

MSX

YAMAHA

YRM-301

MIDI RECORDER
OWNER'S MANUAL

ENREGISTREUR MIDI
MANUEL D'UTILISATION

MIDI RECORDER
BEDIENUNGSANLEITUNG

YAMAHA YRM-301 MIDI RECORDER

SINCE 1887  **YAMAHA**
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

INTRODUCTION

Congratulations on your purchase of a Yamaha YRM-301 MIDI Recorder program cartridge! The MIDI Recorder is an extremely sophisticated music software package designed to work with the Yamaha CX series music computers. The MIDI Recorder offers the following features:

- Real-time 4-track digital recording from a MIDI keyboard such as one of the Yamaha DX series digital FM synthesizers
- Four independent four-track banks.
- Note-by-note step-write recording from a MIDI keyboard.
- Playback sequencing of four or even more FM digital tone generators.
- Full track-down capability.
- Editing capability permits modification of recorded tracks.
- Automatic or manual punch-in recording.
- Chain capability permits sequential playback of banks with tempo, transpose, track and MIDI channel changes.
- Versatile file handling system permits use of floppy disk or cassette tape for storage and retrieval of recorded data.
- Software is mouse compatible for exceptionally easy, fast operation.

In order to take full advantage of the many versatile features of this software package, we urge you to read this manual thoroughly to familiarize yourself with the MIDI Recorder before use. Also, keep the manual handy so it can be referred to whenever needed.

★ To start this program, enter **call MR**

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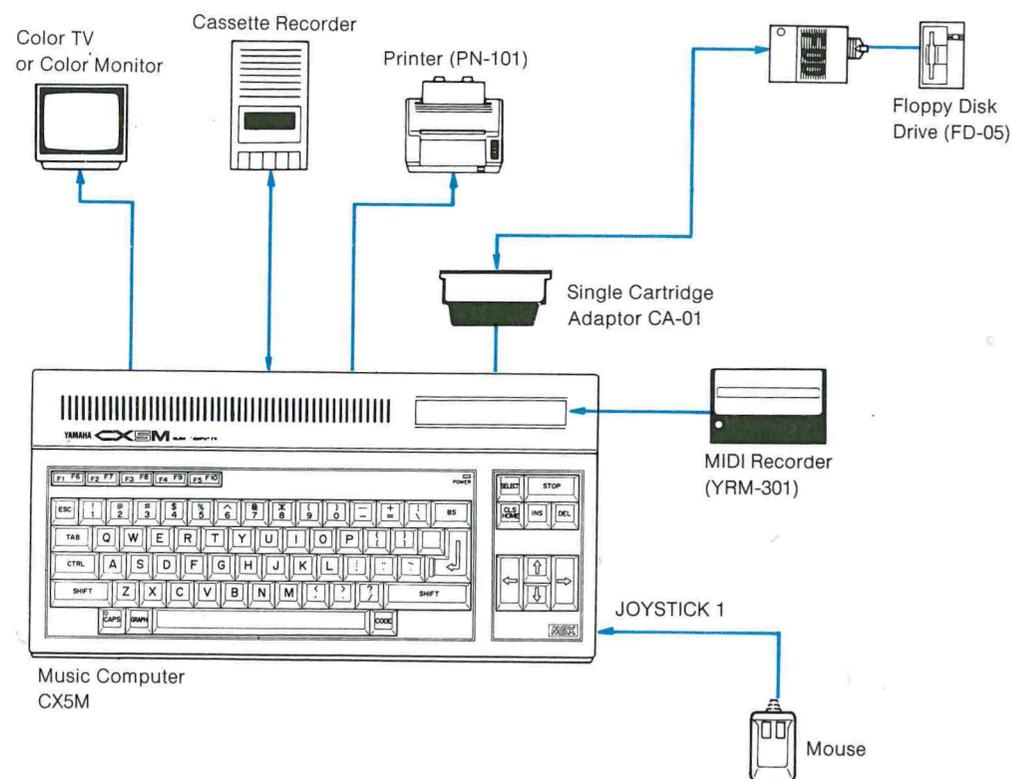
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CHAPTER I SETTING UP YOUR SYSTEM

CENTRAL COMPUTER SYSTEM

The MIDI Recorder can be used in a variety of system configurations suited to a variety of needs. Your system will depend entirely on your own applications and the equipment you own, but we'll present a few of the possibilities here to help you understand the potential of this remarkable software package. But first, let's concentrate on the MIDI Recorder itself and its host, the CX5M Music Computer, and some of the peripherals you might find useful.

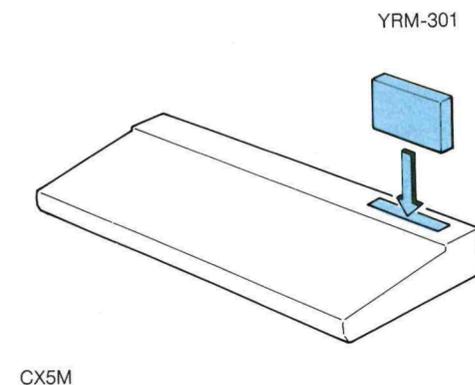
Fig. 1 Central Computer System



MIDI Recorder ROM Cartridge

The YRM-301 MIDI Recorder Cartridge is plugged into the top slot of a CX5M. You should feel the cartridge slide onto the internal connector as you press it from the top. Note that the cartridge WILL ONLY GO IN ONE WAY! If the cartridge simply stops and does not seem to seat properly when plugged in, don't force it! Try inserting it the other way around. Also NEVER ATTEMPT TO PLUG IN THE CARTRIDGE WHILE THE COMPUTER POWER IS ON!!! Always insert the cartridge with the power OFF.

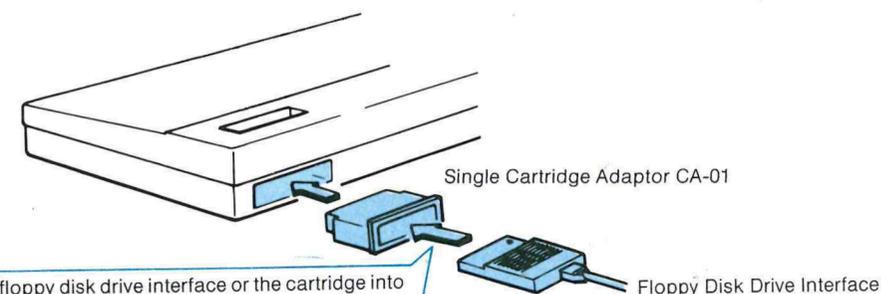
Fig. 2 Insertion of the Program Cartridge



Floppy Disk Drive

With the CX5M a CA-01 Rear Slot Adaptor must be fitted to the rear slot as per the instructions supplied with the adaptor. The FD-05 interface can then be plugged directly into the rear slot adaptor.

Fig. 3 Connection of the Floppy Disk Drive



Cassette Recorder

If cassette data storage is to be used, the 8-pin DIN plug of the supplied cassette cable must be plugged into the CASSETTE jack on the rear panel, and the EAR, MIC and REMOTE plugs at the other end of the cable must be plugged into the corresponding jacks of the data cassette recorder to be used.

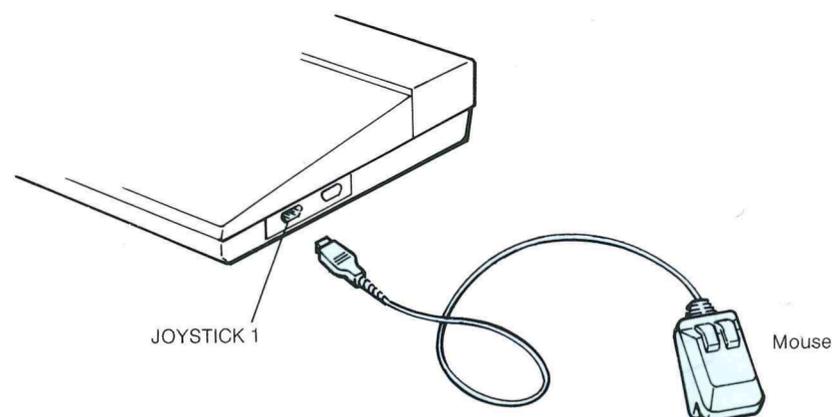
Video Display

Video connections will vary according to the particular model of your CX computer and the type of input provided on your video monitor or TV. Refer to your computer manual for video connections.

Mouse

The use of a the Yamaha mouse is highly recommended — although not essential — for the easiest operation of the MIDI Recorder. The Mouse must be connected to the JOYSTICK 1 terminal on the right side panel of the computer. Refer to the Mouse instruction manual for details.

Fig. 4 Connection of the mouse



Printer

A printer is not an essential accessory for the MIDI Recorder program. If you do have one, however, it can be handy for obtaining printed records of your MIDI Recorder CHAIN programs and disk file listings. Refer to the printer and computer manuals for connection details.

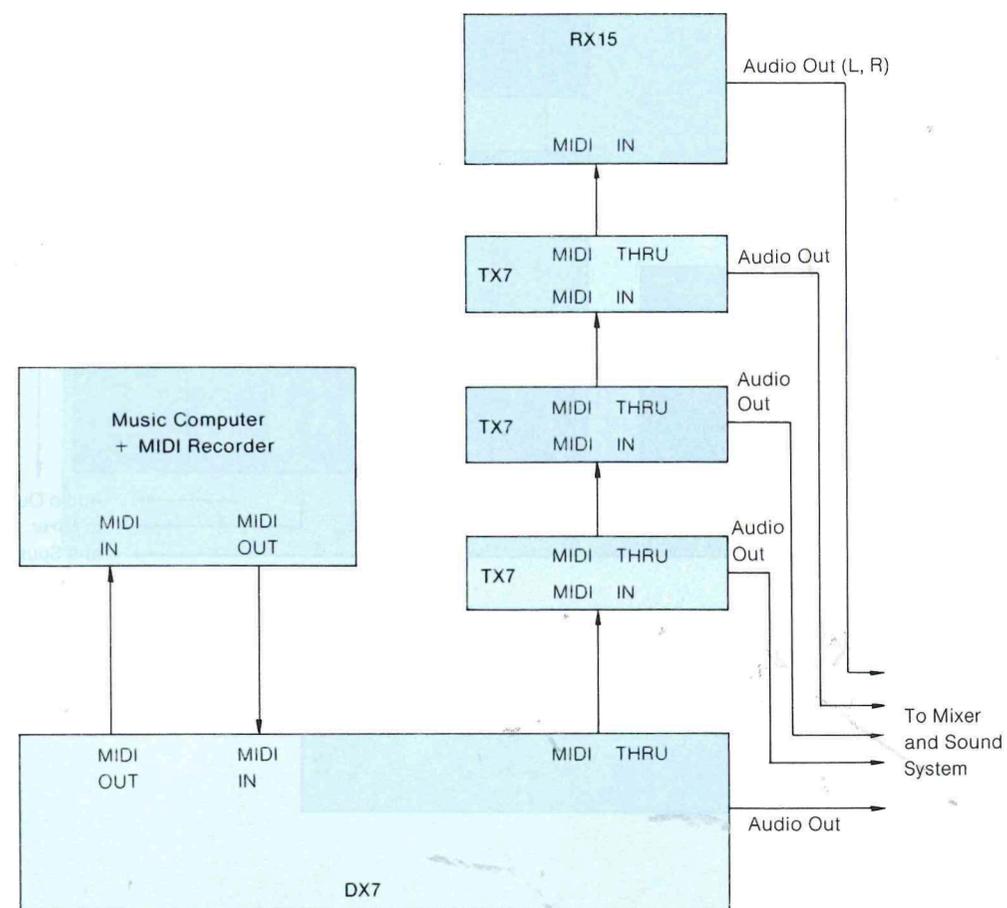
MIDI CONNECTIONS

All other components of your MIDI Recorder system will be connected via the MIDI IN and OUT terminals located on the FM Sound Synthesizer Unit plugged into the left side of your CX computer. This includes the MIDI keyboard you will be using as an input device, the tone generators, and perhaps a rhythm programmer.

System Example 1: MIDI Recorder + DX7 + Three TX7s + RX15

This system uses a DX7 Digital Programmable Algorithm Synthesizer as the input keyboard and one of four tone generators. The remaining three tone generators are provided by three TX7 FM Expander units. This system also requires the use of an audio mixer (at least 4 channels) to combine the outputs from the four tone generators. The RX15 is clocked by the CX computer and is thus synchronized to the MIDI Recorder.

Fig. 5 System Example 1

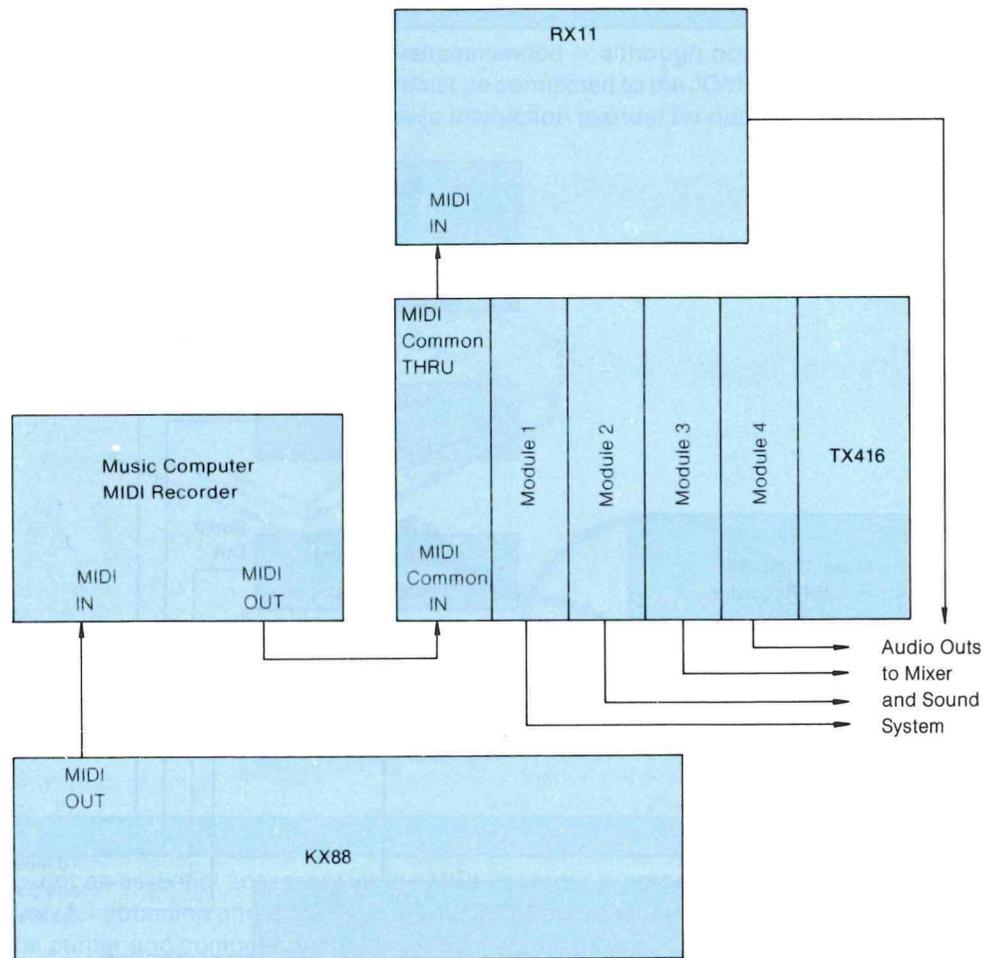


System Example 2: MIDI Recorder + KX88 + TX416 + RX11

This top-level system uses the superlative KX88 Master Keyboard for input and a TX416 4-module FM tone generator system. 4 modules of the 8-module TX816 could also be used. The KX88 could be replaced with a DX7, DX5 or DX1. This system also requires the use of an audio mixer (at least 4 channels) to combine the outputs of the four tone generators. The RX11 Digital Rhythm Programmer is clocked by the CX computer and is thus synchronized to the MIDI Recorder.

