YAMAHA

QX5FD

DIGITAL SEQUENCE RECORDER

OPERATING MANUAL

ABOUT THIS MANUAL

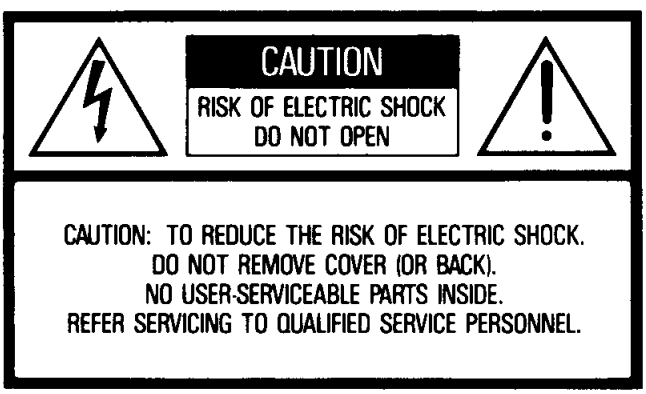
Thank you for purchasing the QX5FD Digital Sequence Recorder. The QX5FD is an 8 track MIDI sequencer with extensive editing functions and a built-in 3.5" floppy disk drive. In order to understand the QX5FD and take full advantage of its capabilities, please read this manual carefully.

If this is you first time to use the QX5FD, we suggest that you read pages 1–10 to get an idea of the possibilities offered by the QX5FD. Then skip to page 68 and work through the Tutorial. Later you will want to read the rest of this manual to take full advantage of the QX5FD's functions.

CONTENTS

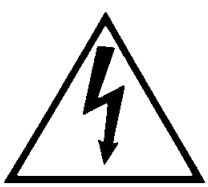
SUPPLEMENTAL MARKING INFORMATION

Yamaha Digital Musical Instrument Products will have elther a label similar to the graphic shown below or a molded/stamped facsimile of the graphic on its enclosure. The explanation of these graphics appears on this page. Please observe all cautions indicated.



SEE BOTTOM OF UNIT FOR GRAPHIC SYMBOL MARKINGS

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



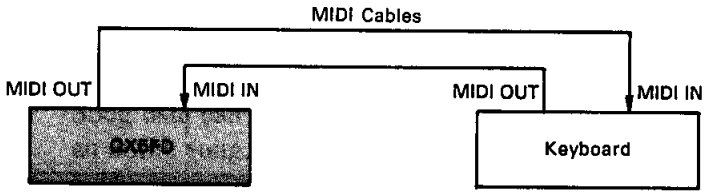
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This information on safety is provided to comply with U.S.A. laws, but should be observed by users in all countries.

HOW DOES THE QX5FD WORK?

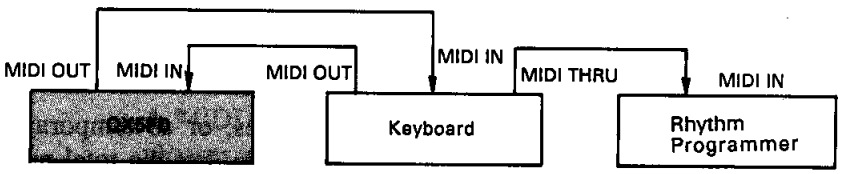
This section will give you a quick overview of the QX5FD. When you play a MIDI keyboard, it sends messages indicating which note was played and how strongly, sustain pedal on/off, etc. The QX5FD digitally records these messages and can "play" them back, causing a MIDI tone generator to produce sound. To use the QX5FD, you need a MIDI keyboard and at least one MIDI tone generator or synthesizer.

Of course, if your keyboard has a built-in tone generator, you can connect the QX5FD MIDI OUT back to the MIDI IN of your keyboard (synthesizer, electronic piano, etc.). A multi-timbral synthesizer such as the DX11 is ideal for such applications, since it can act as up to 8 independent tone generators, each controlled by a different MIDI channel.

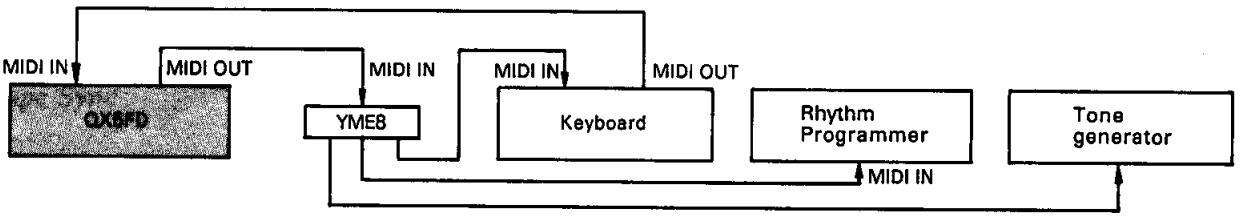


In this type of setup, however, make sure that the messages received at MIDI IN of your keyboard are not being re-transmitted from its MIDI OUT, creating a loop. (I.e., if your keyboard has a Merge function, turn it Off.)

If you have a Rhythm Programmer such as the RX17, you can synchronize it to the QX5FD. Connect the QX5FD MIDI IN to the Rhythm Programmer's MIDI IN. (In the following diagram, the synchronization signals from the QX5FD MIDI OUT are re-transmitted from the DX11 MIDI THRU and reach the Rhythm Programmer.)



If the QX5FD will be controlling three or more devices, we suggest you use a MIDI Thru box such as the YME8 or the MJC8. (MIDI signals can become delayed or distorted when sent through three or more THRU jacks.)



RECORDING

The QX5FD can record MIDI data in three ways.

Realtime — Notes are recorded in the timing that you play them.

Punch In — The same as realtime recording, but you can set the point at which recording will begin and end.

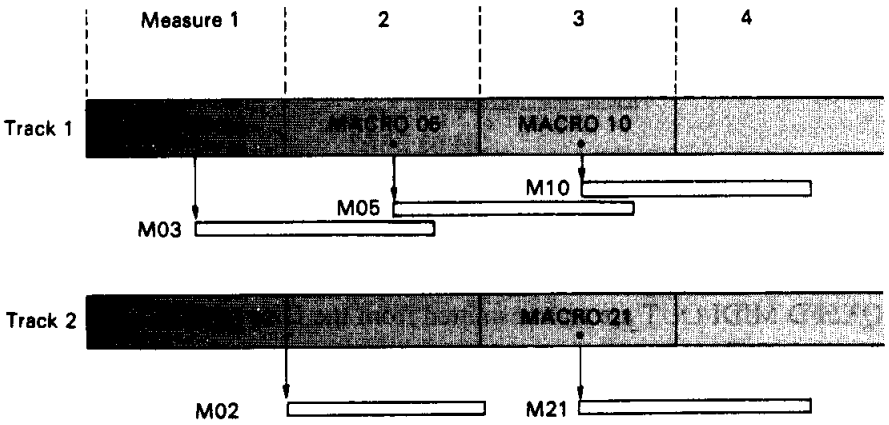
Step — You can use a MIDI keyboard to enter notes and specify their timing and gate time using the QX5FD panel switches.

EIGHT TRACKS

8 tracks of MIDI data can be stored, edited, saved and loaded independently. Recording is always done on track 1. When you have finished recording a track, you can exchange track 1 with an empty track (2-8) and record again. Channel information is recorded, and each track can contain independent MIDI data of up to 16 channels. Tracks can be joined, mixed, cut, deleted, exchanged, etc. Each track can be turned on or off for playback.

THIRTY-TWO MACROS

Think of a macro as a "floating track." A macro contains the same data as a track, and tracks and macros can be freely exchanged. A macro number can be inserted at any point in a track. (See Event Edit, Macro page 28.) When playback comes to that point in the track, the data in the macro will begin playing along with the data in the tracks. Up to 4 macros can be playing at once. A Macro can be called any number of times from any number of tracks.



Macros are handy for repeated phrases, or as temporary storage. There is no limit to the capacity of a track or macro, but the total number of recorded notes (tracks + macros) must be less than 20,000. (If Note On Velocity data is recorded, capacity is about 15,000 notes.)

EDITING

Since the QX5FD "records" data, not sound, you have complete freedom to change a performance after it has been recorded. There are three ways to edit what you have recorded.

Event Edit

Edit individual MIDI "events". You can go in and change, insert, delete, or change the timing of individual notes or data such as Program Change messages.

Measure Edit

Edit individual measures. You can delete, insert and copy measures, and selectively remove or change certain data from specified measures.

Track Edit

Edit whole tracks. You can exchange, copy, mix, erase, and connect tracks, and transfer specified data to another track or macro.

LOAD/SAVE

Data recorded in the QX5FD will *be erased when the power is turned off.* If you want to keep your recording, you must save it to disk. Use 3.5" dual-side double-density double-track (2DD) floppy disks, and prepare them for use using the Format job explained on page 55. The format is 9 sectors per track (720 kBytes) and is compatible with MSX-DOS and MS-DOS.

FEATURES

The QX5FD offers an unprecedented array of features in a compact unit, just the right size for placing on top of a keyboard. Some outstanding features;

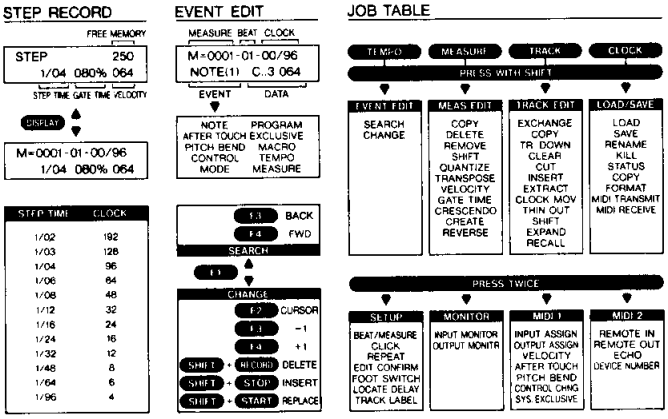
Tracks & Macros	8 tracks and 32 macros give you great versatility in your composing and arranging. Tracks can be given a one-character label to help you remember the contents.
Memory Capacity	You can record approximately 20,000 notes (15,000 when recording velocity data). Recording controller data (Aftertouch, etc.) will also use memory.
Disk Drive	Song data can be saved to and loaded from the built-in 3.5" floppy disk, either as an entire song, as individual tracks, or just the setup used in a song.
Data Entry Dial	The front panel dial can be used for speedy entry of data, position, or settings.
Relative Tempo	Tempo changes can be inserted at any point.
3 Position Memories	Three measure positions can be stored and jumped to at the touch of a switch.
Locate	Recording and playback can be set to automatically begin from a certain measure.
Punch In/Out Recording	You can set recording to begin and end at specified measures.
Step Recording	A MIDI keyboard and the QX5FD panel switches can be used to enter complex phrases note by note.
Unlimited Editing	Recorded data can be edited by track, measure or event.
MIDI re-channelizing	Each incoming and outgoing channel of MIDI messages can be independently re-assigned to a different channel.
Tape Sync	An FSK tape sync signal can be recorded on tape to synchronize the QX5FD with a multitrack recorder.
Backlit LCD	The two-line 16-character LCD is backlit for easy visibility even in dim lighting.

PRECAUTIONS

LOCATION	Avoid placing the QX5FD in direct sunlight or close to a source of heat. Also, avoid locations in which the device is likely to be subjected to vibration, excessive dust, cold or moisture.
HANDLING	Avoid applying excessive force to the switches, dropping or rough handling of the unit. While the circuitry is of reliable integrated circuit design, the QX5FD should be treated with care.
POWER CABLE	Always grip the plug directly when removing it from an AC receptacle. Removing the plug from the AC receptacle by pulling the cable can result in damage to the cable, and possibly a short circuit. It is also a good idea to disconnect the QX5FD from the AC receptacle if you don't plan to use it for an extended period of time.
CLEANING	Use only a mild detergent on a cloth, and dry with a soft cloth. Never use solvents (such as benzine or thinner) since they can melt or discolor the finish.
ELECTRICAL STORMS (LIGHTNING)	Computer circuitry, including that in the QX5FD, is sensitive to voltage spikes. For this reason, the QX5FD should be turned off and unplugged from the AC receptacle in the event of an electrical storm. This precaution will avoid the chance that a high voltage spike caused by lightning will damage the device.
ELECTROMAGNETIC FIELDS	Computer circuitry is also sensitive to electromagnetic radiation. Television sets, radio receivers, transmitters and transceivers, and wireless microphone or intercom systems are all potential sources of such radiation. The QX5FD should not be placed too close to such devices.
FLOPPY DISK	When inserting a floppy disk in the disk drive, make sure it is facing the correct way (label up). Do not remove the disk while the disk access LED is on.

OPERATION GUIDE

The QX5FD Top Panel contains a JOB TABLE to show how to enter job groups, and quick guides of EVENT EDIT and STEP RECORD. It is for your reference when you operate the QX5FD.



JOB TABLE

The four main function switches (Tempo, Measure, Track and Clock) each access two job groups, one group when double-clicked, and one group when pressed while holding [SHIFT]. To exit from a Job mode, press one of these function switches or [SHIFT] + [RESET].

EVENT EDIT

This guide contains an illustration of the LCD, a list of events and a diagram of EDIT operations. For details see EVENT EDIT (page 22).

Search

When the cursor is hidden, use [F3] (◁), [F4] (▷) to move through track 1 searching for events you want to change. Press [F1] (JOB) to switch from Search to Change. The cursor will start blinking.

Change

Use [F2] (CURSOR) to select what you will change (Position, Event, Data), and use [F3] (◁) [F4] (▷) to change the value.

Finally, Delete, Insert or Replace the event using [SHIFT] and [RECORD] / [STOP] / [START].

After you have Deleted, Inserted, or Replaced the event, you will automatically return to Search mode (cursor hidden).

STEP RECORD

This guide contains illustrations of the LCD and a table showing the number of clocks per step. By pressing [DISPLAY], you can display the current position measure, beat, clock. For details see STEP RECORDING (page 17).

Step Time

Time value of the note (1/2 – 1/96).

Gate Time

Length the note is held, displayed as a percentage of the Step Time.

