

Owner's Manual

X-26

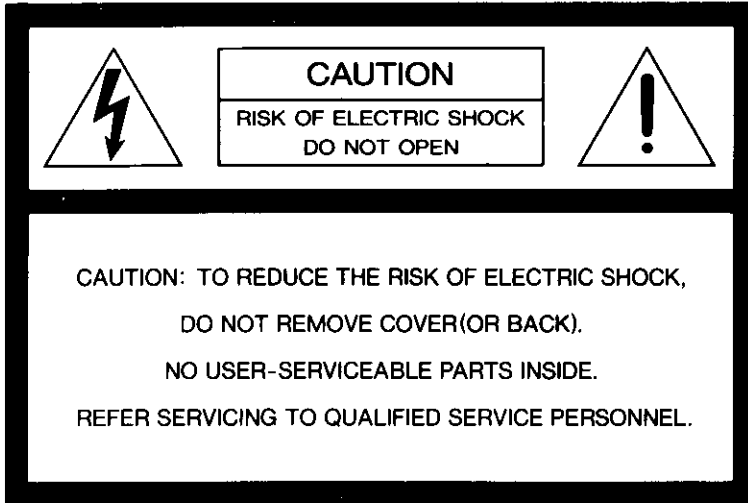
MULTITRACKER



Fostex[®]

SAFETY INSTRUCTIONS

1. Read Instructions — All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions — The safety and operating instructions should be retained for future reference.
3. Heed Warnings — All warnings on the appliance 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 appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.
7. Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance 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.
9. Heat — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization — The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
12. Power Cord Protection — Power supply cords should be routed so that 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 appliance.
13. Cleaning — The appliance should be cleaned only as recommended by the manufacturer.
14. Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
15. Object and Liquid Entry — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
16. Damage Requiring Service — The appliance 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 a marked change in performance; or
 - E. The appliance has been dropped, or the enclosure damaged.
17. Servicing — The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

"WARNING"

"TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE."

TABLE OF CONTENTS

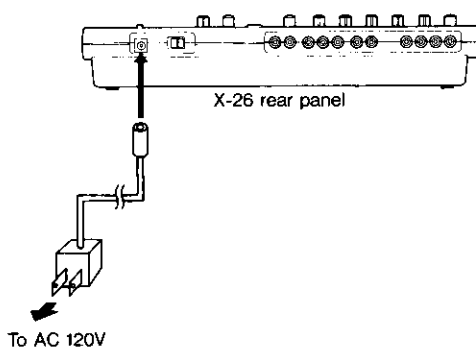
	PAGE		
SECTION 1	Introduction, Precautions on safety	2	
SECTION 2	Before operating.....	3	
SECTION 3	Understanding important terms.....	3	
SECTION 4	The controls and their function/ operation	5	
SECTION 5	Signal flow diagram.....	9	
SECTION 6	Basic operation		
	Recording the rhythm track.....	12	
	Overdubbing.....	13	
	Punching in/out.....	17	
	Mixdown with effect processing.....	18	
SECTION 7	Ping-pong recording.....	20	
SECTION 8	Operating examples		
	Direct stereo recording of 6 sound sources.....	22	
	Stereo ping-pong recording with effect processing.....	22	
	Special application of AUX.....	23	
SECTION 9	Tape sync		
	When synchronizing a small number of sound sources.....	24	
	When synchronizing a large number of sound sources.....	25	
SECTION 10	Routine maintenance.....	26	
SECTION 11	Block diagram.....	27	
SECTION 12	Specifications.....	27	
SECTION 13	Trouble shooting.....	28	

SECTION 1. INTRODUCTION

Model X-26 is a highly functional 6 input (2 mic/line & 4 line) multitracker, a combination of mixer and high performance four track cassette recorder. It is an intelligent machine which can perfectly assist the creative process from multiple recordings of a musician, ping-pong recording, effects processing by AUX SEND/RECEIVE, and tape sync mixdown in parallel with MIDI equipments.

We hope you can produce great recordings through full utilization of the Model X-26 by reading through this manual first.

Connecting method of the exclusive AC adaptor (included)



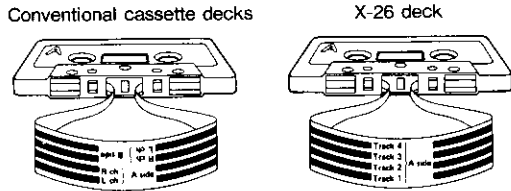
PRECAUTIONS ON SAFETY

- The AC adaptor supplied is interconnected between the house AC outlet and the AC Adaptor Jack of this unit. This adaptor can be used on both 50 and 60 Hertz without any change. Absolutely do not use an AC adaptor of another manufacturer. If this adaptor is to be used in an area of different voltage, consult your nearest Fostex dealer or the main office Service Department.
- When disconnecting the AC adaptor from the AC outlet, always grasp the AC plug itself to pull out. It can break the internal wire if the cord is pulled directly.
- Do not plug in or out the AC adaptor with wet hands. You could receive an electric shock.
- It is dangerous to continue using a cord with worn insulation. Stop using it if the cord is damaged.
- Do not open the case and touch anything inside. There is danger of receiving an electric shock if you do. It could also harm the unit.
- Be careful not to allow any water, liquids or metal objects such as a hair pin to get inside. It could result in electric shock. If water, etc. should accidentally get inside, immediately pull out the AC adaptor from the outlet and contact your nearest Fostex dealer or service station.
- Be sure to switch on this unit first before switching on power to the other equipment to avoid damaging them. Also, when the input and output plugs are to be plugged in or out of this recorder, be sure the input volume control of that channel or buss, is set to "0".

SECTION 2. BEFORE OPERATING

1. The Cassette Format.

As shown in the drawing below, the cassette format uses four tracks, in typical stereo recordings, the bottom two tracks are used for Side A (L+R) and the top two tracks are used for Side B (L+R). AC-90 cassette thus holds 45 minutes of stereo audio on each "side" (actually the same side). In multitrack recordings, all four tracks are used in the same direction so there is no Side B, and a C-90 will therefore hold 45 minutes of multitrack audio.



2. The Proper Tape.

Your X-26 is designed for use only with High Bias 70 μsec EQ tape. CrO₂ and Type II designations are common, but always look for the 70 μsec EQ identification. Maxell UD-XL II and TDK SA are recommended, as are other tapes of comparable quality. Do not use metal tape formulations and never use C-120 cassettes because they are too thin for multitrack recording.

3. The Right Connections.

Be careful when you connect other equipment to the X-26. Never connect the output of an amplifier to an X-26 input, for example, because you could damage the unit. Less severe problems caused by impedance mismatching can result in a loss of volume and/or frequency response. In general terms, microphones are low level signals and should be used on inputs 1 & 2 of the X-26. Drum machines, synthesizers and other electronic instruments are "line" level devices and can be used on all of the X-26 inputs. Electric guitars are so often customized electronically and used with such a wide variety of effects boxes that it's impossible to state even a general rule. The best advice is: always turn everything down to minimum—X-26 controls as well as the device you're attempting to connect—then slowly increase gain controls to determine whether you've made the right connection. The specifications on Page 27 contain the input and output impedances of your X-26.

4. A Final Caution.

Always turn the X-26 on and off with the transport in the STOP mode, and make sure that the AC Adaptor cables are well out of the way of traffic.

SECTION 3. UNDERSTANDING IMPORTANT TERMS

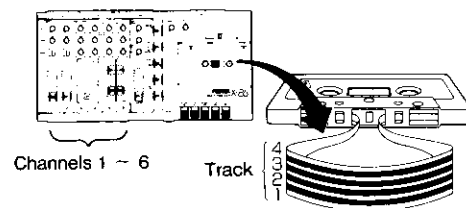
WHAT IS MULTITRACK RECORDING?

It is the process of recording individual parts of a performance separately on individual tracks and then mixing them all together to achieve the finished production. There are several advantages to this process. Not all the musicians involved have to be in the same place at the same time; you are able to concentrate on the individual elements so that each part is the best it can be; you can try several different mixes of the recorded material until the final production is the best it can be. Also, one musician can do everything. There's still nothing wrong with recording a good, tight band with two well-placed microphones. But with today's technology, especially MIDI, the multitrack process is very efficient.

WHAT'S THE DIFFERENCE BETWEEN TRACK AND CHANNEL?

The term "track" refers to a physical space on recording tape. How many tracks are available is determined by the recording heads. A reel of 1/4" tape may have one, two, three, four or right tracks.

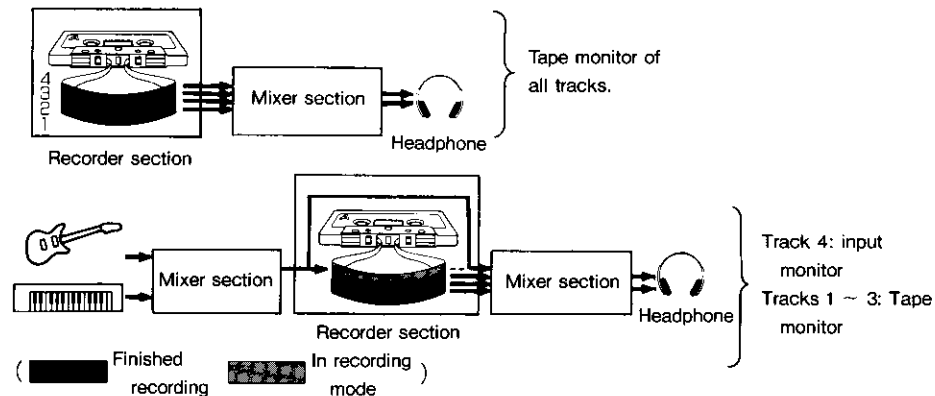
The term "channel" refers to a discrete pathway in or out of an electronic device. Thus the X-26 is a 4-track 2-channel device. The heads are 4-track and there are two channel inputs and outputs via the mixer section, which has six main channel inputs and two main channel outputs.



WHAT'S THE DIFFERENCE BETWEEN INPUT MONITOR AND TAPE MONITOR?

Monitor simply means to listen. In the recording process, it's very important to know what signal you're listening to. Something that sounds great as it is being recorded may sound terrible when it is played back because the recording level may have been too low (hiss) or too high (distortion). The term "Input Monitor" refers to the signal going to the record head; the term "Tape Monitor" refers to the signal

coming off the playback head. In the X-26, whenever you are in the RECORD mode you are listening to Input Monitor; when you are in the PLAY mode you are listening to Tape Monitor. After each recording, rewind and listen to Tape Monitor—this is your ultimate reference for making artistic judgments and decisions.



WHAT IS A BUSS?

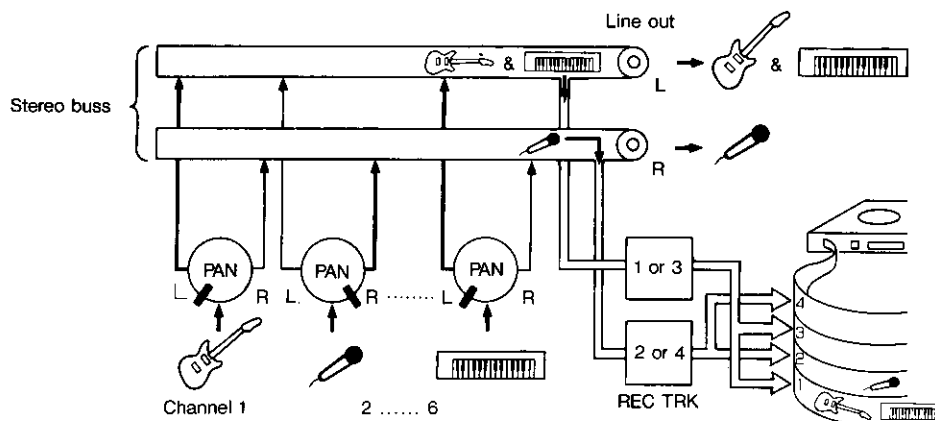
The term "buss" or "bus" refers to a discrete signal path which acts like a common carrier on which other signals may "ride," and usually ends at an output terminal. Think of a regular city bus with a prescribed route. Like passengers, signals can get on, ride for a while, transfer to another route, return to the original route, and end up at the final destination.

The X-26 has the following busses:

● **Stereo Buss.** This is the main signal pathway through the X-26, the common carrier which unites the mixer and the recorder. It may contain a mixture of both input signals and tape playback signals, or as in the diagram below, it is the way various input signals reach the record head. During mixdown, all the various signals will travel this route on their way to the master recorder via the main Line Outputs (L and R) of the X-26.

● **Aux Buss.** This is a monaural signal pathway available to both input signals and tape playback signals and is normally used as an effects send to external units like reverbs for processing. Aux Receive is a stereo input to the main buss.

● **Monitor Buss.** This is a "branch" of the main stereo buss and lets you hear what you are doing, either by way of an amplifier and speakers (monitors) or by way of headphones. The signal is the same for both. You'll appreciate its importance as you begin working with different signal levels—the level that you are sending to the recorder is almost always different than the level you are listening to. **MIXING TIP:** Headphones are a great convenience but in the final mixing stages, use a good set of speakers so you can really hear the results of your work.



SECTION 4. THE CONTROLS AND THEIR FUNCTION/OPERATION

Letters in () are the actual panel letterings. For the sake of convenience, these panel letterings will be given priority in the text (PAN (4), EQ (9), etc.).

PANEL CONTROLS

1. INPUT GAIN SELECTOR (GAIN MIC/LINE)

This is switched according to what is connected to the front MIC/LINE input (27). It is set to MIC when a microphone or low level electric guitar is plugged in, and set to LINE when high output level electric musical instruments, etc., such as a keyboard, is plugged in.

2. INPUT FADER 1, 2

These control the sound volume of equipment connected to (27).

3. AUX SEND LEVEL KNOB 1, 2 (AUX 1, 2)

This is the knob for controlling the level of the signal, at the point immediately after the INPUT faders 1, 2 (2) (post fader signal), and send them to the AUX SEND jack (33). These are normally used as effect send volume controls at setting amount of reverb to be applied to channels 1, 2 sound sources. Refer to "What is AUX?", page 18 and "What is PRE/POST?", page 18 for details.

4. INPUT PAN POT 1, 2 (PAN 1, 2)

The knobs for adjusting the left and right balance of the signals from the input faders 1, 2 (2) which are to be sent to the stereo buss. Refer to "What is stereo buss?", page 4 for details.

5. SUBMIX SECTION (SUB MIX)

The section for mixing into stereo, the input signals from LINE input 3~6 or output signals from tracks 1~4.

SUB GAIN (INPUT/TRK 1~4): Center position is volume "0" and rotating to left raises each sound volume of channels 3~6. Rotating to right raises sound volume of tracks 1~4.



SUB PAN: Adjusts sound position (left/right balance) of signals passing SUB GAIN. This is also used, not only at recording channels 3~6 but for setting sound position of each track at mixdown.

The signals combined here into stereo, are sent to the stereo buss when REMIX/NORM selector (11) is set to REMIX. This function thus allows recording the sound sources of channels 3~6, and also ping pong recording. Refer to REMIX/NORM selector (11), page 7 for details.

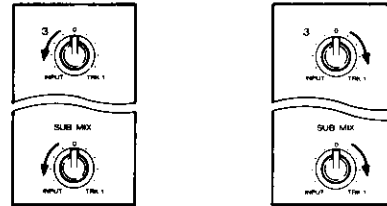
6. AUX SEND LEVEL KNOBS 3~6 (AUX 3~6)

These are the level adjusting knobs for signals to be sent to the AUX SEND jacks from LINE inputs 3~6 (28) or output signals from tracks 1~4, and center position is "0" volume.

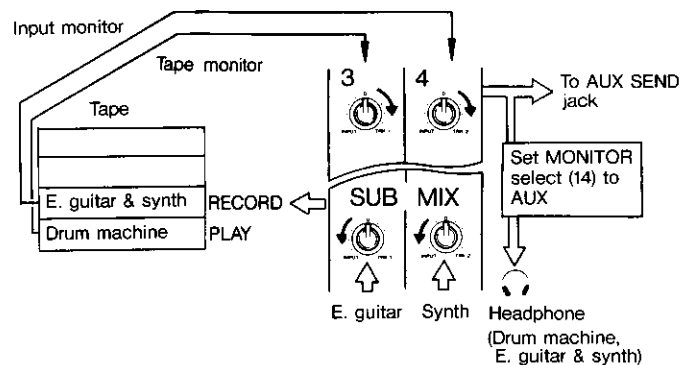
It can be used in various ways such as effect sending or monitoring of recorder outputs.