★ TX416 = TX216 plus two TF1 FM Tone Generator Modules.

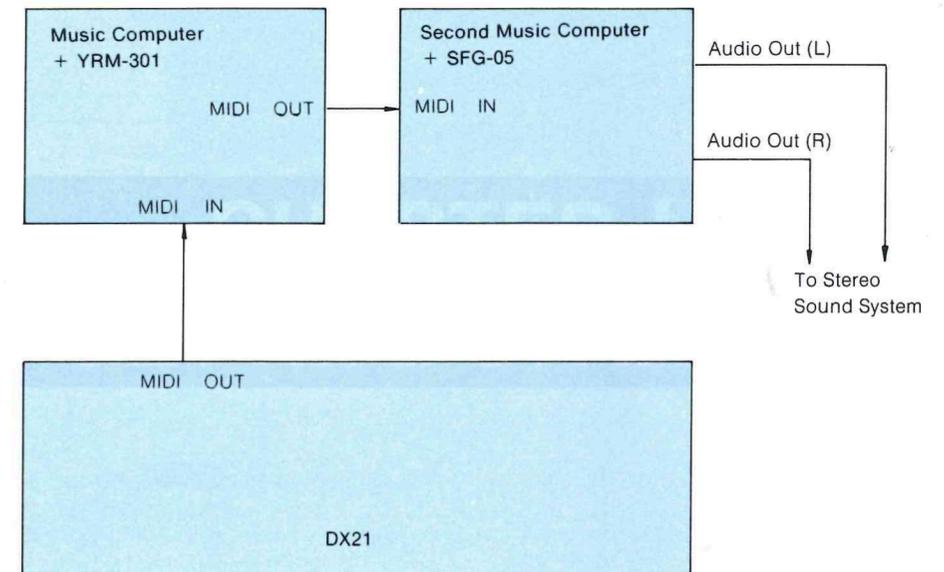
Fig. 6 System Example 2



System Example 3: MIDI Recorder + DX21 + SFG-05 Synthesizer unit

This is a cost-effective system utilizing the DX21 synthesizer and an SFG-05 Sound Synthesizer Unit installed in a second CX music computer. The SFG-05 is an upgraded version of the original sound synthesizer unit installed in the CX computers. It permits assigning the internal voices to up to four different MIDI channels, making it an excellent choice for use with the MIDI Recorder. Note that the MIDI Recorder is NOT capable of driving the sound synthesizer installed in the computer on which it is being run. All MIDI data is output via the unit's MIDI OUT terminal. An RX21 Digital Rhythm Programmer would be an ideal match for this system. Note that since the DX21 keyboard does not output touch (velocity sensitivity) data, velocity changes can not be recorded in real time. Velocity data can be programmed in during the step-write process, however.

Fig. 7 System Example 3



SAT2

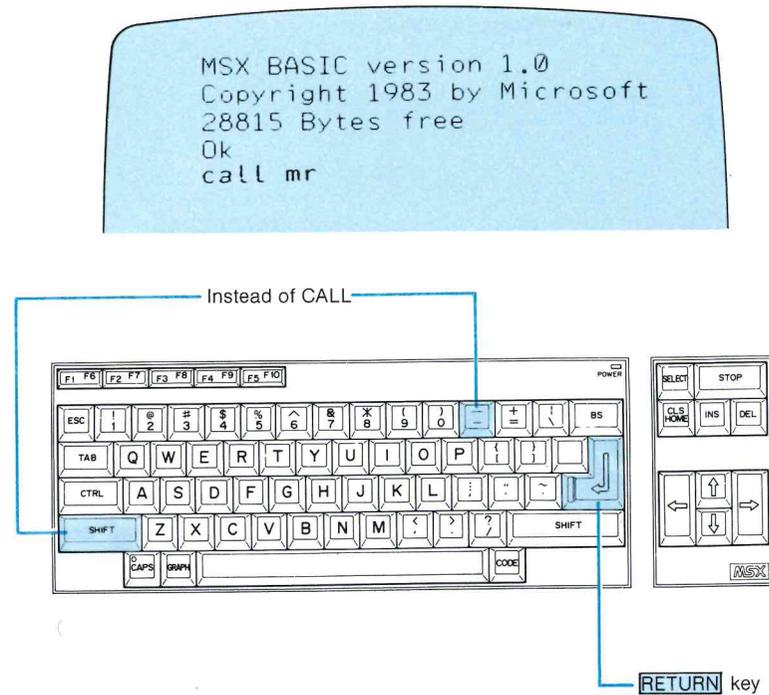
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**CHAPTER II
GETTING STARTED**

STARTING THE PROGRAM

Once your system is properly set up, make sure the power to all connected equipment is turned ON, and then turn ON the CX computer. After the title page the standard BASIC or disk BASIC page will appear (depending on whether you have a disk system connected or not). To call the MIDI Recorder, simply type `call mr` in response to the BASIC prompt and press the **RETURN** key.

Fig. 8 Calling the MIDI Recorder

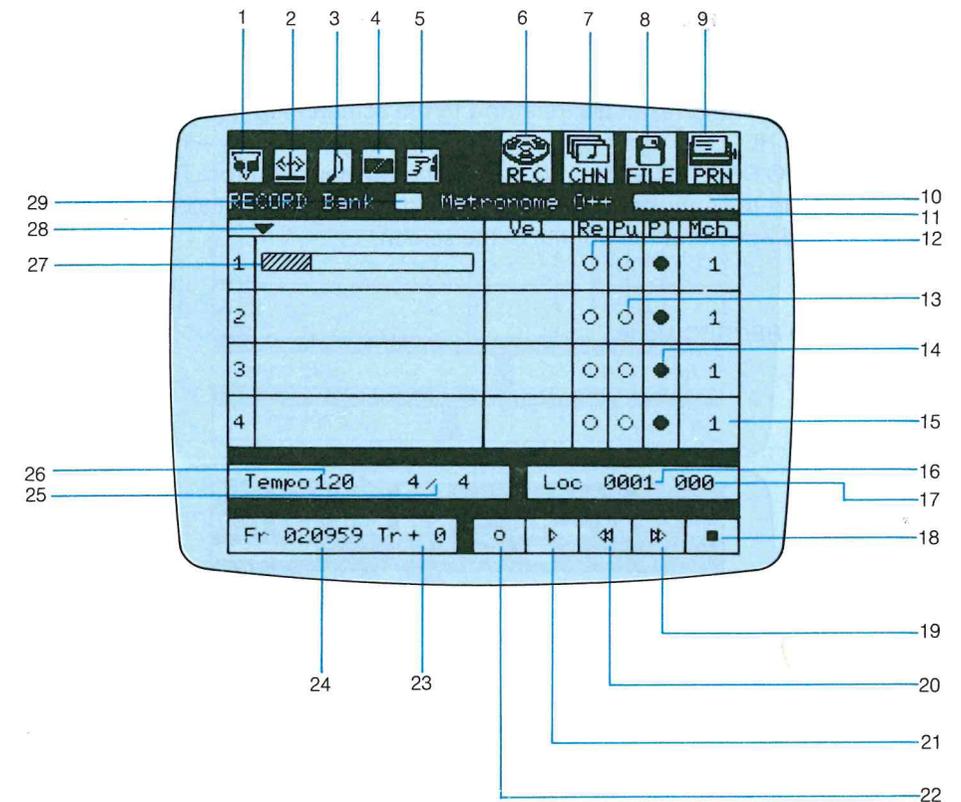


★ With disk version, the message `Enter the date` will appear first. Typing the date in and pressing the **RETURN** key, or ignoring this and just pressing the **RETURN** key will cause the BASIC initial display to appear.

★ The CALL command can be replaced by **SHIFT** + **_** (underscore) and all letters can be typed either in upper-case or lower-case.

The main MIDI Recorder page will appear within a few seconds.

Fig. 9 The Main Page of the MIDI Recorder



- | | |
|------------------------------------|----------------------------------|
| 1. AUTO RECORD mode selector | 16. MEASURE counter |
| 2. EDIT mode selector | 17. CLOCK counter |
| 3. STEP WRITE mode selector | 18. STOP sector |
| 4. TRACK FUNCTION mode selector | 19. FAST FORWARD sector |
| 5. SYSTEM PARAMETERS mode selector | 20. REWIND sector |
| 6. RECORD display selector | 21. PLAY sector |
| 7. CHAIN display selector | 22. RECORD MODE sector |
| 8. FILE display selector | 23. TRANSPOSE indicator |
| 9. PRINT selector | 24. FREE BYTE (memory) indicator |
| 10. BEAT indicator | 25. TIME SIGNATURE indicator |
| 11. METRONOME ON/OFF selector | 26. TEMPO indicator |
| 12. RECORD READY sector | 27. TRACK LENGTH indicator |
| 13. PUNCH IN RECORD sector | 28. CURRENT LOCATION pointer |
| 14. PLAYBACK sector | 29. BANK SELECT sector |
| 15. MIDI CHANNEL sector | |

This is the main MIDI Recorder page which contains all the record, playback and editing functions. We will go into the actual operation of each function in a later chapter. For now we'll simply learn how most of the functions are accessed and how parameters are changed.

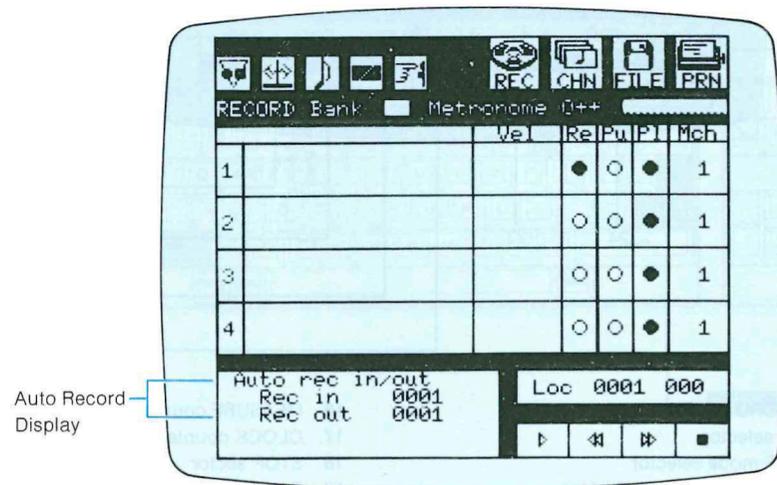
OVERVIEW OF OPERATION

Using the Mouse

If you are using the Yamaha mouse with the MIDI Recorder — and this is highly recommended for maximum operation efficiency — you'll notice that if you now move the mouse around on the table top the red cursor arrow will follow your movements. This arrow cursor is used to point to the function to be accessed or the parameter to be changed.

The two buttons on top of the Mouse serve different functions. The left button is used to select the ON or OFF type functions. For example, referring to the screen map above, use the mouse to move the arrow to the AUTO RECORD mode sector (at least part of the arrow — most logically the point — must be inside the AUTO RECORD sector). Now press the left mouse button. The AUTO RECORD sector should have turned blue, indicating that it is selected, and a block of parameters pertaining to the AUTO RECORD mode should appear at the bottom of the screen.

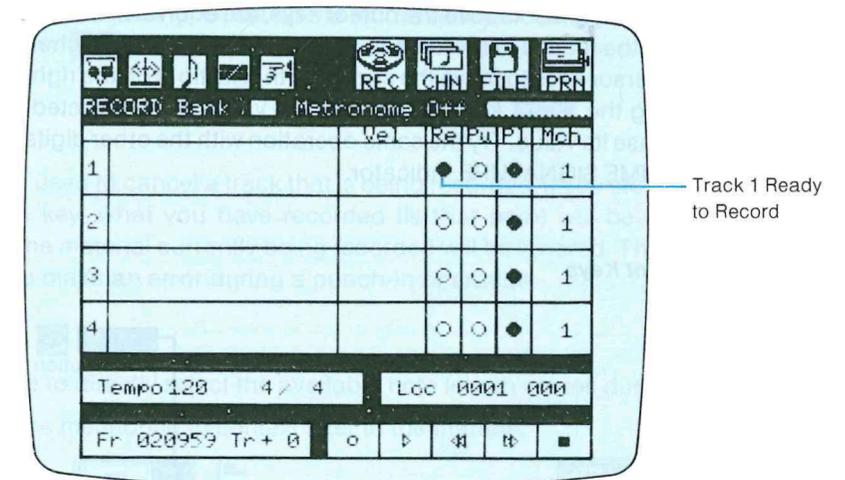
Fig. 10 Screen in AUTO RECORD Mode



With the arrow still in the AUTO RECORD sector press the left button again. The AUTO RECORD sector will change back to white (OFF) and the parameter block at the bottom of the screen will disappear.

Now move the tip of the arrow into the top circle in the **Re** column in the central blue portion of the screen. Press the left button. The circle should have turned red. This indicates that you have just set the RECORD READY mode for track one. Press the left button again to "de-select" the RECORD READY mode.

Fig. 11 Screen In Track-1 RECORD READY Mode



Now move the cursor so that its tip is just below the rightmost digit of the TEMPO indicator. This time, hold down the right button while moving the mouse to the left and right. As you move to the right the value of the selected digit will increase, and as you move to the left it will decrease. Try the same operation with the other digits in the TEMPO indicator, then the digits in the TIME SIGNATURE indicator. The right button is thus primarily used to set numerical values.

There are a few exceptions to this pattern, and these will be noted as we look at the specific functions to which they apply.

