Roland
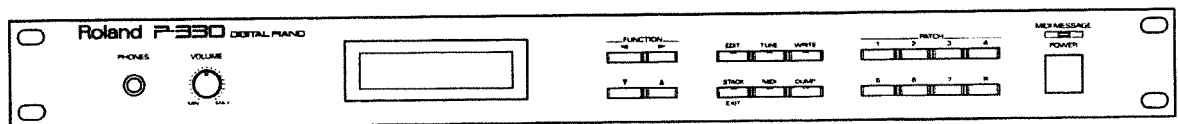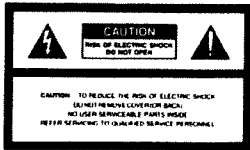
MIDI DIGITAL PIANO

P-330

Owner's Manual

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

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

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK OR INJURY TO PERSONS.

IMPORTANT SAFETY INSTRUCTIONS

WARNING When using electric products, basic precautions should always be followed, including the following:

1. Read all the instructions before using the product.

2. To reduce the risk of injury, close supervision is necessary when a product is used near children.

3. Do not use this product near water- for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

4. This product should be used only with a cart or stand that is recommended by the manufacture.

5. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss.
Do not operate for a long period of time at a high volume level or at level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

6. The product should be located so that its location or position does not interfere with its proper ventilation.

7. The product should be located away from heat sources such as radiators, heat registers or other products that produce heat.

8. The product should avoid using in where it may be effected by dust.

9. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

10. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.

11. Do not tread on the power-supply cord.

12. Do not pull the cord but hold the plug when unplugging.

13. When setting up with any other instruments, the procedure should be followed in accordance with instruction manual.

14. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

15. The product should be serviced by qualified service personnel when:

   A: The power-supply cord or the plug has been damaged; or
   B: Objects have fallen, or liquid has been spilled into the product; or
   C: The product has been exposed to rain; or
   D: The product does not appear to operate normally or exhibits a marked change in performance: or
   E: The product has been dropped, or the enclosure damaged.

16. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

SAVE THESE INSTRUCTIONS

WARNING
THIS APPARATUS MUST BE EARTH GROUNDED.

The three conductors of the mains lead attached to this apparatus are identified with color as shown in the table below, together with the matching terminal on the UK type power plug. When connecting the mains lead to a plug, be sure to connect each conductor to the correct terminal, as indicated.
"This instruction applies to the product for United Kingdom."

MAINS LEADS		PLUG
Conductor	Color	Mark on the matching terminal
Live	Brown	Red or letter L
Neutral	Blue	Black or letter N
Grounding	Green-Yellow	Green, Green-Yellow, letter E or symbol

Please read the separate volume "MIDI", before reading this owner's manual.

Thank you for purchasing the Roland Digital Piano Sound Module P—330.
The P—330 is a MIDI sound module that adopts the SA sound technology, and contains various effects as well as various sound sources. To make the best use of the P—330, read this owner's manual carefully.

CONTENTS

■PANEL DESCRIPTION

Edit Button
Tune Button
Write Button
Patch Buttons
MIDI Message Indicator
Display

Roland P-330 DIGITAL PIANO

Headphones Socket
Volume Knob
Function Buttons

If you push either of ▼ or ▲ buttons
while holding the other button down,
the change of value(display) will be
quicked.

Power Switch
Dump Button
MIDI Button
Stack/Exit Button

MIDI IN Connector
MIDI Out Connector
MIDI THRU Connector

Output Sockets
Output Level Switch

4

■IMPORTANT NOTES

Power

● The appropriate power supply for this unit is shown on its name plate.
Please make sure that the line voltage in your country meets the requirement.

● Do not use the same socket used for any noise generating device, or any device that may consume large amounts of power.

● This unit might not work properly if plugged into the wall socket while switched on, or if turned on immediately after being turned off, and so on. If this happens, turn the unit off, then turn it on agaiafter waiting for a few seconds.

● It is normal for this unit to become hot while being operated.

Power Cable

● To avoid damaging a power cable or causing a short circuit, be sure to hold the plug when disconnecting the cable from a wall socket. If the unit is not to be used for a long period of time, be sure to disconnect the power cable from the wall socket.

Location

● Avoid using this unit in the following locations :

* In excessive heat such as near a heater or where it may be affected by direct sunlight

* In excesssive humidity.

* Where it may be affected by dust or vibration.

Cleaning

● Use a soft cloth and clean only with a mild detergent.

● Do not use solvents such as paint thinner or alcohol.

Memory Backup

● The P-330 features a memory back-up system that retains the data even when switched off. The battery that supports the back-up circuishould be replaced every five years. Call Roland for battery replacement.(The first replacement may be required before five years, depending on how much time had passed before you purchased the unit.)
When the unit is in for service, data in the memory may be erased during the repair work.

① Connections

Other MIDI Sound Module

MIDI IN

Sequencer
(MC-500 Optional)

Roland MC-500

MIDI
Keyboard
Controller

MIDI OUT

MIDI IN   MIDI OUT

MIDI IN   MIDI IN
MIDI Output Selector
(MPU-105 Optional)
MIDI THRU

Stereo Amplifier

<Ouput Level Switch>
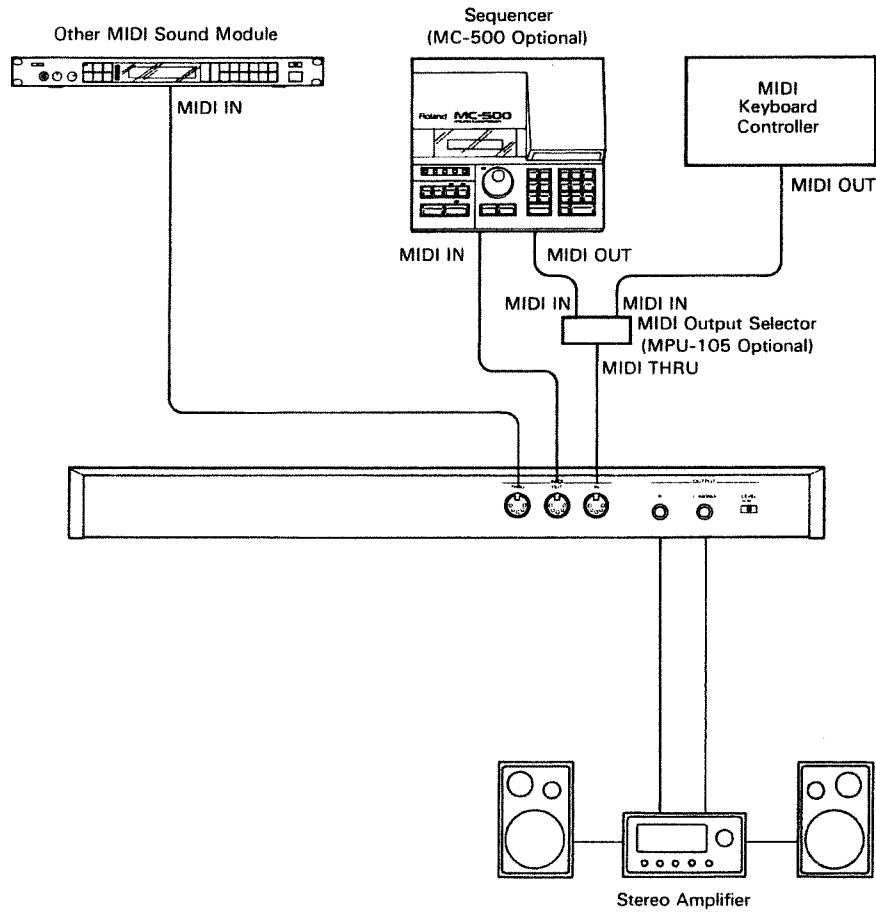
H M L

○ Keyboard Amplifier   M／H
○ Recording Equipment   H
○ Mixer   L／M／H
○ Guitar Amplifier   L／M

＊An exact copy of the signal fed into MIDI IN will be sent through MIDI THRU.

＊The signal fed into MIDI IN is not sent from MIDI OUT.

2 OUTLINE OF THE P-330

The P-330 is a MIDI Sound Module that features various functions. The following explains the features and operational structure of the P-330.

1. FEATURES of the P-330

● SA Sound System

The P-330 utilizes SA/S technology to reproduce the timbres, dynamics, and characteristics of many acoustic musical instruments, such as pianos.

● Multi Effects

The P-330 includes programmable Multi Effects, grouped in Chorus, Tremolo and Equalizer sections.

● Patches

As you change Patches during live performance, the effects will also be changed as well as the Tone (timbre). In other words, a Patch consists of a Tone and Effects.
The P-330 can store up to 64 different Patches.

● Performance Controlling Functions

MIDI Control messages sent from an external device can change the performance controlling functions on the P-330.

● Stacking Function

The P-330's Stacking function allows you to set-up more than one P-330, increasing the number of voices to be played simultaneously.

2. Basic Structure of the P-330

【Tone】

The P-330 provides 8 basic preprogrammed Tones.

Tone	Number of Voices
Piano 1	16
Piano 2	16
Piano 3	16
Harpsichord	10
Clavi	10
Vibraphone	16
E. Piano 1	16
E. Piano 2	10

【Patch】

A Patch consists of one of the 8 Tones and an effect program of Chorus, Tremolo and Equalizer sections.
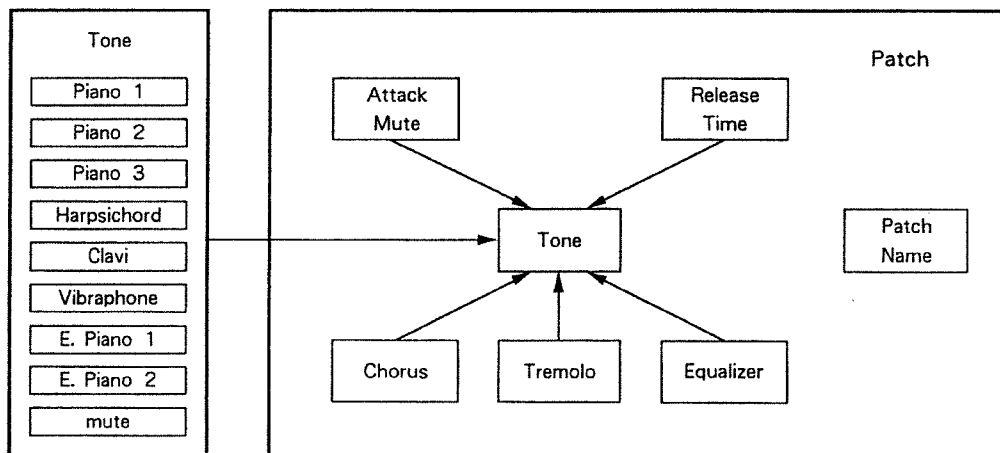
[Multi Effects]

● **Chorus**

Two types of LFO's (Low Frequency Oscillators) are provided for the chorus effect. By combining these two LFO's, various chorus effects can be created.

● **Tremolo**

Tremolo is a periodical alteration of the volume of a tone, creating effects similar to vibrato.

● **Equalizer**

An equalizer corrects the frequency characteristic of a tone.
That is , the brightness of a tone will be altered.

3. The P-330's Four Modes

One of the following four modes should be selected depending what you wish to achieve with the P-330.
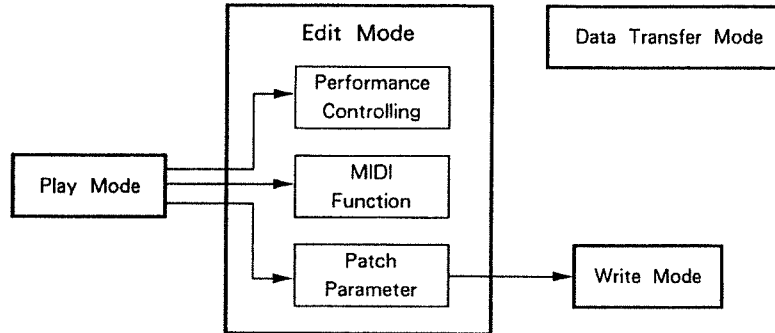
[Play Mode]

This is the normal playing mode, which allows you to call a Patch you like and play it.

[Edit Mode]

This mode allows you to edit the parameters and functions of the P-330.

● MIDI Functions include MIDI Channels, OMNI mode setting etc.

●Performance Controlling Functions determine how each function of the P-330 should be controlled by an external device.

●Patch Parameters include parameters related to the Tones, such as Sound Selection and Effect settings.

