YAMAHA

DIGITAL SEQUENCE RECORDER
ENREGISTREUR DE SEQUENCES NUMERIQUES
DIGITAL-SEQUENZER

OWNER'S MANUAL
MANUEL D'UTILISATION
BEDIENUNGSANLEITUNG

HOW TO USE THIS MANUAL

We would like to take this opportunity of saying thank you for purchasing the Yamaha QX1 Digital Sequence Recorder. You now possess a musical device that will challenge the limits of your imagination. The QX1 provides you with the means to create music that combines human spontaneity with total digital control. Truly the "best of both worlds".

We suggest that you always read this Owner's Manual, and the accompanying Operations Directory, in the same manner in which they were written--while actually using the QX1. In this way, anything you read can immediately be put into practice, so that you may become familiar with the various operations--just like driving a car.

The QX1 Digital Sequence Recorder is a sophisticated computer-controlled musical instrument. It is capable of creating and manipulating music in a virtually unlimited number of ways. As you become more acquainted with the QX1, your musical horizons will expand and you will become increasingly aware of the awesome potential of this extraordinary machine.

Computer technology is often thought to be quite intimidating, particularly if you're not too familiar with it. Well, to get you straight past that "problem", the idea of this manual is to give you an immediate "hands on" introduction to the easy-to-use QX1, rather than bogging you down with a vast amount of theory and instructions before you even switch on your QX1. Step by step this manual will lead you through the main operations of the QX1, giving examples where necessary, and useful facts and figures on the way, so that, at your own pace, you can learn how to use this powerful creative tool efficiently and effortlessly, and, what's more important, you can enjoy doing it!

Read the INTRODUCTION, then carefully read the PRECAUTIONS and CONVENTIONS sections, then connect up and initialize the QX1 according to the SETTING UP chapter. We then offer you a QUICK DEMONSTRATION of the QX1 Digital Sequence Recorder. This is followed by more detailed chapters on the four main modes of the QX1, which we recommend that you read in the order in which they appear in this manual. For a full understanding of the QX1, however, you will have to read the accompanying OPERATIONS DIRECTORY.

The TX816 APPLICATIONS chapter explains how to use the QX1 with the TX816 FM Tone Generator System, an extraordinarily powerful digital device designed to ideally match the QX1's capabilities.

The MIDI system in which the QX1 operates is explained in the chapter entitled HOW THE MIDI SYSTEM WORKS.

This manual also contains a dual purpose DATA CHART which can be used to keep a record of the 32 banks (each containing 8 tracks) or the 8 chains (each containing 32 steps). We provide a blank chart that you can copy, plus samples of how the chart may be filled in.

Welcome to QX World ... your music may never be the same again!

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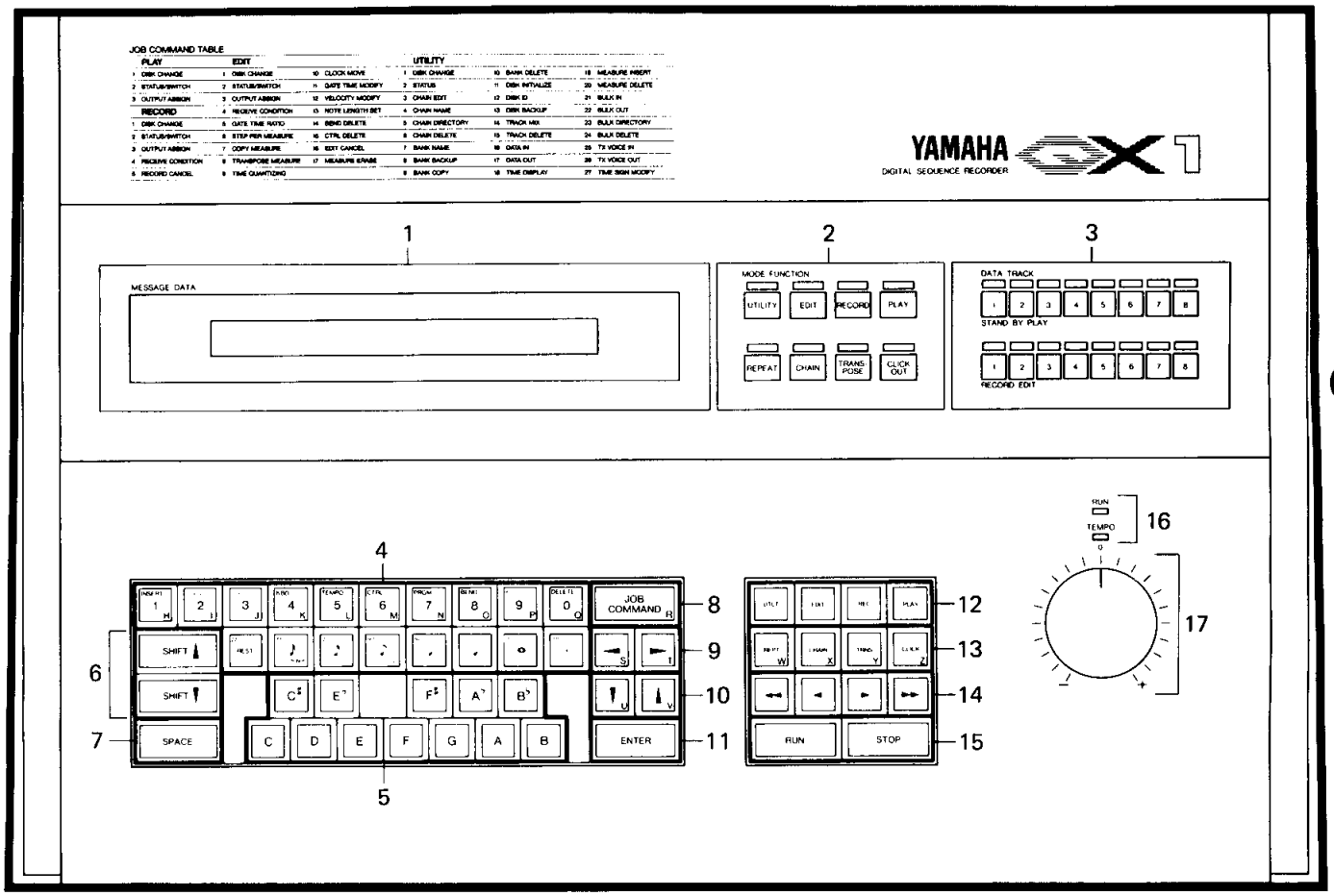
FEATURES OF THE QX1

FRONT PANEL



DISPLAY BOARD
Section 1 ~ 3

1. MESSAGE/DATA DISPLAY

An LCD (Liquid Crystal Display) showing functions and data in two rows of 40 characters.

2. MODE/FUNCTION INDICATORS

When you select any of the four main modes, UTILITY, EDIT, RECORD or PLAY, the corresponding LED lights. When you select any of the four additional functions, REPEAT, CHAIN, TRANSPOSE, or CLICK, the corresponding LED lights.

3. DATA/TRACK DISPLAY

When a track contains any data, the corresponding STAND BY/PLAY LED lights. When a track is selected for record or edit, the corresponding RECORD/EDIT LED lights.

DATA KEYBOARD
Section 4 ~ 11

Used for entry of all data in any mode. See the O.D. for detailed descriptions.

4. CHARACTER, SYMBOL & FUNCTION keys

These keys are all multi-purpose and are used for entry of many kinds of data.

Pressing a key enables you to enter the data on the center of the key. Hold down the appropriate [SHIFT] key to use the functions printed on the upper or lower parts of the keys.

5. PITCH keys
Used to enter musical pitches. May also be used as alphabet keys.

6. SHIFT keys
Used for selecting different functions of the character keys.

7. [SPACE] key
For entering blanks into data spaces. Also used for data entry in the Edit Mode.

8. JOB COMMAND
Used for selecting the job commands within each main mode.

9. [◄S] and [►T]
Moves the cursor on the LCD to different data entry spaces.
Hold for continuous cursor movement.

10. [↑U] and [↓V]
Used for scrolling through bank directories, or through music data in the Edit mode.
Hold for continuous cursor movement.

11. [ENTER]
When you type in data, pressing this key enables the QX1 to accept it and use it.

MODE/FUNCTION KEYBOARD Section 12 ~ 15

For calling up the main modes, additional functions, and for function switching.

12. [UTLT]/[EDIT]/[PLAY]/[REC]
Press these keys to enter the four main modes.

13. [REPT]/[CHAIN]/[TRNS]/[CLICK]
These turn these "additional functions" on and off. They may also be used as alphabet keys.

14. [◄◄] [◄] [►] [►►]
[◄] and [►] move forward or backward by one measure. Hold for continuous measure scrolling. [◄◄] and [►►] initiate high-speed forward or reverse measure scrolling -- stopped by pressing the (STOP) key.

15. [RUN] [STOP]
The [RUN] key starts or continues playback or recording or 2-bar edit monitoring.
The [STOP] key stops the above functions.

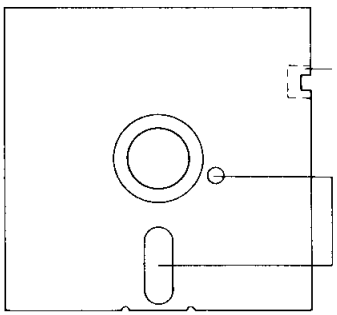
TEMPO CONTROLLER Section 16 ~ 17

16. RUN INDICATOR/TEMPO INDICATOR
The RUN indicator lights during playback or record. When external synchronization is used the RUN indicator flashes until the external clock signal is received. It also flashes during the 2-measure lead-in before recording begins. The TEMPO indicator flashes on the first beat of each measure, at all times.

17. TEMPO CONTROLLER
Allows temporary changes of tempo during record or playback.

DISK DRIVE Section 18 ~ 20

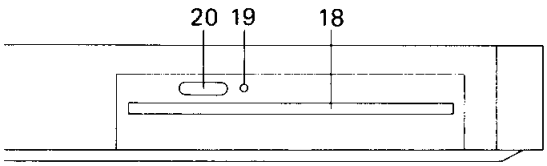
Floppy disk



Covering this notch with the protection seals supplied with the floppy disks sets the memory protection function, which means that data can no longer be written onto that disk.

Do not touch these areas with your fingers or any other foreign objects (both side).

Disk drive



18. FLOPPY DISK INSERTION SLOT

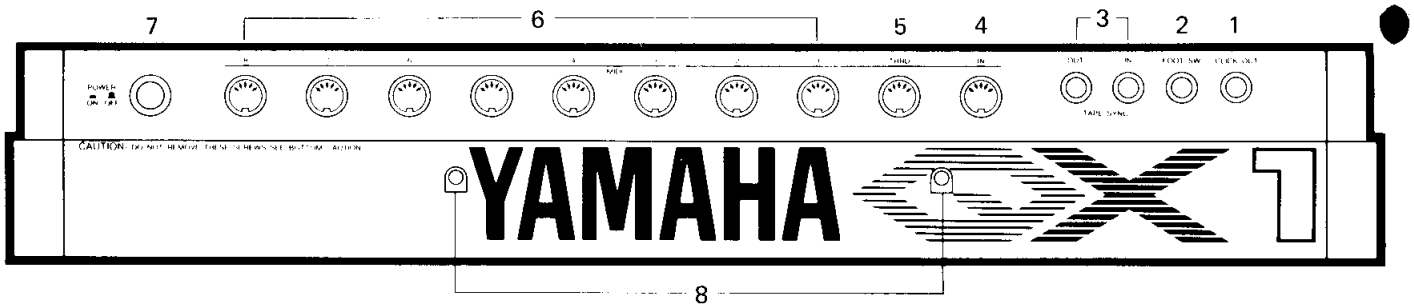
19. DISK DRIVE LED

Lights when the disk is rotating.

20. DISK LOCK

Locks and unlocks the disk drive. Always lock the disk drive when in use. Unlocking it ejects the floppy disk. It cannot be unlocked while the LED is lit--only when the QX1 is turned off, or the Disk Change job command is activated.

REAR PANEL



1. CLICK OUT

The output jack for the CLICK function (electronic metronome). A standard 1/4" phone jack.

2. FOOT SW

The input jack for the FC-4 or FC5 footswitch used to start/stop recording and playback. A standard 1/4" phone jack.

3. *TAPE SYNC IN & OUT*

The input and output jacks for the tape sync signals. See PLAY MODE job command 02. Standard 1/4" phone jacks.

4. *MIDI IN*

Connecting the MIDI OUT of MIDI devices to this input allows you to send performance data memory data, MIDI clock signals, etc.

5. *MIDI THRU*

Outputs the same MIDI signal that is input to the MIDI IN terminal. This is used if you are controlling the QX1 with a MIDI device and you wish to control another instrument with the same device. It passes the signals straight through to the second instrument.

6. *MIDI OUT 1 – 8*

The output terminals for recorded MIDI data. These correspond to tracks 1 – 8 when the QX1 is turned on. The MIDI CLOCK signal is output from MIDI OUT8.