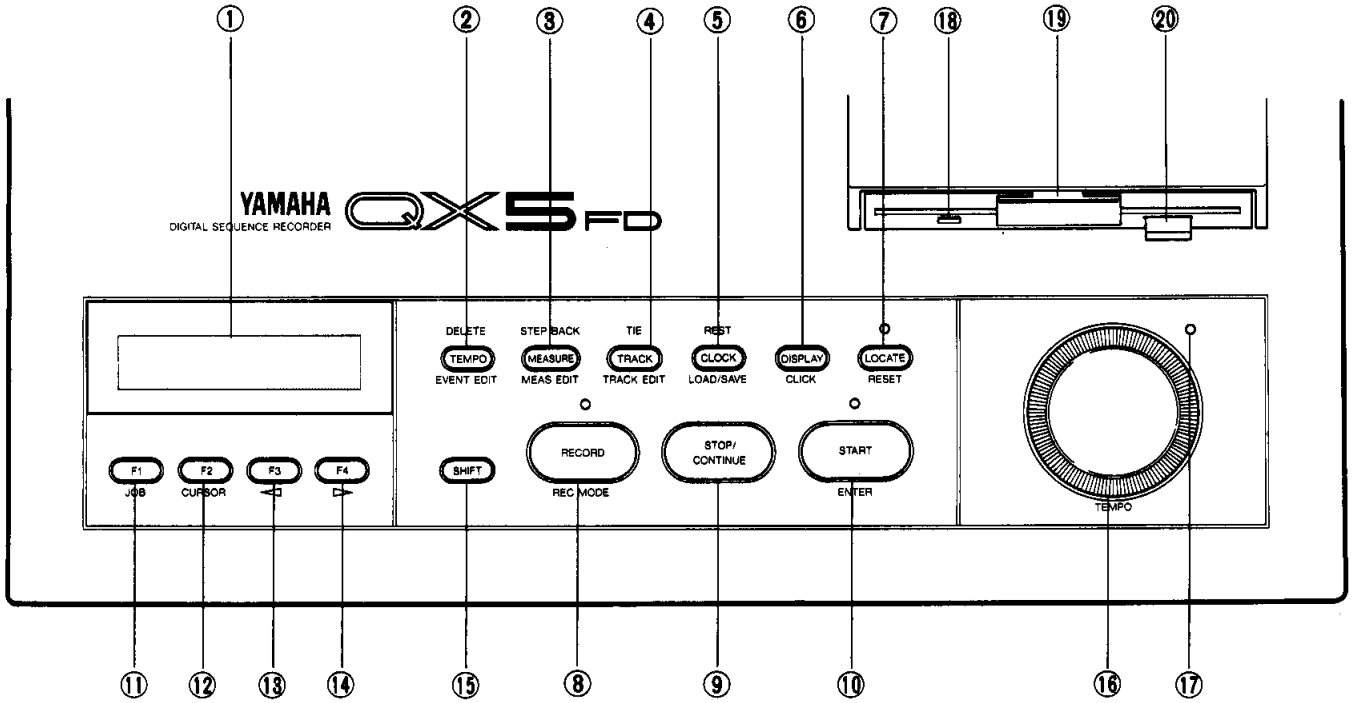
Velocity

Force with which the note is played (1 – 127).

Free Memory

Unused memory in blocks of approximately 80 notes.

FRONT PANEL



① ***LCD*** — A two-row 16-character Liquid Crystal Display, backlit for high visibility.

★ **The Job Table (page 5) describes the functions of the following 4 switches when pressed with [SHIFT] and when double-clicked.**

② ***TEMPO*** — Display and change the current tempo. While [SHIFT] is pressed, you can recall and set the Tempo Memories.

③ ***MEASURE*** — Move through the measures of a song (fast forward and rewind). While [SHIFT] is pressed, you can recall and set the Measure Memories.

④ ***TRACK*** — Each track can be switched on or off. [F1]-[F4] switch tracks 1-4. While [SHIFT] is pressed, [F1]-[F4] switch tracks 5-8.

⑤ ***CLOCK*** — The QX5FD can be controlled by its own internal clock, MIDI clock, or tape (FSK) clock. While [SHIFT] is pressed, the Clock Output can be turned on or off.

⑥ ***DISPLAY [CLICK]*** — Select display mode. Tempo, Measure, Track and Clock can each have their own display (with help message) or all be shown in one display (no help messages). When pressed with [SHIFT], the click is turned on or off.

⑦ ***LOCATE [RESET]*** — When this is on, pressing [START] will begin recording or playback from the measure in the first (left) Measure Memory. The LED indicates Locate On. You can loop between the current measure and the first Measure Memory by pressing [SHIFT] + [START]. By pressing [SHIFT] with this switch, you can abort the current operation.

⑧ ***RECORD [REC MODE]*** — Enter record mode. When [RECORD] is pressed with [SHIFT] the Record Mode will change from Realtime to Punch-In to Step Record.

⑨ ***STOP/CONTINUE*** — Stop recording or playback. If pressed again, play will continue from that point. If pressed after [RECORD], recording will begin from that point.

⑩ ***START [ENTER]*** — Start recording or play from the beginning of the song. When editing, executes the selected function.

★ **In the four main displays (Tempo, Measure, Track, Clock), switches [F1]-[F4] perform the function indicated in the LCD above the corresponding numbers [F1]-[F4] as explained in DISPLAY, page 11.**

⑪ ***F1 [JOB]*** — When performing a Setup, Edit or Load/Save function, [F1] steps through the jobs.

⑫ ***F2 [CURSOR]*** — When performing a Setup, Edit or Load/Save function, [F2] moves the cursor.

⑬ ***F3 [◁]*** — When performing a Setup, Edit or Load/Save function, [F3] [◁] decrements the data indicated by the cursor.

⑭ ***F4 [▷]*** — When performing a Setup, Edit or Load/Save function, [F4] [▷] increments the data indicated by the cursor.

⑮ ***SHIFT*** — Used to access the functions printed in purple below the keys. Holding down [SHIFT] reverses the movement of the [JOB] and [CURSOR] keys. For some operations, holding down [SHIFT] makes ◁ ▷ and the dial move in larger steps.

⑯ ***DIAL*** — The dial can be used in the same way as the ◁ ▷ keys to scroll through events and change data. Especially with large amounts of data, using the dial can be much quicker and easier than using the ◁ ▷ keys. For example when searching through events (Event Edit mode) or entering data over a wide range of values (all modes), a few turns of the dial will take you where you need to go.

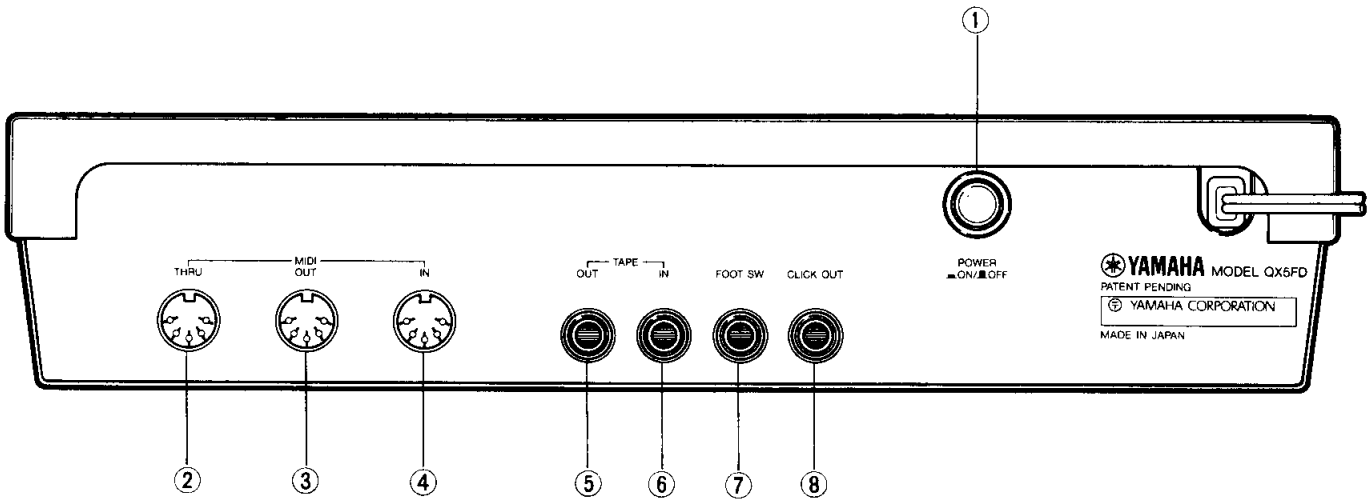
⑰ ***TEMPO LED*** — In recording and playback modes, this LED flashes to indicate the currently set tempo.

⑱ ***DISK ACCESS LED*** — This LED indicates that the floppy disk is being read or written to. *When this LED is lit, do not attempt to remove the floppy disk.*

⑲ ***DISK DRIVE*** — A 3.5" 2DD floppy disk drive for saving and loading data is built in.

⑳ ***EJECT BUTTON*** — Press this button to eject the floppy disk from the drive.

REAR PANEL



① ***POWER*** — A push-on, push-off power switch.

② ***MIDI THRU*** — All messages received at MIDI IN are retransmitted unchanged from this terminal.

③ ***MIDI OUT*** — Sequence playback and other MIDI messages are sent from here. You may set the MIDI OUT to echo back messages received at the MIDI IN terminal.

④ ***MIDI IN*** — MIDI messages coming in to this terminal can be recorded by the QX5FD.

⑤ ***TAPE OUT*** — In play and record mode, this sends an FSK tape sync signal.

⑥ ***TAPE IN*** — In play and record mode, this receives an FSK tape sync signal.

⑦ ***FOOT SW*** — An optional footswitch such as the FC4 or FC5 can be used to start, stop or continue playback or recording.

⑧ ***CLICK OUT*** — The metronome signal is output from this jack to an external mixer or amp. The internal click tone will be disabled if this is connected.

SIMPLE RECORDING EXAMPLE

Here's a short example to show you how easy QX5FD operation is. Make MIDI connections as shown on page 1. Turn the QX5FD power on.

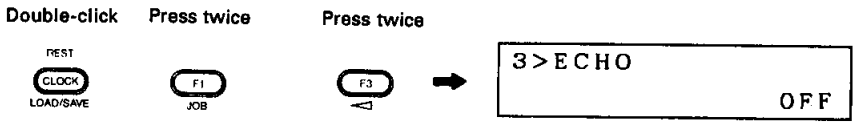
Echo

When the power is turned on, the QX5FD will be set to re-transmit or *Echo* incoming recorded messages to the tone generator(s) connected to the QX5FD MIDI OUT so that you can listen to what is being recorded.

If you are using a keyboard with a built-in tone generator (such as the DX11) and you can already hear the notes as you record them, it is a good idea to set your keyboard to "Local Off" so that playing the keyboard will send messages from the keyboard's MIDI OUT, but will not make the internal tone generator produce sound. (See the owner's manual for your keyboard.) The messages from the keyboard will be recorded by the QX5FD and "echoed back" to the tone generator.

If you cannot set your synthesizer to "Local Off" mode, your synthesizer will be sounding each note twice; once played by you from the keyboard, and once echoed back from the QX5FD. Therefore, you will need to turn the QX5FD Echo off, as follows.

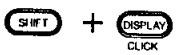
Double-click the [CLOCK] switch. Press [JOB] twice to get the Echo display, and press ◁ twice to make it read "OFF".



If you are using a tone generator that is separate from your keyboard, you should leave Echo set ON so that you can hear what you play.

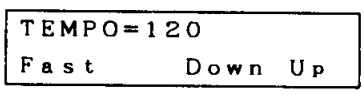
Click

While holding [SHIFT], press [CLICK] to turn the internal click (metronome) on/off. (Page 57 explains how click can be set to sound automatically.)



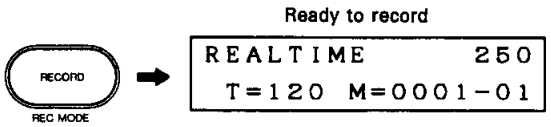
Tempo

Press [TEMPO] and use the ◁ ▷ keys or the dial to set a comfortable tempo.

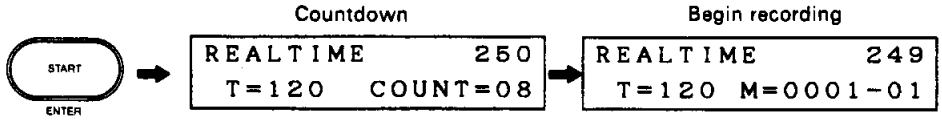


Recording

This completes the basic setup for recording. Press RECORD. (The Record LED will light.)



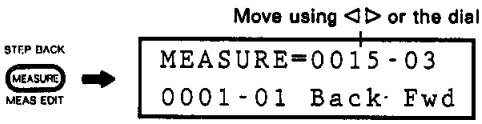
Then press START. (The Start LED will light.) If the metronome is on, you will get a eight-beat countdown. After the countdown, recording will begin.



Play your keyboard for a few measures. When you have played enough, press STOP/CONTINUE. Both Record and Start LEDs will go off.

Playback

Pressing START will playback (from the beginning) what you just recorded. To "rewind" or "fast forward", press MEASURE and use ◁ ▷ or the dial to move through the measures.



STOP/CONTINUE is dual-function. If pressed during playback or recording, it will make the QX5FD *stop*. Press it again to *continue* playback or recording from the current position in the song. For example, you can press STOP/CONTINUE to stop playback, use ◁ ▷ or the dial to find the measure you want, and press STOP/CONTINUE again to continue from that point.

START will always playback or record from the beginning of the song. (You can use the Locate function to set the point where START will begin from. See Locate, page 16.)

