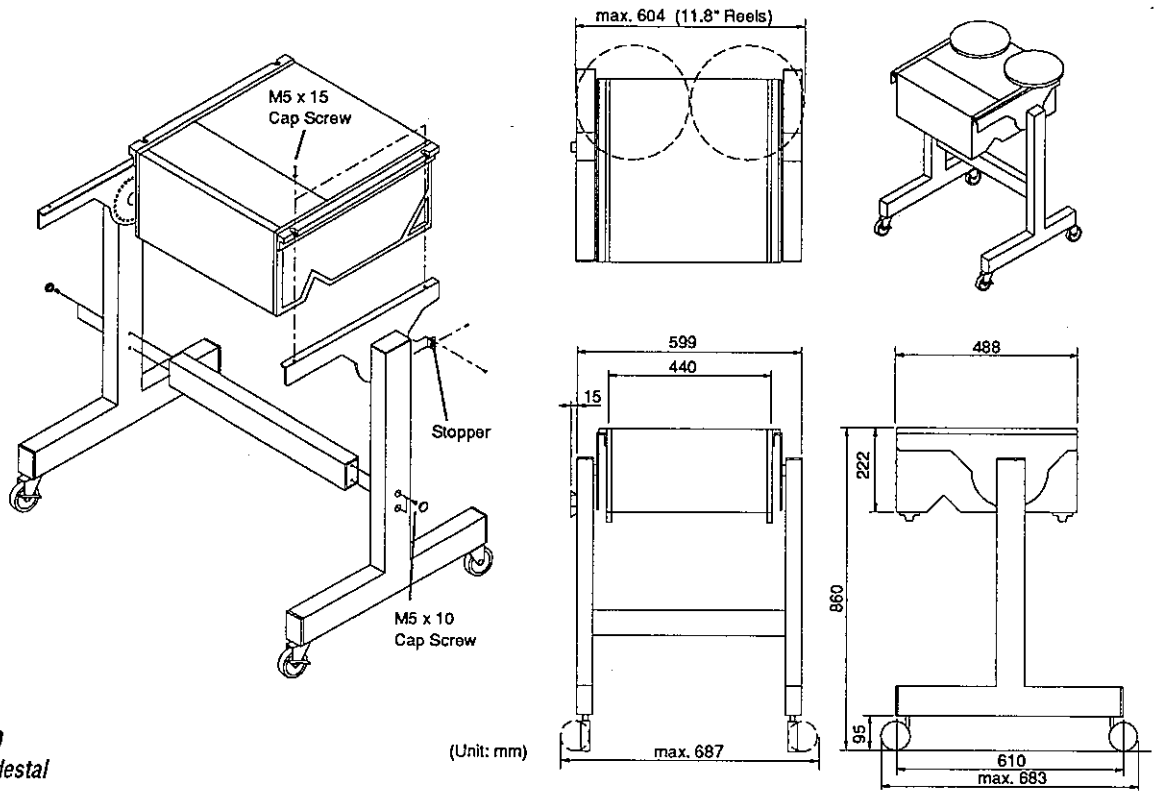


Figure 5-10
ZA-5BP Pedestal

5.4.1.3.2 Assembling the ZA-81B-T with Spacer

(Refer to **Figure 5-11**)

1. Remove the bottom feet from the MX-55.
2. Attach the Rack Mount adapters to the sides of the machine using the M4x10 flathead screws as shown in **Figure 5-8**.
3. Assemble the Spacer and Stand as shown in **Figure 5-11**.
4. Mount the MX-55 to the Stand using the M5x15 Cap Screws with washers as shown in **Figure 5-11**.

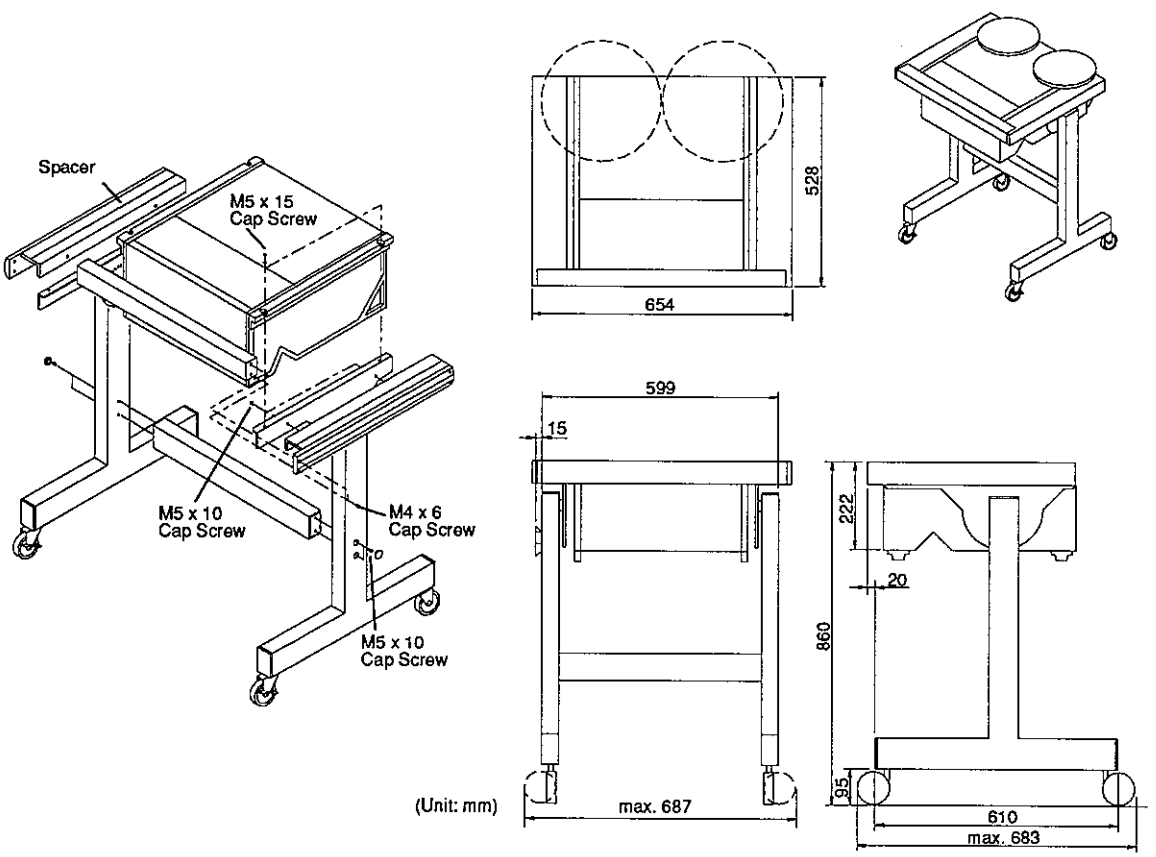


Figure 5-11
ZA-5BP Pedestal with Spacer

5.4.1.3.3 Assembling the ZA-5BN

(Refer to **Figure 5-12**)

1. Remove the bottom feet from the MX-55.
2. Assemble the Spacer and the stand as shown in **Figure 5-12**.
3. Mount the MX-55 to the Stand using the M5x15 Cap Screws with washers as shown in **Figure 5-12**.
4. Clamp the Tilt Brake Cable behind the Spacer using the cable clamps.

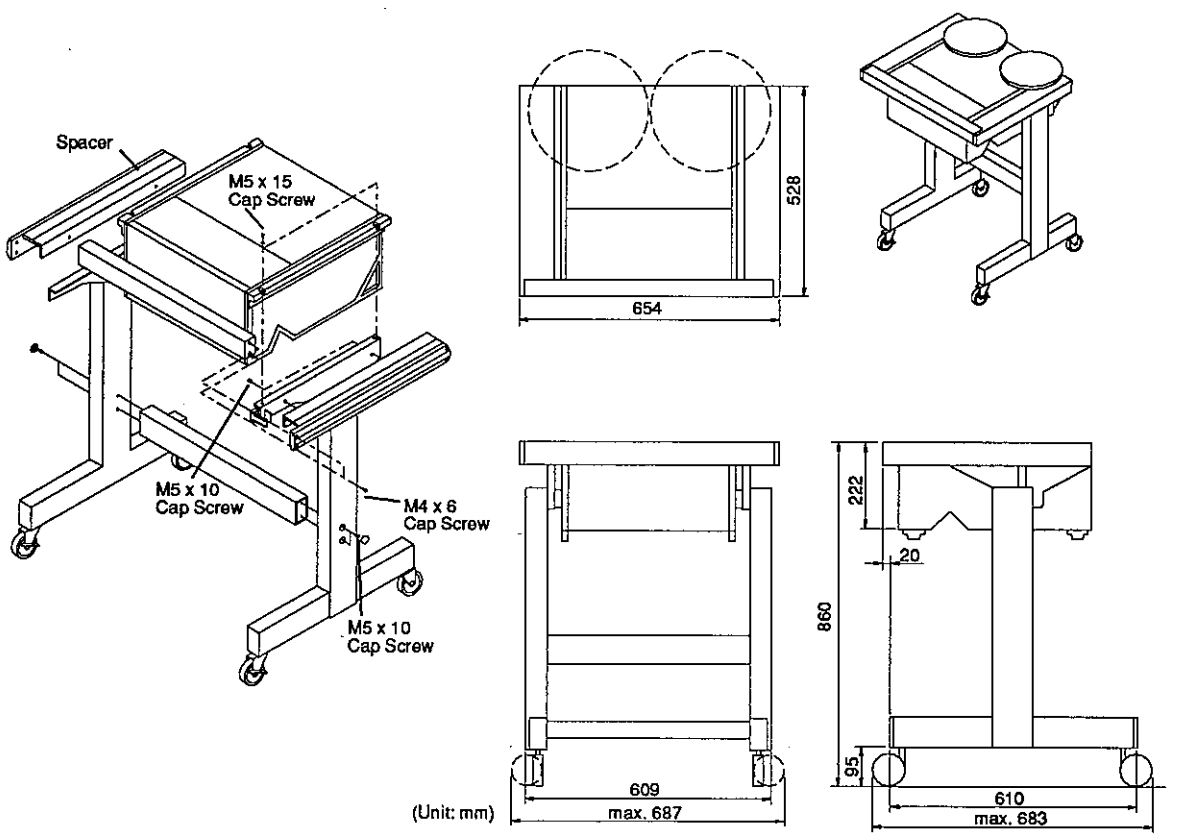


Figure 5-12
ZA-5BN Pedestal

5.4.1.4 Optional Input/Output Transformers

(Input Transformer - ZA-5CL)
(Output Transformer - ZA-5CM)