7. *POWER SWITCH*

When the power is turned on, the LCD lights up and the tempo LED starts flashing.

8. *Slots for inserting the music rack of the QX1.*

INTRODUCTION

The QX1 Digital Sequence Recorder is the result of Yamaha's world-leading expertise in digital technology. It is specifically designed for musicians, including those who have had no experience whatsoever with computer-controlled musical instruments. Without having to learn any special computer language, you can immediately use any function of the QX1 just by reading this Owner's Manual and the accompanying Operations Directory.

The QX1 is a digital music device that functions in the MIDI system. Explained elsewhere in this manual, MIDI (which stands for Musical Instrument Digital Interface) is basically a universal language that has been created in order to allow digital music instruments to control and drive each other. As the name suggests, digital music instruments convert all musical information into numbers, which are easily transmitted from one device to another.

For example, all Yamaha's digital instruments: the DX1, DX7 and DX9 Programmable Algorithm Synthesizers, the KX1 and KX5 remote keyboards, the RX11 and RX15 Digital Rhythm Programmers, the CX5M Music Computer, and the TX816 FM Tone Generator System, are MIDI compatible, and may be joined together in a variety of configurations so that each unit may either drive, or be driven by, the others. Using extremely simple connections, highly powerful digital music systems may be easily assembled.

The QX1 does not contain any sound generating devices. It simply provides a way of recording musical sequences in the form of MIDI data onto a floppy disk, then "playing back" these sequences to drive other MIDI compatible digital music devices. It has four basic modes of operation --Record, Play, Edit and Utility. We'll describe them briefly here, and in more detail in subsequent chapters, and also in the Operations Directory.

The Record Mode

Music is recorded in real time (i.e. as you play it) from an external MIDI instrument. The Click output (a digital metronome signal) supplies a "count in" and enables you to keep time. Recording may also be carried out in the Edit mode, where music data may be entered note by note from the QX1 keyboard (read the appropriate section in this introduction). The data is stored as 32 Banks, each one of which can be up to 999 bars (measures) in length. The tempo and time signature of a Bank can be recorded, and varied within the duration of a Bank. You can think of a Bank as a song, or as a movement of a composition.

Each Bank can contain polyphonic music data on each of eight Tracks -- like an eight-track tape deck, except that each Track can be overdubbed by an unlimited amount, with no loss in quality whatsover -- remember, we're dealing with music data here, not recorded sound. Pure information that does not suffer from distortion--it's all in the form of numbers. And of course you can erase any unwanted sections, or punch in anywhere during a recording.

What's more, you can link together Banks into Chains, that can contain up to 32 Steps, each Step being a single Bank or up to 32 repetitions of a Bank. Ideal for creating a sequential playback of pieces for a performance, or for linking together several movements (each one with different tempo, time signatures, and instrumental arrangements) to form a large composition.

The floppy disk, a mere 5 1/4" in diameter, can hold about 80,000 notes. That's about an album's worth of "normal" music. So you can build up a library of recorded music data in a very compact space and as floppy disks are so inexpensive, you can make safety copies of all your disks, which we highly recommended.

The Play Mode

The Play mode enables you to transmit the MIDI information programmed into the QX1 to any compatible sound generating instrument, such as the Yamaha TX816

FM Tone Generator System, whose eight voice modules correspond to the eight Tracks in the QX1. The tempo of the playback may be altered by the large Tempo Controller on the QX1, and a Transpose function allows you to playback a piece in any key or octave. Normally, the eight Tracks are transmitted from the corresponding MIDI output, but they may also be sent to any output, and up to four Tracks may be sent to the same output.

The Repeat feature provides continuous repeat playback of a Bank or Chain, until you cancel it. Playback may also be activated by the optional footswitch (Model no. FC4 or FC5) which performs the functions of the RUN and STOP keys (also in the Record Mode).

The Edit Mode

Essentially, many of the QX1's editing functions are jobs that used to be done with a razor and splicing tape, in the editing of taped music. Except that here it's taken to the "nth degree". Any note that you record, even in the middle of a chord, can be quickly located, and altered in many ways. Not just moved, deleted, lengthened or shortened. You can change the volume of any note, insert voice changes, alter the Gate Time (see GLOSSARY), and the amount of Pitch Bend. Depending on the MIDI compatibility of your MIDI instrument, a variety of control functions such as Modulation Wheel, Portamento, Sustain Footswitch, and Breath Control may be edited.

The Edit mode may also be used for input of single notes. It has an Insert function that allows you to add extra material to an already recorded piece, or create a totally new composition by inputting notes one at a time, setting all the parameters on the QX1 DATA keyboard. In this way, even if you do not know how to play a musical instrument, you can create sophisticated music with the QX1.

The Utility Mode

As the name suggests, the Utility mode enables you to manipulate or examine existing data, rather than create new data. Within this mode, as with the three other main modes, are a series of submodes, or Job Commands. The most important of these are listed in the Job Command Table printed on the front panel of the QX1.

The Utility mode contains 27 different Job Commands. The most obviously useful ones to the first-time user are probably the following:

Chain Edit, which allows you to create a Chain of Banks (see Record Section, above). Related to this are the Chain Name Change, Chain Directory and Chain Delete sub-modes, whose functions are self-explanatory. The Utility mode also enables you to delete a Bank, change its name, and copy a Bank to another Bank or even to another floppy disk. Floppy disks are "initialized" (see GLOSSARY) and given a name (ID) in this mode, and you can copy an entire disk onto a second disk. Track Mix enables you to overdub the data from one Track to another (if, for example, you want two instruments to play the same part), and there's also a Track Delete function.

An extremely useful Time Display feature provides you with a means of timing a composition or any part thereof, to within 1/10th of a second, and if you change the playback tempo, the timing will change accordingly. You can also delete measures from a Bank, and even insert blank measures into a Bank, to create a pause or to make space for the insertion of new material.

There are several other Job Commands available in the Utility mode, but it might be confusing to describe them here, so we'll save them for a subsequent chapter. Now, let's see about setting the QX1 up and playing...

JOB COMMAND TABLE

PLAY		EDIT			UTILITY		
1 DISK CHANGE	1 DISK CHANGE	10 CLOCK MOVE	1 DISK CHANGE	10 BANK DELETE	19 MEASURE INSERT
2 STATUS/SWITCH	2 STATUS/SWITCH	11 GATE TIME MODIFY	2 STATUS	11 DISK INITIALIZE	20 MEASURE DELETE
3 OUTPUT ASSIGN	3 OUTPUT ASSIGN	12 VELOCITY MODIFY	3 CHAIN EDIT	12 DISK ID	21 BULK IN
RECORD	4 RECEIVE CONDITION	13 NOTE LENGTH SET	4 CHAIN NAME	13 DISK BACKUP	22 BULK OUT
1 DISK CHANGE	5 GATE TIME RATIO	14 BEND DELETE	5 CHAIN DIRECTORY	14 TRACK MIX	23 BULK DIRECTORY
2 STATUS/SWITCH	6 STEP PER MEASURE	15 CTRL DELETE	6 CHAIN DELETE	15 TRACK DELETE	24 BULK DELETE
3 OUTPUT ASSIGN	7 COPY MEASURE	16 EDIT CANCEL	7 BANK NAME	16 DATA IN	25 TX VOICE IN
4 RECEIVE CONDITION	8 TRANSPOSE MEASURE	17 MEASURE ERASE	8 BANK BACKUP	17 DATA OUT	26 TX VOICE OUT
5 RECORD CANCEL	9 TIME QUANTIZING		9 BANK COPY	18 TIME DISPLAY	27 TIME SIGN MODIFY

PRECAUTIONS

NOTE:

Read this section thoroughly BEFORE setting up your QX1. The QX1 uses state-of-the-art microcircuitry which, though outstandingly durable and reliable, requires certain working conditions in order to carry out its sophisticated functions efficiently and accurately.

Location

Avoid placing the QX1 in direct sunlight.
Any extremes of temperatures should also be avoided – for one thing, they can badly affect the LCD (Liquid Crystal Display) Panel, and also, the microprocessors used in the QX1 are designed to function best within a "normal" temperature range. If you are using the QX1 in termperatures over 40 deg. C. (for example, at an outdoor concert in a hot climate) it is recommended that you use a cooling fan to keep the QX1 at a lower temperature, or data errors may result.

Extremely high humidity or dry conditions should be avoided, as should excessive dust or vibrations. Although the QX1 is most at home in a studio, it is of course possible to use it in a live situation, if you treat it as you would a fine automobile--with care and caution.

Positioning

The QX1 is a light, compact device and you may be tempted to place it in an unorthodox position--vertically, or at an angle, as you might do with a synthesizer. This is inadvisable, as the floppy disk drive, like a record turntable, performs best when horizontal, and may be seriously affected by being used in any other position. However, if it is unavoidable, a slight tilt should not affect performance of the QX1.

Ensure that the ventilation grills on the upper and lower surface of the QX1 are uncovered so that air may circulate freely to eliminate any risk of overheating.

It's also advisable to set it at a convenient hight for you to operate. After an editing session (and with the fascinating sound-world of the QX1, an editing session can easily stretch to several hours!) you may realize, with some regret, that you've been sitting awkwardly for quite a long time. Any way that you can make yourself more comfortable when operating the QX1 will help you to use it faster and more efficiently, so that your creative ideas can be realized freely and effortlessly. Set it so that your hands and arms are at a loose, relaxed angle when using the QX1 keyboard, and so that you can see the LCD Panel easily without having to lean forward.

Ideally, a good quality office chair should be used, with a comfortable, firm back support, armrests that do not impede your use of the QX1, and wheels so that you may easily roll yourself across to adjust your amp, mixer, or any other equipment.

Relocation

The QX1 comes with a protective sheet of card inserted into the disk drive. DO NOT LOSE THIS SHEET! It should ALWAYS be inserted into the disk drive, which should then be locked, before moving the QX1. The QX1 should NOT be moved with a floppy disk inserted--the resulting vibrations could result in a loss of data and could even cause damage to both the disk and the disk drive. The recommended procedure is to insert the protective sheet into the disk drive (remembering to lock it) every time you finish a session with the QX1.

Prior to moving the unit, disconnect all cables by grasping the plugs, NOT by tugging on the cords. This will prevent any damage to the cables.

Cleaning the Exterior Paneling

To remove dirt or fingermarks from the exterior paneling of the QX1, it is best to use a soft, dry cloth that will not shed any fluff. It is not advisable to use any solvents such as benzine or thinners. Do not use any aerosol sprays near this unit--they can easily get into the disk drive and prevent accurate reading of data from floppy disks.

Floppy Disks – Specifications and Handling

Just as a tape recorder itself does not store music signals, the QX1 does not store music data. Data is stored on floppy disks--a medium that is common in the world of computers, and is a far more accessible, space-saving method than magnetic tape. Each disk can contain about 80,000 notes. The QX1 uses 5-1/4" double-sided double-density double-track floppy disks (also known as flexy disks, mini-floppy disks, and diskettes).

Disks should be handled with great care--they are very delicate. The following precautions should be noted:

NEVER touch the surface of a disk with your fingers. This will make data reading inaccurate or impossible. Aerosol sprays, dust, and even smoke must not be allowed to come into contact with the disk, for the same reason.

NEVER bend or fold a disk, or attach paper clips to it.

NEVER write directly onto the sleeve of the disk. Always write on a self-adhesive label and attach it gently to the disk.

NEVER bring a disk into a magnetic field of any sort, e.g. near a monitor speaker. This can seriously affect the recorded data.

ALWAYS store disks in temperatures between 4°C and 52°C. Temperatures outside this range will irreparably damage disks.

NOTE:

> When the QX1 is operating in a room temperature of 40°C or higher, its interior may reach a temperature of 52°C and disk damage could result. Avoid unduly high temperatures or use a cooling fan.

ALWAYS replace disks in their envelopes after use, and put them back into their case. Disks should be stored vertically so that there is no pressure on the disk surface. It is recommended that you do not leave a disk in the QX1 while it is not being operated. Store the disk safely, and insert the protection sheet into the QX1's disk drive, and lock it.

Effects on Other Electrical Equipment

The QX1 contains innumerable digital circuits. It may cause static interference with radios or televisions in close proximity. It is advised that you keep these types of equipment as far away from the QX1 as is conveniently possible.

Confirmations and Warning Messages

A variety of confirmation and warning displays appear on the LCD Panel when the QX1 is operating, so that you always know what is happening, what has just happened, or what you may have done wrong. Don't worry--it's impossible to damage the QX1 just by entering the wrong data.
If a warning display appears, the data or operation will need to be corrected before the QX1 can be operated again. Consult the "CONFIRMATIONS AND WARNINGS" section in the Operations Directory if you don't know what to do when a message appears.

Owner's Manual, Etc.

Keep the Owner's Manual and Operations Directory in a safe place. Even though you may have become totally familiar with the QX1, future reference to these items may well prove to be highly informative. And a further reminder: keep the protective sheet for the disk drive in a safe place (preferably in the QX1 itself, while it is not being operated). This will ALWAYS be required when you move the QX1.