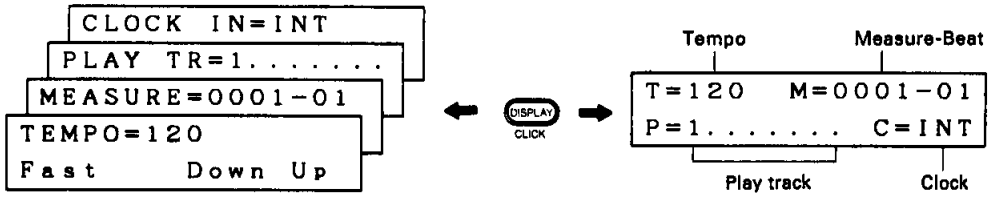
This should give you an idea of what MIDI recording is like. To understand the possibilities of the QX5FD, please read the rest of this manual carefully, and try out each function.

MAIN FUNCTIONS

The four main functions (Tempo, Measure, Track and Clock) can each be accessed by pressing [TEMPO], [MEASURE], [TRACK] or [CLOCK] and using [F1]-[F4] to change the setting. You have a choice of displays for these 4 functions.

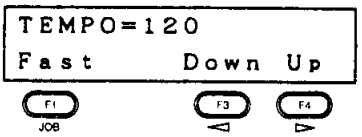
DISPLAY

You may choose to display all four main function settings combined, or separately. To switch display modes, press [DISPLAY]. When displayed separately, the lower line of the LCD will remind you what [F1]-[F4] do (ie. a "help" message) for each function. Whichever display is selected, [TEMPO], [MEASURE], [TRACK] and [CLOCK] will select the function, and [F1]-[F4] will change the settings. In the "combined" display, the blinking cursor indicates which function is selected. Once you are familiar with the QX5FD, the "combined" display may be more convenient, but in this manual the illustrations will always be the "separate" display.



TEMPO

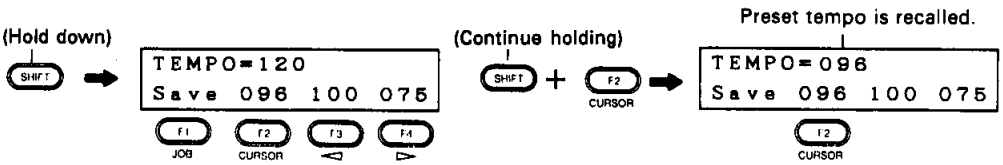
Press [TEMPO] and use [F3] and [F4] or the dial to change the tempo between 20 and 300, indicating the number of quarter notes per minute. The tempo LED will blink to indicate the current tempo. While you hold down [F1], the tempo will be multiplied by 4. This is useful when you want to quickly find a certain section while playing back. [F2] has no effect in Tempo mode.



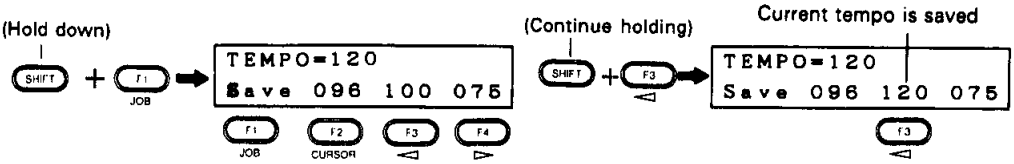
Tempo Memory

You can preset 3 different tempo for instant recall. Press [SHIFT] and the display will show the three preset tempo. Pressing [F2]-[F4] while holding [SHIFT] will set the tempo to the selected value. To change a tempo preset, continue holding [SHIFT] and press [F1]. The cursor will start blinking on the "S" of "Save." Now press [F2]-[F4] to save the current tempo in a preset.

Recall Tempo Memory

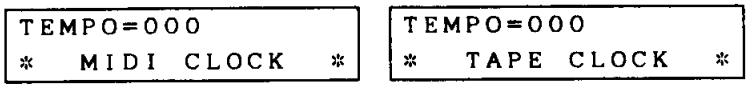


Save Tempo Memory



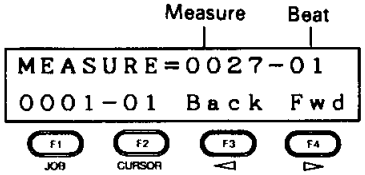
NOTE

If Clock is set to MIDI or TAPE (see Clock, page 14), you will not be able to change the tempo. It will only be displayed. If there is no MIDI clock producing device connected, or if the tape is stopped, the displayed tempo will be 0.



MEASURE

Press [MEASURE] and use [F3] and [F4] or the dial to move backward or forward. [F1] will take you to measure 1 (the beginning of the song) and [F2] will move to the beginning of the current measure (beat 1).



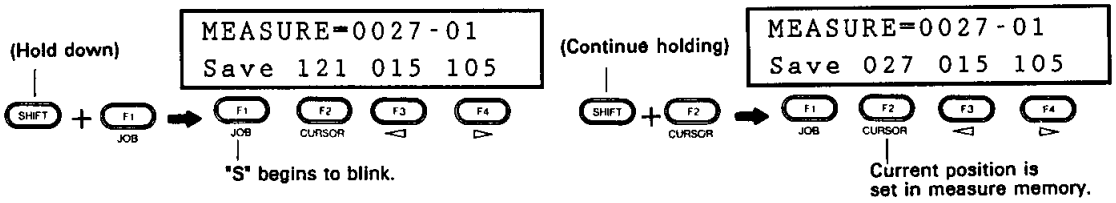
If you are at beat 100 or beyond, the display will show the last two places. (It is possible, though unusual, to have more than 100 beats in a measure.) If more than one track is on, the measure marks of the lowest-numbered track will be used. (It is possible to have different time signatures for different points in each track. See Beat/Measure, page 57.)

Measure Memory

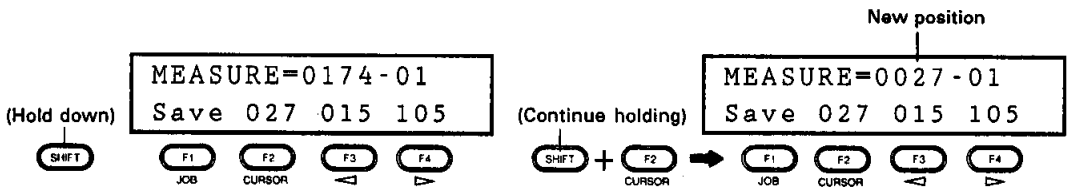
Three measure memories can be set to locations in your song where you frequently need to go. For example, suppose measure 27 was the beginning of the chorus. It would be useful to set a measure memory to "27" so that you could jump there at one touch instead of using the ◁ ▷ keys or the dial.

When the Locate function is on (red LED lit), the QX5FD will always start from the location set in the measure memory [F2] as explained in Locate, page 16. Measure memory [F2] is also used in Loop Playback (page 65). [F3] and [F4] measure memories are used as the Punch In and Punch Out points (page 17.)

Set Measure Memory



Recall Measure Memory



TRACK

Each of the 8 tracks can be set to Off, Muted, or On. This is useful when you want to hear certain parts by themselves, or hear what the song sounds like without a certain part. For example, suppose you had two different solos in separate tracks. You could alternately mute one and then the other to see which sounded better. Press [TRACK] and use [F1]-[F4] to switch tracks 1-4. Pressing [F1]-[F4] while holding [SHIFT] will switch tracks 5-8.

When data is created in a track as a result of a Measure edit (page 30) or Track edit (page 40) operation, the new track will automatically be turned On.

Track On/Off

While stopped, you can switch tracks 1-8 On or Off. (This will automatically return you to measure 1.) When a track that contains data is turned on, its number will be displayed. When a track that has no data (or has come to the end of its data) is switched on, a "*" is displayed. As you near the end of a multi-track composition, the track numbers will change to "*" as they run out of data. In the example below, tracks 1-5 are on, but tracks 3 and 5 have finished playing.

```
PLAY TR=12*4*...
Tr1 Tr2 Tr3 Tr4
```

Track Mute

During playback, you can switch tracks between On and Mute (indicated by "–"). A Muted track will not send data. When STOP is pressed or the data in the track ends, Muted tracks are reset to On. In the example below (during playback), tracks 1,2,3 and 8 still have data, but only 3 and 8 are playing.

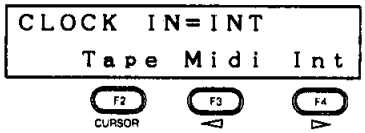
```
PLAY TR=_3**..8
Tr1 Tr2 Tr3 Tr4
```

NOTE

To help you remember the type of data in each track, you can assign a Track Label (a single alphabetical character A–Z) to each track as explained in Track Label, page 58. If you have done so, the Track Label A–Z will be displayed instead of the Track Number 1–8.

CLOCK

Press [CLOCK] and use [F2]-[F4] to select the master timing clock for the QX5FD.

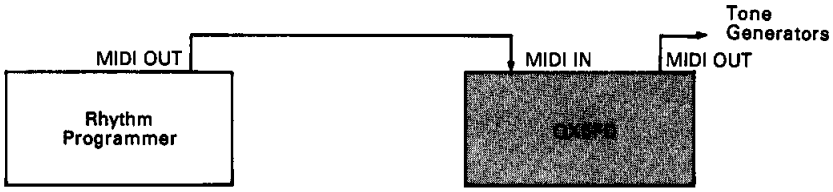


Internal Clock

The QX5FD internal clock determines the tempo. When Internal Clock is selected, you can change the tempo using the QX5FD panel keys or dial (See Tempo, page 11). Normally, you will use the QX5FD set to Internal Clock.

MIDI Clock

A MIDI clock-producing device (rhythm programmer, sequencer, etc.) connected to the QX5FD MIDI IN will determine the tempo. Set the QX5FD to MIDI Clock if a Rhythm Programmer or another sequencer is the master timing source for your setup, as shown in the following example.

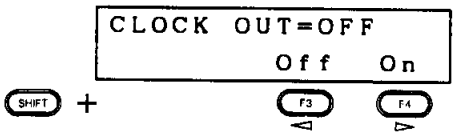


Tape Clock

An FSK tape sync signal received at the Tape In jack will determine the tempo. Set the QX5FD to Tape Clock if you are synchronizing it to a tape recorder such as the MT2X, as shown in the example in Tape Sync, page 67.

Clock Out

You can choose whether or not to transmit clock (timing) data from MIDI OUT and Tape Out. Hold down [SHIFT] and use [F3] and [F4] to turn Clock Out off and on.

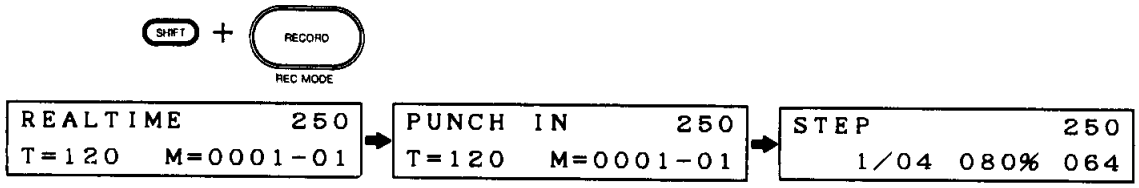


If you switch this during playback, the display will change immediately, but the clock signals will begin on the next beat. Tape Out will not send clock data while the QX5FD is stopped.

All recording is done on track 1. In order to record, track 1 must be on. (see Track, page 13) When you press [RECORD], the Record LED will light, the display will show the currently selected Record Mode (Realtime, Punch In, Step), and the measure counter will move to the beginning of the current measure. When the Record LED is lit, you will not be able to enter other modes. Press [RECORD] again to exit record mode.

Recording Mode

There are three ways to record; Realtime (record your performance just as you play), Punch In (record only specified measures of a song) and Step (record notes one by one). Change the Record Mode by pressing [REC MODE] while holding [SHIFT]. (When power is first turned on, Realtime Record is selected.)



Recording Procedure

Since recording is always done on track 1, you must be sure to transfer the recorded data to another track 2–8 before recording a different part. Thus, recording procedure will usually be;

1. Record (on track 1)
2. Exchange track 1 with an empty track or macro (see Exchange page 41)
3. Record another part (on track 1), etc.

Start and Continue

In all three recording modes, you may either START recording from measure 1 or CONTINUE recording from the beginning of the current measure. When you enter Record mode, you will always be returned to the beginning of the current measure. However if another sequencer or rhythm programmer is connected to the QX5FD MIDI IN, it is possible that it has sent a Song Position Pointer message to the QX5FD making it move to the middle of a measure. If you Continue recording from the middle of a measure, actual recording will start from the beginning of the *next* measure.

Recall

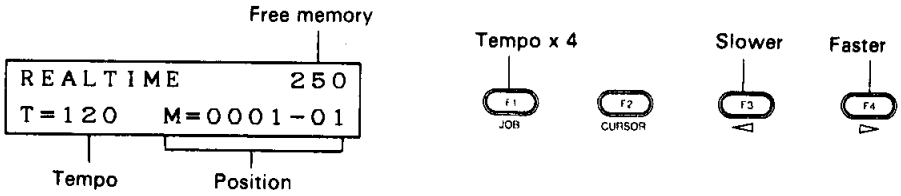
When you begin to record, the old data in track 1 will be erased. If you START recording (from the top) all the data in track 1 is erased. If you [CONTINUE] recording (from the middle) all subsequent data in track 1 is erased. However, this old data can be recovered using the Recall function (page 48).

NOTE

During recording, if free memory goes below 009, this message will be displayed. Press any switch to return to the previous display.

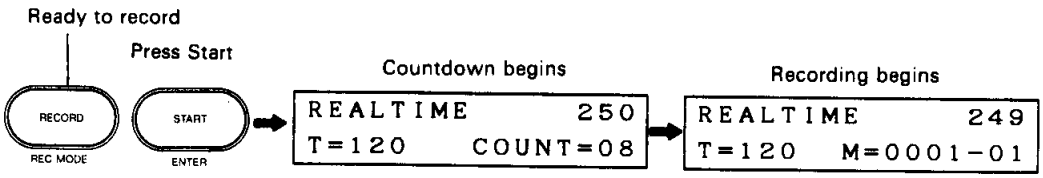
REALTIME RECORDING

Realtime recording is where the QX5FD records your performance just as you play it. The number in the upper right indicates the size of free memory in blocks of about 80 notes (without velocity). In Record mode, holding down [F1] will speed the tempo up x4, and [F3] [F4] and the dial will decrease and increase tempo just as in Tempo mode. Tempo memories (page 11) can be recalled, but not saved.



