YAMAHA

Advanced MIDI Applications

DX7 II·FD/D

DIGITAL PROGRAMMABLE ALGORITHM SYNTHESIZER

SUPPLEMENTAL BOOKLET

Welcome

This Supplemental Booklet describes the various MIDI functions available on the DX7 II and explains how to access and use them. The DX7 II has extensive, flexible MIDI capabilities; if you develop an understanding of the range of possibilities they provide, you can open the door to an expanded world of creative freedom in your electronic music making. The practical musical applications included as examples in this booklet are intended as starting points for your own experimentation.

For continuing information concerning the DX7 II FD/D , consult AfterTouch, the official publication of the Yamaha Users Group. Many advanced functions will be discussed in its pages in the coming months. There will also be information regarding the availability of other materials concerning more advanced applications. To receive a free copy of AfterTouch every month, send your request to AfterTouch, P.O. Box 7938, Northridge, CA 91327-7938. On your letter or postcard, be sure to indicate that you are the owner of a DX7 II FD/D.

Contents

1 Introduction

Introduction

The MIDI functions and settings discussed in this booklet provide a wide variety of options for the management of MIDI messages on the DX7 II. MIDI messages may be sent and received in a variety of configurations at the touch of a button. Since many of these MIDI function settings reside in the System Setup memory, they accompany Voice and Performance data and can be stored to a RAM4 cartridge or floppy disk for easy retrieval. This wide degree of flexibility and easy access frees you from the "technical" side of MIDI, and allows you to concentrate on more creative musical performances.

MIDI functions on the DX7 II will be presented under seven basic headings: MIDI Channel Settings, MIDI Control Number Settings, Local Control, Note On/Off, Program Change, Data Transmission, and Data Reception. In addition, the MDR (MIDI Data Recorder) functions of the disk drive in the DX7 II FD will be explained.

To access any of the MIDI functions parameters in the DX7 II, simply follow these two steps: First, enter the Edit Mode by pressing the EDIT button. Then, press either the MIDI 1 button (#31) or the MIDI 2 button (#32), depending on the function you want to access. Since there are multiple functions associated with each button, you may need to press the selected button repeatedly to reach the LCD screen that gives access to the desired parameter.

When you have reached the desired LCD screen, use the Cursor buttons and the Data Entry buttons or slider to select and set the various function parameters and values.

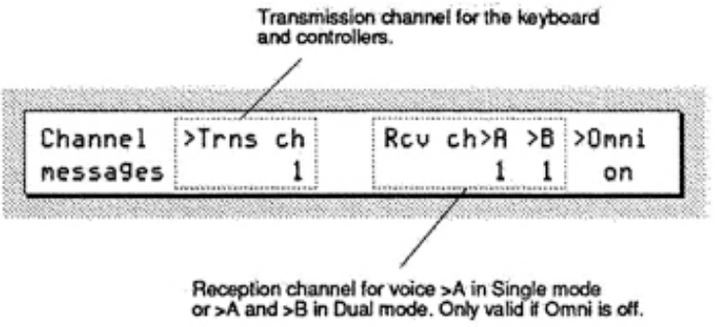
2 MIDI Channel Settings

MIDI Channel Settings

The DX7 II offers a complete selection of options for both the MIDI transmit and MIDI receive channels. MIDI transmission can be set to any one of the 16 MIDI channels, or it can be completely turned off. MIDI reception is similarly available on any of the 16 MIDI channels. In the Single or Dual Voice mode, the MIDI reception channel is determined by the Voice A setting. In the Split mode, the MIDI reception channel can be selected individually for Voices A and B. If Omni mode is on, the DX7 II will respond to incoming data on all channels simultaneously. This overrides the individual settings for Voices A and B.

Once set, these MIDI Channel settings (like the other System Setup functions) remain active until you change them or load different System Setup data. Refer to the material on DX7 II System Setup Data (in Section 7 of this booklet) for a complete list of these functions.