＊The edited version of the MIDI functions and Performance Controlling functions are automatically written in the internal memory except for a few, while Patch Parameters requires an appropriate writing procedure.

[Write Mode]

This mode allows you to write an edited Patch into the internal memory.

[Data Transfer Mode]

In this mode, Sound data written in the internal memory of the P-330 can be transferred to another P-330, a sequencer or a computer, etc.

③ Basic Procedure

1. Power-up

Make sure that the P-330 is properly connected to the external devices, then take the following procedure.

Step 1   **Turn the P-330 on.**

POWER
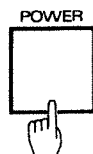
```
Roland P-330
    Digital Piano
```

⇩

Play Mode Display

```
Patch **
  **************
```

Step 2   **Turn on the MIDI controlling unit connected to the P-330.**

Step 3   **Turn the amplifier on, then turn up the volume.**

2. Contrast Control of the Display

Adjust the contrast of the Display so that the Display can be seen clearly.

Step 1   **Push the TUNE button.**
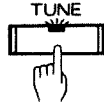
TUNE

Step 2   **Push the FUNCTION ◄ button twice.**

◄

⇩

```
LCD Contrast
      ▶   9
```
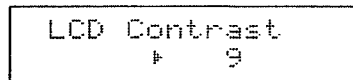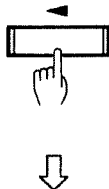
Step 3   **Using the FUNCTION ▼▲ buttons, adjust the contrast.(1 to 16 are possible.)**

▼   ▲
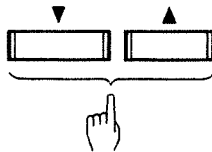
Step 4   **Push the TUNE button.**

3. MIDI Setting

It is essential to set the MIDI channel of the connected MIDI devices to the same number. Otherwise, MIDI messages cannot be communicated properly, and therefore the P—330 cannot be played correctly.

If you wish to use the P—330 regardless of the MIDI channel set on the external device, change the OMNI mode to ON.

a. MIDI Channel Setting

*The MIDI channel you set will be retained even after the unit is turned off.

Step 1   Push the MIDI button.

MIDI Channel   Omni Mode
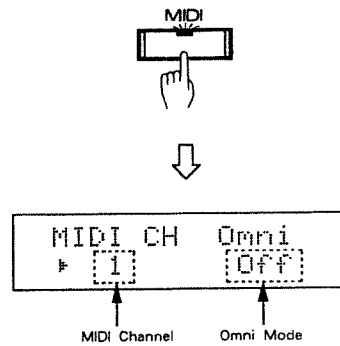
Step 2   Using the FUNCTION ▼▲ buttons, set the MIDI channel from 1 to 16.

Step 3   Push the MIDI button.

When MIDI messages are received, the MIDI Message Indicator lights up.

MIDI MESSAGE

b. OMNI Mode Setting

If you wish to use the P-330 regardless of the MIDI channel set on the connected device, change the OMNI mode to ON.

*The OMNI mode you set will be retained even after the unit is turned off.

Step 1   **Push the MIDI button.**

```
     MIDI
    ┌──┬──┐
    │  │  │
    └──┴──┘
      (hand)
```

⇩
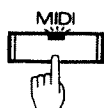
```
┌─────────────────────────┐
│ MIDI CH   Omni          │
│ ▸  1         Off        │
└─────────────────────────┘
```

Step 2   **Push the FUNCTION ▶ button to move the cursor to the right.**

```
      ▶
    ┌──┬──┐
    │  │  │
    └──┴──┘
      (hand)
```

⇩
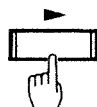
```
┌─────────────────────────┐
│ MIDI CH   Omni          │
│             ▸Off        │
└─────────────────────────┘
```

Step 3   **Using the FUNCTION ▼▲ buttons, turn OMNI to ON.**

Step 4   **Push the MIDI button to return the unit to the Play mode.**

When MIDI messages are received, the MIDI Message Indicator lights up.

```
  MIDI MESSAGE
  ┌─────────────┐
  │   ▄▄▄▄      │
  └─────────────┘
```

4. Sound Selection

The P—330 can store 64 different Patches. A Patch (Patch Number) is represented by a Bank (1 to 8) and a Number (1 to 8), and can be called by using the panel switches on the P—330 or external MIDI Program Change messages.

Number

Bank \ Number	1	2	3	4	5	6	7	8
1	11	12	13	14	15	16	17	18
2	21	22	23	24	25	26	27	28
3	31	32	33	34	35	36	37	38
4	41	42	43	44	45	46	47	48
5	51	52	53	54	55	56	57	58
6	61	62	63	64	65	66	67	68
7	71	72	73	74	75	76	77	78
8	81	82	83	84	85	86	87	88

The table below shows how the Bank/Number correspond to the Patch numbers.

＊Tones assigned to Patches 11 to 18 are the basic sounds of the P—330, and are not programmable, except that the ON/OFF of Chorus and Tremolo can be controlled by Control Change messages. (See page 23)

＊The number of voices to be played simultaneously is different depending on the Tone assigned to a Patch. (See page 8.)

＊The Patch Number used just before the unit is turned off is retained in memory, and therefore will be automatically called when the unit is swithed on.

【Display】

In the Play Mode Display, the Patch Number currently selected and its Patch Name are shown.

Patch Number

```
┌─────────────────────────────┐
│ ┌───────────┐               │
│ │Patch 21   │               │
│ │╌╌╌╌╌╌╌╌╌╌╌│               │
│ │*************** │           │
│ └───────────┘               │
└─────────────────────────────┘
```

Patch Name
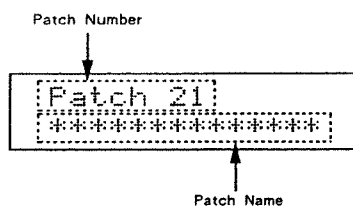
While the following MIDI messages are being received, the relevant sign is shown at the upper right corner of the Display.

MIDI Messages

```
┌─────────────────────────────┐
│  Patch 11   ┌──────┐         │
│    Piano 1  │BAMVP │         │
│             └──────┘         │
└─────────────────────────────┘
```
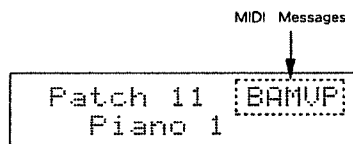
B ····· Bender Messages other than CENTER
A ····· After touch Messages other than "0"
M ····· Modulation Messages other than "0"
V ····· Volume Messages other than MAX
P ····· Panpot Messages other than CENTER

a. Sound Selection on the P—330

Using the PATCH or FUNCTION buttons, Patches on the P—330 can be changed.

【Sound Selection with PATCH buttons】

Using the PATCH buttons 1 to 8, any Patch you like can be called. First, assign a Bank, then a Number. When both Bank and Number are pushed, the corresponding Patch will be called.
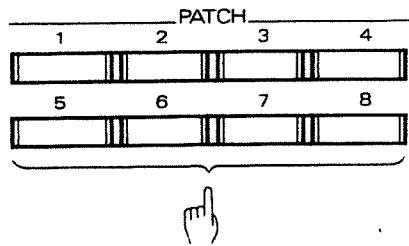
[e.g.] Selecting Patch 25

Push PATCH button 2.

```
Patch 11 ← 2_
    Piano 1
```

⇩

Patch 25 is selected when PATCH button 5 is pushed.

```
Patch 25
*-*-*-*-*-*-*-*-*-*-*-*-*
```

【Sound Selection with FUNCTION buttons】

FUNCTION buttons ▶ and ◀ can used for assigning a Bank, and FUNCTION buttons ▼ and ▲ can be used for assigning a Patch Number.
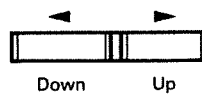
Select a Bank   Select a Patch Number

Down   Up   Down   Up
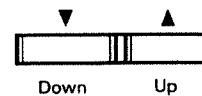
b. Sound Selection from an external MIDI device

Program Change messages sent from an external MIDI device can change Patches on the P—330.

The Patch Numbers of the P—330 correspond to Program Change Numbers as shown below.

Number

Bank \	1	2	3	4	5	6	7	8
1	1	2	3	4	5	6	7	8
2	9	10	11	12	13	14	15	16
3	17	18	19	20	21	22	23	24
4	25	26	27	28	29	30	31	32
5	33	34	35	36	37	38	39	40
6	41	42	43	44	45	46	47	48
7	49	50	51	52	53	54	55	56
8	57	58	59	60	61	62	63	64

The table below shows how the Bank/Number correspond to the program change numbers

*Program Change numbers 65 to 128 are ignored, and therefore do not change Patches.

5. Tuning

The Tuning function allows you to tune the P-330 with another musical instrument.

*The Tuning value you set will be retained even after the unit is turned off.

Step 1 **Push the TUNE button.**

TUNE

```
Tune
       ► 442.0Hz
```
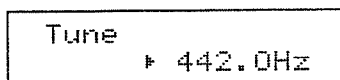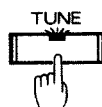
Step 2 **Tune the P-330 using the FUNCTION buttons ▼ and ▲.**

The value shown in the Display represents the frequency of the standard pitch (=A4). You can change values from 438.0 to 446.0Hz in 0.1 Hz steps.

Step 3 **Push the TUNE button.**

4 EDITING

1. Setting MIDI Functions

The edited data will be retained even after the unit is turned off.

a. Editing Procedure

*MIDI function you have set is retained even after the unit is turned off.

Step 1   **Push the MIDI button.**
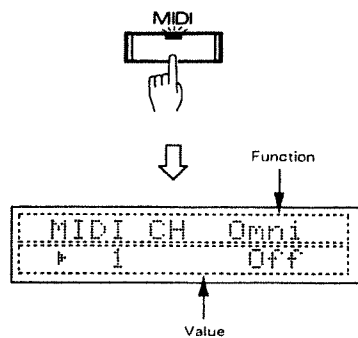
Step 2   Call the Function to be edited using the FUNCTION buttons ▶ and ◀.
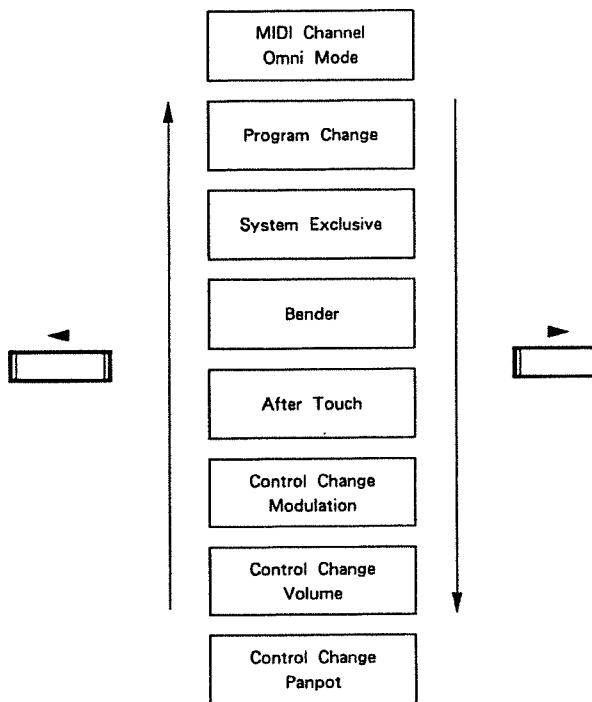
Step 3   Change the value using the FUNCTION buttons ▼ and ▲.
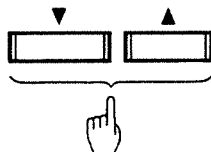
Step 4   Repeat Steps 2 and 3 as many times as necessary.

Step 5   Push the MIDI button.

b. MIDI Functions

*MIDI Functions of the P—330 are preprogrammed as shown below by the manufacturer.

MIDI Function		Value
MIDI Channel Omni Mode		1/Off
Program Change		On
Exclusive		On
Bender		On
After touch		On
Control Change	Modulation	On (1)
	Volume	Off
	Panpot	Off

[MIDI Channel/OMNI Mode]

```
MIDI CH    Omni
  ▶  1          Off
```

Set the MIDI receive channel and OMNI ON or OFF mode.

1 to 16 are valid for a MIDI channel.

OMNI ON or OFF can be selected by moving the cursor with the FUNCTION buttons ▶. When "Off" is selected, MIDI messages are received on the set MIDI channel. When "On" is selected, all the MIDI messages are received no matter what MIDI channel is set.

[Program Change]

```
MIDI Prog.C
          ▶  On
```

This selects whether to receive Program Change messages (=On) or not (=Off).