If You Are Using a DX7 or KX1

If you possess a Yamaha DX7 synthesizer or KX1 remote keyboard that was manufactured before the standardization of MIDI specification, you may find that the after-touch does not work when using one of these keyboards to program the QX1. In this case, contact the store where you purchased your keyboard and ask them to replace the ROM system.
Models with the following serial numbers will require this update modification:

DX7: Serial Numbers 1001–24880, 25125–26005.
KX1: Serial Numbers 1001–1105

CONVENTIONS

The QX1 gives you plenty of information while you are operating it. This appears as LCD messages and LED indications on the front panel of the QX1. Virtually all of the operations are carried out by pressing the computer-style buttons on the QX1.

Keys

In the text we will place the name of any key within box.
For example: [CLICK Z] or [►►] or [RUN]

Many of the QX1 keys have two or three functions, which are selected by using the [SHIFT ↑] or [SHIFT ↓] keys in combination with the selected key. For example, the [INSERT 1 H] key.

In both the text and the illustrations, we will only refer to the particular function that is being used at the time, for example:

For functions that are written in the top section of a key, we will assume that you know to press the selected key while holding down the [SHIFT ↑] key to activate this function. And for the functions in the lower section of a key, we will assume that you know to press the selected key while holding down the [SHIFT ↓] key to activate the function. (Actually, we'll remind you of this from time to time!).
So, in visual terms:

[SHIFT ↑] + [INSERT 1 H] = [INSERT]
[SHIFT ↓] + [INSERT 1 H] = [H]

IMPORTANT: When typing in alphabetical data, ALL the alphabetic character keys MUST be pressed while holding down the [SHIFT ↓] key. However, when using the [C], [D], [E], [F], [G], [A] and [B] keys to enter pitch data, there is no need to use the [SHIFT ↓] function.

EXCEPTIONS: The dual-function keys that will ALWAYS have both functions illustrated are the [←S], [←T], [↓U], and [↓V] keys to clearly distinguish them from the other "arrow" keys [◄], [►], [SHIFT ↑], [SHIFT ↓].

LCD Messages

Any LCD message will appear in the text in quote marks, and although a single LCD message may contain several different items of information, such as "MODE", "PROT" (memory protect status), "USE" (amount of memory used up), "BANK" number, "BANK" name, "TEMPO", and "TIME" signature, the text will only mention whatever is necessary from a message. For example the following message:

RECORD READY display

```
RECORD READY              MEASURE:mmm
BANK  nn  BBBBBBBB        TEMPO:ttt  TIME:06/08
```

may be referred to simply as "RECORD READY" if that is all you need to know. Many LCD messages are created by entering data, so in the text we'll use quote marks when mentioning any data to be typed in (usually numerical data).

SETTING UP

The QX1 may be set up in countless different configurations. In this section we'll use a most basic setup, just to get you started. We also will use a few words that you may not understand. You don't actually need to understand them to operate the QX1, just as, to return to our driving simile, you don't need to know what a manifold gasket is in order to drive a car. We'll also ask you to use certain keys without always explaining why. This is because our approach here is to get you playing the QX1 as fast as possible. Later on in this manual some things will be made clear to you. And the O.D. (the OPERATIONS DIRECTORY) contains detailed explanations of all the controls and operations of your QX1. So, read on, and enjoy what happens!

The most basic setup is really simple. It shouldn't take you more than a few minutes to connect it up. You'll need the following items:

*The QX1 Digital Sequence Recorder.

*A MIDI compatible instrument. For many examples in this manual, we'll assume that you're using a Yamaha DX7 synthesizer, which is ideally suited to the QX1.

*Two standard MIDI connecting cables (Yamaha MIDI-03 or MIDI-15, 3 or 15 metres long respectively). These cables feature internationally standardized 5-pin DIN connectors. NOTE: It is inadvisable to use MIDI cables longer than 15 metres. Like audio signals, MIDI signals are subject to deterioration if sent over large distances, and this can cause unpredictable data errors.

*A brand new 4 1/4" double-sided double-density double-track floppy disk.

*The monitor system of your choice. This can be a simple amplifier or a sophisticated mixer/power amp/speaker system. You'll need two audio input--one for your DX7 (or other MIDI instrument) and one for the Click Output of the QX1 (Impedance rating: 600 Ohms).

*Audio connecting cables for the QX1 Click Output and your MIDI instrument. For the QX1, we recommend a single conductor shielded cable with a standard 1/4" (6.3 mm) tip/sleeve phone plug. Coiled guitar cords are not recommended as they often have an inferior high frequency response compared with straight cords.

MIDI Connections

(a) Connect the MIDI IN of the QX1 to the MIDI OUT terminal on your MIDI instrument.

(b) Connect the MIDI Output 1 of the QX1 to the MIDI IN of your MIDI instrument.

Audio Connections

(a) Connect the signal output of your MIDI instrument to your amp or mixer.

(b) Connect the CLICK OUT 1/4" jack on the QX1 to your amp or mixer. This line output has an impedance rating of 600 Ohms.

Music Rack Installation

(a) The QX1 is supplied with a music rack, which fits into the two sockets on the rear panel. If you wish to change any cables while the rack is installed, it has a hinged black plastic base which can be lifted up to allow you to easily see the cables without removing the rack. The Owner's Manual and Operations Directory are both designed to fit onto this rack.

CAUTION!!

Do not allow any manuals, music scores, or other objects to cover the ventilation grill in the upper right-hand section of the QX1. This could cause overheating, resulting in data errors.

AC Power

(a) Connect your MIDI instrument and the QX1 to the AC mains supply. The QX1 consumes only 40W of power, with the following power requirements.

U.S. & Canadian models: 120 volts, 50/60 Hz. Other areas: 100 - 120/220 - 240 volts, 50/60 Hz.

(b) Turn the power on. It's advisable to turn on the QX1 and your MIDI instrument BEFORE turning on your amp or mixer, to avoid any mains "thumps" damaging amps or speakers. When the QX1 power is turned on, the Tempo Indicator will begin to blink, and you'll see the "WELCOME" message on the Message/Data panel (which for conciseness will usually be referred to as the LCD, meaning Liquid Crystal Display).

MIDI Channel Setting

(a) MIDI data can be transmitted on sixteen channels (see the "HOW THE MIDI SYSTEM WORKS" chapter). When the QX1 power is turned on, it is automatically set to receive data on MIDI channel 1, so set your MIDI instrument to transmit data on MIDI channel 1.

(b) The MIDI transmission channel of the QX1 is also automatically set to channel 1 when its power is turned on, so set your MIDI instrument to receive data on MIDI channel 1, or to the Omni mode (allowing it to receive MIDI data on all sixteen MIDI channel; the QX1, by the way, has no Omni mode).

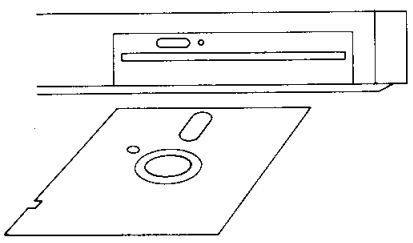
Inserting and Initializing a Floppy Disk

This section is of vital importance, and we'll cover this operation in some detail.

If you have never used a floppy disk before, read the PRECAUTIONS section earlier in this manual, and the manufacturer's recommendations on the disk packaging.

The QX1 will not function without a floppy disk, just as a camera won't function without film. Like film, a floppy disk is highly sensitive and needs to be handled with care. Here's how it's done:

(a) Having turned on the QX1 power and seen the "WELCOME" message on the LCD, you now need to insert your floppy disk. Insert it with the "window" of the disk going in first, and the small notch in the sleeve to the left. Push it in with your thumb till you hear a slight click as it slides right into the slot, and stays there. Then lock the disk by firmly pushing in the disk lock. If you've inserted the disk the wrong way round, you won't be able to lock it.



(b) Now hit the [ENTER] key on the QX1 DATA keyboard. The small red LED on the front of the disk drive will light up. After a few seconds, if your disk has not already been initialized for the QX1, the LED will go out, and you will see the "CONFLICT DISK"/ "DISK INITIALIZE" messages alternately, changing about twice a second. (If the disk has already been initialized for the QX1, you can go straight to paragraph (g). The LCD message shown there will now be displayed.

```
DISK INITIALIZE
SET DISK & HIT ENTER KEY !
```

(c) You will see the above message if you have inserted a new disk, or one that has been initialized by another computer. If you think the latter may be the case, remove the disk immediately, first pressing the disk lock button to unlock the disk drive. Then insert a new disk, lock it in, and hit [ENTER]. If you had initially inserted a new, unused disk, then also hit [ENTER]. Now the disk drive LED will light up, and you'll see the flashing "SURE? YES (Y) / NO (N)" message.

```
SURE ? YES(Y)/NO(N)
```

(d) The above message gives you yet another chance to retrieve a "wrong" disk. (As a further precaution, we've even made it slightly awkward to enter the "YES" command--see paragraph (e) below). If you now think you may have inserted that wrong disk (we're really playing it safe here--we wouldn't want you to ruin an irreplaceable disk) do the following: While holding down [SHIFT ⇑], press [N]. After a couple of seconds, you'll hear a click, the disk drive LED will go out, and the "CONFLICT DISK/DISK INITIALIZE" alternating messages will appear. The click that you heard means that you can unlock the disk drive and insert a new disk, remembering to lock it in.

(e) This time, you're sure you've got a new disk. So, as before, you hit [ENTER] and get the flashing "SURE? YES(Y)/NO(N)" message. You can now use our safety-conscious irrevocable "YES" command, made slightly awkward so that you have that final moment in which to say "Yes, I'm SURE it's the right command!".

While holding down [SHIFT ⇑], hit [Y] (on the MODE/FUNCTION keyboard), and the flashing "EXECUTING NOW!!" message will appear. This means that the disk is now being initialized. The process takes about three minutes and you'll hear a few slight bumps and buzzes coming from the disk drive. When it's over, the next message you see will be "DISK ID SET".

```
DISK ID SET
.........................................
```

(f) You can now give your disk an "ID", also known as a file name or code name. (This is not necessary for operation of the QX1, so if you don't want to give your disk an ID, go straight to paragraph (g) below.) The dots along the bottom of the LCD panel indicate the entry spaces. The cursor will appear below the first dot. You can have up to 40 letters, numbers, or spaces in your ID. Type in numbers by simply pressing the appropriate keys. To type in letters, press the required letters while holding down [SHIFT ⇑]. To type in spaces, press [SPACE].

If you make a mistake or wish to change the ID, pressing [←S] or [→T] will return the cursor to the left hand side of the LCD. Pressing [←S] and [→T] while holding [SHIFT ⇑] will move the cursor one space left or right, respectively.

(g) Once you've typed in your ID, you can enter it ("enter" means to actually store the data on the floppy (disk) by pressing [ENTER]. You will now see the "PLAY MODE" message, and the PLAY LED indicator on the MODE/FUNCTION panel will light. This means that you can play back any previously recorded music data, or enter any of the main operating modes of the QX1 Digital Sequence Recorder.

```
PLAY MODE              PROT:0    USE:000K
BANK 01   ********     TEMPO:***  TIME:**/**
```

So--welcome to QX world! After your patience in working through the previous section, we'd now like to offer you a quick and easy demonstration of the QX1.

THE QX1–A QUICK DEMONSTRATION

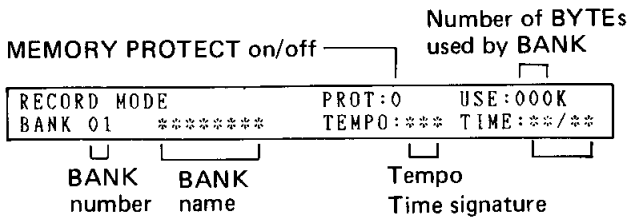
NOTE:

This demonstration only works if you have inserted and initialized a brand new floppy disk into the QX1, because it depends on certain conditions, such as bank 01 and track 1 being empty and ready to receive data. If you are using a disk that already contains data, bypass the "QUICK DEMONSTRATION" and go straight on to the "RECORDING ON THE QX1" section.

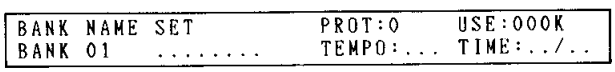
NOTE ALSO:

This is a very simple demonstration. However, if you get lost or think you've made a mistake, you can press [PLAY] at any time and start over again from paragraph (a). You may see an "EXECUTION NOW!!" message flashing for a few seconds, before the LCD returns to its initial "PLAY MODE" display. (The only time you can't do this is when the LCD message says "RECORDING". In this case, press [STOP] then [PLAY] before restarting the demonstration). OK, let's go...

(a) Press [RECORD] . The LCD message will immediately change to "RECORD MODE".



(b) Press [ENTER] . The LCD message will immediately change to "BANK NAME SET".



(c) Press [←T] to move the cursor to the "TEMPO" section of the LCD. Type in any tempo between "040" and "280". (Try "120").

