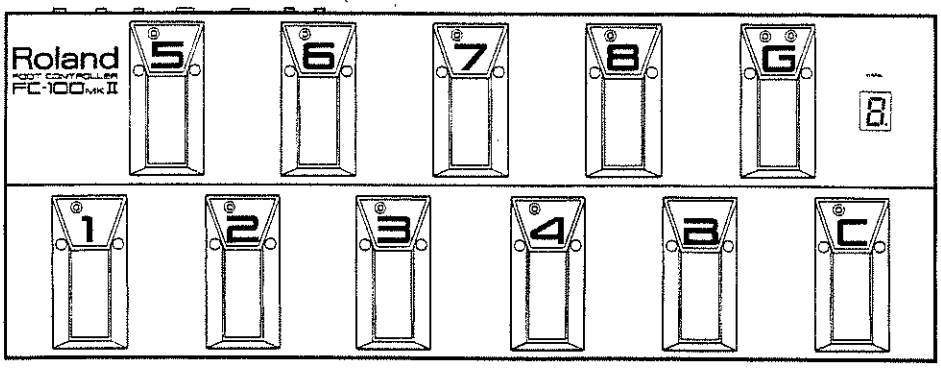
Roland

MIDI FOOT CONTROLLER

FC-100 MK II

Owner's Manual



Thank you for purchasing the Roland FC-100MK II can be connected to any instrument featuring an RRC (Roland Remote Control) IN socket.
Please read this owner's manual carefully.

FEATURES

The FC-100MK II is a greatly enhanced version of the FC-100 foot controller.

By connecting the optional RRC TO MIDI Converter (RMC-1), the FC-100MK II can be used as an all-purpose MIDI foot controller, which provides pedal control over transmission of any Program Change to a connected MIDI device.

The FC-100MK II allows you to make a whole range of setting, including the MIDI channel, and Control Numbers for the all-purpose pedal unit or expression pedal.

Using MIDI messages (System Exclusive), the settings for, and operation of each pedal can be individually controlled from an external MIDI device.

CONTENTS

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

IMPORTANT NOTES

Concerning placement

- Avoid using or storing the unit in the following places, as damages could result.
  - Places subject to extremes in temperature. (Such as under direct sunlight, near heating units, above equipment generating heat, etc.)
  - Places near water and moisture. (Baths, washrooms, wet floors, etc.) Places otherwise subject to high huidity.
  - Dusty environments.
  - Places where high levels of vibration are produced.

Maintenance

- For everyday cleaning, wipe the unit with a soft dry cloth, or one that is dampened slightly. To remove dirt that is more stubborn, wipe using a mild, neutral detergent. Afterwards, make sure to wipe throughly with a soft cloth.

- Never apply benzene, thinners, alcohol or any like agents, to avoid the risk of discoloration and deformation.

Concerning memory backup

- Please be aware that the contents of memory may at times be lost; when sent for repairs or when by some chance a malfunction has occurred. Important data should be written down on paper. During repairs, due care is taken to avoid the loss of data, however, in certain cases, such as when circuitry related to memory itself is out of order, we regret that it may be impossible to restore the data.

Ohter Precautions

- Protect the unit from strong impact.

- Avoid getting any foreign objects (coins, wire, etc.), or liquids (water, drinks, etc.) into the unit.

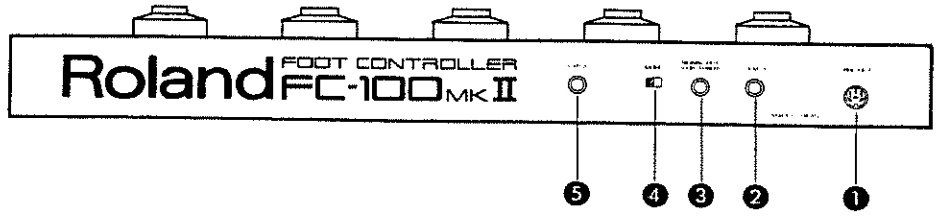
- Before using the unit in a foreign country, check first with your local Roland Service Station.

- At any time that you notice a malfunction, or otherwise suspect there is damage, immediately refrain from using the unit. Then contact the store where bought, or the nearest Roland Service Station.

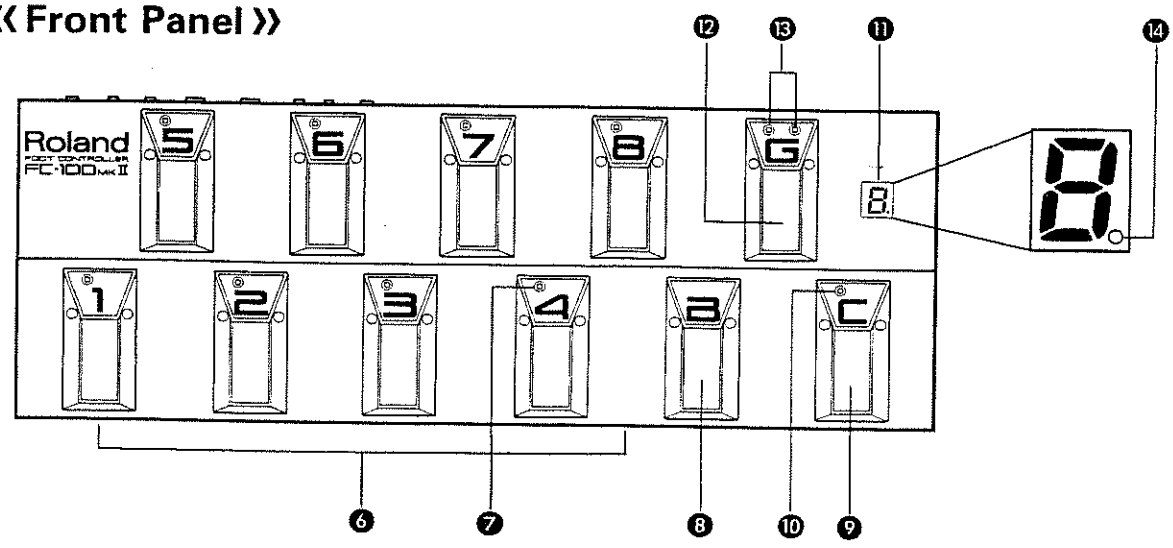
In the event that your instrument must be returned for service, it should be returned together with the connection cable and the host unit. The problem may outside the unit.