To set the MIDI Channel parameters, enter the Edit mode and press the MIDI 1 button (#31) until the following display appears:



Use the Cursor buttons to select the appropriate parameter, and use the Data Entry buttons or slider to set the MIDI Channel value.

3 MIDI Control Number Settings

Overview

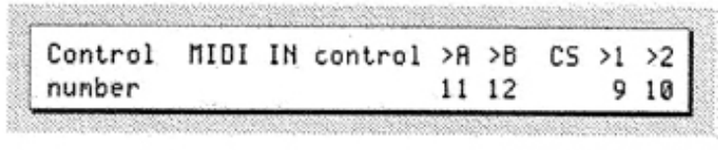
Since each MIDI Controller device is assigned its own MIDI Controller Number, and since manufacturers of MIDI instruments and Controller devices sometimes vary in their assignment of MIDI Controller Numbers, compatibility between units is sometimes a problem. The DX7 II solves this difficulty with its MIDI IN Control Number settings, which give you the ability to specify MIDI Control Numbers for a variety of functions.

Programming the ways in which the DX7 II will respond to incoming MIDI IN Controller messages is a multi-step process. First, you assign MIDI Controller Numbers to the available parameters in the MIDI IN Control LCD screen (accessed via button #31); these settings are stored as part of the System Setup memory. Next, you use the Voice Edit and Performance Edit modes to program the effects that will be controlled by the Incoming MIDI Control Number messages; these effects can be different for each Voice memory and Performance memory.

MIDI IN Control Numbers

The MIDI IN Control Number function allows you to set the DX7 II to respond to incoming MIDI messages from Controller Numbers ranging from 11 to 31. These Control Numbers can be set independently for Voice A and Voice B; therefore, two different MIDI controllers can be used for these effects whenever the DX7 II is in Dual or Split mode.

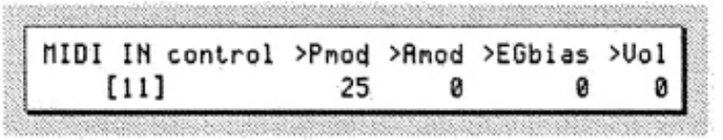
To set the MIDI IN Control Numbers, press the MIDI 1 button (#31) until the following display appears:



Use the Cursor buttons to access Voice A or Voice B, and use the Data Entry buttons or slider to set the desired Control Number. As mentioned above, the range is 11~31. In the display above, Voice A is set to respond to incoming messages from Controller Number 11, while Voice B is set to respond to incoming messages from Controller Number 12.

As with the DX7 II's own controllers, any combination of Pitch Modulation, Amplitude Modulation, EG Bias, or Volume effects can be controlled over a variable range (0~99) by the MIDI IN Controller. These settings are programmed in the Voice Edit mode, and can be different for each Voice memory.

The effects that will be controlled by the MIDI IN Controller messages can be programmed for each Voice in memory. To do so, you start by choosing the Voice you wish to edit. Then, enter Voice Edit mode and press button #26 until the following display appears:



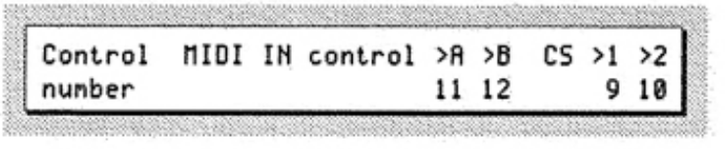
Use the Cursor buttons to select the parameters you wish to edit, and use the Data Entry buttons or slider to set the value for the selected parameter. In the display above, the MIDI IN Control for Voice A is set to control Pitch Modulation (Pmod) over a total range of 25. Notice that the programmed MIDI IN Control Number appears in brackets beneath the display screen title.

Remember that the MIDI IN Control Number is programmed for both Voice A and Voice B in Dual and Split modes; therefore, the Controller assigned to a particular effect may change, depending on whether the voice has been selected as Voice A or Voice B.