Countdown

To record from the beginning, press [START]. To record from measure 1 or the current position, press [CONTINUE]. If Clock=Internal, you will get a 2-measure countdown (metronome and display) before recording begins. You can send a Program Change message during the countdown, and it will automatically be recorded at the top of the measure you begin recording on. If Clock=MIDI or Tape, there is no countdown. Also, if you have set Click to Manual (see Click, page 57) and turned it off (see Click, page 65), there will be no countdown.



Measure Marks

Whether or not the metronome automatically comes on during recording will depend on the Click setting (page 57), but you can always turn it on/off by pressing CLICK while holding [SHIFT]. The metronome is accented on the first beat of each measure. If tracks 2-8 are playing, the measure marks (page 29) in those tracks will determine how the measure marks are recorded. If no other tracks are playing, the Beat/Measure setting (page 57) will determine the measures. (You can take advantage of this to produce some interesting polyrythms!) If track 1 is shorter than other tracks and the current measure is past the end of track 1 when you continue recording, empty measures will be filled in appropriately.

Stop Recording

To stop recording, press [STOP]. The Record and Start LEDs will go off, and the display will show "Executing", then return to the previous mode.

Locate

In Realtime Record, you can use the Locate function to start recording from a specified measure. If you press [START] when Locate is off, you will begin recording (or playback) from measure 1. But if you press [START] when the Locate is on, recording (or playback) will begin from the measure memory [F2] (page 12). If you press [START] during recording, you will begin recording from the measure memory, and data already recorded will be lost. A Start message received via MIDI will make the QX5FD start play or record from measure 1, regardless of the Locate Status. See also Loop Playback, (page 65).

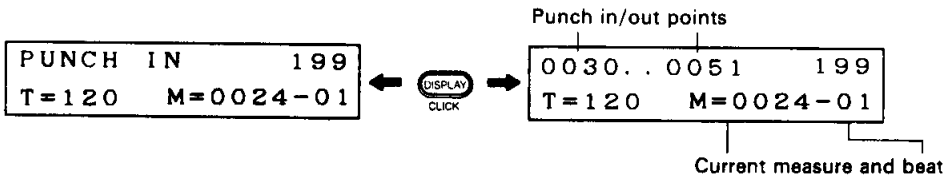
PUNCH IN RECORDING

Punch In recording is much like Realtime recording. However, even though both the Record and Start LEDs will be on, actual recording will be done only between specified measures.

Set the Punch In/Out points using the Measure Memory function (page 12). F3 is the Punch In point, F4 is the Punch Out point.

Enter Punch In Record mode

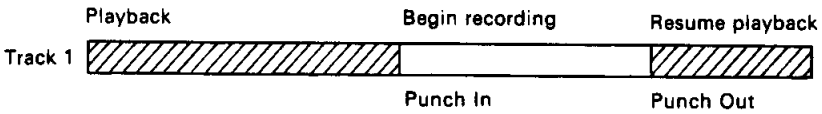
Press DISPLAY to show either the current position or the beginning (punch in) and end (punch out) of recording.



When you press CONTINUE or START, the QX5FD will playback normally until it reaches the Punch In point, when recording will begin. When it reaches the Punch Out point, playback will resume. There is no countdown for Punch In recording.

Punch In/Out Points

Suppose you wanted to rerecord a few measures in the middle of a song. Set the Punch In/Out points, move to a spot a few measures before the section, and Continue recording. Play along with the already recorded performance. When you reach the Punch In point, the recorded part will drop out, and your new performance will be recorded. When you come to the Punch Out point, the old performance will reappear.



When you press STOP, the measure counter will return to the point where you started or continued playback before punch in. This is very handy when making repeated tries over the same section. You can set a footswitch (page 58) to CONTINUE/STOP, and if you make a mistake, press the footswitch and try it again! It may be helpful to set the F2 mesure memory location a few measures ahead of the punch in point at F3. This makes it easy to rehearse the punch in.

NOTE

In Punch In Record, you can use the Locate function to start playback from a specified measure. See page 16.

STEP RECORDING

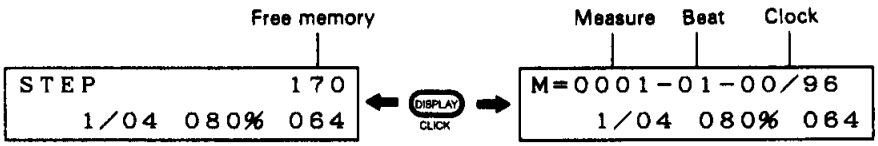
This is where you use the QX5FD keys and a MIDI keyboard to enter data step by step, to create phrases that would be difficult to play in real time.

Measure marks in the newly recorded track are created according to the Beat/Measure setting, and are not affected by measure marks of tracks 2-8.

To speed up data entry, Gate Tie, Velocity, Ties, and Rests can be entered using MIDI controllers such as Modulation Wheel, Data Entry Slider etc. (Quick Input Via MIDI, page 21.)

Step Recording Display

By pressing [DISPLAY], you can choose between displaying the amount of free memory, or displaying your current position (measure, beat, clock). You will probably want to display the position most of the time.



Clock

For the QX5FD, the smallest subdivision of time is the "clock". One QX5FD internal clock is a 1/384th of a whole note. Thus, a whole note is 384 clocks, and a quarter note is 96 clocks. In the case of 4/4 time, each beat will have 96 clocks. You can see that the number of clocks per beat will differ according to the Beat/Measure setting (page 57). For x/4 time, 96 clocks per beat; for x/8 time, 48 clocks per beat; and for x/16 time, 24 clocks per beat. (A Step time/Clock chart is printed on the front panel of the QX5FD.)

Begin Recording

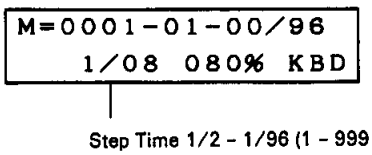
When you press [START] or [CONTINUE], Step Recording will begin. Notes you play on the MIDI keyboard will be recorded at intervals of the step time. The actual timing with which you press the keys does not matter. For example if the Step Time is 1/16, each note will be a sixteenth note. To enter chords, press several notes together. To record single notes, each note must be released before the next is pressed. You can send Program Changes from the keyboard as usual, and they will be recorded along with the notes, but without a time interval. Only Notes and Program Changes will be recorded in Step Record mode.

STEP RECORDING PARAMETERS

As usual, [CURSOR] moves the blinking cursor, and ◁ ▷ and the dial change the data at the cursor.

Step Time

Step Time is the time value of the note. Each time you enter a note or chord, the position will advance by one of these steps, Step Time is variable from 1/2 to 1/96. (See also Quick Input Via MIDI, page 21.)



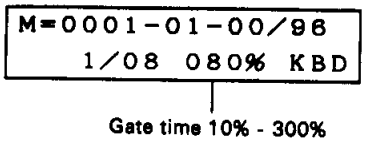
Usually you will want the Step Time to be a regular note value, but you may also specify a Step Time of 1–999 Clocks (1/384th of a whole note). Hold [SHIFT] and use ◁ ▷ or the dial to specify the Step Time in clocks. If the Step Time cannot be expressed as a note fraction, it will be indicated in clocks.

999,...,193,1/2,191,...,013,1/32,011,010,009,1/48,007...,1/96,...001

This can be useful when you need to enter notes of irregular length.

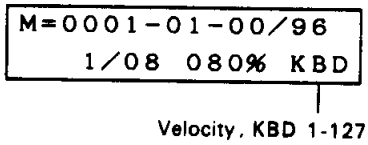
Gate Time

Gate Time is the percentage of the Step Time the note will sound. If gate time is 100%, a quarter note will last exactly 96 clocks. A gate time of 10% would be the same as playing staccato. Use [CURSOR] to move the blinking cursor to Gate Time, and use ◁ ▷ to set it between 10% and 300% in steps of 5%. (Also see Quick Input Via MIDI, page 21.) The default Gate Time is 80%.



Velocity

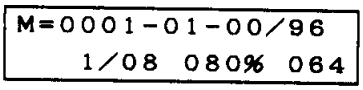
Velocity can be set to a fixed value (1-127) or set to KBD, when the velocity produced by the keyboard will be used. (Also see Quick Input Via MIDI page 21.)



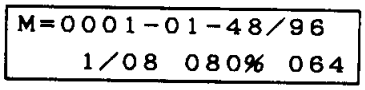
STEP RECORDING EXAMPLE

As an example, enter Step Recording mode and press [START]. Press [DISPLAY] to select the position display. Press [CURSOR] to move the blinking cursor to Step Time and use ◁ ▷ to make it read 1/8. Notes we enter now will be eighth notes. Press and release a note on the MIDI keyboard. Notice that our position is now M=0001-01-48/96. Each beat is 96 clocks (assuming Beat/Measure is 4/4), and an eighth note is half a beat. Press and release another note. The position is now M=0001-02-00/96, indicating the second beat of the first measure.

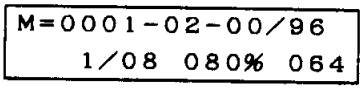
No notes yet



After the first note



After the second note



STEP RECORDING SWITCHES

In Step Recording mode, the [TEMPO], [MEASURE], [TRACK], [CLOCK] and [LOCATE] switches have the following functions.

Tempo (Delete)

Erase the previous event (Note or Program Change). If more than one event had the same timing, all will be erased.

Measure (Step Back)

Move back one step time interval without deleting anything.

Track (Tie)

This is valid only immediately after inputting a note. It extends the timing of that note by one Step Time. (Also see Quick Input Via MIDI, page 21.)

Clock (Rest)

This inputs a rest corresponding to the Step Time. (Also see Quick Input Via MIDI, page 21.)

Locate (Protect)

This will protect data that has already been Step Recorded. After pressing this, you will not be able to Delete data.

Shift + Tempo (Delete Measure)

Delete one measure.

Shift + Track (Insert Measure Mark)

Insert a Measure mark (page 29) at the current position. In Step Record mode, Measure marks are automatically created according to the Beat/Measure setting (page 57), but you can use this function to end the measure at any point, allowing you to input complex time signatures.

Shift + Measure (Separate a Chord)

If two or more notes were entered at the same timing in the last step, this will separate the notes by intervals of the step time. I.e., "Separate a Chord".

Shift + Clock (Fill Rests)

Fill the remaining part of the beat with rests.

Calculator

To assist you in calculating clocks (for example when programming "–tuplets" such as 5 over a quarter note), pressing F1 during Step Record will display the following calculator.

```
xxx*yy/zz=qqq.rr
```

The equation you specify in "x,y,z" will be calculated. "q" is the quotient, "r" is the remainder.

QUICK INPUT VIA MIDI

To speed up the Step recording process, you can specify MIDI notes and controller numbers to select Step Time, Gate Time, Velocity, Tie and Rest. This allows you to do most of your Step entry from a MIDI keyboard without touching the QX5FD.

While stopped (the START LED is off) in Step record mode, press JOB to get the display you want, and use CURSOR and the < > keys and dial to select the MIDI control number that you will use to input the data. When "Off" is selected, the data can be set only from the QX5FD.

For example, if you select control number 6 for Gate Time, moving a DX7 Data Entry Slider will adjust Gate Time. You might set Modulation Wheel (control number 1) to adjust Velocity, Data Entry –1/No (control number 97) to input a Tie, and Data Entry +1/Yes (control number 96) to input a Rest. You will see the QX5FD Gate Time and Velocity display change as you move the controller.

You can specify a note to select Step Times (i.e., the time value of the note). For example, you could press a C1 on your keyboard before inputting half notes (1/2), D1 before inputting quarter notes (1/4), etc. However, note numbers you specify here cannot be recorded as notes, so be sure to specify notes that you will not need to record in your song.


```
1>STEP TIME
1/02          C-2
```

1/02–1/96 (step) — Off, C-2–D#7 (note)

Select a MIDI note number to select each note value (1/2–1/96 note).

```
2>GATE TIME
             006
```

Off, 0–63

Select a MIDI controller (continuous type) to input Gate Time (10–95% of the note value).

```
3>VELOCITY
             001
```

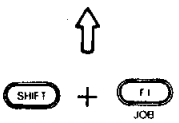
Off, 0–63

Select a MIDI controller (continuous type) to input Velocity.

```
4>TIE
             097
```

Off, 64–121

Select a MIDI controller (on/off switch type) to input Ties.




```
5>REST
             096
```

Off, 64–121

Select a MIDI controller (on/off switch type) to input Rests.

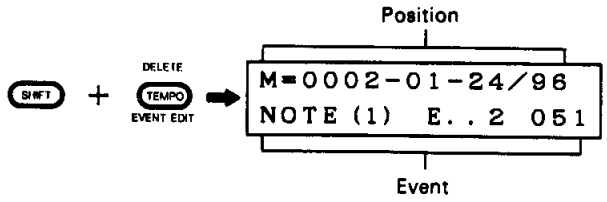
There is a table of MIDI control numbers on page 26.

NOTE

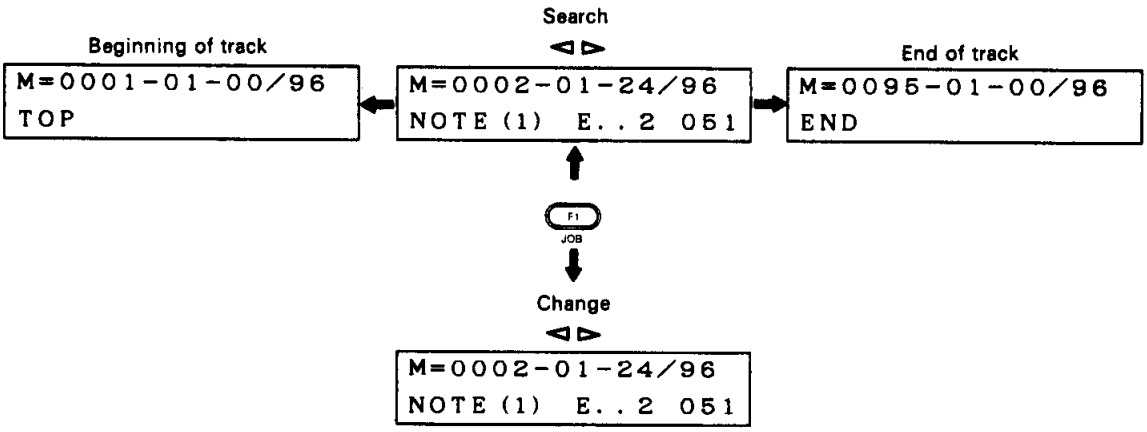
Gate Time can be adjusted via MIDI over a range of 10% to 95%. To set Gate Times of 100%-300%, use the QX5FD front panel switches.