1 Panel Descriptions

≪Rear Panel≫



≪Front Panel≫



❶ RRC OUT Socket
Connect this with the RRC IN Socket of an external device using the supplied RRC cable.

❷ Expresion Pedal Jack 1 (EXP1)
Connect an expression pedal to this jack. The expression pedal will function differently depending on the external device and specific settings you use.

* Be sure to use a Roland EV-5 Expression Pedal or BOSS EV-10. Use of other pedals may in certain cases not allow for normal operation.

❸ Tuner's Signal Out Jack
Connect a tuning unit (such as BOSS TU-12) to this jack.

* This jack becomes inactive when an RMC-1 (optional) is connected.

❹ Mode Selector Switch
This selects how the Control Pedal ❾ will function.

❺ Expression Pedal Jack 2 (EXP2)
Connect an expression pedal to this jack. The functions available will vary depending on the particular pedal and specific settings you use.

❻ Number Pedals (1 – 8)
Use these pedals for selecting relevant numbers.

❼ Number Indicators (1 – 8)
The indicator for the number currently selected will light up.

❽ Bank Pedal
Provides for selection of the bank.

❾ Control Pedal
This pedal will function in a variety of ways, depending on the type of device connected and the settings that are made.

❿ Control Indicator
This shows the current status of the Control Pedal ❾.

⓫ Bank Display
This indicates the bank currently selected.

⓬ Group Pedal
Use this for selecting a group.

⓭ Group Indicator (A/B)
The indicator for the group currently selected will be lit.

⓮ Point
This shows the current Mode and the On/Off state of MIDI Mix.

* The above explanation of pedal functions applies to normal pedal operations.

2 How to use the FC-100MK II

The FC-100MK II features two Foot Pedal Modes; the RRC Foot Pedal and MIDI Foot Pedal modes. Select the one that suits your purpose.

1. RRC Foot Pedal Mode

Select this mode for connecting the FC-100MK II with devices featuring an RRC IN connector. The FC-100MK II can be connected to any device which is compatible with the FC-100.

To use the RRC Foot Pedal Mode ·····
Refer to "3 RRC Foot Pedal Mode" on page 6.

2. MIDI Foot Pedal Mode

Select this mode for controlling MIDI devices, in combination with the RRC TO MIDI Converter (Roland RMC-1: optional).

This mode allows you to make changes in settings related to the following:

- MIDI Mix On/Off
- MIDI Channel
- OMNI On/Off
- Control Number
  Control Pedal
  Expression Pedal

To use the MIDI Foot Pedal Mode ·····
Refer to "4 MIDI Foot Pedal Mode" on page 9.

* **Whenever you connect an RMC-1 to the FC-100MK II**, be sure to set the FC-100MK II to the MIDI Foot Pedal mode.

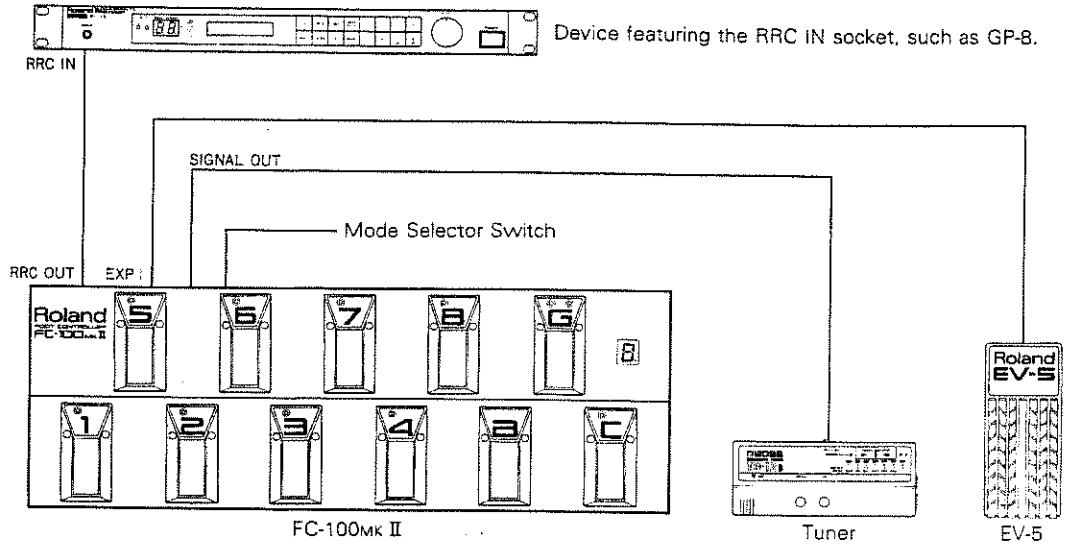
3 RRC Foot Pedal Mode

Select mode for connecting the FC-100MK II to devices equipped with an RRC IN Socket.

This mode allows you to select patches, or use the Control Pedal and Expression Pedal for control. Two expression pedals can be connected at the same time.

* The expression pedal jack 2 ❺ (EXP2) cannot be used with certain types of devices that you might wish to connect.

1. Setup Examples



* Set the position of the Mode Selector Switch ❹ as explained in the owner's manual for the device to be connected to the FC-100MK II.

* When connecting RRC cable, be sure to connect the IN socket on one unit to the OUT socket on the other unit. Do not connect IN to IN or OUT to OUT.

* Be sure to cannot the RRC cable securely, until it locks in place.