CS MIDI IN Control Numbers

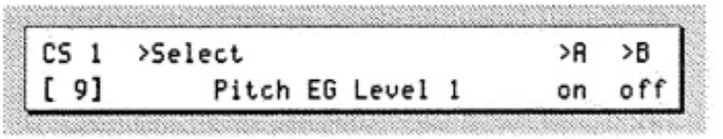
The MIDI IN Control Number function also allows you to assign incoming MIDI Controller messages (from Control Numbers ranging from 9 to 31) to control the functions that have been assigned internally to the DX7 II's two Continuous Sliders (CS1 and CS2).

To set the MIDI IN Control Numbers for CS1 and CS2, press the MIDI 1 button (#31) until the following display appears:



Use the Cursor buttons to access CS1 or CS2, and use the Data Entry buttons or slider to set the desired Control Number. As mentioned above, the range for incoming Controller messages is 9~31. In the display above, the programmed CS1 parameter is set to respond to incoming messages from Controller number 9, while the programmed CS2 parameter is set to respond to incoming messages from Controller number 10.

The CS1 and CS2 effects themselves can be programmed for each Performance in memory. To do so, you start by choosing the Performance you wish to edit. Then, enter Performance Edit mode and press button #27 until the CS1 display screen appears:



Use the Data Entry buttons or slider to select one of the 105 available parameters (for example, Pitch EG Level 1, as in the diagram above). Then, press the Cursor buttons to select Voice A or Voice B, and use the Data Entry buttons to turn the parameter on or off for both voices. Notice that the programmed MIDI IN Control Number for CS1 appears in brackets beneath the display screen title.

Once you have programmed CS1 to your satisfaction, press button #27 to access the CS2 display screen and program CS2 in a similar fashion. Notice that the programmed MIDI IN Control Number for CS2 appears in brackets beneath the display screen title.

CS MIDI OUT Control Numbers

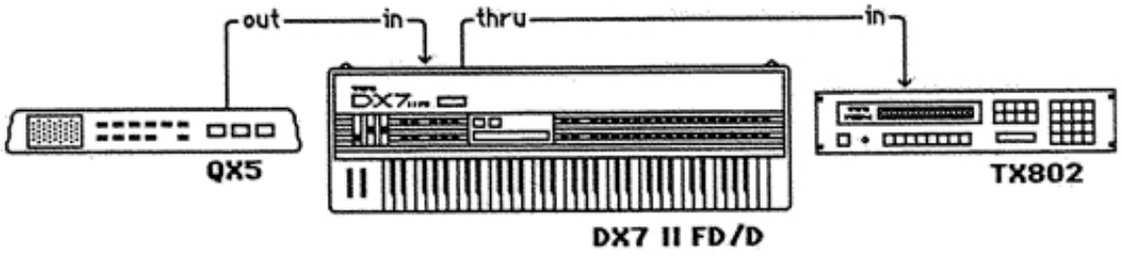
The CS1 and CS2 MIDI Control Number values also determine the outgoing MIDI Control Number that is assigned to the Continuous Sliders, so that they can be used to control external devices. In other words, CS1 or CS2 could control both a DX7 II FM parameter and some aspect of an external device at the same time. Note that MIDI reception is limited to Control Numbers 9~31; Control Numbers 5~8 are available only for transmission. Therefore, if you assign either Continuous Slider to Control Numbers 5 through 8, the parameter assigned to that Slider will not respond to incoming MIDI Controller messages.

4 Local Control

Local Control

The Local Control function allows you to turn the DX7 II's keyboard control of its internal tone generators on or off. With Local Control off, you can play the DX7 II keyboard and send MIDI messages without hearing the DX7 II's sounds. This is advantageous when the DX7 II is used as part of a MIDI system that includes a sequencer or other MIDI tone generators.

Study the example MIDI system below. The sequencer sends MIDI data to the DX7 II's tone generator, while the DX7 II keyboard controls an external tone generator.



With Local Control on, the DX7 II can control both its own sounds and those of the external tone generator; the DX7's internal sounds are also being controlled by the sequencer. With Local Control off, the DX7 II controls only the external tone generator, while its internal sounds are "played" by the sequencer.