EVENT EDIT

This is where you perform operations in track 1 on individual notes or other messages such as Sustain On/Off, etc. (These are called "events".) The upper line of the display will show the position of the event, and the lower line will show the event. To enter this mode, make sure that track 1 is on, and press [SHIFT] + [EVENT EDIT].



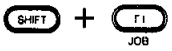
You can step through track 1 searching for events, and then change them or move them back and forward in time. Select between Search and Change by pressing [JOB]. As explained below in Search (see RECORD, STOP, LOCATE), you can save time by Searching only for events of a specified type or channel. (See RECORD, STOP, LOCATE in Search mode.)



SEARCH

The cursor is hidden. The switches will function as follows.

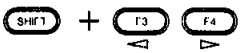
Enter Change mode.



Jump to the previously Inserted or Replaced event, and enter Change mode, ready to edit it again. This allows you to easily re-do your last edit. (This event will be remembered until you Delete an event, or enter Track Edit, Measure Edit, Record, or Load/Save mode. After executing an Event Edit operation, you can return to Play mode, see how your edit sounds, come back to Event Edit, and jump to the right place to re-do the last edit.)

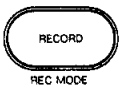
(dial)

Move to the previous or next event. If the newly displayed event is a note, it will be transmitted from MIDI OUT. By holding down ▷ you can play through the events in rapid succession (play backwards by pressing ◁).



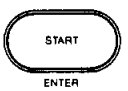
(SHIFT + dial)

Move to the previous or next measure.



Search for the next event of the type (e.g., Note, A.T., etc.) you previously specified by pressing Locate (see below).

Search for the next event of the channel (1–16) you previously specified by pressing Locate (see below).



Transmit the currently displayed event (if it is a MIDI event).

The currently displayed event will be put in the Search memory. You can search for events of the same type or channel as this event by pressing RECORD or STOP (see above). If the displayed event is not a MIDI channel message, a channel number will not be specified for Search (see STOP, above).

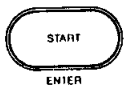
CHANGE

The cursor is blinking. Move the cursor and use ◁ ▷ and the dial to change the event type, channel, and data indicated by the cursor. (Each type of event will have different categories of data.) The switches will function as follows.

Return to Search mode. Any changes you have made will be cancelled. (You must finalize changes by Delete, Insert or Replace if you want to make them permanent. See "Execute the Change", next page.)

Move the cursor (hold SHIFT to move the cursor backwards) to select the data you want to change.

Change the data at the cursor. Holding SHIFT will change in larger steps. The dial can be used to change the data in the same way as the ◁ ▷ switches.



Transmit the currently displayed event (if it is a MIDI event). This allows you to check the changes you have made before you finalize by Deleting, Inserting, or Replacing.

Put the currently displayed event in the Search memory. (Same as in Search mode. See RECORD, STOP and LOCATE in "Search", page 23.)

When you want to change the position (timing) of an event, move the cursor to "M" and use ◁ ▷ or the dial to move the event by individual clocks. Hold SHIFT and use ◁ ▷ or the dial to move the event to the previous or next beat.

Execute the Change

Changes you make are not permanent until you Delete, Insert or Replace.

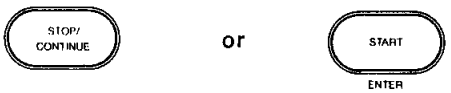
Delete: To delete the selected event, press [SHIFT] + [RECORD]. Even if you have changed the type and/or position (timing) of the event, the original event at the original position will be deleted.

Insert: To insert the modified event at the current timing, press [SHIFT] + [STOP]. The original unchanged event will remain at its original location. For example, if you modify only the position (measure-beat-clock) and Insert, you will get an additional event of the same type in a different position. If you modify only the data or type of message and then Insert, the new event will be inserted at the same position as the original event.

Change: To change the original event's data, type and/or position, press [SHIFT] + [START]. The original event will be deleted and a new event of the specified type, data, and position will be inserted. For example, if you modify only the position (measure-beat-clock) and then Change, you have in effect moved the original event to a new location.

If Edit Confirm (page 58) has not been turned off, you will be asked "Are you sure?".

Press [STOP] or [START] to abort or execute the change.



Go back to Change mode without executing.

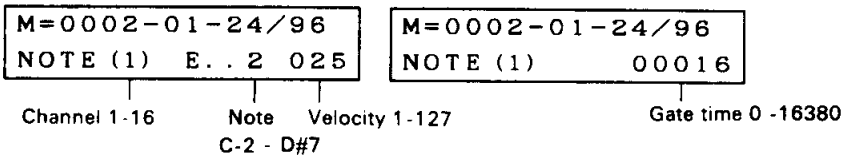
Execute the change and return to Search mode.

EVENTS

You will encounter 10 types of events in Event Edit.

Note

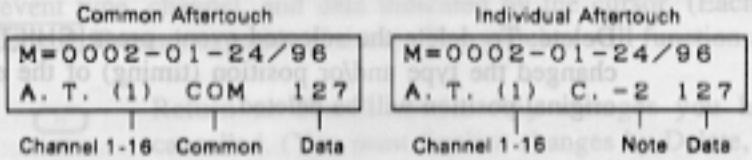
Note events are displayed as follows. Notice that the cursor has an "extra space to move" to change Gate time.



Gate time is the length of the note in "clocks" or 1/384 notes. It can be modified in steps of 4. Pressing ◁ ▷ or using the dial while holding [SHIFT] will move in steps of 100.

Aftertouch

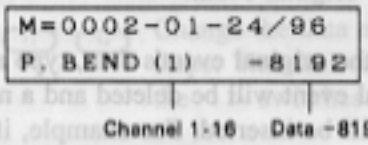
Aftertouch (Common and Individual) events are displayed as follows.



The Aftertouch on the DX7II (and most other MIDI keyboards) is Common Aftertouch, where a single Aftertouch value is sent for the whole keyboard.

Pitch Bend

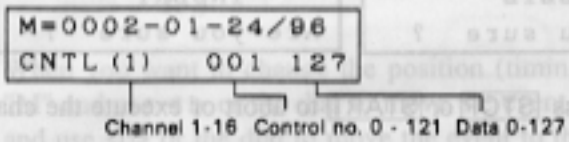
Pitch Bend events are displayed as follows.



The above display indicates that the Pitch Bender has reached the lowest position. By using ◁ ▷ or the dial + SHIFT, you can change the Pitch Bend data in steps of 100.

Control Change

Control Change events are displayed as follows.



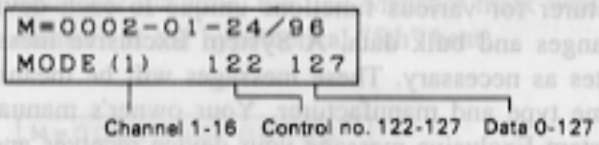
The example above would indicate that Modulation Wheel (Control #1) had reached its maximum position (127).

For your information, here are some of the frequently used MIDI Control Changes. Consult the owner's manual for your synthesizer or tone generator to learn which Control Changes it responds to.

Continuous Controllers (data is 0-127)	Switch Controllers (0 is Off, 127 is On)
1 Modulation Wheel	64 Sustain
2 Breath Controller	65 Portamento
4 Foot Controller	66 Sostenuto
5 Portamento Time	67 Soft
6 Data Entry Slider	96 Data Increment
7 Main Volume	97 Data Decrement

Mode Change

Mode Change events are displayed as follows.



Mode Changes are a special subdivision of Control Changes. Most of them require a certain data value, as shown in the following table. The QX5FD will let you enter data outside of these values, so be careful not to set a Mode Change that will not be understood by the receiving device. Consult the owner's manual for your synthesizer or tone generator to learn which Mode Changes it responds to.

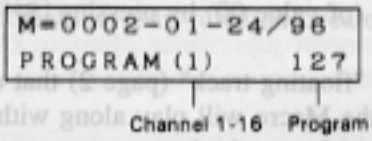
Mode Change	Data
122 Local	00: Off, 127: On
123 All Note Off	00
124 Omni Off	00
125 Omni On	00
126 Mono On	00-16
127 Poly On	00

NOTE

The QX5FD will not record All Note Off (Mode Change #123), but when it is received, will check the Key Assign Table (see note on page 64) and generate Note Off messages for whatever notes are currently on. Also, Mono On (Mode Change #126) will be accepted only if the data is 1.

Program Change

Program Change events are displayed as follows.

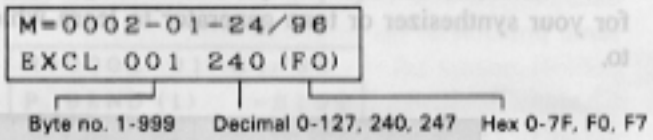


The response to a Program Change message will differ for each device. Consult the owner's manual for your device.

System Exclusive

System Exclusive messages are special MIDI messages used by each manufacturer for various functions unique to each device, such as voice parameter changes and bulk data. A System Exclusive message can consist of as many bytes as necessary. These messages will be meaningful only to devices of the same type and manufacturer. Your owner's manual will tell you what kind of System Exclusive message your device receives and transmits.

Data is displayed as both Decimal and Hexadecimal numbers. (Hexadecimal numbers are often used when referring to MIDI and computer data. Refer to a textbook on computers or MIDI.)



For example, the System Exclusive message in the following example will set a DX7II synthesizer's LFO speed to 99.

Byte no.	001	002	003	004	005	006	007
Data	240(F0)	67(43)	016(10)	001(01)	009(09)	099(63)	247(F7)

Decimal Hex

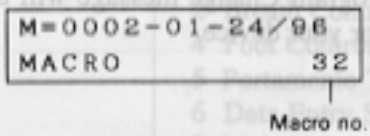
Step through the bytes in the System Exclusive message by moving the cursor to Byte no. and using ◁ ▷ or the dial. The first byte of the message will always be 240(F0) indicating the beginning of a System Exclusive, and the last byte will always be 247(F7) indicating the end of a System Exclusive. You can edit System Exclusive messages of 1000 bytes or longer, but the Byte number display only goes up to 999.

Delete the currently displayed data byte by pressing [SHIFT] + ◁.

Insert a new byte (of value 00) by pressing [SHIFT] + ▷.

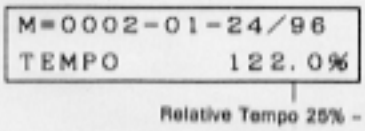
Macro

A Macro is a sort of "floating track" (page 2) that can be called at any point in a track. When called, the Macro will play along with the other tracks until it ends. You may have up to 4 Macros playing at once.



Relative Tempo

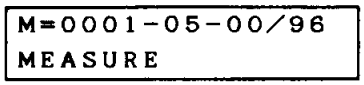
When Clock=INT, Relative Tempo will change the actual tempo in relation to the Tempo. For instance, if the Tempo is 120 and we come to a Relative Tempo mark of 50%, the actual playback tempo will slow down to 60. However, the Tempo display will not change.



Relative Tempo can be set from 25% to 400% in 127 exponential steps. When Clock=Tape or MIDI, Relative Tempo marks will be ignored.

Measure

This mark is at the end of each measure. It can be moved back and forward in time. For 4/4 time, the first Measure mark would be as follows (the end of each measure is the hypothetical "5th" beat).



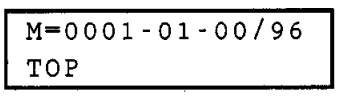
Measure Marks can be moved, inserted, or deleted to lengthen or shorten a measure. For example, move the position of a Measure Mark toward the beginning of the song and Replace ([SHIFT] + [START]) it to make a short measure followed by a long measure. You can Delete ([SHIFT] + [RECORD]) and Insert ([SHIFT] + [STOP]) Measure Marks to make measures of arbitrary length.

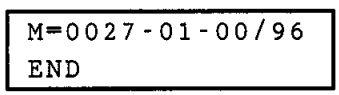
This has many uses. For example, in Measure Edit (page 30) you must specify the affected area in measures. But what if the data area you need to modify begins or ends in the middle of a measure? Simply move the Measure Mark (or insert a new one) to before or after the data to be modified.

Another application is to create measures of irregular length to be inserted as spacing where needed. Or if you need to remove a small amount of time from inside a track, insert Measure Marks to define a very short measure, and use the Measure Edit function Delete (page 32) to remove it.

TOP/END

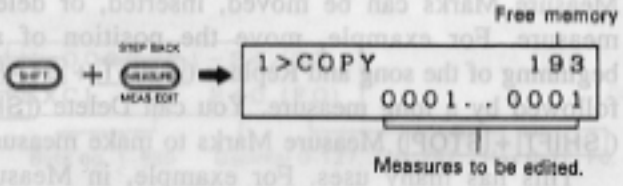
The following LCDs will appear at the beginning and end of a track. They are not "events", and cannot be changed or removed.



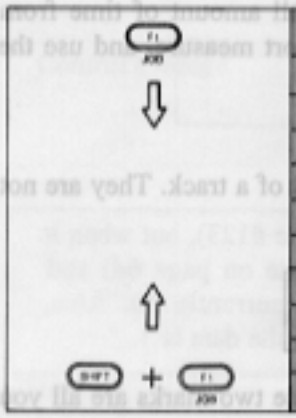


If you try to Event Edit a track that contains no data, these two marks are all you will see, and you will be unable to insert any data. If you want to create a track of data using Step Edit, you must first create some empty measures using the Measure Edit function Create (page 37).

This is where you perform operations on specified measures of track 1. In each job, the upper right corner will display the amount of free memory in blocks of about 80 notes. If the QX5FD contains no data, there will be 250 blocks of free memory. The lower line of the display will show the measures to be edited. To enter Measure Edit mode, press [SHIFT] + [MEAS EDIT].