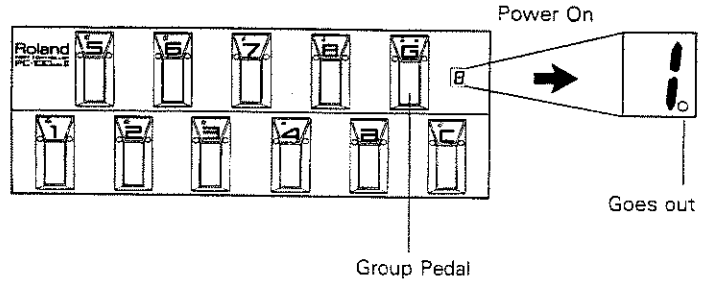
2. Mode Setting

Once the connections are completed, set the FC-100MK II to the RRC Foot Pedal mode.

[HOW]

Switch on the unit connected to the FC-100MK II while holding the Group Pedal ⑫ down.

* Be sure use the switch on the connected unit for turning power on or off.



When the FC-100MK II is set to the RRC Foot Pedal mode, the Point ⑭ will go out.

* Once the FC-100MK II is set to the RRC Foot Pedal mode, it will automatically default to the RRC Foot Pedal Mode at power-up, without need for holding the Group Pedal down.

* The FC-100MK II is set to the RRC Foot Pedal mode when it leaves the manufacturer.

3. Operation

a. Patch Selection

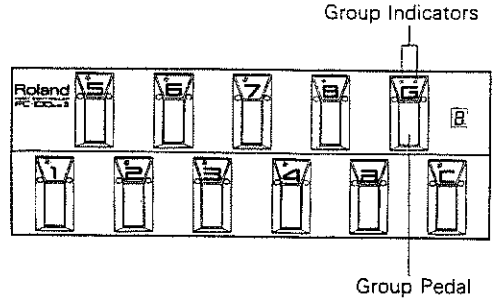
A Patch is a program number for an external device. It is represented by Group, Bank and Number. There are a total of 128 Patches available for selection.

* A Patch is normally displayed in the same way as on the connected device. However, the initial display at power-up will be Group A, Bank 1 and Number 1.

To select a Patch, do as follows.

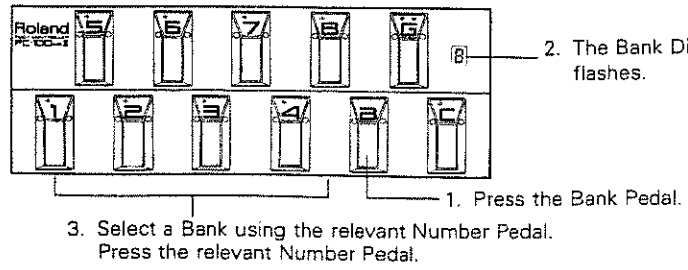
[STEP 1]

Select a Group.
Press the Group Pedal ⑫ to select Group A or B. The Group Indicator ⑬ for the selected group will light up.



[STEP 2] Select a Bank.

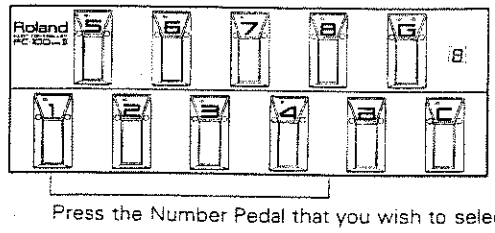
Press the Bank Pedal ❽ and confirm that the Bank Display ⓫ is blinking. Then press a relevant Number Pedal ❻ to select the Bank you want. The selected Bank is shown in the Bank Display ⓫.



* To cancel the Bank selecting mode, press the Bank Pedal ❽ while the Bank Display ⓫ is blinking.

[STEP 3] Select a Number.

Press the relevant Number Pedal ❻ to select the Number you want. The corresponding Number Indicator ❼ will light up.



b. Control Pedal

The Control Pedal functions differently depending on the type of device you use. Read the owner's manual for the device, and if necessary, change the position of the Mode Selector Switch ❹ on the rear of the unit.

* When the Mode Selector Switch ❹ is set to the "I" position and the Control Pedal ❾ is turned on, selecting a Patch will automatically turn off the Control Pedal ❾.

c. Expression Pedal

Two expression pedals can be connected to the Expression Pedal Jacks (EXP1 ❷ and EXP2 ❺) at the same time.

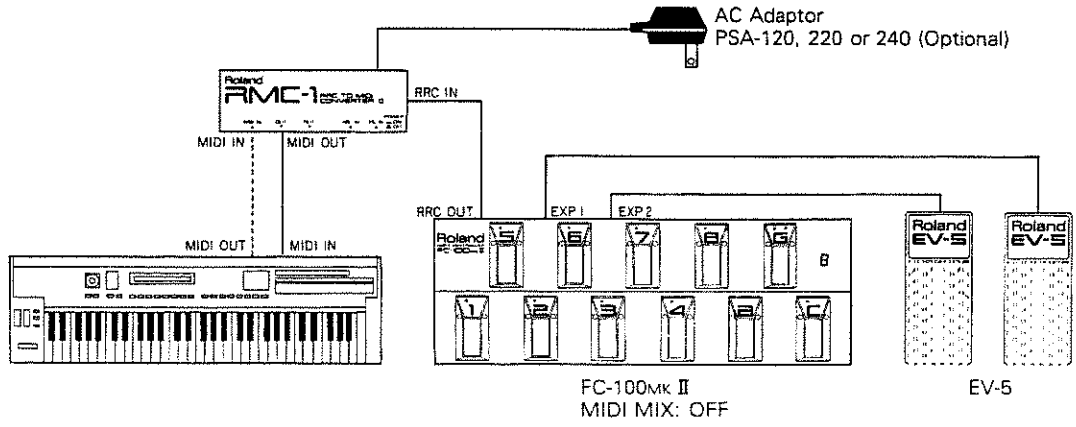
* The EXP2 ❺ jack cannot be used with some types of devices.

* Depending on the external device you use, the expression pedal will function differently. Read the owner's manual for the relevant unit.