(d) Press [←T] again, to move the cursor to the "TIME" position. Type in any number between "01" and "32" (number of beats in a bar). (Try "04".)

(e) Press [←T] one last time, moving the cursor to the second half of the "TIME" section. Type in one of the following two-digit numbers: "01". "02", "04", "08", "16", "32" (length of each beat). (Try "04". This will give you, together with the previous operation, a regular 4/4 beat).

Example of BANK NAME · TEMPO · TIME

(f) Press [ENTER] .You will now see the "RECORD READY" message.

(g) Press [CLICK] (the CLICK OUT LED on the MODE/FUNCTION panel will light). This activates the Click signal to give you a rhythm guide when you start recording.

(h) The QX1 is now ready to record. If you are too, then press [RUN]. The Click signal will give you a two-bar "count in", then the "RECORDING" message will appear, and you can START PLAYING on your MIDI instrument!

```
RECORDING                MEASURE:001
BANK 01   BBBBBBBB     TEMPO:120 TIME:04/04
```

(i) At the end of your performance, hit [STOP]. The "RECORD READY" message will reappear.

(j) Press [PLAY]. You'll see the flashing "EXECUTING NOW!!" message for a few seconds, followed by the "PLAY MODE" message.

```
PLAY MODE                PROT:0    USE:001K
BANK 01   BBBBBBBB     TEMPO:120 TIME:04/04
```

(k) Press [ENTER] and the "EXECUTING NOW!!" message will blink at you again for a few seconds, and then the "BANK PLAY READY" message will appear.

```
BANK PLAY READY          MEASURE:001
BANK 01   BBBBBBBB     TEMPO:120 TIME:04/04
```

(l) Press [RUN] to play back your digital recording. The LCD will show "BANK PLAYING". If you don't want to hear the Click signal, hit [CLICK] and the CLICK OUT LED will go out.

```
BANK PLAYING             MEASURE:001
BANK 01   BBBBBBBB     TEMPO:120 TIME:04/04
```

(m) After playback has finished, you can hear it again without "rewinding". Just hit [RUN] agian. This time you can vary the tempo if you like, by turning the large TEMPO CONTROLLER wheel to the right of the front panel. The "TEMPO" section of the LCD will indicate the new tempo you have selected.

(n) You can also sit back and enjoy repeated playback of your performance by pressing [REPT] before or after hitting [RUN]. The REPEAT LED on the MODE/FUNCTION panel will illuminate.

(o) You can "play along" with your recorded performance, on the same MIDI instrument that is being driven by the QX1.

NOTE:

If you alter the volume on your MIDI instrument, the level of the music that is being played back will also change accordingly. Also, if you change the voice setting on your MIDI instrument, the played back music will also switch to the same voice setting. Similarly, any parameter that you change on your MIDI instrument, such as vibrato, or pitch bend, will affect both the recorded music AND whatever you play over it.

(p) And as a further treat--how about trying the automatic TRANSPOSE feature? Here's how: Hit [TRNS]. The TRANSPOSE LED on the MODE/FUNCTION panel will light.

(q) Transposing won't happen until you hit one of the PITCH keys arranged in

a one-octave layout in the lower half of the QX1 DATA keyboard. Hit any of the PITCH keys and the key of your music will change up at the start of the next measure. What's more, if you hit the same PITCH key again, the pitch will be transposed up by an octave, and a further octave each time you press the same key. Pressing another PITCH key will bring you back to the original octave range. If you want to transpose down, press the PITCH key while holding down [SHIFT ↑] . Repeated pressings of the same PITCH key, while holding down [SHIFT ↑] , will take you down through more octaves.

(r) Finally --try pressing the same PITCH key (during repeat playback) eight or more times, with or without holding down [SHIFT ↑] --you may be surprised by the result!

RECORDING ON THE QX1

The INTRODUCTION contains a description of the recording facilities available on the QX1. The "QUICK DEMONSTRATION" section will have given you an initial experience of recording on the QX1. In this section we'll show you, in more detail, how to use the Record mode. We'll assume that you're using the basic system described in the "SETTING UP" chapter.

With this system, it is best to record onto Track 1 of whichever bank you select, for two reasons: (1) The QX1 is automatically switched to record on Track 1 when its power is turned on. (2) Your MIDI instrument is connected to the MIDI Output 1 of the QX1. This means that, initially at least, your instrument can only receive data recorded onto Track 1.

Of course, the QX1 can function in many different systems, and through study of the O.D. will inform you of its full capabilities in the Record Mode.

Bank Selection

There are 32 banks in the QX1. You select which one to record onto as follows:

(a) Press [REC] . The LCD message will change from "PLAY MODE" to "RECORD MODE". On the MODE/FUNCTION panel, the PLAY LED will go out and the REC LED will light. On the RECORD/EDIT panel, LED number 1 will light up, indicating that Track 1 is selected for recording onto.

BANK DIRECTORY display (RECORD MODE)

```
RECORD MODE              PROT:0    USE:000K
BANK 01   ********       TEMPO:***  TIME:**/**
```

(b) The "RECORD MODE" message will indicate bank 01. If you wish to record onto this bank, go straight on to paragraph (c).

To select another bank, press [∧V] (to go to the next higher-numbered bank) or [∨U] (which will go to bank 32 and count downwards from there) until you reach the desired bank number. You'll see the bank number at the lower left corner of the LCD changing by one unit each time you press either of these keys.

(c) Having arrived at your desired bank number, press [ENTER] and the LCD will instantly change to the "BANK NAME SET" display. In this mode you are now able to enter the bank name and the tempo and time signature of the piece you wish to record.

BANK NAME SET display

Bank Name, Tempo and Time Signature Setting

(a) The bank name is set in the same way as the disk ID, except that this time you can use a maximum of eight letters, numbers, or spaces. Type in your bank name (song title, date, code number, or whatever you like). Remember that when typing in letters you need to hold down the [SHIFT↑] key. DO NOT hit the [ENTER] key yet.

Example of BANK NAME · TEMPO · TIME

```
BANK NAME SET            PROT:0    USE:000K
BANK nn   BBBBBBBB       TEMPO:120  TIME:04/04
```

(b) Press the [←T] key to move the cursor to the "TEMPO" entry space, and type in a three-digit number from "040" to "280." This sets the tempo, as with a metronome, in quarter-notes per minute.

(c) Press the [←T] key again, to move the cursor to the "TIME" entry space. The first number you type in will be a two-digit number between "01" and "32". This sets the number of beats in a measure.

(d) Hit [←T] again, to move the cursor on to the second part of the "TIME" entry space, and type in two more digits to indicate the length of each beat (1/4 note = "04", 1/8 note = "08", etc.). You can select from the following: 01, 02, 04, 08, 16, 32.

(e) The information you have typed in is not yet entered into the floppy disk. To do this, hit [ENTER]. The message will change to "RECORD READY". The LCD will still display all the information you have just entered: "BANK NUMBER", "BANK NAME", "TEMPO", and "TIME". The "MEASURE" indicator will show "001", indicating that you are now ready to record from the beginning of the track.

```
RECORD READY            MEASURE:001
BANK 01   BBBBBBBB    TEMPO:120 TIME:04/04
```

Click Function

If you're going to record a track and then overdub more performances, it's likely that a rhythm guide of some kind will be very useful to you, and this is the purpose of the Click Function. This is turned on by simply hitting [CLICK] on the MODE/FUNCTION keyboard. Above this, on the MODE/FUNCTION panel, the red CLICK OUT indicator will light. To hear the Click signal the Click Out jack must be connected in the "SETTING UP" section. Recording can now begin.

Recording – Take One

On the front panel of the QX1, there is a square arrangement of control buttons --the MODE/FUNCTION keyboard. The lower half of this keyboard can be thought of as corresponding to the transport controls of a tape deck, with the following functions available: Play/Record: [RUN], Stop/Pause: [STOP], Rewind: [⇤], and Fast Forward: [⇥]. The [◄] and [►] keys let you "move" one measure backwards or forwards respectively.

(a) When you press [RUN], you'll be given two bars of Click as a "count-in" before recording starts. The Click is programmed with an accent at the start of each bar, so you know exactly where you are. After two bars the RUN LED indicator will light up and the LCD message will switch to "RECORDING". You can now begin playing your MIDI instrument. You will probably want to adjust the level of the Click signal on your amp or mixer--now is as good a time as any to do that.

```
RECORDING               MEASURE:001
BANK 01   BBBBBBBB    TEMPO:120 TIME:04/04
```

(b) While you're playing, the Click will continue, and you may notice that the red TEMPO indicator is flashing on the first beat of each measure. Also, on the LCD panel, the MEASURE section will be counting the measures, starting at "001".

(c) You can temporarily vary the tempo during the Recording procedure, without affecting the tempo you have entered previously.

(d) To stop the recording, press [STOP]. The recording will stop at the beginning of the following bar. The RUN light will go out, the LCD will change to "RECORD READY", and the MEASURE counter will indicate the bar you have stopped at. The TEMPO indicator will continue to flash.

RECORDING—FURTHER OPTIONS

NOTE:

In actual fact, the take isn't finished yet. After having pressed [STOP] to halt the recording, the music data is not saved onto the floppy disk until you press one of the four main mode keys ([UTLT] , [EDIT] , [REC] , [PLAY]). Although some of the options in this chapter must be carried out before pressing any of the main mode keys, DO NOT turn off the QX1 power, thinking you have recorded a once-in-a-lifetime piece of superb playing, until you press one of the above keys, or you will lose your recording forever!
O.K., so you've done your first take. You may or may not be satisfied with your performance. Either way, there are now several options open to you.

You can:

Play back your recording. (In this case, go straight on to the "PLAYING BACK ON THE QX1" section).

Leave this bank and start recording a new piece of music, onto another bank. (In this case, go back to the section entitled Bank Selection in the "RECORDING ON THE QX1" chapter).

Continue recording from where you left off or from a later measure.

"Rewind" and record from the beginning again, or from an earlier measure, erasing all or part of your first take.

Overdub more music onto the same track.

Record onto another track in the same bank.

Use the Punch-In Mode to change certain measures in your recording.

In this chapter we will also describe how you can change the tempo while recording, and how voice changes are recorded.

Continuing in the Recording Mode

(a) Press [RUN] to continue recording where you left off. Once again, the Click guide will give you a two bar count-in, so that you can commence playing as soon as the QX1 goes into the Recording mode, with no gap in the recording. The LCD will show the "RECORDING" message at this point, and the "MEASURE" indicator will continue counting from where you recommenced recording.

(b) Press [STOP] to finish the recording. The LCD will revert to the "RECORD READY" message, and the "MEASURE" counter will show the measure you have stopped at.

(c) If you wish to continue recording from a later measure, this is easily done. First, check to see if the cursor is under the first digit of the "MEASURE" indicator on the LCD. If it isn't, it can be moved there by pressing [←T] . Then type in a three-digit number higher than the one you are now at (Limit: "999") and hit [ENTER] . The "MEASURE" indicator will now show the number of the bar from which you will continue recording.

(d) A second way of recording from a later measure is to press the [►] key just above the [STOP] key. This will "move" the recording point on to the next

measure. You can press this key as many times as you like, till you reach the desired measure.

(e) A third way of recording from a later measure is to press [⏭]. This key is the equivalent of a "fast forward" button. You will see the "MEASURE" display changing rapidly, and you can stop it by hitting [STOP] . You may not be exactly at the required measure (this "fast forward" control really is fast!) so you can locate the exact bar by using [►] and [◄] to move you forwards or backwards, one measure at a time.

CAUTION!!

When moving backwards, any data in measures you move through will be erased. Take care!

(f) Having arrived at the desired measure, pressing [RUN] will restart the recording, preceded again by a two bar Click count. The LCD will show the "RECORDING" message, which will revert to "RECORD READY" as soon as you hit [STOP] to finish the recording. You may now playback or move to any other recording option.

Erasing in the Recording Mode

(a) If you wish to erase your recording and begin again, simply press [⏮] and the "MEASURE" count will return to "001". Then hit [RUN] to start recording again.

NOTE:

This erase procedure only works on the take you have just completed. Erasing two or more overdubbed recordings is a different matter and is mentioned in the Overdubbing section below.

(b) You can erase a part of your recording (starting at the end and working backwards) by pressing [◄] to back up one bar at a time, or [⏮], the rapid "rewind" function which can be stopped by pressing [STOP] .

CAUTION!!

Whenever you back up you erase data, so if you back up too far you will not be able to regain lost music data.

(c) A safer way to "rewind" is to type in the desired measure number. First check that the cursor is on the first digit of the "MEASURE" counter. If it isn't, press [⏮T] to position it there. Then type in the required measure number, a three digit number smaller than the one you are now at, and hit [ENTER] . The "MEASURE" counter will now show the new measure form which recording can recommence, and all music data after this number will have been erased.

(d) Having arrived at the desired measure, pressing [RUN] will restart the recording, preceded again by a two bar Click count. The LCD will show the "RECORDING" message, which will revert to "RECORD READY": as soon as you hit [STOP] to finish the recording. You may now playback or move to any other recording option.