To enter Measure Edit mode, press [SHIFT] + [MEASURE]. Measure Edit mode has 11 jobs. Select the job you want by pressing [JOB]. ([SHIFT] + [JOB] will step back through the jobs.)

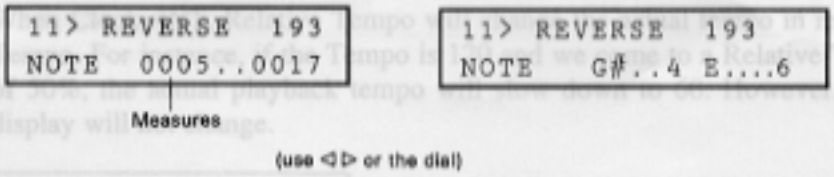


1> COPY	Copy measures to specified point
2> DELETE	Delete measures
3> REMOVE	Remove specified data from measures
4> SHIFT	Change data values of specified messages
5> QUANTIZE	Correct timing of each event
6> TRANSPOSE	Change all note numbers up or down
7> VELOCITY	Increase or decrease all velocity values
8> GATE TIME	Lengthen or shorten all note durations
9> CRESCENDO	Gradually increase/decrease velocity values
10> CREATE	Insert new blank measures
11> REVERSE	Invert data values of specified messages

When you have selected an editing job, set the data for the editing parameters and then Execute. If after setting parameters you change your mind, simply select another job. Since Measure Edit operations are performed on track 1, use the Track Edit job 1. Exchange to move the data to be edited into track 1.

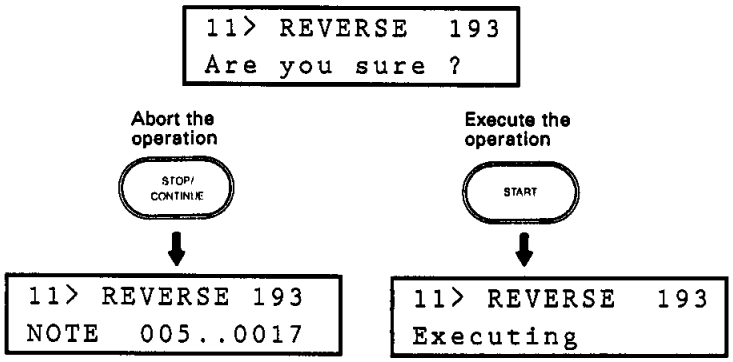
Make Settings

Press [CURSOR] to move the blinking cursor ([SHIFT] + [CURSOR] moves backwards), and use ◁ ▷ or the dial to change the settings. For some editing jobs you will specify only the measure numbers to be affected. In the REMOVE, SHIFT and REVERSE jobs the cursor will move additional spaces to the right, allowing you to specify additional data as in the following example.



Execute

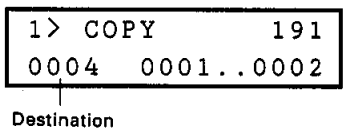
After specifying the measures (and data) to be affected, you need to Execute by pressing START. If Edit Confirm (page 58) has not been turned off, you will be asked "Are you sure?". Press STOP to abort or START to execute the change.



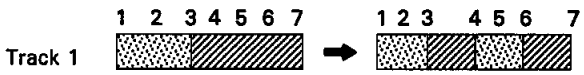
Operations affecting a large amount of data may take several seconds to Execute. Some operations (such as Copy) will increase the amount of data, and other operations require that there be at least as much free memory space (work area) as the data being edited. If there is not enough free memory to perform the operation, the LCD will show "ERROR: Memory full". In such cases, you may have to temporarily Save one or two tracks to disk (see Save, page 51), Clear the tracks you saved (see Clear, page 43), and try the editing operation once again. Later you can reload the tracks you temporarily saved. (see Load, page 50)

1. COPY

Copy the specified measures to the specified destination point in the track. If the specified destination point is not the end of the track, the overwritten data will be lost.



If you executed the above example, track 1 would change as follows, and the data previously in measures 4 and 5 would be lost.



2. DELETE

Delete the specified measures. Later measures are moved forward.

```
2>DELETE        191
      0007..0016
```

If you executed the above example, the track would change as follows.

NOTE

Executing this operation requires free memory equal to the Deleted data + 4 blocks. If you are sure you will not need to Recall (page 48), you can press [SHIFT] + [START] to execute. In this case only 4 blocks of free memory are needed, but you will get a message "CAN'T RECALL, Are you sure?". Press [START] again if you are sure. Press [STOP] to abort.

3. REMOVE

Remove a selected type of data from the specified measures.

```
3>REMOVE        191
P. BEND 0006..0015
```

Select the type of data to be Removed. (use wheel or ◁▷)

CH	Messages of a certain MIDI channel
NOTE	Notes in a certain range
VEL	Velocity data (all notes will be given a velocity of 64)
A.T.	Aftertouch data (Individual and Common)
P.BEND	Pitch Bend data
CNTL	Control Changes in a certain range
MODE	Mode messages
PROG	Program Changes
EXCL	System Exclusive messages
MACRO	Macro numbers
TEMPO	Relative Tempo changes
SPOT/C	Events between specified clocks of each measure
ALL	Everything (blank measures will remain)

The Track Edit command Extract (page 44) is similar to this Remove command, but allows you to keep the extracted data and put it in another track.

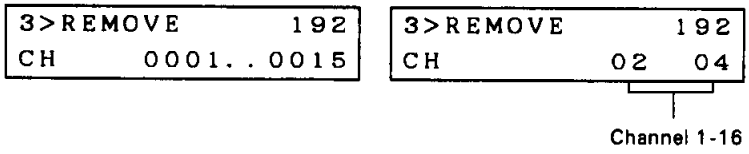
NOTE

Executing a "Remove" operation requires free memory equal to the Removed data + 4 blocks. If you are sure you will not need to Recall (page 48), you can press [SHIFT] + [START] to execute. In this case only 4 blocks of free memory are needed, but you will get a message "CAN'T RECALL, Are you sure?". Press [START] again if you are sure. Press [STOP] to abort.

In addition to specifying the measures to be affected, the following four Remove operations (Channel, Note, Control and Spot/C) require you to select the range of data to be removed.

Remove Channel

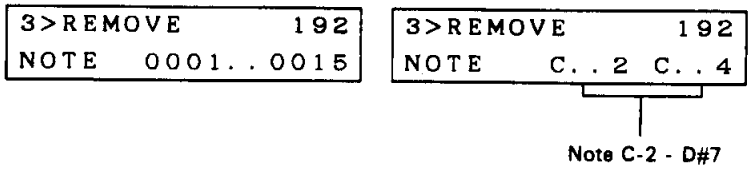
When you select Channel data to be Removed, the cursor will move two "additional" spaces, allowing you to select the range of channel data to be deleted.



If you executed the example above, all data on MIDI channels 2, 3 and 4 would be deleted from measures 1-15 of track 1.

Remove Note

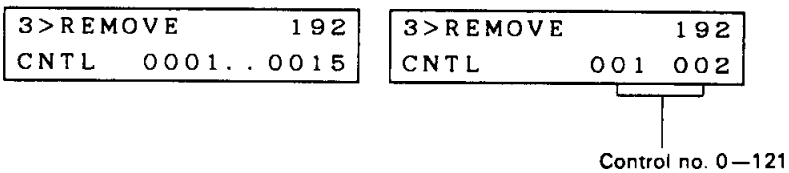
When you select Note data to be Removed, the cursor will move two "additional" spaces, allowing you to select the range of notes to be deleted.



If you executed the example above, all notes between C2 and C4 would be deleted from measures 1 through 15 of track 1.

Remove Control

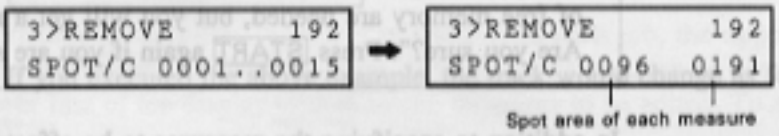
When you select Control data to be Removed, the cursor will move two "additional" spaces, allowing you to select the range of Control data to be deleted.



If you executed the example above, all Modulation Wheel and Breath Controller data (control changes 1 and 2) would be deleted from measures 1 through 15 of track 1. See the table of Control Change numbers on page 26.

Remove Spot/C

When you Remove data from an area or "Spot" (specified in Clocks) of each measure, the cursor will move two "additional" spaces, allowing you to select the clock range from which to delete data.



If you executed the example above, all data would be deleted from the second beat (clocks 96–191) of measures 1 through 15 of track 1. In this example we assume a time signature of 4/4, as shown in the following diagram.

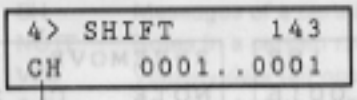
4/4 time

Beat	1	2	3	4
Clock	0–95	96–191	192–287	288 –383

The Step Time / Clock table printed on the front panel of the QX5FD will help you calculate clock numbers for the spot you need to remove.

4. SHIFT

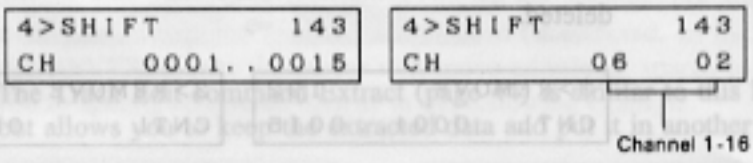
You can change all data of a certain type in specified measures. (For shifting all specified data in an entire track, see Track Edit, Shift page 47.) You can shift Channel, Note, Control or Macro data.



CH	All data of one Channel to another Channel
NOTE	A Note to another Note
CNTL	A Control Change to another Control Change
MACRO	A Macro to another Macro

Shift Channel

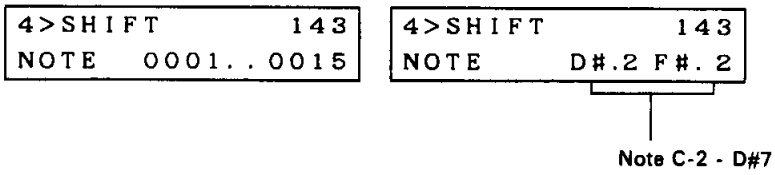
Shift all data of a specified MIDI channel to another channel.



If you executed the above example, all data on MIDI channel 6 would be shifted to MIDI channel 2 for measures 1-15.

Shift Note

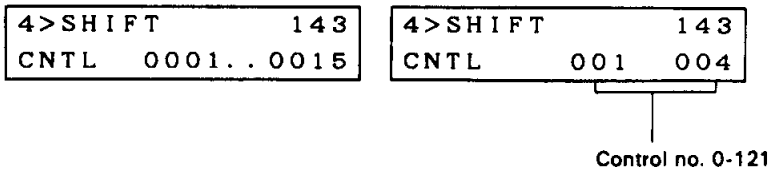
Shift a specified note to another note.



If you executed the above example, all D#2 notes would be shifted to F#2 for measures 1-15. This function is especially useful when using Note On messages to trigger an RX rhythm programmer. The example above would shift all Rim Shots (D#2) to Claps (F#2). See your RX manual for the Instrument Note Numbers.

Shift Control

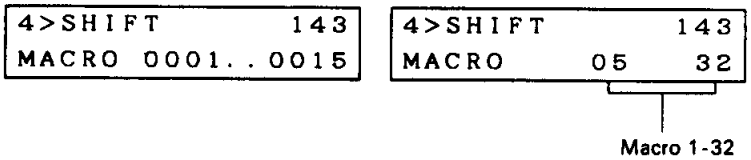
Shift a specified control change to another control change.



If you executed the example above, all Modulation Wheel messages (control #1) would be Shifted to Foot Controller messages (control #4) for measures 1-15. See the table of Control Changes on page 26.

Shift Macro

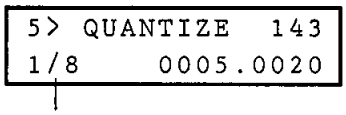
Shift a specified Macro number to another Macro number.



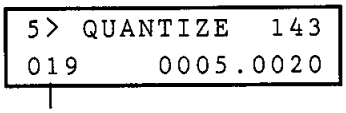
If you executed the above example, Macro 5 would be shifted to Macro 32 for measures 1-15. For example, suppose Macro 5 contains a drum roll and Macro 32 contains a harp glissando. If the track you are editing calls Macro 5 in several places but you want to change each drum roll to a harp glissando. You would specify "MACRO 05 32."

5. QUANTIZE

Adjust the timing of each event to the nearest specified step (or multiple of the specified clocks). This lets you "tighten up" performances you recorded in Realtime.



Timing precision 1/2 - 1/96 note
(◁ ▷ or dial)



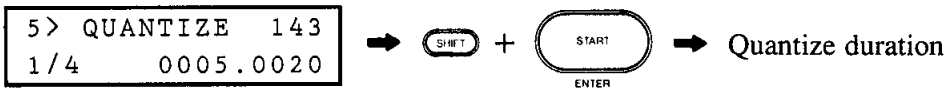
Timing precision 1-999 clocks
(SHIFT + ◁ ▷ or dial)

Usually you will specify the desired timing precision as a note value (1/2 –1/96), but for special cases (such as playing five over a quarter note) you can specify timing precision as 1–999 clocks by pressing [SHIFT] and using ◁ ▷ or the dial. Regular fractions of a note will still be displayed as a note value—for example 24 clocks will be displayed as 1/16.

If you executed the above left example, all events in measures 5–20 would be moved to the nearest eighth note. If you executed the above right example, all events in measures 5–20 would be moved to the nearest multiple of 19 clocks (0, 19, 38, ...) in each measure. (By the way, 19 clocks is about 1/5 of a quarter note. Refer to the discussion of clocks in Step Record, page 18.)

Quantize Duration

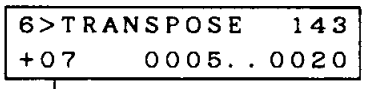
Normally, Quantization keeps the duration (length) of the original note, and moves the beginning and end of the note the same distance. However you may Quantize the note *duration* by pressing [SHIFT] + [START] to Execute. This will make all note lengths a multiple of the specified timing.