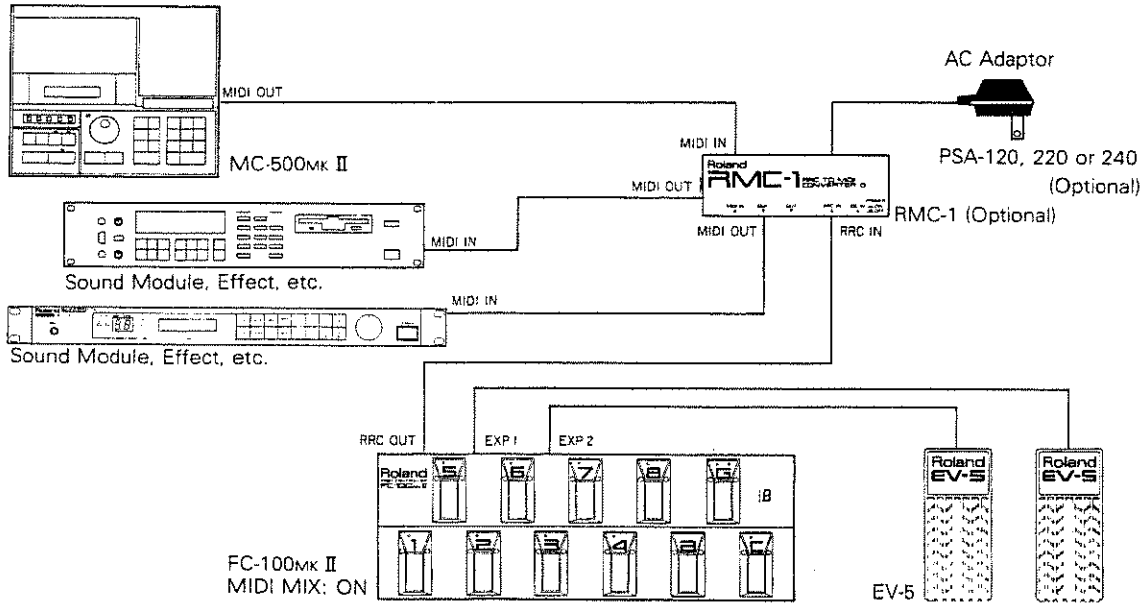
[4] MIDI Foot Pedal Mode

Select this mode for connecting the FC-100MK II to MIDI equipped devices via the Roland RMC-1 (optional). From this mode you can select patches, or use the Control Pedal or two expression pedals. An expansive range of controls can be achieved through variations in settings.

1. Setup Examples



The FC-100MK II can crontrol a sound module or keyboard. If you connect the MIDI OUT socket on the external instrument to the MIDI IN on the RMC-1, the display of the FC-100MK II will match that of the external device. (Set the FC-100MK II to MIDI MIX Off as explained in the following section.)



The FC-100MK II can also control a sound module that is at the same time being controlled by a sequencer. (Set the FC-100MK II to MIDI MIX On as explained in the following section.)

* When connecting RRC cable, be sure to connect the IN socket on one unit to the OUT socket on the other unit. Do not connect IN to IN or OUT to OUT.

* Be sure to connect the RRC cable securely, until it locks in place.

2. Mode Settings

To use the FC-100MK II in the MIDI Foot Pedal mode, you must first make settings for the following:

a. MIDI Mix On/Off

You can select either MIDI Mix On or Off. MIDI Mix On mixes the messages from MIDI IN (RMC-1) and those of the FC-100MK II and sends the mixed data from MIDI OUT (RMC-1). MIDI Mix Off sends only the FC-100MK II's data from the MIDI OUT on the RMC-1.

* For detailed explanation, see "MIDI Implementation" on page 26.

b. MIDI Channel

Set the MIDI channel of the FC-100MK II to the same number as the external device so that the messages can be received and transmitted.

c. OMNI On/Off

You can select OMNI On or Off. At OMNI On, all MIDI messages (except for Exclusive messages) on all channels are received regardless of which MIDI channel is selected. At OMNI Off, only the messages on the set MIDI channel will be recieved.

* The FC-100MK II always transmits messges only on the set MIDI channel.

d. Control Numbers

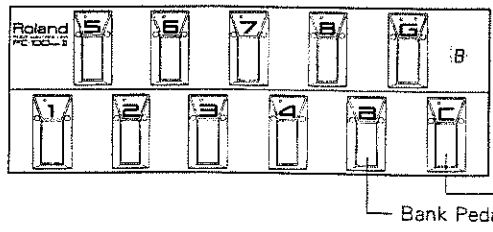
Control numbers need to be assigned to the Control Pedal ❾ and expression pedals ❷ and ❺.

Be sure to set the parameters in the order shown, that is, a, b, c then d. After you have finished making the settings, switch on the unit without pressing the pedal, and it will be set to the MIDI Foot Pedal mode. The settings you have made will be retained even after the unit is switched off.

[STEP 1] Set MIDI Mix to On or Off.

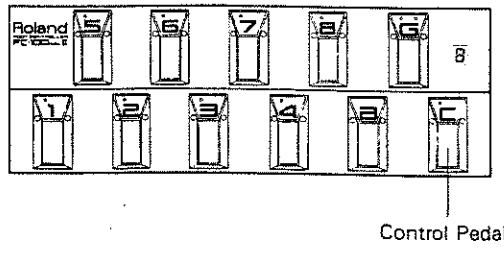
○ **To set to MIDI Mix On**

Turn on the power while holding both the Bank Pedal ❽ and Control Pedal ❾ down.



○ **To set to MIDI Mix Off**

Turn on the power while holding the Control Pedal ❾.



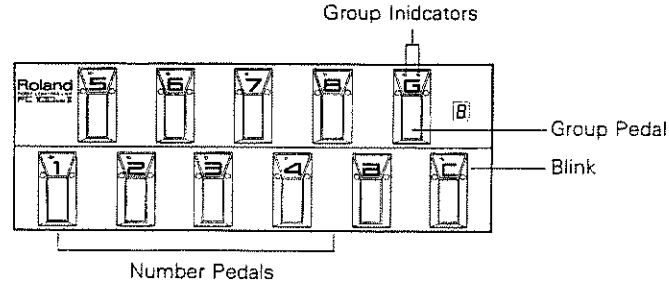
* Be sure to use the switch on the connected device (RMC-1) to turn power on or off.