1. Lay the machine on its side, so that the rear panel is facing you. Remove the Bottom Panel, and open the Amplifier Panel.
2. Change resistors R114, R115, R214, and R215 on the AUDIO AMPLIFIER PCB assembly to 18 kohms.
3. If a 600 Ohm input impedance is required, solder across the jumper positions marked "**b**" on the ZA-5CL PCB (PB-7NPA).
4. If non-floating input is required, solder across the jumper positions marked "**b**" on the ZA-5CL PCB (PB-7NPA).
5. If non-floating output is required, solder across the jumper positions marked "**b**" on the ZA-5CM PCB (PB-7NQA).
6. Select the required output impedance by soldering across the jumper positions as shown below:

Load Impedance	b	c
Load > 3.7 k ohm	Short	Short
Load between 860–3.7 k	Short	Open
Load < 860 ohms	Open	Open

7. Remove the cable from CN1 and CN2 on the AUDIO AMPLIFIER PCB assembly, which connects to the Input connectors.
8. Remove the cable from CN1 and CN2 on the OUTPUT AMPLIFIER PCB assembly (located behind the VU Meters), which connects to the Output connectors.
9. Close the Amplifier Panel, attach the Bottom Panel, and stand the machine on its bottom feet. Open the Connector Panel.
10. Attach the Input/Output Transformer assembly to the inside of the Connector Panel with the stand-offs provided.
11. Connect the cable from the Output connectors to header connector CN1 (channel 1) and CN3 on the INPUT TRANSFORMER PCB assembly.
12. Connect the cable from the INPUT TRANSFORMER PCB assembly to CN1 and CN2 on the AUDIO AMPLIFIER PCB assembly.
13. Connect the cable from the Output connectors to header connectors CN 1 (channel 1) and CN 2 (channel 2) on the OUTPUT TRANSFORMER PCB assembly.
14. Connect the cable from the Output Transformer assembly to CN1 (channel 1) and CN3 (channel 2) on the OUTPUT AMPLIFIER PCB assembly.
15. Close the Connector Panel.
16. Perform the Level Setting procedure in **§4.3.4.1**.

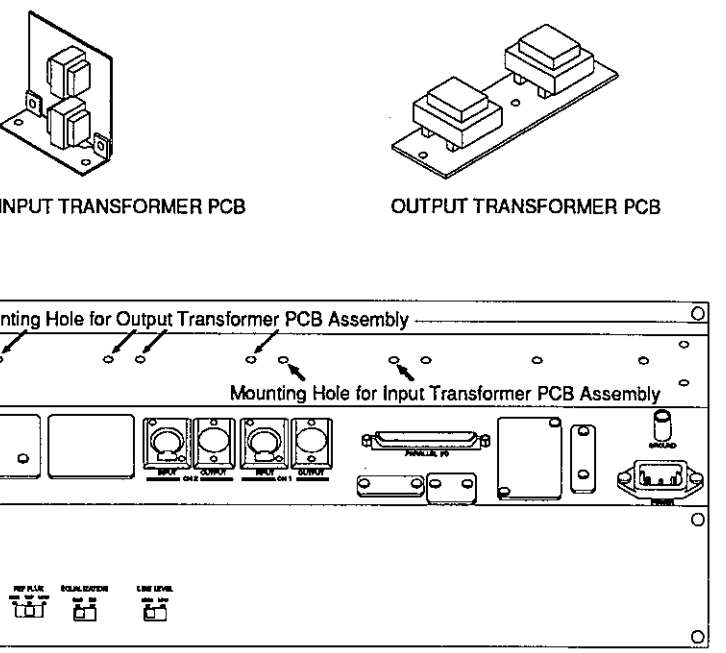


Figure 5-13
Installation of Input/Output Transformers

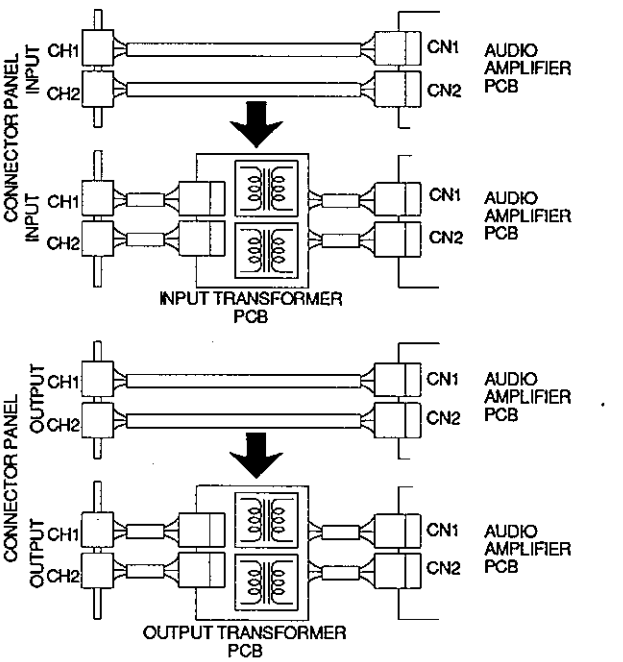


Figure 5-14
Optional Input/Output Transformer Wiring

5.4.2 VEM Unit Installation

The VEM PCB assembly is a small printed circuit board assembly which allows the MX-55 to be used for twice-speed listening without the pitch change normally associated with increasing the tape speed.

1. Remove the cover panel from the left side frame.
2. Open the Amplifier assembly (refer to **§5.1.2.1** for further information about opening the Amplifier).
3. Open the rear panel (refer to **§5.1.2.2**).
4. Attach the VEM PCB assembly to the left side frame using the two holes marked "*" in **Figure 5-15**. The component side of the PCB should face the rear of the machine.
5. Connect the cable connector from the VEM PCB assembly marked "**2**" (5 pin) to CN2 on the MONITOR AMPLIFIER PCB assembly (PB-19XA).
6. Connect the cable connector leading from the VEM PCB assembly marked "**26**" to CN26 on the TRANSPORT CONTROL PCB assembly (PB-4HHA).
7. Route the cable as shown in **Figure 5-15**.
8. Close the Amplifier assembly.
9. Close the Rear Panel.
10. Reinstall the left side panel.

Operation Instructions for Voice Edit Mode

Set the Speed Mode switch (**Figure 2-2, [11]**) to the VEM position. Select the channel(s) for listening by pressing the appropriate Monitor Select button (**Figure 2-4, [15]**), and adjust the listening volume using the MONITOR level control (**Figure 2-4, [14]**). When the PLAY button (**Figure 2-1, [16]**) is pressed, the tape speed will be increased to twice the selected speed, but the pitch of the recorded material will remain unchanged.

NOTE: In Voice Edit mode, the pitch-shifted audio signal appears only at the built-in Monitor Speaker and PHONES connector.

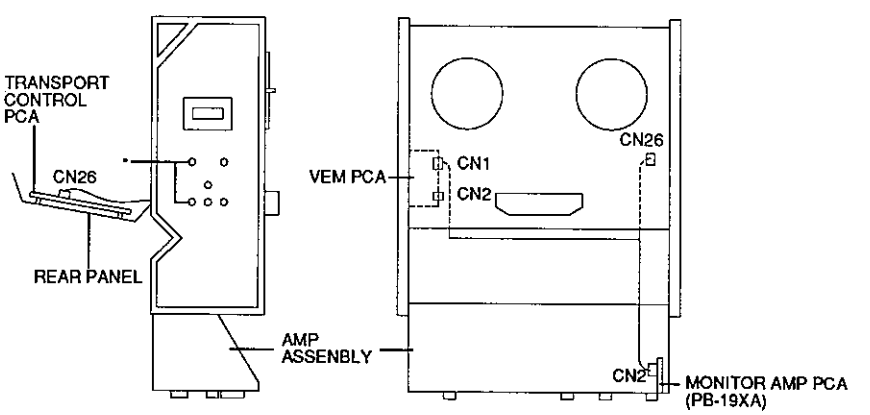


Figure 5-15
VEM Unit Installation

5.4.3 Mounting the Foot Switch Jack or Fader Control Connector

1. Remove the Connector Panel.
2. Remove the blank panel on the Connector Panel. Mount the Foot Switch Jack or Fader Control Connector in Place of the blank panel.
3. Open the Rear Panel.
4. Connect the connector of the cable to the header CN25 on the CONTROL PCB assembly. Reinstall the Connector panel. Close the Rear Panel.

NOTE: Change the SW2 setting on the CONTROL PCB assembly as appropriate. Refer to **Table 5-2** for more information.

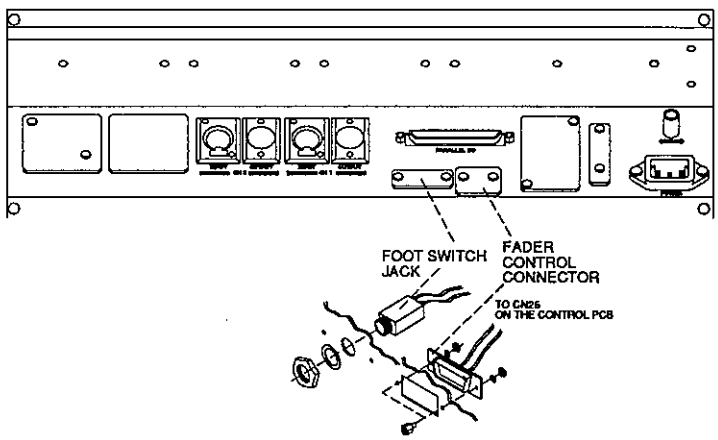


Figure 5-16
Mounting Foot Switch Jack/Fader Control Connector

5.4.4. Mounting the Proximity Sensor

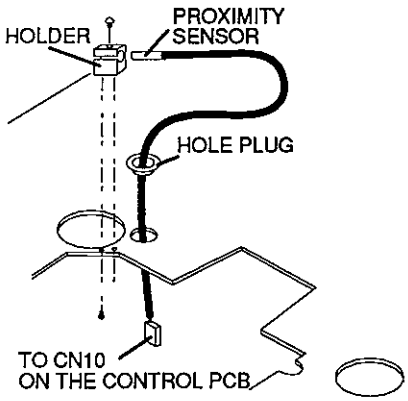


Figure 5-17
Mounting the Proximity Sensor

1. Remove the Deck Skin Panel. Replace the hole plug on the Deck Skin Panel with the hole plug included in the kit..
2. Install the Sensor Holder on the Deck Skin Panel with M2x5 screws. Temporarily attatch the sensor to the holder with M2x4 screw.
3. Insert the sensor cable through the Deck Skin Panel. Reinstall the Deck Skin Panel.
4. Open the Rear Panel, connect the sensor connector to CN10 on the CONTROL PCB assembly.
5. Thread tape on the machine. Adjust the sensor position so that the clearance between the sensor head and the tape is 0.5mm.