If you executed the above example by pressing [SHIFT] + [START], the length of all notes would be changed to the nearest multiple of 96 clocks (a quarter note). For example, notes with duration of 48–143 will be changed to a duration of 96. Notes with duration of 47 clocks or less will be changed to the minimum duration of 4 clocks.

6. TRANSPOSE

Move all note numbers up or down by a specified interval of up to 2 octaves. Notes are limited C-2–D#7.



Interval -24 — +24

If you executed the above example, all notes in measures 5-20 would be transposed up a fifth.

7. VELOCITY

Add or subtract a specified value to the velocity of all notes.

```
7>VELOCITY    143
+20     0005..0020
```

Velocity offset −99– +99

If you executed the above example, all notes in measures 5-20 would be played somewhat more strongly. Velocity is limited to 1-127.

8. GATE TIME

Adjust the gate time (how long the note is held) for all notes. The original gate time is multiplied by the number you enter (10%-300% in steps of 5%).

```
8>GATE TIME   143
120%   0005..0020
```

Gate Time 10% — 300%.

If you executed the above example, all notes in measures 5-20 would be held somewhat longer. Gate Time is limited to 16380 clocks.

9. CRESCENDO

Gradually change the velocity. Over the measures that you specify, an increasing number is added to (or subtracted from) the velocity until the velocity bias you specify is reached at the end of the last measure.

```
9>CRESCENDO   143
+50     0005..0020
```

Final velocity bias −99– +99

If you executed the above example, the notes would be played with increasing force from measure 5, and when the end of measure 20 is reached, the velocity would be 50 higher than originally recorded. Velocity is limited to 1-127.

10. CREATE

Insert empty measures of a specified time signature (1-32/4, 8, 16). Following measures are pushed back.

```
10> CREATE    143
04/04 0003..0005
```

Measures to be created

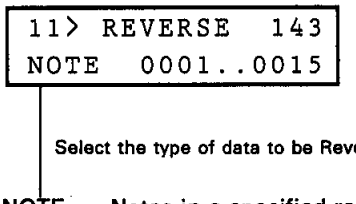
4,8,16 (length of each beat)

1-32 (number of beats)

If you executed the example above, the track would change as follows.

11. REVERSE

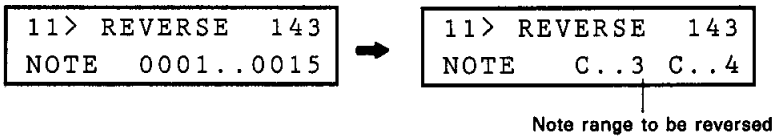
Use this to Reverse the data value of the selected events. You can reverse Note, Velocity, Aftertouch, Pitch Bend, or Control data.



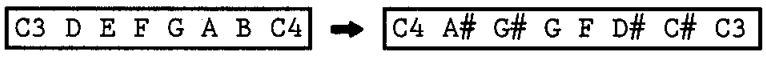
NOTE	Notes in a specified range
VEL	Velocity data
A.T.	Aftertouch data
P.BEND	Pitchbend data
CNTL	Control Change data for specified Control Changes

Reverse Note

Reverse all notes in the specified note range.



If you executed the above example, all notes between C3 and C4 would be reversed (inverted). Notice that this is a true musical inversion. For example, if you had played a C major scale, it would be inverted as follows.



Notes outside the C3–C4 range will be unaffected. Reverse Note is especially useful when composing 12-tone music. (However, the QX5FD has no function for reversing the *order* of the notes.)

Reverse Velocity

Reverse all velocity values.

If you executed the above example, the velocity values of all notes in measures 1–15 will be reversed; velocity 127 will become velocity 1, velocity 1 will become 127, etc.

One possible application of Reverse Velocity is to copy a track (see Track Copy, page 41), and Reverse the velocity of one and change its channel number (see Shift Channel, page 34). Use the two tracks to play two instruments which will "cross-fade" according to the velocity of each note. Notes which were originally played loudly will sound one instrument, and notes which were originally played softly will sound the other instrument.

Reverse Aftertouch Reverse all Aftertouch data values.

```
11> REVERSE  143
A.T.  0001..0015
```

If you executed the above example, the Aftertouch values of all notes in measures 1–15 will be reversed; aftertouch 127 will become aftertouch 1, aftertouch 1 will become 127, etc.

This could be used in a similar way as explained in Reverse Velocity to create two cross-fading tracks.

Reverse Pitchbend Reverse all Pitchbend data values.

```
11> REVERSE   143
P.BEND 0001..0015
```

If you executed the above example, the Pitchbend data in measures 1–15 will be reversed; upward bends will become downward bends, etc.

Reverse Control Reverse data values for the specified Control Changes.

```
11> REVERSE   143
CNTL    0001..0015
```

➡

```
11> REVERSE   143
CNTL       001 002
```

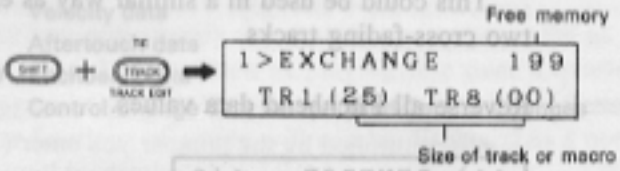
Control Changes to be reversed

If you executed the above example, the data values of Control Changes 1 and 2 (Modulation Wheel and Breath Controller—see the table on page 26) in measures 1–15 will be reversed; Modulation Wheel 127 will become Modulation Wheel 1, etc.

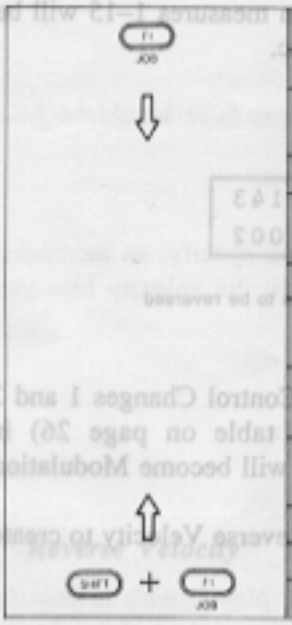
This could be used in a similar way as explained in Reverse Velocity to create two cross-fading tracks.

TRACK EDIT

This is where you perform operations affecting entire tracks and macros. To enter this mode, press [SHIFT] + [TRACK EDIT]. In each job, the upper right corner will display the amount of free memory (in 80 note blocks), and the amount of memory occupied by each track or macro is displayed in parentheses "( )". If a track or macro is larger than 99 blocks of data, the LCD will show 99.



Track Edit has 12 jobs.
Select the job you want by pressing [JOB]. Pressing [SHIFT] + [JOB] will step backwards.

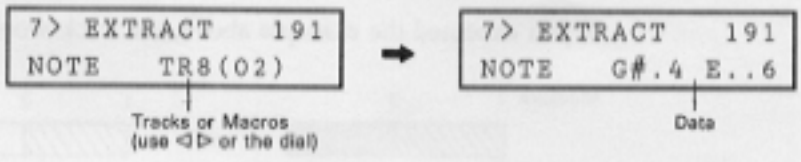


1> EXCHANGE	Exchange contents of track/macro.
2> COPY	Copy all data from a track/macro to another track/macro.
3> TR.DOWN	Mix the contents of a track/macro into another track/macro beginning at a specified measure of the destination.
4> CLEAR	Erase a track/macro.
5> CUT	Cut a track/macro at specified measure. Put the "tail" in another track or macro (or discard it).
6> INSERT	Insert a track or macro at specified measure of destination track.
7> EXTRACT	Extract specified type of data from a track/macro, and put it in another track/macro (or Delete it).
8> CLOCK MOV	Move a track/macro forward or backward in time. (Measure marks are not affected.)
9> THIN OUT	Delete approximately half of all selected continuous controller messages.
10> SHIFT	Change data values or channel number of selected messages.
11> EXPAND	Change total length (time) of track/macro.
12> RECALL	Recall data erased by Record, Measure Edit or Track Edit.

When you have selected a Track Edit job, set the data for the editing parameters and then Execute. If after setting parameters you change your mind, simply select another job.

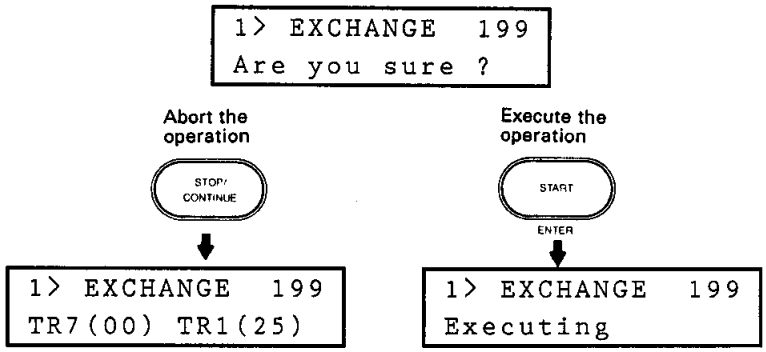
Make Settings

Press [CURSOR] to move the blinking cursor ([SHIFT] + [CURSOR] moves backwards), and use ◁ ▷ or the dial to change the settings. For most jobs in Track Edit you will specify only the Tracks and/or Macros to be affected. However for some jobs (EXTRACT and SHIFT) the cursor will move additional spaces to the right, allowing you to specify additional data as in the following example.



Execute

After specifying the measures (and data) to be affected, you need to Execute by pressing START. If Edit Confirm (page 58) has not been turned off, you will be asked "Are you sure?". Press STOP to abort or START to execute the change.



Operations affecting a large amount of data may take several seconds to Execute. Some operations (such as Copy) will increase the amount of data, and other operations require that there be at least as much free memory space (work area) as the data being edited. If there is not enough free memory to perform the operation, the LCD will show "ERROR: Memory full". In such cases, you may have to temporarily Save one or two tracks to disk (see Save, page 51), Clear the tracks you saved (see Clear, page 43), and try the editing operation once again. Later you can reload the tracks you temporarily saved. (see Load, page 50)

1. EXCHANGE

Exchange the contents of tracks 1-8 and macros 1-32. Use the CURSOR and ◁ ▷ keys to select the tracks and/or macros to be exchanged.

```
1>EXCHANGE      191
 TR4 (00)  TR1 (25)
```

If you executed the above example, track 4 (empty) would be exchanged with track 1 (25 blocks of data). Since all Event editing (page 22) and Measure editing (page 30) must be done in track 1, it is usually a good idea to keep your data in tracks 2–8, and Exchange it into track 1 whenever you need to edit it. When finished editing it, Exchange it back to its original track. To help you remember which data is in which track, you can give each track a one-character Label (see page 58) which will be Exchanged along with the data.

2. COPY

Copy the contents of a track or macro to another track or macro. The old data in the copy destination will be lost.

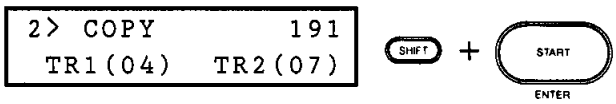
```
2>COPY          191
 TR4 (05)  M06 (15)
```

Source Track or Macro — Destination

If you executed the above example, macro 6 would contain the same data as track 4. The contents of track 4 will remain unchanged, and the old data that was in macro 6 will be lost.

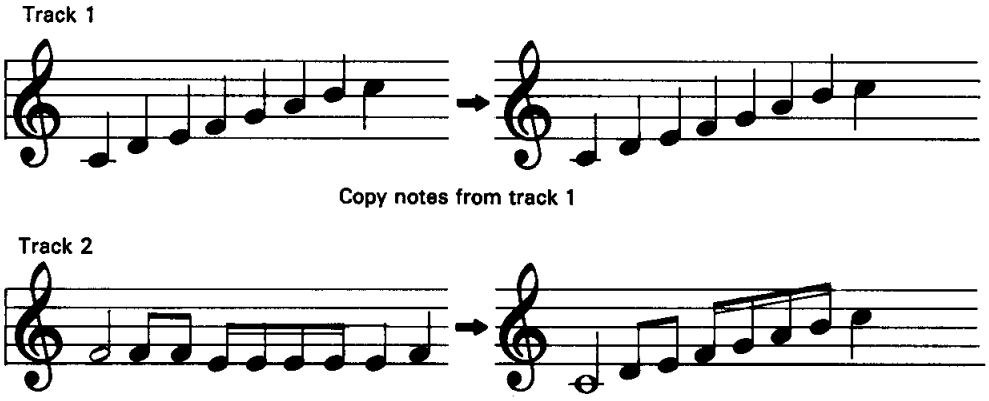
Copy Notes

Normally, *all* data will be copied, but by pressing [SHIFT] + [START] when executing, you can Copy the *note data* (note numbers) of the source track to the timing, duration and velocity of the notes which already exist in the destination track. I.e., the note numbers of the destination track will be changed to match the note numbers of the source track. Other data in the destination track will remain unchanged.



Copy only note numbers

If you executed the example above by pressing [SHIFT] + [START], note numbers would be copied from track 1 to track 2 as follows.

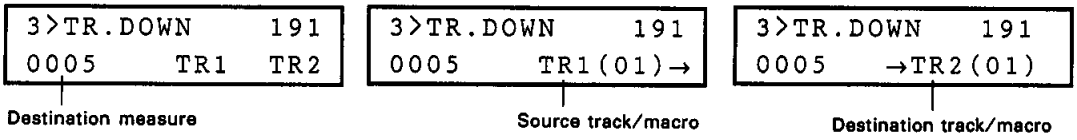


Notice that if one track contains fewer notes than the other track, the notes in the destination track will stop with the fewer one.

One application of this function would be to copy the notes from an accurate but unexpressive track 1 to an enthusiastically played but inaccurate track 2. This would combine the accurate notes from track 1 with the good timing and dynamics of track 2.

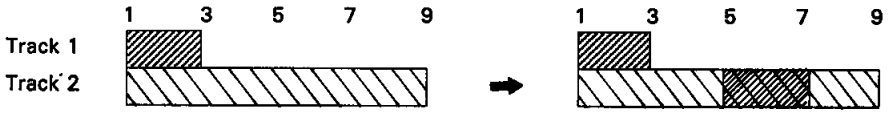
3. TR. DOWN

Track Down (mix) the contents of a track/macro into another track/macro beginning at a specified measure of the destination.



