Vestax

PERSONAL MULTITRACK RECORDER

MR44

OWNER´S MANUAL

Special Features

- MR44 is an all-in-one multitrack recorder with a 4 channel mixer, independent track monitor function and recorder which can record 4 tracks simultaneously, all combined in a compact case.
- Using each trim volume, the 4 channel mixer can be used in conjunction with a wide variety of instruments such as mic, guitar, synthesizer, etc. Also, by employing AUX, PAN VOLUME and the high quality faders. MR44 freely demonstrates various mixing techniques.
- Double speed mode using the latest full logic mechanism further continues the high sound quality of the MR series. This has been cultivated by the knowledge of musical instrument manufacturer together with the technology of Vestax recording. The result is a superior frequency response.

Of course, it has interchangeability with the stereo format at normal mode of 4.75 cm/s tape speed.

- It creates a variety of sounds by employing 5 band stereo graphic equalizer.
- LED METERS and LED TAPE COUNTER with fine visibility improves the operation and over dubbing or ping-pong and are easily operated by ZERO RETURN/CUING function.
- Compact 19" rack mountabledesingn is mobile and safe.

Contents

1. IMPORTANT

- To prevent electric shock, do not remove cover.
- No user serviceable parts, refer servicing to qualified personnel.
- Always disconnect all the equipment from the main supply when disconnecting the signal leads.
- The AC ADAPTOR cord should be connected last. Make sure that the power switch is off when connecting.
- Disconnect from AC ADAPTOR when equipment is not used for an extended period of time.

2. PRECAUTIONS

Please read these instructions before operating this unit.

- Humidity and Dust

Avoid use where there is high humidity and dust which may cause damage to internal parts.

- Temperature

Avoid use in hot (over 35°C) and cold (below 5°C) locations. Keep the unit away from extreme direct heat such as direct sunlight, heating radiators, or closed vehicles.

- KEEP AWAY FROM LIQUIDS.

Do not stand vessels containing liquids on or near the equipment. If liquid does happen to enter equipment, disconnect the power cord from the power outlet immediately.

3. WARRANTY

Warranty might vary from country to country. Each distributor has their own warranty system in accordance with the country or state regulations. Vestax has manufacturers responsibility for products by the manufacturing country's regulations.

4. SPECIFICATIONS

MERCHANICAL CHARACTERISTICS

TAPE	: C-60, C-90 TYPE chrome, Hi-bias, (70 μs EQ)
TRACK FORMAT	: 4 track 4 channel
HEAD CONFIGURATION	: 4 channel REC/REPRO (hard permalloy) 4 channel ERASE (ferrite)
MOTOR	: FG servo motor × 1 DC control motor × 1
TAPE SPEED	: 4.75 cm/sec ± 1%, 9.5 cm/sec ± 1%, switchable
PITCH CONTROL	: ± 10%
WOW & FLUTTER	: HI-SPEED 0.04% W. RMS NORM-SPEED 0.05% W. RMS
FAST WINDING TIME	: Approx. 90 sec., (C-60 TAPE)

PERFORMANCE CHARACTERISTICS

FREQUENCY RESPONSE:	
HI-SPEED	20 Hz ~ 18 KHz ±3 dB
NORM-SPEED	35 Hz ~ 12.5 KHz ±3 dB
S/N RATIO	: 85 dB (IHF "A" WID dbx IN)
TOTAL HARMONIC DISTORTION	: 1% (1 KHz, 0VU, dbx IN)
CHANNEL SEPARATION	: more than 55 dB (1 KHz)
ERASURE	: more than 70 dB (1 KHz)

MIXER SECTION

MIC/LINE INPUT (1 ~ 4 channel)	
INPUT IMPEDANCE	: 10KΩ
NOMINAL INPUT LEVEL	: −10 dBV ~ −50 dBV
MINIMUM INPUT LEVEL	: −56 dBV TRIM MAX
MAXIMUM INPUT LEVEL	: −16 dBV TRIM MIN
AUX RETURN (L/R)	
INPUT IMPEDANCE	: 10 KΩ
NOMINAL INPUT LEVEL	: −10 dBV
MINIMUM INPUT LEVEL	: −16 dBV
AUX SEND (1/2)	
OUTPUT IMPEDANCE	: 1 KΩ
NOMINAL LOAD IMPEDANCE	: 10 KΩ
NOMINAL OUTPUT LEVEL	: −10 dBV
HEADPHONE OUTPUT	
NOMINAL LOAD IMPEDANCE	: 8 ~ 40 Ω
MAXIMUM OUTPUT LEVEL	: 40 mW
SYNC INPUT/OUTPUT	
INPUT IMPEDANCE	: 47 KΩ
NOMINAL INPUT LEVEL	: −10 dBV
OUTPUT IMPEDANCE	: 2.8 KΩ
NOMINAL OUTPUT LEVEL	: −10 dBV

LINE OUT (L/R)	
OUTPUT IMPEDANCE	: 1 KΩ
NOMINAL LOAD IMPEDANCE	: 10 KΩ
NOMINAL OUTPUT LEVEL	: −10 dBV
TAPE OUT (1 ~ 4 track)	
OUTPUT IMPEDANCE	: 1 KΩ
NOMINAL LOAD IMPEDANCE	: 10 KΩ
NOMINAL OUTPUT LEVEL	: −10 dBV
MONITOR OUT (L/R)	
OUTPUT IMPEDANCE	: 1 KΩ
NOMINAL LOAD IMPEDANCE	: 10 KΩ
NOMINAL OUTPUT LEVEL	: −10 dBV
EQUALIZER	
TYPE	: STEREO 5 BAND GRAPHIC
BOOST/CUT RANGE	: ±10 dB
FREQUENCY	: 100, 400, 1K, 5K, 10K, (Hz)
NOISE REDUCTION	: dbx type II

POWER	: DC 12 V 850 mA
DIMENSIONS	: 482 × 100 × 177 mm (W × H × D) 19 inch 4U EIA
WEIGHT	: 3.0 kg

* dbx is a registered trademark of dbx incorporated.
* 0 dBV = 1.0 volt, 0 dB = 0.775 V rms.
* Change in specifications and features may be made without notice or obligation.

5. TRACK FORMAT

The track format is designed with consideration to improving sync cross-talk while maintaining interchangeability with the standard cassette format. A tape recorded on tracks 1 and 2 of the MR44 can be played on regular format cassette decks with a tape speed of 1-7/8 ips (4.8 cm/s).
The MR44 records and plays in only one direction using the entire width of the tapes. So do not turn over the tape, or you will erase recorded tracks.

- Stereo Cassette Deck
  Tape run method ➡

	⬅ L Channel Track	B
	⬅ R Channel Track	
A	R Channel Track ➡	
	L Channel Track ➡	

- 4 Track Cassette Recorder

Track 4	➡
Track 3	➡
Track 2	➡
Track 1	➡

6. CASSETTE TAPE

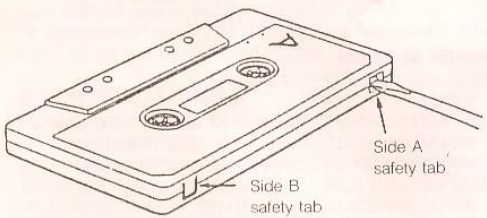
Remove both safety tabs of the cassette in order to protect the finished master, or you may accidentally erase the tracks of your master.
Do not use C-120 cassettes, as the extremely thin tape used in C-120 cassettes might lead to problems from stretching and breaking. So, use the shortest possible tape for a given job.
In order to get the best results, use 70 μs High Bias, Type II tapes such as TDK SAX, MAXELL UD XLIIS or equivalent formulations.

7. TAPE INTERCHANGEABILITY

(1) This equipment is designed for recording by the one way multi-track recording method. It is different from the regular stereo cassette recorder which is designed to record/play by two tracks respectively. However, the head of this equipment is designed to be interchangeable with a regular cassette deck, and tapes which have been recorded on a regular cassette deck can be played back on this equipment. This is done by connecting the MR-44 line out to an amp, setting the 1 and 2 channel changeover switch on "TAPE", setting "PAN" on left for track 1 and right for track 2, adjusting the balance with the fader of each channel, and adjusting the volume with the master fader.