To experiment with Local Control, enter the Edit mode and press the MIDI 1 button (#31) until the following display appears:

```
MIDI  >Note on/off  >PC trns mode >Local
        all           normal        on
```

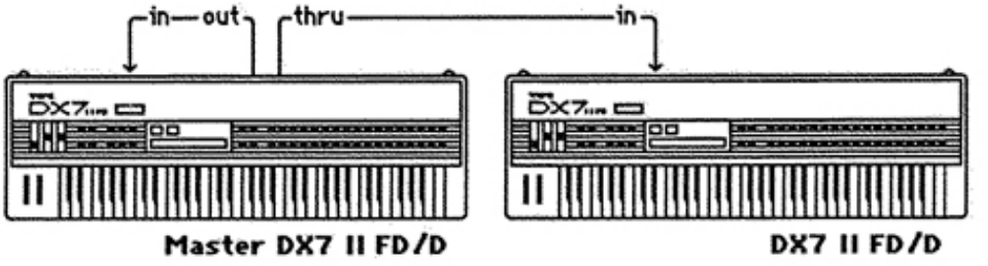
Use the Cursor buttons to select the "Local" parameter, and use the Data Entry buttons to turn the function on or off.

5 Note On/Off

Note On/Off Function

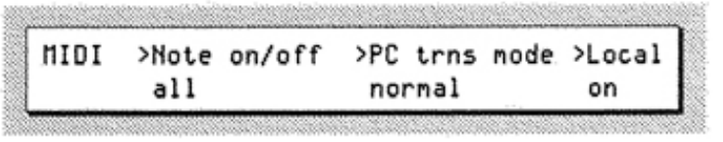
The MIDI Note On/Off function usually is set to "all," meaning that both even and odd numbered note on/off messages will be played by the DX7 II. You can, however, set it to receive only "odd" note numbers or "even" note numbers. When used in conjunction with another DX7 II, this feature allows you to double the maximum number of notes that can be played simultaneously.

To experiment with this feature, set up the following system.



Turn Local Control "off" on the first (master) DX7 II. (Refer to Section 4 for details.) Then, create a MIDI loop from the first DX7 II's MIDI OUT to it's own MIDI IN. Next, connect the first DX7 II's MIDI THRU to the MIDI IN of the second (slave) DX7 II. This allows the master DX7 II to play itself and another DX7 II as if both were external tone generators.

On the first (master) DX7 II, enter the Edit mode and press the MIDI 1 button (#31) until the following display appears:



Use the cursor and Data Entry buttons to set the "Note On/Off" parameter to "even." Next, follow the same procedure and set the second DX7 II's "Note On/Off" parameter to "odd."

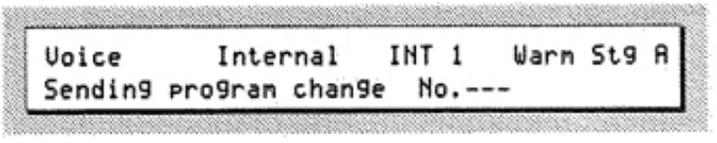
Now, when you play the master DX7 II, you can take advantage of the full 32-note polyphony of two DX7 IIs. For example, middle C (C3) is MIDI note #60 (even number), and thus will sound on the master DX7 II; C♯3 is MIDI note #61 (odd number), so it will sound on the slave DX7 II.

6 Program Change

Program Change

The MIDI Program Change function has a number of alternatives, which may be programmed and used according to your needs.

First of all, an Immediate Program Change may be sent to another MIDI device without changing programs on the DX7 II. This function is available in any of the Play modes. To experiment with this, press and hold the button corresponding to the Play mode you are in (Single, Dual, Split, or Performance). The following display will appear:

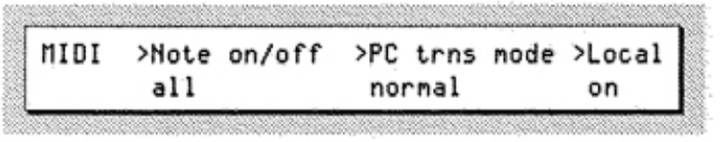


While still holding the appropriate Play mode button, enter the Program Change number you wish to send using buttons #1 ~ #10. Buttons #1 ~ #9 provide numbers 1~9, while button #10 provides a zero (0). Note that you must use a three-digit number in this process: To select Program #1, you must enter "001" using the number buttons; to select Program #16, you must enter "016" using the number buttons. The overall range is 001~128. As soon as the third digit is entered, the Program Change message is sent. This allows you to select a voice in an external source without changing the DX7 II's current voice.