Overdubbing

NOTE:

When you have completed an overdub, it is impossible to remove it from the original track. So if you want to play it safe, you can first record your overdub onto another track (see the Recording onto Another Track section below) and then, once you are satisfied with your overdub, mix it with the original track onto a third track (see the O.D.'s "UTILITY MODE" chapter, Job Command 14 "Track Mix").

(a) Once you are satisfied with your first take, it is extremely simple to overdub. To start the overdub procedure, press [REC] . You'll see the "EXECUTING NOW!!" flashing message for a few seconds, which may be accompanied by some slight bumping sounds from the disk drive as it saves your performance onto the floppy disk. Then the LCD will return to the "RECORD MODE" display. The yellow LED corresponding to track 1 on the DATA TRACK display will light up, confirming that the musical data has been recorded onto the floppy disk.

(b) Hit [ENTER] , and the LCD will again show the flashig "EXECUTING NOW!!" message, quickly followed by the "RECORD READY" message.

(c) The QX1 is now ready to overdub. If you wish to overdub from the start of the piece, go on to paragraph (d). However, if you want to start your overdub from, say, bar 32, this is easily done. Check that the cursor is under the first digit of the "MEASURE" counter on the LCD. If it isn't, press [←T] until it is. Then type in "032"and hit [ENTER] . You are now all set to overdub from bar 32.

(d) Press [RUN] to get a two-bar Click count in. You'll then hear your first take (either from the beginning or from bar 32 as selected) and you can play over this and record a second part. The LCD will show "RECORDING" as with the first take.

(e) When you have finished recording your overdub, hit [STOP] , and the LCD will revert to the "RECORD READY" message. At this time your options are as numerous as they were at the start of this chapter, so you can choose what you want to do next--playback, continue recording, do a further overdub (as many as you wish), erase, or record onto another track.

NOTE:

If you wish to erase your performance, the procedure described in the "Erasing in the Recording Mode" section will only allow you to erase the overdub you have just performed, NOT the previous take. To erase part or all of the original take plus your overdub(s) consult the O.D.'s, "UTILITY MODE" chapter under Job Command 15 "Track Delete" or Job Command 20 "Measure Delete".

Recording onto Another Track

Each bank in the QX1 contains eight tracks, just like an eight-track tape deck. Recording onto another track is NOT the same as overdubbing. With this procedure, you will have completely separate tracks of music data that can be individually modified or edited, and can be used to drive separate MIDI instruments.

In the normal Playback mode, separate tracks will automatically drive separate MIDI instruments connected to the eight MIDI outputs on the rear of the QX1: Track 1 via Output 1, Track 2 via Output 2, and so on. However, as we said at the start of this chapter, we're assuming that you're using the basic system comprising the QX1 plus a single MIDI instrument such as the Yamaha DX7 synthesizer. So in the normal course of things, only the data on track 1 will drive your MIDI instrument.

We'll begin, then, by showing you how up to four tracks can be assigned to the same MIDI Output and transmit music data to the same MIDI instrument. (The O.D. Will inform you what to do when using the QX1 in other, more complex systems.)

(a) Press [PLAY] . You will now see the "PLAY MODE" message.

(b) Press [JOB COMMAND] . The message will switch to the " JOB COMMAND SELECT" display.

```
JOB COMMAND SELECT
COMMAND ..
```

(c) Type in "03" and hit [ENTER] . You will now see the "TERMINAL ASSIGN" display, with the cursor under the first number in the upper row.

OUTPUT ASSIGN display

```
TERMINAL ASSIGN    i  j  k  l  m  n  o  p
MIDI CH. ASSIGN    qq rr ss tt uu vv ww xx
```

(d) Each of these numbers indicates to which output terminal the corresponding track will transmit data. When the QX1 is switched on, the LCD panel shows each track assinged to its correspondingly numbered terminal, and each track set to MIDI channel 1. If you want to assign track 2 to terminal 1, press [←T] to move the cursor to the second position, then type in "1". If you want to assign the maximum of four tracks to Terminal 1 at this time, keep pressing [←T] to move the cursor to the four tracks you plan to record on, and type in "1" for each track (for example, tracks 1, 2, 3 and 4). Now press [ENTER] . The LCD will revert to the "PLAY MODE" display.

(e) Press [REC] to commence track selection procedure. The "RECORD MODE" message will appear on the LCD.

(f) Press [JOB COMMAND] . The "JOB COMMAND SELECT" message will appear on the LCD.

(g) Type in "02" and hit [ENTER] . The "TRACK SELECTION" display will appear on the LCD.

STATUS/SWITCH display

```
REC. TRK:r              MODE:m
PLAY TRK:abcdefgh       FREE:fffK BYTES
```

(h) Type in the number of the next track you wish to record onto (for example "2").

(i) Press [ENTER] . The LCD will revert to "RECORD MODE", and the red LED corresponding to the track you have selected (e.g.Track 2) will light up.

(j) Press [ENTER] once more. After a few seconds of the flashing "EXECUTING NOW!!" message, the LCD will display the "RECORD READY" message.

(k) To record onto the newly selected track, hit [RUN] . After a two-bar count-in, the RUN LED will light up, the LCD will switch to "RECORDING", the "MEASURE" indicator will commence counting, and you can record onto the new track, while hearing the previously recorded track.

NOTE:

If you change the program (voice setting) on your MIDI instrument, the original track, as well as the new track, will play in the new voice, because both tracks are assigned to the same MIDI output, driving the same MIDI instrument.

(l) To finish recording on the new track, press [STOP]. You may now move on to any of the options listed at the start of this chapter. To select a further track to record onto, go back to paragraph (e) in this section.

Notice that every time you enter music data onto an unused track, its corresponding yellow LED lights up on the DATA TRACK display. And every time you select a new track to record onto, the RECORD/EDIT LED corresponding to that track lights up.
The QX1 always informs you what's going on while you're recording, so if you keep an eye on the LED panels, mistaken erasing or overdubbing need never occur.

Punch-In Recording

At any time during a recording or overdubbing session, you are free to select the Punch-In Record function, which allows you to correct or change part of a recording, from any desired measure.

NOTE:

> The Punch-In function erases all previously recorded data, so if you are overdubbing it is not possible to correct only one layer of overdubbing, without losing earlier takes. As far as the QX1 is concerned, any number of overdubs you do on a track is considerd as a single recording, and the overdubbed layers CANNOT be separated!

The procedure for Punch-In recording is described in detail in the O.D.'s "RECORD MODE" section.

Changing Tempo While Recording

Having entered the tempo of the piece that you wish to record, it is easy to temporarily alter the tempo of the actual recording process. For example, if you wish to create highly complex or rapid musical passages, you can slow down the recording tempo, perform the music at a more comfortable speed, then play back at the faster original tempo. Or if you are creating very slow, minimal music, with many long notes or long pauses, it might be easier to speed up the recording tempo, record the music, and play back at the slower original tempo.

In both cases the QX1 is unlike a tape deck, because a change of speed is not accompanied by any change of pitch. (The converse is also true--pitch can be changed without altering speed, using the TRANSPOSE function--see the "QUICK DEMONSTRATION").

There are two ways of altering the record tempo:

(a) The record tempo may be altered by using the TEMPO CONTROLLER wheel on the right of the QX1. Turning the wheel to the right (clockwise) increases tempo, and turning the wheel to the left (counterclockwise) decreases tempo. This may be done either when the LCD shows the "RECORD READY" message (i.e. before pressing [RUN] to start a recording, or after stopping in the middle of a recording) or during an actual recording (when the LCD shows "RECORDING").

The range of the TEMPO CONTROLLER depends on two things:

1. The tempo programmed into the recording.
2. The position of the TEMPO CONTROLLER at the time you first entered the "RECORD READY" mode by pressing the [ENTER] key.

Experiment with it to find out how the range varies, remembering that the maximum tempo range of the QX1 is 40 to 280 quarter-notes per minute.

(b) The record tempo may also be changed by typing in a new tempo, as follows: when you see the "RECORD READY" message (indicating that you are at the start of a recording, or have stopped in the middle of a take), press [←T] to move the cursor to the "TEMPO" section of the LCD.

Type in your new tempo (any three-digit number from "040" to "280"). The "TEMPO indicator will show the new tempo setting. Then press [ENTER] to enter the new tempo. You may now record at the new tempo by pressing [RUN] . And you may still use the TEMPO CONTROLLER wheel to change tempo while recording.

NOTE:

With both the above methods, the originally programmed tempo is not affected. Changing the programmed tempo is done using the Utility Mode, Job Command 07 (see O.D.).

Changing Voices While Recording

If you change the voice on your MIDI instrument while recording a performance onto the QX1, the voice changes will be rememberd. However, the QX1 has no way of knowing which voice you started your performance with. So when you playback your recording, the QX1 will begin playback by using the last voice you switched your instrument to, because this was last voice command it received (and, unless you have altered anything since completing the recording, this is the present voice setting on your instrument).

The procedure in this case is to use the Edit Mode to insert a program command (voice setting command) at the start of the recording. Then, when you play back, the QX1 will immediately switch to the correct voice for the start of the performance, regardless of the present voice setting on your MIDI instrument. Read the "EDITING ON THE QX1" chapter to find out how to perform this simple operation.

PLAYING BACK ON THE QX1

Having completed your recording, whether a simple one-take performance, a multiple overdub, or a recording on several tracks, the Playback procedure is the same, when we are using the basic system of QX1 plus one MIDI instrument.

NOTE:

> With this basic system, you are sending playback data out through a single MIDI output. Hence, a recording on more than one track requires that you assign the recorded tracks to a single output, as described in the "Recording onto Another Track" section of the "RECORDING--FURTHER OPTIONS" chapter.

(a) Press [PLAY]. The LCD will display the "PLAY MODE" message.

(b) At this time, you may select any bank for Playback, by pressing the [↑U] or [↓V] keys until the desired bank number appears on the LCD.

(c) Hit [ENTER]. The LCD will show the flashing "EXECUTING NOW!!" message for a few seconds, and then the "BANK PLAY READY" display will appear.

```
BANK PLAY READY          MEASURE:001
BANK 01   BBBBBBBB    TEMPO:120 TIME:04/04
```

(d) If you do not wish to hear the Click Output during playback, hit [CLICK], which will turn off the CLICK LED.

(e) Press [RUN] to start playback of the recorded music data. The LCD will switch to "BANK PLAYING", the RUN LED will light, and the "MEASURE" indicator will begin to count bars, starting from "001".

(f) At the end of playback, the LCD will revert to its original "BANK PLAY READY" display, reset the "MEASURE" counter at "001", and the RUN LED will go out.

(g) If you wish to stop playback before the end of the recording, press [STOP]. The playback will stop at the beginning of the next measure. The LCD will show the "BANK PLAY READY" message with the "MEASURE" counter showing the number of the bar at which you have stopped.

PLAYBACK—FURTHER OPTIONS

At this point, having stopped in the middle of playing back, you have the following options open to you.

You can:

Leave this bank and play another bank. (In this case, go back to the beginning of the "PLAYING BACK ON THE QX1" chapter.)

Leave this bank and start recording a new piece of music, onto another bank. (In this case, go back to the section entitled Bank Selection in the "RECORDING ON THE QX1" chapter.)

Continue playing back from where you left off, or from a later measure.

"Rewind" and play from the beginning again, or from an eariler measure.

Play from a selected measure.

In this chapter we will also include instructions for changing the tempo during playback, and a brief mention of other options.

Continuing in the Play Mode

At this point we'd like to remind you again that the lower half of the MODE/FUNCTION keyboard fulfils virtually the same functions as the transport controls of a tape deck.

(a) Continue playback by pressing the [RUN] key again. The LCD will switch to "BANK PLAYING" and the "MEASURE" indicator will continue counting bars from where playback recommenced.

BANK PLAYING display

```
BANK PLAYING              MEASURE:001
BANK 01   BBBBBBBB        TEMPO:120 TIME:04/04
```

(b) To play back from a later measure, move forward through the bank one measure at a time by pressing [►]. The "MEASURE" counter will of course show you what measure you're at. When you reach the desired measure, press [RUN] to initiate playback.

(c) You can also "Fast Forward" through the bank by pressing [►►]. This can be stopped at any time by pressing [STOP] . (If you don't press [STOP] the QX1 will wind all the way to the end, then jump to the beginning of the bank again and stop).When you reach the desired measure, hit [RUN] to play back.

"Rewinding" in the Play Mode

NOTE:

This procedure does NOT erase music data, as it does in the Record Mode.

(a) To hear part of a recording again, you can move back through the bank one measure at a time by pressing [◄]. The "MEASURE" counter will of course show you whatmeasure you're at. When you reach the desired measure, press [RUN] to initiate playback.

(b) If you've stopped playback in the middle of a bank, and want to hear the whole piece again, the quickest method is to "rewind" by pressing [◄◄]. This will rapidly move the playback point to the beginning of the bank ("MEASURE" count "001"). You can stop this function anytime by hitting [STOP] . You may then play back again by hitting [RUN] .