〔Exclusive〕

```
MIDI Exclusive
     ▶  On
```

This selects whether to receive Exclusive messages (=On) or not (=Off).

〔Bender〕

```
MIDI Bender
     ▶  On
```

This selects whether to receive Bender messages (=On) or not (=Off).

〔Aftertouch〕

```
MIDI After.T
     ▶  On
```

This selects whether to receive Aftertouch messages (=On) or not (=Off).

〔Control Change〕

It is possible to turn on or off each Control Change function or change Control Change numbers.

● Modulation

```
MIDI Control.C
Mod    ▶ On ( 1)
```

This sets how Modulation messages should be received.

Off ... Modulation messages are not received.

On (1), 2 to 31 .... Modulation messages are received.

Normally, Modulation messages can be received on Control Change number 1. However, Modulation messages can also be received on different Control Change numbers from 2 to 31.

● Volume

```
MIDI Control.C
Volume ▶ Off
```

This determines how Volume messages should be received.

Off ... Volume messages are not received.

On (7), 1 to 6, 8 to 31 .... Volume messages are received.

Normally, Volume messages can be received on Control Change number 7. However, Volume messages can also be received on different Control Change numbers : 1 to 6 or 8 to 31.

● Panpot

```
MIDI Control.C
Panpot ▶ Off
```

This determines how Panpot messages should be received.

Off ... Panpot messages are not received.

On (10), 1 to 9, 11 to 31 .... Volume messages are received.

Normally, Panpot messages can be received on Control Change number 10. However, Panpot messages can also be received on different Control Change numbers : 1 to 9 or 11 to 31.

2. Setting Performance Controlling Functions

This determines how the Functions of the P—330 should be controlled by an external MIDI device.

a. Editing Procedure

*Performance Controlling Functions (except Memory Protect) you have set is retained even after the unit is turned off.
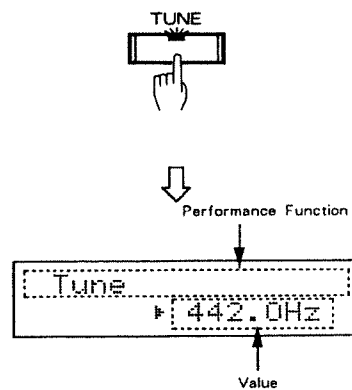
Step 1   Push the TUNE button.

Step 2   Select the Performance Controlling Functions to be edited, using the
FUNCTION buttons ▶ and ◀.

Display Contrast
Memory Protect
Tuning
Octave Shift
Velocity Curve
Bender → Pitch
Bender → Chorus (sawtooth wave)
Bender → Chorus (sine wave)
Bender → Tremolo
After Touch → Pitch
After Touch → Chorus (sine wave)
After Touch → Chorus (sawtooth wave)
After Touch → Tremolo
Modulation → Pitch
Modulation → Chorus (sine wave)
Modulation → Chorus (sawtooth wave)
Modulation → Tremolo
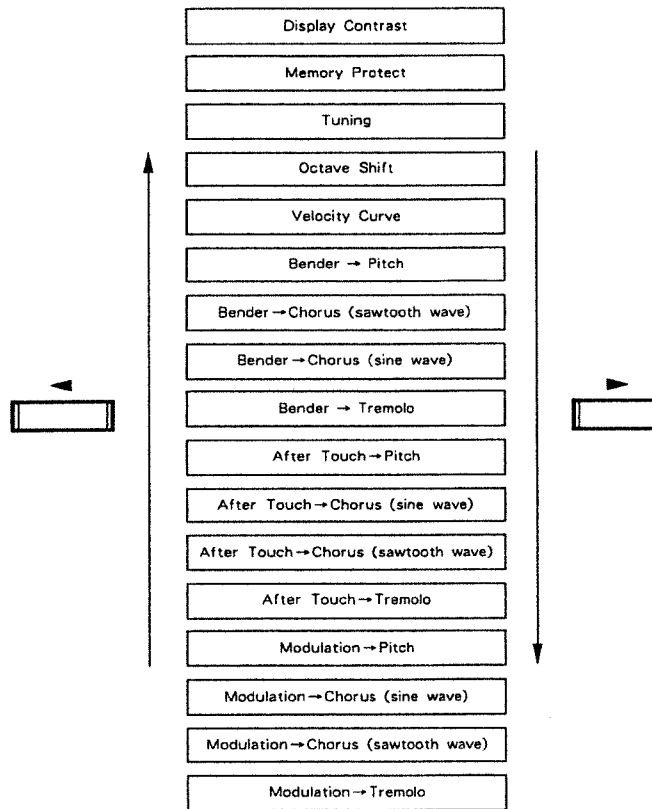
Step 3   Change the value with the FUNCTION buttons ▼ and ▲.
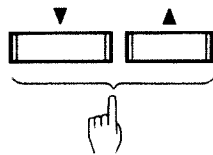
Step 4   Repeat Steps 2 and 3 as many times as necessary.

Step 5   Push the TUNE button.

b. Performance Controlling Functions

*The Performance Controlling Functions of the P—330 are preprogrammed as shown below by the manufacturer.

Performance Functions Value		Value
Display Contrast		9
Memory Protect		On
Tuning		442.0Hz
Octave Shift		0
Velocity Curve		1
Bender	Pitch	0
	Chorus (sawtooth wave)	0
	Chorus (sine wave)	0
	Tremolo	0
After Touch	Pitch	0
	Chorus (sawtooth wave)	0
	Chorus (sine wave)	0
	Tremolo	0
Modulation	Pitch	0
	Chorus (sawtooth wave)	0
	Chorus (sine wave)	0
	Tremolo	0

【Display Contrast】

```
LCD Contrast
      ▶    9
```
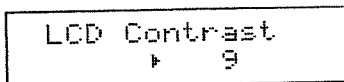
The contrast of the Display can be changed from 1 to 16. Higher values deepen the contrast.

【Memory Protect】

```
Protect
      ▶   On
```
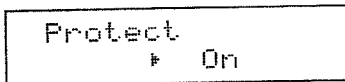
The Memory Protect function protects Patch data in memory from accidental erasure. Set this to On except for when writing data.

*The Memory Protect function defaults to ON.

27

【Tuning】

```
 Tune
      ▶   442.0Hz
```
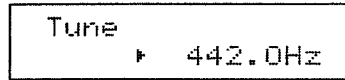
The Tuning function allows you to tune the P-330 with another musical instrument.
You can change values from 438.0 to 446.0Hz in 0.1 Hz steps.

【Octave Shift】

```
 Octave Shift
      ▶   0
```
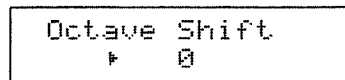
The Octave Shift transposes the entire sound range of the Note messages sent from an external MIDI device in octave steps from −2 to +2 octaves (five steps).
Note names outside of the range ($E^{\flat}_0$−F_6) are transposed to the nearest octave in the range.

【Velocity Curve】

```
 Velocity Curve
      ▶   1
```
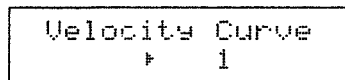
Select one of the following 8 Velocity Curves which determine how the volume or timbre should be changed by the strength of playing (=Velocity).

Tone Color and Volume alteration

Intensity of Key touching ──▶
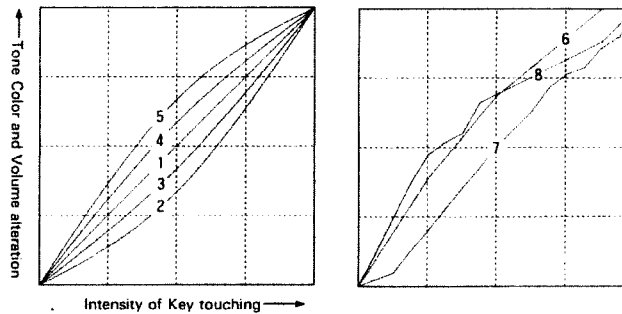
【Bender】

Bender messages can control not only the pitch but also the depth of Chorus/Tremolo effects. 63 is the central value for the Bender.

*If the Chorus or Tremolo is set to off, Bender messages set here will have no effect on the Patch.

*When Chorus or Tremolo are turned on, the value set here is added to the existing value in each Patch. If the total value exceeds the maximum (=100), the actual effect of the Bender does not increase anymore.

● Bender → Pitch

```
Bender → Pitch
        ▶  12
```

This can raise or lower the existing pitch from −12 to +12 (semi−tone steps, maximum ± one octave). When a (−) value is selected, the pitch is lowered from the central value.

● Bender → Chorus (Sawtooth wave)

```
Bender → ⌐\ Chor
        ▶  10
```

The depth of Chorus (sawtooth wave) can be set from 0 to 10.

● Bender → Chorus (Sine wave)

```
Bender → ⌐\ Chor
        ▶  10
```

The depth of Chorus (sine wave) can be set from 0 to 10.

● Bender → Tremolo

```
Bender → Tremolo
        ▶  10
```

The depth of Tremolo can be set from 0 to 100.

【Aftertouch】

Aftertouch messages can control pitch, the depth of Chorus and Tremolo. The amount of aftertouch can be set here.

*If the Chorus or Tremolo is set to off, Aftertouch messages set here will have no effect on the Patch.

*When Chorus or Tremolo are turned on, the value set here is added to the existing value in each Patch. If the total value exceeds the maximum (=100), the actual effect of the Aftertouch does not increase any more.

● Aftertouch → Pitch

```
After → Pitch
        ▶    0
```

This can raise or lower the existing pitch from −12 to +12 (semi−tone steps, maximum ± one octave).

● Aftertouch → Chorus (Sawtooth wave)

```
After → ⌐\, Chor
        ▶   10
```

The depth of Chorus (sawtooth wave) can be set from 0 to 10.

● Aftertouch → Chorus (Sine wave)

```
After → ⌐\, Chor
        ▶   10
```

The depth of Chorus (sine wave) can be set from 0 to 10.

● Aftertouch → Tremolo

```
After → Tremolo
        ▶   10
```

The depth of Tremolo can be set from 0 to 100.

[Modulation]

Modulation messages can control pitch, the depth of Chorus and Tremolo. The amount of modulation can be set here.

*If the Chorus or Tremolo is set to off, Modulation messages set here will have no effect on the Patch.

*When Chorus or Tremolo are turned on, the value set here is added to the existing value in each Patch. If the total value exceeds the maximum (=100), the actual effect of the Modulation does not increase any more.

● Modulation → Pitch

```
┌──────────────────────┐
│  Mod → Pitch         │
│     ►    0           │
└──────────────────────┘
```

This can raise or lower the existing pitch from −12 to +12 (semi−tone steps, maximum ± one octave).

● Modulation → Chorus (Sawtooth wave)

```
┌──────────────────────┐
│  Mod → ⌒\ Chor       │
│     ►    0           │
└──────────────────────┘
```

The depth of Chorus (sawtooth wave) can be set from 0 to 10.

● Modulation → Chorus (Sine wave)

```
┌──────────────────────┐
│  Mod → ⌒\, Chor      │
│     ►    10          │
└──────────────────────┘
```

The depth of Chorus (sine wave) can be set from 0 to 10.

● Modulation → Tremolo

```
┌──────────────────────┐
│  Mod → Tremolo       │
│     ►    10          │
└──────────────────────┘
```

The depth of Tremolo can be set from 0 to 100.

3. Patch Editing

Patch Editing includes Tone assignment for a Patch, changing effect settings, etc.

*The edited data does not automatically rewrite the existing data. If you wish to retain it, take the appropriate writing procedure as explained on page 39 "Writing Procedure".

a. Editing Procedure

Step 1   Call the Patch to be edited.

Step 2   Push the EDIT button.
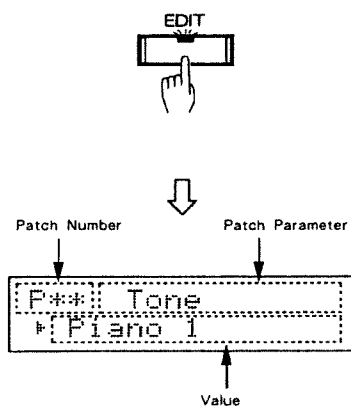
Step 3   Call the Display of the parameter to be edited, using the FUNCTION buttons ▶ and ◀.