8. TRACKS AND CHANNELS

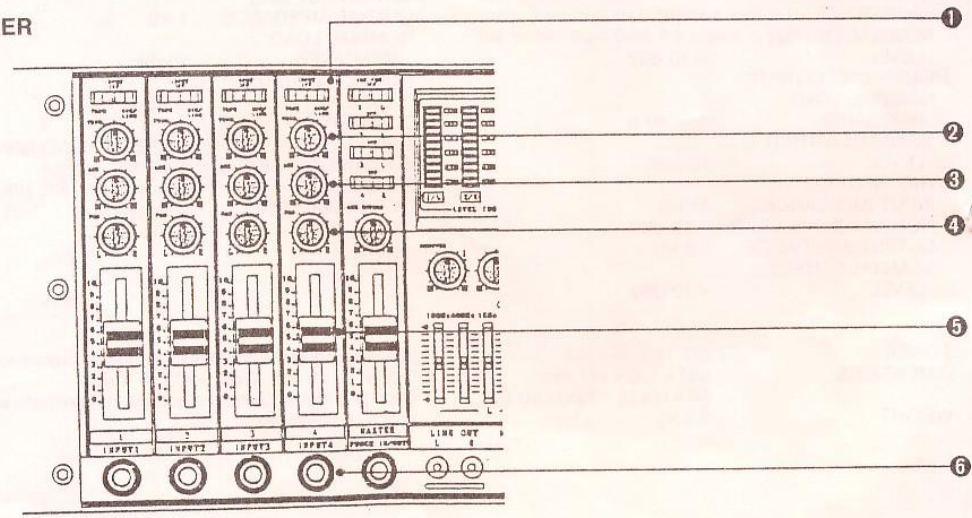
The terms "channel" and "track": In this owner's manual, the term "channel" refers to the circuitry and controls required to process one input source. MR44's mixer section has four "channels." The term "track" refers to the magnetic bands on tape used to store signals recorded by MR44's recorder section. Since MR-44 records four separate bands of audio on tape, it is a four-"track" recorder.

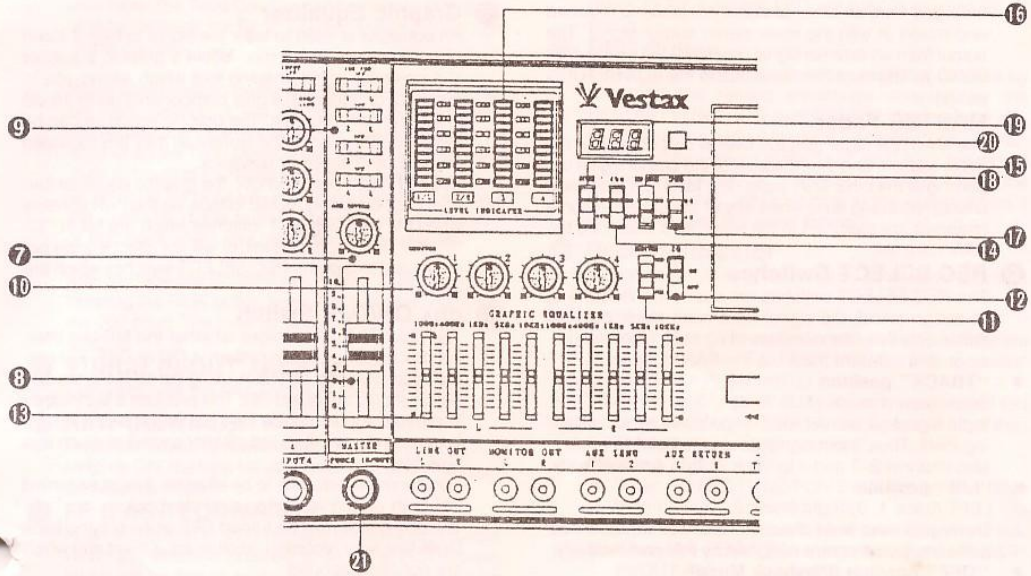


NOTE: The optional Remote Punch In/Out pedal is effective regardless of the removal of safety tabs.

9. NAMES AND FUNCTIONS

MIXER





❶ INPUT Select Switch

This switch selects the input signal which goes to the mixer section.

MIC/LINE: Select the MIC/LINE input connector on the front panel of the MR44 OFF: Acts as a "mute".

This "mute" can be useful in many ways. When used on MIC/LINE signals it will allow you to turn on a signal accurately without having to move the fader to a preset mark. This "drop-in" function with all controls preset can be used to edit out undesirable sections from a track when you are remixing. Prior to your final mix, the use of this mute function will allow you to hold all your preliminary mix settings including the level set by the fader, and still silence an input while you "fine tune" another.

TAPE: Selects an internal connection from the recorder's input channel 1 corresponding to tape track 1; channel 2 to track 2; channel 3 tape track 3 and channel 4 to track 4. Nothing will be available at this switch point unless there are signals on the tape. The large block diagram shows the entire playback signal path from the recorder to this connection, and that the signal also appears at front panel RCA PHONO connector marked TAPE OUT.

❷ TRIM

This control alters the gain of the first amplifier, it will affect the level of MIC/LINE signals but has no effect on the TAPE signals. The amount of increase or gain that the amplifier gives the signal is determined by TRIM control. The TRIM control allows you to adjust the amplifier to handle a wide variety of signal levels. Turning the TRIM control clockwise (right) causes the amp to give more gain when working with mic's or softer sound sources.

Turning the TRIM counterclockwise (left) reduces the amount of gain when working with line level signals or louder sound sources.

❸ AUX SEND Controls

The AUX SEND controls are used primarily when adding effects such as reverberation or echo to the sound of a channel of track. The AUX SEND control on each mixer channel determines the amount of signal from that channel sent to the AUX SEND jack. The AUX SEND jack(s) must be connected to the input of an external signal processor such as the effect processor.

❹ PAN

The PAN control is used to assign (send) the input channel's signal to the Stereo Busses. The PAN provides continuously variable assingment to the L Buss (full counterclockwise rotation) and the R Buss (full clockwise rotation). This allows you to make stereo mixes and locate an input channel's signal anywhere in the stereo panorama.

❺ Input Faders

The input faders are used to adjust the level (volume) of the corresponding mixer channel's signal, whether it comes from a source plugged into an input jack or from the MR44's recorder section. (The INPUT SELECT switches are used to choose between the two.) The faders are used to set up the optimum levels when recording, and to balance (mix) the sound from the recorder's tracks when playing back a recording.

Noise and distortion are at their lowest at input fader level "7".

❻ MIC/LINE Input Jacks (1 ~ 4)

These four input jacks accept signals from microphones, or from line-level sources including, electronic keyboards, electric guitars, basses and tape players. The four channel inputs are standard monaural 6.3 mm phone jacks. When a source is plugged into one of these jacks, its signal is sent to the corresponding channel of the MR44's mixer.

⑦ AUX RETURN Control

The AUX RETURN control determines the level at which the signal from an external signal processor is returned and mixed in with the main stereo output signal. The output from an external signal processor fed by the AUX SEND jack(s) must be connected to the AUX RETURN jack(s).

⑧ MASTER Fader

The MASTER fader sets the overall output level of the mixer section, and thus the level of the output signal appearing at the LINE OUT jacks. The MASTER fader also affects recording level when any of the mixer section's channels are assigned to the recorder's tracks via the PAN controls.

⑨ REC SELECT Switches

The REC SELECT switches are used when recording to assign (send) the signal from each mixer channel either directly to the corresponding track of the recorder or to a different track via the PAN controls.

- **"TRACK" position**
  Track record mode (1, 2, 3, 4)
  Input Signal will be recorded respectively without affecting PAN. Thus, input signal goes channel-1 to track 1, also channel 2, 3 and 4 to track 2, 3 on 4 respectively.
- **"L/R" position**
  LEFT (track 1, 3)/Right (track 2, 4)
  The signal input from channels 1 ~ 4 will be recorded to the tracks, which are assigned by PAN respectively.
- **"OFF" position (Playback Mode)**
  The track in this position will be on the playback mode. The tracks not to be used for recording should be set at this position.
  [Note] When any of the REC SELECT switches are set to a position other than OFF, the red indicator LED above the transport REC button will flash, indicating that the MR44 is set up to record. Recording will commence when the transport REC and PLAY buttons are pressed simultaneously. If all REC SELECT switches are set to OFF, the unit will not record even if the transport REC and PLAY buttons are pressed.

[NOTE]
Do not move record select switches during recording. This will cause a clicking noise on tape.