NOTE: The appropriate length of the sensingfoil is about 10–15mm. If SW2-1 and SW2-2 is in the On position, the SEARCH 3 key can be used as the On/Off switch for the proximity sensor.

Section 6 Specifications

6.1 Tape Transport

Track Configuration	1/4" (6.3 mm) wide tape 2 track 2 channel NAB or DIN stereo.
Tape Speeds	Switchable for speed version change. High speed version 15 ips (38.1 cm/s) and 7.5 ips (19.05cm/s). Low speed version 7.5 ips (19.05 cm/s) and 3.75 ips (9.5 cm/s).
Tape Speed Accracy	Within ±0.2%
Tape Speed Deviation	0.2% maximum
Pitch Control	+20% continuously variable control. Percentage or IPS readout with 0.01% precision multiturn encorder servo system.
Fast Wind Time	100 s for 2,500 ft (60 Hz), 110 s for 2,500 ft (50 Hz).
Reel Size	NAB 5–10.5", EIA Cine, DIN 11.8". Maximum Tape Length: 3,280 ft (1,000 m, 50 µm thickness).
Motors	Capstan Motor — Quarts PLL Servo Controlled Direct, Drive Brushless Type DC Motor. Reel Motor — Induction Type AC Motor.
Heads	Plug in head block with full access to independent head height, tilt and azimuth adjustment.
Tape Tension	Play and Record 60–120 gf Fast wind 100 gf nominal Peak 500 gf
Start Time	15 ips max. 0.5 s 7.5 ips max. 0.3 s 3.75 ips max. 0.2 s Time to reach within twice specified Wow and Flutter.
Wow and Flutter	Peak Weighted DIN 45507, IEC Pub.386. 15 ips max. ±0.06% 7.5 ips max. ±0.08% 3.75 ips max. than ±0.12%
Tape Time Counter	Seven Segment LED readout from tachometer/logic measurement circuit; indicates Tape Time in Hours, Minutes and Seconds.
External Speed Control Range	-50%, +100% at all speed (4.8 kHz–19.2 kHz).
VEM Tape Speed	+100% with VEM optional accessory and continuous lower speed change acompanying tone change.

6.2 Electronics

NOTE: All specifications are measured with AMPEX #456.

Line Input XL type female connector active balanced 10 kΩ Input Impedance, Input Level +4 dBu (0 dBu to +10 dBu adjustable)/ -16 dBu (-10 dBu to -20 dBu adjustable),Maximum Input Level +30 dBu.

Mic Input XL type female connector active balanced, 10 kohm Input Inpedance (20 Hz to 20 kHz), Minimum Input Level -70 dBu (OFF/0/-20 dB switchable gain selection), Applicable microphone impedance 150 Ω to 150 kΩ, 1CH/BOTH/2CH switchable Input Selection.

Line Output XL type male connector active balanced, BAL/UNBAL switchable, less than 5 Ω Output Impedance, +4 dBu (0 to +13 dBu adjustable) or -16 dBu (-7 to -20 dBu adjustable) switchable onto more than 200 ohm Load Impedance, Maximum +26 dBu balanced or +21 dBu unbalanced.

Bias and Erase Frequency 150 kHz

Reference Magnetic Flux Level
MX-55N 185/250/370 nWb/m switchable
MX-55D 250/320/510 nWb/m switchable

Frequency Response (0 dB = 250 nWb/m)

Overall

15 ips	30 Hz to 20 kHz ±2 dB (0 dB)
7.5 ips	20 Hz to 18 kHz ±2 dB (-10 dB)
3.75 ips	20 Hz to 10 kHz ±2dB (-20dB)

Sel-Rep

15 ips	30 Hz to 12 kHz ±3 dB
7.5 ips	20 Hz to 5 kHz ±3 dB
3.75 ips	20 Hz to 2.5 kHz ±3 dB

Distortion max. 0.3% at 1 kHz, 250 nWb/m, 15 ips

Crosstalk
MX-55N min. 55 dB
MX-55D min. 50 dB

Depth of Erasure 1 kHz, 1,040 nWb/m, 15 ips
MX-55N min. 75 dB
MX-55D min. 75 dB

Signal-to-Noise Ratio Unweighted with audio filter (30 Hz to 18 kHz) at specified Flux Level.

Model	EQ	Speed	S/N Ratio	Flux Level
MX-55N	NAB	15 ips	69 dB	1040 nWb/m
MX-55N	NAB	7.5 ips	71 dB	1040 nWb/m
MX-55N	NAB	3.75 ips	64 dB	740 nWb/m
MX-55N	IEC	15 ips	71 dB	1040 nWb/m
MX-55N	IEC	7.5 ips	68 dB	1040 nWb/m
MX-55N	IEC	3.75 ips	64 dB	740 nWb/m
MX-55D	IEC	15 ips	72 dB	1040 nWb/m
MX-55D	IEC	7.5 ips	69 dB	1040 nWb/m
MX-55D	IEC	3.75 ips	65 dB	740 nWb/m

Built-in Test Oscillator 100 Hz, 1 kHz and 10 kHz sine wave switch selectable

6.3 Physical

Power Requirements	100, 117, 220 or 240 Volts ±10 %, single phase AC, 50 or 60 Hz, 150 VA
Operating Envirionment	41–104°F (5–40°C), 20–80% RH
Storage Envirionment	-4–113°F (-20–45°C), 10–80% RH
Weight	67 Lbs (30 kg)
Dimensions (W x D x H)	440 x 222 x 488 mm

6.4 Accessories

Standard

NAB Hub Reel Hold Down Knob

NAB 10.5" Empty Reel (MX-55N only)

DIN 12" Reel (MX-55D only)

Power Cable

Fuse	1 A	2 pcs
Fuse	2 A	4 pcs
Fuse	5 A	1 pcs
Fuse	5 A	1 pcs (slow blow)

Lubrication Oil (PZ9E003)

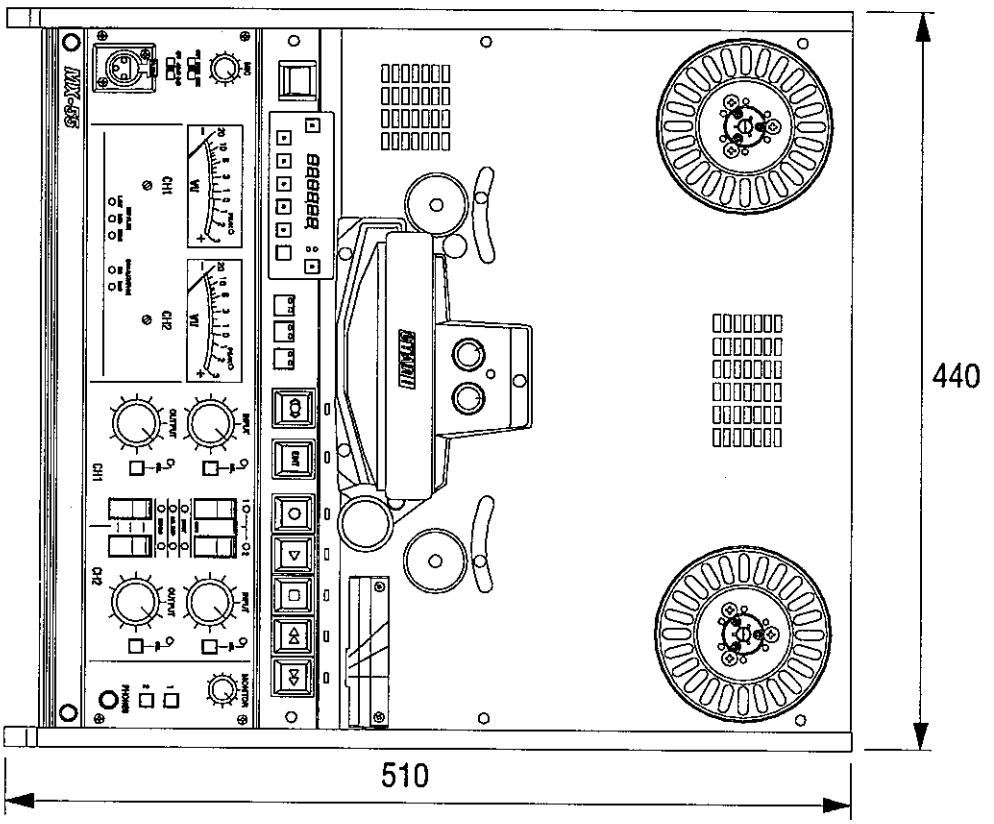
Foot for horizontal installation

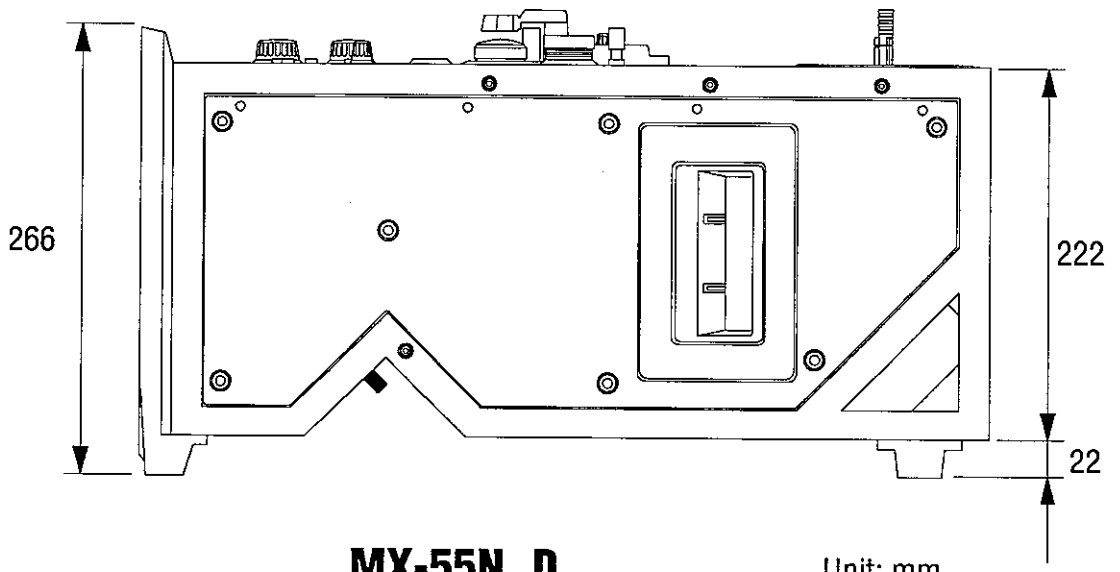
Operation Manual

Optional

CB-127 Transport Remote Controller	CB-127-S
Deluxe stand (Tilt adjustable with Hand-Rest Reel Spacer and Rack Mount Panel)	ZA-81C-S
Standard stand (Tilt adjustable with Rack Mount Panel)	ZA-81B-T
Reel Spacer (Hand-Rest Reel Spacer for ZA-81B-T)	ZA-81D-S
Rack Mount Adapter (Mount Panel to install MX-55 onto 19" Rack)	ZA-5CG
Scissors	SB-12S
Fader Unit	ZA-5CU
VEM Unit	ZA-5CV
Proximity Sensor	ZA-5CW
Foot Switch Jack	ZA-5CX
Input Transformer	ZA-5CL
Output Transformer	ZA-5CM

Otari reserves the right to change the specification without notice or obligation.