Playback From a Selected Measure

An accurate way to select a playback point is to type in the desired measure number. This can be done before playback or after stopping playback in the middle of a bank. (In both cases the LCD must show "BANK PLAY READY".)

(a) First check that the cursor is on the first digit of the "MEASURE" counter. If isn't, press [←T] to position it there.

(b) Then type in the required measure number (a three digit number between "001" and the number of the last measure of the bank) and hit [ENTER] . The " MEASURE" counter will now show the new measure number, and hitting [RUN] will start playback from this point.

Changing Tempo While Playing Back

In the "QUICK DEMONSTRATION" chapter, we explained how to use the TEMPO CONTROLLER to alter playback tempo. There is an alternative method of doing this, by entering a new tempo value.

(a) When you see the "BANK PLAY READY" message (either before playback or after stopping in the middle of a bank) press [←T] to move the cursor to the "TEMPO" section of the LCD.

(b) Type in your new tempo (any three-digit number from "040" to "280"). The "TEMPO" indicator will show the new tempo setting. Then press [ENTER] to enter the new tempo. You may now play back at the new tempo by pressing [RUN] .

(c) The TEMPO CONTROLLER wheel may still be used during playback. Its range will depend on three things:

1. The new tempo setting you have entered.
2. The position of the TEMPO CONTROLLER at the time you entered the new tempo.
3. The position of the TEMPO CONTROLLER at the time you first pressed the [ENTER] key to enter the "BANK PLAY READY" mode.

Experiment with it to find out how the range varies, remembering that the maximum range of tempo's available on the QX1 is 40 to 280 quarter-notes per minute.

NOTE:

When you use either method of changing playback tempo, the originally programmed tempo is not affected. Changing the programmed tempo is done using the Utility Mode, Job Command 07 (see O.D.)

Chain Play and Other Options

As explained in the "Record Mode" section of the INTRODUCTION, it is possible to link banks together into "chains" of up to 32 "steps", each "step" being an entire bank played once or repeated up to 32 times. In this way you can program the QX1 to play an entire concert by itself, initiated by merely pressing [RUN] !

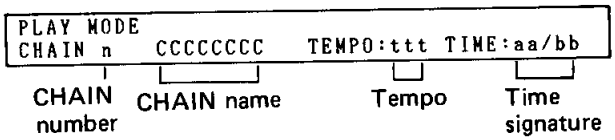
Although chains are played back in the Play Mode, they are assembled in the Utility Mode, so read the "USING THE UTILITY MODE ON THE QX1" chapter for an explanation of how to create chains. Also, please consult the relevant sections in the O.D. for a complete explanation of the Chain function.

Chain playback is carried out as follows:

(a) Press [PLAY] to select the Play Mode. The LCD will show the "PLAY MODE" message.

(b) Press [CHAIN] on the MODE/FUNCTION keyboard to select Chain Play. The red CHAIN LED on the MODE/FUNCTION display panel will light up. The LCD will retain the "PLAY MODE" part of the display, but the lower part of the LCD will show the Chain Directory, which can be "scrolled" through by pressing the [↑U] and [↓V] keys, until it shows the chain you want to play back.

CHAIN DIRECTORY display



(c) Press [ENTER] . The "EXECUTING NOW!!" message will flash for a few seconds, followed by the "CHAIN PLAY READY" display.

CHAIN PLAY READY display

(d) You can now play back the chain you have selected, and use all the playback options described in this chapter, just as with the Bank Play Mode.

The following playback options are also detailed in the "QUICK DEMONSTRATION" chapter:

Using the Tempo Controller.

Using the REPEAT function.

Using the TRANSPOSE function.

"Playing Along" on your MIDI instrument during playback.

The O.D. also covers all the controls and functions in detail, so we suggest that you read these sources of information, at the same time trying out everything you find there on your QX1, to gain a full understanding of its comprehensive playback capabilities.

EDITING ON THE QX1

Editing on the QX1 is a truly exciting creative experience, giving you the opportunity to create music that you may only have imagined before, and perhaps some that you have never imagined! In the normal Edit mode (or "Change" mode) any exisiting music data can be altered or deleted. Switching to the "Insert" mode, you can add new data to a composition, or create an entirely new piece of music, inputting data and notes one at a time.

After acquiring some familiarity with the QX1, you will begin to use certain sub-modes to speed up the editing process. For example, if you are entering music in the Insert Mode, you can rapidly create a repetitive bass part by entering only one bar, then using the Copy Measure sub-mode (Job Command 07) to copy it however many times is required. If the part then changes key, retaining a similar phrase, you can simply transpose the same bar using the Transpose Measure sub-mode (Job Command 08). Time Quantizing (Job Command 09) lets you play a passage inaccurately, then correct its overall timing in a single operation.

A fairly full description of the Editing Mode is given in the INTRODUCTION. The O.D. contains detailed descriptions of all the editing functions. So in this chapter, as a hands-on introduction to editing, we'll give you three immediately useful examples of the fascinating Edit Mode.

But first, let's just LOOK at a piece of music in the Edit Mode. By now, you'll probably have at least one satisfying performance stored onto the QX1's floppy disk, and you may be wondering how to search and find notes, even in the middle of a chord. Here's how it's done:

Examining Music Data

(a) Let's say you've just played back a complete recording. The LCD is showing the "BANK PLAY READY" message, with the "MEASURE" counter at "001". To start the Edit procedure, press [EDIT]. The LCD will immediately change to the "EDIT MODE" display. You'll also notice that the EDIT LED is illuminated, on the MODE/FUNCTION panel, and the LED for Track 1 on the RECORD/EDIT display panel has also lit, indicating that you'll be editing the music data stored on Track 1.

(b) You can now select which bank to edit by scrolling through the Bank Directory using the [↑U] and [↓V] buttons. The Bank Number and Bank Name will show on the LCD.

BANK DIRECTORY display (EDIT MODE)

```
EDIT MODE              PROT:0    USE:nnnK
BANK nn   BBBBBBBB     TEMPO:ttt TIME:aa/bb
```

(c) Having selected a bank, press [ENTER]. The "EXECUTING NOW!!" message will flash for a few seconds, probably accompanied by slight bumping and buzzing sounds from the disk drive. This is perfectly normal, it shows that the disk is moving and being scanned for the relevant data. The LCD will then switch to the "INCREASABLE SPACE" message.

```
INCREASABLE SPACE              nnnK BYTES
TOP OF TRACK
```

(d) The "INCREASABLE SPACE" message shows you how much data you can add to the existing recording, in the form by Bytes (a common computer term--see GLOSSARY), and the LCD also tells you that you are at the beginning of the recording ("TOP OF TRACK"). Now press [↓V] once. The "MEAS. BAR" (measure bar) display will appear. This represents a bar line in data form, this one being the beginning of the first bar of the track ("MEASURE: 001").

```
MEASURE:mmm     STEP:../..  CLK:..../....
MEAS.BAR        TIME:aa/bb
```

(e) The [↓V] key enables you to go through the recording, one step at a time, examining each separate piece of data. Providing you started playing during the first bar of the recording, the next time you press [↓V] you should hear a note, and the LCD will display the data of that note. This includes "MEASURE NUMBER", "STEP NUMBER", "CLOCK NUMBER", "NOTE NAME", "DYNAMICS", "NOTE NUMBER","GATE TIME", and "VOLUME NUMBER". All these terms will be explained later, and in the O.D., and they can all be modified.

NOTE DATE display

```
MEASURE:mmm     STEP:rr/ss  CLK:bbbb/cccc
PPqq  1111   ddd     kkk  gggg  nnnn  vvv
```

(f) If you didn't hear a note, keep pressing [↓V] until you do. Then carry on pressing the same key. You'll notice that, however long the original notes were, you only get a short staccato note in this mode. When scrolling through a track, each time you reach a note a MIDI impulse is transmitted to your MIDI instrument, just as if you've lightly tapped a key. You'll also find that, as you continue scrolling through the track, the original melody may seem to have disappeared altogether, or may seem strange and fragmented. There are two reasons for this:

1. The notes are not being played in the original rhythm, they are being played one at a time every time you hit the [↓V] key.
2. If you recorded any chords, the notes from those chords are being separated and played one at a time every time you hit the [↓V] key. This is how you can examine and edit notes in the middle of a chord.

(g) While you're scrolling through, you'll see a "MEAS.BAR" display appear at the start of every measure. There will be no sound accompanying this display, it is merely information data and tells you what measure you are at, and the time signature of this measure.

(h) You may see other displays appear, also unaccompanied by any sound. These may include "TEMPO CHANGE" (if you have programmed in a tempo change), "CONTROL CHANGE" (if you have used a control such as a modulation wheel or foot sustain pedal during the recording), "PITCH BEND" (if you used a pitch bend Wheel during the recording) and "PROGRAM CHANGE" (if you changed the voice of your MIDI instrument during the recording). Again, these are all explained in the O.D., and they may all be deleted or modified.

(i) You can scroll backwards through the track,one data step at a time, by using [↑U]. When you get back to the beginning of the track, you'll again see the "TOP OF TRACK" display, this time without the "INCREASABLE SPACE" message. This is because the increasable space may have changed, if you have inserted or removed any data; its new figure will be displayed the next time you enter the Edit mode as at the start of this section.

(j) You may also move quickly through the track in the Edit mode, using the function keys in the lower half of the MODE/FUNCTION keyboard. [►] and [◄] move you forwards or backwards one measure at a time. [►►] and [◄◄] are the "Fast Forward" and "Rewind" controls, which may be stopped at any time by [STOP]. As in the Record and Play modes, you will not hear any music while using these controls.

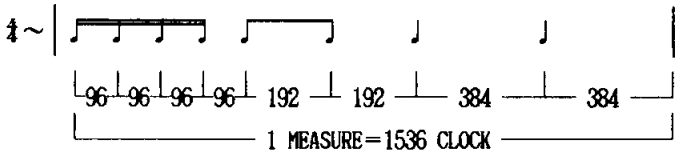
(k) The [RUN] key allows you to play back two measures of the piece you are now at. This enables you to find out where you are in the track if you're not sure, and to check an edit you have nust carried out. You may also use the REPEAT function in this mode, by pressing [REPT] before or after pressing [RUN] . The [STOP] key stops playback with or without repeat.

Clocks, Steps and Quantizing

The three rather unmusical words printed above are of vital importance in the Edit mode of the QX1. They are all related to each other. We'll explain them as follows.

The QX1 handles music timing data with a digital clocks which divides time up into units that equal 1/384 th of a quarter note. All note lengths are expressed in clocks.

CLOCK versus notes



The above illustration shows the clock value of various notes in a 4/4 measure.

All data is entered at clocks, so you can inject "feel" into music data by slightly varying the clock position of some notes.

Clocks are very small units, and to locate notes faster, the QX1 has a Step function. Using job command 06 in the Edit mode, you can divide a measure up into any number of steps, from 1 to 99. When the QX1 is first switched on, it selects 4 steps to a measure.

STEP PER MEASURE display

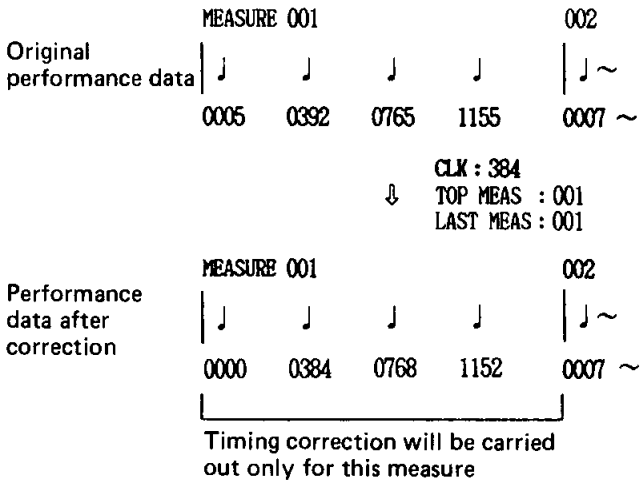
```
STEP PER MEASURE
STEP:ss
```

STEP versus note (4/4 time signature)

In the above illustration the 4/4 bar is divided into 4 steps, hence each step equals a quarter note or 384 clocks. If you have a rapid passage of music, you may find it easier to use 16 steps a bar, so each step equals a sixteenth note (384 diveded by 4 = 96 clocks). This makes it easier to locate notes when scrolling through the data.

The Time Quantize function (job command 09 in the Edit mode) lets you select a number of clocks (1 to 999) as a basic unit of time, and move all notes to these units. This, in effect, slows down the clock. For example, if you select 384 clocks in the time quantize mode, the clock is slowed down to one time division per quarter note, so all notes will occur at quarter note intervals, as the following illustration shows.

Example of TIME QUANTIZING input



Smaller numbers of clocks may be selected, to make a musical performance slightly more regular, though still retaining rhythmic subtlety.