Tone Select
Attack Mute
Release Time
Chorus Switch
Chorus Rate (sawtooth wave)
Chorus Depth (sawtooth wave)
Chorus Rate (sine wave)
Chorus Depth (sine wave)
Tremolo Switch
Tremolo Rate
Tremolo Depth
Bass Equalizer
Treble Equalizer
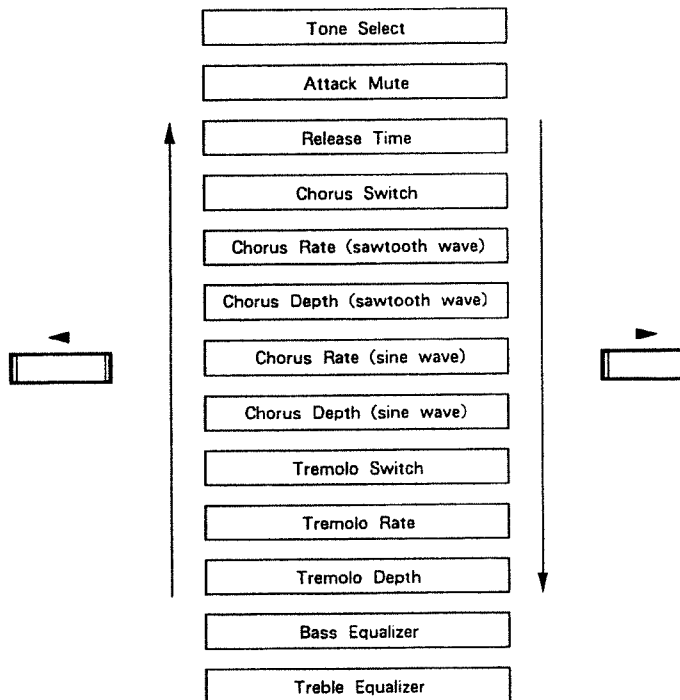
Step 4   Change the value with the FUNCTION buttons ▼ and ▲.
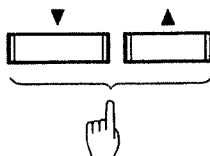
Step 5   Repeat Steps 3 and 4 as many times as necessary.

Step 6   To write edited data, take the appropriate wiring procedure (see page 39).

                *If you do not wish to retain the edited data, push the EDIT button.

33

When a parameter value is even slightly edited, an * (edit mark) appears next to the Patch Number in the Display. (An edit mark appears in the Play Mode Display as well.)

Edit Mode Display   Edit Mark

```
P21* Release
Time  ▸   4
```

Edit Mark

Play Mode Display

```
Patch 21*
**************
```
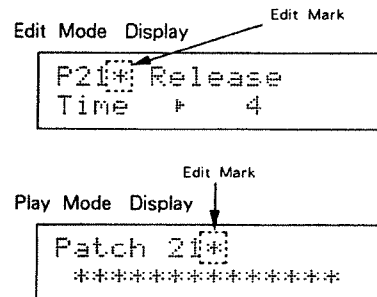
[Note on Editing]

1) In Patches 11 to 18, Tone Select, Attack Mute and Release Time settings are cannot be called. This means that when editing any of these Patches, those Parameter Displays cannot be called.

2) When "mute" is selected with Tone Select, the other Parameter Displays cannot be called.

3) When the Chorus Switch is turned off, the Rate or Depth Display in each Chorus cannot be called.

4) When the Tremolo Switch is turned off, the Rate or Depth Display of Tremolo cannot be called.

5) Patch Names can be changed by taking the writing procedure.

b. Patch Parameters

[Tone Select]

```
P** Tone
▶ Piano 1
```

This selects a Tone to be assigned to a Patch from the following Tones.

Tone	Number of Voices
Piano 1	16
Piano 2	16
Piano 3	16
Harpsichord	10
Clavi	10
Vibraphone	16
E. Piano 1	16
E. Piano 2	10
mute	

[Attack Mute]

```
P** Attack Mute
          ▶   0
```

Use this for softening the attack effect. 0 to 16 are valid. At "0", the set attack is obtained intact.

＊When Piano 1, Piano 2, Clavi or E. Piano 1 is selected, it will sound as "0" no matter what value is set.

[Release Time]

```
P** Release
Time  ▶   0
```

The Release Time can be set from −8 to +8. Higher values increase the time.

【Chorus】

Chorus effects create fat and spacious sounds. Two types of LFO's (Low Frequency Oscillators) are provided, so that you can freely use them to create a wide variety of chorus effects.

● Chorus Switch

```
P**    Chorus
        ▶  On
```

The Chorus (sawtooth and sine waves) effects can be turned on or off with this parameter.

● Chorus (Sawtooth Wave) Rate

```
P**   ⁄\⁄  Chorus
Rate  ▶  10
```

The rate of the Chorus effect (sawtooth) can be set from 1 to 100.

● Chorus (Sawtooth) Depth

```
P**   ⁄\⁄  Chorus
Depth ▶  10
```

The depth of the Chorus effect (sawtooth) can be set from 0 to 100.

● Chorus (Sine Wave) Rate

```
P**   ⁄\⁄  Chorus
Rate  ▶  10
```

The rate of the Chorus effect (sine wave) can be set from 1 to 100.

● Chorus (Sine Wave) Depth

```
P**   ⁄\⁄  Chorus
Depth ▶  10
```

The depth of the Chorus effect (sine wave) can be set from 0 to 100.

【Tremolo】

● Tremolo

> Tremolo is a periodical alteration of the volume of a tone, creating effect similar to vibrato.

● Tremolo Switch

```
P**    Tremolo
         ►  On
```

> Tremolo On/Off can be selected.

● Tremolo Rate

```
P**    Tremolo
Rate   ►  10
```

> The rate of Tremolo can be set from 1 to 100.

● Tremolo Depth

```
P**    Tremolo
Depth  ►  10
```

> The depth of Tremolo can be set from 0 to 100.

【Equalizer】

An equalizer controls the frequency characteristic of a tone. That is, the brightness of a tone will be altered.

● **Bass**

```
┌─────────────────────────────┐
│ P※※   Equalizer             │
│ Bass  ►   0                 │
└─────────────────────────────┘
```

The lower frequencies are adjusted. −100 to +100 are valid. (+) values boost the bass sounds, while (−) values cut them.

● **Treble**

```
┌─────────────────────────────┐
│ P※※   Equalizer             │
│ Treble►   0                 │
└─────────────────────────────┘
```

The higher frequencies are adjusted. −100 to +100 are valid. (+) values boost the treble sounds, while (−) values cut them.

c. Writing Procedure

The P−330's Writing function can write the edited Patch in memory for future use.

[Memory Protect]

The Memory Protect function is provided for preventing data from accidental erasure. For writing data, however, this should be set to OFF. There are two methods for releasing the Memory Protect function as follows.

<Releasing the Memory Protect temporarily during the writing procedure>

Even after starting the writing procedure, you can turn the Memory Protect function OFF. This, however, is a temporary condition that is valid only once, and therefore can be effectively used when you do not need to repeat the writing procedure.

<Releasing the Memory Protect beforehand>

When you are to perform writing repeatedly, such as when re−arranging the Patch order, turn the Memory Protect function OFF beforehand as follows, so that it remains OFF until you set it back to ON again.

Step 1   Push the TUNE button.

TUNE

Step 2   Push the FUNCTION button ◀ once.

◀

⇩

```
┌─────────────────────────┐
│  Protect                │
│          ▶  On          │
└─────────────────────────┘
```
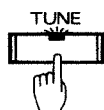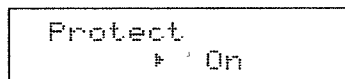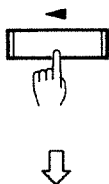
Step 3   Set the Memory Protect to Off using the FUNCTION button ▼.

Step 4   Push the TUNE button.

【Writing Procedure】

Step 1   Push the WRITE button.

WRITE

⇩

Destination Patch Number

Current Patch Number

```
P21*→ P21
Sure? Write/Exit
```
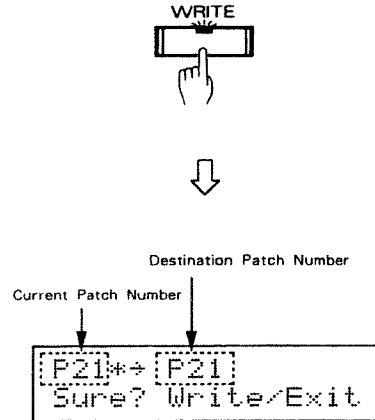
＊To leave the writing mode, push the EXIT button.

STACK
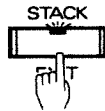
Step 2   Select the destination Patch number by pushing the relevant PATCH
               button.(If you do not wish to change the current Patch Number, skip
               this step.)

               ＊When any of Patches 11 to 18 are selected, Tone Select, Attack Mute
               and Release Time parameters cannot be changed even with an
               appropriate writing procedure.

               ＊When any of Patches 11 to 18 are selected, skip Steps 3 and 4.

Step 3   Push the WRITE button.

WRITE

⇩

```
P21*→ P21 Name?
************
```
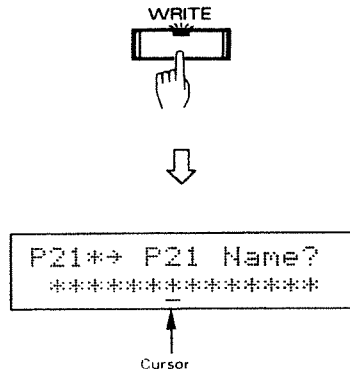
Cursor

Step 4 If you wish to change the Patch Name, do as follows.

①Using the FUNCTION buttons ▶ and ◀. move the cursor to the letter to be re—written.

②Select a letter with the FUNCTION buttons ▼ and ▲.

Name a Patch using the following letters. Up to 14 letters can be used for a Patch name.
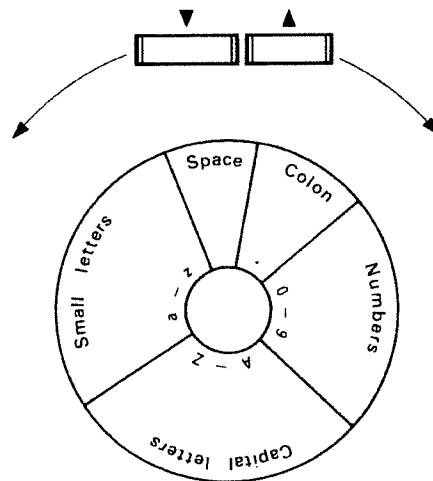
Step 5 Push the WRITE button.

If the Memory Protect has been turned Off, the Display responds as shown below for a while, then returns to the Play Mode indication.

41
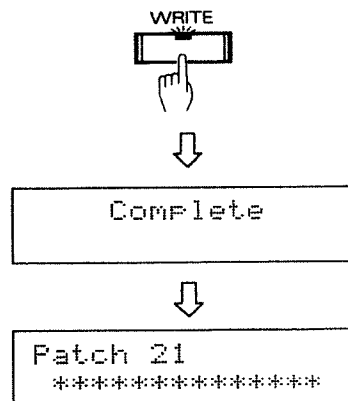
If the Memory Protect has not been turned Off, the following Display is shown for a while.

```
┌─────────────────────────┐
│                         │
│      Protected          │
│                         │
└─────────────────────────┘
```

⇩

```
┌─────────────────────────┐
│  Forcedly Write         │
│  Sure? Write/Exit       │
└─────────────────────────┘
```
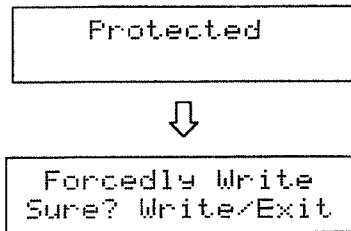
To temporarily release the Memory Protect function, push the WRITE button.

5 Other Useful Functions

1. Data Transfer

The P—330 can transfer data in memory to another P—330, a sequencer, etc, using Roland Exclusive messages.

a. Bulk Dump

The entire data in memory including the Performance Controlling Functions, MIDI Functions and Patch Parameters can be transferred.

When stacking the P—330's (see page 47 "Stacking"), you may use the Bulk Dump function to make all the units set exactly the same.