The DX7 II also gives you a number of choices for transmitting MIDI Program Change messages in conjunction with program changes made on the DX7 II (using its Program Change buttons). These choices are selected and programmed in the Edit mode, and operate in any of the Play modes. The DX7 II has a total of 128 MIDI Program Change numbers: Program Change numbers 1~64 correspond to DX7 II Internal programs 1~64, while Program Change numbers 65~128 correspond to DX7 II Cartridge programs 1~64.

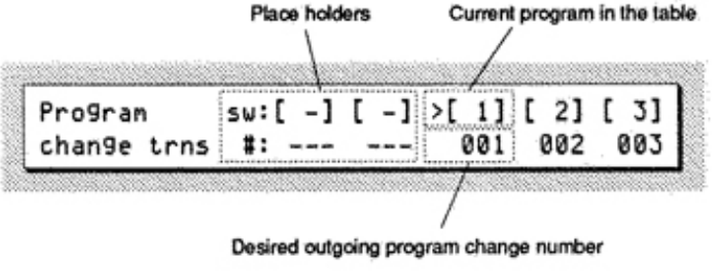
There are three basic choices: 1) You can set the DX7 II to send the same Program Change number as that of the program selected on the DX7 II (this is called "normal"); 2) You can program each of the DX7 II's Program Change numbers to send out a different Program Change number to an external device (this is called "programmable"); and 3) You can set the DX7 II to send no program change messages at all (this is called "off"). These Program Change settings are stored as part of the System Setup memory.

To access the Program Change functions, enter the Edit mode and press the MIDI 1 button (#31) until the following display appears:



Use the Cursor buttons to select the "PC trns" parameter. Use the Data Entry buttons to select "off" (no Program Change sent), "normal" (Program Change corresponds to the program number button pressed), or "programmable" (a predetermined Program Change number is sent).

To take advantage of the "programmable" Program Change option, you need to assign individual Program Change numbers to each program number button. To do this, press the MIDI 1 button (#31) again to call up the following display:



Use the Cursor buttons to cycle through the 64 program memory positions available. (In the "programmable" mode, the Internal and Cartridge number locations are treated as being identical, so the overall range is 1~64.) Use the Data Entry buttons or slider to determine the Program Change number to be sent (001~128) when the selected program number button is pressed. This Program Change table is also stored as part of the System Setup memory; it becomes operational whenever you select the "programmable" value for the "PC trns" parameter.

7 Data Transmission

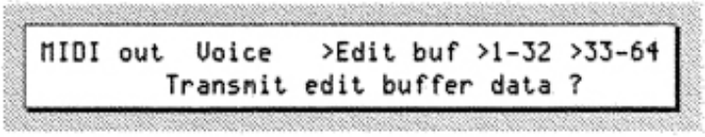
Overview

The DX7 II transmits and receives Voice data (including Fractional Scaling data), Performance data, Microtuning data, and System Setup data. Before sending or receiving data, be sure to set the appropriate Device Number (the MIDI channel on which System Exclusive data is sent and received). For more information, see the Device Number material in the Data Reception Section of this booklet (Section 8).

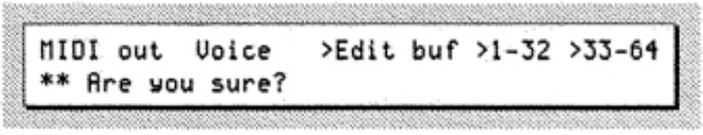
Voice Data

Voice data can be transmitted in three forms: single Voice (contents of the Edit/Play buffer), Voices 1~32, or Voices 33~64.