Using the Computer Keyboard

Mouse-Equivalent Keys

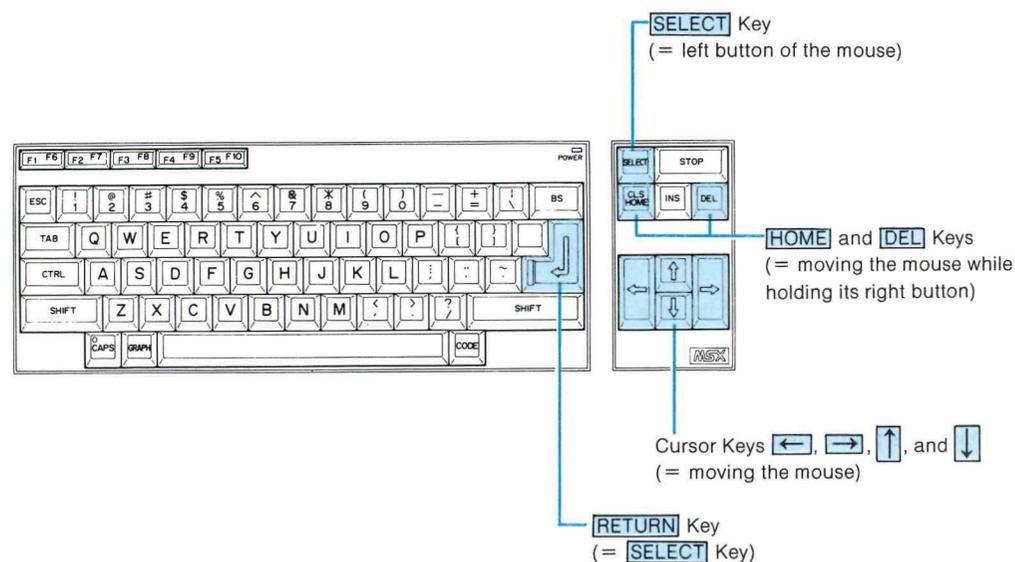
Although the Mouse is generally recommended for operation of the MIDI Recorder, all functions can be carried out directly from the computer keyboard. There are also a very few functions for which keyboard entry is the easiest and most appropriate method.

When using the keyboard, the cursor keys (the right, left, up and down arrow keys) are used to position the red cursor arrow on the screen. The **[SELECT]** key in the block of keys above the cursor keys is equivalent to the left mouse button. To test this, use the cursor keys to move the arrow to the AUTO RECORD mode sector (at least part of the arrow — most logically the point — must be inside the AUTO RECORD sector). Now press the **[SELECT]** key. The AUTO RECORD sector should have turned blue, indicating that it is selected, and a block of parameters pertaining to the AUTO RECORD mode should appear at the bottom of the screen.

With the arrow still in the AUTO RECORD sector press the **SELECT** key again. The AUTO RECORD sector will change back to white (OFF) and the parameter block at the bottom of the screen will disappear.

The **HOME** and **DEL** keys, also above the cursor keys, are equivalent in function to holding the right mouse key and moving the mouse to the left and right: i.e. they are used to change numeric parameters. Test this by using the cursor keys to move the cursor so that its tip is on the rightmost digit of the TEMPO indicator. Now pressing the **DEL** key will increase the value of the selected digit, while pressing the **HOME** key will decrease its value. Try the same operation with the other digits in the TEMPO indicator, then the digits in the TIME SIGNATURE indicator.

Fig. 12 Mouse-Equivalent Keys



Special keys

There are a few other "specialized" key functions which should be noted:

- **F1 ~ F5**

The **F1** through **F5** keys correspond to the RECORD MODE, PLAY/RECORD, REWIND, FAST FORWARD and STOP sectors on the screen (note how closely these resemble the controls on any standard tape recorder). These keys can be used to activate the corresponding functions, as can the mouse.

- **Space Bar**

The space bar is the fastest and easiest means of playing back recorded data or beginning recording of a new track from the first bar of the piece. After you've recorded a track, simply tap the space bar to hear the results from the beginning. Or set up the record ready mode and tap the space bar to begin recording from bar 1. The **F2** or mouse PLAY select functions will initiate playback from the current location.

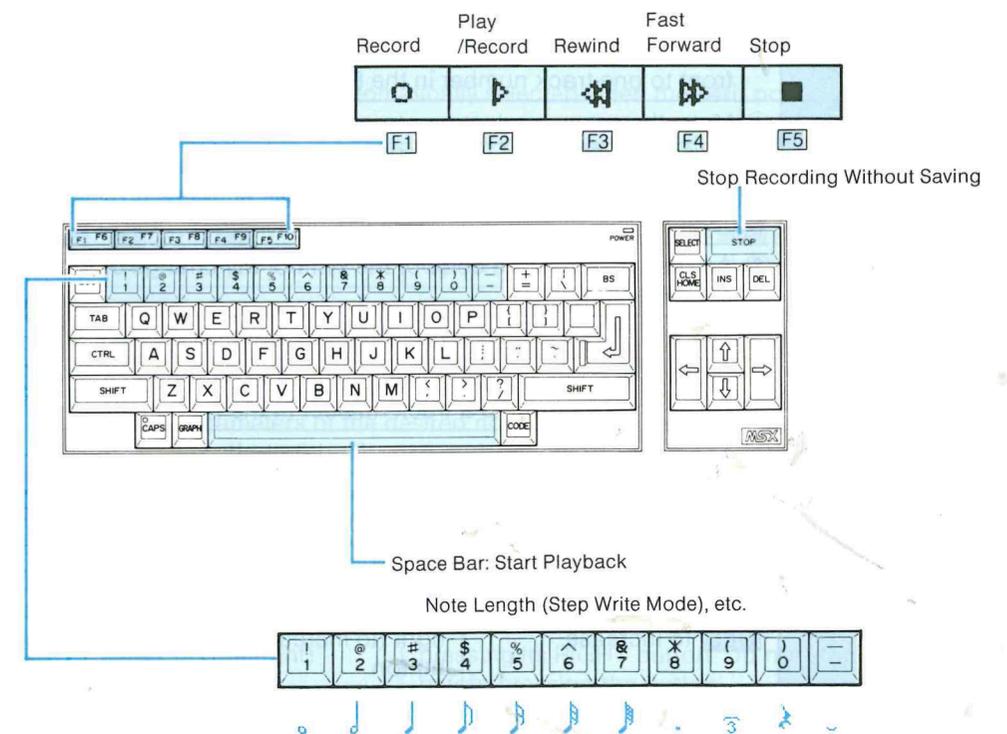
- **STOP Key**

The **STOP** key can be used to cancel a track that is being recorded. If you stop recording using either the mouse or the **F5** key, what you have recorded till that point will be saved. By pressing the **STOP** key, however, the material currently being recorded will be ignored. This is like a "never mind" function — handy if you make an error during a punch-in operation.

- **Numeric Keys 1 ~ 7**

These keys can be used to directly select the available note length values during the step write mode. All these functions will be mentioned in context later in the manual.

Fig. 13 Special keys



SUMMARY OF OPERATIONS

Keyboard or Mouse General Operations

OPERATION	STEPS/NOTES	
	KEYBOARD	MOUSE
Changing the whole page display	① Move the arrow-mark cursor to one of the large icons located at the upper-right corner of the screen.	
	↑, ↓, ←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② Activate the icon (its color will turn blue).	
	RETURN or SELECT	Press the LEFT button of the mouse.
	★ A large icon is automatically de-selected when you select another one.	
Changing the display window at the lower-left corner of the screen ★ Record page only	① Move the arrow-mark cursor to one of the small icons located at the upper-left corner of the screen.	
	↑, ↓, ←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② Activate the icon (its color will turn blue).	
	RETURN or SELECT	Press the LEFT button of the mouse.
	★ A small icon is automatically de-selected when you select another one OR when you repeat step ② with the cursor on the selected icon. ★ Selection of second and third icon is possible only if a red circle appears front to one track number in the Re column.	
Controlling the recorder ★ Record and Chain pages only ★ See also table below	① Move the arrow-mark cursor to one of the small icons located at the lower-right corner of the screen.	
	↑, ↓, ←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② Activate the icon (the color of the symbol will change or the symbol will start flashing).	
		Press the LEFT button of the mouse.
	★ Recording mode can be selected only in Record page and when a red circle appears front to a track number in the Re column.	
Changing various settings	① Move the arrow-mark cursor to the data to be set.	
	↑, ↓, ←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② If the data is a numerical parameter, set its value.	
	HOME to decrease DEL to increase	Move the mouse to the left (to decrease) or to the right (to increase) WHILE pressing the RIGHT button.
	★ Some parameters may be set by changing one digit at the time.	
② If the data corresponds to a two-state feature (ON/OFF and the like), select the option		
	RETURN or SELECT	Press the LEFT button of the mouse.

OPERATION	STEPS/NOTES	
	KEYBOARD	MOUSE
Selecting a function ★ Filer Page and Track Function window	① Move the arrow-mark cursor to the function name after setting the related data.	
	↑, ↓, ←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② Select the function (its name appears in reversed color).	
	RETURN or SELECT	Press the LEFT button of the mouse.
	③ If the Sure? (RET/ESC) message appears, confirm or cancel.	
	RETURN to confirm ESC to cancel	Press the LEFT button again to confirm. To cancel, use the keyboard.
Setting note length and other symbols ★ Step Write Recording only ★ See also table below	① Move the arrow-mark cursor to one of the music symbol located in the step write recording window.	
	↑, ↓, ←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② Select a music symbol (its background turns to blue).	
	RETURN or SELECT	Press the LEFT button of the mouse.
	★ One note length is always selected. Selecting a note length automatically de-selects the previously selected note length. ★ Symbols other than note length symbols are de-selected in the same way they are selected. ★ Triplet symbol is automatically selected when the 64th note symbol is selected.	
Correcting or moving a note ★ Edit window	① Locate the signal dash of the note by moving the arrow-mark cursor over the edition area.	
	←, and → (Cursor Keys)	Move the mouse across a level surface WITHOUT pressing any button.
	② Select the note to be modified or moved.	
	RETURN or SELECT	Press the LEFT button of the mouse.
	★ If there are more than one note at the same location, repeat step ② until the parameters of the desired note are displayed in blue color. ★ To alter the note, refer to the above entry "Changing various settings". ★ To move the note, follow steps ① and ② to locate its KEY ON signal dash, then see step ③ below.	
③ Move the KEY ON signal of the note.		
	HOME (to the left) DEL (to the right)	Move the mouse to the left or to the right while pressing its RIGHT button. Do not start moving before pressing the button.

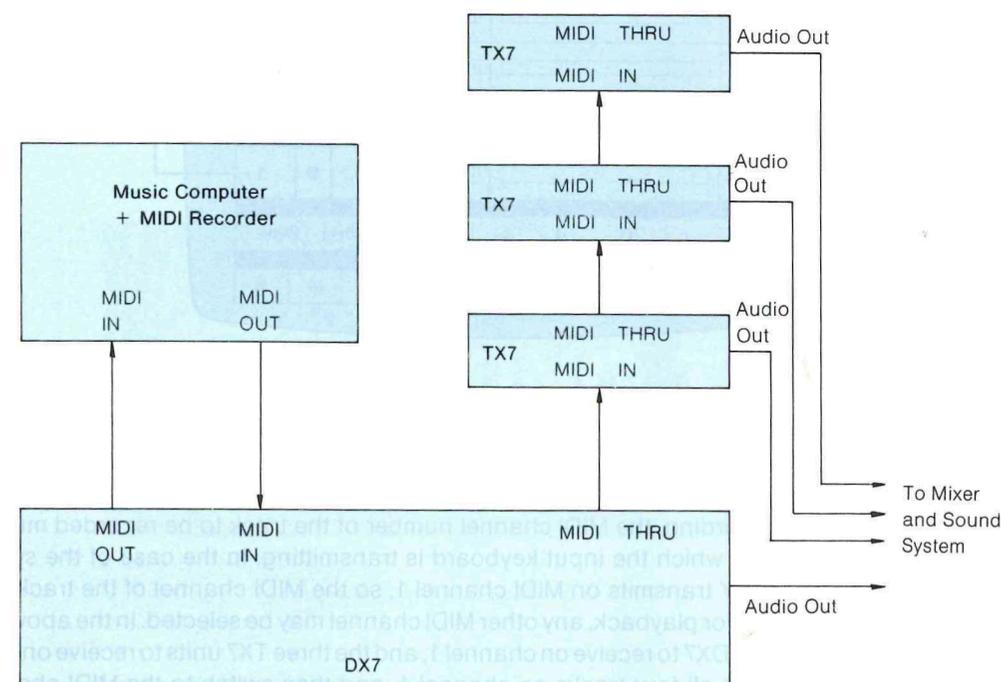
MIDI CHANNEL ASSIGNMENT

Since you will probably be using four or even more MIDI channels when using the MIDI Recorder, it is important to have a thorough understanding of how they relate to system operation. This section will give you a basic overview of the system, then practical examples will be provided in the sections dealing with actual operation.

Basic Channel Assignment

Consider the following system:

Fig. 14 System example



This system is capable of recording music data from the DX7 keyboard, and playing it back via the four tone generators comprised of the one contained in the DX7 and one in each of the three TX7 units. Note, however, that only a single MIDI cable carries the MIDI OUT signal from the computer to all four tone generators. The MIDI OUT from the computer feeds the MIDI IN of the DX7, the MIDI THRU of the DX7 (which simply retransmits anything received at the MIDI IN terminal) then transmits the same data out to the MIDI IN of the first TX7, the MIDI THRU terminal of the first TX7 then transmits the same data on to the MIDI IN of the second TX7, and so on. This type of setup is possible because each tone generator can be set to receive on a different MIDI channel (16 channels are available), and will ONLY play back data which is received on the channel to which it is assigned. Naturally, each of the four

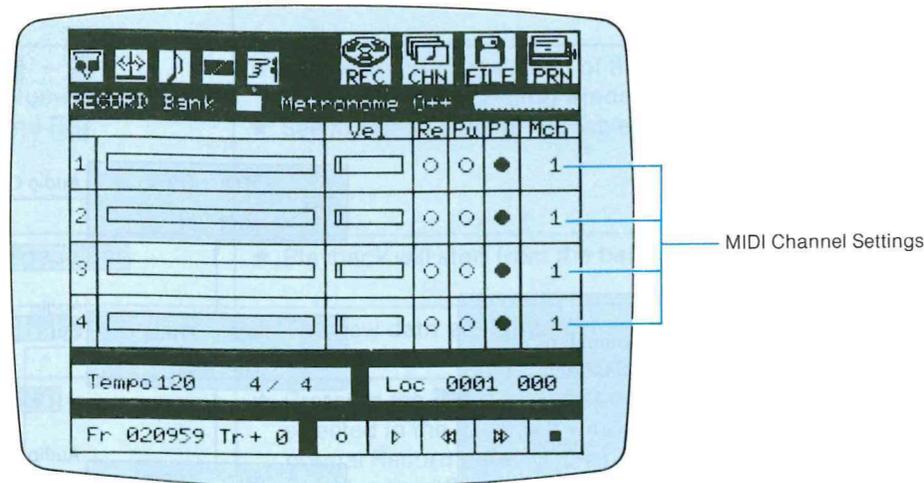
Keyboard Quick Operations

OPERATION	COMPUTER KEY	NOTES
Controlling the recorder ★ Record and chain page only	[F1] ~ [F5] (Function Keys)	★ Allows for direct selection of the icons located at the lower-right corner of the screen. ★ See the same entry in the table above.
Setting note length and other symbols ★ Step Write Recording only	[1] ~ [0] (Numeric Keys) and [—]	★ Allows for direct selection of the music symbols in the step write Recording window. ★ See the same entry in the table above.
Starting playback	[Space Bar]	★ Playback will start from the beginning of the track.
Cancelling a recording	[STOP]	★ The new data are ignored. In a punch-in operation, the old data are not erased.
Returning from a window	[ESC]	★ Pressing the [ESC] key after a special display was selected in the lower-left window will cause the normal Record page to re-appear. ★ See also the "Selecting a function" entry in the above table.
Cancelling Printing, etc.	[CTRL] + [STOP]	★ To abort printing and cassette recorder operation.