MX-55N, D Unit: mm

Section 7 Printed Circuit Board Layouts and Parts Lists

7.1 General

The following P.C.B. pattern layout drawings and parts lists are provided for service reference. Parts list includes only main parts or the parts difficult to obtain in the field. Also the lists include the parts which should be replaced with the exact same parts supplied by Otari to maintain the performance. Many diodes, transistors, and ICs are well described in the schematics attached to the machine, so to find out the correct parts number of those parts you need, refer to the schematics.

7.2 Parts Lists

1. Control PCB Assembly: PB-4HHA
2. Audio Amplifier PCB Assembly: PB-19ZA

[1] Control PCB Assembly

Ref. No.	Description	Parts No.	Notes
VR1–6	Potentiometer	RV414296	10k
VR7	Potentiometer	RV42329	42k
R137	Resistor	R8DJ470M	3W 47 ohm
R139	Resistor	R4CJ330M	5W 33 ohm
R140	Resistor	R8DJ151M	3W 150 ohm
R141	Resistor	R8DJ131M	3W 130 ohm
R142	Resistor	R4CJ240M	5W 24 ohm
R143	Resistor	R4CJ101M	5W 100 ohm
R144	Resistor	R8DJ181M	3W 180 ohm
R145	Resistor	R4CJ201M	5W 200 ohm
R146	Resistor	R8DJ271M	3W 270 ohm
R147,152	Resistor	R7CJR47M	2W 0.47 ohm
R193	Resistor	R8CJ621M	2W 620 ohm
RA1	Resistor Array	R94-132	4.7k x8
RA3	Resistor Array	R94-136	10 k x8
C49	Capacitor	C11R067M	50 V/ 1 µF Bipolar
C50	Capacitor	C110062M	25 V/10 µF Bipolar
C60	Capacitor	C122077M	25 V/22 µF Bipolar
C72	Capacitor	C147016M	16 V/47 µF Low Leakage
C300-314	Spark Killer	CZ20001W	
RL1	Relay	RY1DC060	
SW1,2	Switch	WH98012	
CP1	Check Pin	CN901157	Black
CP3	Check Pin	CN901149	Red
X1	Crystal	PZ4C041	6.144MHz
PC1-1	5Photo Coupler	PN-0267	

[2] Audio Amplifier PCB Assembly

Ref. No.	Description	Parts No.	Notes
T1	Transformer	TF41006	
L1, 2	Inductor	IN29018	680 µH
L3	Inductor	IN19116	1.5 mH
L11, 21	Inductor	IN19135	12 µH
L12, 22	Inductor	IN19129	3.9 mH
L13, 23	Inductor	IN19134	10 mH
L14, 24	Inductor	IN19108	330 µH
L15, 25	Inductor	IN19132	6.8 mH
VR1	Potentiometer	RV412290	100 ohm
VR2	Potentiometer	RV424297	20 k
VR3, 4	Potentiometer	RV424173	20 k
VR7	Potentiometer	RV424284	20 k
VR11, 21	Potentiometer	RV414233	10 k
VR12	Potentiometer	RV454285	50 k
VR14	Potentiometer	RV453282	5 k
R56	Resistor	R7HF682M	6.8 k 1%
R58	Resistor	R7HF332M	3.3 k 1%
R66	Resistor	R7HF1691	1.69 k 1%
R67	Resistor	R7HF1742	17.4 k 1%
R68	Resistor	R7HF184M	180 k 1%
R72	Resistor	R96-001	4.3k (3900 ppm)
R82	Resistor	R7AJ560M	1/2W 56 ohm
R94, 95	Resistor	R7AJ1R0M	1/2W 1 ohm
R102	Resistor	R7HF103M	10k 1%
R117	Resistor	R7HF5601	5.6k 1%
R151, 251	Resistor	R7HF133M	13k 1%
R161	Resistor	R7HF912M	9.1k 1%
R177, 277	Resistor	R7HF163M	16k 1%
R178	Resistor	R7HF822M	8.2k 1%
R179, 279	Resistor	R7HF16221	6.2k 1%
R180, 280	Resistor	R7HF45324	5.3k 1%
C3	Capacitor	C12R2121	50 V/2.2 µF Bipolar
C4	Capacitor	C11R067M	50 V/1 µF Bipolar
C7	Capacitor	C110070M	50 V/10 µF Bipolar
C22	Capacitor	C110155M	16 V/100 µF Bipolar
C25	Capacitor	C122077M	25 V/22 µF Bipolar
C26	Capacitor	C1R4776M	50 V/0.47 µF Bipolar
C29	Capacitor	CFF2563Y	0.056 µF 2%
C30	Capacitor	C110062M	25 V/10 µF Bipolar
C133, 233	Capacitor	C110165M	25 V/100 µF Bipolar
C136, 236	Capacitor	C122014M	16 V/22 µF Low Leakage
C140, 240	Capacitor	CFF2103Y	0.01 µF 2%
C146, 246	Capacitor	CFF2562Y	0.0056 µF 2%
C147, 247	Capacitor	CFF2224Y	0.22 µF 2%
C180, 280	Capacitor	CFF2183Y	0.018 µF 2%
C181, 281	Capacitor	CFF2682Y	0.0068 µF 2%
C182, 282	Capacitor	CFF2222Y	0.0022 µF 2%
RL1-3	Relay	RY2DC087	
SW1	Switch	WH12289	
SW1	Button	KN1061	
SW2	Switch	WH32039	
SW3, 4	Switch	WH32058	
SW5	Switch	WH32037	
SW6	Switch	WH34040	
CPE1	Check Pin	CN901149	Red
GND	Check Pin	CN901157	Black

Section 8 Exploded Views and Parts Lists

8.1 General

The following exploded view drawings and parts lists are provided for service reference. Each drawing has own parts list followed with a 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-55,

contact Otari; we assume no liability for improper servicing due to changes and improvements which we make that subsequently render certain of those documents obsolete. Most all of exploded view drawings are not prepared for the parts which differ from those for the MX-55, please refer to the parts list in which you will find the proper information.

Following are the lists of the exploded view drawings included in this manual.

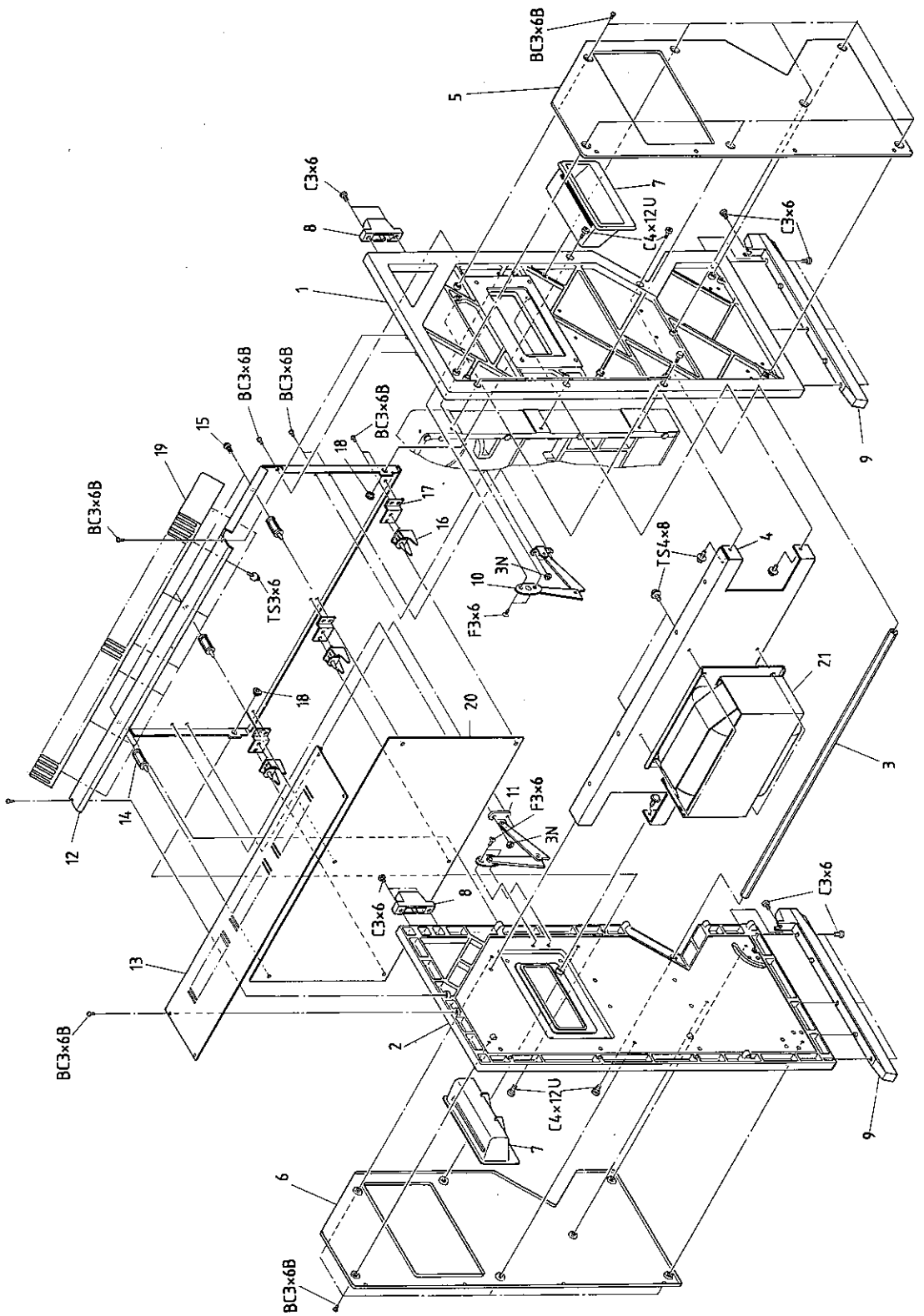
8.2 Parts Lists

No.	Description	Parts No.
1.	Case Assembly	K1123-
2.	Head Assembly (MX-55N)	KH-43G
	Head Assembly (MX-55D)	KH-43M
3.	Reel Assembly	KW-41D
4.	Tape Deck Assembly (1)	T0041-
5.	Tape Deck Assembly (2)	T0041-
6.	Transport Control Panel Assembly	CB-21K
7.	Amplifier Assembly (MX-55N)	A1123-
	Amplifier Assembly (MX-55D)	A1129-
8.	Connector Panel Assembly	CB-750