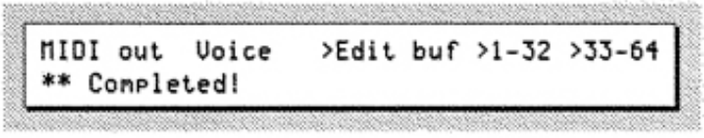
To transmit a single Voice, first select the voice in Single mode. This copies the voice into the Edit/Play buffer. If the voice includes Fractional Scaling data, insert a cartridge formatted for Fractional data before selecting the voice. Next, enter the Edit mode and press the MIDI 2 button (#32) until the following display appears:



Use the Cursor buttons to select the "Edit buf" parameter. Press the YES Data Entry button and the following display appears:



Press YES again and the data is sent:

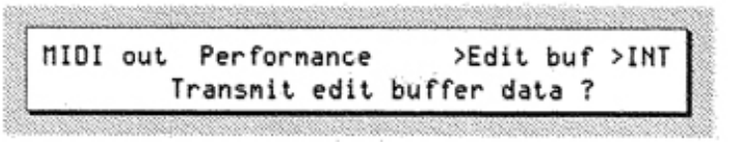


Transmission of Voices 1~32 or 33~64 is carried out in the same manner. Start by using the Cursor buttons to select either the "1~32" or "33~64" parameter, and then proceed as above.

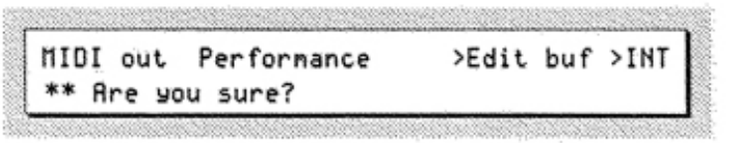
Performance Data

Performance data can be transmitted in two forms: single Performance (contents of the Edit/Play buffer) or a block of 32 Performances.

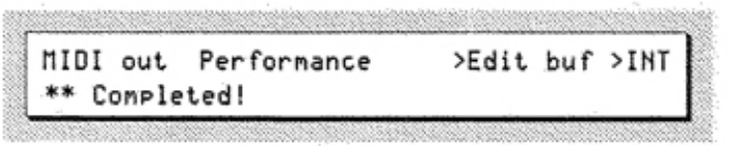
To transmit a single Performance, first select the appropriate Performance. This copies the Performance into the Edit/Play buffer. Next, enter the Edit mode and press the MIDI 2 button (#32) until the following display appears:



Use the Cursor buttons to select the appropriate parameter: "Edit buf" selects the current Performance in the Edit/Play buffer, and "INT" selects all 32 internal Performance combinations. Press the YES Data Entry button and the following display appears:



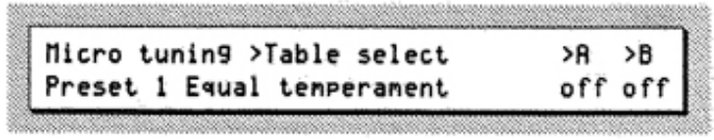
Press YES again and the data is sent:



Microtuning Data

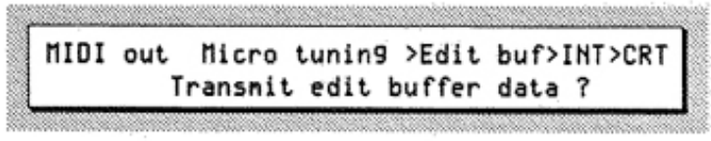
Microtuning data may be transmitted in three forms: single Microtuning scale (contents of the Edit/Play buffer), the two internal Microtuning scales (User 1 and User 2), or the 63 Microtuning scales contained in a Microtuning data cartridge (either RAM or ROM).