Entering Voice Changes

At the end of the "RECORDING--FURTHER OPTIONS" chapter is a section entitled Changing Voices While Recording. It tells you how, when you play back a recording containing voice changes, the QX1 will transmit these changes, but it cannot start playback with the correct voice unless a Program Change command is entered at the start of the track. This is very simple to do, and is a good way to start your hands-on introduction to the Edit mode. Of course, this operation may be carried out on a track that contains no subsequent voice changes.

(a) Return to the beginning of the track you have been examining in the Edit mode. This may be done by using any one of three different keys. In ascending order of rapidity, these are: [↑U] (one data step at a time), [◄] (one measure at a time) and [⇤] ("Rewind" function). You will now see the "TOP OF TRACK" LCD message.

```
MEASURE:...     STEP:../..  CLK:..../....
TOP OF TRACK
```

NOTE:

You can of course enter a voice change at any point in a recording, simply by scrolling through your recording in the Edit mode until you reach the desired point, then proceeding to the next paragraph.

(b) While holding down [SHIFT↓], press [INSERT]. The LCD will switch to the "INSERT" display.

Example of display when [INSERT] function has been called out

```
INSERT :001     STEP:01/04  CLK:0000/0384
....  ....  .mf      255  ....  ....  064
```

(c) While holding down [SHIFT], press [PRGM]. The lower half of the LCD will switch to the "PRGM" display, with the cursor under the first of three dots at the lower centre area of the LCD.

```
INSERT :mmm     STEP:rr/ss  CLK:bbbb/cccc
--- PRGM ---        ...
                     └┴──Voice number
```

(d) Type in the voice number data (a three-digit number from "000" to "127"). This data may differ from the voice number on your MIDI instrument. With the Yamaha DX synthesizers and TX tone generators, the voice data entered

here is one less than the voice number on the instrument. For example, to select voice 24 on the DX7, type in "023". The O.D. gives instructions for finding out the voice number data for other MIDI instruments.

(e) Press [ENTER] . The voice number will disappear on the LCD. The "INSERT" display will remain. Pressing either [↑U] or [↓V] will switch the upper half of the LCD to a "MEASURE STEP CLK" display, and the lower half will show the program number (voice number) you have just entered. This is how the voice data is stored in the Edit mode, and any time you return to this track for editing, you will see this data display, immediately following the first "MEAS.BAR" display.

```
MEASURE:mmm     STEP:rr/ss  CLK:bbbb/cccc
--- PRGM ---        ppp
                    └└—Voice number
```

(f) To hear the effect of this Program Change data, you must return to the Play mode. By now you're getting used to the QX1, so we'll describe this operation very briefly:

Press [PLAY], and wait for the "PLAY MODE" message.

Press [ENTER] , and wait for the "BANK PLAY READY" message.

Hit [RUN] to hear your recording begin with the voice you have programmed in. Even if you change the voice on your MIDI instrument, it will always switch to the programmed voice when you start playback from the beginning of the track.

The Insert Mode-Creating New Music Data

Without warning you, we sneaked in a little example of the Insert mode in the last section. You "Inserted" a voice command at the beginning of your recording. This is something you may often want to do on your QX1, and it shows you how easy it is to use the Insert mode. However, there's much, much more that can be done in this mode. You can take an empty bank and enter music data from the QX1 keyboard itself. This means that even if you've never played a piano or synthesizer in your life, you can now create sophisticated digital music, with only minimal knowledge of music theory, just by experimenting with the QX1's Insert mode. We'll now show you how quick and easy this can be.

(a) Whatever mode you are now in, pressing [EDIT] will get you back to the Edit mode. (Exceptions to this are if the QX1 is actually recording or playing back, in which case you must first press [STOP]). The LCD may flash the "EXECUTING NOW!!" for a few seconds, before switching to the "EDIT MODE" display.

(b) Use [↑U] and [↓V] to select an empty bank for editing on. When you find one, the LCD will show only asterisks in the "BANK NAME", "TEMPO", and "TIME" sections.

```
EDIT MODE              PROT:0    USE:000K
BANK 01   ********     TEMPO:***  TIME:**/**
```

(c) Press [ENTER] . The LCD will switch to the "BANK NAME SET" message. You may now type in a bank name or number, remembering that when you type in letters you must hold down [SHIFT↑] . You can type in a maximum of eight characters or spaces. DO NOT hit [ENTER] yet!

```
BANK NAME SET          PROT:0    USE:000K
BANK 01   ........     TEMPO:...  TIME:../..
```

(d) Press [←T] to move the cursor to the "TEMPO" section, and type in your chosen tempo (from "040" to "280").

(e) Press [←T] again to move the cursor to the "TIME" section. Type in any number from " 01" to "32", indicating the number of beats in a bar.

(f) Press [←T] one last time, to move the cursor to the second part of the "TIME" display. Type in one of the following numbers: "01", "02", "04", "08", "16", "32", to indicate the length of a beat ("04" = 1/4 notes, "08" = 1/8 note,etc. note,etc.

(g) Now press [ENTER]. The LCD will switch to the "INCREASABLE SPACE/TOP OF TRACK" message. You are now ready to enter music data.

```
INCREASABLE SPACE                nnnK BYTES
TOP OF TRACK
```

(h) The insert mode is activated by pressing [INSERT] while holding down [SHIFT↑]. The LCD will now show the "INSERT" display.

Example of display when INSERT function has been called out

```
INSERT :001     STEP:01/04  CLK:0000/0384
....  ....  .mf      255   ....  ....  064
```

(i) In this mode the two rows of PITCH keys on the DATA keyboard are activated. All twelve pitches are available, arranged as on a piano keyboard, from [C] to [B], including sharps and flats. When you press one of these keys you will hear the appropriate note, played staccatoo using whatever voice you have selected on your MIDI instrument. In the lower center section of the LCD, the MIDI pitch number of each note will be indicated.

(j) If you press the same PITCH key a second time, the note will play an octave higher. Further pressings will give higher octaves, and you'll see on the LCD that every time the note is raised an octave, the MIDI note number increases by 12. Pressing a PITCH key while holding down [SHIFT↑] will have the reverse effect--the notes will go down in octaves, and the MIDI number will decrease by 12. Pressing any other PITCH key will bring you back to the original octave range.

(k) Immediately above the PITCH keys are the NOTE LENGTH keys. These range in value from [𝅘𝅥𝅯] to [𝅝] (1/32 note to whole note). At the left of this row is the [REST] key, and at the right is the [·] key (for dotted notes).

This is all you need to begin inserting music data. You insert notes by simply selecting the pitch and note length and pressing [ENTER]. The clock will then move on to the next note position, by an amount equal to the note you have just entered. If you do not wish to insert another note at this point, you can insert a rest by pressing [REST] instead of a PITCH key.

USING THE UTILITY MODE ON THE QX1

The Utility mode has the largest number of Job Commands of the four main modes. It enables you to carry out a variety of extremely useful and time-saving operations. These are described in detail in the O.D., but in this chapter we'll mention some of the more commonly used sub-modes.

Creating Chains

Chains are created in the Utility Mode. Each "link" (called a "step" in QX1 language) in a chain is a bank, played once or repeated a number of times. You can have up to 32 steps in a chain, and up to 32 repetitions of a bank in each step. This enables you to playback a sequence of compositions, or join together several movements to form a long piece. See job command 03 in the O.D.

Mixing Tracks

Job command 14 lets you mix together tracks as many times as you like. This can be compared to "bouncing down" on a multitrack tape deck. This effectively enables you to record an unlimited number of parts, provided that the playback equipment has sufficient polyphonic capacity to handle the data. (The TX816 FM Tone Generator System, for example, has eight 16-voice modules, allowing you to play a total of 128 monophonic parts at the same time!)

Disk Backup

Job command 13 lets you make a copy of your floppy disk – –highly recommended so as to avoid loss of valuable data.

Time Display

Job command 18. You can measure the time of a bank to within 1/10th of a second– –very useful for film music composers. The time display will also change accordingly if you alter the playback tempo of your piece.

Read the O.D. to discover the 23 other possibilities available in the Utility Mode.

HOW THE MIDI SYSTEM WORKS

MIDI stands for Musical Instrument Digital Interface. It is an internationally accepted standard for signal communications between digital music devices. More and more major manufacturers are adopting the MIDI system, and although MIDI instruments made by different manufacturers are not always totally compatible, they should at least be able to play each other and switch each other's voices.

The MIDI system is what makes it possible to connect all Yamaha's digital instruments together easily and quickly, to form enormously powerful digital music systems. And it is all based on a very simple fact:

Any number can be expressed by a combination of 1's and 0's.

This is also the basis for the entire computer industry, and is easily explained as follows:

We normally express numbers using the decimal system, which has ten different digits (including zero). An alternative way of expressing a number is the binary system, which uses only two digits: 1 and 0. The decimal system expresses numbers as powers of ten (one, ten a hundred, a thousand, etc.) and the binary system expresses numbers as powers of two (one two, four, eight, etc.). Here are some decimal numbers and their equivalents in the binary system.

0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
10	1010
16	10000
32	100000
64	1000000
100	1100100
127	1111111

From this, it did not take a great quantum leap in thinking for an unknown engineer to figure out that this meant that any number could be transmitted by merely switching on and off an electronic pulse signal. The presence of a signal should indicate a 1, and the absence of a signal would indicate a 0, and this is exactly how MIDI works. Any information is broken down into numbers, which usually have a maximum value of 127. Why 127? Well if you look at the above table of figures, you'll see that the final binary figure is a row of seven 1's. So 127 is the largest number that can be expressed using 7 digits in the binary system.

The MIDI standard is based on the use of eight-digit binary numbers. These numbers, or units of information, or data, are called "bytes" and are said to be made up of eight "bits" rather than digits. The number 0 is sent as 00000000, 1 as 00000001, 2 as 00000010, 3 as 00000011, and so on.

The first bit in each byte is used to indicate whether the bit is a "Status Byte" (a byte that commands a MIDI Device to perform a certain operation, e.g. "Key On") or a "Data Byte" (a byte that supplies the numerical value of data). So only seven bits are used to indicate data value, from 0 to 127. For greater numerical data values, more than one byte can be sent. Fro example, the Pitch Bend function on the DX7 uses two bytes giving a total of 14 bits (numerical data range 128 x 128 = 16,384).

Each individual bit within a byte is examined by the receiving MIDI instrument to see if it is a 1 or a 0. Hardly a complex procedure, which is why MIDI data is transferred incredibly quickly. This was agreed upon as the most economical and efficient way of expressing subtle and complex information and, simple though it seems, it does in fact enable you to create music that is MORE subtle than you can perceive!

Every time you press a key on the DX7 a variety of MIDI signals are sent out extremely rapidly. These signals include Key On, Key Off, Key Pitch, Voice Number, and signals for all the Functions such as Pitch Bend, Modulation Wheel, Sustain Switch, After Touch, and so on. Sounds like a lot of information to send for each note, especially if you are playing rapid, complex polyphonic music. But MIDI works fast--the accepted data transmission standard for MIDI is 31.25 kilobauds, which means 31,250 bits per second. That's fast enough for the most rapid changes in a musical program to be handled with ease.

What happens when you play a chord? The MIDI system separates out the notes in the chord, and sends the MIDI impulses serially, or one after another. True, the music is, in effect, cut up into thin "slices" of time, but just as in a movie where a projection speed of only 24 frames a second appears like smooth, uninterrupted motion, the "slices" of time are way, way too small for the ear to separate them. Machines are much more perfect than people and this is exactly why the simple MIDI system is able to deal with the most subtle, expressive, spontaneous music that you can play.

The 31.25 kilobaud transmission rate permits an extremely useful MIDI feature--the transmission of 16 MIDI channels on a single cable. Each MIDI signal starts with a MIDI channel number. This signal will only be received by an instrument set to the same MIDI channel number, or set to Omni, the mode that permits reception of all MIDI channels. In this way, a single cable may be used to send data to sixteen instruments, each performing a diffferent musical part.

"MIDI Formatting" is the phrase used to describe the signals that have been agreed upon to indicate various functions according to the "system exclusive information" of the Yamaha series of digital music devices. This format is not necessarily compatible with other manufacturer's MIDI devices, apart from the basic signals such as Key On, Voice Change, etc.
Every time a signal is sent, it usually consists of more than one byte. For example, the Key On Signal uses three bytes, as follows:

1. Key On, which can be notated as 1001 nnnn

This byte is also known as the Status Byte, as it tells the MIDI instrument the category of this signal, and is transmitted before the other two bytes.

The Key On byte is separated into two sections: The first half, 1001, means "a key has been pressed" according to the MIDI format. The second half gives the MIDI channel number, from 1 to 16. Astute readers will notice that the second half has only four digits, which in the binary system allows you to express only numbers up to 15. However, we can also express a zero, so channels numbers 1 thru 16 are expressed in this MIDI signal as 0 thru 15, subtracting one from the channel number for the purposes of transmission only. This is commonly done in the MIDI system.

2. Note Number, which can be notated as 0kkkkkkk.

This indicates the pitch of the note. MIDI note numbers range from 0 to 127, indicating notes C-2 to G8 (-2 and 8 are octave numbers). This gives a range of over 10-1/2 octaves. When you think that the average grand piano has a range of less than 7 1/2 octaves, the MIDI note range is more than enough for any musical purpose.