⑩ MONITOR/PHONES Control

This control is used to set headphone and control room listening level. It adjusts the level of signal sent to the PHONES jack and MONITOR OUT jacks without affecting the signal level appearing at the LINE OUT jacks.

⑪ MONITOR SELECT Switch

- **MONITOR:**
  This position is selected to listen to the four tape tracks. In this position a mix from the four MONITOR controls is sent to the PHONES jack and the MONITOR OUT jack.
- **MIX:**
  This position is selected to hear a combination of the four tape tracks and input sources connected to the input jacks. The mix from the MONITOR controls is combined with the stereo output from the mixer section and sent to the PHONES jack and MONITOR OUT jack.
- **PGM**
  This position is selected to monitor the stereo output from the mixer section. In this position, the mix sent to the MONITOR OUT jack and PHONES jack is the same mix that is sent to the LINE OUT jacks.

⑫ EQ Switch

This switch turns the graphic equalizer on and off.

⑬ Graphic Equalizer

An equalizer is used to tailor the signal to help it stand out or integrate into a mix. MR44's graphic equalizer is a powerful signal shaping tool which allows you to augment or attenuate signal components up to 10 dB in five frequency bands. The graphic equalizer can be switched ON to enhance signals as they are recorded on tape, and again in playback.
[NOTE] When switched ON, the graphic equalizer can affect signals being routed to tape via the PAN controls when the REC SELECT switches which are set to "L" or "R". The graphic equalizer will not affect signals being routed to tape via REC SELECT switches which are set to "1—4".

⑭ dbx ON/OFF Switch

The dbx switch determines whether the MR44's internal dbx noise reduction system is ON or OFF. For normal recording and playback using the MR44's, the dbx switch should be turned ON. This provides a significantly improved signal-to-noise ratio (as much as 85 dB) so your recordings will sound cleaner and have much less tape hiss.
For dbx noise reduction to be effective, it must be turned ON both during recording and playback.
The dbx switch may be turned OFF when playing back tapes that were recorded on other equipment and which are not dbx-encoded.

⑮ METER Switch

When the METER switch is set to "PGM," meters 1 and 2 display the level of signals appearing at the mixer section's stereo outputs (the LINE OUT jacks). When set to "4 TRACK," the four LED peak meters display the level of the corresponding recorder track signals.

- **"4 Track" Position**
  This indicates the playing level of each track. During record and playback it indicates each signal that is entered.
- **PGM (Program Monitor)**
  It indicates the level of L/R, BUSS signal and LINE OUT. It is set up for the confirmation of mix level at ping-pong recording.

⑯ LED Peak Meters

The four LED peak meters accurately display output levels from the MR44's four recorder tracks when the METER switch is set to "4 TRACK", or meters 1 and 2 display the level of signals appearing at the mixer section's stereo outputs (the LINE OUT jacks) when the METER switch is set to "PGM."
The LED peak meters are a guide for setting up the optimum recording levels.

⑰ TAPE SPEED SELECT SW (TAPE SPEED CHANGE)

This is a tape speed change switch for double or normal speed.

- **9.5 cm/sec.**
  Works at double speed as regular cassette deck in this mode.
- **4.8 cm/sec.**
  Works at the same speed as a regular cassette deck. It is used to play tapes which have been recorded on an audio cassette deck, or conversely, to play tapes on an audio deck which have been recorded on the MR-44

⑱ ⑲ ⑳ RESET and ZERO RETURN

The Tape Counter is useful for locating any specific point on a tape. The Tape Counter can be reset to 000 at any time by pressing the RESET button located to the right of the counter.

Being able to return to any desired point on a tape can be very helpful. If the ZERO RETURN button is depressed, the tape will automatically stop during rewind when the Tape Counter reaches 000. All you have to do to return to a specific point is reset the Tape Counter to 000 at the point you wish to return to, and depress the ZERO RETURN button. The tape will always stop at that point when you use the rewind function.

After the tape has stopped when using ZERO RETURN, pressing the REW button again starts rewinding beyond the 000 point. The tape will automatically stop at its beginning.

㉑ PUNCH IN/OUT JACK

Connects with the foot switch of PUNCH IN/OUT.

㉒ REW (REWIND):

Press this button to rewind the tape. If the ZERO STOP switch is ON, the tape will stop rewinding when the counter reaches "999."

㉓ FF (FAST FORWARD):

Press this button to wind the tape ahead at high speed. When this button is pressed while in the PLAY mode, audio will be heard as the tape winds ahead at high speed.

㉔ STOP:

Immediately stops the transport and/or defeats the RECORD mode.

㉕ PLAY Button

Pressing this button places the transport in the PLAY mode. The end stop mechanism releases all functions when the tape reaches its end. Pressing the FF or REW button during playback will enable you to locate at high speed by monitoring the tape, a desired recorded portion or the end of a program.

NOTE: Monitoring the tape at a high speed will cause high level, very high-frequency audio signals to appear at the outputs. Be sure that you turn down the output/monitoring level prior to using this function, so that the headphones or speaker units will not be damaged by excess high frequency.

NOTE: Do not use this facility too often as head wear is increased by fast moving tape.

㉖ PLAY:

Starts the transport running in the PLAY mode. The green PLAY indicator LED will light to indicate PLAY status.

㉗ REC Button

Pressing this button begins the recording process by activating the record electronics selected by the RECORD FUNCTION switches and starting tape motion. Recording cannot be done if both RECORD FUNCTION switches are set to the SAFE position or the record protection tabs are missing on a cassette. Check the RECORD FUNCTION switches or the cassette tabs if the MR44 does not enter Record.

㉘ Record Indicator

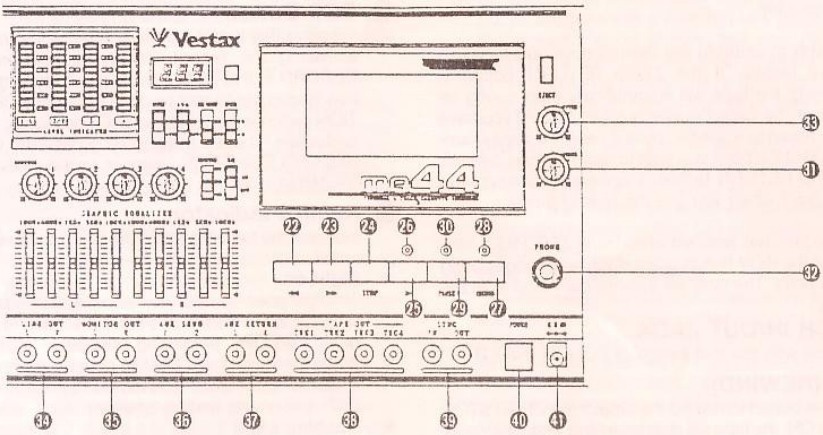
Indicates the following situations by either flashing or light on/off.

- **Light on**
  The light goes on when the record and play buttons are pressed while the REC FUNCTION SW is in a position other than OFF. (recording position)
- When the record and PAUSE buttons are pressed ON while the REC FUNCTION SW is in a position other than OFF. (recording waiting position)
- **Flashing Light**
  - When the REC FUNCTION SW is in a position other than OFF.
  - When the tab for record delete prevention is cut out.
  - When the FOOT SW is connected with PUNCH IN/OUT jack.
- **Light off**
  When the REC FUNCTION SW is in all OFF position.

㉙ ㉚ PAUSE:

Temporarily stops playback or recording. The orange PAUSE indicator LED will light when the PAUSE mode is active. When this button is pressed in the recording position, the PAUSE and PLAY indicators flash, and recording may be temporarily stopped. To resume recording, press the play back button.

When the pause button is first pressed the "PAUSE" and "PLAY" indicators will light. The MR44 is then ready for play. When play is required, press "PLAY". To pause during record press pause. Pressing pause or play will then release it. Pause mode condition will not occur when the pause button is pressed before the record button is pressed.



31 MONITOR/PHONE VOLUME

Adjusts the output signal level which goes to (32) PHONE and (35) MONITOR OUT.