To transmit a single Microtuning scale, press the Performance button and then enter the Edit mode. Press the Microtune button (#29) until the following display appears:



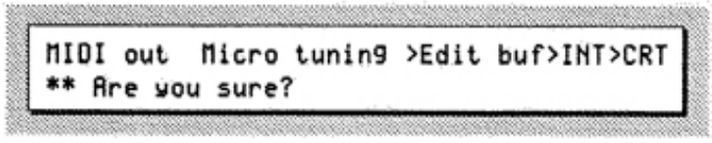
With the Cursor on the Table Select parameter, use the Data Entry buttons to select the Microtuning data you wish to transmit. This places it into the Edit/Play buffer This step is necessary only when you want to transmit a single Microtuning; for the other data types, simply begin with the steps below.

Press the MIDI 2 button (#32) until the following display appears:

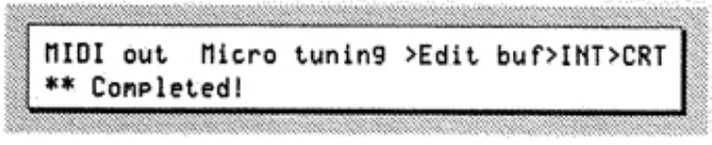


Use the Cursor buttons to select the type of transmission: "Edit buf" for the single Microtuning in the Edit/Play buffer (from the previous step), "INT" for the two internal Microtuning scales (User 1 and User 2), or "CRT" for the 63 Microtuning scales in a RAM or ROM cartridge.

Press the YES Data Entry button and the following display appears:



Press YES again and the data is sent:



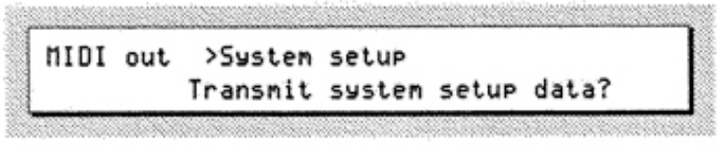
System Setup Data

The System Setup memory discussed in this booklet includes the following function settings:

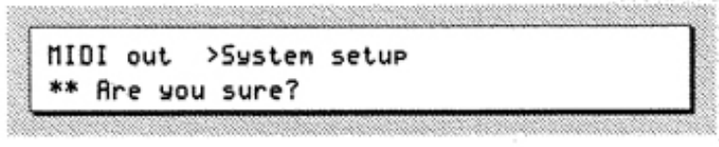
Channel Messages—transmission channels: 1~16 or off
reception channels: 1~16 or off (voices A and B)
omni receive mode: on or off
Control Number—voices A and B (11~31)
continuous sliders CS1, CS2 (5~31)
Note On/Off data—all, odd, or even
Program Change Transmission—off, normal, or programmable
Local Control—on or off
Device Number—1~16 or off
Receive Block—voices 1~32 or 33~64

This data is retained with the appropriate Voice and Performance data, and can be stored to or loaded from either a RAM cartridge or a floppy disk. System Setup data also can be transmitted or received via MIDI.

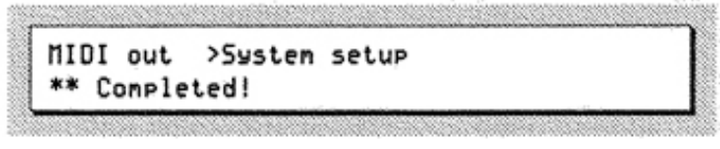
To transmit System Setup data, enter the Edit mode and press the MIDI 2 button (#32) until the following display appears:



Press the YES Data Entry button and the following display appears:



Press YES again and the data is sent:

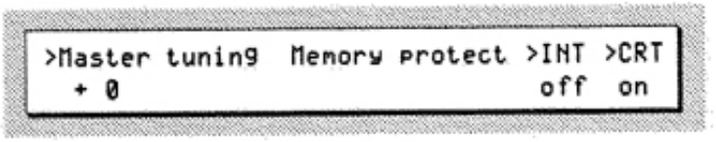


8 Data Reception

Data Reception

In order to receive the types of data listed in the previous Section, the Device Number on the DX7 II must be the same as that on the transmitting MIDI device. The Device Number is simply the MIDI channel being used for System Exclusive data transmission and reception. When receiving Voice data, the Receive Block must also be set to specify whether incoming Voice data is to be stored in memory locations 1~32 or 33~64.