[STEP 2] Set the MIDI channel

* If you do not need to change MIDI channels and OMNI, skip this step and go to step 3.

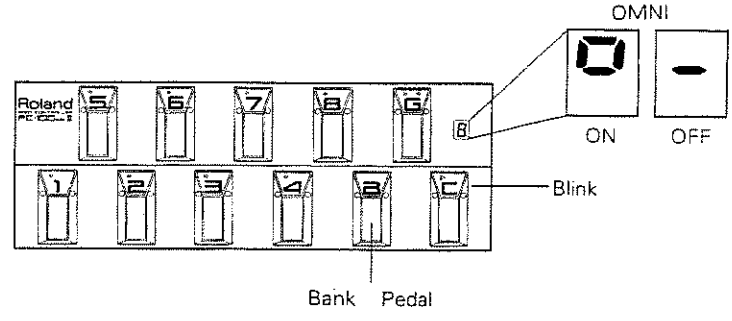
Press the Number Pedal ❻ and Group Pedal ⓬ that corresponds to the MIDI channel you want. The indicators represent MIDI channels as shown below.

Number	1	2	3	4	5	6	7	8
Group A	1	2	3	4	5	6	7	8
Group B	9	10	11	12	13	14	15	16



[STEP 3] * If you do not need to change the status of OMNI On/Off, press the Control Pedal ❾ then go to step 4. (Skip step 3.)

1) Press the Bank Pedal ❽ to select OMNI On or Off.



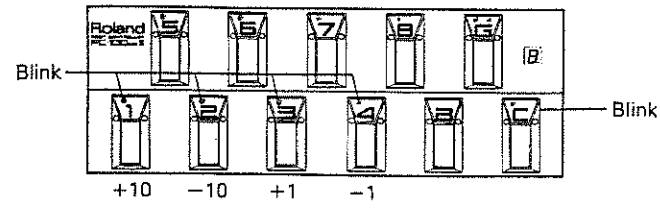
2) Press the Control Pedal ❾, then go to step 4.

[STEP 4] 1) Using the Number Pedals ❻ (1 – 4), change the Control Numbers shown in the Bank Display ⓫.

* If you do not need to change the Control numbers, press the Control Pedal ❾ and go to the next step.

2) Press the Control Pedal ❾ to finalize the setting.

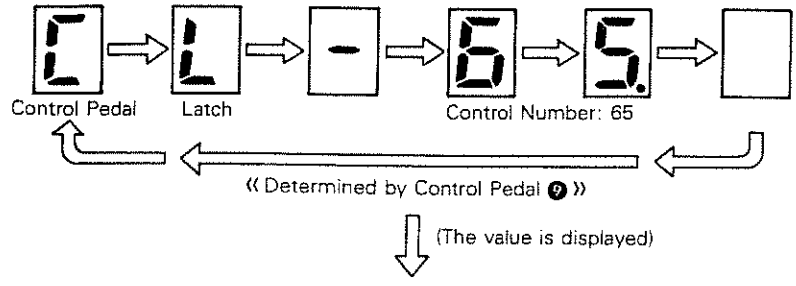
[How to set a Control Number]



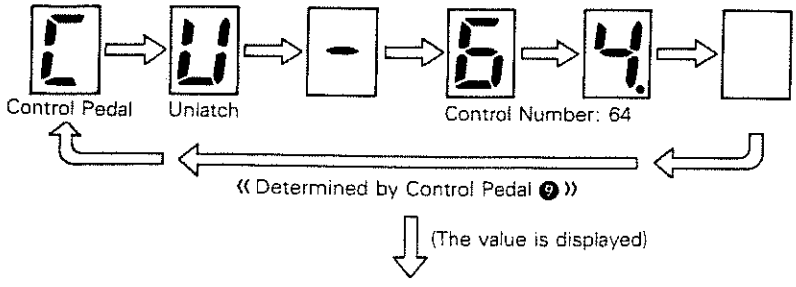
The value assigned to the above Control Pedal (1 – 4) is added to (+ value) or subtracted from (– value) the current control number.

* 0 to 95 are valid for a control number. Any number higher than 96 is automatically substituted by 95.

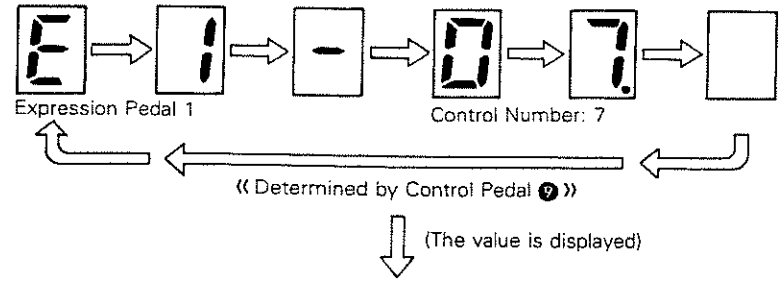
《Control Pedal (in Latch mode: see page 15.)》



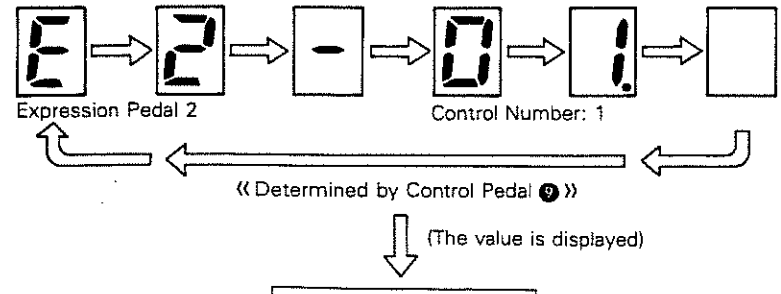
《Control Pedal (in Unlatch mode: see page 15.)》



《Expression Pedal 1》

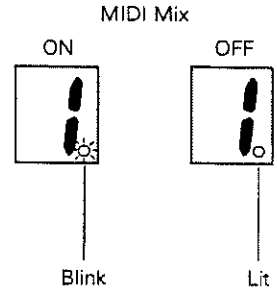


《Expression Pedal 2》



MIDI Foot Pedal Mode

Now, the Point ⓮ shows the current MIDI Mix status, and the FC-100MK II is in the MIDI Foot Pedal mode.