Example 1: Use at effect send

When using for effect send, it is rotated in same direction as for SUB GAIN (5). By doing so, this knob functions as a so called, "Effect send volume control" at sending the signal immediately before SUB GAIN (5) (PRE FADER signal) to the AUX SEND jack (33). In other words, it allows setting amount of reverb to the channels 3~6 sound source and the tracks 1~4 outputs.



Example 2: Use at monitoring outputs of each track at overdubbing



*This is an example of monitoring tracks 1 and 2 by setting these knobs to TRK 1 and TRK 2 when overdubbing the electric guitar and synthesizer (input to channels 3 and 4) to track 2.

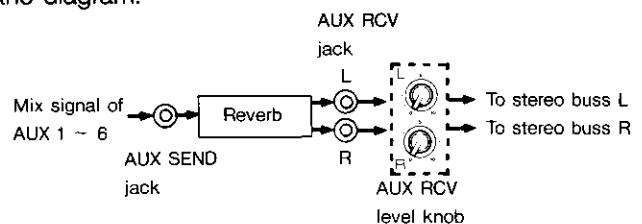
Refer to "What is AUX?", page 18 and explanation on MONITOR selector (14) in "What is PRE/POST?", page 18.

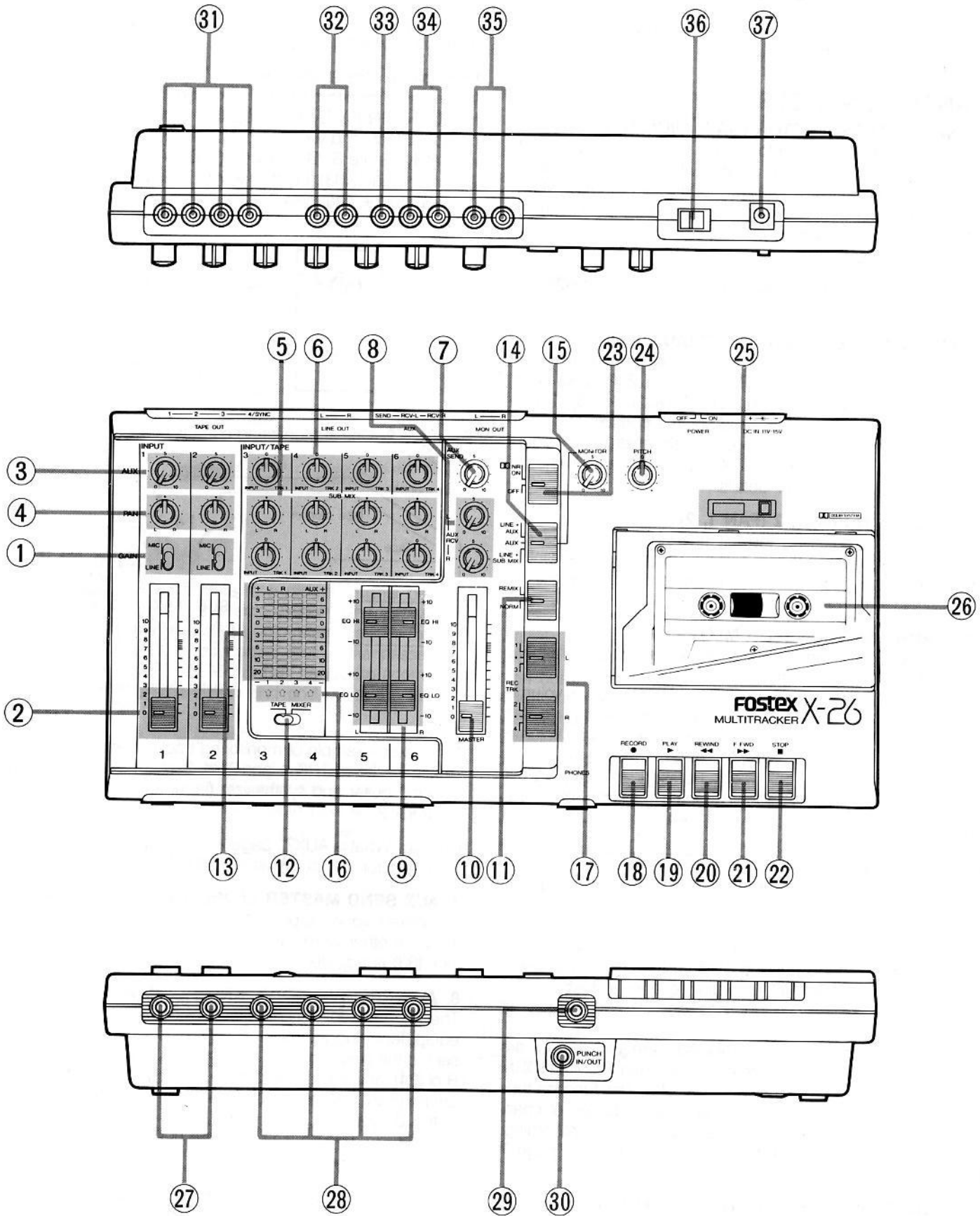
7. AUX SEND MASTER LEVEL KNOB (AUX SEND)

The mixed signal output level of AUX 1, 2 (3) and AUX 3~6 (6), or in other words, the signal level output at AUX SEND jack (33) is adjusted.

8. AUX RECEIVE LEVEL KNOB L, R (AUX RCV L, R)

The knob for adjusting the level of output signals, from the equipment plugged into the AUX RCV jack (34), which are sent to the stereo buss. L corresponds to L of (34), and R to R of (34), and each is sent to the stereo buss L and R. These are normally used to adjust the effecter return level, as shown in the diagram.





9. EQUALIZER (L: EQ HI, LO; R: EQ HI, LO)

Sound quality of the input signals from MIC/LINE input (27) and AUX RCV jack (34), and the signal mixed in the SUB MIX section (5) are adjusted when they are sent to the stereo buss. The low region (100Hz \pm 12dB) is adjusted at LO and the high region (10kHz \pm 12dB) at HI.

10. MASTER FADER (MASTER)

This adjusts the stereo buss output level, or in other words, the output signal level from the LINE OUT jack (32). It is for adjusting, not only the mixdown output level (both L and R will change) but also used for adjusting the recording level of each track.

11. REMIX/NORMAL SELECTOR (REMIX/NORM)

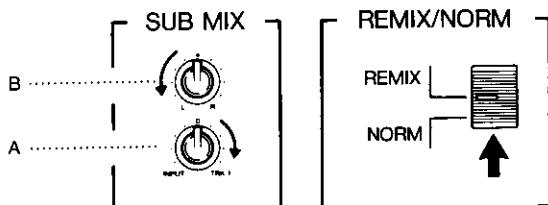
This determines whether or not the signal mixed into stereo in the SUB MIX section (5) should be sent to the stereo buss.

REMIX: The signal will be sent to the stereo buss. This position is selected, at the mixdown process when track outputs assigned in SUB MIX (5) are sent to the stereo buss; at ping pong recording; recording input signals from LINE inputs 3~6 (28); etc.

NORM: The signal will not be sent to the stereo buss. At other than the cases in above REMIX, this selector is normally set to this position.

Be careful of howling which will occur if this selector and the SUB MIX section (5) are set such that the output of a track in the recording mode (A in the diagram) is sent to the stereo buss (B in the diagram) used for sending to this track in the recording mode, thus creating a loop.

Example: The setting which will create a loop when recording on track 1.



*Be careful to note that when the REC TRK selector (17) is set to "1", a loop will also be formed in the same way at STOP and FF/RWD modes.

12. METER SELECTOR SWITCH (TAPE/MIXER)

This is for selecting the meter (13) display mode.

TAPE: Output levels of tracks 1~4, from the left, will be indicated on the meter (13) (1, 2, 3, 4).

MIXER: The stereo buss output level (L, R) and the AUX SEND jack (33) output level (AUX) will be indicated.

13. LED LEVEL METER

This indicates levels of various signals in relation with the above meter selector switch (12).

14. MONITOR SELECTOR (LINE + AUX/AUX/LINE + SUB MIX)

Signals to be sent to the PHONES jack (29) and MON OUT jack (35) are selected here. In other words, it selects the source signal to be monitored.

LINE + AUX: You can listen to the mixed signals (AUX at the center position) of the stereo buss output and the output from the AUX SEND jack (33).

AUX: Output signal from the AUX SEND jack (33) can be heard with the sound image at center (left and right sound at the same level).

LINE + SUB MIX: The mixed signals of the stereo buss output and the signals converted to stereo in the SUB MIX section (5) can be heard (However, when the REMIX/NORM selector (11) is set at REMIX, the stereo buss output only can be heard).

Following are representative settings of the REMIX/NORM selector (11) and the MONITOR selector (14).

Operation		REMIX/ NORM	MONITOR selector
recording	Using channels 1 and 2 only	NORM	AUX
	Using channels 3~6	REMIX	AUX (At stereo recording: LINE+SUB MIX)
overdubbing	At rehearsal	NORM	LINE+AUX
	At take (recording)	NORM	AUX
	To monitor recorder output in stereo	NORM	LINE+SUB MIX
ping-pong recording	At rehearsal	REMIX	LINE+SUB MIX
	At take (recording)	REMIX	AUX
mixdown	When sending from LINE OUT jack to master recorder	REMIX	LINE+SUB MIX
	At tape sync, mix down, etc. by using MON OUT jack for sending to the master recorder	REMIX	LINE+AUX

*For details on tape sync, refer to "What is tape sync?", page 24.

15. MONITOR LEVEL KNOB (MONITOR)

This adjusts the output signal levels from PHONES jack (29) and MON OUT jack (35) or, in other words, the headphone sound volume. As the basic level is about 4~5 on the scale, be careful of excess sound volume from the speaker by turning up the level too high, especially when monitoring by the headphone together with the speaker.

16. RECORD TRACK LED (↑ ↑ ↑ ↑)

These LED's will light in three different colors to indicate the modes of each track. They correspond to tracks 1~4, from left to right.

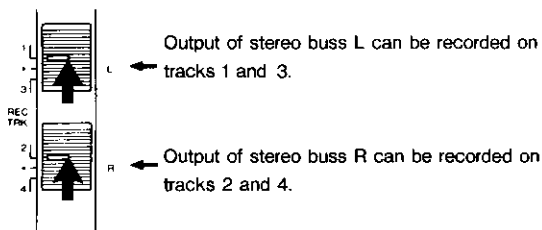
Color of	Mode of each track		Setting	
	Monitor	REC/PLAY	Function	REC TRK selection
Green	Tape monitor	REC/PLAY	STOP	OFF
			PLAY	ON or OFF
		Playback	RECORD	OFF
			FF/REW	OFF
Amber (Mix of red and green)	input monitor	REC/PLAY	STOP	ON
		Playback	FF/REW	ON
Red	Input monitor	RECORD	RECORD	ON
			In punch-in mode	ON
		PLAY+Foot switch function	ON	

*Refer to "What is punch in/out?", page 17 for details.

17. RECORD TRACK SELECTOR (REC TRK 1•3, 2•4)

This is for selecting the track for recording. The center "•" is the OFF position and no track can be recorded. Be careful not to form feed back a loop as the track selected here will be at input monitor except in the PLAY mode (Refer to explanation in (11)).

Example: Recording on tracks 1 and 2



18. RECORD BUTTON (RECORD)

The recorder will enter the record mode by pressing this button only (It is not necessary to press the PLAY button (19) at the same time). However, it will not enter the record mode if the record track selector (17) is set at OFF.

19. PLAY BUTTON (PLAY)

20. REWIND BUTTON (REWIND)

21. FAST WIND BUTTON (F. FWD)

22. STOP BUTTON (STOP)

23. DOLBY B NOISE REDUCTION SWITCH (NR ON/OFF)

For the sake of high quality sound, it is suggested this be always switched ON at normal use.

24. PITCH CONTROL (PITCH)

Tape speed can be varied over a range of $\pm 10\%$.

25. COUNTER SECTION

The counter is reset to "000" by pressing the button on the right.

26. DECK TRANSPORT

Always be sure the transport is stopped when loading and unloading the cassette.

FRONT/REAR PANEL SECTION

27. MIC/LINE INPUT JACKS (1, 2)

From a low output level microphone up to high output level musical instruments can be plugged in here (Refer to GAIN (1), page 5).

28. LINE INPUT JACKS (3, 4, 5, 6)

High output level equipments such as electric musical instruments are plugged in here. It must be noted that low output level equipments such as a microphone cannot be used here.

29. HEADPHONE JACK (PHONES)

The headphone volume is controlled by the MONITOR pot (15).

30. REMOTE PUNCH IN/OUT JACK (PUNCH IN/OUT)

The optional Fostex Model 8051 foot switch is plugged in here. Punch in/out will then be possible even though both hands are occupied. Refer to "Punch in/out", page 17 for details.

31. TAPE OUT JACKS (TAPE OUT 1, 2, 3, 4/SYNC)

Output signals of tracks 1~4, from left to right, are output here. These are used, such as for sending the track outputs to an external mixer for sending a monitor signal to the musicians and effect processing. 4/SYNC means "output of track 4 can be used for SYNC OUT." Refer to "Tape sync", page 24 for details on SYNC OUT.

32. LINE OUT JACKS (LINE OUT L, R)

Stereo buss signals are output here. Normally, these signals are sent to the master recorder at mixdown.

33. AUX SEND JACK (AUX SEND)

Mixed signals of AUX 1, 2 (3) and AUX 3~6 (6) are output here. Normally, effect inputs such as a reverb is plugged in here.

34. AUX RECEIVE JACKS (AUX RCV•L, RCV•R)

These are line level (-20dBV) input jacks and the signal can be sent from RCV•L to stereo buss L, and from RCV•R to stereo buss R, respectively (these are respectively routed through AUX RCV L, R (8)). Mainly, effector stereo outputs are plugged in here. Refer to AUX RCV (8), page 5 for details.

35. MONITOR OUT JACKS (MON OUT L, R)

The signal selected by the MONITOR selector (14) is output here (the same signals heard in the headphone). Normally, monitor amplifier/speaker, etc. are connected here. Note that the level at these jacks will be at standard level when the MONITOR pot (15) is set at about 4~5.

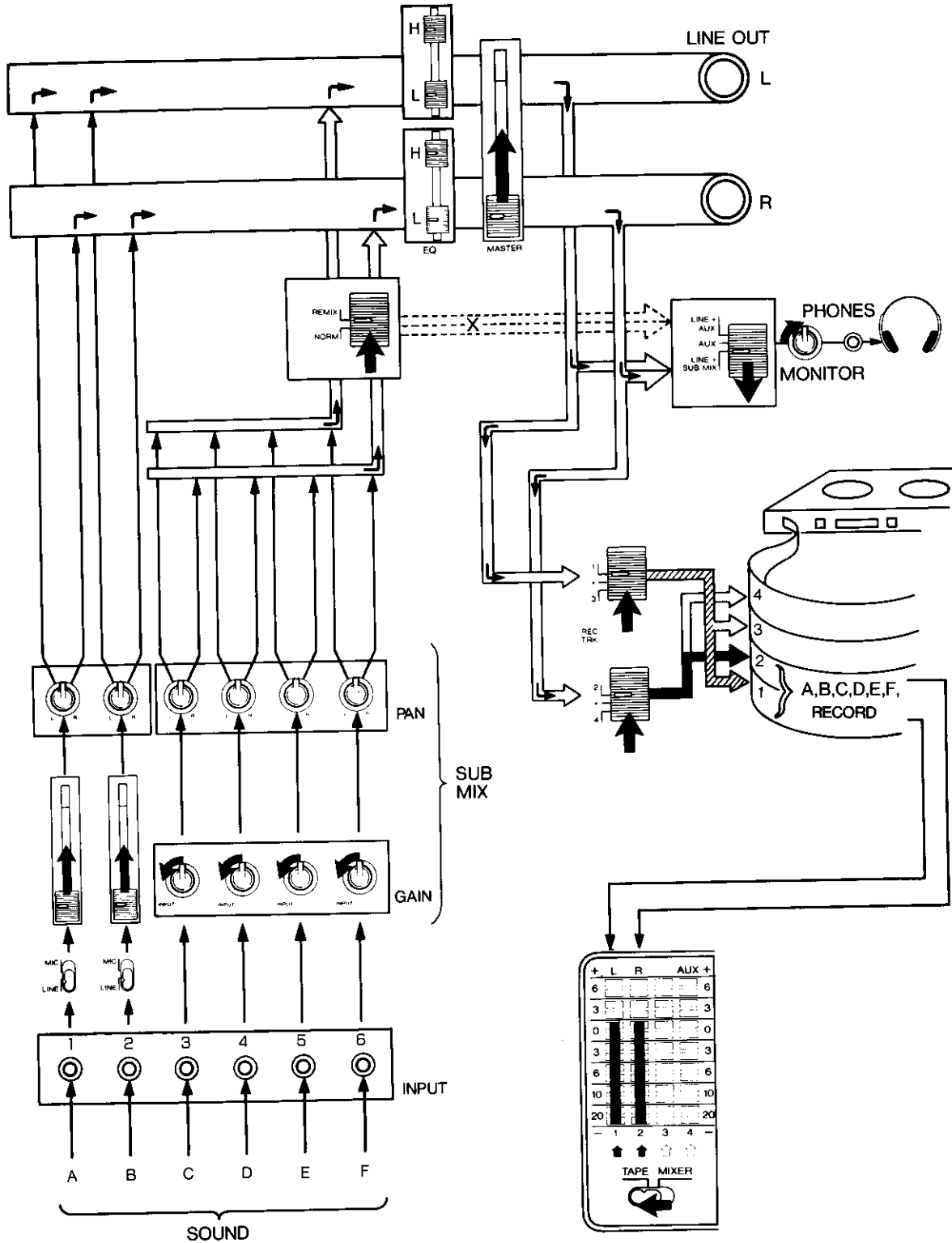
36. POWER SUPPLY SWITCH (POWER ON/OFF)