[1] Case Assembly

No.	Description	Parts No.
1.	Frame, R	K112301
2.	Frame, L	K112302
3.	Stud	KZ7B819
4.	Angle	K112311
5.	Panel, Side, R	K112307
6.	Panel, Side, L	K112306
7.	Handle	CY1004
8.	Foot, Case	CY4108
9.	Foot, Case	CY4109
10.	Hinge, L	CY2015
11.	Hinge, R	CY2016
12.	Panel A, Rear	K112304
13.	Panel B, Rear	K112305
14.	Support, Tapping Screw	PZ1G119
15.	Screw, Tapping	F32V06SB
16.	Spacer	PZ4E089
17.	Angle	K112308
18.	Coller	KZ6C119
19.	Heat Sink Assembly	CB-751
	Transistor (2SB863O)	QB863O
	Transistor (2SD1148O)	QD1148O
	Transistor (2SB1032K)	QB1032K
	Transistor (2SD1436K)	QD1436K
	Regulator (SI-3242P)	ISI3242P
	Regulator (7805)	IH7805H
	Regulator (7815)	IH7815H
	Diode, Bridge (S15VB20)	PNS15B20
20.	TRANSPORT CONTROL PCB Assembly	PB-4HHA
21.	Transformer	TF11119

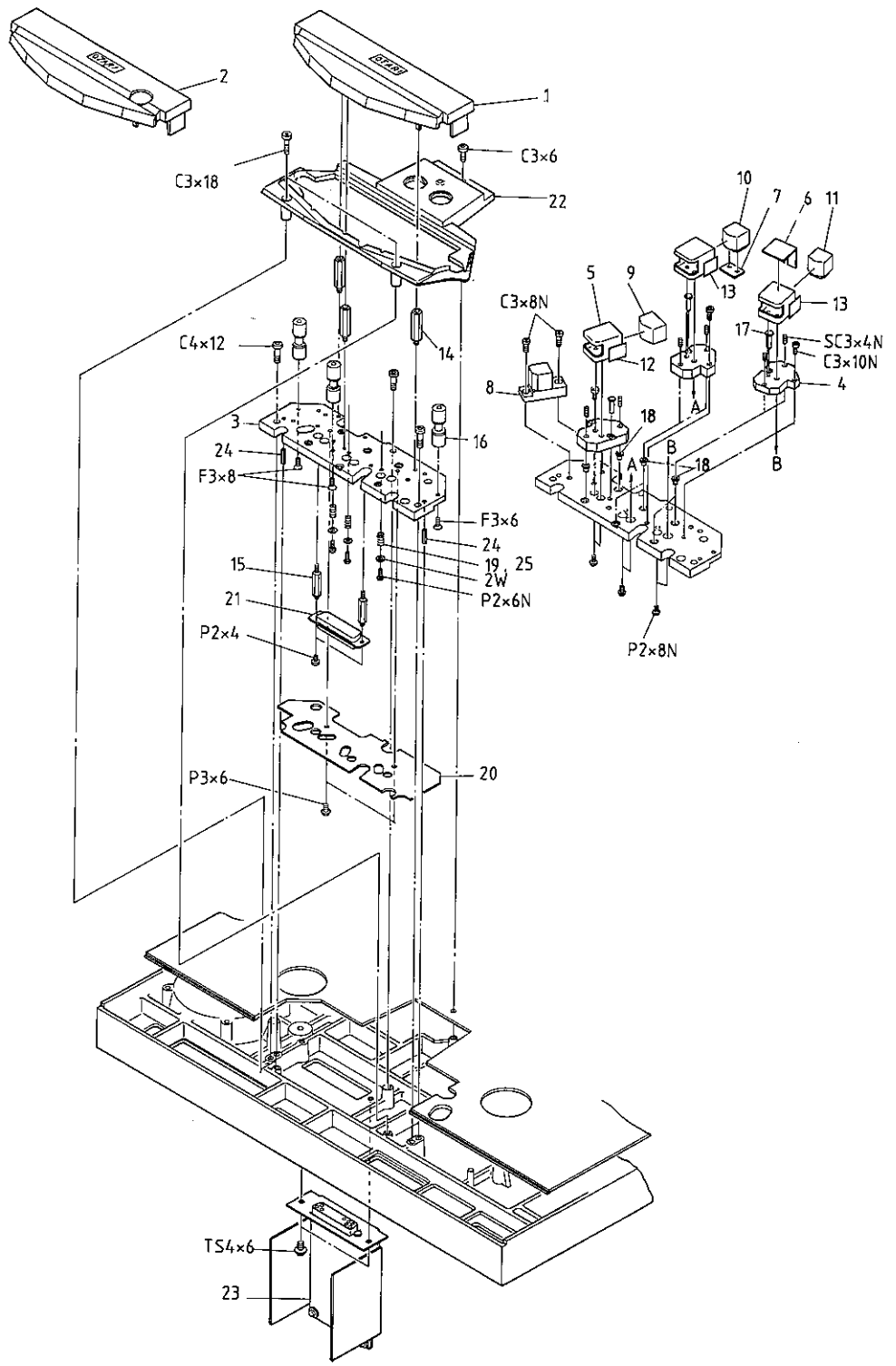
Case Assembly



[2] Head Assembly

No.	Description	Parts No.
1.	Head Housing Ass'y (MX-55N)	KH-43GB
2.	Head Housing Ass'y (MX-55D)	KH-43GA
3.	Base, Head	KH0C069
4.	Bracket, Head	KH0D143
5.	Case, Shield	KH0B033
6.	Cover, Shield	KH0B032
7.	Spacer	KH43G02
8.	Head, Erase	GH4E082D
9.	Head, Record (MX-55N)	GH4R005
	Head, Record (MX-55D)	GH4R100A
10.	Head, Play 4 Track 2 Ch	GH4P069
11.	Head, Play 2 Track 2 Ch (MX-55N)	GH4P027
	Head, Play 2 Track 2 Ch (MX-55D)	GH4P099A
12.	Label, REC Head	PT5032A
13.	Label, PLAY Head	PT5032B
14.	Stud	KZ7B147
15.	Stud	KZ7B820
16.	Guide, Tape	KG4A003
17.	Pin, Head	KZ5G020
18.	Pin, Retaining	KH42C03
19.	Spring, Head Adjustment (MX-55N)	GS2016
20.	Plate, Shield	KH43G0
21.	Connector, D sub 25 p	CN225103
22.	Skirt	T004102
23.	HEAD AMPLIFIER PCB Assembly	PB-1AAA
24.	Pin	F62314
25.	Spring, Head Adjustment (MX-55D)	GS2015