[Important]

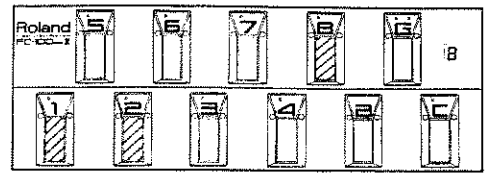
* To change the settings, switch the unit off once, then repeat from step 1.
* What is displayed for the Point ⓮ will vary depending on whether MIDI Mix On or Off is selected at power-up.
* If the unit is switched off in the course of making settings, those settings which have already been made will be kept in memory, while those not yet edited remain at their previous settings.
* When you have made settings in the MIDI Foot Pedal mode, then change to the RRC Foot Pedal mode, the data in memory will be retained. When you next redo settings in the MIDI Foot Pedal mode, the data in memory will be shown in the display. (The MIDI Mix On/Off status, however, is determined by the setting existing at power-up.)
* In the course of making settings, MIDI messages are not transmitted or received.

3. Restoring the Factory Preset Data

The Factory Preset data can be restored at any time as follows.

[STEP 1] While holding the Number Pedals ❻ 1, 2 and 8 turn on the power.

[STEP 2] Turn off the power.



Turn off the power once, then turn it on. In this way, the Factory Preset data will be restored.

If you turn on the power without pressing the pedals, the FC-100MK II is set to the RRC Foot Pedal mode and the data in the MIDI Foot Pedal mode will be returned to the factory presets.

* For details of Factory Preset data, see "[6] Factory Preset Data" on page 19.

4. Operation

a. Patch Selection

The FC-100MK II allows you to select from 128 Patches (combinations of Group/Bank/Number) and at the same time transmit the corresponding Program Change number. Patches (Group/Bank/Number) correspond to Program Change numbers as shown below.

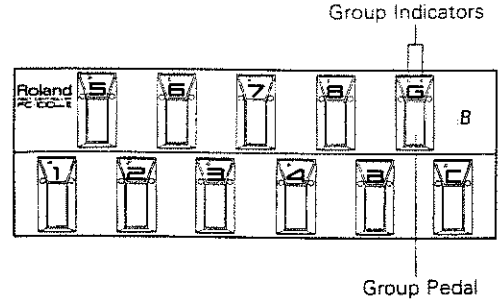
* At power-up, the FC-100MK II is default to A-1-1 (Group A/Bank 1/Number 1).

			Number							
			1	2	3	4	5	6	7	8
Group A	Bank	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
Group B		1	65	66	67	68	69	70	71	72
		2	73	74	75	76	77	78	79	80
		3	81	82	83	84	85	86	87	88
		4	89	90	91	92	93	94	95	96
		5	97	98	99	100	101	102	103	104
		6	105	106	107	108	109	110	111	112
		7	113	114	115	116	117	118	119	120
		8	121	122	123	124	125	126	127	128

To select a Patch, do as follows.

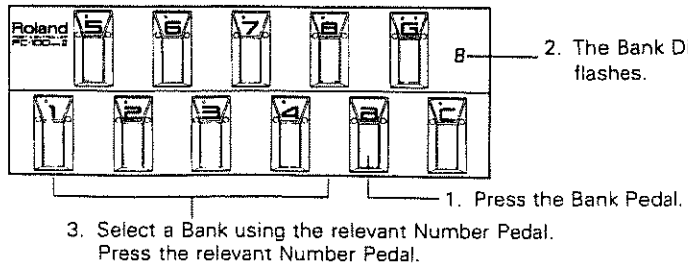
[STEP 1] Select a Group.

Press the Group Pedal ⓬ to select Group A or B. The Group Indicator ⓭ of the selected Group will light up.



[STEP 2] Select a Bank.

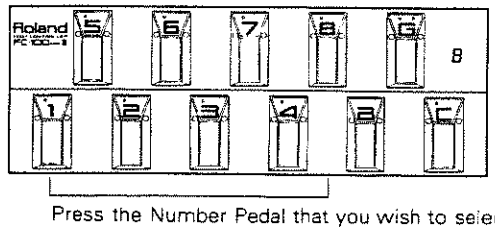
Press the Bank Pedal ❽, and confirm that the Bank Display ⓫ is blinking. Then press a relevant Number Pedal ❻ to select the Bank you want. The selected Bank is shown in the Bank Display ⓫.



* To cancel the Bank selecting mode, press the Bank Pedal ❽ while the Bank display ⓫ is blinking.

[STEP 3] Select a Number.

Press the relevant Number Pedal ❻ to select the Number you want. The corresponding Number Indicator ❼ will light up.



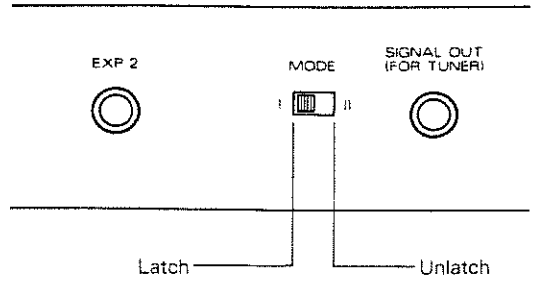
b. Control Pedal

The Control Pedal ❾ has two modes, I and II, which provide Latch and Unlatch modes, respectively.

◇ **I Mode (Latch)**
Each time you press the pedal ❾, it is turned on and off alternately.

◇ **II Mode (Unlatch)**
While the pedal is being pressed, it remains on. When it is released, it is turned off.

To change modes, use the Mode Selector Switch ❹ on the rear of the unit.



* When the Control Pedal is set to "On" in the "I" mode (Latch mode), changing Patches will not affect the condition of the Control Pedal.

* Depending on the device you use, the Control Pedal functions differently. Please read the owner's manual for the connected device.

c. Expression Pedal

Expression pedals can be connected to both Expression pedal Jacks (EXP1 ❷ and EXP2 ❺) at the same time.