37. AC ADAPTOR RECEPTACLE (DC IN: 11V~15V)

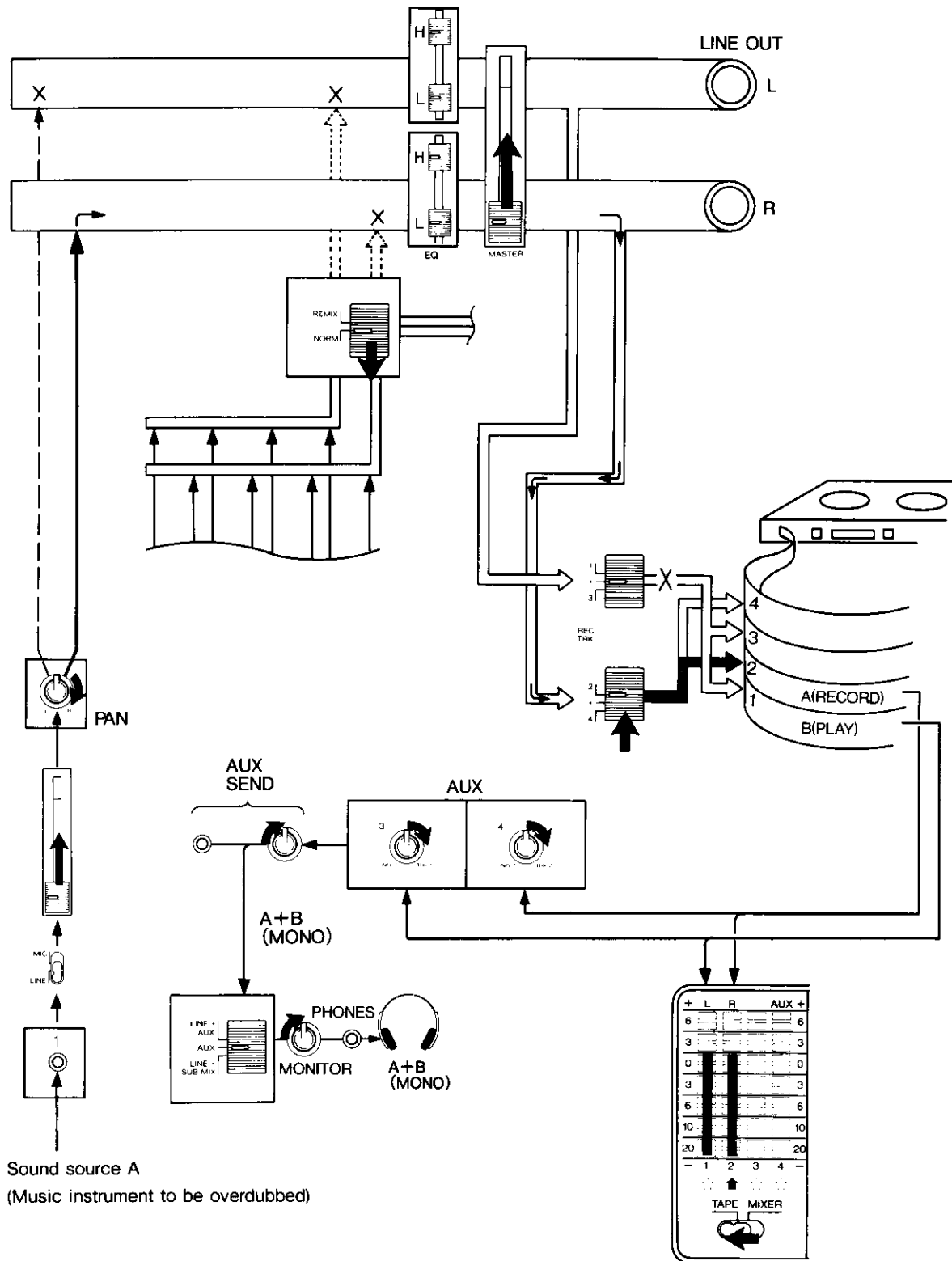
SECTION 5. SIGNAL FLOW DIAGRAM

Let us study the X-26 internal signal flow based on actual examples as a consolidation of the explanations up to this point.

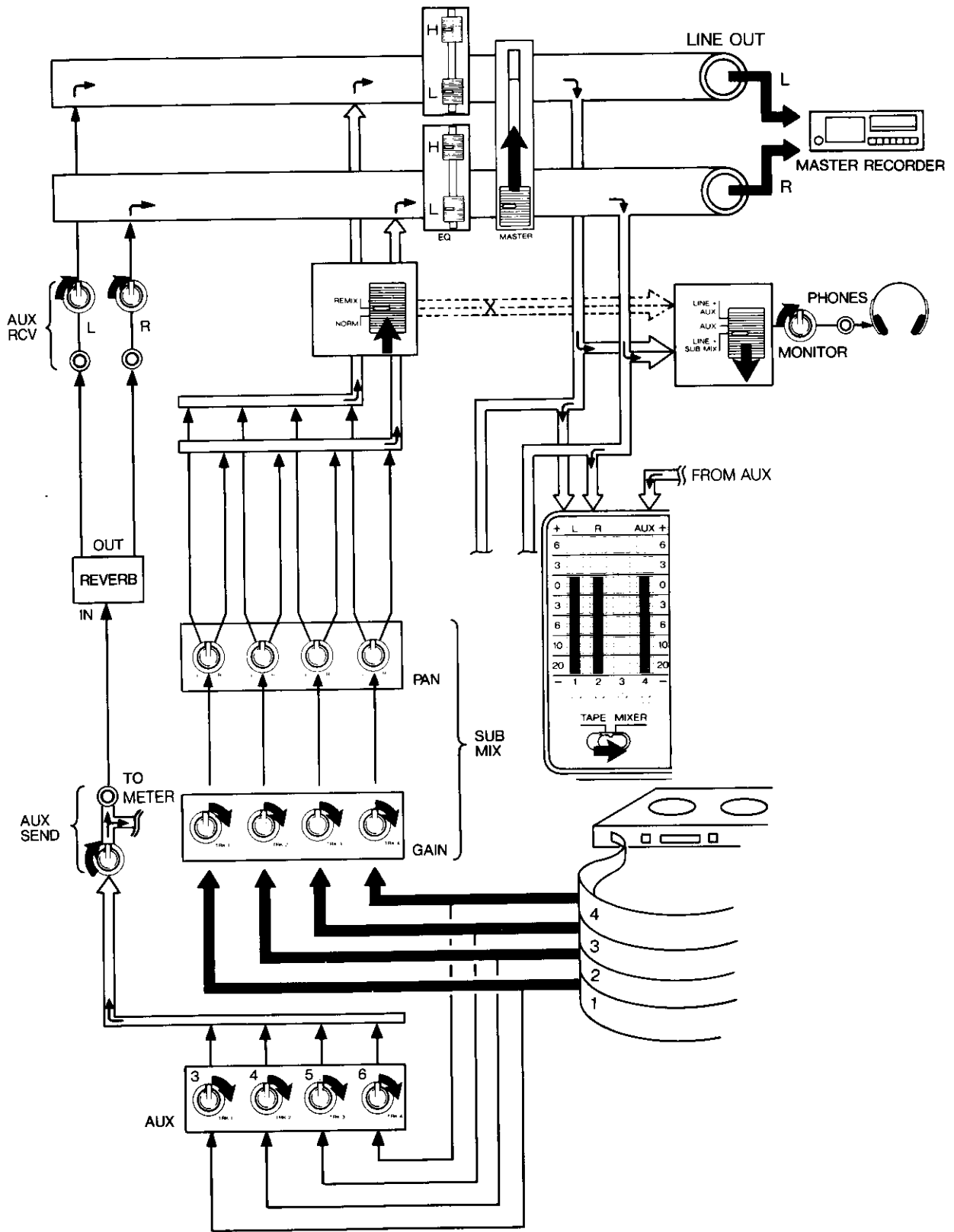
Example 1: Record 6 sound sources into stereo on tracks 1 and 2.



Example 2: Playback track 1 and overdub onto track 2.



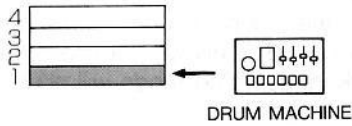
Example 3: Mixdown while reverb processing at the same time.



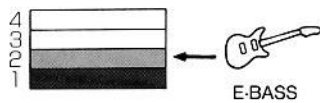
SECTION 6. BASIC OPERATION

Here, the work (one man quintet recording) will be carried out by the procedures in the following schematics to explain the basic techniques in multitrack recording.

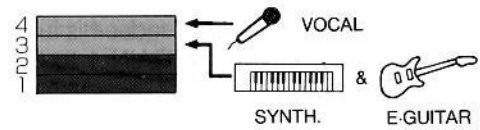
Procedure 1: Drum machine is recorded on track 1 (Recording the rhythm track).



Procedure 2-1: Electric bass is overdubbed on track 2.



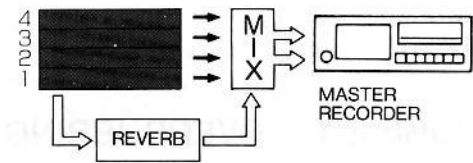
Procedure 2-2 & 3: Make another overdubbing.



Procedure 3: Renew the vocal mistakes with best performance by punch in/out.



Procedure 4: Mixdown while processing reverb at the same time.



(■ IN RECORDING MODE ■ FINISHED RECORDING)

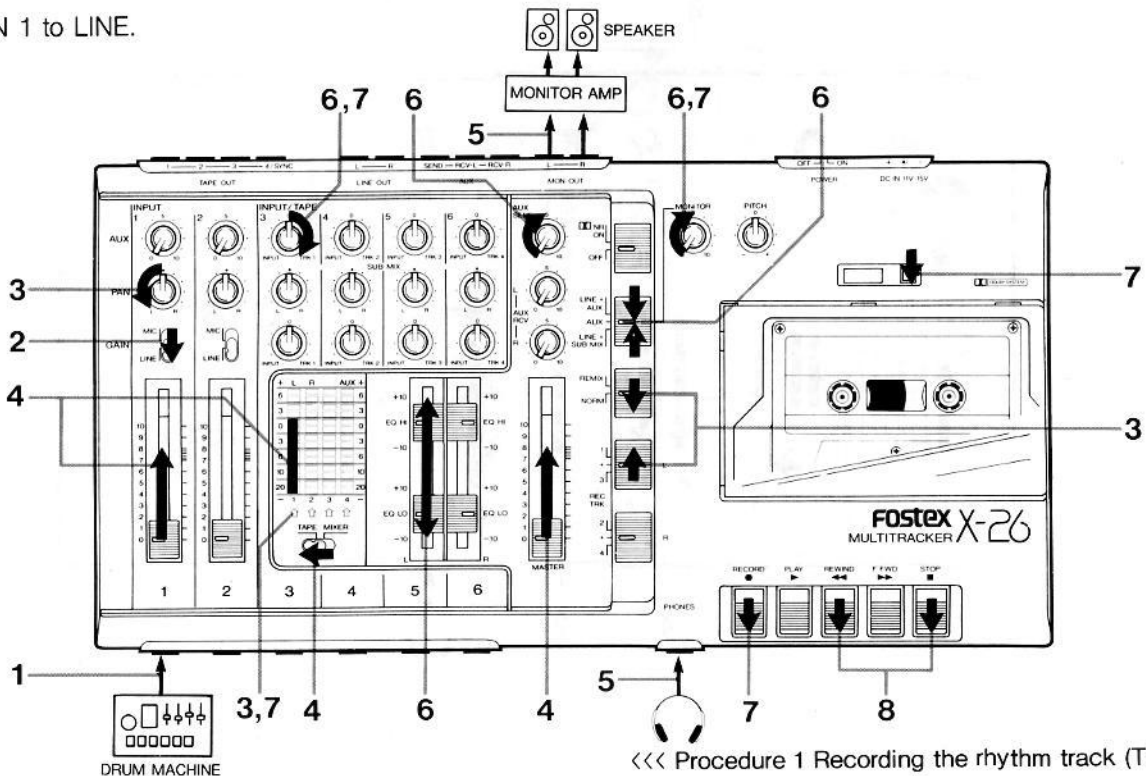
PROCEDURE 1 RECORDING THE RHYTHM TRACK

*Before proceeding with the work, set all control pots to "0" (zero) and make sure all REC TRK selectors are switched OFF at center position (this is called the "Initial state.") with the tape stopped.

1. Plug the drum machine into MIC/LINE input 1.
2. Set GAIN 1 to LINE.

3. Set REMIX/NORM selector to NORM. Then, set REC TRK selector to 1 (REC TRK LED 1 will light in amber) and rotate PAN 1 to fully to the left.

This prepares to send the drum machine output to track 1. The recording level is set next.



<<< Procedure 1 Recording the rhythm track (Track 1) >>>

4. Set MASTER fader to 7 or 8, meter selector to TAPE, and start the drum machine. Then, slowly raise INPUT fader 1 from zero and the track 1 meter will start indicating. Set the fader where the meter indicates maximum +3.

If the level is still low although INPUT fader 1 is fully raised, temporarily return it to zero, switch GAIN 1 to MIC, then repeat the above process.

Next, monitor this sound. The track selected by REC TRK selector will be in the input monitor mode (Refer to page 3) except when the recorder is in other than the PLAY mode (This is why REC TRK LED 1 changed from green to amber and why the track 1 meter had indicated a level). Therefore, in this case, try monitoring by setting AUX 3 to TRK 1.

5. After making sure the MONITOR pot is set to zero, plug a headphone into the PHONES jack (If you wish to listen on a speaker, you can connect MON OUT jack to a monitor amp/speaker).

6. Set monitor selector to AUX, AUX SEND to halfway, and slightly advance AUX 3 to the TRK 1 side (at about 4 on the scale). As the MONITOR pot is raised, the sound will be imaged at center, and if necessary, adjust the tone by EQ L, then readjust the recording level.

7. Now let's start recording. Stop the drum machine for the moment, press the reset button to reset the counter. Enter the recording mode by pressing RECORD button (REC TRK LED 1 will change to red), then start the drum machine. Adjust the monitor sound volume by the MONITOR pot (or by AUX 3) (This will not affect the recording level). The track in recording mode will always be in the input monitoring mode.

8. When the performance is ended, press the STOP button to cancel the recording mode, and press the REW button to rewind tape to "000."