32 PHONE JACK

Jack for connecting with monitoring headphone. Use stereo type headphone with impedance of more than 8 Ω

33 PITCH CONTROL

Sliding this control allows you to adjust the speed of the MR44 by approximately ± 1% in both record and playback modes. Sliding the knob to the left (−) slows the tape, while sliding it to the right (+) speeds up the tape. You can return to the basic speed of 1 7/8 ips (4.8 cm/sec) by setting it at the center detented position. The PITCH CONTROL offers you a variety of creative possibilities. In order that the MR44 could be designed to offer the greatest possible range of speeds. You will need to excercise care in the fine tuning. For use with musical material this allows pitch changes of about one and quarter whole tone. Which provides a convenient way to add difficult vocal harmonies. In any case, we suggest that you use "full slow" or "full fast" only during final playback, as minor drifts in this control circuit from hour to hour may result in slight speed variations. If, for example, you use "maximum" during recording, you will not be able to make a minor "upward" correction during playback because you will have no leeway. Also, it is recommended to make a run of several seconds in the play mode for the speed to stabilize, especially when the change in speed is large. Before beginning to record again, check the pitch carefully with a short playback, and you will have less trouble with drift.

34 LINE OUT L/R

Output jacks for two BUSS signals which were devided to L/R in the mixer section.

35 MONITOR OUT

Output jack for the MONITOR signal.
The same signal is put out as 32 PHONE jack.
The volume is adjusted by 31 MONITOR PHONE VOLUME and it can be used as a SUB OUT because it is totally separate to output from 34 LINE OUT.

36 AUX SEND 1, 2 JACK

The signals, which are set up by 4 AUX SEND VOLUME, are output in parallel.

37 AUX RETURN L,R JACK

The STEREO INPUT jacks for the line level.

38 Tape out (TRK 1-4)

Outputs the play signal of tape by each track respectively. Output level is fixed and can not be adjusted.

39 SYNC IN/OUT

It is used when this equipment syncronizes with MIDI equipment. Connect the signal from MIDI-FSK converter to SYNC IN, also, connect the SYNC OUT to input of MIDI-FSK converter when it plays back. The signal from SYNC IN is recorded through limiter and filter, these input/output signals are by passed even when dbx is in the ON position.

40 POWER SW

41 DC JACK

This is a connection jack for the exclusive AC adapter. In the case that the DC jack of front and rear panel are used simultaneously, front pannel jack is prioritized.

10. Basic Function

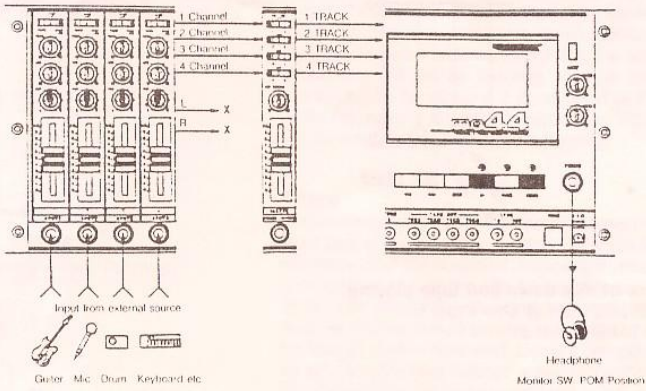
MR44 is an all-in-one unitized 4 in-2 out mixer, 4 track recorder and 4 channel monitor.
In this section, it explains how each of the three sections are connected.

(1) The relation of mixer, recorder and monitor when recording the signals from external source.

a) Direct Recording

- INPUT SELECT SW (1ch ~ 4ch):
  ALL "MIC/LINE" position
- REC FUNCTION SW (1 TRK ~ 4 TRK)
  1, 2, 3, 4 TRK position

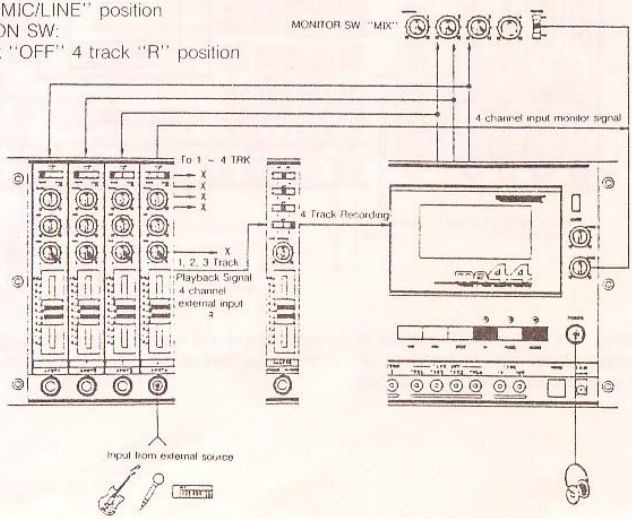
At this time, the mixer section works as 4 in 4 out and it is recorded directly with channel 1 to track 1, channel 2 to track 2, channel 3 to track 3 and channel 4 to track 4 of the mixer.



(2) The relation of mixer, recorder and monitor when recording by ping-pong.

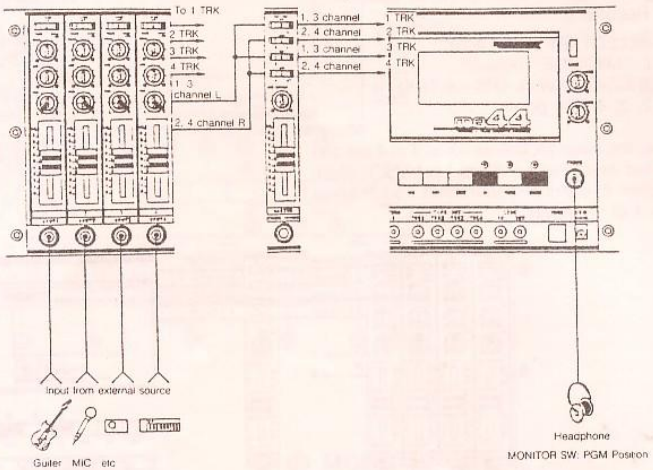
a) In the case, track 1, 2 and track 3 are recorded to the track 4 while input signal from external source is recorded to track 4, both will be recorded simultaneously:

- INPUT SELECT SW:
  1 ~ 3 channel "TAPE" position,
  4 channel "MIC/LINE" position
- REC FUNCTION SW:
  1 ~ 3 track "OFF" 4 track "R" position

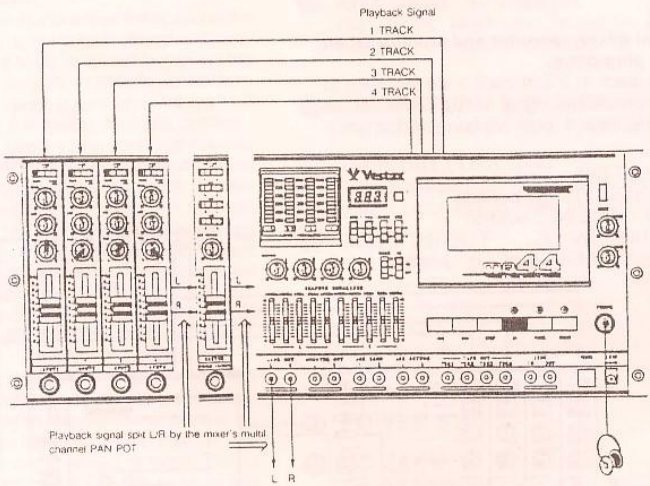


b) 2 BUSS Recording
- INPUT SELECT SW (1 ch ~ 4 ch):
  ALL "MIC/LINE" position
- REC FUNCTION SW (1 TRK ~ 4 TRK):
  L, R position

At this time, mixer section works as 4 IN 2 OUT. The function of PAN POT of each channel works to assign L and R.



(3) In the case of mix down and tape playing.
- INPUT SELECT SW (1 ch ~ 4 ch):
  ALL "TAPE" position



The above is the connecting structure of each section of MR-44. For further information, please refer to the block diagram in the last page. It is emphasised that of if you can understand and make full use of the diagram, you can master the large part of the instruction in this manual.

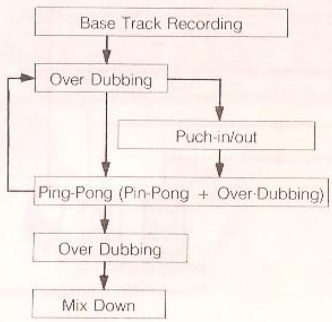
11. Method of Multi-track Recording:

Multi-track recording is done the following order:

1. Base track recording: Recording of the base of the sound such as rhythm.
2. Over dubbing: recording of other tracks by synchronizing whille base track is playing.
3. Remix: Mix down of 4 tracks, original tape, to 2 channel, stereo.