MIDI Recorder tracks can be assigned to transmit on any of the 16 MIDI channels so the four tone generators can be controlled independently.

Now let's take another look at the main MIDI Recorder page.

Fig. 15 The Main Page



The numbers in the rightmost column of the central blue track functions block are the MIDI record/playback channels for the corresponding track (thus the **Mch** heading). Any of the 16 available MIDI channels can be selected for each track (1 — 16), as well as a special **M** or Multi mode. We'll discuss the Multi mode later. For recording, the MIDI channel number of the track to be recorded must match the MIDI channel number on which the input keyboard is transmitting. In the case of the system described above, the DX7 ONLY transmits on MIDI channel 1, so the MIDI channel of the track to be recorded must also be set to 1. For playback, any other MIDI channel may be selected. In the above system, for example, you could set the DX7 to receive on channel 1, and the three TX7 units to receive on channels 2, 3, and 4. You would record all four tracks on channel 1, and then switch to the MIDI channel corresponding to the desired tone generator's receive channel for playback. Each tone generator will only play data received on the MIDI channel to which it is assigned. If you use a DX21 or DX5, in which any of the 16 MIDI channels can be selected for transmission, you can simply leave the MIDI Recorder MIDI channel assignments set to 1, 2, 3 and 4 for the corresponding tracks, and switch the transmitting keyboard to the corresponding transmission channel when recording each new track.

The Multi Mode

When the Multi Mode for any track is selected — an **M** appears in the MIDI channel sector rather than a channel number — the MIDI Recorder automatically records the channel number on which the music data is received, and combines it with the music information. In this mode, the selected track will thus receive data on any MIDI channel. This makes it possible to mix tracks which were recorded via different MIDI channels onto a single track, and still keep the different voices independent on playback. Track mixing is carried out using a "MIX" function which will be described later. The MIX function allows, for

example, data recorded on tracks 1, 2 and 3 to be combined and stored on track 4, leaving tracks 1, 2 and 3 open for further recording — similar to "track down" or "bouncing tracks" on a conventional multitrack tape recorder. Suppose, for example, that you have recorded tracks 1, 2 and 3 in the Multi mode, transmitting to track 1 on MIDI channel 1, to track 2 on MIDI channel 2, and to track 3 on MIDI channel 3. If you then mix these tracks onto track 4 and play them back — also in the Multi mode — the data recorded on channel 1 will play ONLY on a tone generator set to receive on channel 1, the data recorded on channel 2 will play back ONLY on a tone generator set to receive on channel 2, and so on, just as if the tracks were still separate. Note however that this is only possible with an input keyboard that can be set to transmit on different MIDI channels (DX21, DX5, DX1 or KX88).

**CHAPTER III
OPERATING THE
MIDI RECORDER**

RECORDING AND PLAYBACK

Record Ready

Prior to making a recording, you need to carry out the following operations:

Tempo Setting

Position the cursor within the white **Tempo** block, under one of the three digits indicating tempo. According to which digit you have selected, the tempo can now be adjusted in units, tens, or hundreds.

Fig. 16 Tempo Setting



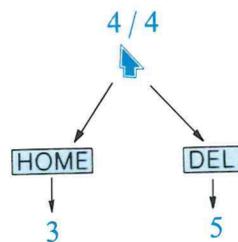
The **DEL** key increases the tempo. The **HOME** key decreases the tempo. With a mouse, hold the right button down, and move the mouse right or left to increase or decrease tempo respectively. The overall tempo range is 40 ~ 200 quarter notes per minute. When the power is first turned on, the tempo will be set to 120.

NOTE: The tempo is not memorized by the MIDI recorder, and must always be set, both for record and playback. You can change the tempo while recording, or record at a slow tempo then playback at a fast tempo, for easier performance of complex or rapid passages.

Time Signature Setting

Position the cursor within the white **Tempo** block, under the first time signature number (the numerator indicates the number of beats per bar).

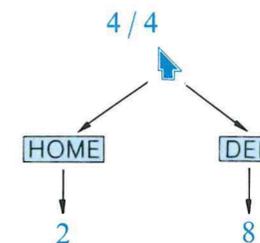
Fig. 17 Number of Beats



The **DEL** key increases the numerator value. The **HOME** key decreases the numerator value. With a mouse, hold the right button down, and move the Mouse right or left to increase or decrease numerator value respectively. The overall numerator value range is 2 ~ 10 beats per bar.

In the same way, the denominator value (length of beat) is set with the cursor under the denominator number.

Fig. 18 Beat Length

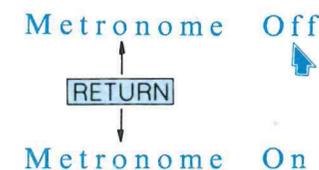


The possible denominator values are 2, 4, 8 and 16 (indicating half notes through sixteenth notes). However, the value of the denominator must not be smaller than two thirds of the numerator value. When the power is first turned on, the time signature will be set to 4/4.

Metronome ON/OFF

A metronome signal is incorporated into the MIDI Recorder. When the power is first turned on, the metronome will be turned OFF. To turn it ON, position the cursor over the word **OFF** and press **SELECT** or **RETURN** (or the left mouse button). **OFF** will be replaced by **ON**. Switching the metronome off is done in the same manner.

Fig. 19 Metronome ON/OFF



When you enter the record or playback mode, the metronome will produce an audible click, with a high note on the first beat of each bar. The metronome signal is output via the CX computer's video/audio output cable. Monitor the metronome via your video monitor's audio circuit, or via a mixer or amplifier.

Bank Selection

The MIDI Recorder has 4 banks on which you can record a performance. To select a bank, position the cursor in the small white BANK SELECT sector to the right of the word **Bank**. This sector can be thought of as being divided up into 4 equal parts, which correspond to banks 1 through 4, reading from left to right. According to where you have placed the cursor, pressing **SELECT** or **RETURN** (or the left mouse button) will select that bank.

Fig. 20 Selection of bank 1



Track Selection

Within each bank are 4 tracks, which can be thought of in exactly the same way as a 4 track tape deck. You can only record on one track at a time. To select a track for record, position the cursor in the appropriate RECORD READY sector, and press **SELECT** or **RETURN** (or the left mouse button). The spot in the center of the sector will turn red, indicating that the track is now ready to record onto.

MIDI Channel Selection

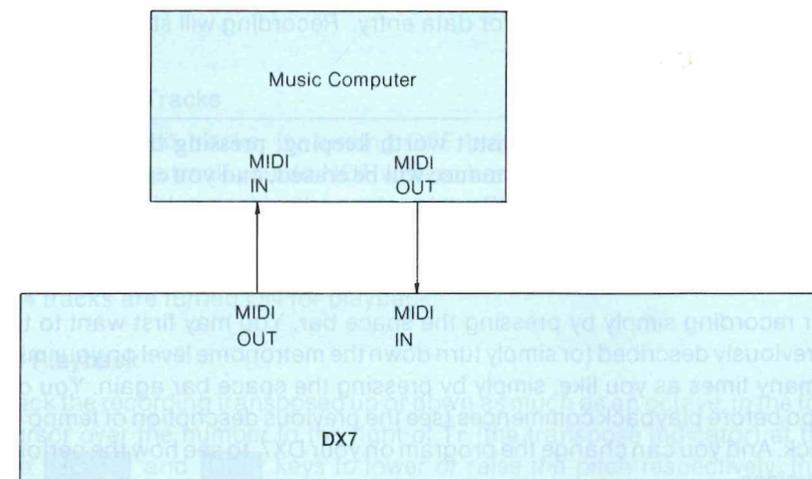
The MIDI Channel of the track you have selected should be set to the same MIDI Channel that your keyboard is transmitting on. Simply position the cursor in the appropriate MIDI Channel sector, and set the MIDI Channel number using the **HOME** and **DEL** keys (or press the right mouse button and move the mouse sideways). With a DX7, this should be Channel 1, as this keyboard always transmits MIDI data on Channel 1.

Basic Recording/Playback Procedure

IMPORTANT: Any recording will NOT be permanent until you have saved the data on floppy disk or cassette. The recording can be carried out, and you can playback, edit, copy, or assemble a chain, but all data will be LOST as soon as the computer is turned off, unless you save it as described later in this manual.

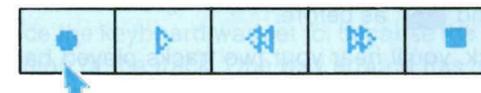
For clarity, this section assumes a simple setup whereby a MIDI keyboard such as a DX7 is used for both performance and playback. Its MIDI OUT terminal should be connected to the MIDI IN of the computer keyboard, and vice versa.

Fig. 21 System Used In This Section



Put the MIDI Recorder into the record mode by pressing **F1** (or positioning the cursor in the RECORD MODE sector and pressing the left mouse button). The spot in the center of the RECORD MODE sector will turn red, indicating that the MIDI Recorder is now set to record on the selected track.

Fig. 22 RECORD MODE sector



To start recording, press **F2** (or position the cursor over the PLAY/RECORD sector and press the left mouse button). The MIDI Recorder gives you a 2 bar count-in, indicated aurally by the metronome, and visually by the BEAT INDICATOR.

After 2 bars, you can start playing, and your performance will be recorded. The MEASURE COUNTER and CLOCK COUNTER will start, and the VELOCITY INDICATOR on the selected track will behave like a level Meter, indicating the level (key velocity) of your performance. During the recording, the CURRENT LOCATION POINTER will move slowly to the right, and the FREE BYTE indicator will start to count down, as data is entered and bytes are used up.

To stop recording, press **F5** (or position the cursor in the STOP sector and press the left mouse button). The figures on the LOCATION BLOCK will reverse to white-on-red for a few seconds, while the data is stored. The MEASURE COUNTER will indicate how many bars you have recorded. The FREE BYTE indicator will show how much space is left for data entry. Recording will stop automatically if the end of memory is reached.

NOTE: If you feel that your performance isn't worth keeping, pressing the **STOP** key will stop the recording as normal, except that your performance will be erased, and you can go back to the beginning and re-record, as described below.

You can now:

- Playback your recording simply by pressing the space bar. You may first want to turn off the metronome, as previously described (or simply turn down the metronome level on your mixer or monitor). Playback as many times as you like, simply by pressing the space bar again. You can change the playback tempo before playback commences (see the previous description of tempo setting) or even during playback. And you can change the program on your DX7, to see how the performance sounds with different voices.
- Re-record your performance. Press **F1** to reactivate the Record Mode, (or position the cursor in the RECORD MODE sector and press the left mouse button) then press the space bar, to start recording from the beginning without needing to "rewind"; again, with a 2-bar count in.
- Record onto another track. If you're satisfied with your first "take", no need to "rewind"; simply move the cursor to the RECORD READY sector of another track, and press **SELECT** (or the left mouse key). The first track will be out of the Record Ready mode, and the new track will be in the Record Ready mode (as indicated by its red RECORD READY spot).

Press **F1** to activate the Record Mode, then commence recording by pressing the space bar (and remember that 2 bar count in!). You'll be able to hear your original track as you add the new one. Stop the recording by pressing **F5**, as before.

This time, when you playback, you'll hear your two tracks played back through your DX7 — both with the same voice, of course. You can continue to record on other tracks, until you've used up all four tracks.

- Correct parts of your recording (see the PUNCH IN/OUT RECORD section).

Playback Procedure — Further Possibilities.

• Playback From Any Selected Point

You can stop playback in the middle of a piece (by pressing **F5**, or the left Mouse button with the cursor in the STOP sector) and play on from there by pressing **F2** (or move the cursor to the PLAY/RECORD sector and press the left mouse key).

You can also play back from any selected point by using the **F3** and **F4** keys to "rewind" or "fast forward" respectively, until the MEASURE COUNTER and CLOCK COUNTER show your desired setting, then press **F2** to start playback. To locate a point using the mouse, move the cursor to the REWIND or FAST FORWARD sector, and hold down the left mouse button until you reach the desired point.

• Instant Start/End Location

To instantly locate the start or end of a track, position the cursor over the MEASURE COUNTER, and press **HOME** or **DEL** respectively (with the mouse, hold down the right button and move the mouse left or right respectively).

• Playback of Selected Tracks

You can playback selected tracks, by turning OFF playback selectors. Position the cursor in the PLAYBACK SECTOR of the track you do NOT wish to hear. Press **SELECT** or the left mouse button, to turn OFF the track. The blue spot in the center of the PLAYBACK SECTOR will turn white, indicating that the track will not playback. The music data, however, is still recorded, and at any time you can turn the track ON again for playback (in the same manner as you turned it OFF). When the computer is first turned ON, all 4 tracks are turned ON for playback.

• Transposed Playback

You can playback the recording transposed up or down as much as an octave, in the following manner. Position the cursor over the number to the right of **Tr** (the transpose indicator) at the bottom of the screen. Use the **HOME** and **DEL** keys to lower or raise the pitch respectively, in semitone steps. With a mouse, hold the right mouse key and move the mouse left or right, to perform the same functions. The transpose indicator number will indicate the amount of transpose up or down (plus or minus) up to the maximum of 12 semitones (1 octave).

When you playback the track, it will be transposed by the selected amount, but the recorded data will remain at the original pitch, which can be resumed simply by resetting the transpose indicator to zero.

When you turn the computer on, the transpose indicator will read zero.