PROCEDURE 2-1 OVERDUBBING AN ELECTRIC BASS

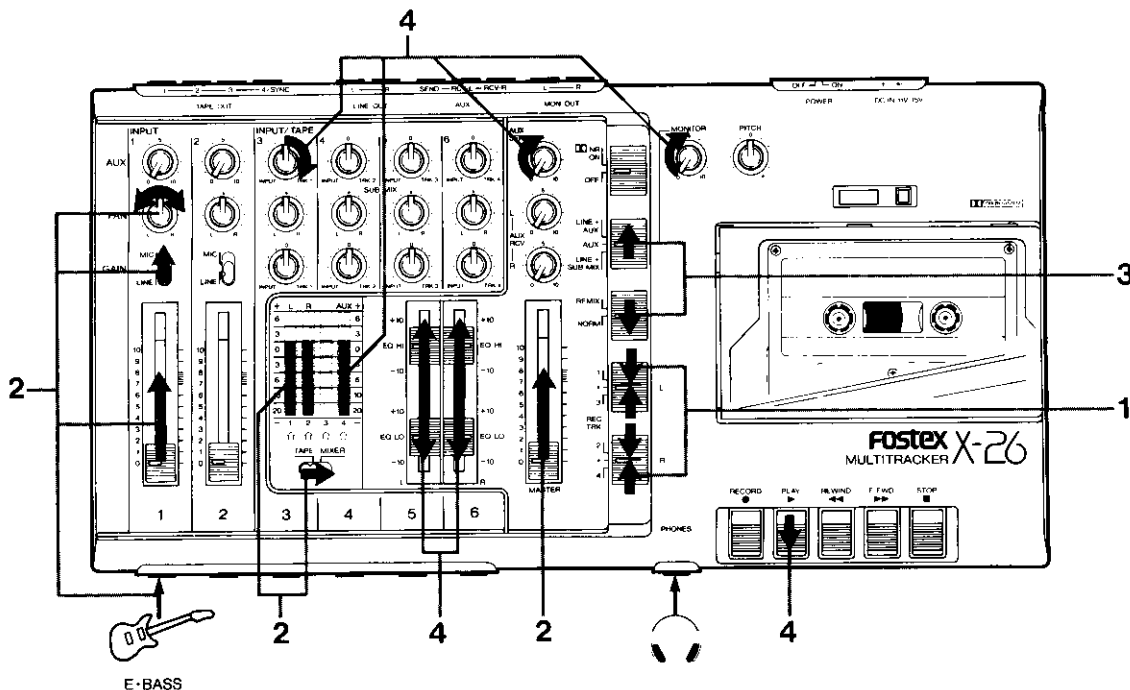
What is overdubbing?

Recording a new sound on a separate track in synchronization with a pre-recorded track while it is played back and monitored.

In this procedure, an electric bass is overdubbed onto track 2 while listening to the previously recorded drum machine on track 1. First, the new part is "rehearsed" (practice performance), then proceed to the "take" (actual recording) after many practicing.

1. After returning everything to the initial state (refer to previous Procedure 1), set up the controls for rehearsal.

2. Plug the electric bass into the MIC/LINE input 1, switch GAIN 1 to MIC, set PAN 1 at center, set MASTER fader to 7 or 8, switch the meter selector to MIXER and play the electric bass. As INPUT fader 1 is raised, the meter will indicate the level according to the PAN 1 setting. Set the INPUT fader where the level will not exceed "0." If the level is too high even though INPUT fader 1 is reduced, return it to zero for the moment, switch GAIN 1 to LINE and readjust the level again.



<<< Procedure 2-1 Overdubbing an electric bass on track 2: Rehearsal >>>

3. The electric bass will be monitored here. In the case of Procedure 1, track 1 could be input monitored (at STOP) as "1" was selected by the REC TRK selector but as "2" is not selected here, this (input monitoring of track 2 cannot be done. Then, why is it set to "OFF/center position" The reason is, even though REC TRK selector is set to "2" to allow input monitoring, the headphone sound will be cut off at the instant the PLAY button is pressed to start rehearsal (the selected track is usually not entered in the recording mode at rehearsal and thus the track selected by will enter the tape monitor mode when PLAY is pressed.). Therefore, to be able to monitor the sound source (electric bass, in this case) at rehearsal, you must listen to the stereo buss* to which this sound source is sent. On the other hand, as it is necessary only to tape monitor the prerecorded track (track 1, in this case), it will be convenient if AUX 3~6 (corresponds, in order, to tracks 1~4) are used in the same way as in Procedure 1. To monitor prerecorded drum machine and electric bass at the same time, set MONITOR selector to "LINE + AUX."

Set the REMIX/NORM selector to NORM.

*Refer to Section3, page 4.

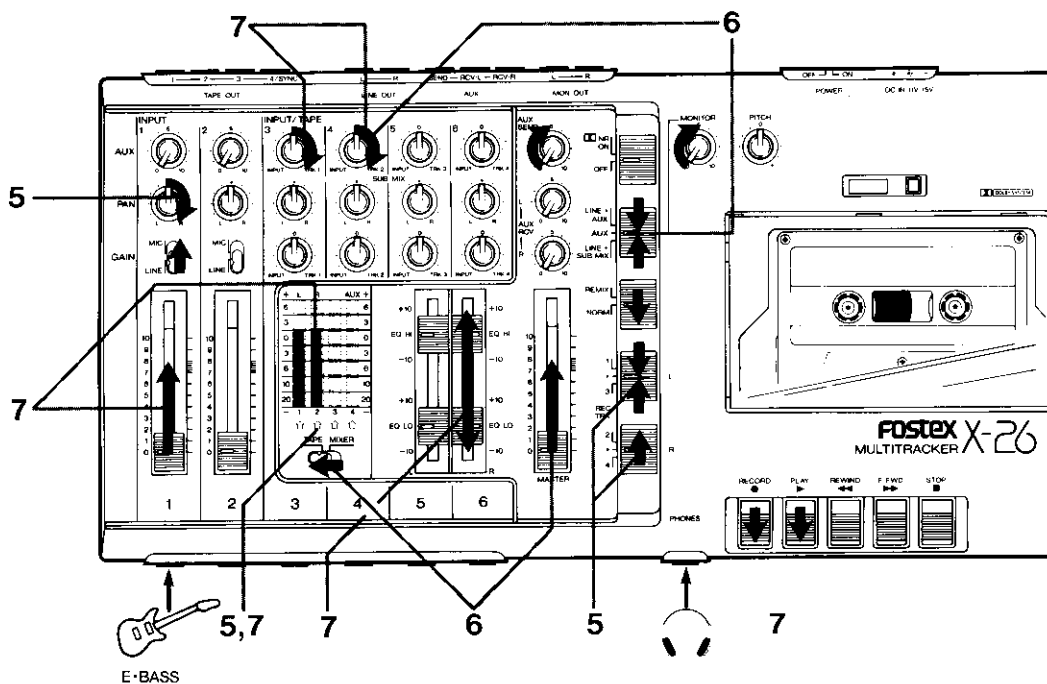
4. As the electric bass will be heard as the MONITOR pot is raised, adjust the sound image position and tone as desired with PAN 1 and EQ. Set AUX SEND to "10" to listen to the drum machine, then, press PLAY button. The

drum machine will be heard and the AUX meter will start indicating as AUX 3 is raised toward the TRK 1 side, start the rehearsal. Sound volume is adjusted by the MASTER fader for the electric guitar and by AUX 3 for the drum machine. Upon finishing the rehearsal, rewind tape to "000" on the tape counter.

5. Now comes the "take." As this is the actual recording step, set REC TRK selector to "2" (REC TRK LED 2 will light in amber) and rotate PAN 1 to fully to the Right.

6. Set MASTER fader to 7 or 8 and meter selector to TAPE. Return MONITOR selector to AUX and be sure the electric bass image position does not shift toward right (Same situation as in Procedure 1). When AUX 4 is raised to the TRK 2 side, track 2 can be input monitored (monitoring of electric bass) with sound image at center.

7. Re-adjust the recording level and tone with the INPUT fader 1 and EQ R. After checking for proper level by the meter, press the RECORD button to start overdubbing (REC TRK LED: 1→green light, 2→red light). Monitor sound balance between the drum machine and electric bass is adjusted by AUX 3 and AUX 4 (Recording level will not be affected.). Upon ending the tune, rewind to the beginning of the tune, press the PLAY button and tape monitor while adjusting sound volume balance of each track with AUX 3, 4 to check whether it is the best "take." If there is any mistake, the process is repeated again until a satisfactory "take" is recorded.



<<< Procedure 2-1 Overdubbing an electric bass on track 2: Take >>>

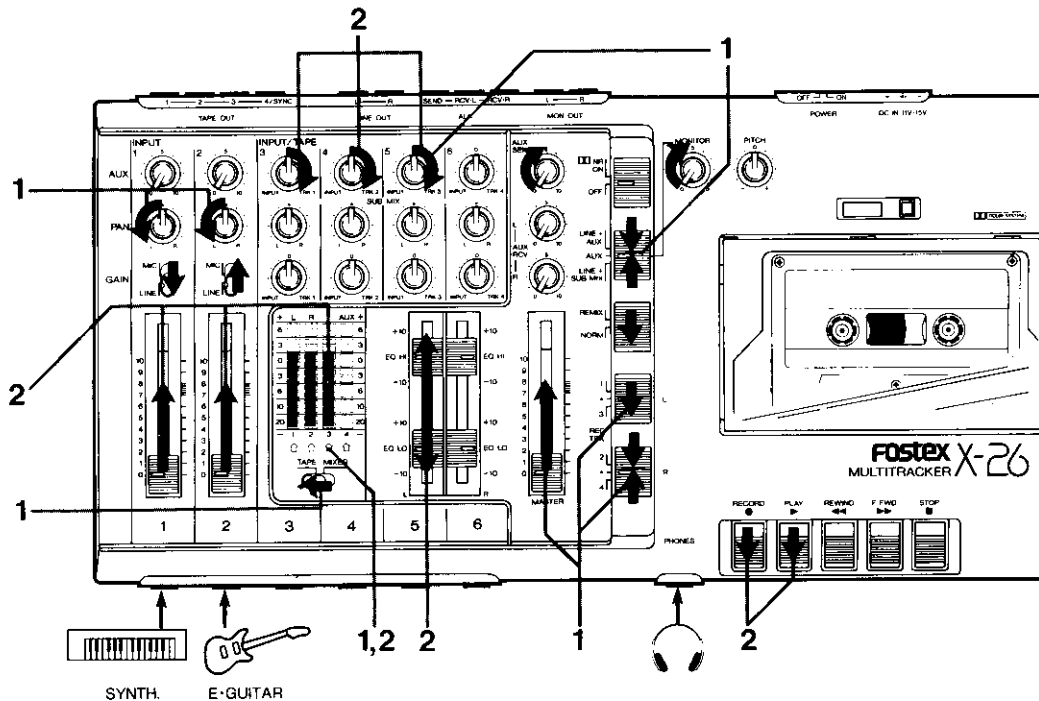
PROCEDURE 2-2 OVERDUBBING A SYNTH AND ELECTRIC GUITAR ON TRACK 3

In the previous examples, only one sound source was recorded on one track but it is, of course, possible to record a multiple number of sounds on one track.

Method of rehearsal: It is the same as in Procedure 2-1. Set REC TRK selector to OFF, MONITOR selector to LINE + AUX, REMIX/NORM selector to NORM, and plug in the synth and electric guitar to MIC/LINE input 1, 2. It is the same for the meter selector which is set to MIXER, adjust the level with INPUT fader 1, 2 and MASTER fader, and setting the positions of GAIN 1, 2.

Monitoring methods for tracks 1 and 2 are the same as in Procedure 2-1. The drum machine is monitored by raising AUX 3 towards the TRK 1 side, and the electric bass by raising AUX 4 towards the TRK 2 side. Adjust sound volume of the electric guitar with the MASTER fader and its image position with PAN 1, 2.

1. When rehearsal is finished, next comes the take. Select "3" on the REC TRK selector (REC TRK LED 3 will light in amber), rotate PAN 1, 2 to fully to the Left and set MASTER fader to 7 or 8. Set meter selector to TAPE, return MONITOR selector to AUX, raise AUX 5 toward TRK 3 to input monitor track 3 (synth and electric guitar).
2. Re-adjust the recording level and tone with the INPUT fader 1, 2 and EQ L, and after checking on the meter that it is at the proper level, start the take by pressing the RECORD button (REC TRK LED: 3 only lights in red). The monitor sound volume balance is adjusted by AUX 3, 4 for track 1, 2, and by AUX 5 for track 3 (synth and electric guitar) (This will not affect the recording level). After finishing the take, the method in tape monitoring tracks 1~3 is the same as in Procedure 2-1.



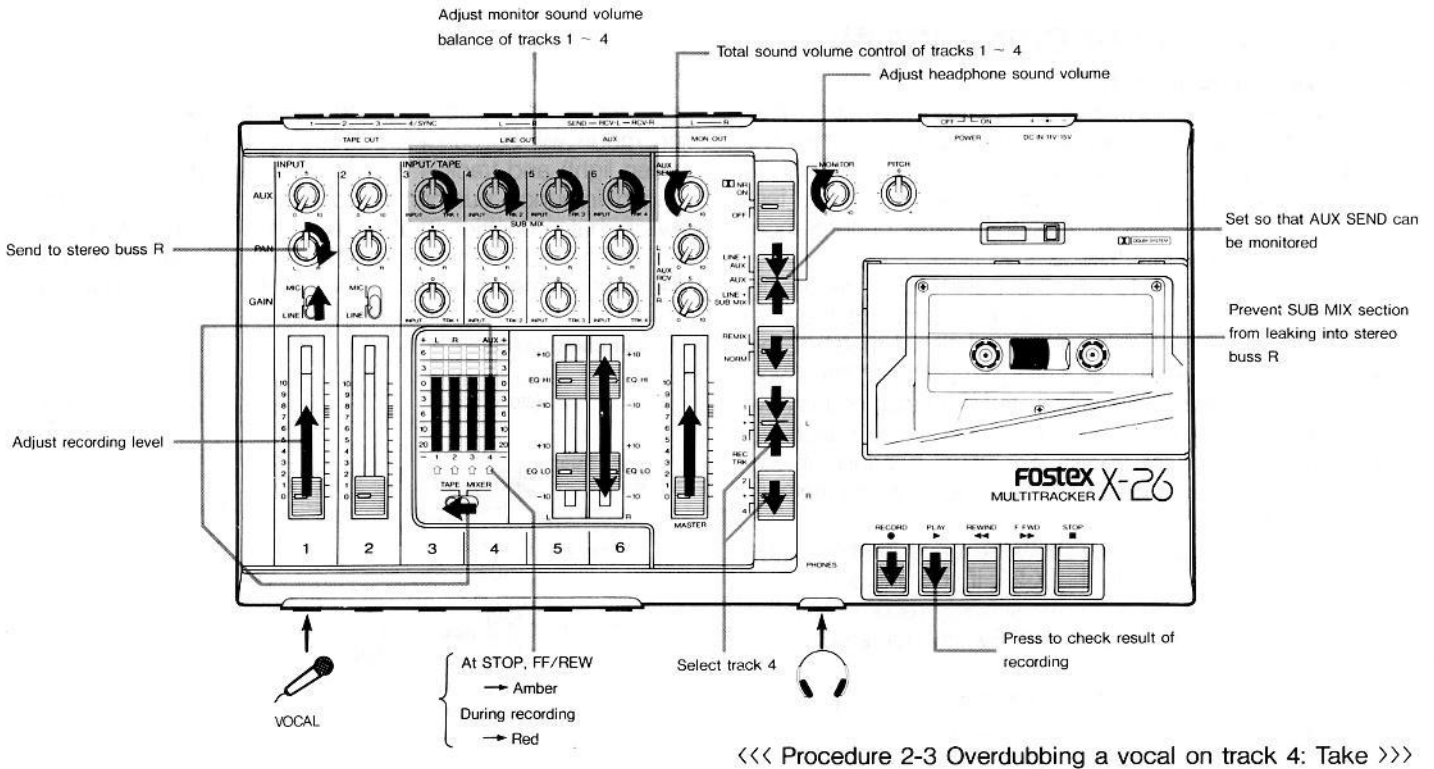
<<< Procedure 2-2 Overdubbing a synth and electric guitar on track 3: Take >>>

PROCEDURE 2-3 OVERDUBBING A VOCAL ON TRACK 4

Let's overdub a vocal on the last remaining track 4. The methods on rehearsal and take are about the same as in Procedure 2-1 and the largely different points are as follows:

- At rehearsal:** Tracks 1~3 are tape monitored by raising AUX 3, 4, 5 toward TRK 1, 2, 3 side.
- At take:** Select "4" by the REC TRK selector. Raise AUX 3~6 toward the TRK 1~4 side to tape monitor tracks 1~3, Input pan to all the way Right and input monitor track 4.

Refer to the operating diagram to correctly proceed with the work. When doing a "Mic take" as in this example, it is recommended to monitor with a headphone only whenever possible to prevent sound from a speaker to be picked up by the mic to cause howling.