【Connections】

to MIDI IN
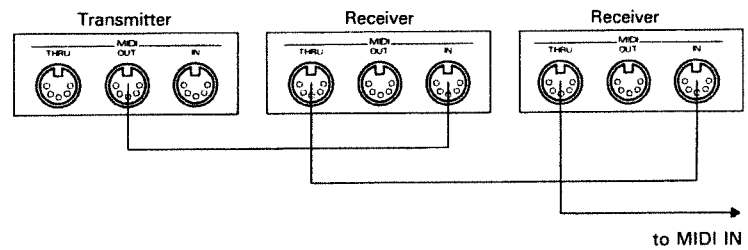
【Procedure】

▶ Transmitter

Step 1   Push the DUMP button.

```
        DUMP
      ┌──┬──┐
      │  ╨  │
      └──┬──┘
        ┌┴┐
        (m)
         )
```

⇩
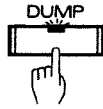
```
┌──────────────────────────┐
│ Bulk Dump                │
│ Sure?   Dump/Exit        │
└──────────────────────────┘
```

*To leave this mode, push the EXIT button.

Step 2   Push the DUMP button.

```
        DUMP
      ┌──┬──┐
      │  ╨  │
      └──┬──┘
        ┌┴┐
        (m)
         )
```

⇩
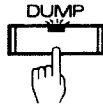
```
┌──────────────────────────┐
│                          │
│          Wait            │
│                          │
└──────────────────────────┘
```

⇩

```
┌──────────────────────────┐
│                          │
│        Complete          │
│                          │
└──────────────────────────┘
```

⇩

```
┌──────────────────────────┐
│ Patch **                 │
│   **************         │
└──────────────────────────┘
```

▶ Reciever

Set the reciecer's Exclusive Message to on, it will reciever all exclusive
data even if other mode is selected.
(Using P−330 as a reciever.)

*The P−330 is preprogrammed to be set the Exclusive on.

b. Transfering a Part of the Data (=a Patch)

The P−330's Data Transfer function also allows you to transfer only a specific Patch (e.g. the edited data). If you record the Patch data in a sequencer or computer which can record Exclusive messages, you can call it at any time later even after the same Patch has been edited on the P−330.

[Connections]
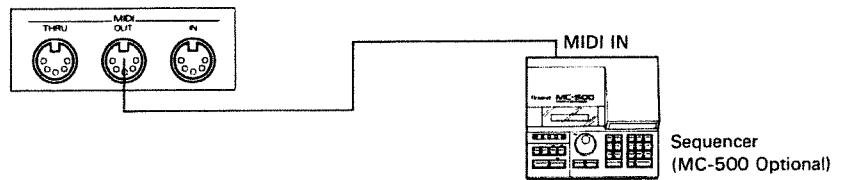
【Procedure】

▶ Transmitter

Step 1   Select a Patch to be transferred.

Step 2   Push the DUMP button.
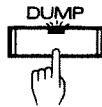
Step 3   Push the FUNCTION button ▶ once.

⬇
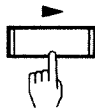
```
Edit Buffer Dump
Sure?  Dump/Exit
```

*To leave this mode, push the EXIT button.

Step 4   Push the DUMP button.

▶ Reciever

Set the reciever's Exclusive Message to on, it will reciever all exclusive data even if other mode is selected.
(Using P-330 as a reciever.)

*The P-330 is preprogrammed to be set the Exclusive on.

2. Stacking

You can stack more than one P—330 to increase the number of voices to be simultaneously played. Up to 8 units can be stacked at the same time.

*The following settings for the Stacking function will be retained even after the unit is turned off.

[Connections]

1st   2nd   3rd

MIDI Device   to MIDI IN
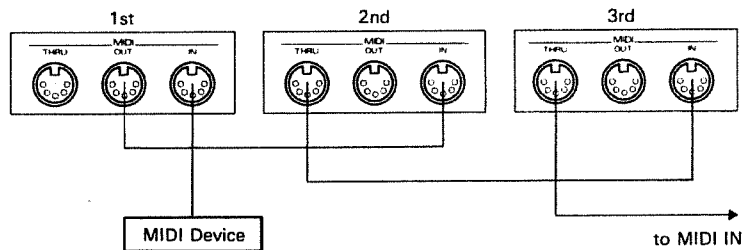
[Procedure]

Take the following procedure on the P—330's to be used.

Step 1   Push the STACK button.

STACK

EXIT

Stack On/Off   the number of units   Voice Order
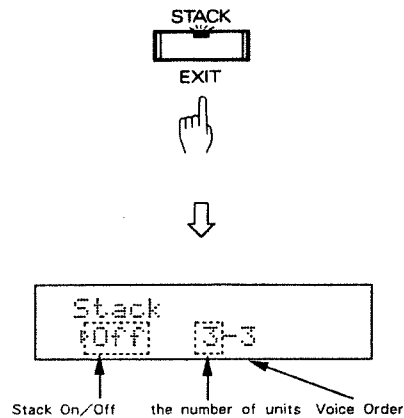
Step 2   Push the FUNCTION button ▲ to turn on the Stack function.

Step 3   Move the cursor to the right by pushing the FUNCTION button ▶.

Step 4   Push the FUNCTION buttons ▼ and ▲ to set the number of P—330 to be stacked.

Step 5   Push the FUNCTION button ▶ to move the cursor to the right.

Step 6   Push the FUNCTION buttons ▼ and ▲ to set the order of stacking (which unit is to be connected first, second, etc.)

Step 7   Push the STACK button.

When using three P—330's

	Setting	Voice Order				
1st	3—1	→ 1	4	7	10	:
2nd	3—2	→ 2	5	8	:	:
3rd	3—3	→ 3	6	9	:	48 (30)

The number shown in ( ) is the voice order when a 10 voice polyphonic Tone

∗When the number of the units is not correctly set, or the stacking order of two units is set the same, the data will not be played properly.

∗When only one P—330 is used, be sure to set the Stack to Off.

■ APENDIX TABLES

Preprogrammed Patch Parmeter

Patch No.	Patch Name	Tone Select	Attack Mute	Release Time	Chorus					Tremolo			EQ	
						Triangle		Sine						
					Switch	Rate	Depth	Rate	Depth	Switch	Rate	Depth	Bass	Treble
11	Piano 1	(Piano 1)	(0)	(0)	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	0
12	Piano 2	(Piano 2)	(0)	(0)	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	0
13	Piano 3	(Piano 3)	(0)	(0)	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	0
14	Harpsichord	(Harpsichord)	(0)	(0)	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	0
15	Clavi	(Clavi)	(0)	(0)	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	0
16	Vibraphone	(Vibraphone)	(0)	(0)	Off	(8)	(82)	(23)	(7)	Off	51	51	0	0
17	E. Piano 1	(E. Piano 1)	(0)	(0)	On	8	82	23	7	On	(63)	(50)	0	0
18	E. Piano 2	(E. Piano 2)	(0)	(0)	On	8	82	23	7	Off	(63)	(50)	0	0
21	Soft Piano 1	Piano 1	16	0	On	8	0	23	0	Off	(63)	(50)	0	+17
22	Cut Piano 1	Piano 1	8	−5	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	+10
23	Long Piano 1	Piano 1	8	7	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	+7
24	Flutter Piano 1	Piano 1	16	8	On	94	16	23	18	On	41	50	−22	−84
25	Loud Piano 1	Piano 1	8	0	On	8	82	23	7	Off	(63)	(50)	+100	+100
26	Broken Piano 1	Piano 1	8	0	On	62	50	83	0	Off	(63)	(50)	−100	+100
27	Tight Piano 1	Piano 1	8	−2	On	8	0	23	0	Off	(63)	(50)	−40	+29
28	Ring Piano 1	Piano 1	16	8	On	8	0	23	0	Off	(63)	(50)	0	+66
31	Soft Piano 2	Piano 2	16	0	On	8	0	23	0	Off	(63)	(50)	0	+12
32	Cut Piano 2	Piano 2	8	−5	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	+10
33	Long Piano 2	Piano 2	8	7	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	+7
34	Flutter Piano 2	Piano 2	16	8	On	94	16	23	18	On	41	50	−22	−84
35	Loud Piano 2	Piano 2	8	0	On	8	82	23	7	Off	(63)	(50)	+100	+30
36	Broken Piano 2	Piano 2	8	0	On	62	50	83	0	Off	(63)	(50)	−100	+100
37	Tight Piano 2	Piano 2	8	−2	On	8	0	23	0	Off	(63)	(50)	−40	+29
38	Ring Piano 2	Piano 2	16	8	On	8	0	23	0	Off	(63)	(50)	0	+19
41	Soft Piano 3	Piano 3	0	0	On	8	0	23	0	Off	(63)	(50)	0	0
42	Cut Piano 3	Piano 3	0	−7	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	+10
43	Long Piano 3	Piano 3	0	7	Off	(8)	(82)	(23)	(7)	Off	(63)	(50)	0	+7
44	Flutter Piano 3	Piano 3	0	8	On	94	16	23	18	On	41	50	−22	−84
45	Loud Piano 3	Piano 3	0	0	On	8	82	23	7	Off	(63)	(50)	+100	+30
46	Broken Piano 3	Piano 3	0	0	On	62	50	83	0	Off	(63)	(50)	−100	+100
47	Tight Piano 3	Piano 3	0	−2	On	8	0	23	0	Off	(63)	(50)	−40	+29
48	Ring Piano 3	Piano 3	0	8	On	8	0	23	0	Off	(63)	(50)	0	+39

*The display doesn't indicate the value which is shown in ( ).

Patch No.	Patch Name	Tone Select	Attack Mute	Release Time	Chorus						Tremolo			EQ	
					Switch	Triangle		Sine			Switch	Rate	Depth	Bass	Treble
						Rate	Depth	Rate	Depth						
51	Harpsichord A	Harpsichord	0	4	On	8	0	23	0		Off	(63)	(50)	−100	+13
52	Harpsichord B	Harpsichord	0	−5	On	98	6	2	51		On	20	70	−100	−100
53	Harpsichord C	Harpsichord	0	0	On	13	82	29	21		On	100	25	−100	0
54	Harpsichord D	Harpsichord	0	8	On	82	34	73	25		On	100	.59	−100	+10
55	Clavi A	Clavi	16	0	On	8	0	23	0		Off	(63)	(50)	0	0
56	Clavi B	Clavi	16	8	On	8	0	12	0		On	100	30	−100	−17
57	Clavi C	Clavi	16	−8	On	30	35	24	3		Off	(63)	(50)	+30	+30
58	Clavi D	Clavi	16	−8	On	30	35	24	3		On	58	58	+63	+30
61	Vibraphone A	Vibraphone	0	0	On	8	0	23	0		On	51	51	0	0
62	Cut Vib A	Vibraphone	0	−8	Off	(8)	(0)	(23)	(0)		Off	(51)	(51)	0	0
63	Cut Vib B	Vibraphone	0	−8	On	100	5	23	0		Off	(51)	(51)	−100	0
64	Cut Vib C	Vibraphone	0	−4	On	100	5	23	0		On	100	100	−25	+10
65	Long Vib A	Vibraphone	0	8	On	100	11	11	47		On	27	27	−100	0
66	Long Vib B	Vibraphone	0	8	On	22	29	23	0		On	70	70	−35	+55
67	Long Vib C	Vibraphone	0	8	Off	(8)	(0)	(23)	(0)		On	100	100	+10	+39
68	Long Vib D	Vibraphone	0	8	On	22	100	22	100		On	40	40	−13	+7
71	Soft E. Piano 1	E. Piano 1	16	0	On	8	8	23	0		Off	(63)	(50)	0	+17
72	Cut E. Piano 1	E. Piano 1	5	−8	Off	(8)	(82)	(23)	(7)		Off	(63)	(50)	0	+10
73	Long E. Piano 1	E. Piano 1	8	8	Off	(8)	(82)	(23)	(7)		Off	(63)	(50)	0	+7
74	Flutter E. P 1	E. Piano 1	16	8	On	94	16	23	18		On	41	50	−22	−84
75	Loud E. Piano 1	E. Piano 1	8	0	On	8	82	23	7		Off	(63)	(50)	+100	+100
76	Broken E. P 1	E. Piano 1	8	0	On	62	50	83	0		Off	(63)	(50)	−100	+100
77	Tight E. Piano 1	E. Piano 1	8	−8	On	8	0	23	0		Off	(63)	(50)	−40	+75
78	Ring E. Piano 1	E. Piano 1	16	8	On	8	21	23	20		Off	(63)	(50)	0	+66
81	Soft E. Piano 2	E. Piano 2	0	0	On	8	0	23	0		Off	(63)	(50)	0	+17
82	Cut E. Piano 2	E. Piano 2	0	−8	Off	(8)	(82)	(23)	(7)		Off	(63)	(50)	0	+10
83	Long E. Piano 2	E. Piano 2	0	8	Off	(8)	(82)	(23)	(7)		Off	(63)	(50)	0	+7
84	Flutter E. P 2	E. Piano 2	0	8	On	94	16	23	18		On	(63)	(50)	−22	−84
85	Loud E. Piano 2	E. Piano 2	0	0	On	8	82	23	7		Off	41	50	+100	+100
86	Broken E. P 2	E. Piano 2	0	0	On	62	50	83	0		Off	(63)	(50)	−100	+100
87	Tight E. Piano 2	E. Piano 2	0	−8	On	8	0	23	0		Off	(63)	(50)	−40	+75
88	Ring E. Piano	E. Piano 2	0	8	On	8	21	23	20		Off	(63)	(50)	0	+66

∗The display doesn't indicate the value which is shown in ( ).