Voice Changes

The MIDI Recorder will accept voice changes. Note, however, that when the recording is played back, it will begin with the LAST voice the keyboard was set to, because the recording does not contain any voice command at the beginning of the track. One way around this is to have a one measure rest at the start of your performance, during which you press the voice key, thus recording a voice command which will switch the keyboard to the correct voice for the start of the piece. It is also possible to enter a voice change command (simply press the appropriate voice selector on the recording keyboard) during the 2-bar count-in prior to recording.

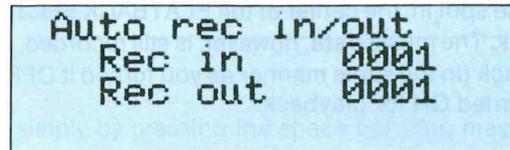
When using a basic single keyboard setup, you can even record a track with no voice changes, then record another track which contains only voice changes. On playback these voice changes will operate, and as they are separate from the music track, they can of course be changed by re-recording at any time.

When using more than one keyboard (for example, with each track controlling a TX7 module) the above procedure can be followed by mixing the music track and voice change track together onto a single track. This is described in the TRACK FUNCTIONS chapter.

Auto Record

This feature allows you to start and stop recording at any set measure. Move the cursor to the AUTO RECORD SELECTOR, and press **SELECT** or the left mouse button. The AUTO RECORD SELECTOR will turn blue, and the lower left part of the screen will switch to the Auto Record In/Out display.

Fig. 23 Auto Record IN/OUT Display



You can set the Auto Record In and Out points (Stop and Start Record points, indicated as measure numbers) by positioning the cursor under any digit of the Rec In or Rec Out indicators, and using the **HOME** and **DEL** keys to set the value of that digit. With the mouse, press the right mouse button and move the mouse left or right, to decrease or increase the value, respectively.

The next step is to exit the Auto Record display, by setting the cursor over the AUTO RECORD SELECTOR and pressing **SELECT** or the left mouse key. The AUTO RECORD SELECTOR will turn white, and the lower portion of the screen will revert to its normal display.

To activate the Auto Record mode, move the cursor to the word **Loc** in the LOCATION BLOCK, and press **SELECT** (or left mouse button). **Loc** will be replaced by **A.R.** (in red) indicating that the Auto Record mode is active. Select a track for recording, as previously described, and press **F2**, or use the mouse with the PLAY/RECORD sector, to start recording. There will be no 2 bar count in when using Auto Record. The measure count starts immediately.

No need to activate the RECORD MODE sector — this will turn red when we reach the pre-selected Rec In point, and recording will start there, and stop automatically at the pre-selected Rec Out point. Playback can now be carried out as usual.

Punch IN/OUT Record

Closely related to the Auto Record feature, this allows you to correct any part of a recording (any selected group of whole measures) by inserting new data, as follows:

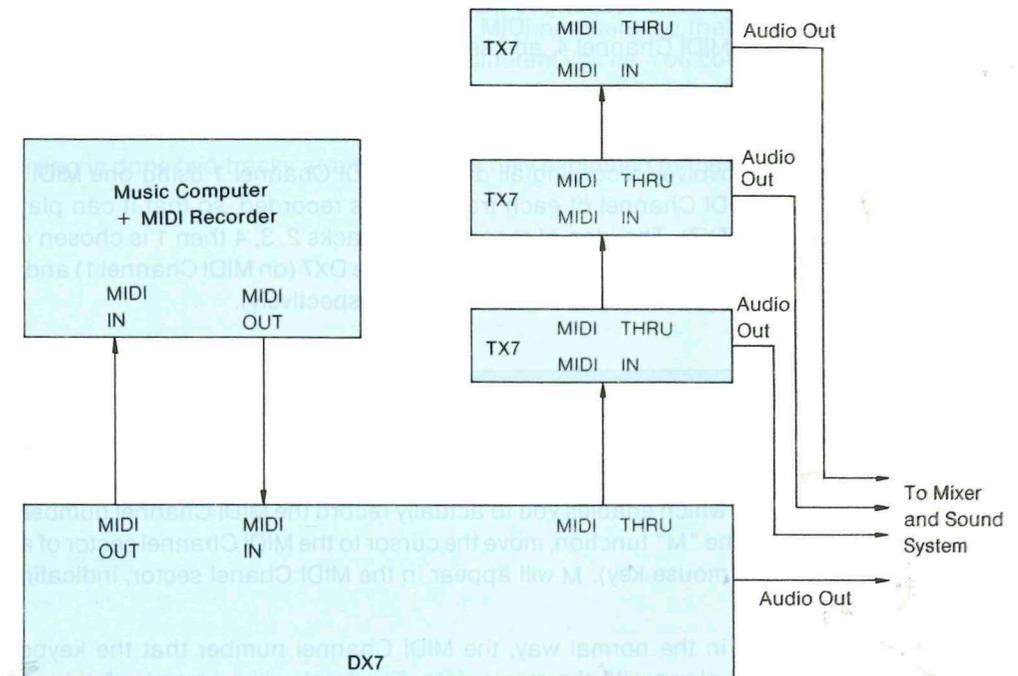
Activate the Auto Record display, and select the Rec In and Rec Out points. Exit the Auto Record display, then activate the Punch In/Out Record mode by selecting a track for record FIRST, then move the cursor to the word **Loc** in the LOCATION BLOCK, and press **SELECT** (or left mouse button). **Loc** will be replaced by **A.R.** (in red) and the PUNCH IN/OUT RECORD SECTOR on the selected track will turn green, indicating that the Punch In/Out Record mode is active. Press **F2**, or use the Mouse with the PLAY/RECORD sector, to start recording. There will be no 2 bar count in — the measure count starts immediately, and you will be able to hear the pre-recorded track. At the pre-selected Punch In point, you'll no longer hear the original recording, indicating that the track is being "erased" and you can enter new data (i.e., start playing). Recording will cease at the pre-selected Rec Out point. You can now playback as normal, and you will hear your performance with the corrected passage inserted into the track.

As a safety device, pressing the **STOP** key while punching in stops the recording, and the original track remains complete. You can then attempt another punch in operation. You can also punch-in manually by activating the punch-in mode for the selected track. Starting playback, then enter the RECORD mode at the desired point by pressing the **F1** key. The punch in function must be used for longer than 96 clocks (1 4/4 measure).

Multi-Track Recording and Playback

We'll now assume the following setup, which includes a DX7 synthesizer and three TX7 Tone Generators, enabling you to have a separate voice for each track of the MIDI Recorder. In this way, true multi-track recording is possible. The sound is monitored through a mixer capable of accepting the four sound outputs as well as the metronome signal of the MIDI Recorder.

Fig. 24 System example for this section



For multi-track recording and playback, you will need to set the tempo, time signature, and metronome, and select a bank and a track, just as you did for the previously described basic recording procedure. The difference comes in the use of MIDI channels.

To start with, the DX7 always transmits on MIDI Channel 1, so all tracks will need to be recorded on MIDI Channel 1. To play back, however, you must set each track to a different MIDI number, so that the individual tracks can control each sound source independently. A typical 4 track recording procedure would be as follows:

- 1) Set all tracks to MIDI Channel 1 (this is automatically done when the computer is turned on).
- 2) Set the TX7's to MIDI Channels 2, 3 and 4 respectively. We'll refer to these as TX7-2, TX7-3 and TX7-4 respectively.
- 3) Record on track 2, as normal.
- 4) For playback, set track 2 to MIDI Channel 2, and select the required voice on TX7-2.
- 5) Record on track 3, as normal, while listening to track 2.
- 6) For playback, set track 3 to MIDI Channel 3, and select the required voice on TX7-3.
- 7) Record on track 4, as normal, while listening to tracks 2 and 3.
- 8) For playback, set track 4 to MIDI Channel 4, and select the required voice on TX7-4.
- 9) Record on track 1 as normal, while listening to tracks 2, 3 and 4.
- 10) Finally, play back as normal. Track 1 will play back through the DX7.

To sum this up, the procedure involves recording all data via MIDI Channel 1 using one MIDI device (the DX7), then switching the MIDI Channel of each track, as it is recorded, so that it can play back through another MIDI device (a TX7). The idea of recording on tracks 2, 3, 4 then 1 is chosen only so that we end up with a nice neat arrangement: track 1 controlling the DX7 (on MIDI Channel 1) and tracks 2, 3 and 4 controlling the 3 TX7's (on MIDI Channels 2, 3 and 4 respectively).

The "M" Function

In the case of a MIDI keyboard that can transmit on any MIDI Channel (for example, a DX21) a different, and much simpler multi-track recording procedure is possible.

Each track has an "M" function, which enables you to actually record the MIDI Channel number along with the music data. To activate the "M" function, move the cursor to the MIDI Channel sector of a track, and press **SELECT** (or the left mouse key). **M** will appear in the MIDI Channel sector, indicating that the "M" function is activated.

Now, when you record a track in the normal way, the MIDI Channel number that the keyboard is transmitting on will be recorded along with the music data. The track will "remember" this number, and play back the recording only on that MIDI channel. Our 4-track recording procedure would go like this:

- 1) Set all tracks to **M**.
- 2) Set the DX21 to transmit on MIDI channel 2, and the TX7's to MIDI Channels 2, 3 and 4 respectively. We'll refer to these as TX7-2, TX7-3 and TX7-4 respectively.
- 3) Record on track 2, as normal.
- 4) For playback, track 2 remains set to "M". You just need to select the required voice on TX7-2.

- 5) Set the DX21 to transmit on channel 3 and record on track 3, as normal, while listening to track 2.
- 6) For playback, simply select the required voice on TX7-3.
- 7) Set the DX21 to transmit on channel 4 and record on track 4, as normal, while listening to tracks 2 and 3.
- 8) For playback, select the required voice on TX7-4.
- 9) Set the DX21 to transmit on channel 1 and record on track 1 as normal, while listening to tracks 2, 3 and 4.
- 10) Finally, play back as normal. Set the DX21 to receive on channel 1 so that track 1 will play back through the DX21.

The idea of recording on tracks 2, 3, 4 then 1 is chosen only so that we end up with a nice neat arrangement: track 1 controlling the DX21 (on MIDI Channel 1) and tracks 2, 3 and 4 controlling the 3 TX7's (on MIDI Channels 2, 3 and 4 respectively).

The beauty of having each track with its own MIDI number is that we can actually mix tracks together onto a single track, and retain these individual MIDI numbers, so that data stored on a single track can control several MIDI instruments, each with different voices. You could mix 3 tracks onto a 4th track in the same bank, then continue to record on the newly-available three tracks (just like "ping-ponging" on a 4 track tape deck). You can even fill all 4 tracks and mix them onto a track in a different bank.

Track mixing is done two tracks at a time, and is fully explained in the TRACK FUNCTIONS chapter.

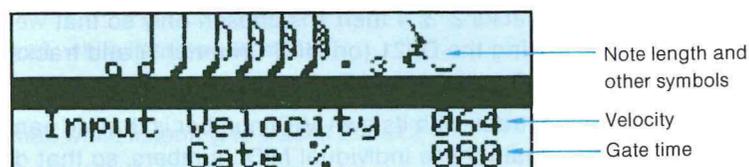
STEP WRITE RECORDING

The Step Write record mode allows you to enter music data one note at a time, setting note pitches, note lengths, note levels (input velocity) and gate lengths. Pitches are entered simply by pressing a key on a MIDI keyboard, once you have set the other parameters on the screen. Like the Real Time Record mode, you can of course carry out multi-track recording, track mixing, etc.

The Step Write mode is entered by first selecting a track for recording, then moving the cursor to the STEP WRITE SELECTOR and pressing **SELECT** (or the left mouse button).

The STEP WRITE SELECTOR will turn blue, and the lower left portion of the screen will show the Step Write display.

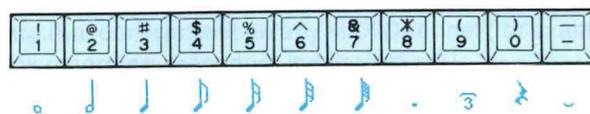
Fig. 25 Step Write Display



Note Length Entry

The Step Write display permits selection of note lengths from whole note to 96th notes, as well as dotted notes, triplets, rests and tied notes. The computer keys corresponding to these functions are shown below.

Fig. 26 Note Length Display and Corresponding Computer Keys



So for example, if you want to select a quarter note, press the **3** key. The blue cursor will move to the quarter note symbol on the screen.

An alternative way of selecting note lengths is to move the red cursor to a note length symbol, and press **SELECT**. With a mouse, you position the cursor over the desired note length symbol and press the left mouse button.

NOTE: When you select the 64th note, you will actually get a 96th note. The MIDI Recorder records data in small increments of time called "clocks", that are equivalent to a 96th of a whole note. As 64 is not a factor of 96, it cannot be recorded. A 64th note triplet is a 96th note, so when you select a 64th note the triplet symbol will also be lit.

Dotted Notes

A dotted note is 50% longer than a standard note. To select a dotted note, first select the basic note length, then press the **8** key. Or move the cursor to the dot symbol and press **SELECT** (or the left mouse button). A blue cursor will appear over the dot symbol, in addition to the one over the basic note length symbol.

Be sure to turn off the dot function (in the same way you turned it on) after entering your note, or all subsequent notes will be dotted. It is not possible to select a dotted 32nd note (half of a 32nd note is a 64th note, and therefore impossible to enter).

Triplets

A triplet note has a value that is two-thirds of its standard value. To select a triplet note, first select the basic note length, then press the **9** key. Or move the cursor to the triplet symbol and press **SELECT** (or the left mouse button). A blue cursor will appear over the dot symbol, in addition to the one over the basic note length symbol.

Be sure to turn off the triplet function after entering your note, or all subsequent notes will be triplets.

Rests

Rests, or silences, are entered by simply selecting the length of the rest as you would for a note, then pressing the **0** key. Or move the cursor to the rest symbol and press **SELECT** (or the left mouse button). A blue cursor will appear over the rest symbol, in addition to the one over the note length symbol. Then hit any key on the MIDI keyboard to enter the rest.

Be sure to turn off the rest function (in the same way you turned it on) after entering your rest, or all subsequent pressings of keys on the MIDI keyboard will produce rests instead of notes, even though you will hear the notes as you press the keys.

Tied Notes

Tied notes are long notes or odd-length notes produced by combining two or more notes of the same pitch. This is carried out as follows: enter the first part of the note in the normal manner. Then select the length of the next part of the note, and press the **=** key. Or move the cursor to the tie symbol and press **SELECT** (or the left mouse button). A blue cursor will appear over the tie symbol, in addition to the one over the note length symbol. Then hit any key on the MIDI keyboard to enter the tied note, which will of course have the same pitch as the original note. Subsequent pressings of any key on the MIDI keyboard will enter further tied notes.