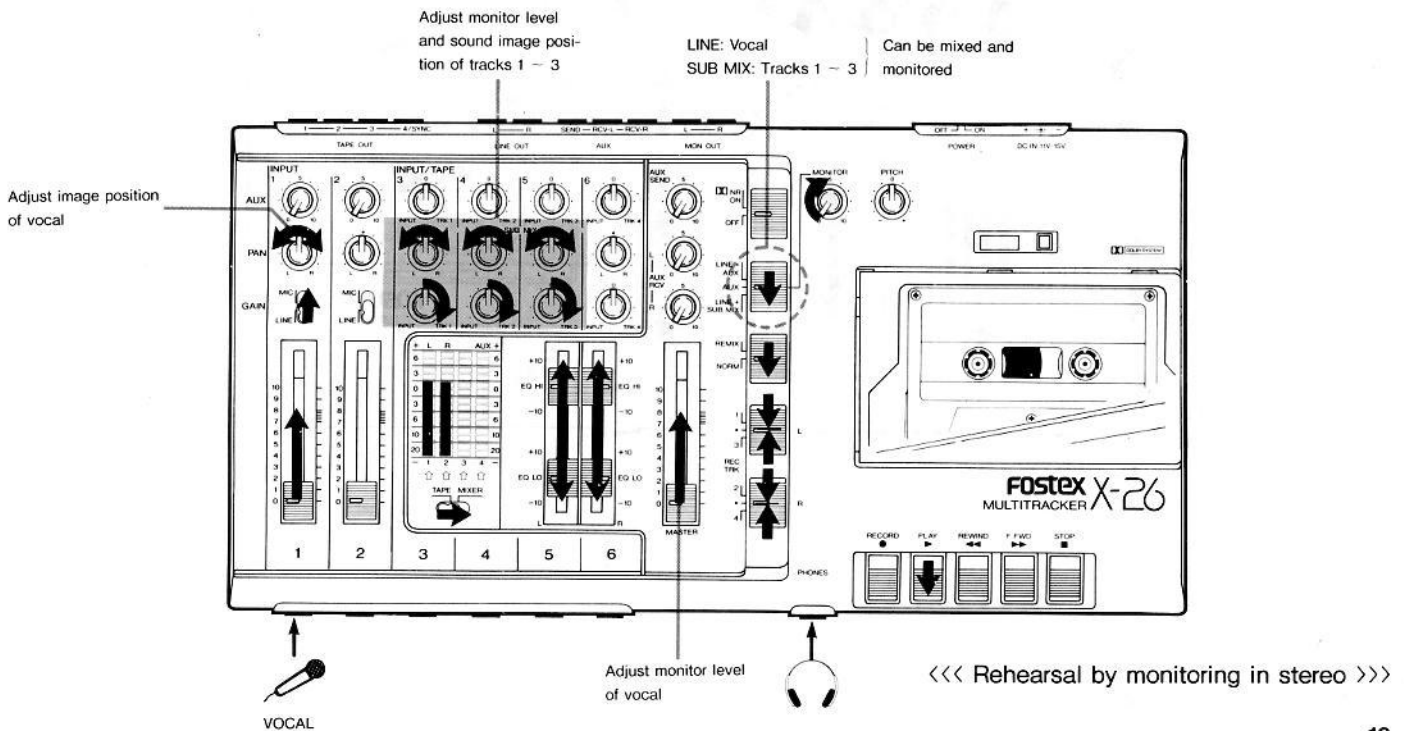
REHEARSAL BY MONITORING IN STEREO

In the previous examples, the recorder output was monitored with the sound image at center by using AUX 3~6, but by using the SUB MIX section, you can rehearse with the left/right balance at any position. However, you must be careful of the followings.

NOTE 1: When doing a take as shown in the diagram, the sound source to be recorded (vocal in this case) will be monitored at the right side (due to setting PAN 1 to fully to the Right).

NOTE 2: As SUB GAIN set to TRK side cannot receive input signals from the LINE input, this method is not recommended if LINE input 3~6 must be used.

The diagram shows an example of rehearsal for overdubbing a vocal onto track 4 while monitoring playbacks of tracks 1~3.



PROCEDURE 3 PUNCHING IN/OUT

What is punching in/out?

It is simply a way to fix mistakes in otherwise acceptable recording. Suppose you have just finished a vocal that you really like, except for one place where the singer is off pitch. You could re-record the whole part, of course, but you feel uncertain if the singer will improve the overall performance. This is the best one, the "keeper."

Here's the perfect time to use the punch-in/out recording technique. You find a logical section that surrounds the mistake. You rehearse so that the recorded signal matches the new signal in both level and feeling (important). Then you record over the portion you've selected. The start of this new recording is the punch-in point and the end is the punch-out point. Timing is critical in this operation because if you punch-in too soon or punch-out too late, you'll wreck the very thing you're trying to fix.

The chart and diagram below show the steps for three ways of punching in and out with the X-26. If you are performing as well as operating the X-26, we strongly recommend the optional Fostex Model 8051 Foot Switch. Otherwise you might have to enlist the services of a friend to help push the switches—if you're singing into a live microphone, you may pick up the sounds of the X-26 being operated.

Upon completing the various settings, advance the tape to slightly before the section to be replaced, press the PLAY button and start singing with the tracks 1~4 playback sound. Balance the sound volume level of each track with AUX 3~6, then step on the foot switch just before reaching the section to be replaced. Track 4 will enter the recording mode (RED TRK LED 4: red light) and punch-in is started (track 4 will be input monitor). After completing the necessary correc-

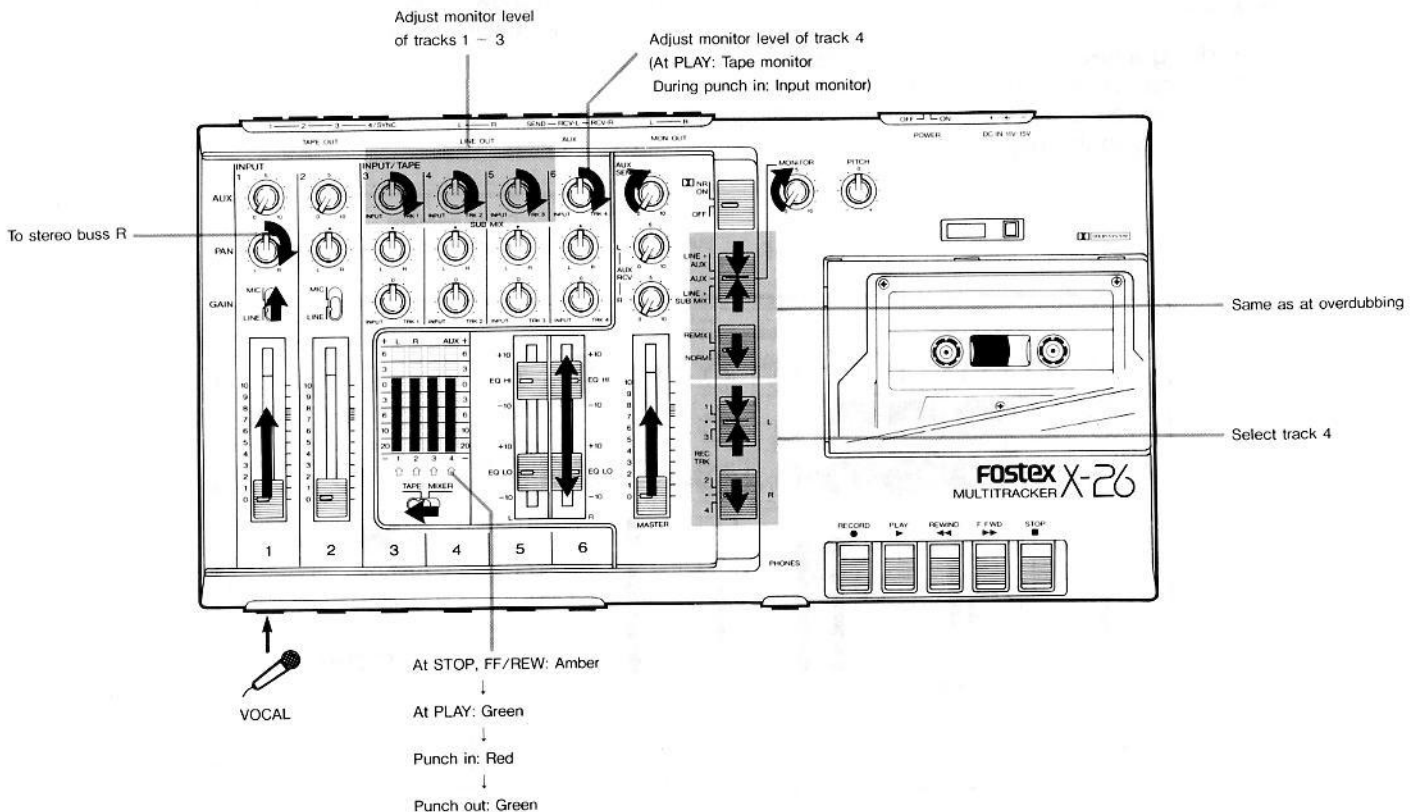
tion, immediately step on the foot switch again. The recording mode will be cancelled (punch-out; REC TRK LED 4: green light) and track 4 will return to tape monitor.

Punch in/punch out can be done without using the foot switch but, considering the ease in operation, its use is recommended whenever possible. If, by all means, you must use another method, refer to the diagram in "Punch in/out."

Punching in/out

	Initial setting (stop mode)	PLAY ⇒	PUNCHING IN ⇒	PUNCHING OUT ⇒
8051 foot switch	ON		PUSH	PUSH
REC TRK LED				
REC TRK selector	OFF		ON	OFF
REC TRK LED				
Recorder function	ON			OFF STOP
REC TRK LED				

*In any of the above methods, be very careful in the in/out timing. Should the "in" point be too early or the "out" point too late, undesired sections will be erased.



<<< Procedure 3 Punching in/punching out vocal on track 4 >>>

PROCEDURE 4 MIXDOWN WITH EFFECT PROCESSING

What is mixdown?

The process of playback of a multiple number of tracks, assign them to stereo (or monaural bass), and copying (dubbing) it onto a master tape.

Now let's do a mixdown. In this example, AUX 3~6 that was used to monitor the recorder output are used for effect send and mix down the playback sounds of tracks 1~4 while separately applying reverb to these tracks.

Before proceeding with the work, be sure you fully understand the next two items.

WHAT IS AUX?

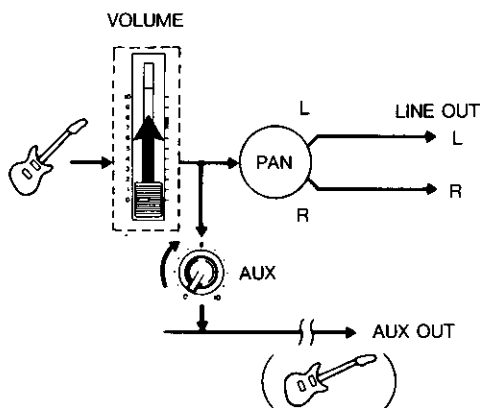
AUX is an abbreviation of "auxiliary" and in audio, also means "spare." AUX is used for monitoring the recorder output or effect send (especially at reverb processing) at mixdown as in Procedures 1~3. In other words, this has been named "auxiliary" or "spare" as it is the section which has the other role aside from the basic function of "accepting sound sources, sending them to the stereo buss and recording them on each track of the recorder."

In the X-26, AUX is provided in each of all six input channels. Among these, 1 and 2 are fixed to the channels 1 and 2 POST faders, and are used mainly as effect sends. 3~6 are used mainly for effect sends (fixed to PRE fader) when the same source (input signal from LINE input or the output signals of tracks 1~4) selected by SUB GAIN are selected, or used mainly for monitoring the recorder output when the channels 3~6 sound source are accepted by SUB GAIN but not effect processing the signals.

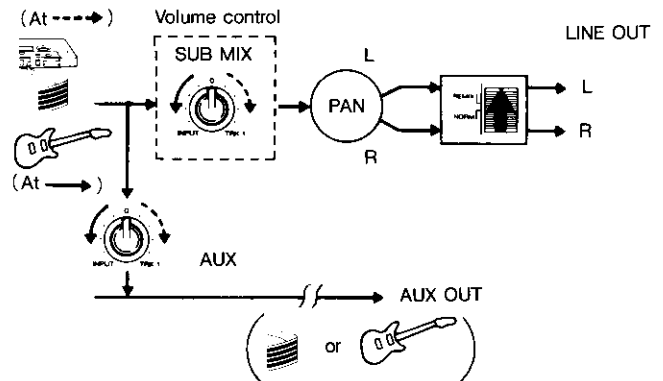
WHAT IS PRE/POST?

These prefixes, of course, means "before" and "after," and are used such as "PRE fader," "POST fader," "POST equalizer," etc. Their meaning in actual use will be explained in the following.

●**POST fader:** The signal taken after the control pot (inside the dotted line) is called the "post fader signal" and when it is sent to AUX, it is called "POST fader." The AUX Send Level is affected by the Fader.

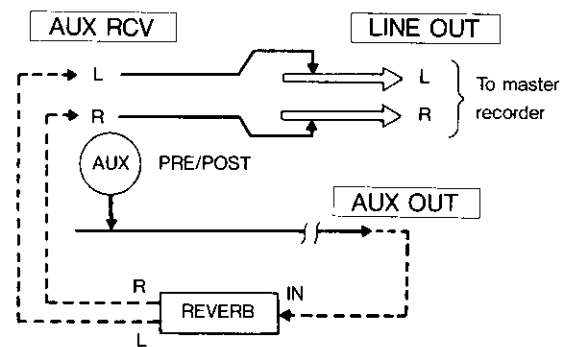


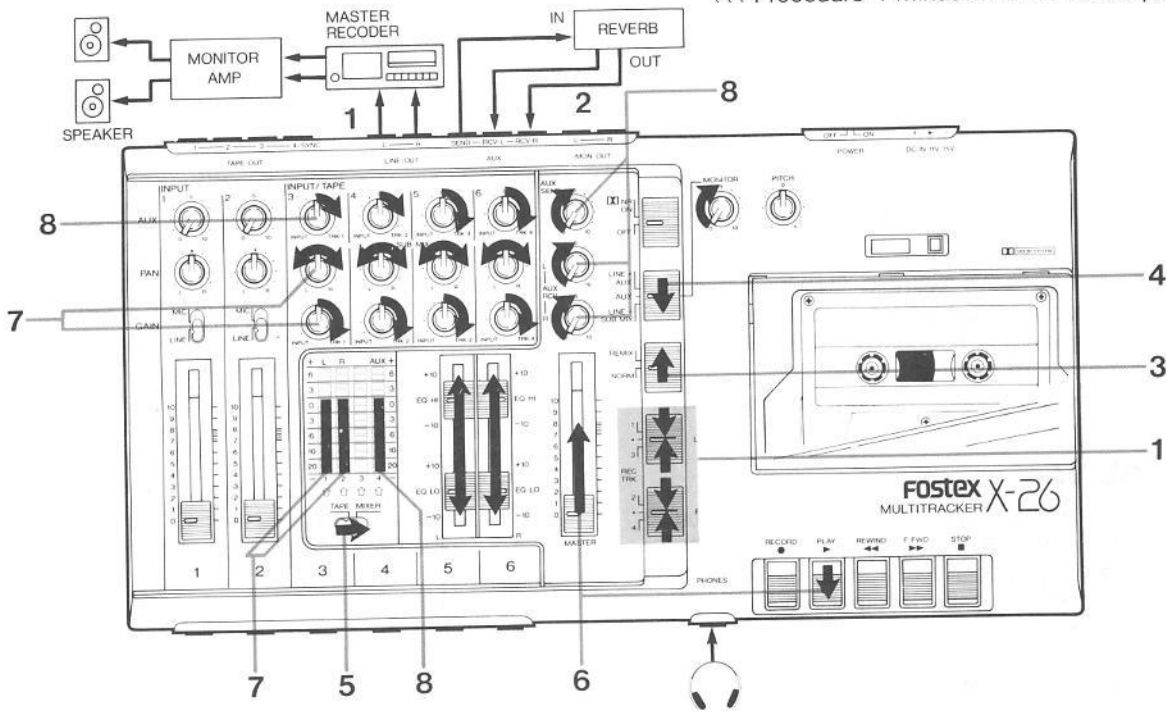
●**PRE fader:** The signal taken before the control pot (inside the dotted line) is called the "PRE fader signal" and when it is sent to AUX, it is called "PRE fader." It is not affected by the AUX Send Level and can be sent at its own level to AUX OUT.



There are some mixers with a PRE/POST switch but to discriminate from this, in the X-26, AUX 1, 2 are called "POST fixed"; and AUX 3~6 are called "PRE fixed."

The AUX output thus obtained is normally sent to echo type effecters such as a reverb except when it is used for monitoring the recorder output. The effect sound (wet signal) is then sent to the stereo buss via AUX receive, etc. and mixed with the sound source being input or the dry signal (original sound) of the recorder output.