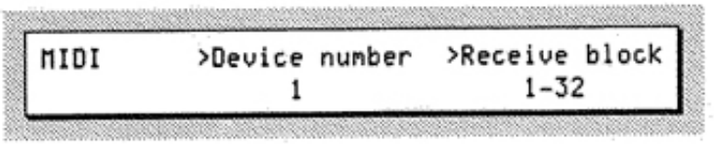
Before Voice and Performance, Microtuning, or System Setup data can be received, the internal Memory Protect must be turned off. To do so, enter the Edit mode and press Utility button #14 until the following display appears:



Use the Cursor buttons to select the "INT" parameter, and use the OFF Data Entry button to turn the Memory Protection off (as in the display above).

Device Number

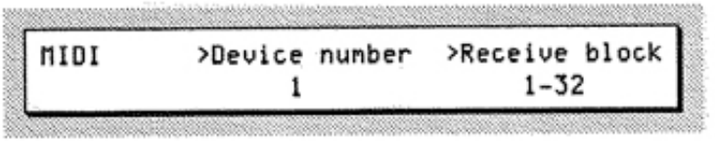
To set the Device Number, enter the Edit mode and press the MIDI 2 button (#32) until the following display appears:



Use the Cursor buttons to select the "Device number" parameter, and the Data Entry buttons to set the device number. The available settings are 1~16 or "off." When the Device Number is "off," no System Exclusive messages can be transmitted or received.

Receive Block

To set the Receive Block, enter the Edit mode and press the MIDI 2 button (#32) until the following display appears:



Use the Cursor buttons to select the "Receive block" parameter, and use the Data Entry buttons to select either "1~32" or "33~64." This setting is very useful for loading voices from the original DX7 into the DX7 II.

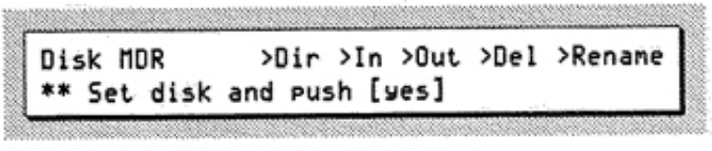
9 Disk MDR Functions

Disk MDR Functions

The DX7 II FD comes equipped with an onboard disk drive, which uses 3.5 inch, double-sided, double-density floppy disks. This disk drive can be used to record a variety of MIDI System Exclusive data (such as sequence data, voice data, rhythm pattern data, and other useful bulk memory data) from external MIDI instruments. You might, for example, store sequence data from a QX5 sequencer (which has no built-in disk drive).

The MIDI equipment transmitting the data you wish to store must to able to output System Exclusive messages without receiving a "dump request." In other words, it must be able to initiate the transmission of its data without receiving a request from another device. It must also be able to send data in bulks that are no larger 20 kilobytes (since the DX7 II's buffer is only 20K in size). Larger volumes of data must be split up into 20K segments within the transmitting equipment before the DX7 II FD can be used to store the data. The DX7 II FD will ignore any data that exceeds the 20K byte maximum per file.

To access the Disk MDR functions, press Utility button #16 until you see this display:



Recording external MIDI data is a two-step process. First, the DX7 II FD must receive the incoming data (using the "In" function); this data is placed temporarily in a buffer. Next, you must write this data to disk, assigning a name to the new file. Be sure that your file name identifies the instrument from which the System Exclusive data came; otherwise, you are in for a lot of confusion.

To transmit MIDI data to an external instrument, you first select the file you want to transmit (using the "Dir" function); then, you set up the external instrument to receive its MIDI data; finally, you transmit the data to the external instrument (using the "Out" function).

All other Disk MDR functions operate just as they do in the Disk INT and Disk CRT screen displays. For more information on the DX7 II FD's various disk drive operations, consult the following Supplemental Booklets: "Utility Parameter Reference Guide" and "Memory Management."