Be sure to turn off the tie function (in the same way you turned it on) after entering your tied note, or all subsequent pressings of keys on the MIDI keyboard will produce more tied notes at the same pitch as the original note, even though you may hear other pitches as you press the keys.

Input Velocity

When you enter notes in the Step Write mode, the velocity with which you press a key is not recorded. The only way to enter this value is to set it on the screen. The Input Velocity (level) is normally set at 64 (equivalent to "mf") but you can adjust the level over a range of 1 (soft) to 127. The following table gives an idea of the relationship between input velocity and actual level (expressed as musical dynamic markings):

Table 1 Input Velocity/Dynamic Markings

Input Velocity	Dynamic Marking	Level
8	ppp	Very Weak
24	pp	
40	p	Weak
56	mp	Moderately Weak
72	mf	Moderately Strong
88	f	Strong
104	ff	Very Strong
120	fff	

Enter the input velocity by positioning the cursor over the input velocity number (it doesn't matter which digit) and use the **HOME** and **DEL** keys (or press the right mouse button and move the mouse left or right) to decrease or increase the value, respectively. Note that this value will remain until you change it.

Gate Length

Gate length refers to the length of time a note is held down, as a percentage of the overall note length, and is normally set at 80%, which gives a natural-sounding gap between notes. This could also be described as the time between the KEY ON and KEY OFF signals. The available range is 1 ~ 100%.

Percussive type voices often have a very short gate length, if they have a sustain programmed in which will cause the note to continue even after the key is released. Most orchestral voices, for example strings, require the key to be held down for most of the note length, and voices which have a sharp attack and cut-off (e.g., electric organ) sound exactly for the amount of time the key is held down, and therefore their gate length set at 100%.

Basically, a short gate length will produce a sharp, staccato effect, and a longer gate length will produce a smooth, legato effect.

Enter the gate length by positioning the cursor over the gate length number (it doesn't matter which digit) and use the **HOME** and **DEL** keys (or press the right mouse button and move the mouse left or right) to decrease or increase the value, respectively. Note that this value will remain until you change it.

Note and Chord Entry

Having entered the Step Write mode, and selected the various parameters relating to a note, you enter it simply by pressing the appropriate note on your MIDI keyboard. Chords may also be entered, though care should be taken to press all notes of the chord at exactly the same time, otherwise notes may play back separately.

When you enter a note, the CLOCK COUNTER will count forward by an amount equal to the length of the note, as follows:

Table 2 Note Lengths/Clocks

Note Length Symbol							
Number of Clocks	96	48	24	12	6	3	1

As you continue to enter notes, the MEASURE COUNTER will also start to count forward.

Playback

To play back your recording, exit the Step Write mode by positioning the cursor over the STEP WRITE SELECTOR, and press **SELECT** (or the left mouse button). The selector will turn white, and you can play back from the beginning of your piece by pressing the space bar. Other playback options are identical to those in the Real Time Record mode.

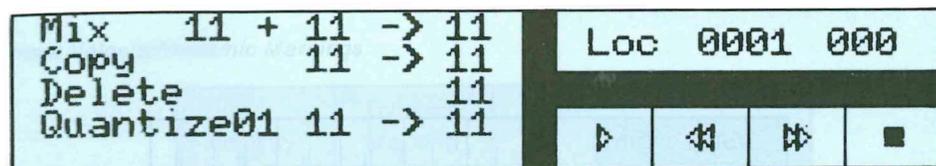
Further Step Write Recording

If you wish to add more data to a recorded track using the Step Write mode (whether the track was recorded in the Step Write or the Real Time mode) entering the Step Write mode will automatically locate the end of the recording, as indicated by the MEASURE COUNTER and CLOCK COUNTER. You can now input more notes, chords, or rests as desired.

TRACK FUNCTIONS

The MIDI Recorder incorporates four extremely useful track functions, which are selected by placing the cursor over the TRACK FUNCTIONS SELECTOR, and pressing **[SELECT]** (or the left mouse key). The TRACK FUNCTIONS SELECTOR will turn blue, and the lower left portion of the screen will show the Track Functions display.

Fig. 27 Track Functions Display



The four track functions use the following method of track numbering:

Bank	Track			
	1	2	3	4
1	11	12	13	14
2	21	22	23	24
3	31	32	33	34
4	41	42	43	44

The track functions are as follows:

Mix

This allows you to mix the data recorded on two tracks, to another track in the same bank, or even in another bank.

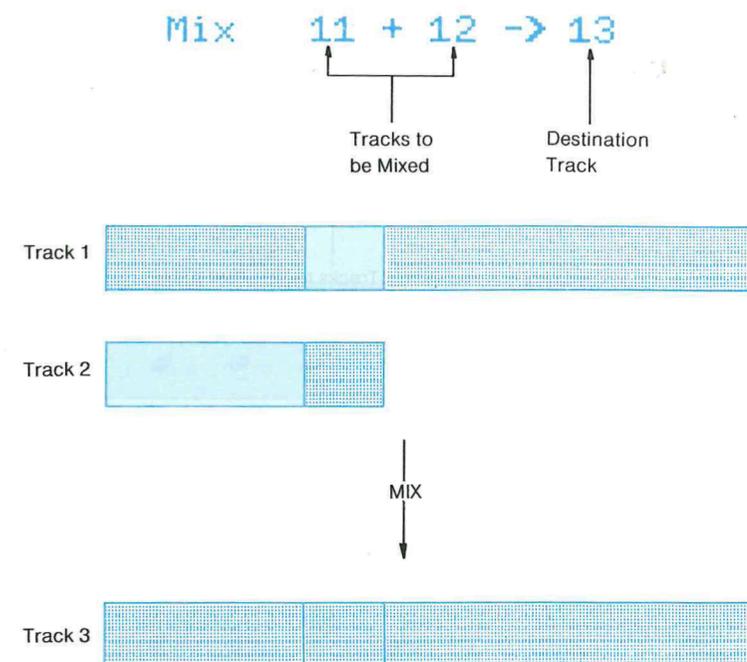
Enter the numbers of the tracks to be mixed by moving the cursor to the first two numbers on the MIX display and using the **[HOME]** and **[DEL]** keys to decrease or increase the track numbers (with a mouse, press the right button and move the mouse left or right). Enter the destination track number (the third number on the display) in the same manner.

Move the cursor to the word **Mix** and press **[SELECT]** (or the left mouse button). The word **Mix** will reverse out to white on black, and the message **Sure? (RET/ESC)** will appear at the bottom of the screen. This gives you a chance to cancel the mix function, if the destination track contains material that you do not wish to lose. Cancel the mix function by pressing **[ESC]**.

To mix, press **[RETURN]** (or the left mouse button). The **Sure? (RET/ESC)** message will disappear, and after the mix has been carried out (which will take a few seconds, depending on the length of the tracks) the word **Mix** will resume its former color.

You can mix several tracks onto one track by mixing two at a time (for example, to mix all four tracks of bank 1 onto track 3 of bank 2, mix 11 and 12 to 21, 13 and 14 to 22, then 21 and 22 to 23).

Fig. 28 Mix Function



Copy

This allows you to copy the data recorded on a track, to another track in the same bank, or even in another bank.

Enter the number of the track to be copied by moving the cursor to the first number on the COPY display and using the **[HOME]** and **[DEL]** keys to decrease or increase the track number (with a mouse, press the right button and move the mouse left or right). Enter the destination track number (the second number on the display) in the same manner.

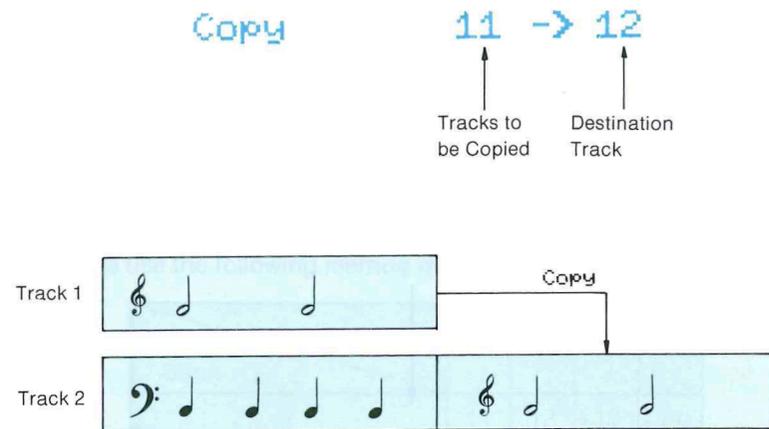
Move the cursor to the word **Copy** and press **[SELECT]** (or the left mouse button). The word **Copy** will reverse out to white on black, and the message **Sure? (RET/ESC)** will appear at the bottom of the screen. This gives you a chance to cancel the copy function, if the destination track already contains material. To cancel the copy function, press **[ESC]**.

To copy, press **[RETURN]** (or the left mouse button). The **Sure? (RET/ESC)** message will disappear, and after the copy function has been carried out (which will take a few seconds, depending on the length of the track) the word **Copy** will resume its former color.

You can actually copy onto a track containing material, and the new data will be added onto the end of the existing data. This can be useful if you wish to repeat the same passage, by carrying out the

copy function several times (simply press **RETURN** or the left mouse button as many times as desired). It can also be a good way of compiling a song section by section on one track.

Fig. 29 Copy Function



Delete

This allows you to delete (clear all data from) a track.

Enter the number of the track to be deleted by moving the cursor to the number on the DELETE display and using the **HOME** and **DEL** keys to decrease or increase the track number (with a mouse, press the right button and move the mouse left or right).

Move the cursor to the word **Delete** and press **SELECT** (or the left mouse button). The word **Delete** will reverse out to white on black, and the message **Sure? (RET/ESC)** will appear at the bottom of the screen. This gives you chance to cancel the delete function, if the selected track contains material you do not wish to lose. To cancel the delete function, press **ESC**.

To delete, press **RETURN** (or the left mouse button). The **Sure? (RET/ESC)** message will disappear, and after the delete function has been carried out (which will take a very short time, depending on the length of the track) the word **Delete** will resume its former color.

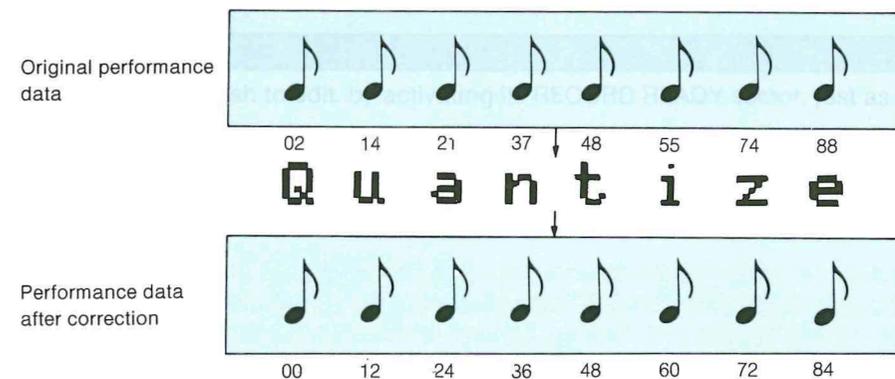
Fig. 30 Delete Function



Quantize

The Quantize function allows you to correct timing imperfections in the recording, by "moving" notes to a specified unit of time. The MIDI Recorder records data in small increments of time called "clocks", that are equivalent to a 96th of a whole note. Once the recording is completed, you can select a quantize unit that contains a specified number of clocks. For example, selecting a quantize unit of 12 will correct all notes to the nearest 8th note (an 8th note contains 12 clocks).

Fig. 31 Quantize Function (to 8th Note)

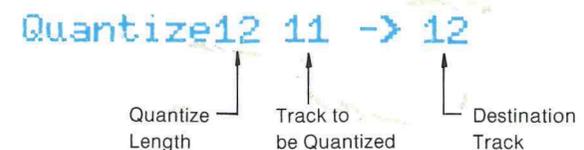


Note that if you quantize a complex and rapid melody, several notes may be quantized to the same quantize unit, resulting in chords. If this is not desirable, you can always quantize the original track again, using a shorter quantize unit.

The Quantize procedure is as follows:

- 1) Enter the quantize length by moving the cursor to the first number on the QUANTIZE display and using the **HOME** and **DEL** keys to decrease or increase the quantize length (with a mouse, press the right button and move the mouse left or right). The range is 1 through 24 (clocks).
- 2) Enter the number of the track to be quantized (the second number on the QUANTIZE display) in the same manner. The third number indicates the track to which the quantized (corrected) data will be transferred. This "destination track" number is entered in the same manner.

Fig. 32 Quantize Display



EDITING

Move the cursor to the word **Quantize** and press **SELECT** (or the left mouse button). The word **Quantize** will reverse out to white on black, and the message **Sure? (RET/ESC)** will appear at the bottom of the screen. This gives you a chance to cancel the quantize function, if the selected destination track contains material you do not wish to lose. To cancel the quantize function, press **ESC**.

To quantize, press **RETURN** (or the left mouse button). The **Sure? (RET/ESC)** message will disappear, and after the quantize function has been carried out (which will take a few seconds, depending on the length of the track) the word **Quantize** will resume its former color.

The MIDI Recorder's Edit mode lets you alter any individual note in your recording, in the following five ways:

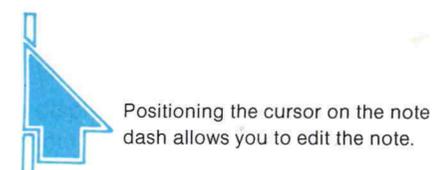
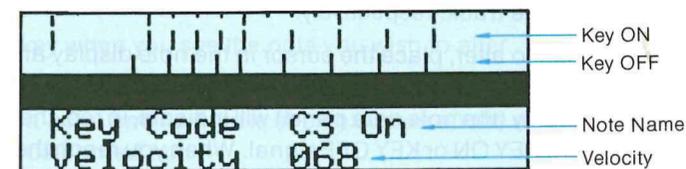
- You can alter the pitch of the note, over the entire MIDI range (over 10 1/2 octaves) to correct a mistake or create new melodies.
- You can alter the level of the note (its key velocity) to add dynamics and expression to your recording.
- You can move a note forwards or backwards in time, to correct timing errors or create subtle rhythms.
- You can alter the length of a note.
- You can delete a note.

Edit Point Location

Select the track you wish to edit, by activating its RECORD READY sector, just as if you were going to record on that track.

Call the Edit mode by positioning the cursor on the EDIT SELECTOR and pressing **SELECT** (or the left mouse button). The EDIT SELECTOR will turn blue, and the Edit Display will appear in the lower left portion of the screen.