1. After returning X-26 to the initial state (Refer to Procedure 1), LINE OUT jack is connected to the master recorder LINE IN. It is recommended here to use a speaker instead of a headphone to monitor at mixdown in order to grasp the stereo image (spread, depth, presence) of the actual sound. Connect the MON OUT jack or master recorder line output to TAPE input of the monitor amp/speaker.

2. Connections are made for reverb processing. Connect the AUX SEND jack to the reverb INPUT, and the reverb stereo output (OUTPUT L, R) to the AUX RCV jack L, R.

NOTE: When reverb is the stereo input, either input mix it (Refer to the reverb manual) or connect them in parallel with a parallel box, or "Y" cables. Also, when the output is monaural, it is split into two and connect both to the AUX RCV jack. As the rated input level of is -20dBV , if reverb has an output level selector it must be set to -20dBV . It can be used directly if it is the -20dBV type.

This completes the connections. Set a blank tape on the master recorder and X-26 is setup next.

3. Set REMIX/NORM selector to REMIX. When it is thus set, playback sound of tracks 1~4 to be mixed in the SUB MIX section, can be sent to the stereo buss.

4. Set MONITOR selector to LINE + SUB MIX. When it is thus set, the same signals sent to the master recorder can be heard (When in the REMIX mode, it will be LINE + SUB MIX or LINE ONLY and the same content as the output signal from the LINE OUT jack can be monitored) when monitoring by the PHONES jack or MON OUT jack.

5. Set the meter selector to MIXER so that the stereo buss output level can be confirmed by meter L, R. Also, enter the master recorder in the SOURCE or REC/PAUSE mode so that the input signal level can be checked and monitored.

6. Set MASTER fader to about 7 or 8 and press the PLAY button.

7. As SUB GAIN 3 is raised toward the TRK 1 side, the track 1 sound (drum machine) will be heard from the speaker (headphone). Image position of this sound can be adjusted by SUB PAN 3. Level balance will be indicated by L, R of the meter.

8. Now let's try applying reverb. Setup so that effect sound only is output from the reverb (Be sure it does not mix with the original sound of SUB GAIN 3.). Then, set both L and R of AUX RCV to "10" and AUX SEND, also to "10." As AUX 3 is raised toward TRK 1, meter will begin to indicate and reverb will be applied.

Tracks 2~4 are also monitored in the same way as in steps 7 and 8. Tones of the left and right mixed signal can be adjusted by EQ.

9. Playback the tape several times and adjust the SUB MIX section and AUX 3~6 for best balance of sound volume, sound image position and amount of reverb of each track. Also, check by the meter L, R and AUX that the signals sent to the master recorder and the reverb are at suitable levels. If they are slightly high in level, adjust by lowering the MASTER fader and AUX SEND (If it is excessively high, try to retard each volume control pot by the same amount so as not to disturb the balance.). If the results are O.K., adjust the master recorder recording level so that its indications are about the same as on the meter L, R. The master recorder is started in the recording mode first, then X-26 is played back. Fade in/fade out is controlled by the MASTER fader.

ADVICE: As AUX 3~6 are used as fixed PRE fader effect sends, they will not follow the level of the original sound determined by SUB GAIN 3~6. Therefore, if level of the original sound is lowered (or raised), it must also be lowered (or raised).

As level of the reverb output (effect sound) sent to the stereo buss is set by AUX RCV, this must be retarded if the overall reverb sound volume is to be lowered.

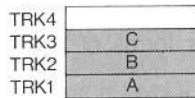
SECTION 7. PING-PONG RECORDING

What is ping-pong recording?

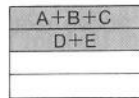
It is the process of "bouncing tracks." You combine three parts, for example, and record this mix on the fourth track, thereby freeing up the first three tracks for more parts. This procedure takes good planning because once you combine parts you must treat this "sub-mix" as a single part. For this reason, it's a good idea to leave the critical parts for the final recordings (F and G in our example).

Example: One man septet by ping-pong recording

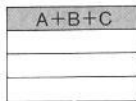
- 1) Record A, B, C on tracks 1 ~ 3



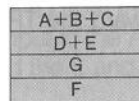
- 4) Ping-pong record D, E on track 3



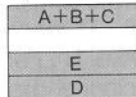
- 2) Ping-pong record on track 4



- 5) Record F, G on tracks 1 and 2



- 3) Record D, E on tracks 1 and 2



Septet of A - G is completed !

Please note the following points at ping-pong recording.

- For example, when recording onto an adjacent track such as from track 2 to track 3 or track 1, oscillation could occur depending on the case. In such a case, the send level must be lowered (by SUB GAIN in the X-26) and the high frequency regions suppressed (by EQ).

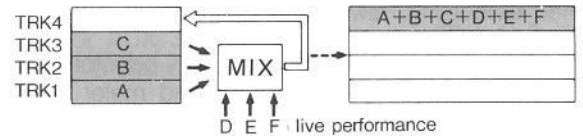
Ping-pong recording (Track 1, 2, 3 + Sound source D, E, F → Track 4: Take)

* Numbers are points of changes when shifting from rehearsal to take.

- The sounds of each track mixed by ping-pong recording cannot be separately changed in balance later. Necessary adjustments should be carefully done during the rehearsal stage.

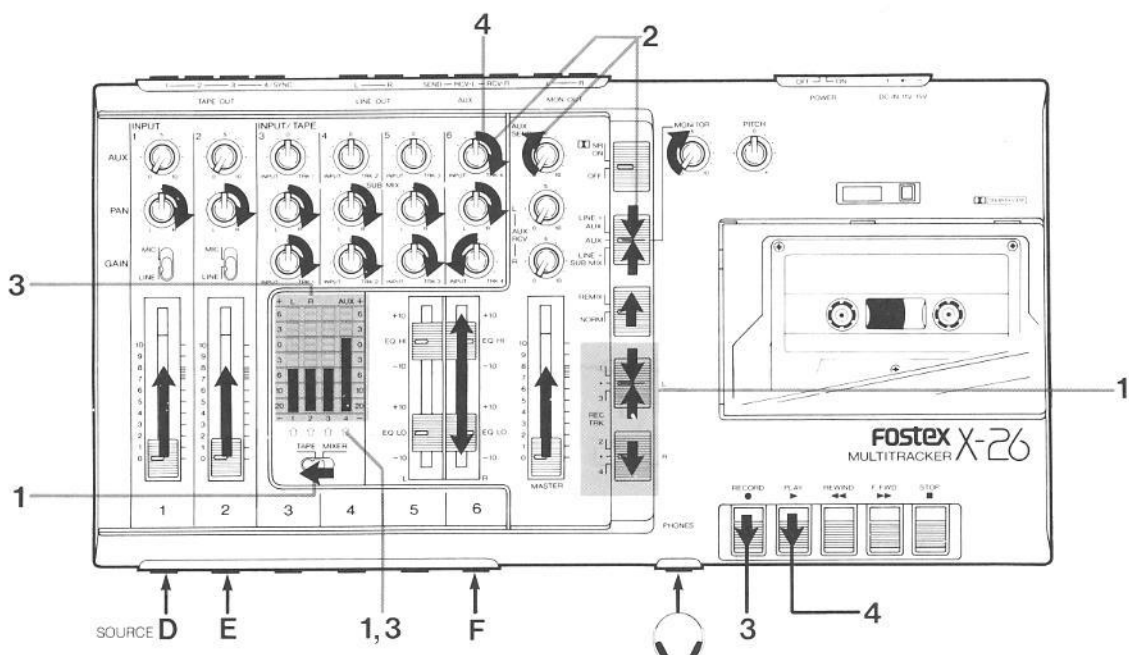
In the example here, tracks 1 ~ 3 are ping-pong recorded on track 4. Furthermore, the process of playing an additional three sound sources and simultaneously recording them on track 4 (=plus 3 ping-pong) will be explained.

- Ping-pong recording by plus 3 on track 4.



First, start rehearsing. After setting in the initial state (all control pots → 0, REC TRK selector → OFF), connect sound sources D, E and F to channels 1, 2 and 6. Then, set the REMIX/NORM selector to REMIX and the MONITOR selector to LINE + SUB MIX. This completes preparation in listening to the stereo buss output sound. Then, after setting the meter selector to MIXER, MASTER fader to 7 or 8, raise input faders 1, 2 and levels of sound sources D and E will be indicated on the meter. As the MONITOR pot is raised, that sound will be heard in the headphone. Level checking and monitoring of sound source F is done by raising SUB GAIN 6 toward the INPUT side.

Method of setting GAIN 1, 2 is the same as in "Basic operation," Procedure 1 (Page 12). Also, as channels 3 ~ 6 are inputs exclusively for line levels, select an electric musical instrument, etc. for sound source F.



After completing setup of the sound sources for plus 3, press the PLAY button to playback the tape, raise SUB GAIN 3, 4, 5 toward the TRK side to tape monitor tracks 1~3. The image position of the sound source to be added can be adjusted by PAN 1, 2 and SUB PAN 6, and the same for tracks 1~3 by SUB PAN 3, 4, 5 but there is not much meaning in these adjustments since the sound will be monaural after recording on track 4. Furthermore, as these sounds will all be assigned to "R" (for sending to track 4) at "take," it is better, beforehand, to check and adjust the mix signal level (the track 4 recording level) by "R" of the meter. For this reason, both PAN and SUB PAN should be set to full "R". Then, adjust the tone by EQ R and while balancing each sound for optimum indications on the meter "R", repeat rehearsal (sound will be heard only from the right). When you have finished rehearsing, rewind the tape.

1. The take is done next. Set REC TRK selector to 4 (REC TRK LED 4 will light in amber) and meter selector to TAPE.
2. Set MONITOR selector to AUX and AUX SEND to "10." As you raise AUX 6 toward the TRK 4 side under these settings, you can input monitor track 4 with the sound image

at center. Let's check it by playing sound source D (E, F) (Do not touch the already adjusted INPUT fader and SUB GAIN 6). Adjust sound volume by AUX 6.

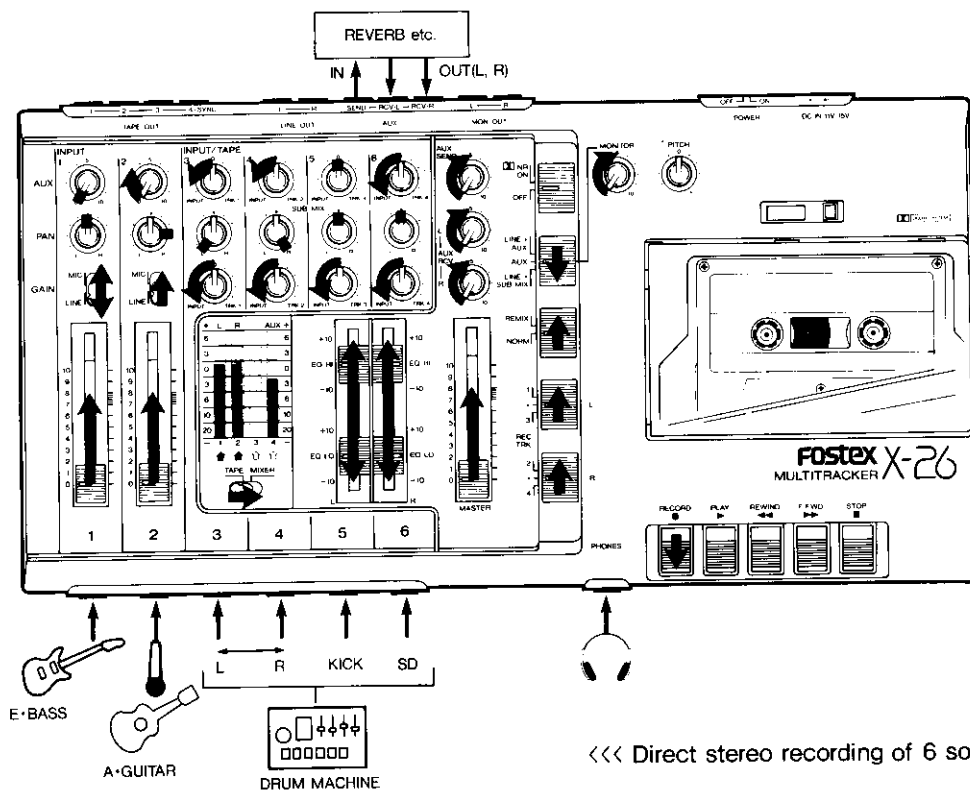
3. Start plus 3 ping-pong recording by pressing the RECORD button (REC TRK LED 4 will change to red). The recording level will be indicated on 4 of the meter, and the output levels of tracks 1~3 (not the send level to track 4) on 1~3 of the meter.
4. When the tune is ended, the tape is rewound and the result is checked. Press the PLAY button and tape monitor track 4 by the signals at AUX 6. If it is OK, tracks 1~3 will no longer be needed and therefore, let's overdub new sounds on it in step with track 4.

Refer to the above example for other forms of ping-pong recording.

Be careful not to mix the track outputs for ping-pong recording in the SUB MIX section as a loop will be formed and cause howling. In the above example, SUB GAIN 6 must not be raised toward the TRK 4 side.

SECTION 8. OPERATING EXAMPLES

Through explanations up to the previous section, you should now have a better understanding in basic multitrack recording techniques from recording procedure (level adjusting, methods in monitoring, etc.) to mixdown/effector processing. Various examples in other applications will be introduced in this section.



<<< Direct stereo recording of 6 sound sources >>>

1. DIRECT STEREO RECORDING OF 6 SOUND SOURCES

As X-26 is a 6 input mixer for 2 mic/line and 4 exclusive line levels (AUX receive is also provided), let's try stereo recording by full utilization of these inputs. AUX will also be used for effect send and echo processing will be done at the same time.

Please refer to the drawing. This is an example of recording 6 sound sources with reverb down to track 1 and track 2 (stereo). The sound sources connected to channels 1~6 (3~6 are parallel outputs of the drum machine) are level set by the INPUT fader and SUB GAIN, and sent to the stereo buss at their respective balance adjusted by PAN and SUB PAN (REMIX/NORM selector→REMIX. Refer to "Basic Operation" for selecting of GAIN 1 and method in setting each sound source level.).

On the other hand, the mixed signals from the PRE/POST fader output of the various sound sources balanced by AUX 1~6, are sent to reverb via AUX SEND from the AUX SEND jack, and the reverb output that is input to the AUX RCV jack is adjusted in level by AUX RCV and the L and R signals are sent to the stereo buss.

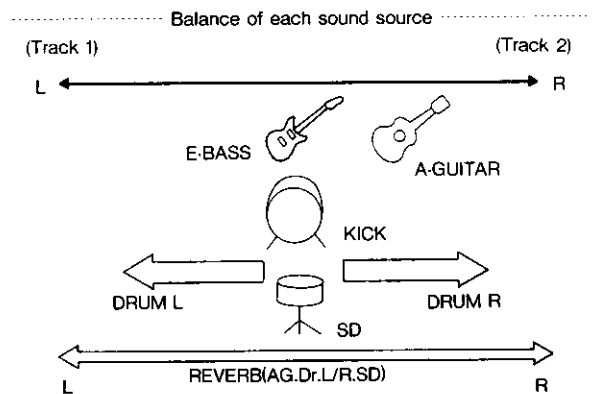
The signals thus arriving at the stereo buss, pass through the MASTER fader (7~8), and by setting the meter selector to MIXER, the L, R levels are checked by the meter (send level to the reverb is indicated at AUX).

This mixed signal is headphone monitored by setting MONITOR selector to LINE+SUB MIX (MONITOR volume control→UP).

As the REC TRK selector is set to 1 and 2, the REC TRK LED 1 and 2 will light in amber (at STOP, FF/REW) and each sound source in channels 1~6 are sent to track 1 (L) and track 2 (R) in their respective sound image positions together with the respectively applied reverb elements. The tones of L and R can be adjusted by EQ.

Now, when the RECORD button is pressed, REC TRK LED 1 and 2 will change to red and direct stereo recording of the 6 sound sources will be started.

NOTE: The output of the track to be recorded must not be sent to the stereo buss that is being used for send to that track. In the above example, if SUB GAIN 3, 4 or AUX 3, 4 are raised to the TRK 1, 2 side, it could cause howling by creation of a loop.



2. STEREO PING-PONG RECORDING WITH EFFECT PROCESSING

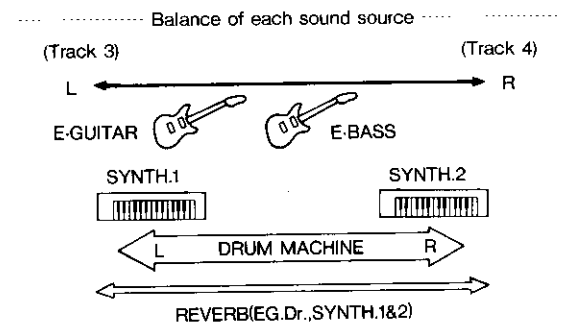
In the previous plus 3 ping-pong recording, the 6 sound sources recorded on track 4 could not be separately effect processed later (because they were all mixed into monaural). In the following, ping-pong recording made with effect processing will be introduced. It is a plus 4 ping-pong recording with final mixdown into stereo of all original sounds and effect sounds.