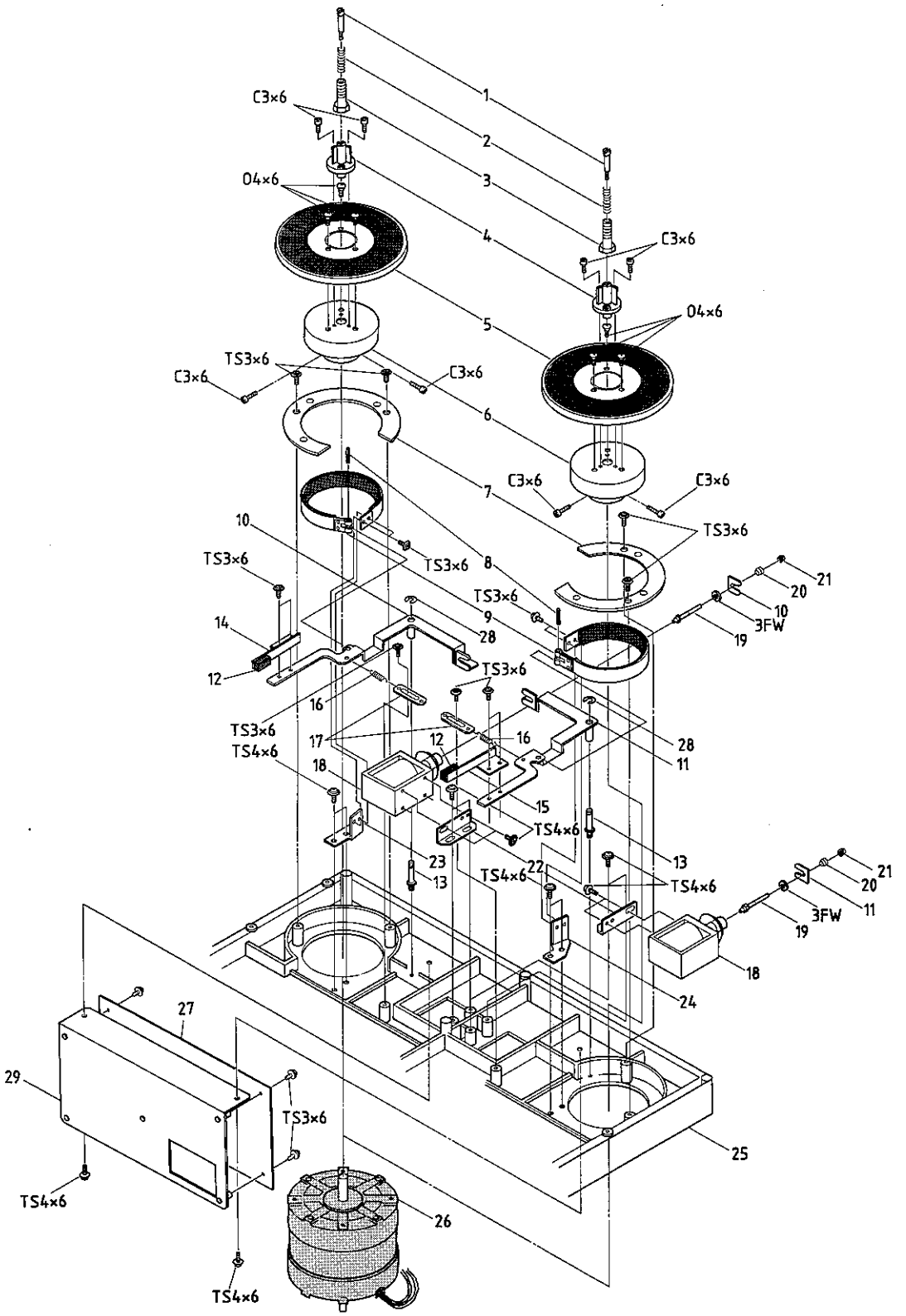
Head Assembly



[3] Reel Assembly

No.	Description	Parts No.
1.	Pin, Reel Shaft	KW0E058
2.	Spring	GS2109
3.	Shaft, Reel	KW0B052
4.	Nail, Reel Drive	KW0E063
5.	Reel Table Assembly	KW-41DF
6.	Drum, Brake	KW0A057
7.	Guide, Brake	KW41D02
8.	Pin	F62314
9.	Brake Band Assembly	KW-4E-A
10.	Brake Arm L Assembly	KW41DB
11.	Brake Arm R Assembly	KW41DA
12.	Stopper, Rubber	PZ1C113
13.	Shaft, Arm	KW41D01
14.	Angle, L	KZ3A135
15.	Angle, R	KZ3A136
16.	Spring	GS1149
17.	Plate, Spring Adjustment	KZ3A134
18.	Solenoid	GP1F04
19.	Screw	KZ6A095
20.	Washer	KZ6C116
21.	Nut	F951D001
22.	Bracket, Solenoid	KZ2A127
23.	Angle L, Brake	KW41D11
24.	Angle R, Brake	KW41D10
25.	Plate, Deck	T004104
26.	Motor, Reel	MR1C030
27.	VOLTAGE SELECT PCB Assembly	PB-7NWA
	Capacitor	CZ10052W
	Fuse, 5A Slow Blow	FH9-007
	Fuse, 1A 12.5V	FH7A010
	Fuse, 2A 12.5V	FH7A020
	Fuse, 5A 12.5V	FH7A050
28.	Retaining Ring, E-Type	F75040
29.	Bracket Assembly	T0046-A

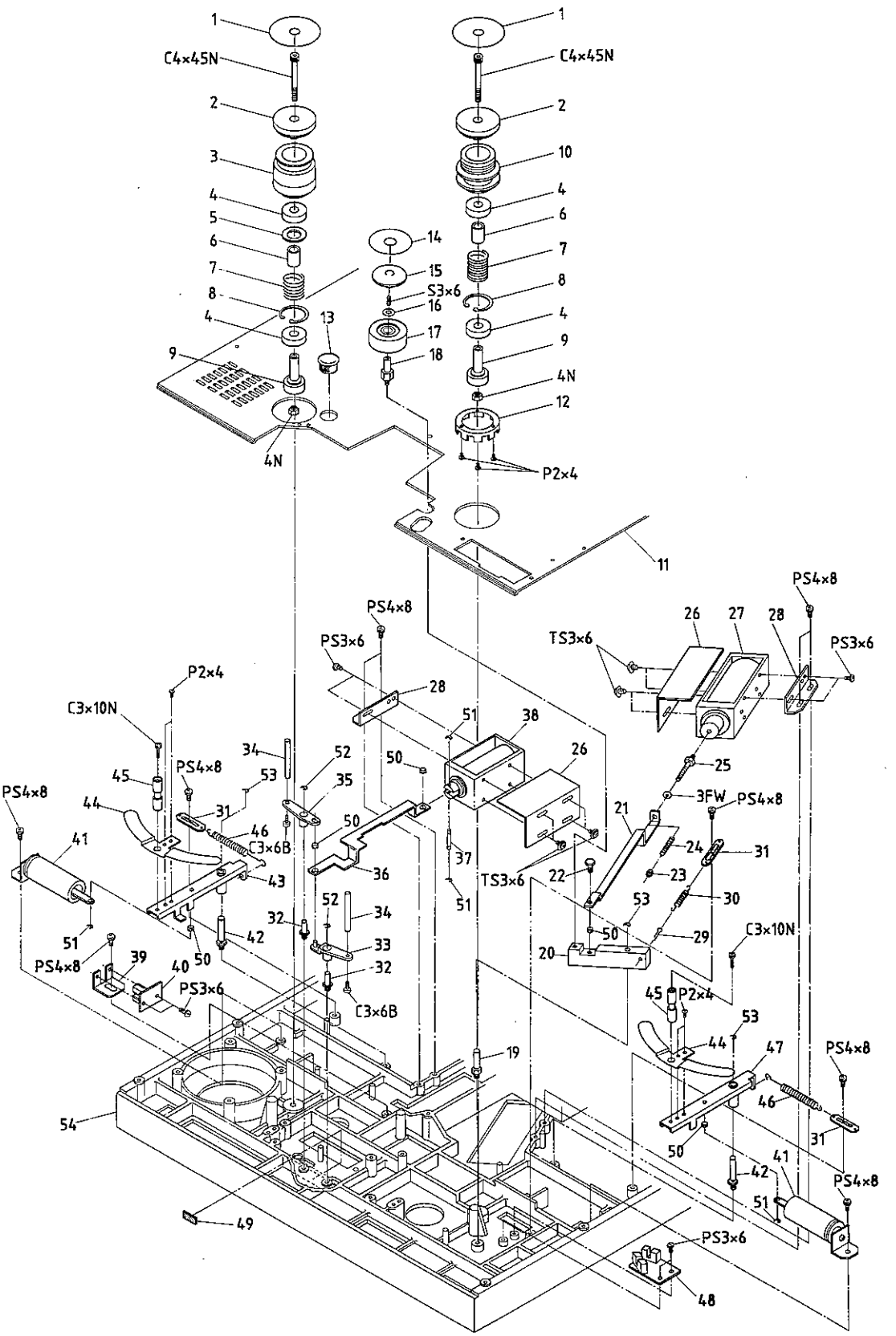
Reel Assembly



[4] Tape Deck Assembly (1)

No.	Description	Parts No.
1.	Film, Protection	KZ6C091
2.	Cap, Roller	KI4N001
3.	Roller, Impedance	KI0A063
4.	Bearing	BA1Z048
5.	Washer	KZ6C061
6.	Collar	KZ7C080
7.	Spring	GS2108
8.	Retaining Ring, C-Type	F7019.0
9.	Shaft, Roller	GP4Y003
10.	Roller, Counter	GR4Z003
11.	Skin, Deck	T004101
12.	Ring, Slit	SR3Z033
13.	Plug, Hole	PZ1G118
14.	Film, Protection	KZ6C092
15.	Cap, Pinch Roller	KP0B051
16.	Spacer	KZ6C067
17.	Pinch Roller Assembly	KP-4S-A
18.	Shaft, Pinch Roller	KP0B051
19.	Shaft, Arm	KP4S002
20.	Arm, Pinch Roller	KP4S001
21.	Link, Solenoid	KZ3A13
22.	Pin, Link	KZ5G028
23.	Nut	F951D001
24.	Spring	GS2125
25.	Screw, Link Adjustment	KZ6A095
26.	Plate, Shield	KR4R008
27.	Solenoid	GP1B13
28.	Bracket, Solenoid	KZ2A127
29.	Pin, Split	F66212
30.	Spring	GS1033
31.	Plate, Spring Adjustment	KZ3A134
32.	Shaft, Link	KW41D03
33.	Lifter Link R Assembly	KR-4T-A
34.	Pin, Lifter	KR4T001
35.	Lifter Link L Assembly	KR-4T-A
36.	Link, Lifter	KR4T002
37.	Pin, Solenoid	KZ5A006
38.	Solenoid	GP1Q01
39.	Bracket, Sensor PCB	KZ2A129
40.	PHOTO SENSOR PCB Assembly	PB-4HFA
	Photo Sensor	PN-0227
41.	Air Pot Assembly	AS-73H
42.	Shaft, Arm	KA41D1
43.	Tension Arm L Assembly	KA-41DB
44.	Blind	KA41D01
45.	Guide, Tape	KG4D008
46.	Spring	GS1148
47.	Tension Arm R Assembly	KA-41DC
48.	ROLLER TACHO PCB Assembly	PB-4HCA
49.	Stopper, Rubber	PZ1C113
50.	Bushing	KZ6C118
51.	Retaining Ring, E-Type	F7502.0
52.	Retaining Ring, E-Type	F7503.0
53.	Retaining Ring, E-Type	F7504.0
54.	Plate, Deck	T004104