When setting the destination measure, SHIFT + ◁ sets measure 1, and SHIFT + ▷ sets the last measure of the destination track. If the measure marks in the two tracks are different (e.g., one track is in 3/4 time and the other is in 4/4 time), the measure marks of the lower numbered track will be used.

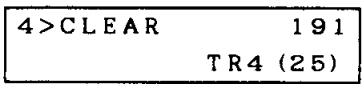
If you executed the example above, the tracks would change as follows.



Since each track or macro can contain data of any number of channels, when you have finished editing a track, you could use Track Down to combine it with other finished tracks, leaving the rest of the tracks free for editing use.

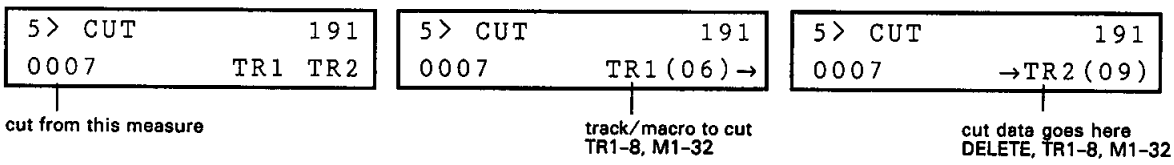
4. CLEAR

Erase the contents of a track or macro.



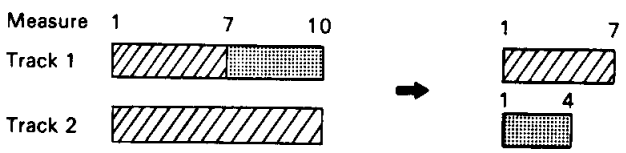
5. CUT

Cut a track or macro at the specified measure and put the cut data in another track or macro (or discard it).



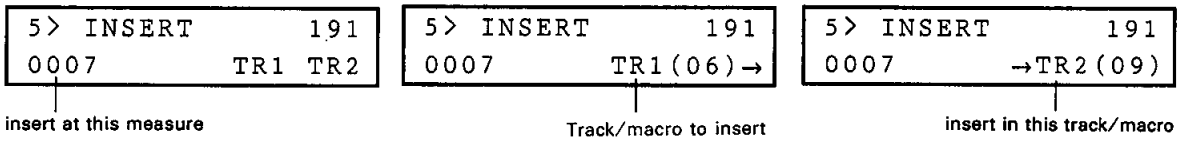
When selecting the measure at which to cut, SHIFT + ◁ sets measure 1, and SHIFT + ▷ sets the last measure of the track to be cut. If you select "DELETE" for the destination track, the cut data will be discarded.

If you executed the above example, track 1 would be cut at measure 7, and the "tail" would be put in track 2. (The old data in track 2 is lost.)

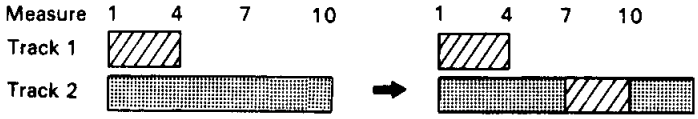


6. INSERT

Insert a track or macro at the specified measure of the destination track. The data in the source track remains unchanged.

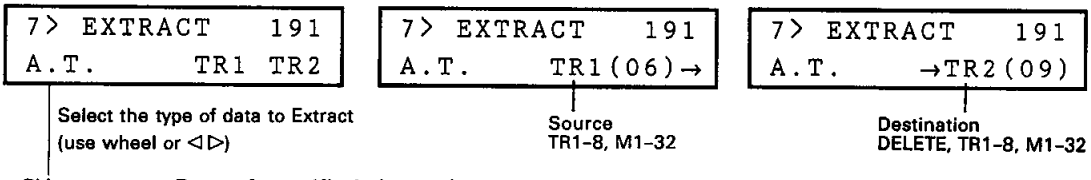


When selecting the measure at which to insert, SHIFT + ◁ sets measure 1, and SHIFT + ▷ sets the last measure of the destination track. If you executed the above example, track 1 would be inserted into track 2 at measure 7.



7. EXTRACT

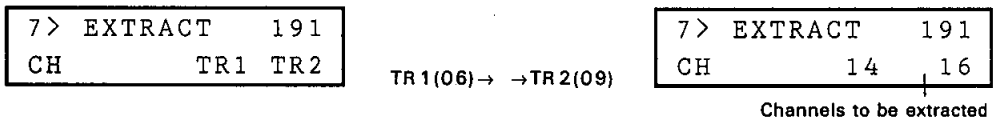
Extract the specified type of data from a track/macro and put it in another track/macro (or Delete it). The extracted data is removed from the source track. The new destination track will be the same length as the source track. (Spot/M is an exception.) All the old data in the destination track will be lost.



CH	Data of specified channels
NOTE	Notes in a specified range
A.T.	Aftertouch data (individual and common aftertouch)
P.BEND	Pitch Bend data
CNTL	Control Changes of specified numbers
MODE	Mode messages
PROG	Program Changes
EXCL	System Exclusive messages
MACRO	Macro numbers
TEMPO	Relative Tempo marks
SPOT/C	All data in a specified part (Clocks) of each measure
SPOT/M	All data in specified Measures
MEASURE	Measure marks (data remains in source track/macro)

The following five Extract operations require you to select the range of data to be removed.

Extract Channel



If you executed the above example, all data of channels 14–16 would be removed from track 1 and placed in track 2.

Extract Note

```
7> EXTRACT    191
NOTE      TR1 TR2
```

TR1(06)→ →TR2(09)

```
7> EXTRACT    191
NOTE    C..3 D#.7
```

If you executed the above example, all notes from C3–D#7 would be removed from track 1 and placed in track 2.

Extract Control Change

```
7> EXTRACT    191
CNTL      TR1 TR2
```

TR1(06)→ →TR2(09)

```
7> EXTRACT    191
CNTL      001 004
```

If you executed the above example, Control Changes 1–4 would be removed from track 1 and placed in track 2. (See the table of Control Changes on page 26.)

Extract Spot/C

```
7> EXTRACT    191
SPOT/C    TR1 TR2
```

TR1(06)→ →TR2(09)

```
7> EXTRACT    191
SPOT/C 0000 0095
```

If you executed the above example, all data in clocks 0–95 (for 4/4 time this would be the first beat) would be removed from each measure of track 1 and placed in track 2. (All the old data in track 2 would be lost.)

For details on clocks in a measure, see Remove Spot/C on page 34.

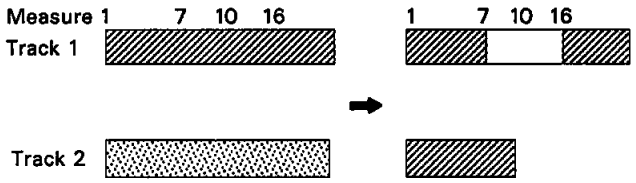
Extract Spot/M

```
7> EXTRACT    191
SPOT/M    TR1 TR2
```

TR1(06)→ →TR2(09)

```
7> EXTRACT    191
SPOT/M 0007 0015
```

If you executed the above example, all data in measures 7–15 would be removed from track 1 and placed in track 2. *Thus, the new track 2 would be 9 measures long.* All the old data in track 2 would be lost.



When specifying the measures to be extracted, [SHIFT] + ◁ selects measure 1, and [SHIFT] + ▷ selects the last measure of the source track.

Extract Measure

This is a special case. When Measure Marks are extracted, they do not disappear from the source track. The selected destination track will contain an empty framework of Measure Marks from the source track. This is useful when you have built up a complex rhythmic part in a track (with changing time signatures, etc.) and wish to copy only the measure framework. For more information, see Measure Marks in Event Edit (page 29).

8. CLOCK MOVE

Move the timing of a track or macro forward or backward by up to 999 clocks.

If you executed the above example, the entire track 3 would move forward an eighth note (48 clocks). If you moved the track backward (–048) i.e. earlier in time, the data in the first 48 clocks would all be moved to clock 0 of the first beat.

It is often effective to use Clock Move to compensate for voices with a slow attack. For example, strings often have a slower attack than other voices, and will appear to be lagging behind other voices, even when the Note On messages are actually simultaneous. If you Clock Move the track with the string data a bit back in time, the string notes will begin playing slightly ahead of the other voices, giving the impression of perfect timing.

9. THIN OUT

Delete about half of the selected Continous Control message from a selected track or macro. You can select Aftertouch (Individual and Common), Pitch Bend or Control Change (continuous controls).

Select data to be thinned out

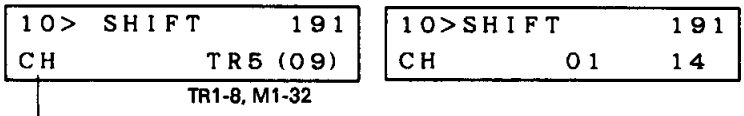
A.T.	Aftertouch
P.BEND	Pitch Bend
CNTL	Control Change

If the above example were executed, about half the Aftertouch messages in track 2 would be deleted.

Especially when you move a controller slowly, many messages with very similar data will be sent. You can usually delete half of them without any audible difference. If you are running low on QX5FD memory, thinning out some data can help. Repeating this operation several times will eventually produce "rough" Changes in controller data. In certain situations this may be an interesting effect, although most musical applications require smooth controller changes.

10. SHIFT

All data of a specified type in a track or macro can be Shifted to another value.



TR1-8, M1-32

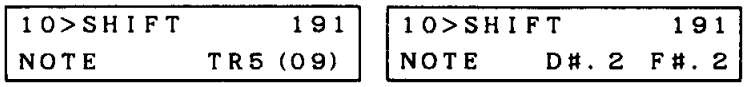
Data to be shifted

CH	All data of one Channel to another Channel
NOTE	A Note to another Note
CNTL	A Control Change to another Control Change
MACRO	A Macro to another Macro

Shift Channel

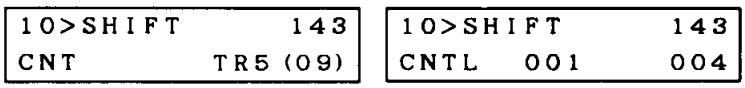
If you executed the above example, all channel 1 messages in track 5 would be shifted to channel 14.

Shift Note



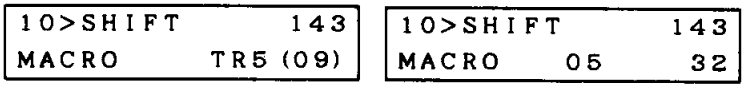
If you executed the above example, all D#2 notes in track 5 would would be shifted to F#2. This type of operation is often useful when controlling a Rhythm Programmer from the QX5FD. Most rhythm programmers play specific sounds for each note. The example above might, for example, change all Snare hits to Hi-Hat hits. Consult the Instrument/Note table for your rhythm programmer.

Shift Control



If you executed the above example, all events of Control Change #1 (Modulation Wheel) would be shifted to Control Change #5 (Portamento Time). This operation might come in handy if your keyboard is not able to transmit a type of Control Change that your Tone Generator receives. Consult the operation manual for your synthesizer or tone generator. See also the table of Control Change messages on page 26.

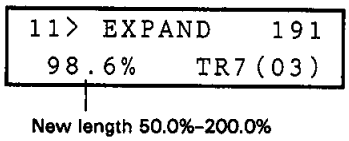
Shift Macro



If you executed the above example, all occurrences of Macro 5 in track 5 would be shifted to Macro 32. Suppose Macros 5 and 32 contained frequently used repetitive patterns—Brass flourishes, for example—of a slightly different type. By Shifting Macros, you can easily try out different possibilities, and see how each combination sounds. Notice that you are allowed to shift Macros *in a Macro.* Yes, a Macro may call another Macro, or even call itself!

11. EXPAND

Change the total length (time) of a track or macro. Use ◁ ▷ or the dial to set the new length in steps of 1%. Use [SHIFT] + ◁ ▷ or the dial to move in steps of 0.1%.

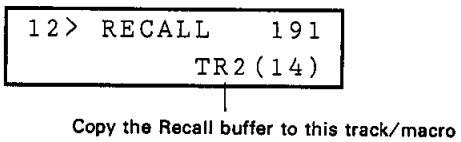


If you executed the above example, track 7 would be shortened to 98.6% of its original length. Since the Measure Marks in the track or macro will also be moved, the number of measures will remain the same, although the measures themselves will be shorter. In the example above, if the measure in track 7 were originally 4/4 (384 clocks per measure) then the measure marks would have been at 05-00/96, but after the track was shrunk to 98.6% the measure marks would be at 04-90/96.

This Expand operation has a variety of uses. For example, a melody may become an interesting bass line when slowed down to a half or quarter (execute 200.0% twice) of its original length and Transposed (see Measure Edit, page 30) down an octave. Or try speeding up a part (i.e., shorten the length). Or you could prepare two identical tracks and change the length of one of them by 0.5% to make them gradually drift out of sync.

12. RECALL

When you Record, Measure Edit or Track Edit, the original data is saved in the Recall buffer. If you decide that your recording or editing was a mistake, you can Recall the contents of this buffer to any track or macro.



If you executed the above example, the data erased by your last operation would be restored to track 2 (in turn, erasing the contents of track 2).

The Recall buffer is affected as follows.

Measure Edit

COPY: The original data in the destination is saved.
CREATE: The recall buffer is cleared.

For all other Measure Edit operations, the original data in the edited measures is saved in the Recall buffer.

Track Edit

EXCHANGE: The recall buffer is not affected.
INSERT: The recall buffer is cleared.
COPY, TR.DOWN, CUT, EXTRACT:
The original data in the destination track/macro is saved. (When you specify "Delete" for CUT and EXTRACT, the deleted data is saved.)
CLEAR, CLOCK MOV, THIN OUT, SHIFT, EXPAND, RECALL:
The original data in the edited track is saved.

Record

The data replaced by the new recording (i.e., the previous data in track 1) is saved.

Other

The recall buffer is cleared when you enter CHANGE mode in Event Edit or when you Transmit data (Load/Save mode).