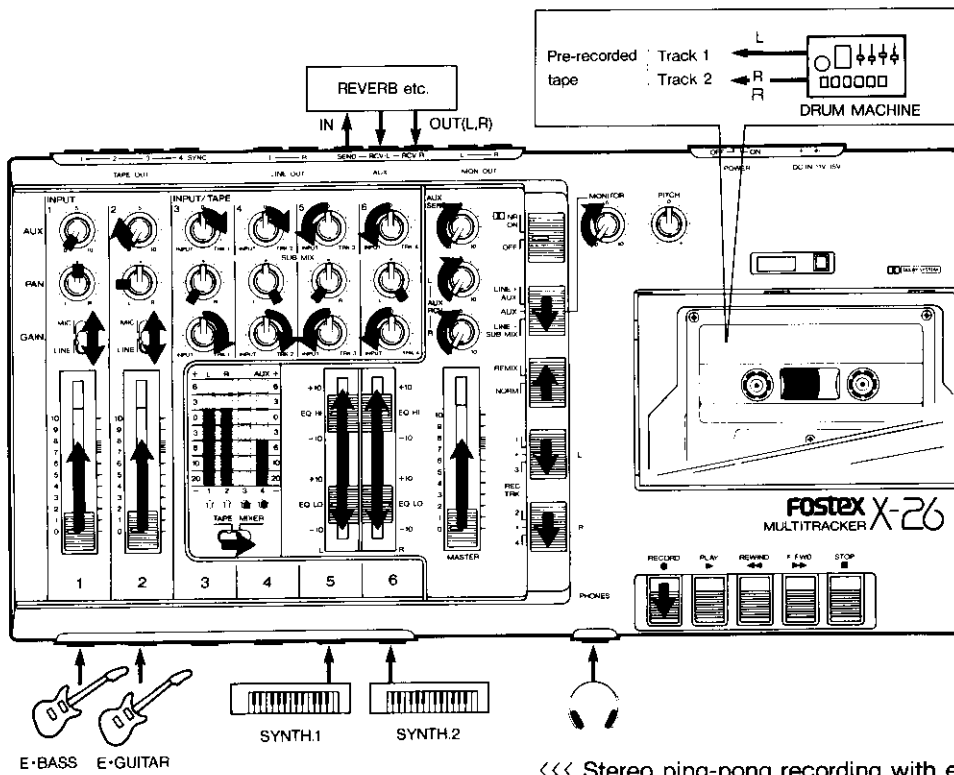
Refer to the diagram. This is an example of adding the various sound sources of channels 1, 2, 5 and 6, and at the same time, recording the necessary reverb on tracks 3 and 4 while ping-pong recording on tracks 3 and 4 (1→3, 2→4) the L, R outputs of the drum machine which had been pre-recorded on tracks 1 and 2. The outputs track 1, 2 and SYNTH 1, 2 mixed in the SUB MIX section are sent to the stereo buss by selecting REMIX on the REMIX/NORM selector (Note that 3 of SUB PAN is set fully left and, 4 to full right). The electric bass and electric guitar are also sent to the stereo buss by balance setting of PAN 1, 2. In addition, individual reverb sound by AUX 1~6 and, are also sent to the stereo buss via AUX RCV (This is the same as the previous "Direct stereo recording of 6 sound sources." However, note that AUX 3, 4 are raised toward the TRK 1, 2 side).

The signals thus gathered at the stereo buss pass through the MASTER fader, its level indicated on the meter and monitored by the headphone (meter selector→"MIXER," MONI-

TOR selector→"LINE+SUB MIX," MONITOR volume control→UP).

3 and 4 are selected at REC TRK selector, REC TRK LED 3, 4 are lit in amber (at STOP, FF/REW), the output of track 1 is sent to track 3, the output of track 2 is sent to track 4, the sound source to be added and the reverb sound are sent to tracks 3 and 4 in their respective balance. Minute adjustment of the tone can be done by EQ. Then, recording is started by pressing the RECORD button and the REC TRK LED 3, 4 will change to red.





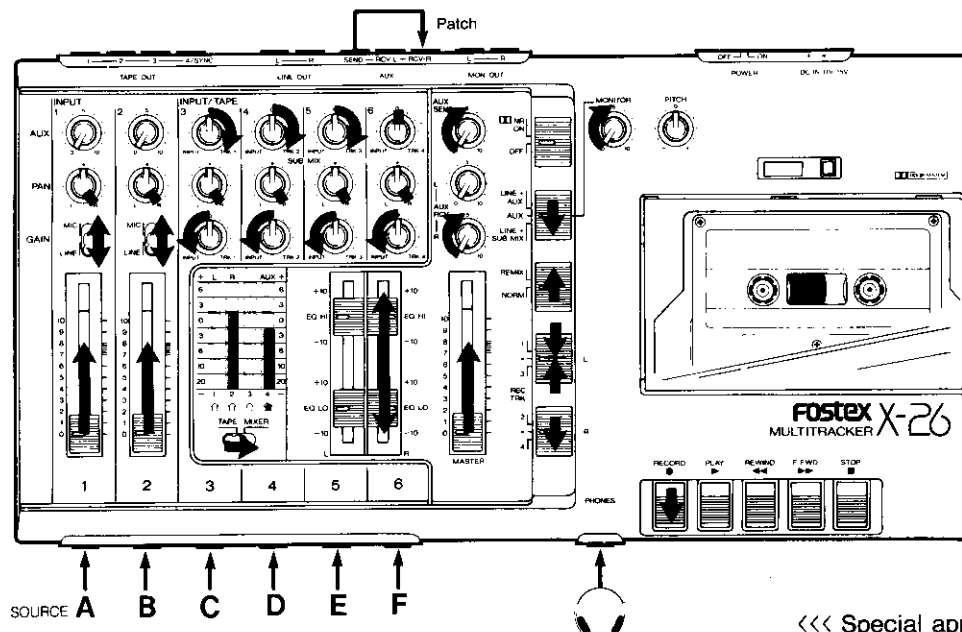
<<< Stereo ping-pong recording with effect processing >>>

3. SPECIAL APPLICATION OF AUX

In the previous examples, AUX was used for recorder output monitoring and effect sends but in the following, special methods in its use will be introduced.

Please refer to the diagram. In this example, tracks 1~3 are ping-pong recorded on track 4 together with 6 sound sources (A~F). The important point here is the AUX SEND jack which is patched to the AUX RCV jack but as the rated levels are different between AUX SEND jack and AUX RCV jack, AUX SEND is set to about 6 or 7. Next, the A~F sound sources are all sent to the stereo buss R (REMIX/NORM selector→REMIX, PAN and SUB PAN→all pots to full CW), outputs of tracks 1~3 are also balanced in sound volume by

AUX 3~5, and sent to stereo buss R via AUX SEND→AUX SEND jack→AUX RCV jack R→AUX RCV R. To avoid creating a loop, AUX 6 is set to "0." These signals passing through the MASTER fader are checked in level by LED level meter R and monitored by the right headphone (Meter selector→MIXER, MONITOR selector→LINE+SUB MIX, MONITOR volume control→UP). The tone, of course, can be minutely adjusted by EQ R. Select track 4 (see schematic) by the REC TRK selector, press the RECORD button (REC TRK LED 4 will light in red), and ping-pong recording with sound sources A~F added will be started. The entire sound level of tracks 1~3 can be adjusted by AUX RCV R.



<<< Special application of AUX >>>

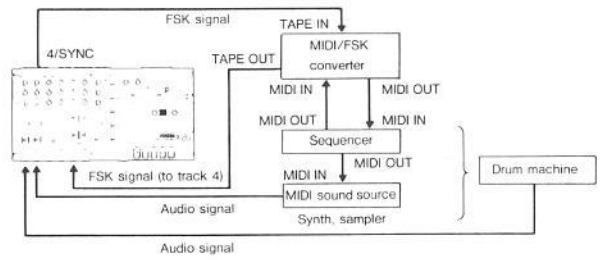
SECTION 9. TAPE SYNC

What is tape sync?

It is the process of dedicating one track of the recorder (usually track 4) as a control track in order to run MIDI instruments. With today's technology, tape sync recording is a smart, efficient process. You only need to record the vocals and acoustic instruments. All the electronic instruments can be programmed to play in "real time" as the master mix is being made, and thus are "first generation" on the master tape.

MIDI signals are not able to be recorded directly on magnetic tape. For this reason, you need a device which translates MIDI data into audio signals which can be "read" by the tape recorder. It's called FSK which stands for Frequency Shift Keying. Many sequencers and drum machines have FSK outputs built-in; there are also stand-alone units like the Fostex Model TS-15.

The following diagram shows a typical hook-up arrangement for tape sync recording.

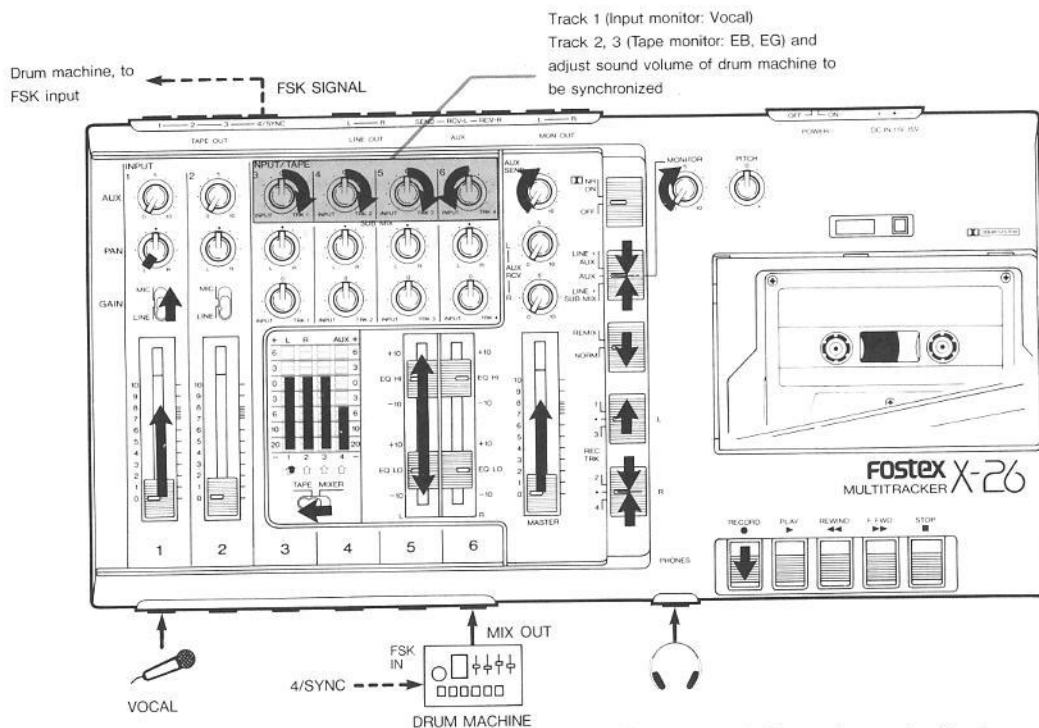
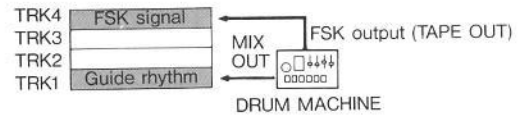


1. WHEN SYNCHRONIZING A SMALL NUMBER OF SOUND SOURCES

The drum machine will be the sound source to be synchronized here and the method of synchronizing and mixing down three outputs—L and R of the drum machine and SD (snare drum)—and recording them in sync with the tape (VOCAL, E.BASS, E.GUITAR) will be explained. Reverb processing using AUX will also be shown.

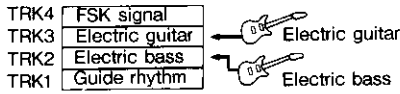
First, program rhythm pattern to the drum machine. Next, set the tempo (do this carefully as tempo cannot be changed later), play it and record the FSK signal on track 4. At the same time, record the drum machine audio output (MIX

OUT) as a guide on track 1. In regards to the FSK signal recording level, refer to the operating manual of the drum machine (or the MIDI/FSK converter). In general, about -6~-3 on the LED level meter seems to be OK. The above operating manual should also be referred to in regards to the length of recording time necessary for the pilot tone (the high pitched tone indicating the standby condition before starting) heard coming from the FSK output.



<<< Tape sync 1: Record vocal with drum machine in sync >>>

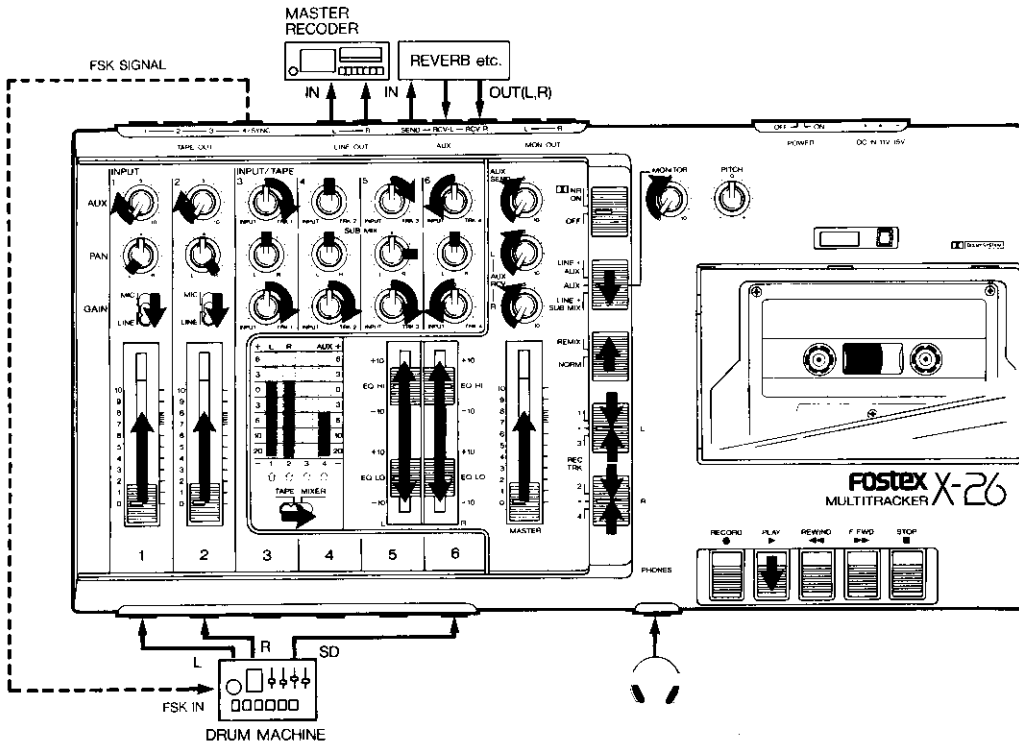
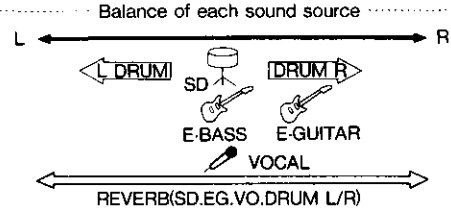
Next, while tape monitoring the guide rhythm, overdub the electric bass on track 2, and while tape monitoring tracks 1, 2, overdub the electric bass on track 3.



OUT (refer to the operating diagram on page 24). The TAPE OUT jack 4/SYNC can thus be used exclusively for the FSK signal output (=SYNC OUT).

When recording is thus finished, the drum machine rhythm program is reassembled and mixdown in the last step. Reverb processing can also be done by using AUX (refer to the operating diagram on this page).