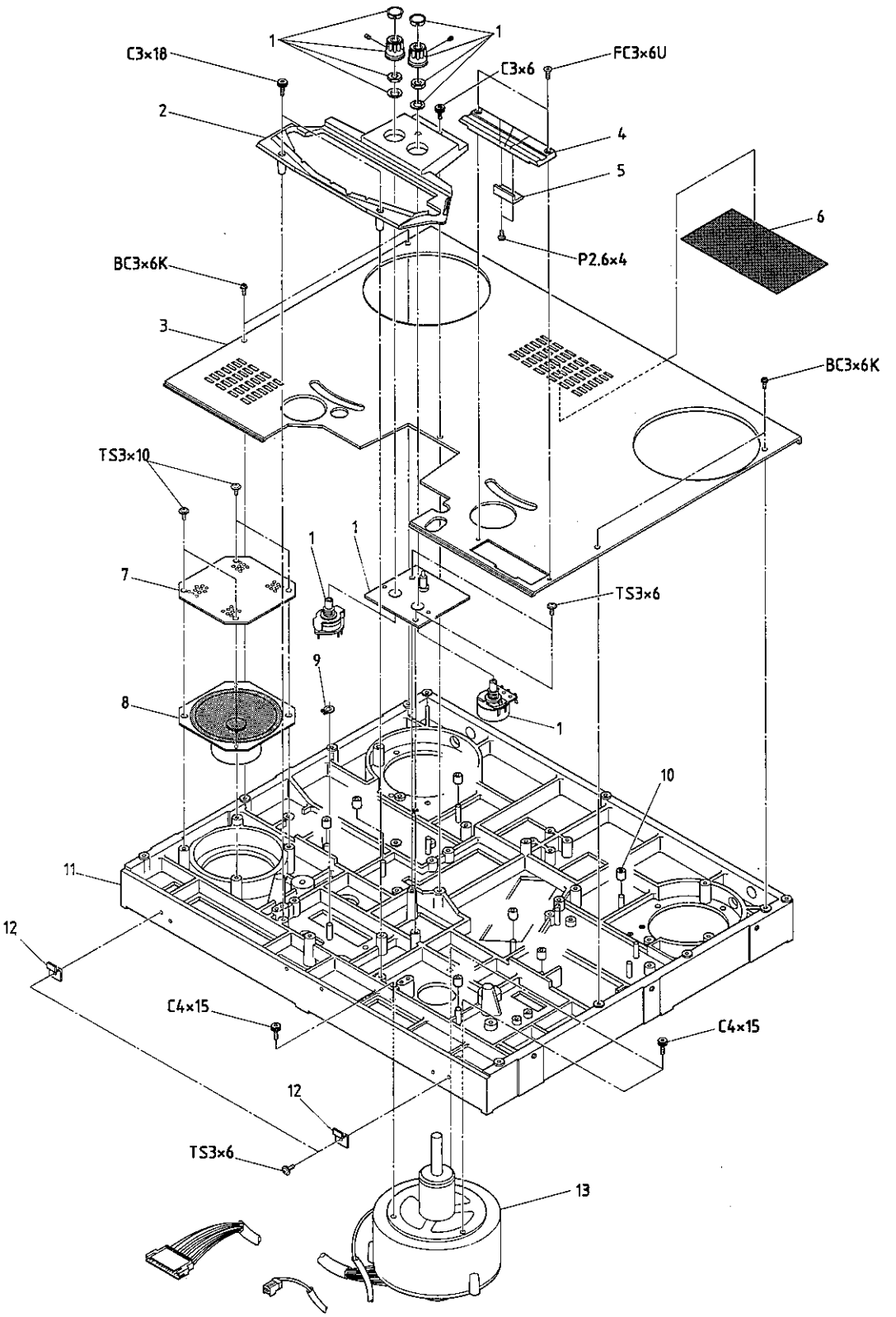
Tape Deck Assembly (1)



[5] Tape Deck Assembly (2)

No.	Description	Parts No.
1.	PITCH CONTROL VR PCB Assembly	PB-4HGA
	Encoder, Rotary	SR3Z027
	Switch, Rotary	WH63087
	Knob	KN1103
	Cap	KN1099
2.	Skirt	T004102
3.	Skin, Deck	T004101
4.	Block, Splicing	T004107
5.	Stopper, Cutter	T004106
6.	Blind	PZ1B070
7.	Cover, Speaker	T004105
8.	Speaker Assembly	T0041-A
9.	Retaining Ring	F730404
10.	Damper	PZ1C109
11.	Plate, Deck	T004104
12.	Stopper	KZ2A130
13.	Motor, Capstan	MR-1D

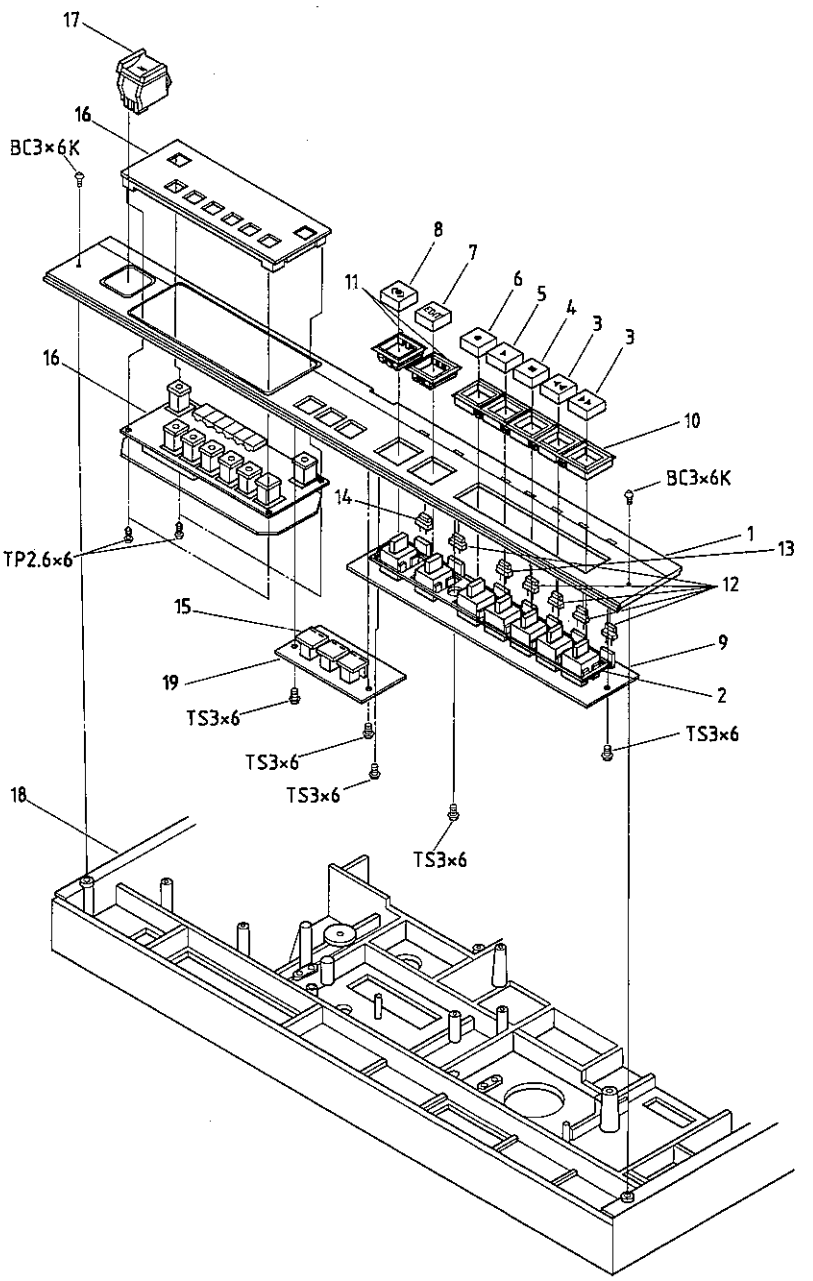
Tape Deck Assembly (2)



[6] Transport Control Panel Assembly

No.	Description	Parts No.
1.	Panel, Control	CB21K01
2.	Frame, Switch	CB21K03
3.	Button, WIND	KN2143
4.	Button, STOP	KN2141
5.	Button, PLAY	KN2142
6.	Button, RECORD	KN2144
7.	Button, EDIT	KN2147
8.	Button, CUE	KN2145
9.	TRANSPORT CONTROL SW 1 PCB Assembly	PB-4HDA
	Switch, Push	WH11258
10.	Escutcheon, Switch	PZ4A023
11.	Escutcheon, Switch	PZ4A022
12.	LED (Green)	PNTLG208
13.	LED (Red)	PNTLR208
14.	LED (Amber)	PNTLY208
15.	Cap, Switch (Gray)	WH0B126C
16.	Timer Display Assembly	ZA-93E
	Lens	KN5010
	TIMER INDICATOR PCB Assembly	PB-7HTA
	TIMER DRIVE PCB Assembly	PB-7HUA
17.	Switch, Power	WH42062
18.	Plate, Deck	T004104
19.	TRANSPORT CONTROL SW 2 PCB Assembly	PB-4HEA
	Switch, Push	WH1129