* Depending on the external device you use, the expression pedal will function differently. Read the owner's manual for the relevant unit.

5 Using Exclusive Messages

[Important]

> Exclusive messages are automatically transmitted and received between the FC-100MK II and a compatible Roland product. To control the FC-100MK II using external Exclusive messages, you must use an external device that can transmit and recieve Exclusive messages specific to the FC-100MK II.

1. Concerning Modes

The FC-100MK II features five modes. Using external Exclusive messages, you can change modes, MIDI Mix status, and Control numbers (Control Pedal and Expression Pedal).

《MODE 0》 RRC Foot Pedal Mode (page 6)
When a Patch is selected, the corresponding Control Change is transmitted. When using the Control Pedal or Expression pedal, Control Change is transmitted.

《MODE 1》 MIDI Foot Pedal Mode (page 9)
The same message as Mode 0 are transmitted. MIDI channels and Control numbers can be changed.

《MODE 2》 RRC Remote Control Mode
Only the Control Pedal ❾ works as a remote control pedal. When a Patch is selected, the corresponding Control Change is transmitted. When using the Control Pedal or Expression pedal, Control Change is transmitted. (The same backup data as Mode 0 is set.)

《MODE 3》 MIDI Remote Control Mode
Only the Control Pedal ❾ works as a remote control pedal. The same messages (Program Change and Control Change messages) as Mode 1 are transmitted. (The same backup data as Mode 1 is set.)

《MODE 4》 RRC All Remote Control Mode
All the pedals (except for the Expression pedals) work as remote control pedals and can be controlled by the Exclusive messages. (The same backup data as Mode 0 is set.)

* Modes 0 or 1 can be set at power up using pedals. Any of the five modes can be changed to by sending Exclusive messages from an external device.

About Remote Control Pedals

> Remote Control Pedal functions are assigned to Modes 2, 3 and 4, which can only be selected by Exclusive messages. Remote Control pedals are those which can be controlled individually by means of external Exclusive messages. (In Mode 4, the Bank Display can also be controlled.) Also, a Remote Control Pedal transmits pedal messages when receiving Exclusive messages, therefore, the FC-100MK II can be used for versatile purposes with Exclusive messages.

* Data changed by Exclusive messages is not retained in memory. When the unit is switched off or the mode is changed, it is erased.

* Data which can be changed in each mode is shown on page 19 "6 Reference : 1. Table of data which can be edited".

* For details about Exclusive messages, see page 26 "MIDI Implementation Chart".

2. About the RRC Mode (Mode 0, 2 and 4)

The RRC (Roland Remote Control) mode is provided for connecting the FC-100MK II to a Roland product that features an RRC IN connector. The communication format is compatible with MIDI. However, no channel data is recognized (including Exclusive) when messages are received, and channel 1 is always used for transmission.

6 Reference

1. Table of data which can be edited

○ ··· This can be changed by panel operation (Meanwhile, the backup data can be changed.)
● ··· This can be changed by using Exclusive messages.

	Mode 0	Mode 1	Mode 2	Mode 3	Mode 4
Default Mode	○	○			
Mode Change	●	●	●	●	●
MIDI Mix	●	○●	●	☆●	●
MIDI Channel	★	○	★	☆	★
OMNI On/Off	ON	○	ON	☆	ON
Control Numbers					
Control Pedal					
(Latch)	●	○●			
(Unlatch)	●	○●			
EXP 1	●	○●	●	☆●	●
EXP 2	●	○●	●	☆●	●
Remote Control					
Indicators					
Control Pedal			●	●	●
Group Pedal					●
Number Pedals (1 – 8)					●
Bank Display					●
Bank Display blinking					●
Internal Flip-flop					
Control Pedal			●	●	●
Group Pedal					●
Bank Pedal					●
Number Pedals (1 – 8)					●
Output Mode Register					
Control Pedal			●	●	●
Group Pedal					●
Bank Pedal					●
Number Pedals (1 – 8)					●

* Internal Flip-flop ..This indicates the On/Off status when the Remote Control Pedal is set to Latch mode.
* Output Register ..This indicates the mode (Latch or Unlatch) of the Remote Control Pedal. When the mode is changed from Unlatch to Latch, the internal flip-flop is reset.

★When Mode 0, 2 or 4 (RRC mode) is selected, no channel data is recognized (including Exclusive) when messages are received, and channel 1 is always used for transmission.

☆In Mode 3, the backup data is the same as Mode 1. To change data by panel operation, set to Mode 1.

2. Factory Preset Data

Default Mode	Mode 0	
	Mode 0, 2, 4	Mode 1, 3
MIDI channel	1 (Only for transmitting)	1
OMNI On/Off	ON	ON
MIDI Mix	OFF	OFF
Control Numbers		
Control Pedal		
(Latch)	80 (General Purpose Controller 5)	65 (Portamento)
(Unlatch)	81 (General Purpose Controller 6)	64 (Hold 1)
EXP 1	16 (General Purpose Controller 1)	07 (Main Volume)
EXP 2	17 (General Purpose Controller 2)	01 (Modulation Depth)