In the last step, while tape monitoring tracks 2 and 3, track 1 is erased and a vocal is overdubbed. In this step, the FSK signal on track 4 is sent from the TAPE OUT jack 4/SYNC to the drum machine FSK input to let it synchronize, and it will be convenient if it is overdubbed while monitoring its MIX

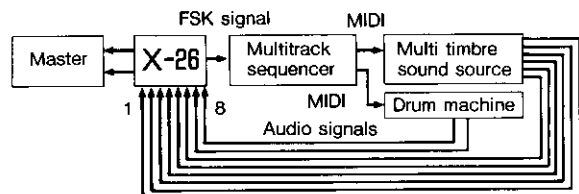


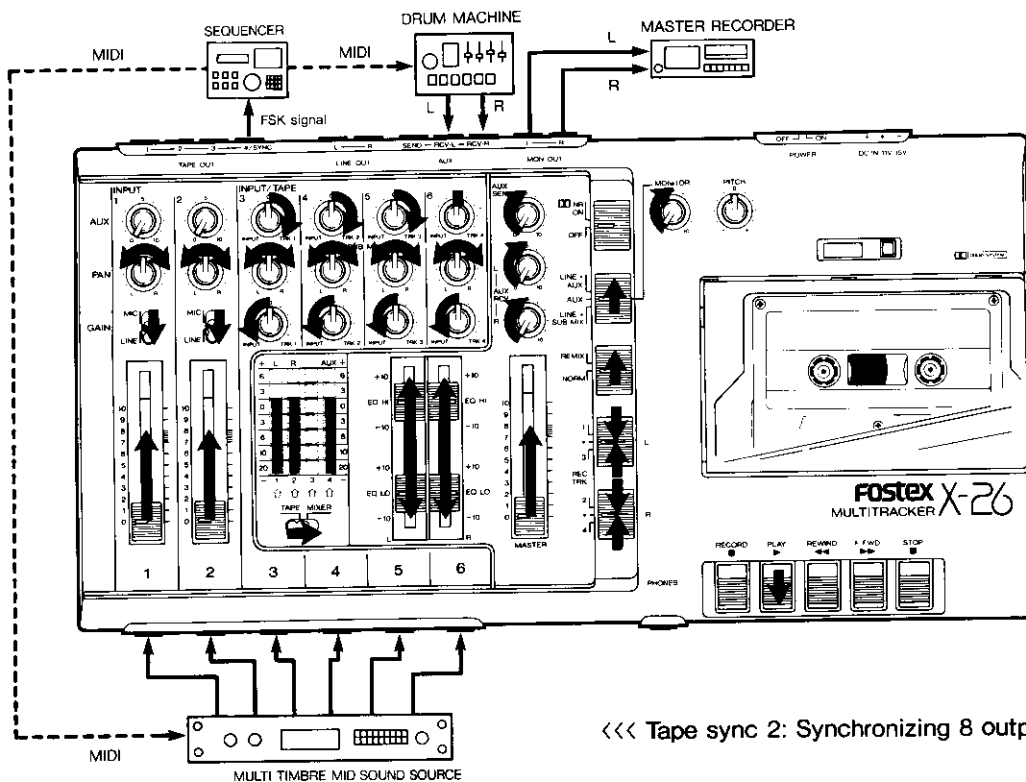
<<< Tape sync 1: Synchronizing the drum machine at mixdown >>>

2. WHEN SYNCHRONIZING A LARGE NUMBER OF SOUND SOURCES

Owing to remarkable developments in electric musical instruments in recent years, many multi-timbral MIDI sound sources capable of putting out multiple number of sounds with one unit have appeared. Among these, some have parallel outputs which have a jack for each sound. For a representative example in their application, synchronized performance combined with a multitrack sequencer can be mentioned but by including the X-26 in this system, it will lead to a creation closer to perfection.

Here's a method of tape synchronizing a total of eight outputs in which the multi-timbral sound source output is assigned to "6" and adding a stereo output drum machine (used only as a sound source). For recording of the FSK signal and tracks 1~3, refer to the previous example.





<<< Tape sync 2: Synchronizing 8 outputs at mixdown >>>

Please refer to the diagram. The important point of this example is in the connecting method of the drum machine and master recorder. First, the drum machine is connected to the AUX RCV jack and its signal sent to the stereo buss output (AUX 3~5→AUX SEND) and then sent to the MON OUT jack, this should be connected to the master recorder (tracks 1~3, however, will be at center image position). Main (master) levels of the electric musical instrument to be synchronized and the live performance recorded on tape are, respectively, set by MASTER fader and AUX SEND, and the signals thus mixed is sent to the master recorder at the level set by the MONITOR volume control.

tracks 1~3 outputs will be added to the stereo buss output (AUX 3~5→AUX SEND) and then sent to the MON OUT jack, this should be connected to the master recorder (tracks 1~3, however, will be at center image position). Main (master) levels of the electric musical instrument to be synchronized and the live performance recorded on tape are, respectively, set by MASTER fader and AUX SEND, and the signals thus mixed is sent to the master recorder at the level set by the MONITOR volume control.

SECTION 10. ROUTINE MAINTENANCE

Common sense says to keep your model X-26 dry and clean, free of dust, to avoid shocks and extremes in temperature/humidity. What you may not know is that all tape recorders require routine cleaning. It's just a matter of physics: as the tape passes over the heads & guides, a little magnetism and some oxide are deposited.

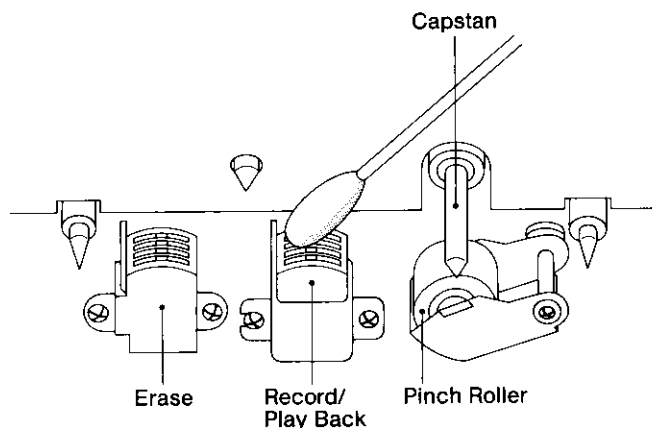
After a short while, you will be able to see the oxide residue, but not the increased magnetism. Each requires its own cleaning procedure. Because if the build-up of oxide and magnetism is left unchecked, the recorder degenerates from impaired to permanently damaged.

Just a few minutes a day of routine cleaning will keep your model X-26 working in top operating condition, giving you all the sound you paid for.

Use the isopropyl alcohol on the heads, guides and capstan shaft. Cotton swabs are great. Use a rubber cleaner on the pinch roller. Never use isopropyl alcohol on rubber parts because they then might dry and crack.

Clean all parts indicated. Be careful with the heads. You don't want to scratch them.

1. Turn the model X-26 Off and remove any tape from the area.
2. Turn the demagnetizer on at a distance of three feet (one meter) from the model X-26.
3. Slowly bring the probe close to the head, begin moving the probe up and down, increasing the arc as you gradually pull away.
4. Turn the demagnetizer off at a distance of three feet (one meter) from the X-26.
5. Repeat the process for all other metal parts in the tape path.



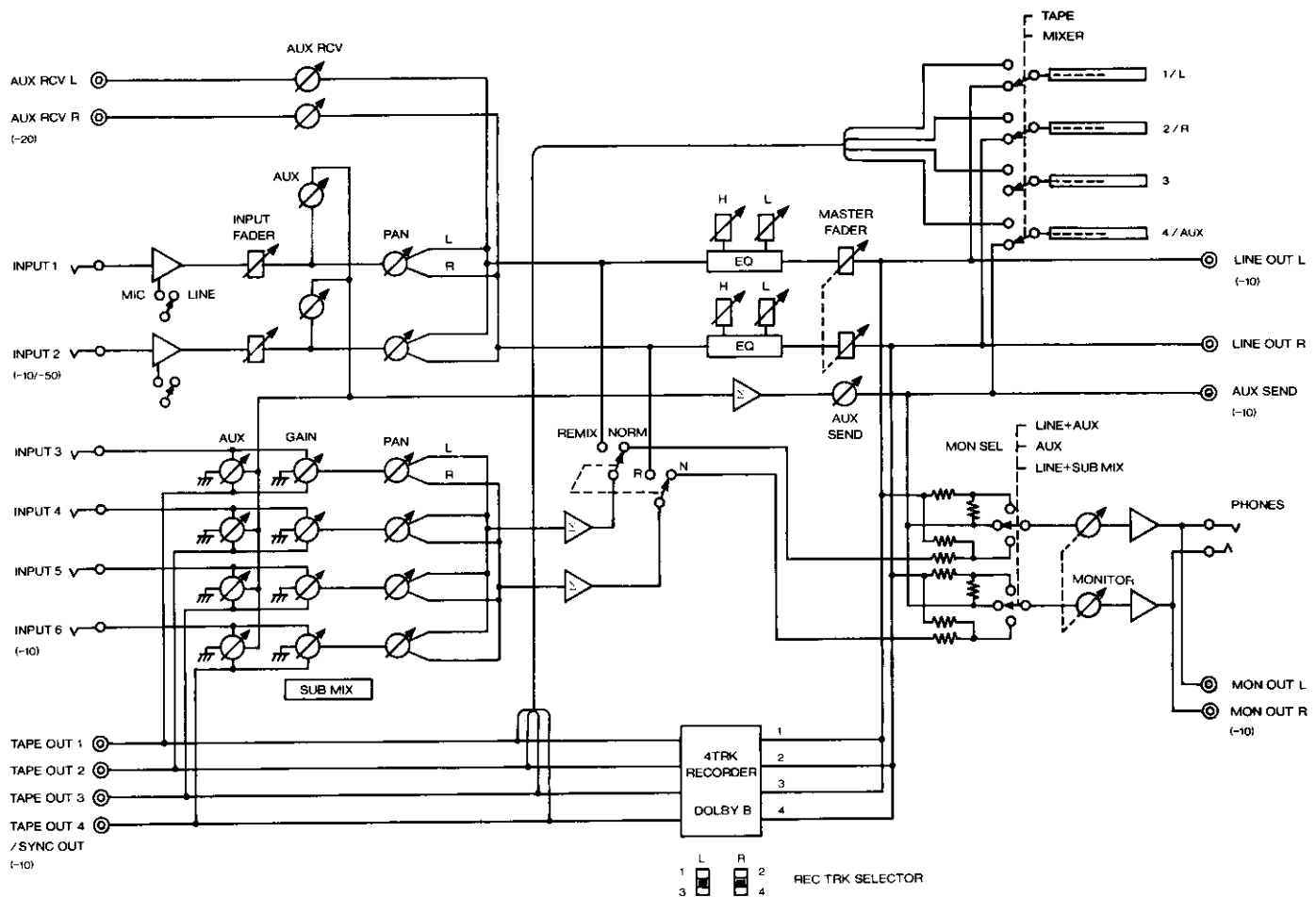
After cleaning, allow the surfaces to dry before inserting a cassette. A canister of compressed air is a great way to keep the cassette compartment dry and dust free.

To demagnetize (degauss) you need a unit like the Fostex HD-10. Follow the instructions that come with the unit. The following process is fairly standard:

Do yourself a favor and set aside a time for cleaning and demagnetizing your model X-26. Do it every day—every four hours if you're really using it hard. With a schedule like this, you'll never have to spend more than a few minutes each time, and your model X-26 will always be ready to perform its best.

If schedules make you sad, then just remember to clean and demagnetize before any recording or mixing session.

SECTION 11. BLOCK DIAGRAM



SECTION 12. SPECIFICATIONS

Tape Speed	4.75cm/s (1-7/8 ips)	Input (× 2)	-50/-10dBV (Switchable), 20kΩ, unbal
Wow Flutter	±0.15% (IEC/ANSI)	Line Input (× 4)	-10dBV, 20kΩ, unbal
Pitch Control	±15%	Aux Rcv. (× 2)	-20dBV, 20kΩ, unbal
Recording Time	30 minutes For C60	Line Output (× 2)	-10dBV, 10kΩ or more
Frequency Response	Mixer section 20—20kHz Recorder section 40—12.5kHz	Aux Send (× 1)	-10dBV, 10kΩ or more
S/N (Record/Playback)	58dB or more "A" weight	Monitor Output (× 2)	-10dBV, 10kΩ or more
Channel Separation	45dB or more at 1kHz	Tape Output (× 4)	-10dBV, 10kΩ or more
Dimension	380(W) × 195(D) × 69(H)	Headphone Output (Stereo) Load Imp.	40Ω
Weight	1.8kg	Equalizer (× 2)	±12dB (at 100Hz, 10kHz)
Power Requirement	DC 12V (11 ~ 15V) 5.2W (FOSTEX AD-12T AC Adaptor)	Recording Tape	Compact Cassette, C60, C90 IEC TYPE II For Use At High Bias Position (TDK SA, MAXELL XL II)
Head	4-channel Hard Permalloy REC/PLAY 4-channel Ferrite ERASE	Record Tracks	4 Tracks, One Direction (Special Format)
Fast Wind Time	105 second	Record/Play Back Channels	4 Channels, Records up To 2 Channels at a time
Erasure Ratio	70dB or more at 1kHz	Noise Reduction	*Dolby B (ON/OFF switchable)

Specifications subject to change without notice.

*Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

SECTION 13. TROUBLE SHOOTING

SOUND TROUBLE		
Symptom	Check point	Treatment
Sound warbles or skips.	Capstan and pinch roller clean?	Clean them.
	Is tape damaged?	Use new and good quality tape.
Recorded tone and volume of sound greatly differs from original.	Is head dirty?	Clean the heads.
	Is tape other than chrome?	Use chrome tape (CrO ₂ , Type II).
	What is setting of Dolby NR switch?	Use same setting as at recording.
Sound distorted/excess noise.	Is GAIN setting proper? Is meter overshooting or too low?	Adjust to suitable level.
Pitch at playback is different from that at recording.	Is PITCH control setting same as that at recording?	Set to same setting as that at recording.

TROUBLE AT RECORDING		
Symptom	Check point	Treatment
Cannot send or record on objective track.	Is the REC TRK selector correctly set? Are PAN and SUB PAN correctly set?	Check that tracks 1, 3 correspond to stereo buss L; and 2, 4 to R.
Oscillates when REC TRK selector is switched ON. Also oscillates when punched in.	Is the ON track output sent to the stereo buss used for send to that track? (SUB GAIN → "TRK," REMIX/NORM selector → "REMIX")	Either set that track output to zero or not send it to the stereo buss (Switch "REMIX" to "NORM," etc.).
Oscillates at ping pong recording.	Is level too high or HI of EQ set too high?	Set to proper level and reduce the high region.
Sound of prerecorded track leaks in at overdubbing.	Is the prerecorded track output sent to the buss?	Either set prerecorded track output to zero or not send it to stereo buss (SUB GAIN → "0"; REMIX/NORM selector → set to "NORM," etc.).
Cannot record.	Is the cassette record protect tab broken? Is the MASTER fader raised?	Cover tab hole with cellophane tape. Raise MASTER fader.
Cannot record signals at LINE input 3~6.	Are these signals sent to the stereo buss?	Set REMIX/NORM selector to "REMIX" and send to the stereo buss.

TAPE TRANSPORT AND OTHERS		
Symptom	Check point	Treatment
Tape is not transported.	Is cassette correctly loaded? Is it sitting flat in the well?	Positively load the cassette in the well.
Power is not applied.	Is the AC adaptor correctly connected?	Connect correctly.

TROUBLE IN THE MONITOR		
Symptom	Check point	Treatment
No sound in the headphone.	Is the MONITOR pot raised?	Raise pot to suitable level.
Sound of monitor amp/speaker plugged into MON OUT jack distorts.	Is MONITOR control pot set at suitable position?	Adjust to standard point which is about.
Sound of the musical instrument is cut off at the instant PLAY button is pressed to start rehearsal.	Were you listening to the music instrument by input monitor of track to which the music instrument sound was sent before pressing PLAY?	Listen to the music instrument on the stereo buss by setting MONITOR selector to LINE+AUX.

EFFECT PROCESSING TROUBLE AND OTHERS		
Symptom	Check point	Treatment
Effect is not applied even though AUX of all channels are raised.	Is AUX SEND and AUX RCV controls raised?	Raise control to suitable level.
Effect sound is heard even though control pot of original sound is fully retarded.	Are you sure AUX 3~6 used for effect send is fully retarded?	Fully retard both (when AUX 3~6 are used for effect sends, they will be fixed to PRE fader.
Sync not properly applied at tape sync.	Is recording level of the FSK signal suitable? Is there no drop out in the tape?	Record at proper level by referring to the drum machine (sequencer) manual. If tape is bad, replace with new good quality tape.

Fostex

FOSTEX CORPORATION 3-2-35, Musashino, Akishima, Tokyo, Japan

FOSTEX CORPORATION OF AMERICA 15431, Blackburn Ave., Norwalk, CA 90650, U.S.A.

©PRINTED IN JAPAN JULY 1988 8288 2110 00 TS