Sample Notes

Patch No.	Patch Name	Tone Select	Attack Mute	Release Time	Chorus					Tremolo			EQ	
					Switch	Triangle		Sine		Switch	Rate	Depth	Bass	Treble
						Rate	Depth	Rate	Depth					

Sample Notes

Patch No.	Patch Name	Tone Select	Attack Mute	Release Time	Chorus					Tremolo			EQ	
					Switch	Triangle		Sine		Switch	Rate	Depth	Bass	Treble
						Rate	Depth	Rate	Depth					

SPECIFICATIONS

P-330 : 16 Voice Polyphonic Digital Piano Sound Module
(Harpsichord, Clavi and Electric Piano 2 are 10 voice polyphonic.)

Sound System : SA Sound System

<Front Panel>
Headphone Jack
Volume
Display (LCD, back-lit)
Function Buttons (►◄▼▲)
Edit Button
Tune Button
Write Button
Stack/Exit Button
MIDI Button
Dump Button
Patch Buttons (1 to 8)
MIDI Message Indicator
Power Switch

<Rear Panel>
MIDI Connectors (IN, OUT, THRU)
Output Jack (Mono, Stereo)
Output Level Switch (H,M,L)

Dimensions : 482 (S) ×340 (D) ×44 (H) m ／19"×13-3/8"×1-3/4"

Weight : 5kg ／11 lb

Consumption : 20W

Accessories : Owner's Manual
Guide book for MIDI
MIDI Cables
Connection Cords (LP-25) ×2

Roland Exclusive Messages

1. Data Format for Exclusive Messages

Roland's MIDI implementation uses the following data format for all exclusive messages (type IV) :

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Maindata
F7H	End of exclusive

MIDI status : F0H, F7H

An exclusive message must be flanked by a pair of status codes, starting with a Manufactures - ID immediately after F0H (MIDI version1.0).

Manufactures - ID : 41H

The Manufactures-ID identifies the manufacturer of a MIDI instrument that triggeres an exclusive message. Value 41H represents Roland's Manufactures-ID.

Device ID : DEV

The Device-ID contains a unique value that identifies the individual device in the multiple implementation of MIDI instruments. It is usually set to 00H - 0FH, a value smaller by one than that of a basic channel, but value 00H - 1FH may be used for a device with multiple basic channels.

Model - ID : MDL

The Model-ID contains a value that uniquely identifies one model from another. Different models, however, may share an identical Model-ID if they handle similar data.

The Model-ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Model-IDs, each representing a unique model :

```
01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H
```

Command ID : CMD

The Command-ID indicates the function of an exclusive message. The Command-ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Command-IDs, each representing a unique function :

```
01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H
```

Main data : BODY

This field contains a message to be exchanged across an interface. The exact data size and contents will vary with the Model-ID and Command-ID.

2. Address mapped Data Transfer

Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory-resident records -- waveform and tone data, switch status, and parameters, for example--to specific locations in a machine-dependent address space, thereby allowing access to data residing at the address a message specifies.

Address-mapped data transfer is therefore independent of models and data categories. This technique allows use of two different transfer procedures : one-way transfer and handshake transfer.

One-way transfer procedure (See Section3 for details.)

This procedure is suited for the transfer of a small amount of data. It sends out an exclusive message completely independent of a receiving device status.

Connection Diagram

Connectional point2 is essential for "Request data" procedures. (See Section3.)

Handshake - transfer procedure (See Section4 for details.)

This procedure initiates a predetermined transfer sequence (handshaking) across the interface before data transfer takes place. Handshaking ensures that reliability and transfer speed are high enough to handle a large amount of data.

Connection Diagram

Connectional points1 and 2 is essential.

Notes on the above two procedures

* There are separate Command-IDs for different transfer procedures.
* DevicesA and B cannot exchange data unless they use the same transfer procedure, share identical Device-ID and Model ID, and are ready for communication.

3. One-way Transfer Procedure

This procedure sends out data all the way until it stops when the messages are so short that answerbacks need not be checked.

For long messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts intervals of at least 20milliseconds in between.

Types of Messages

Message	Command ID
Request data 1	RQ1 (11H)
Data set 1	DT1 (12H)

Request data # 1 : RQ1 (11H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQ1 message, the remote device checks its memory for the data address and size that satisfy the request.

If it finds them and is ready for communication, the device will transmit a "Data set 1 (DT1)" message, which contains the requested data. Otherwise, the device will send out nothing.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
11H	Command iD
aaH	Address MSB
:	:
	LSB
ssH	Size MSB
:	:
	LSB
sum	Check sum
F7H	End of exclusive

* The size of the requested data does not indicate the number of bytes that will make up a DT1 message, but represents the address fields where the requested data resides.
* Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
* The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
* The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Data set 1 : DT1 (12H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, a DT1 message can convey the starting address of one or more data as well as a series of data formatted in an address - dependent order.
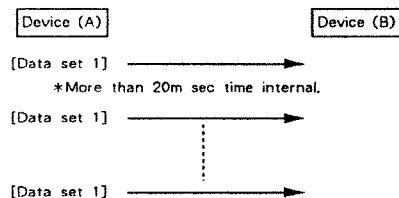
The MIDI standards inhibit non-real time messages from interrupting an exclusive one. This fact is inconvenient for the devices that support a "soft-through" mechanism. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
12H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

* A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
* Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
* The number of bytes comprising address data varies from one Model-ID to another.
* The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Example of Message Transactions

● Device A sending data to Device B
Transfer of a DT1 message is all that takes place.

```
┌──────────┐              ┌──────────┐
│Device (A)│              │Device (B)│
└──────────┘              └──────────┘
[Data set 1] ───────────────▶
      *More than 20m sec time internal.
[Data set 1] ───────────────▶
[Data set 1] ───────────────▶
```

● Device B requesting data from Device A
Device B sends an RQ1 message to Device A. Checking the message, Device A sends a DT1 message back to Device B.

```
┌──────────┐              ┌──────────┐
│Device (A)│              │Device (B)│
└──────────┘              └──────────┘
[Data set 1] ◀───────────────[Request data]
[Data set 1] ───────────────▶
      *More than 20m sec time internal
[Data set 1] ───────────────▶
[Data set 1] ───────────────▶
```

4. Handshake - Transfer Procedure

Handshaking is an interactive process where two devices exchange error checking signals before a message transaction takes place, thereby increasing data reliability. Unlike one-way transfer that inserts a pause between message transactions, handshake transfer allows much speedier transactions because data transfer starts once the receiving device returns a ready signal.

When it comes to handling large amounts of data - sampler waveforms and synthesizer tones over the entire range, for example - across a MIDI interface, handshaking transfer is more efficient than one-way transfer.

Types of Messages

Message	Command ID
Want to send data	WSD (40H)
Request data	RQD (41H)
Data set	DAT (42H)
Acknowledge	ACK (43H)
End of data	EOD (45H)
Communication error	ERR (4EH)
Rejection	RJC (4FH)

Want to send data : WSD (40H)

This message is sent out when data must be sent to a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of the data to be sent.

On receiving a WSD message, the remote device checks its memory for the specified data address and size which will satisfy the request. If it finds them and is ready for communication, the device will return an "Acknowledge (ACK)" message.
Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
40H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

* The size of the data to be sent does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the data should reside.
* Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
* The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
* The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Request data : RQD (41H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQD message, the remote device checks its memory for the data address and size which satisfy the request. If it finds them and is ready for communication, the device will transmit a "Data set (DAT)" message, which contains the requested data. Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
41H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

* The size of the requested data does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the requested data resides.
* Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
* The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
* The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Data set : DAT (42H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, the message can convey the starting address of one or more data as well as a series of data formatted in an address dependent order.

Although the MIDI standards inhibit non-real time messages from interrupting an exclusive one, some devices support a "soft-through" mechanism for such interrupts. To maintain compatibility with such devices, Roland has limited the DAT to 256 bytes so that an excessively long message is sent out in separate segments.

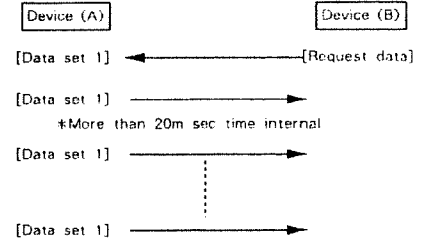| Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
42H	Command ID
aaH	Address MSB
⋮	⋮
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

* A DAT message is capable of providing only the valid data among those specified by an RQD or WSD message.
* Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
* The number of bytes comprising address data varies from one model ID to another.
* The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Acknowledge : ACK (43H)

This message is sent out when no error was detected on reception of a WSD, DAT, "End of data (EOD)", or some other message and a requested setup or action is complete. Unless it receives an ACK message, the device at the other end will not proceed to the next operation.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
43H	Command ID
F7H	End of exclusive

End of data : EOD (45H)

This message is sent out to inform a remote device of the end of a message. Communication, however, will not come to an end unless the remote device returns an ACK message even though an EOD message was transmitted.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
45H	Command ID
F7H	End of exclusive

Communications error : ERR (4EH)

This message warns the remote device of a communications fault encountered during message transmission due, for example, to a checksum error. An ERR message may be replaced with a "Rejection (RJC)" one, which terminates the current message transaction in midstream.

When it receives an ERR message, the sending device may either attempt to send out the last message a second time or terminate communication by sending out an RJC message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
4EH	Command ID
F7H	End of exclusive

Rejection : RJC (4FH)

This message is sent out when there is a need to terminate communication by overriding the current message. An RJC message will be triggered when :

· a WSD or RQD message has specified an illegal data address or size.

· the device is not ready for communication.

· an illegal number of addresses or data has been detected.

· data transfer has been terminated by an operator.

· a communications error has occurred.

An ERR message may be sent out by a device on either side of the interface. Communication must be terminated immediately when either side triggers an ERR message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

Example of Message Transactions

● Data transfer from device (A) to device (B).

```
Device (A)                          Device (B)

[Want to send data] ─────────────►
                    ◄───────────────  [Acknowledge]
[Data set]          ─────────────►
                    ◄───────────────  [Acknowledge]
[Data set]          ─────────────►
                    ◄───────────────  [Acknowledge]
                            :
[End of data]       ─────────────►
                    ◄───────────────  [Acknowledge]
```
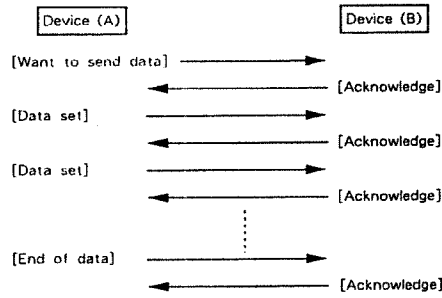
● Device (A) requests and receives data from device (B).

```
Device (A)                          Device (B)

[Request data]  ─────────────►
                ◄───────────────  [Data set]
[Acknowledge]   ─────────────►
                ◄───────────────  [Data set]
[Acknowledge]   ─────────────►
                        :
                ◄───────────────  [End of data]
[Acknowledge]   ─────────────►
```
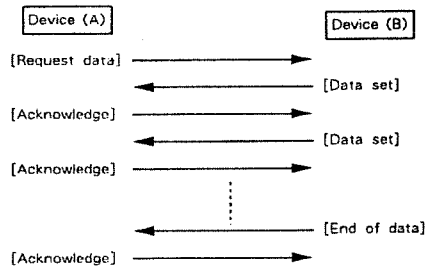
● Error occurs while device (A) is receiving data from device (B).