3. Note Velocity, which can be notated as 0vvvvvvv.

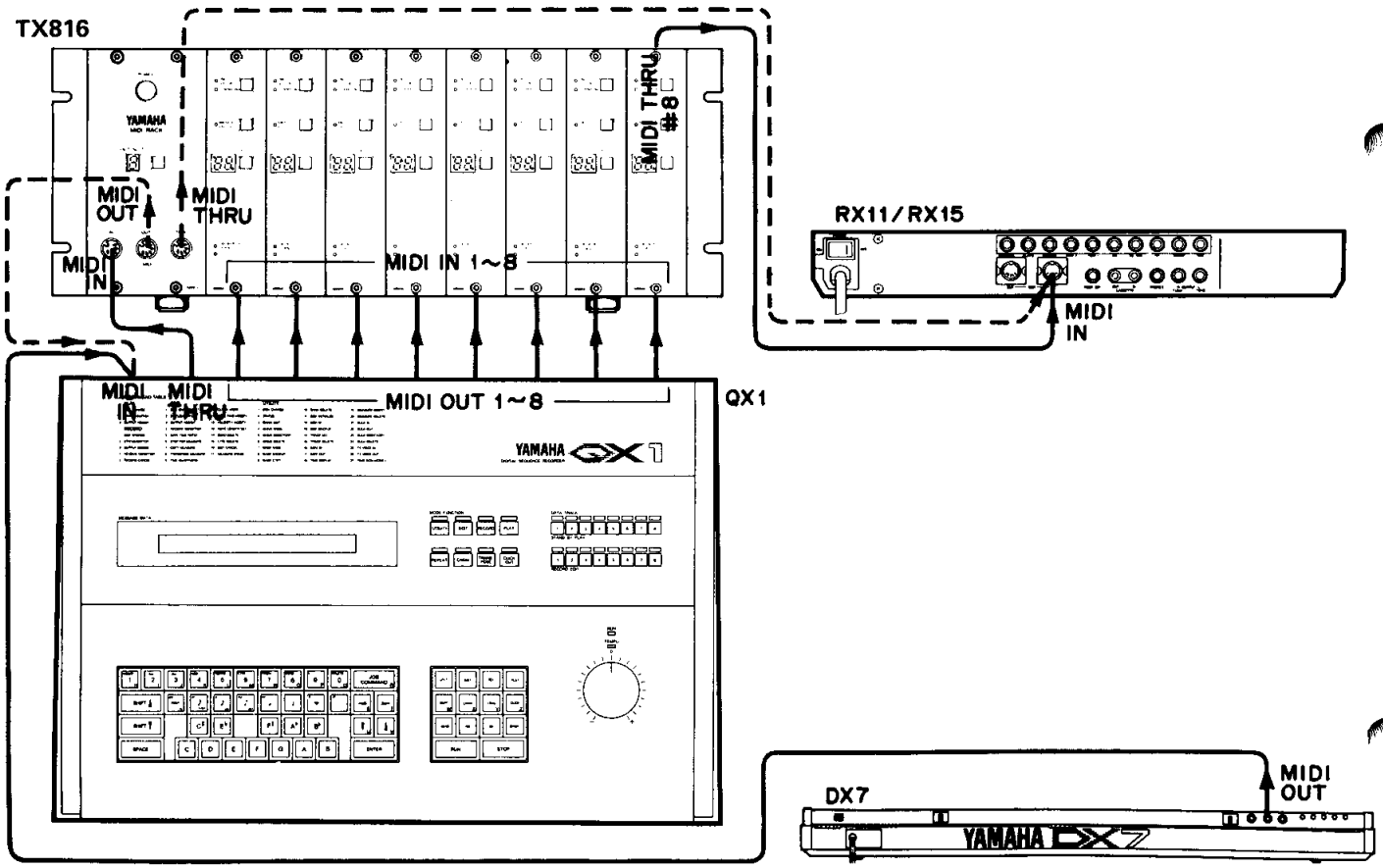
The velocity of the note (which is another way of saying how hard the note was hit) generates a MIDI number from 0 to 127 which can be used to express the volume of the note. 127 increments is more than enough to express the most subtle dynamics--if you can imagine a volume control with 127 divisions on it, this gives you an idea of the degree of subtlety available.

Further explanation of MIDI will not necessarily help you to use this system better. The whole point of the MIDI system is to make digital music systems easy to assemble and simple to use, by musicians who have neither the time nor the desire to acquire a lot of technical knowledge. However, for computer enthusiasts who may wish to use their QX1 together with instruments of their own making, or instruments outside of the Yamaha range, the O.D. contains full MIDI specification of the QX1, and a MIDI Implementation chart.

TX816 APPLICATIONS

The Yamaha TX816 FM Tone Generator contains eight TF1 modules, each of which has a Tone Generator virtually identical to the one incorporated in the DX7 systhesizer capable of producing rich, natural digital voices. The QX1's eight tracks (each of which can contain many overdubs) can directly drive the eight modules on the TX816, to produce powerful, impressive orchestral sounds.

The following system diagram illustrates an enormously powerful digital music setup, including the QX1, which is programmed by the DX7 and plays back through the TX816. You can also control an RX11/RX15 Digital Rhythm Programmer with the QX1, adding remarkably realistic drum and percussion sounds to the rich FM voices of the TX816.



The TX816 Owner's Manual gives detailed instructions on its use. We'll mention here the basic operations that can be carried out when using the QX1 and TX816 together.

Recording Music on Eight Tracks

The "RECORDING--FURTHER OPTIONS" chapter deals with the procedure for recording music data onto different tracks. When you connect the QX1 to the TX816, all tracks may be played back at once.

Dumping Voice Data From the TX816 and Other Instruments

As it contains 16 bulk destinations, the QX1's floppy disk can store all the voice and function data of the TX816 (8 sets of voice data plus 8 sets of function data). See the O.D., Utility mode job command 21. You can load the data back into the TX816 using job command 22.
You can also load in data from any DX synthesizer. In this way you can easily build up a library of voices at low cost.

GENERAL SPECIFICATIONS

CONFIGURATION

• CONTROL PANEL

KEY SWITCH	53
LCD	DOT MATRIX (40 x 2)
LED	MODE INDICATOR x 4
	FUNCTION INDICATOR x 4
	STAND BY/PLAY TRACK INDICATOR x 8
	RECORD/EDIT TRACK INDICATOR x 8
	RUN INDICATOR TEMPO INDICATOR
CONTROLLER	TEMPO CONTROL KNOB
DISK DRIVE	for 5.25 inch floppy disk

• REAR PANEL

MIDI	IN : DIN 5 pin
	THRU : DUB 5 pin
	OUT 1 ~ 8 : DIN 5 pin
OTHER	TAPE SYNC IN OUT : PHONE JACK
	FOOT SW : PHONE JACK
	CLICK OUT : PHONE JACK

MEMORY DATA

• BANK PARAMETER (x 1 ~ 32)

BANK NAME	8 LETTER
TIME	01 ~ 32/01 · 02 · 04 · 08 · 16 · 32
TEMPO	40 ~ 280
MEMORY PROTECT	ON/OFF

• SEQUENCE DATA

NOTE DATA	KEY NUMBER
	VELOCITY
	GATE TIME
	TIMING (CLOCK)
CONTROL CHANGE	
PROGRAM CHANGE	
PITCH BEND	
TIME	01 ~ 32/01 · 02 · 04 · 08 · 16 · 32
TEMPO CHANGE	50 ~ 200%

• CHAIN PARAMETER (x 1 ~8)

CHAIN NAME	8 LETTER

• CHAIN DATA

CHAIN STEP	01 ~ 32
BANK NUMBER	01 ~ 32
PLAY	01 ~ 32

• *DISK PARAMETER*

DISK ID 40 LETTER

• *BULK PARAMETER (x 1 ~ 16)*

BULK NAME 8 LETTER

• *BULK DATA*

FREE

OTHERS

- Power requirements: U.S. Model: 120V (50/60 Hz)
  General Model:100-120/220-240V (50/60 Hz)
- Power consumption: 40W
- Dimensions: 519W x 105H x 329D
- Weight : 7.5 kg
- Recording medium: Double-sided double density double-track 5.25 inch floppy disks
- Operating temperature range: 4°C—40°C
- Standard Accessories : Blank disk, Music rack
  MIDI cable 3m x 2

SAMPLE CHART

QX1 DATA CHART (DUAL-PURPOSE) **BANKS/TRACKS** ☑ **CHAINS** ☐ **DISK I.D.** "ACROSS THE BOARD" **REMARKS:** Versatility Test! **DATE** DEC 1 '84

	1	2	3	4	5	6	7	8	
1	STRING OCTET	BASS	BASS	CELLO	CELLO	VIOLA	VIOLIN	VIOLIN	VIOLIN	double quartet
2	MVLITIPLE PIANOS	LO →							→ HI	pan L thru R
3	JAZZ DANCE	BASS	E.P. 1	E.P. 2	SAX	GTR	VIBES	VIOLIN	TRUMPET	
4	TRAD JAZZ	TUBA	TROMBONE 1	TROMBONE 2	CLARINET	TRUMPET	—	—	—	
5	AMBIENT	VIBES 1	VIBES 2	VIBES 3	PIANO 1	PIANO 2	FLUTES	STRINGS	CHOIR	
6	ECHO'D FLUTE	FLUTE	ECHO 1 →		→ THRU				→ ECHO 7	CLOCK MOVES MAKE ECHOS
7	SPACE FX	LOW HUM	MID HUM	STAR CHIME	BLEEP	BLOOP	STRING FADE	WAILING	SHUDDER	
8	ALLELUJAH CHORUS	BASS	BASS	TENOR	TENOR	ALTO	ALTO	SOPRANO	SOPRANO	DOUBLE 4-PART CHOIR
9	PHASED RHODES	E. PNO 1 →			→ THRU				→ 8	DETUNE TX816 TO -8 -6 -4 -2 0 2 5 7
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
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21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
	1	2	3	4	5	6	7	8	

QX1 DATA CHART (DUAL-PURPOSE) **BANKS/TRACKS** ☐ **CHAINS** ☑ **DISK I.D.** "ACROSS THE BOARD" **REMARKS:** Versatility Test! **DATE** DEC 1 '84

	1 JAZZ GIG	2 SYMPHONY	3 PHILIP GLASS	4 SHORT GLASS	5 DISCO NITE	6 AEROBICS	7	8	
1	BEBOP (1)	1st MOVT (1)	A PHRASE (1)	A PHRASE (2)	MOVEIT (1)	MOVE IT (2)			1
2	REBOP (1)	2nd MOVT (1)	B PHRASE (2)	B PHRASE (1)	JUMPER (1)	JUMPER (1)			2
3	SWING (1)	3rd MOVT (1)	C PHRASE (1)	C PHRASE (1)	SHAKER (1)	SHAKER (3)			3
4	STARLITE (1)	4th MOVT (1)	A PHRASE (2)	A PHRASE (1)	WOBBLE (1)	MOVE IT (2)			4
5	MONA (1)	5th MOVT (1)	B PHRASE (4)	B PHRASE (1)	JACKSON (1)	JUMPER (2)			5
6	LAURA (1)		C PHRASE (11)	C PHRASE (2)	GOTME (1)	SHAKER (4)			6
7	SOLO (1)		D PHRASE (2)	D PHRASE (1)	FUNKY (1)	MOVE IT (2)			7
8	STELLA (1)		E PHRASE (17)	F PHRASE (3)	SWAYIN' (1)	JUMPER (3)			8
9	FINALE (1)		F PHRASE (8)	C PHRASE (1)	HEAD OUT (1)	SHAKER (5)			9
10			A PHRASE (1)	B PHRASE (2)	GET DOWN (1)	HEAD OUT (3)			10
11			C PHRASE (4)	F PHRASE (1)	NELLY (1)				11
12			D PHRASE (9)	B PHRASE (3)					12
13			B PHRASE (3)	C PHRASE (4)					13
14			E PHRASE (23)	F PHRASE (1)					14
15			F PHRASE (4)	A PHRASE (3)					15
16			C PHRASE (24)	E PHRASE (4)					16
17			D PHRASE (5)	A PHRASE (8)					17
18			B PHRASE (6)	G PHRASE (9)					18
19			A PHRASE (7)	H PHRASE (1)					19
20			C PHRASE (1)						20
21			B PHRASE (1)						21
22			E PHRASE (1)						22
23			F PHRASE (1)						23
24			A PHRASE (4)						24
25			C PHRASE (8)						25
26			E PHRASE (9)						26
27			D PHRASE (10)						27
28			E PHRASE (12)						28
29			A PHRASE (15)						29
30			F PHRASE (1)						30
31			G PHRASE (15)						31
32			H PHRASE (2)						32
	1	2	3 DURATION 3 HRS	4 DURATION 40 MIN	5	6 PROGRAM BUILDS	7	8	

(NOTE: Figures next to each step signify number of repeats)

SINCE 1887 YAMAHA

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