In this section, an example of multi-track recording, consist of 4 tracks by one instrument or source (sound) of music recorded to one track respectively, is introduced. This does not mean, it is not always necessary to play 4 different instruments by oneself. Performance by two players, drums and base, can be recorded to each channel at the time.

When you try multi track recording, you may refer to "Ping Pong Recording" in page 14. However, without mastering the basic technique, recording with good quality sound will not be achieved.



Recording Level:
Keeping the record level at appropriate level is important for good sound quality. Noise occurs when recording level is too low and distortion occurs when the recording level is too high. Setting the maximum recording level but without distortion is important for good results. Recording level should be set up at the level of +3 dB where LED flashes occasionally. It is recomended to use a comp/limiter (SL-201) for sound sources such as drums that have wide dynamic range.

dbx Noise Reduction System:
dbx noise reduction system demonstrates superior noise reduction so while recording is done, it should be turned "ON" all the time.

Tape Speed:
MR44 has a capacity for two diffierent running speeds. When the tape speed selector is set up at 9.5, recording time is a half of usual but frequency response is best in this mode and best recording performance will be achieved. The same tape speed should be kept until the last process of mix down.

Recording plan and Track Sheet:

Before recording is started, a basic plan should be considered. It is important to plan the instrumental formation or point of the part which you wish to appeal particularly. If recording is started without a plan, it is difficult to produce good sound because of poor sound quality and lack of track numbers.

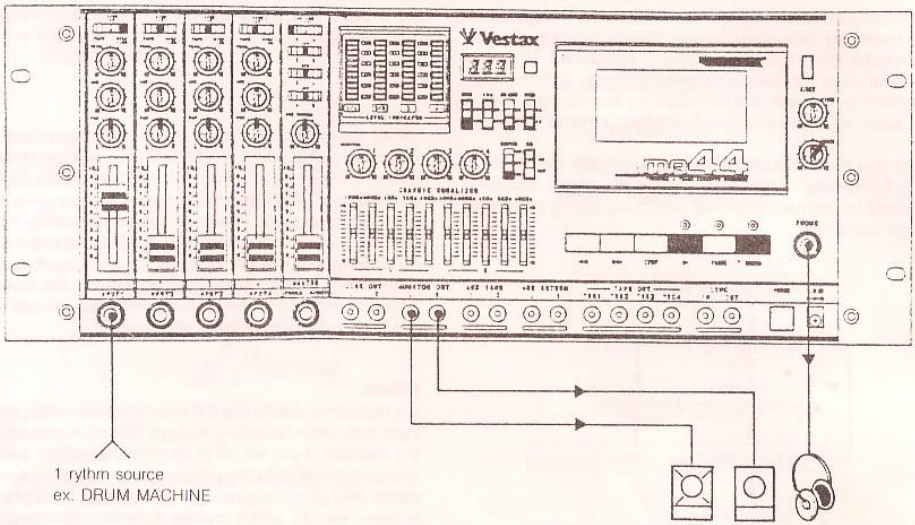
When recording plan is decided, confirmation of the recording process is recommended. It is also recommended to make a track sheet. Track sheet is a list of the processes from the start to the finish of the recording.

Monitor:
MR44 has recording and monitor circuit independantly. When headphone selector is set "MONITOR", volume of each monitor sound can be adjusted by MONITOR LEVEL CONTROL and the best level can be monitored by separating from actual recording level. However, when monitoring by power amplifier through the stereo output jack, the above mentioned monitoring will not be working. In multi track recording, monitoring by headphone is considered as the basic. Also, when microphone is used, it is recommended to use monitoring by headphone to eliminate howling.

Effect:
It is recommended to use the effects between instrument and input jack when recording is done. Distortion and chorus are the element of the sound of musical instrument itself and it is impossible to add the effect to each instrument independently after ping-pong recording is finished. When mix down is done, reverb, which creates dynamics or nuance to entire sound, is recommended. Using a comp/limitter (SL-201) for adjusting the level balance is also recommended because the dynamic range of cassette tape is not wide enough.

a) Base Track Recording

4 TRACK
3 TRACK
2 TRACK
1 TRACK



	INPUT SELECT SW	CHANNEL FADER	TRIM	PAN	AUX SEND
1 Channel	MIC/LINE	Level 7	MIN (Note 1)	Center	MIN
2 Channel	OFF	Level 0	MIN (Note 1)	Center	MIN
3 Channel	OFF	Level 0	MIN (Note 1)	Center	MIN
4 Channel	OFF	Level 0	MIN (Note 1)	Center	MIN
Master Fader		Level 7	AUX Return		MIN

	REC FUNCTION SW	MONITOR VOLUME	MONITOR/PHONES VOLUME	SET TO APPROPRIATE LEVEL
1 Track	1	MIN	MONITOR SW	PGM
2 Track	OFF	MIN	METER SW	PGM
3 Track	OFF	MIN	EQ SW	OFF
4 Track	OFF	MIN	dbx SW	ON

Note 1: Adjust the TRIM to provide an adequate input level, where the +1 LED on the LED METER flashes occasionally when the CHANNEL FADER and MASTER FADER are at level 7.
Input level is too high even when TRIM is down to the MINIMUM position, the output level of DRUM MACHINE should be set down.

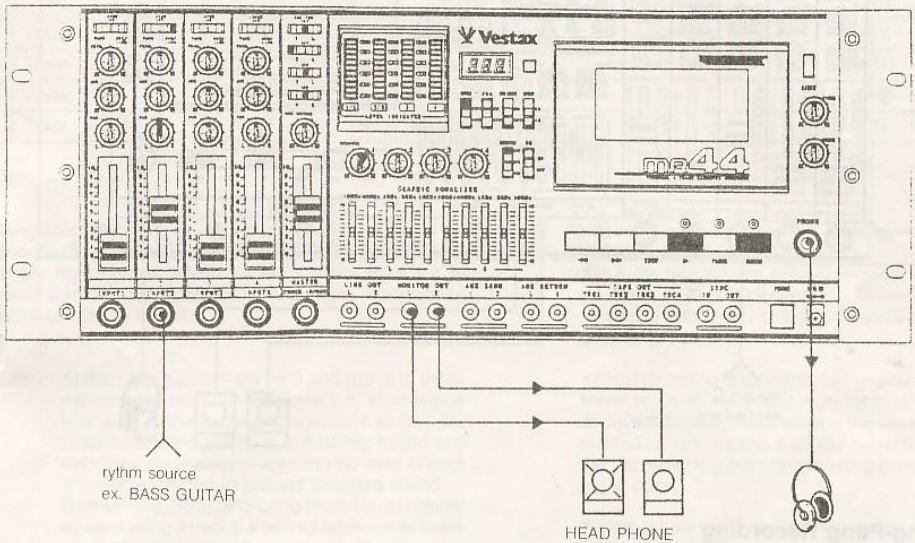
* Confirmation of Base Track Recording

Change the INPUT SELECT SW of CHANNEL 1 to "TAPE", then, playback after "1" of REC FUNCTION SW is changed to "OFF", and the recording can be confirmed.

b) Over dubbing

After the base track recording is completed, recording of the other track will be done by monitoring with head phones while base track is playing.