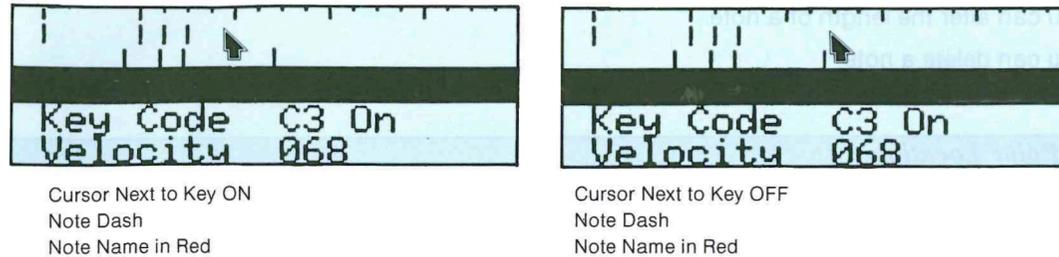
Fig. 33 Edit Display



The "note display" located in the upper section of the edit display shows, in the form of vertical "note dashes", the KEY ON and KEY OFF signals for each note. The upper row of dashes indicate KEY ON signals, and the lower row indicates KEY OFF signals. The length of time covered by the note display is 20 sixteenth notes, or 1 1/4 measures of 4/4 time, starting from the location indicated on the LOCATION BLOCK. The scale at the top of the note display indicates quarter notes (large divisions) and sixteenth notes (small divisions). Measures containing more than 120 clocks (e.g., 6/4, 12/8) can not be shown in their entirety on the edit display.

So if we were editing the beginning of the piece we entered in the Step Write mode, it would look like this:

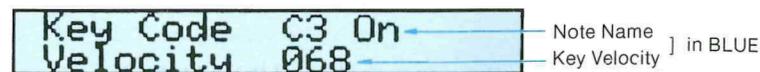
Fig. 34 First 1 1/4 Bars of Step Write Example



You can now "scroll through" your recording, using the **F3** and **F4** keys (the "rewind" and "fast forward" keys respectively). The LOCATION BLOCK will always display the current location, in measures and clocks. With a mouse, you can change location by moving the cursor to the MEASURE COUNTER, and moving the mouse left or right while holding down the right mouse button, to move backwards or forwards through the track, respectively.

To locate the exact note you wish to alter, place the cursor in the note display and move it left and right with the left and right arrow keys. Each time the cursor passes a note dash, the cursor will pause briefly, and the lower part of the edit display (the note data panel) will indicate, in red, the note name (key code), and whether the dash indicates a KEY ON or KEY OFF signal. When you reach the required note, release the arrow key, and the note name will remain on the note data panel. The note names cover the full MIDI range, C-2 to G8. All flat or sharp notes will be shown as sharps (e.g., E flat will be shown as D #) and all flat or sharp keys in the minus octaves (e.g. D # -2) will be shown simply as a minus pitch (e.g. D # -).

Fig. 35 Key Data Display



Before you edit the note, press the **SELECT** key, and the note name will turn blue, and the key velocity number will appear under the note name. The note can now be edited in the ways described below.

With a mouse, the procedure is even simpler. Hold the left mouse button down, and move the cursor along the note display. As you pass each dash, the note data will flash. Release the left mouse button when you reach the desired note, and its data will remain on the screen in blue, indicating that it can immediately be edited.

Location of Notes in a Chord

A chord will appear on the note display as with a single dash, as if it were a single note. This also applies to any group of signals that occur simultaneously, be they KEY ON, KEY OFF, or a combination of both.

To find a note within a chord, carry out the normal note location procedure. When you finally press the **SELECT** key to activate the note for editing, one of the notes in the chord will appear. Repeated pressing of the **SELECT** key will call up the other notes of the chord, one at a time, and their note names and velocity numbers will be displayed. When all notes have been displayed, the next pressing of the **SELECT** key will make the note data panel go blank. Further pressing of the **SELECT** key will restart display of the notes. Press the **SELECT** key until the desired note is displayed in blue, indicating that it is ready for editing.

With a mouse, locate the dash corresponding to a chord, and continue to hold down the left mouse button. The data relating to each note within the chord will be displayed, one note at a time, until the last note has been displayed, at which point the note data panel will go blank. If you continue to hold down the left mouse key, the display of note data will begin again.

Release the left mouse key when you see the note you wish to alter. This note will now be available for editing.

Once you have located a note, and its data is shown in blue on the note data panel, the following four editing operations may be carried out.

Pitch Change

To change the pitch of your selected note, make sure you have located its KEY ON signal. The KEY OFF signal does NOT contain pitch data.

Position the cursor over the Key Code display, and use the **HOME** and **DEL** keys to lower or raise the pitch, respectively. With a mouse, hold down the right mouse button and move the mouse left or right. The new pitch will be entered, and displayed on the note data panel. The total available range of pitches is C-2 to G8 — a range of over ten octaves.

When you have changed the pitch of a note, its KEY OFF signal will also indicate the new pitch.

Level Change

To change the level of your selected note, make sure you have located its KEY ON signal. The KEY OFF signal does NOT contain level (velocity) data.

Position the cursor over the velocity display, and use the **HOME** and **DEL** keys to lower or raise the velocity value, respectively. With a mouse, hold down the right mouse button and move the mouse left or right. The new value will be entered, and displayed on the note data panel. The total available range of velocity values is 001 to 127.

Position Change

To move a note, the only way is to move the start of the note, i.e., its KEY ON signal, so in effect the note will then have a different length. This can be corrected by adjusting the position of its KEY OFF signal, if desired.

To change the position of your selected note, make sure you have located its KEY ON signal.

Use the **HOME** and **DEL** keys to move the note dash backwards or forwards respectively. Tapping one of these keys will move the note by one clock (a 96th note). Holding down one of these keys will move the note continuously. The note dash will move on the screen, while the cursor remains in its original position. You can use the scale at the top of the note display as a guide: each large division represents a quarter note; each small division represents a 16th note.

With a mouse, hold down the right mouse button and move the mouse left or right. The note dash will move in the same direction as the mouse. Be careful not to move the mouse even slightly, prior to pressing its right button, or you will "lose" the note dash and have to locate it again.

NOTE: A note can only be moved as far as the next note dash, without altering neighboring notes. If you move the note dash further, it will "gather up" any note dashes it encounters, and move them along with it (this applies to both KEY ON and KEY OFF signals). This could create chords which cannot be seen on the display, so be careful when moving notes.

You can, of course, relocate any note dash to its original position if desired, even if it has been positioned in the middle of a chord.

Note Length Change

To change the length of a note, you simply relocate its KEY OFF signal, in exactly the same way described in the previous section. Again, the note dash corresponding to the KEY OFF signal can only be moved as far as the next note dash without altering neighboring notes.

Note Delete

To delete a note, locate its KEY ON note dash, and providing its note data is displayed in blue, indicating that it is ready for editing, press **BS** to delete the note. Both the KEY ON and KEY OFF note dashes will disappear from the note display.

CHAIN FUNCTIONS

The chain function enables you to create a playback sequence of banks and tracks in order to make a larger musical composition, or a medley or sequence of compositions. The chain contains up to 12 "parts", each part consisting of a bank, or selected tracks from a bank.

In addition, each part can be repeated up to 99 times, transposed up or down by up to 12 semitones, and have its tempo increased or decreased by up to 99 quarter notes per minute. You can also alter the MIDI channel each track transmits on, so the same recorded music can be performed by a variety of MIDI instruments. The entire chain may be played back automatically up to 9 times.

To enter the chain mode, position the cursor over the CHAIN DISPLAY selector, and press **SELECT** (or the left mouse button). The CHAIN DISPLAY selector will turn blue, and the CHAIN DISPLAY will appear on the screen, completely replacing the RECORD/PLAY display. You can now enter the data relating to part 1 of the chain.

Fig. 36 Chain Display

CHAIN PLAY												REC	CHN	FILE	PRN	
Number	1	2	3	4	5	6	7	8	9	10	11	12				
Bank																
Track1 (Mch)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Times	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tempo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loc	0001	000														
Fr	020959	Times	1	1												

Bank Selection

To select which bank will be used as a part in the chain, position the cursor in the part 1 column, next to the desired bank number. Press **SELECT** (or the left mouse button) and the sector next to the selected bank number will turn blue. If you change your mind and want to select another bank, simply move the cursor to the appropriate sector and select another bank. The newly selected sector will turn blue, and the previously selected sector will revert to its original color.

Track Selection

Select tracks in the same way as banks, but position the cursor next to the track numbers. You can, of course, select more than one track — all four tracks may be selected.

MIDI Channel Selection

To select which MIDI channel a track will transmit on, position the cursor in the track selection sector, then use the **HOME** or **DEL** keys to decrease or increase the MIDI channel number, respectively (with a mouse, hold down the right mouse key and move the mouse left or right, respectively). The MIDI channel can be set from 1 to 16, and of course the MIDI instruments that are receiving data from the MIDI Recorder must be set to the corresponding channel.

Repeats Selection

To enter the number of repeat plays a part will have, move the cursor to the repeat sector (to the right of the word "Times") then use the **HOME** or **DEL** keys to decrease or increase the number of repeats, respectively (with a mouse, hold down the right mouse button and move the mouse left or right, respectively). The maximum number of repeats is 99. Set at 1, the part will only be played once.

Tempo Selection

The overall tempo of the chain is set as for normal playback of a bank, but you can speed up or slow down any part by up to 99 quarter notes per minute. Move the cursor to the tempo sector (to the right of the word **Tempo**) then use the **HOME** or **DEL** keys to decrease or increase the tempo, respectively (with a mouse, hold down the right mouse button and move the mouse left or right, respectively). Set at 0, the part will be played at the set playback tempo.

A tempo decrease is indicated by reversing out the color of the tempo sector.

Transpose Selection

You can raise or lower the pitch of any part by up to 12 semitones (one octave). Move the cursor to the transpose sector (to the right of the word **Trans**) then use the **HOME** or **DEL** keys to decrease or increase the pitch, respectively (with a mouse, hold down the right mouse button and move the mouse left or right, respectively). Set at 0, the part will be played at the original pitch.

A pitch decrease is indicated by reversing out the color of the transpose sector.

You can now move on to the next part, and enter its data. In fact, parts may be entered in any order, and of course you can change the data at any time.

Chain Playback

Chains are played back in the same way as tracks, though the MIDI Recorder must be in the CHAIN PLAY mode. During playback, the top sector of each part (to the right of the word **Number**) will turn blue as each part is played. You can also select playback from any part in the chain. Move the cursor to the top sector of the selected part and press **SELECT** (or the left mouse button). The sector will turn blue. You can now start playback from the selected part, in the usual way.

You can also set the chain to be played back continuously up to 9 times. Move the cursor to the blue number to the right of the word **Times** at the bottom of the screen, then use the **HOME** or **DEL** keys to decrease or increase its value, respectively (with a mouse, hold down the right mouse button and move the mouse left or right, respectively). Set at 1, the chain will be played only once.

If you set it for more than one play, the red figure to the right of the blue figure will "count down" the number of plays.

Part Delete

Once you've assembled a chain, you can at any time remove a part from the chain, to shorten it or make room for another part to be inserted. This is done as follows.

Position the cursor in the top sector of the part to be deleted, and press **HOME**.

The selected part will be deleted, and all the parts to its right will move left one space. Parts to the left of the cursor will not change. If the chain originally filled all 12 parts, part 12 will now be empty.

Fig. 37 Chain Delete Example

CHAIN PLAY												REC	CHN	FILE	PRN	
Number	1	2	3	4	5	6	7	8	9	10	11	12				
Bank																
Track1 (Mch)	2	4	1	1	4	1	1	1	1	1	1	1				
4	2	2	2	2	2	2	2	2	2	2	2	2				
4	4	4	4	4	4	4	4	4	4	4	4	4				
Times	1	1	1	1	1	1	1	1	1	1	1	1				
Tempo	0	0	0	0	0	0	0	0	0	0	0	0				
Trans	0	0	0	0	0	0	0	0	0	0	0	0				
MdMac																
Tempo 120 4 / 4												Loc 0001 000				
Fr 020959 Times 1 1												▶ ◀ ⏪ ⏩ ■				

CHAIN DISPLAY
Before deleting part 3.
Cursor over part 3.

CHAIN PLAY												REC	CHN	FILE	PRN	
Number	1	2	3	4	5	6	7	8	9	10	11	12				
Bank																
Track1 (Mch)	1	1	1	1	4	1	1	1	1	1	1	1				
4	2	2	2	2	2	2	2	2	2	2	2	2				
4	4	4	4	4	4	4	4	4	4	4	4	4				
Times	1	1	1	1	1	1	1	1	1	1	1	1				
Tempo	0	0	0	0	0	0	0	0	0	0	0	0				
Trans	0	0	0	0	0	0	0	0	0	0	0	0				
MdMac																
Tempo 120 4 / 4												Loc 0001 000				
Fr 020959 Times 1 1												▶ ◀ ⏪ ⏩ ■				

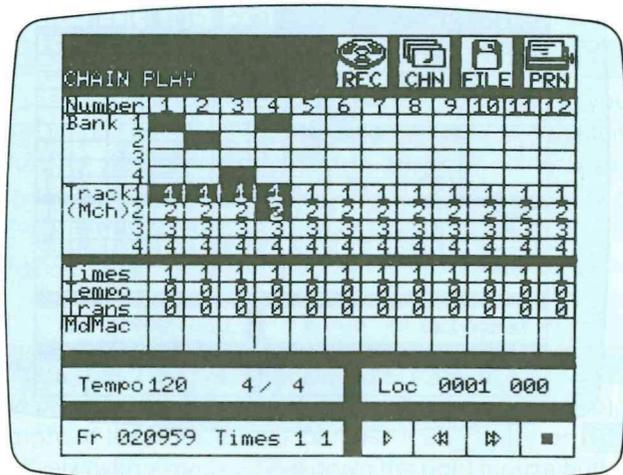
CHAIN DISPLAY
After deleting part 3.
Cursor over part 3.
Parts 4 & 5 moved to
parts 3 & 4.

Successive pressings of the **HOME** key will delete more parts, and continue to move the remaining parts leftwards.

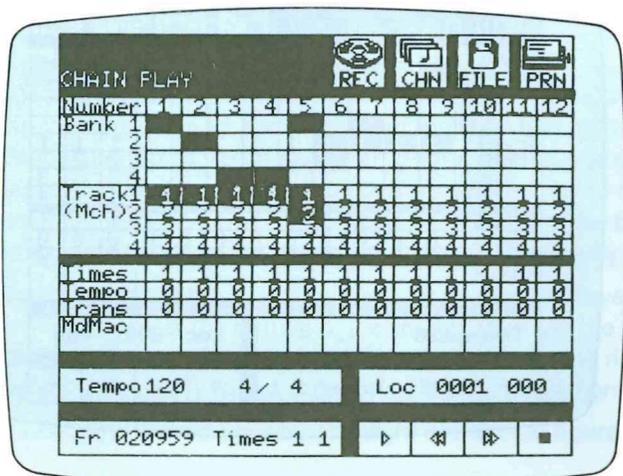
Part Insert

To insert a part, position the cursor in the top sector of the part at which you wish to insert a new part. Press **DEL**, and the selected part will be copied into the next part on the right. All parts to the right of the selected part will be moved one place to the right. You can now modify the part indicated by the cursor, to make a new part, by entering track data, bank data, etc., as previously described.