1) Data transfer from device (A) to device (B).

```
Device (A)                          Device (B)
                        :
                    ◄───────────────  [Data set]
[Acknowledge]       ─────────────►
(Error) ×           ◄───────────────  [Data set]
[Communication error] ─────────────►
                    ◄───────────────  [Data set]
                                       (the same data
                                        as above)
[Acknowledge]       ─────────────►
                        :
```
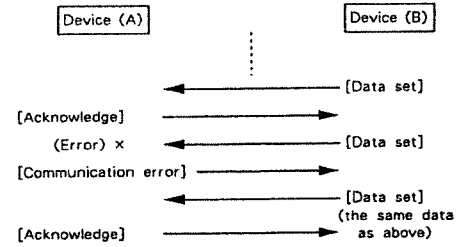
2) Device (B) rejects the data re-transmitted, and quits data transfer.

```
Device (A)                          Device (B)
                        :
                    ◄───────────────  [Data set]
[Acknowledge]       ─────────────►
(Error) ×           ◄───────────────  [Data set]
[Communication error] ─────────────►
(Quit)              ◄───────────────  [Rejection]
```
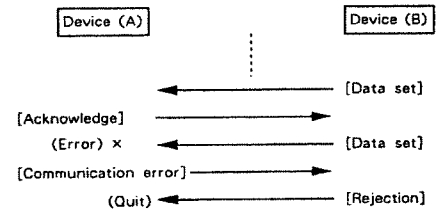
3) Device (A) immediately quits data transfer.

```
Device (A)                          Device (B)
                        :
                    ◄───────────────  [Data set]
[Acknowledge]       ─────────────►
(Error) ×           ◄───────────────  [Data set]
[Rejection]         ─────────────►     (Quit)
```
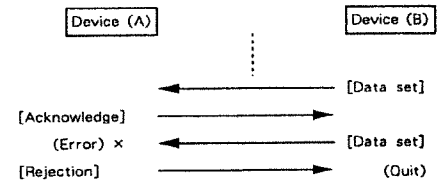
1. TRANSMITTED DATA

■ Exclusive

Status
F0h : System Exclusive
F7h : EOX (End of Exclusive)

Every exclusive message is transmitted in the form given below.

F0h	Staus of System Exclusive
41h	Roland ID
0mh	Device ID= (MIDI Basic Ch – 1) =0h – Fh
22h	Model ID
12h	Command ID (data set)
aah	Address (MSB)
aah	Address (LSB)
vvh	Data vv = 00h – 7Fh
vvh	Data vv = 00h – 7Fh
.	
.	
.	
vvh	Data vv = 00h – 7Fh
ssh	Sum ss
F7h	End of Exclusive

See Address & Data section for details.

Executing Bulk Dump or Edit Buffer Dump from the panel will cause the following messages to be ent.

(1) Bulk Dump
When Bulk Dump is engaged, the following address string is sent ; one address at a time by the respective message followed by the next address in 20ms.

Address (Hex)		Remarkes
00 00 –	00 16	"Patch 11"
00 17 –	00 2D	"Patch 12"
00 2E –	00 44	"Patch 13"
00 45 –	00 5B	"Patch 14"
00 5C –	00 72	"Patch 15"
00 73 –	01 09	"Patch 16"
01 0A –	01 20	"Patch 17"
01 21 –	01 37	"Patch 18"
01 38 –	01 4E	"Patch 21"
01 4F –	01 65	"Patch 22"
01 66 –	01 7C	"Patch 23"
01 7D –	02 13	"Patch 24"
02 14 –	02 2A	"Patch 25"
02 2B –	02 41	"Patch 26"
02 42 –	02 58	"Patch 27"
02 59 –	02 6F	"Patch 28"
02 70 –	03 06	"Patch 31"
03 07 –	03 1D	"Patch 32"
03 1E –	03 34	"Patch 33"
03 35 –	03 4B	"Patch 34"
03 4C –	03 62	"Patch 35"
03 63 –	03 79	"Patch 36"
03 7A –	04 10	"Patch 37"
04 11 –	04 27	"Patch 38"
04 28 –	04 3E	"Patch 41"
04 3F –	04 55	"Patch 42"
04 56 –	04 6C	"Patch 43"
04 6D –	05 03	"Patch 44"
05 04 –	05 1A	"Patch 45"
05 1B –	05 31	"Patch 46"
05 32 –	05 48	"Patch 47"
05 49 –	05 5F	"Patch 48"
05 60 –	05 76	"Patch 51"
05 77 –	06 0D	"Patch 52"
06 0E –	06 24	"Patch 53"
06 25 –	06 3B	"Patch 54"
06 3C –	06 52	"Patch 55"
06 53 –	06 69	"Patch 56"
06 6A –	06 80	"Patch 57"
06 81 –	07 17	"Patch 58"
07 18 –	07 2E	"Patch 61"
07 2F –	07 45	"Patch 62"
07 46 –	07 5C	"Patch 63"
07 5D –	07 73	"Patch 64"
07 74 –	08 0A	"Patch 65"
08 0B –	08 21	"Patch 66"
08 22 –	08 38	"Patch 67"
08 39 –	08 4F	"Patch 68"
08 50 –	08 66	"Patch 71"
08 67 –	08 7D	"Patch 72"
08 7E –	09 14	"Patch 73"
09 15 –	09 2B	"Patch 74"
09 2C –	09 42	"Patch 75"
09 43 –	09 59	"Patch 76"

09 5A –	09 70	"Patch 77"
09 71 –	0A 07	"Patch 78"
0A 08 –	0A 1E	"Patch 81"
0A 1F –	0A 35	"Patch 82"
0A 36 –	0A 4C	"Patch 83"
0A 4D –	0A 63	"Patch 84"
0A 64 –	0A 7A	"Patch 85"
0A 7B –	0B 11	"Patch 86"
0B 12 –	0B 28	"Patch 87"
0B 29 –	0B 42	"Patch 88"
0B 43 –	0B 51	Common Memory

(2) Edit Buffer Dump
When Edit Buffer Dump is engaged, the following address string is sent ; one address at a time by the respective message followed by the next address in 20 ms.

Address	Remarks
0B 52 – 0B 5F	Patch Name
0B 60 – 0B 6D	Parameter

■ Active Sensing

Status
FEh : Active Sensing

The message is interleaved when a non – message time is expected to elaplse more than 300 ms.

2. RECOGNIED RECEIVE DATA

■ Note Event

Note Off

Status	Second	Third
8nh	kkh	vvh
9nh	kkh	00h

kk = Note Number   00h – 7Fh (0 – 127)
vv = Velocity Ignored
n = MIDI Channel Number   0h – Fh (1 – 16)

Note On

Status	Second	Third
9nh	kkh	vvh

kk = Note Number   00h – 7Fh (0 – 127)
vv = Velocity   01h – 7Fh (1 – 127)
n = MIDI Channel Number   0h – Fh (1 – 16)

The notes outside the range 15 – 113 are transposed : up, if low ; down, if high, to the neariest octave inside the range.

■ Control Change

Modulation (receive On Off : switchable)

Status	Second	Third
Bnh	01h	vvh

vv = Moduration   00h – 7Fh (0 – 127)

Control number (Second) can be changed by panel operation.

Volume (receive On Off : switchable)

Status	Second	Third
Bnh	07h	vvh

vv = Volume   00h – 7Fh (0 – 127)

Control number (Second) can be changed by panel operation.

Panpot (receive On Off : switchable)

Status	Second	Third
Bnh	0Ah	vvh

vv = 00h	:	Left
.	:	↑
.	:	↓
vv = 40h	:	Center
.	:	↑
.	:	↓
vv = 7Fh	:	Right

Control number (Second) can be changed by panel operation.

Damper (Hold - 1)

Status	Second	Third
Bnh	40h	vvh

vv = 00h : Off
vv = 01h - 3Fh : Half Damp
vv = 40h - 7Fh : On

Sostenuto

Status	Second	Third
Bnh	42h	vvh

vv = 00h - 3Fh : Off
vv = 40h - 7Fh : On

Soft

Status	Second	Third
Bnh	43h	vvh

vv = 00h - 3Fh : Off
vv = 40h - 7Fh : On

Tremolo

Status	Second	Third
Bnh	5Ch	vvh

vv = 00h - 3Fh : Off
vv = 40h - 7Fh : On

Recognized only when Patch Number is set at one of 11 - 18 (Program Change 0 - 7) on P - 330.

Chorus

Status	Second	Third
Bnh	5Dh	vvh

vv = 00h - 3Fh : Off
vv = 40h - 7Fh : On

Recognized only when Pach Number is set at one of 11 - 18 (Program Change 0 - 7) on P - 330.

■ Program Change (receive On/Off : switchable)

Status	Second
Cnh	pph

pp = Program Change (0 - 63)

■ Channel After Touch (receive On/Off : switchable)

Status	Second
Dnh	vvh

vv = Channel After Touch (0 - 127)

■ Bender (receive On/Off : switchable)

Status	Second	Third
Enh	nnh	mmh

mm * 128 + nn = Bender (0 - 16383)

■ Mode Message

All Notes Off

Status	Second	Third
Bnh	7Bh	00h

Recognized only when in OMNI OFF mode.

The transmitter should send All Notes Off after it has turned off all on notes.
If P - 330 receives the All Notes Off message before it receives individual Note Off messages for all the On notes, it resets the following functions to the initial value : Damper, Sostenute, Soft, Bender, After Touch, Modulation, Volume, Panpot and Tune Table Switch.

OMNI OFF

Status	Second	Third
Bnh	7Ch	00h

OMNI ON

Status	Second	Third
Bnh	7Dh	00h

MONO

Status	Second	Third
Bnh	7Eh	mmh

mm = 00h - 10h

POLY

Status	Second	Third
Bnh	7Fh	00h

When P - 330 receives one of the above listed mode messages (Second = 124 - 127), it regards the message as All Notes Off and sets its mode as follws, whether it is in OMNI ON or OFF mode.

	POLY ON (127)	MONO ON (126) mmmm = 1	MONO ON (126) mmmm ≠ 1
OMNI OFF (124)	OMNI = OFF POLY	OMNI = OFF POLY	OMNI = ON POLY
OMNI ON (125)	OMNI = ON POLY	OMNI = ON POLY	OMNI = ON POLY

■ Exclusive (receive On/Off : switchable)

Status
F0h : System Exclusive
F7h : EOX (End of Exclusive)

All Exclusive messages are sent / received in the folling format. Any address data can be the first address in the message. The length of a data vv should not exceed 24 bytes. Otherwise, all the data received are made disabled. The interval between messages should be no less than 20 ms.

F0h	Staus of System Exclusive
41h	Roland ID
0mh	Device ID = (MIDI Basic Ch - 1) = 0h - Fh
22h	Model ID
12h	Command ID (data set)
aah	Address (MSB)
aah	Address (LSB)
vvh	Data vv = 00h - 7Fh
vvh	Data vv = 00h - 7Fh
.	
.	
.	
vvh	Data vv = 00h - 7Fh
ssh	Sum ss
F7h	End of Exclusive

Refer to Address & Dat section for details.

■ Active Sensing

Status
FEh : Active Sensing

Upon receiving this message, P - 330 starts measuring the time at the end of every message. If no data is received within 300 ms, P - 330 will turn off all the on - notes and reset Damper, Sostenute, Soft, Bender, After Touch, Moduration, Volume, Panpot and Tune Table Switch to the initial value.

Factory setting : Basic Channel 1 with OMNI OFF mode.

Basic Channel (1-16) and OMNI ON/OFF can be changed from the panel. The panel-set data are retained in non-volatile memory even after power-off.

Changing the Basic Channel and OMNI mode turns off all on-notes and resets the following functions to the initial setting value : Damper, Sostenute, Soft, Bender, After Touch, Moulation, Volume, Panpot and Tune Table Switch.