Recording condition
4 TRACK
3 TRACK
2 TRACK
1 TRACK



	INPUT SELECT SW	CHANNEL FADER	TRIM	PAN	AUX SEND
1 Channel	OFF	Level 0	MIN	Center	MIN
2 Channel	MIC/LINE	level 7	MIN (Note 1)	Center	MIN
3 Channel	OFF	Level 0	MIN	Center	MIN
4 Channel	OFF	Level 0	MIN	Center	MIN
MASTER FADER	Level 7	AUX RETURN	MIN		

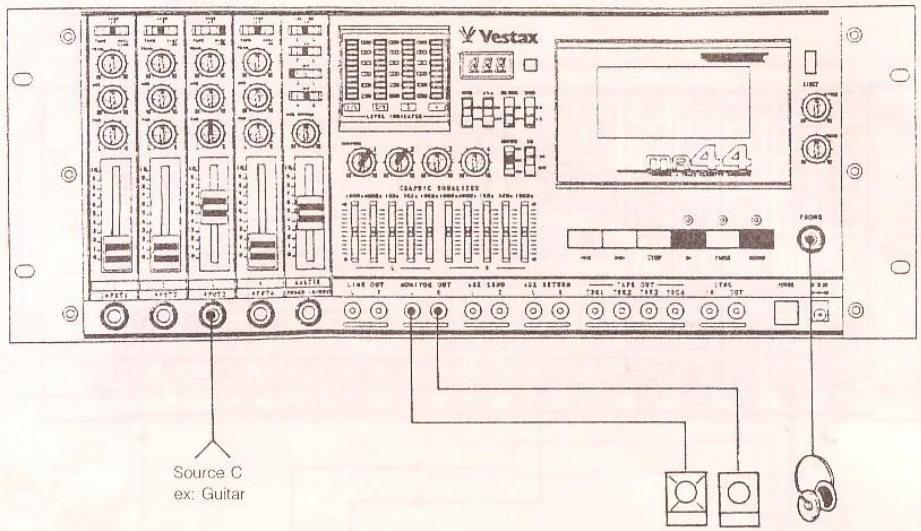
	REC FUNCTION SW	MONITOR VOLUME	MONITOR/PHONES VOLUME	SET TO APPROPRIATE LEVEL
1 Track	OFF	set to appropriate level	MONITOR SW	MIX
2 Track	2	MIN	METER SW	4 TR
3 Track	OFF	MIN	EQ SW	OFF
4 Track	OFF	MIN	dbx SW	ON

* Confirmation of recording track

Firstly, rewind the tape, and raise the MONITOR VOLUME of track 1 and track 2, and then it can be confirmed the recorded sound of drums and base in track 1 and 2 respectively while it plays back by pressing PLAY.

Same manner as above, recording of source C (guitar) to track 3 can be done while track 1 (drums) and track 2 (base guitar) are monitoring.

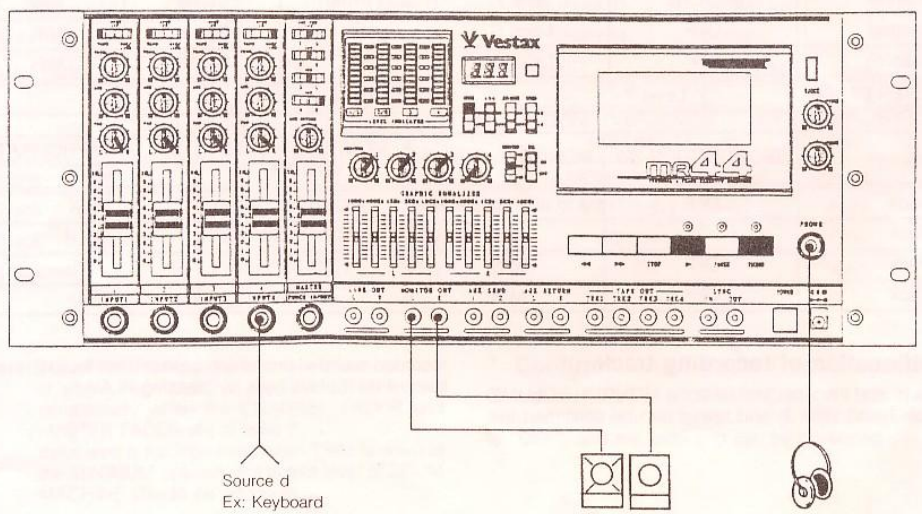
4 TRACK
3 TRACK c
2 TRACK b
1 TRACK a



c) Ping-Pong Recording

While track 1 (drums), track 2 (bass guitar) and track 3 (guitar) are monitoring, source D (keyboard) will be recording in track 4 simultaneously.

4 TRACK a + b + c + d
3 TRACK
2 TRACK
1 TRACK



	INPUT SELECT SW	CHANNEL FADER	TRIM	PAN	AUX SEND
1 Channel	TAPE	set at appropriate level. Note 2	MIN	R	MIN
2 Channel	TAPE	set at appropriate level. Note 2	MIN	R	MIN
3 Channel	TAPE	set at appropriate level. Note 2	MIN	R	MIN
4 Channel	MIC/LINE	set at approrpiate level. Note 2	MIN Note 1	R	MIN

MASTER FADER	set at appropriate level	AUX RETURN	MIN

	REC FUNCTION SW	MONITOR VOLUME	MONITOR/PHONES VOLUME	SET TO APPROPRIATE LVEL
1 Track	OFF	set at appropriate level	MONITOR SW	MIX
2 Track	OFF	set at appropriate level	METER SW	4 TR
3 Track	OFF	set at appropriate level	EQ SW	OFF
4 Track	OFF	set at appropriate level	dbx SW	ON

•Ping-pong recording is as follows: first of all, dubbing the recorded 3 tracks, track 1-2-3, to track 4 by mono. And secondly, dubbing again the recorded 2 tracks, track 1-2, to track 3 by mono. Using this kind of technique, maximum 10 tracks can be recorded.

Note 2: At this time, signal of tracks 3 and signal of external track will be recorded in track 4. Most important point at this occasion is, when 4 singals are combined, the signal level is relatively raised and this is why the process of adjusting the fader of each chennel is needed to prevent distorted sound. Furthermore, once ping-pong record is completed by combining 3 tracks, it will not be possible to adjust the balance of each instrument. Therefore, rehearsal is strongly recommended before ping-pong recording is started.

•When ping-pong recording is performed to the next track such as track 1 to 2, track 2 to 3 and track 3 to 4, the high register of sound source, which will be recorded, should be decrease. When ping pong recording to the next track, avoid excessive volume or level gain.

•When recording is repeated, low register of sound sorce tends to raise and high register tends to decrease. So that, rectification of the sound quality is needed. In this case, it should be rectified from the first recording but when the ping-pong recording is done.

•Vocal or solo instrument sound sources, which will be the center of the sound, should not be recorded in the group of ping pong because it will not be posible to adjust the tone or balance after. Also, the punch in/out should be done before ping-pong recording is performed.

As described above, by using these recording technique, maximum 10 kinds of sound source can be recorded in to 4 tracks.

4 TRACK	ⓐ+ⓑ+ⓒ+ⓓ	4 TRACK	ⓐ+ⓑ+ⓒ+ⓓ
3 TRACK		3 TRACK	
2 TRACK		2 TRACK	ⓕ
1 TRACK	e	1 TRACK	ⓔ

4 TRACK	ⓐ+ⓑ+ⓒ+ⓓ	4 TRACK	ⓐ+ⓑ+ⓒ+ⓓ
3 TRACK	ⓔ+ⓕ+ⓖ	3 TRACK	ⓔ+ⓕ+ⓖ
2 TRACK		2 TRACK	ⓗ+ⓘ
1 TRACK	ⓗ	1 TRACK	

4 TRACK	ⓐ+ⓑ+ⓒ+ⓓ
3 TRACK	ⓔ+ⓕ+ⓖ
2 TRACK	ⓗ+ⓘ
1 TRACK	ⓙ

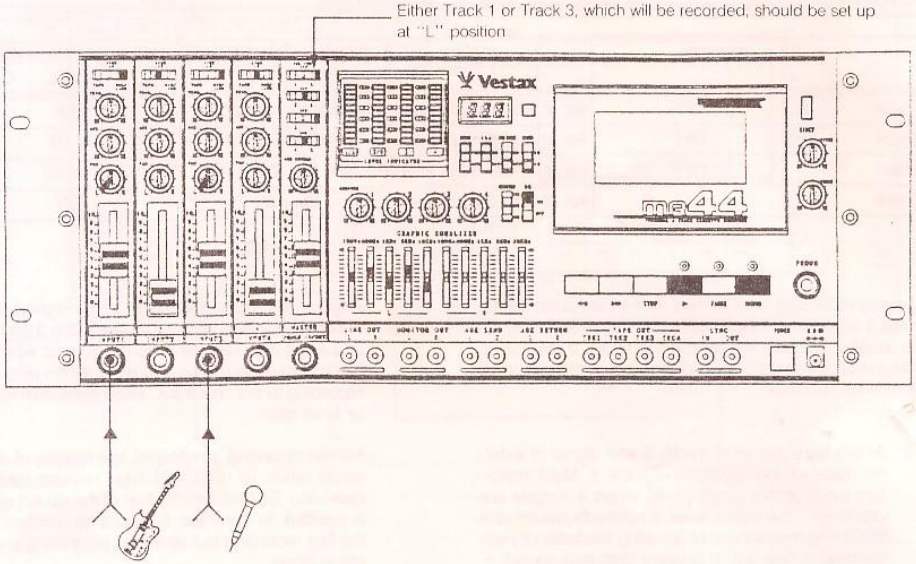
When the signal was too high, it should be corrected by CHANNEL and MASTER FADER.