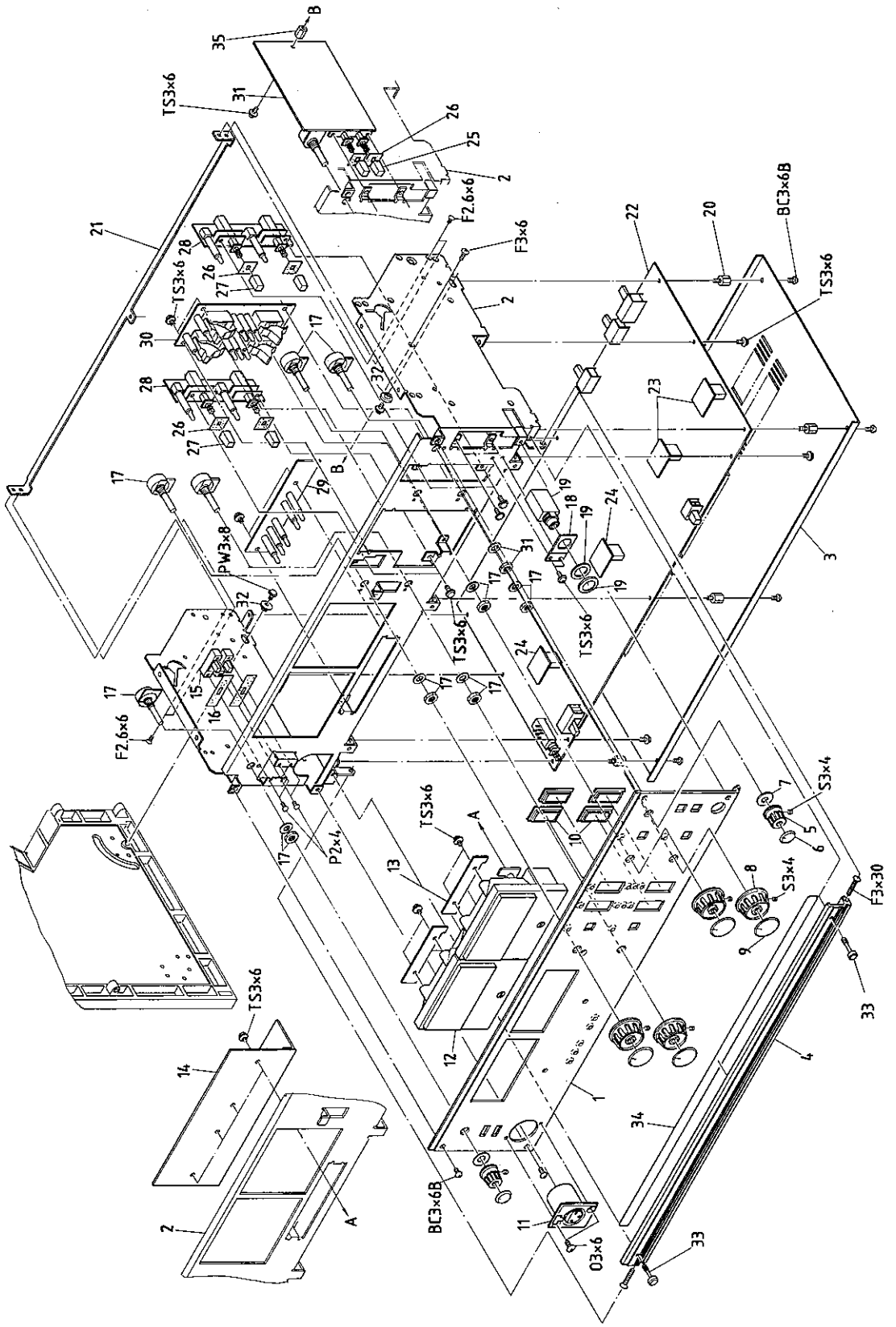
Transport Control Panel Assembly



[7] Amplifier Assembly

No.	Description	Parts No.
1.	Panel, Amplifier	A112301
2.	Chassis, Amplifier	A1123-A
3.	Panel, Bottom	A112305
4.	Panel, Blind	A112307
5.	KnobK	N1103
6.	Cap, Knob	KN1099
7.	Washer	KZ6C048
8.	Knob	KN1100
9.	Cap, Knob	KN1102
10.	Escutcheon, Switch	PZ4A021
11.	Connector,XL-type Receptacle (Female)	CN103046
12.	Meter, VU	ME11021
13.	LED PCB Assembly	PB-7LMB
14.	OUTPUT PCB Amplifier	PB-1AFA
15.	Switch	WH320546
16.	Blind	PZ113066
17.	Potentiometer	RV214100 —
18.	Holder,Phone Jack	A112310
19.	Phone Jack	CN603228
20.	Stud	KZ9L080A
21.	Support, Chassis	A112306
22.	AUDIO AMPLIFIER PCB Amplifier	PB-19ZA
23.	REP REF PCB Assembly (MX-55N)	PB-7MZA
	REP REF PCB Assembly (MX-55D)	PB-7MZB
24.	REC REF PCB Assembly (MX-55N)	PB-7NAA
	REC REF PCB Assembly (MX-55D)	PB-7NAB
25.	Button	KN1061
26.	Blind	PZ1B053
27.	Button	KN1060
28.	SRL SWITCH PCB Amplifier	PB-7LKA
29.	EQ/REF FLUX LED PCB Amplifier	PB-7LJA
30.	MODE SWITCH PCB Amplifier	PB-7LLA
31.	MONI AMPLIFIER PCB Amplifier	PB-19XA
32.	Collar	KZ6C117
33.	Screw, Retaining	KZ6A096
34.	Label, Amplifier Control	PT4215
35.	Stud	KZ9H080A

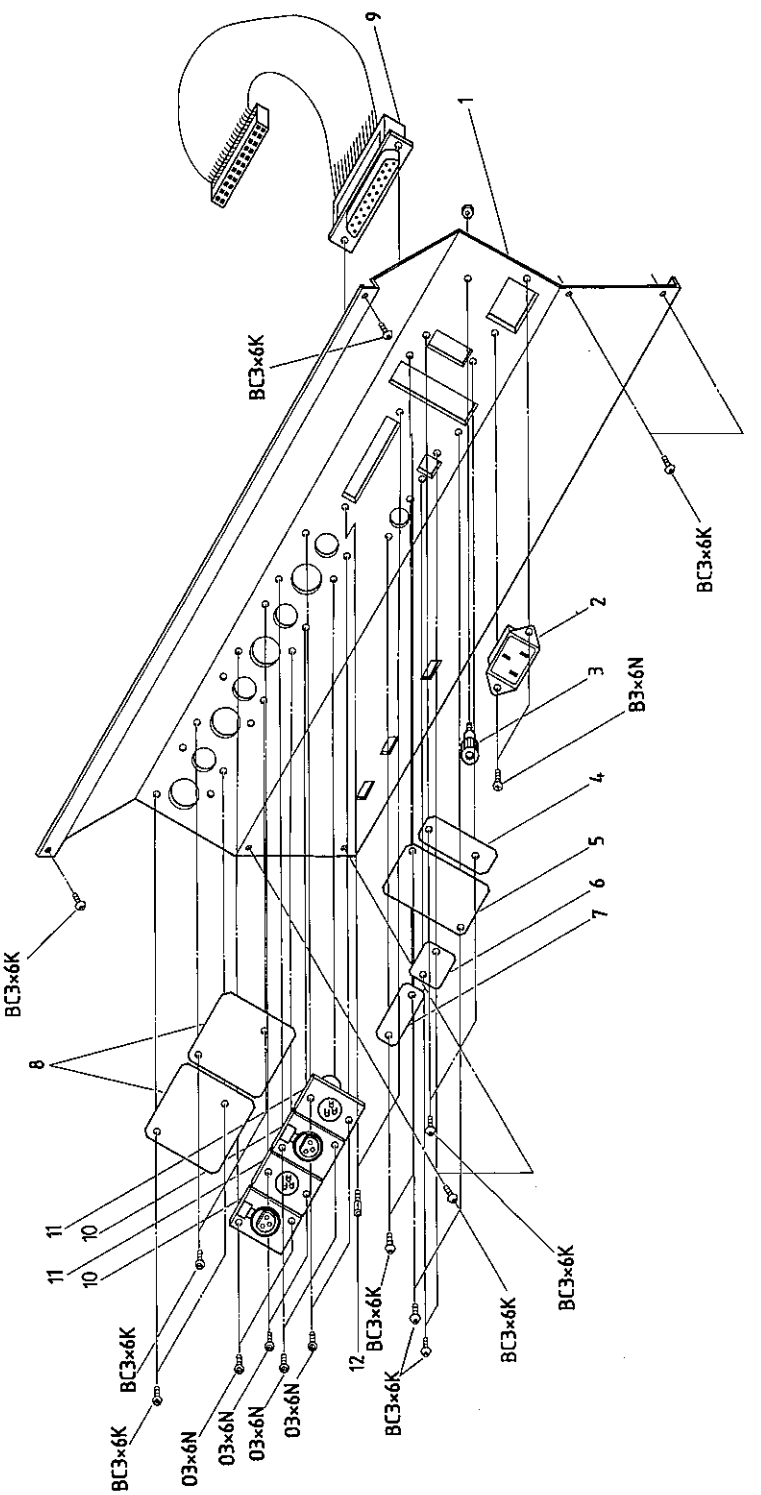
Amplifier Assembly



[8] Connector Panel Assembly

No.	Description	Parts No.
1.	Panel, Connector	CB75001
2.	AC Inlet	CN603012
3.	Terminal, Ground	CN901040
4.	Panel, Blank	CB75008
5.	Panel, Blank	CB75005
6.	Panel, Blank	CB75004
7.	Panel, Blank	CB75007
8.	Panel, Blank	CB75003
9.	Cable Assembly, Parallel I/O	PZ9D164
10.	Connector,XL-type Receptacle (Female)	CN103045
11.	Connector,XL-type Receptacle (Male)	CN103046
12.	Screw, D sub, Lock	CN7B-212

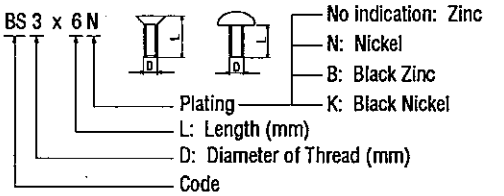
Connector Panel Assembly



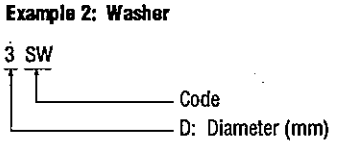
Hardware

	Name	Code		Name	Code
	Bind SEMS Screw	**BS**		Hex Head Bolt	**H**
	Pan SEMS Screw	**PS**		Hex Nut	**N**
	Triple Screw	**TS**		Flat Washer	**W**
	Binding Head Screw	**B**		Fiber Washer	**FW**
	Pan Head Screw	**P**		Stainless Steel Washer	**SSW**
	Flat Countersunk Head Screw	**F**		Spring Washer	**SW**
	Oval Countersunk Head Screw	**O**		Lock Washer	**LW**
	Truss Head Screw	**T**		Knob Washer	**KW**
	Pan Screw with Spring Washer and Flat Washer	**PZ**		Retaining Ring, E-type	**E**
	Hex Socket Head Screw	**C**		Retaining Ring, C-type, Outer	**CO**
	Hex Socket Headless Set Screw, Flat	**S**		Retaining Ring, C-type, Inner	**CI**
	Hex Socket Headless Set Screw, Pinpoint	**SP**		Spring Pin	**SPN**
	Button Head Socket Cap Screw	**BC**			
	Flat Head Socket Cap Screw	**FC**			
	Tapping Pan Head Screw	**TP**			
	Tapping Flat Countersunk Head Screw	**TF**			
	Flat Head Wood Screw	**FWS**			

Example 1: Screw



Example 2: Washer



All screws conform to ISO standard, and have a cross-recessed head, unless otherwise noted.
ISO screws have a point inscribed in the head.

Index

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ERRATA

Otari, Inc.

The following is a correction for pages 8-8 and 8-12 (Exploded Views and Parts Lists) of the MX-55 N, D Operation and Maintenance Manual (Fourth Edition) Part No. OS3-153.

[4] Tape Deck Assembly (1)

In the Manual, No.46 spring is attached to both the Supply Tension Arm and Take-Up Tension Arm. However, the two springs are not the same. The part number of the spring attached to the Supply Tension Arm should be GS1162. And the part number of the spring attached to the Take-Up Tension Arm is GS1148.

[6] Transport Control Panel Assembly

The part number of the No.16 Lens should be read KN5011.

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:

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Chofu-shi, Tokyo182
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NEW ADDRESS

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.