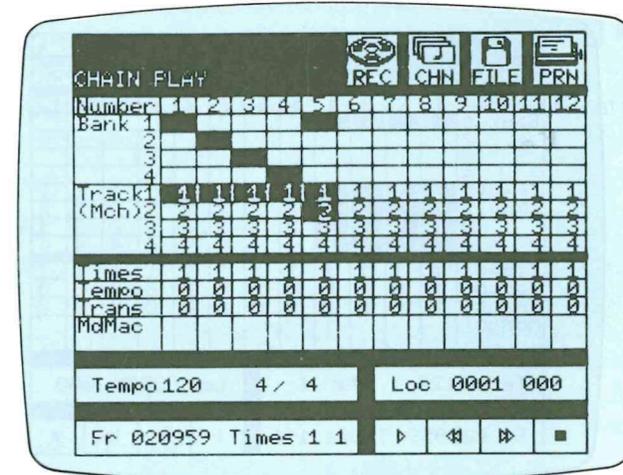
Fig. 38 Part Insertion Example



CHAIN DISPLAY
Before inserting new part
in part 3.
Cursor over part 3.



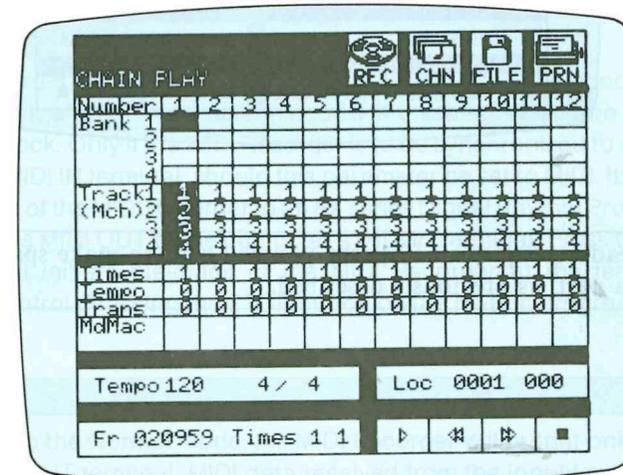
CHAIN DISPLAY
After pressing **DEL** key.
Cursor over part 3.
Part 3 copied to part 4.
Part 4 moved to part 5.



CHAIN DISPLAY
Cursor over part 3
Part 3 altered to create
new part.

The insert function also can save time when assembling a chain, particularly if the parts have a lot in common. Simply carry out the part copy operation (by pressing **DEL**) as many times as required, then modify each part as needed. This can be a lot faster than entering all the data for each part.

Fig. 39 Part Copy Example



CHAIN DISPLAY
Part 1 entered.
Cursor over part 1.

SYSTEM PARAMETERS

The SYSTEM PARAMETERS mode, selected by placing the cursor on the SYSTEM PARAMETERS selector and pressing either the left mouse button or the computer **SELECT** key, accesses a number of parameters which are important for overall system operation.

When the SYSTEM PARAMETER mode is selected, a text window will appear at the bottom of the screen containing the following parameters:

- Clock: Internal or MIDI.
- MIDI out: Normal or Mix.
- Rec mode: No aft or Aft.
- Send Request: -----
- Printer: MSX A, MSX B, Epson A, or Epson B.

Fig. 40 The System Parameters Display

```

Clock      Internal
MIDI out   Normal
Rec mode   No aft
Send req   Off
Printer    MSX  A
    
```

CHAIN FLHT												
	REC	CHN	FILE	PRN								
Number	1	2	3	4	5	6	7	8	9	10	11	12
Bank	1											
Track (Mch)	4	4	4	4	1	1	1	1	1	1	1	1
Times	1	1	1	1	1	1	1	1	1	1	1	1
Tempo	0	0	0	0	0	0	0	0	0	0	0	0
Trans	0	0	0	0	0	0	0	0	0	0	0	0
MdMac												
Tempo 120 4 / 4					Loc 0001 000							
Fr 020959 Times 1 1					▶ ◀ ▶▶ ■							

CHAIN DISPLAY
Part 1 copied 3 times
(press DEL 3 times)
Cursor over part 1.

CHAIN FLHT												
	REC	CHN	FILE	PRN								
Number	1	2	3	4	5	6	7	8	9	10	11	12
Bank	1	1	1									
Track (Mch)	4	4	4	1	1	1	1	1	1	1	1	1
Times	1	1	1	1	1	1	1	1	1	1	1	1
Tempo	0	0	0	0	0	0	0	0	0	0	0	0
Trans	0	0	0	0	0	0	0	0	0	0	0	0
MdMac												
Tempo 120 4 / 4					Loc 0001 000							
Fr 020959 Times 1 1					▶ ◀ ▶▶ ■							

CHAIN DISPLAY
Parts 2, 3 and 4 altered
(bank select, track select,
MIDI nos., no. of repeats,
tempo, transpose).
Cursor over part 1.

Note: If the chain already occupies all 12 parts, you will need to make space for the insertion of a new part, by deleting a part, as previously described.

Clock

This parameter allows selection of the MIDI Recorder's internal or an external MIDI clock for synchronization. Place the cursor just under the blue **Internal** or **MIDI** parameter and press the left mouse button or the computer **SELECT** key to select.

Normally, the MIDI Recorder's internal clock should be selected. In this condition the MIDI Recorder will record and play back at the tempo determined by the setting of its own TEMPO selector, under control of the internal clock. Only if the MIDI Recorder is to be synchronized to an external clock signal, sent to the computer's MIDI IN terminal, should this parameter be set to MIDI. It is possible, for example, to synchronize playback of the MIDI Recorder to an RX series Digital Rhythm Programmer by connecting the rhythm programmer's MIDI OUT to the computer's MIDI IN terminal. Press the START button on the rhythm programmer will initiate playback of the MIDI Recorder at the tempo set by the rhythm programmer's tempo control. Pressing the STOP button on the rhythm programmer will stop playback.

MIDI Out

With this parameter set to the Normal mode, the MIDI Recorder will output only its own playback data via the computer's MIDI OUT terminal. MIDI data received from the input keyboard will NOT be transmitted in real time from MIDI OUT. This mode is to be selected when it is not desirable to have tone generators other than the input keyboard's own internal generator respond to the input keyboard.

When this parameter is set to Mix, data from the input keyboard will be re-transmitted in real-time via the computer's MIDI OUT terminal. During MIDI Recorder playback, the input keyboard data will be mixed with the MIDI Recorder output data and sent via the computer MIDI OUT terminal. Both the MIDI Recorder and input keyboard data still retain their own unique channel numbers. The Mix mode makes it possible to control external tone generators directly from the input keyboard.

REC Mode

This parameter determines whether the MIDI Recorder records or ignores keyboard after-touch sensitivity data. Normally the **No aft** mode is selected. The **No aft** mode is preferable in most applications since after-touch data is continuously being transmitted while a key is being played, consuming a considerable amount of MIDI Recorder memory capacity. For recording short pieces the **aft** mode may be selected, but with longer pieces the computer's memory capacity may be exceeded, resulting in a **memory over error** message and loss of a good take.

Send REQ

This parameter applies only to specialized Yamaha music equipment, and is not fully implemented at this time. It should be Off.

Printer

This parameter permits matching the MIDI Recorder's printer output format to the type of printer used in your system. The choices are MSX A, MSX B, Epson A or Epson B. Check with your Yamaha dealer to determine which specific printer models apply to the above selections. The Yamaha PN-101 printer operates with the normal MSX A selection.

DATA STORAGE

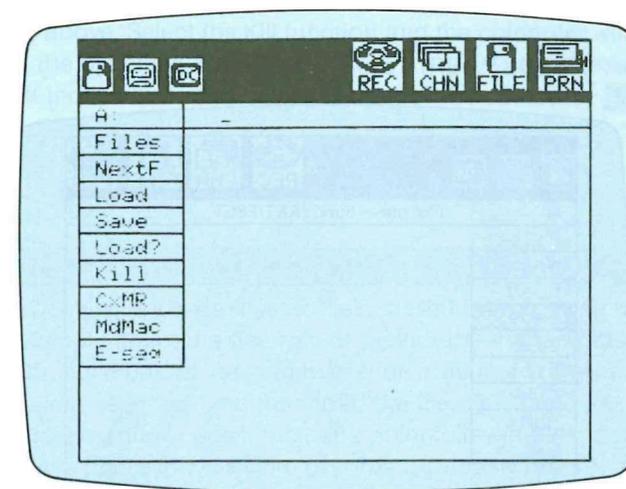
The MIDI Recorder provides for data file storage and retrieval using the Yamaha FD-05 floppy disk drive, or a standard data cassette recorder.

Floppy disk is by far the best choice in terms of speed, versatility, and storage capacity. In all cases the entire contents of the MIDI Recorder memory — all four banks and chain data — is saved onto the storage medium during a SAVE operation, and the entire contents is loaded into the MIDI Recorder memory when a LOAD operation is executed.

To access any file handling operation place the cursor on the FILE DISPLAY selector and press the left mouse button or the computer **SELECT** key.

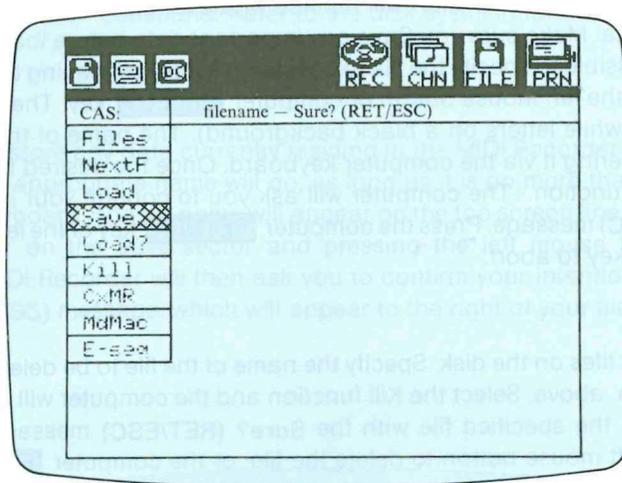
This will call the file handling page.

Fig. 41 The Filer



The three selectors at the top left of this screen select floppy disk, cassette, or memory cartridge operation in order from left to right (memory cartridge operation is not utilizable with conventional MIDI Recorder files, and is not implemented at this time). The MIDI Recorder is smart enough to know what storage device is connected to the computer, and will automatically select that device when the file page is called. Floppy disk operation will be selected if a floppy disk drive is connected, and cassette will be selected if a floppy disk drive is not connected to the system. A list of available file handling functions is provided to the left of the screen. The functions that appear in black are those functions that are operative with the currently selected device, while those in white cannot be used with the current device. An underline cursor appears to the right of the selected device name at the top of the screen — file names for store and load operations are entered here using the computer's alphanumeric keyboard.

Fig. 44 Save Display (Cassette)



Load

To load a file from cassette tape into the MIDI Recorder memory, the name of the file to be loaded must first be specified. If no file name is specified the first file encountered on the tape will be loaded. Note also that a load operation will replace whatever data is in the MIDI Recorder memory with the new loaded data. Make sure you save any important data before loading new material. The name of the file to be loaded may be specified by entering it via the computer keyboard. Once the desired file name has been specified, select the load function. The computer will ask you to confirm your intention to load the file with the **Sure? (RET/ESC)** message. Make sure that the cassette tape is wound to a point before the file to be loaded, start the cassette recorder in the PLAY mode then press the computer **RETURN** key or the left mouse button to load. Press the computer **ESC** key to abort the load operation. The **Loading** message will appear in the message area while the computer searches for and loads the specified file. Once the file has been loaded the **Completed** message will appear for a few seconds, then the cassette recorder may be stopped.

Load?

This is similar to the VERIFY function found in other data cassette save/load systems. It is used to check the data on the tape to ensure that it has been properly recorded by the save function. After a save operation, rewind the cassette to the beginning of the file just saved. Place the cursor in the **Load?** sector and press the left mouse button or the computer **SELECT** key. The MIDI Recorder will ask you to confirm your intention to verify the file with the **Sure? (RET/ESC)** message. Set the cassette player to the PLAY mode and press the left mouse button or the computer **RETURN** key to begin the Load? operation, or press **ESC** to abort. The **Completed** message if the file is verified with no errors. If an error is found the **Load error** message will appear. If the latter occurs, try saving and verifying the file again. If load errors persist you may have to adjust the volume level of the cassette recorder being used, or clean and demagnetize the recorder's heads.

Cartridge

The memory cartridge file handling facility has been provided for special file types which are not implemented at this time. Operation information will be provided when the corresponding software becomes available.

The File Modes

Note that at the bottom of the function list there are three selections we have not yet discussed: CxMR, MdMac and E-seq. These functions pertaining to the handling of different types of files. For basic operation of the MIDI Recorder the CxMR option should always be selected. The MdMac and E-seq options have been provided for special file types which are not fully implemented at this time. Operational information will be provided when the appropriate software and equipment becomes available.

Using a Printer

Printer functions with the MIDI Recorder are limited to printing out the currently displayed screen page. To print, simply place the cursor over the PRINT selector and press the left mouse button or the computer **SELECT** key. The current screen page will be sent to the printer. Printout can be interrupted by pressing the computer **STOP** key while holding the **CTRL** (CONTROL) key.

Printouts of the chain page can be a useful reference. It is also possible to print out a file list from a disk in this manner, so you have a record of what files are on the disk.

Fig. 45 Printout According to the Printer Setting (A or B)



ERROR MESSAGES

Message	Cause
Load error	An error has been encountered during a data load operation.
Save error	An error has been encountered during a data save operation.
Disk write protected	You have attempted to save a file to a write protected disk.
Disk offline	A floppy disk is not inserted in the floppy disk drive, or you are attempting to use a disk which has not been formatted.
Disk full	The disk in use is full and cannot accept any more data. Use a new disk or delete (kill) unwanted files to make space.
Can't save	You are attempting to save when MdMac or E-seq is specified, Specify CXMR.
File not found	The specified file for a file operation cannot be located. Check that the file name you are using is correct, and that the specified file is on the current disk.
No disk cartridge	A floppy disk drive is not connected to the system.
No data cartridge	A data memory cartridge is not inserted in the slot.
File over	The date is too big to be loaded.

Français

ENREGISTREUR MIDI

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