d) Equalizing

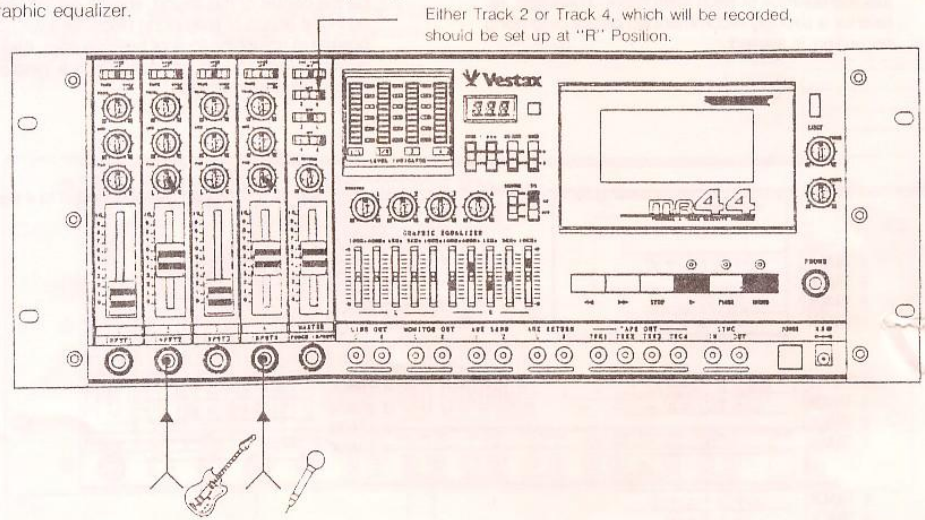
MR44 incorporates a stereo 5-band graphic equalizer for sound equalizing.

In this section, method of using the graphic equalizer for recording will be explained.

a) Setting example for when the sound source to be recorded on track 1 or 3 while sound is corrected by using the graphic equalizer.



Setting example for when the sound source to be recorded on track 2 or 4 while sound is corrected by using the graphic equalizer.



• As described the above, because the graphic equalizer is positioned after MASTER FADER, it can effect to only L or R in BUSS line. Because of this, in the case of direct recording without using BUSS line, graphic equalizer can not be worked.

• When the graphic equalizer is used, there is a tendency to boost all 5 bands, and consequently, just the volume level tends to be raised. Try to get the best sound quality by only cutting. Furthermore, after equalizing, it is absolutely neccessary to confirm whether or not the level of input signal was too high and it should be corrected by CHANNEL and MASTER FADER.

e) Punch-in/out

Punch-in/out recording makes it possible to re-record a short segment of an otherwise perfect track in order to correct a mistake or "brush up" an important passage. You "punch-in" at the point where you begin recording the new segment, and "punch-out" at the end of the new segment so that the previously-recorded material is not erased.

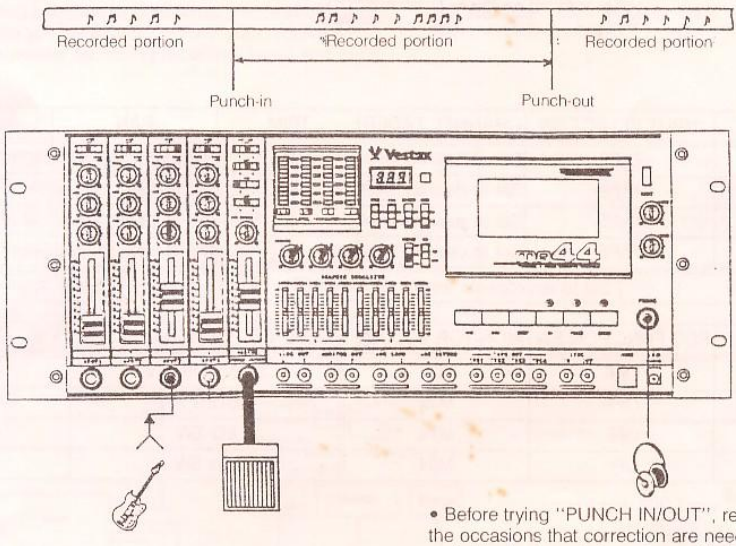
• It is necessary to connect the foot pedal to punch in/out jack to achieve the recording position. By taking advantage of the counter, the rehearsal should be done carefully to find the part which will be corrected.
The important point at this time is, matching the level of play back and level of recording which you intend to correct or change. Adjusting the level can be done by positioning of PGM in METER SW for recording level and track 4 for playing level respectively. Additionally, when PUNCH IN/OUT is done, all of the tracks except the track which you intend to PUNCH IN/OUT should be in OFF position.

Setting example when the signal, which was recorded in track 3, is corrected by PUNCH IN/OUT.

NOTE: Always start with the foot switch off, if you start in on a correction with the foot switch on, you will erase your tape. In order to ascertain whether the foot switch is on or off, remember that with the unit in the REC PAUSE mode the FUNCTION LED flashes when the foot switch is off and remains on when the foot switch is on.
There are 2 types of foot switches on the market; the momentary type (which does not lock) and the alternate type (which does lock). Because the MR-44 allows PUNCH-IN only when the foot switch is on, the following applies:

MOMENTARY TYPE: PUNCH-IN only as long as the foot switch is pressed and held down; release allow PUNCH-OUT.

ALTERNATE TYPE: Press the foot switch once allows PUNCH-IN; press once again allows PUNCH-OUT.



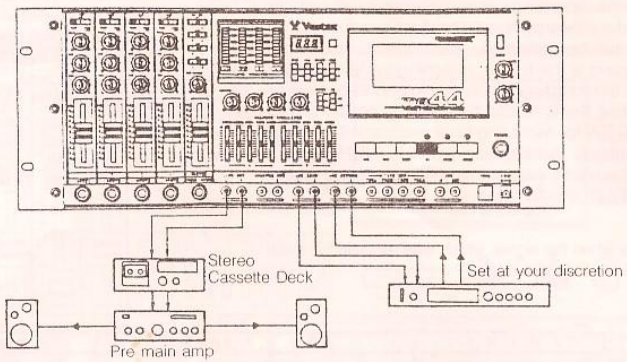
• Before trying "PUNCH IN/OUT", rehearsal carefully. On the occasions that correction are needed, step on the foot switch to start punch in and repeat to finish "PUNCH OUT". Monitor and use the counter several times to find the exact correct phase before attempting.

	INPUT SELECT SW	CHANNEL FADER	TRIM	PAN	AUX SEND
1 Channel	OFF	Level 0	MIN	Center	MIN
2 Channel	OFF	Level 0	MIN	Center	MIN
3 Channel	MIC/LINE	Level 7	MIN	Center	MIN
4 Channel	OFF	Level 0	MIN	Center	MIN
MASTER FADER			AUX RETURN		

	REC FUNCTION SW	MONITOR VOLUME	MONITOR/PHONES VOLUME	SET TO APPROPRIATE LEVEL
1 Track	OFF	set at appropriate level	MONITOR SW	MIX
2 Track	OFF	set at appropriate level	METER SW	4TRK
3 Track	3	set at appropriate level	EQ SW	OFF or ON
4 Track	OFF	set at appropriate level	dbx SW	ON

f) Mix Down

Editing the recorded sound is called "Remix" while mixing each sound sources is called "Mixing". Combining these operation of remix and dubbing is called "Mix Down" which is the ultimate goal of mix down from 4 tracks down to 2 channel (stereo) master tape. The explanation is as follows.



	INPUT SELECT SW	CHANNEL FADER	TRIM	PAN	AUX SEND
1 Channel	TAPE	Set at desired level	MIN	Set at desired level	Set at desired level
2 Channel	TAPE	Set at desired level	MIN	Set at desired level	Set at desired level
3 Channel	TAPE	Set at desired level	MIN	Set at desired level	Set at desired level
4 Channel	TAPE	Set at desired level	MIN	Set at desired level	Set at desired level

MASTER FADER	Set to appropriate level	AUX RETURN	Set to appropriate level

	REC FUNCTION SW	MONITOR VOLUME	MONITOR/PHONES VOLUME	MIN
1 Track	OFF	MIN	MONITOR SW	PGM
2 Track	OFF	MIN	METER SW	4 TRK
3 Track	OFF	MIN	EQ SW	ON
4 Track	OFF	MIN	dbx SW	ON

Mix down is the final process in arranging the 4 factors. 4 factors are as follows:

① Create a dynamic feeling by LEVEL balance.
② Achieve a total balance by PAN.
③ Create a stereo feeling (Depth and width of sound) by effects.
④ Adjust a sound quality by equalizer.