Address & Data

(1) Exclusive Message Addresses Assignment

Address (Hex)	Description		
00 00 - 00 16	Patch 11		
00 17 - 00 2D	Patch 12		
00 2E - 00 44	Patch 13		
.			
.			
(every 17h addresses)			
.			
.			
0B 29 - 0B 3F	Patch 88		
0B 40	LCD Contrast	(0-15)	*1
0B 41	Stack H		*2
0B 42	Stack L		*2
0B 43	Master Tune	(0-80)	*3
0B 44	Octave Shift	(126-127,0-2)	*4
0B 45	Velocity Curve	(0-7)	*5
0B 46	Bender → Pitch	(116-127,0-12)	*6
0B 47	Bender → Tri-Chorus	(0-100)	
0B 48	Bender → Sin-Chorus	(0-100)	
0B 49	Bender → Tremolo	(0-100)	
0B 4A	After → Pitch	(116-127,0-12)	*6
0B 4B	After → Tri-Chorus	(0-100)	
0B 4C	After → Sin-Chorus	(0-100)	
0B 4D	After → Tremolo	(0-100)	
0B 4E	Mod → Pitch	(116-127,0-12)	*6
0B 4F	Mod → Tri-Chorus	(0-100)	
0B 50	Mod → Sin-Chorus	(0-100)	
0B 51	Mod → Tremolo	(0-100)	
0B 52 - 0B 5F	Patch Name	(ASCII)	
0B 60	Tone	(0-63)	*7
0B 61	Attack Mute	(0-16)	
0B 62	Release Time	(0-16)	*8
0B 63	Tri-Chorus Rate	(1-100)	
0B 64	Tri-Chorus Rate	(0-100)	
0B 65	Sin-Chorus Depth	(1-100)	
0B 66	Sin-Chorus Depth	(0-100)	
0B 67	Tremolo Rate	(1-100)	
0B 68	Tremolo Depth	(0-100)	
0B 69	Equalizer Base H	(0-127)	*9
0B 6A	Equalizer Base L	(0,64)	*9
0B 6B	Equalizer Treble H	(0-127)	*9
0B 6C	Equalizer Treble L	(0,64)	*9
0B 6D	Patch Number/Write Request		*10
0B 6E - 0B 6F	Eb0 Individual Tune 1	(0-16384)	*11
0B 70 - 0B 71	E0 Individual Tune 1	(0-16384)	*11
.	.	.	
.	.	.	
.	.	.	
0C 48 - 0C 49	C4 Individual Tune 1	(0-16384)	*11
.	.	.	
.	.	.	
.	.	.	
0D 30 - 0D 31	E8 Individual Tune 1	(0-16384)	*11
0D 32 - 0D 33	F8 Individual Tune 1	(0-16384)	*11
0D 34 - 0D 35	Eb0 Individual Tune 2	(0-16384)	*11
0D 36 - 0D 37	E0 Individual Tune 2	(0-16384)	*11
.	.	.	
.	.	.	
.	.	.	
0E 0E - 0E 0F	C4 Individual Tune 2	(0-16384)	*11
.	.	.	
.	.	.	
.	.	.	
0E 76 - 0E 77	E8 Individual Tune 2	(0-16384)	*11
0E 78 - 0E 79	F8 Individual Tune 2	(0-16384)	*11
0E 7A	Individual Tune Switch	(0-2)	*12

(2) Patch is arranged to the format as shown below :

Offset Data

0		0	a	a	a	a	a	a	b
1		0	b	b	b	b	b	c	c
2		0	c	c	c	c	d	d	d
3		0	d	d	d	e	e	e	e
4		0	e	e	f	f	f	f	f
5		0	f	g	g	g	g	g	g
6		0	h	h	h	h	h	i	i
7		0	i	i	i	i	i	j	j
8		0	j	j	j	j	k	k	k
9		0	k	k	k	l	l	l	l
Ah		0	l	l	l	m	m	m	m
Bh		0	m	n	n	n	n	n	n
Ch		0	o	o	o	o	o	o	p
Dh		0	p	p	p	p	p	q	q
Eh		0	q	q	r	s	s	s	s
Fh		0	s	s	s	t	t	t	t
10h		0	t	t	t	u	u	u	u
11h		0	u	u	u	v	v	v	v
12h		0	v	v	v	w	x	x	x
13h		0	x	x	x	x	x	x	x
14h		0	y	y	y	y	z	z	z
15h		0	z	z	z	z	z	α	α
16h		0	α	α	α	α	α	α	0

a a a a a a	= Attack Mute	(0-16)	
b b b b b b	= name [0]	(0-63)	*13
c c c c c c	= name [1]	(0-63)	*13
d d d d d d	= name [2]	(0-63)	*13
e e e e e e	= name [3]	(0-63)	*13
f f f f f f	= name [4]	(0-63)	*13
g g g g g g	= name [5]	(0-63)	*13
h h h h h h	= name [6]	(0-63)	*13
i i i i i i	= name [7]	(0-63)	*13
j j j j j j	= name [8]	(0-63)	*13
k k k k k k	= name [9]	(0-63)	*13
l l l l l l	= name [10]	(0-63)	*13
m m m m m m	= name [11]	(0-63)	*13
n n n n n n	= name [12]	(0-63)	*13
o o o o o o	= name [13]	(0-63)	*13
p p p p p p	= Release Time	(0-16)	*8
q q q q	= Tone	(0-8)	*14
r	= Chorus Switch	(0-1) (0 : Off 1 : On)	
s s s s s s s	= Tri-Chorus Rate	(1-100)	
t t t t t t t	= Tri-Chorus Depth	(0-100)	
u u u u u u u	= Sin-Chorus Rate	(1-100)	
v v v v v v v	= Sin-Chorus Depth	(0-100)	
w	= Tremolo Switch	(0-1) (0 : Off 1 : On)	
x x x x x x x	= Tremoro Rate	(1-100)	
y y y y y y y	= Tremoro Depth	(0-100)	
z z z z z z z z	= Equalizer Bass	(0-200)	*15
α α α α α α α α	= Equalizer Treble	(0-200)	*15

*1 The data, LCD Contrast (0-15) is displayed as 1-16, respectively as shown below.

Transmitted /received value	Displayed
0	1
.	.
.	.
7	8
.	.
.	.
15	16

*2 The data Stack is displayed as shown below.

Stack H | 0 | s | 0 0 0 | a a a |

Stack L | 0   0   0 0 0 | b b b |

s	: Stack Switch	(0 : Off ; 1 : On)
aaa	: Stack Total numbr-1	(0-7)
bbb	: Stack Oridinary number-1	(0-7)

Example :
  s = 1, aaa = 3, bbb = 2

  Stack
  On 4-3

Transmitted/
received value	Displayed
0 – 9	438.0 – .9
10 – 19	439.0 – .9
20 – 29	440.0 – .9
30 – 39	441.0 – .9
40 – 49	442.0 – .9
50 – 59	443.0 – .9
60 – 69	444.0 – .9
70 – 79	445.0 – .9
80	446.0

Changing Master Tune value also changes the pitch of the sounding notes by that value.

*4   The data, Octave Shift is displayed as follows.

Transmitted/
received value	Displayed
126	– 2
127	– 1
0	0
1	1
2	2

*5   The data, Velocity Curve is displayed as follows.

Transmitted/
received value	Displayed
0	1
.	.
.	.
4	5
.	.
.	.
7	8

*6   Data for Bender, After and Modulation → Pitch are displayed as follows.

Transmitted/
received value	Displayed
116	– 12
117	– 11
.	.
.	.
127	– 1
0	0
1	1
.	.
.	.
11	11
12	12

*7   Tone data are displayed as follows.

Transmitted/
received value	Tone	Chorus	Tremolo
0	Piano 1	Off	Off
1	Piano 2	Off	Off
2	Piano 3	Off	Off
3	Harpsichord	Off	Off
4	Clavi	Off	Off
5	Vibraphone	Off	Off
6	E.Piano 1	Off	Off
7	E.Piano 2	Off	Off
8	mute	Off	Off
16	Piano 1	On	Off
17	Piano 2	On	Off
18	Piano 3	On	Off
19	Harpsichord	On	Off
20	Clavi	On	Off
21	Vibraphone	On	Off
22	E.Piano 1	On	Off
23	E.Piano 2	On	Off
32	Piano 1	Off	On
33	Piano 2	Off	On
34	Piano 3	Off	On
35	Harpsichord	Off	On
36	Clavi	Off	On
37	Vibraphone	Off	On
38	E.Piano 1	Off	On
39	E.Piano 2	Off	On
48	Piano 1	On	On
49	Piano 2	On	On
50	Piano 3	On	On
51	Harpsichord	On	On
52	Clavi	On	On
53	Vibraphone	On	On
54	E.Piano 1	On	On
55	E.Piano 2	On	On

*8   The data, Release Time is displayed as follows.

Transmitted/
received value	Displayed
0	8
.	.
.	.
8	0
.	.
.	.
16	– 8

*9   The data, Equalizer is represented as follows.

(Equalizer H) *2+ (Equalizer L) – 64 = (transmitted and received data)

*See 15.

*10   The following describes Patch Number/Write Request.

| 0 | w | b b b | n n n |

w   : Write Request   (0 : Off ; 1 : On)
b b b : Patch Upper column – 1   (0 – 7)
n n n : Patch Lower column – 1   (0 – 7)

Example :
   w=0 ; bbb=1 ; nnn=2

   Write Request Off
   Patch 23

With Write Request Off, the contents of Edit Buffer are regarded as the editted Patch Memory of that Number.

With Write Request On, the contents of Edit Buffer are written into the Patch Memory of that number regardless of Protect status.

*11   These addresses are used to set values in an Individual Tune Table.
       Each of these values is added to Standard Pitch to enable respective key to be tuned as necessary.
       There are two tables : Table 1 and 2 in each of which 2 bytes are provided per value (each of 99 keys, Eb0 – F8).
       The relationship between the transmitted/ received data and the internal value, and between internal value and the resulting pitch are as shown below :

addr | 0 | s | p p p p p p |
addr+1 | 0 | q   q q q q q q |

When s=0 :
ppppp *128+qqqqqq= (internal value)

When s=1 :
ppppp *128+qqqqqq – 8192 = (internal value)

Internal values range from – 8192 to 8191.

The internal value 4096 equals Pitch interval of 1200 sents : the relationship between the change in internal value and that in pitch (cents) is linearily proportional.

Each of two byte value is processed in the following way : First, MSB byte is stored into the internal buffer, which is written into the specified location in a table together with the associated LSB byte as it receied. The bufferserves as a common temporary storage for all addresses. The sounding notes are immune to a change in the table.

Individual Tune Table is cleared upon power – up.

   *See 12.

   *12   Tune Table Switch is used to select among the Standard Pitch Individual Tune Table 1 and Individual Tune Table 2.The function of the switch is as shown below.

Transmitted/
received	Pitch data
0	Standard Pitch
1	Individual Tune Table 1
2	Individual Tune Table 2

Sounding notes are immune to Tune Table Switch.

Tune Table Switch is reset to 0 upon power up.

*13 Character Code for each note is as follows.

Code	Character
0	(space)
1	'.'
2 – 11	'0' – '9'
12 – 37	'A' – 'Z'
38 – 63	'a' – 'z'

*14 Tones are assigned to the data as follows.

Transmitted received data	Tone
0	Piano 1
1	Piano 2
2	Piano 3
3	Harpsichord
4	Clavi
5	Vibraphone
6	E.Piano 1
7	E.Piano 2
8	Mute

*15 The data, Equalizer is displayed as follows.

Transmitted received data	Display
0	– 100
.	.
.	.
100	0
.	.
.	.
200	+ 100

DIGITAL PIANO
MODEL P-330

MIDI Implementation Chart

Date : Mar. 7. 1988

Version : 1.00

	Function...	Transmitted	Recognized	Remarks
Basic Channel	Default	1	1	Memorized
	Changed	1−16	1−16	
Mode	Default	3	3	Memorized
	Messages	✕	POLY, OMNI ON/OFF	
	Altered	✱✱✱✱✱✱✱✱	MONO (M≠1) → 1, (M=1) → 3	
Note		✕	0−127	
Number	True Voice	✱✱✱✱✱✱✱✱	15−113	
Velocity	Note ON	✕	○	V=1−127
	Note OFF	✕ (9n v=0)	✕	
After	Key's	✕	✕	
Touch	Ch's	✕	✱	
Pitch Bender		✕	○	
Control Change	1	✕	✱✱	Modulation
	7	✕	✱✱	Volume
	10	✕	✱✱	Panpot
	64	✕	○	Hold 1
	66	✕	○	Sostenute
	67	✕	○	Soft
	92	✕	✱✱✱	Tremolo
	93	✕	✱✱✱	Chorus
Prog		✕	✱ (0−63)	
Change	True #	✱✱✱✱✱✱✱✱	0−63	
System Exclusive		○	✱	
System Common	Song Pos	✕	✕	
	Song Sel	✕	✕	
	Tune	✕	✕	
System Real Time	Clock	✕	✕	
	Commands	✕	✕	
Aux Message	Local ON/OFF	✕	✕	
	All Notes OFF	✕	○ (123−127)	
	Active Sense	○	○	
	Reset	✕	✕	
Notes		✱ Can be set to ○ or ✕ manual operation, and memorized. ✱✱ Can be set Control Change numbers to the range of 1−31 manually, and memorized. ✱✱✱ PATCH Numbers with in the range of 11−18 can be recieved.		

Mode 1 : OMNI ON, POLY   Mode 2 : OMNI ON, MONO   ○ : Yes

Mode 3 : OMNI OFF, POLY   Mode 4 : OMNI OFF, MONO   ✕ : No

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