① Level balance is based on adjusting the balance to center around the track containing the main part (vocal, keyboard. etc.)

② Basic of PAN is set up as follows: Rhythm instruments such as drums (drum machine) is in the center, melody instruments such as electric guitar or keyboard are in either left or right and vocal is in the center.

③ Use of effect, if you use too much effect you will get unnatural sound, keep in mind the overall balance when you use it.

④ Use of equalizer, basic is same as effect.
When recording from a master tape, some of the high register is lost, so we recommend that you raise the high register a little. This is because, while it is easy to diminish the high register, it is extremely difficult to retore a clean tone to a muddy sound from which the high register is missing.

We recommend that you master the techniques required to mix these down by paying attention to how the sound sources of the music you listen to everyday have been arranged, and imagining the operations involved.

g) Effect Processing

1. Connect to the input of external effects from AUX send jack, and to AUX Return from the output of external effects.
2. You can get the effect processed sound of MIC/LINE input 1, 2, LINE INPUT 1-4, and also tape playback TRK 1-4.
   - MIC/LINE INPUT 1,2
     Set the AUX SEND SWITCH to INPUT. Adjust AUX send level with AUX SEND knobs 1 and 2.
   - LINE INPUT 1-4
     Set the AUX SEND SWITCH to TAPE. Adjust AUX send level with AUX SEND knobs 1-4.
   - TAPE PLAYBACK TRK 1-4
     Set the AUX SEND SWITCH to TAPE. Adjust AUX send level with AUX SEND knobs 1-4.
3. Control the AUX SEND MASTER knob to match the input level of external effects.
4. Control the effect mix level using EFFECT RETURN knobs L, R.
   * You should cut off the dry signal from the external effects when using effect send/return system as on the above. If your effects are insufficient to cut off the dry signal, or in the case that you wish to use the effects which control the envelope such as compressor, gate, etc., you should connect the effects between the musical instrument and MR-44 when you are recording or connect the effects between the MR-44 and master deck when you are mixing down.

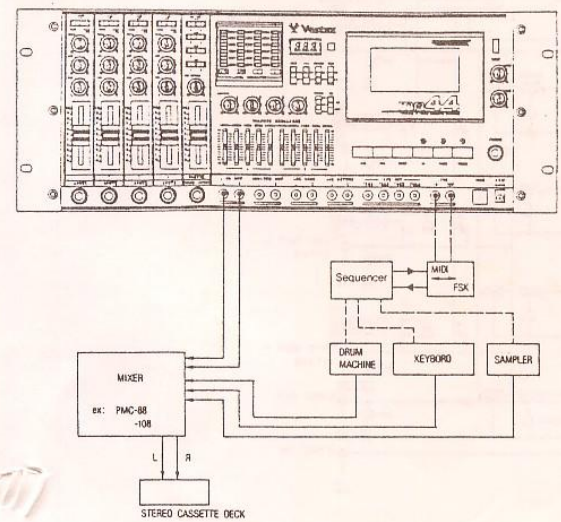
h) MIDI SYNC RECORDING

MIDI SYNC RECORDING is to sync drum machines, sequencers, etc., with a multi-track recorder. In order to do this, first you must change MIDI SYNC signal to FSK (Frequency Shift Keying) signal and record it on one of the recorder tracks. The advantage of this is that you can save recording tracks by letting a sequencer control many MIDI instruments. It is almost like you have more tracks in your recorder. You can make a master by mixing recorded tracks and MIDI equipment.

*** PROCEDURE**

① First program your drum machine. Connect MIDI OUT of the drum machine to the MIDI to FSK converter. Connect FSK output of the converter to SYNC IN of the MR-44. Set REC FUNCTION to TRK 4, and start recording on TRK 4.

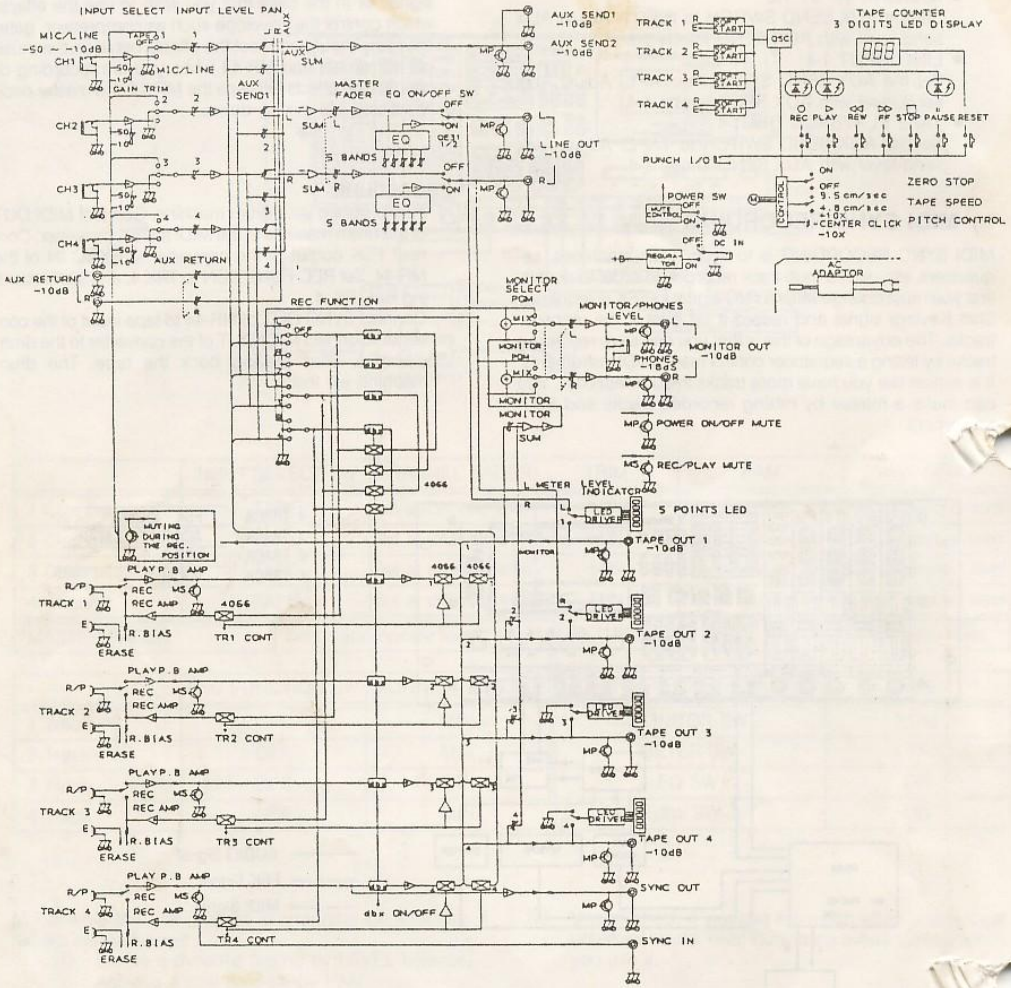
② Connect SYNC OUT of MR-44 to tape input of the converter. Connect MIDI OUT of the converter to the drum machine. Start playing back the tape. The drum machine will follow.



4 TRACK	FSK SIGNAL
3 TRACK	ACOUSTIC GUITAR
2 TRACK	VOCAL 2
1 TRACK	VOCAL 1

——— AUDIO Signal
——-—- FSK Signal
— — — — MIDI Signal

* The FSK signal level of MIDI/FSK converter's is sometimes inadequate, too high or too low, for the recording using the SYNC IN jack. In case FSK signal is too high, it may happen to leak the FSK signal to TRK 3, or to have converter prevent from syncronizing if signal is too low. In such cases, connect the output of converter to MIC/LINE INPUT 2 and adjust the recording level to −3 – OVU using input level fader. The dbx switch should be set as "OFF".



Vestax
VESTAX CORPORATION
2-37-1, KAMIUMA, SETAGAYA—KU,
TOKYO, 154 JAPAN
TEL: 03 (3412) 7011 FAX: 03 (3412) 7013