3. Troubleshooting

Symptom	Cause	What to do
The power cannot be turned on.	o The connected unit is not switched on.	Switch on the connected unit.
	o The RRC cable is disconnected.	Connect the RRC cable securely until it is locked.
	o The RRC cable is not connected correctly.	Make sure that the RRC IN is connected to RRC OUT.
The unit connected to the FC-100MK II does not generate any sound.	o The volume of the expression pedal assigned for Volume is set to zero.	Move the pedal slowly.
	o The Control Pedal set to Mute is working.	Lower the volume of the amplifier, then press the Control Pedal.
Patches on the connected device cannot be changed.	o The connected device is not set to the appropriate mode for Patch selection.	Set the connected device to the appropriate mode that allows you to change Patches.
	o The MIDI channels are not set correctly.	Set the MIDI channel of the FC-100MK II to the same number as the connected device.
The Control Pedal does not work properly.	o The mode is not set correctly.	Set the mode correctly.
	o The mode (Latch or Unlatch) of the Control Pedal is not set correctly.	Change the position of the Mode Selector Switch on the rear of the unit.
	o The Control number is not set correctly.	Set the Control Number properly. (Page 11)
	o The connnected device does not recognize the messages of the set Control Number.	Set the connected device so that it can recognize the messages. * The device you are using may be incapable of recognizing the messages.
The expression pedal does not function properly.	o The expression pedal is not connected properly.	Connect the expression pedal securely to the appropriate jack. Note that the EXP1 and EXP2 jacks function differently.
	o The expression pedal is not adjusted correctly.	Adjust the minimum volume of the expression pedal.
	o MIDI channels are not set correctly.	Set the MIDI channel of the FC-100MK II to the same number as the connected device. (Page 10)
	o The Control number is not set correctly.	Set the Control Number properly. (Page 11)
	o The connected device does not recognize the messages of the relevant Control Pedal.	Set the connected device so that it can recognize the messages. * The device you are using may be incapable of recognizing the messages.
The Tuner Out does not function.	o You are using the RMC-1.	The Tuner Out cannot be used in such cases as at left.
	o The unit you use is not compatible with the Tuner Out of the FC-100MK II.	

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	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Main data
F7H	End of exclusive

≠ MIDI status : F0H, F7H

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

≠ Manufacturer – ID : 41H

The Manufacturer – ID identifies the manufacturer of a MIDI instrument that triggers an exclusive message. Value 41H represents Roland's Manufacturer – 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

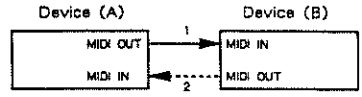
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory – resident records – – waveform and tone data, switch status, and parameters, for example – – to specific locations in a machine – dependent address space, thereby 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 Section 3 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

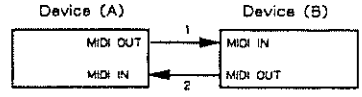


Connection at point 2 is essential for "Request data" procedures. (See Section 3.)

≠ Handshake – transfer procedure (See Section 4 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



Connection at points 1 and 2 is essential.

Notes on the above two procedures

*There are separate Command – IDs for different transfer procedures.
*Devices A 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 and is used 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 20 milliseconds 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	Manufacturer 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.

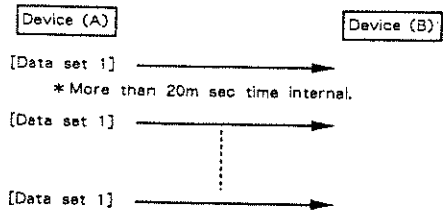
The MIDI standards inhibit non – real time messages from interrupting an exclusive one. This fact is inconvenient for the devices that support a "soft – through" mechanism. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate segments.

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

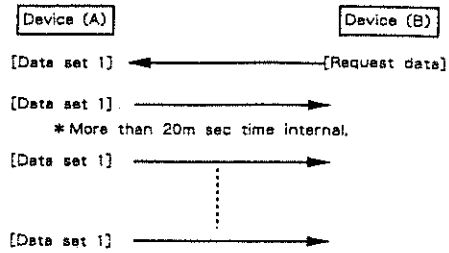
*A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before 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 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.



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	Manufacturer 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	Manufacturer 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	Manufacturer 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	Manufacturer 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	Manufacturer 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	Manufacturer 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 :

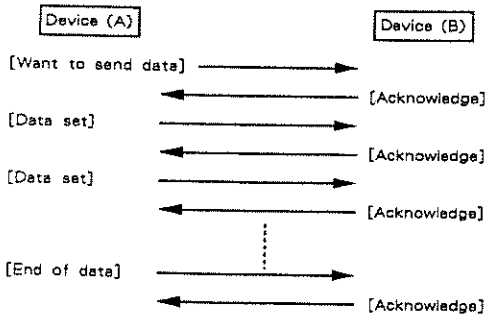
- a WSD or RQD message has specified an illegal data address or size.
- the device is not ready for communication.
- an illegal number of addresses or data has been detected.
- data transfer has been terminated by an operator.
- a communications error has occurred.

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.

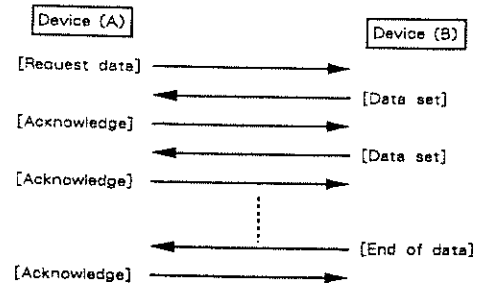
Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

Example of Message Transactions

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

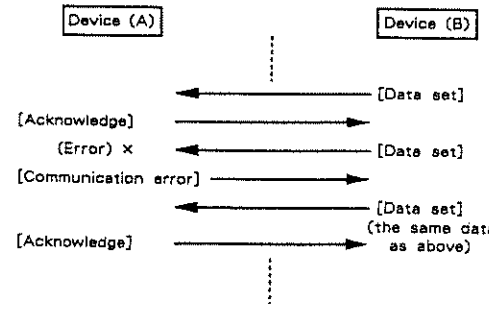


● Device (A) requests and receives data from device (B).

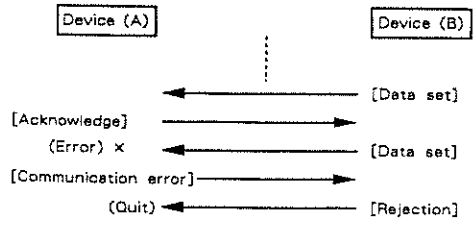


● Error occurs while device (A) is receiving data from device (B).

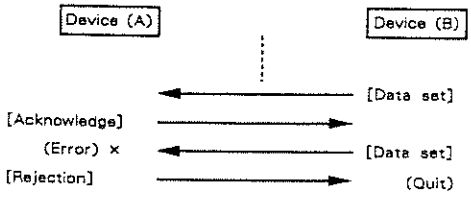
1) Data transfer from device (A) to device (B).



2) Device (B) rejects the data re – transmitted, and quits data transfer.



3) Device (A) immediately quits data transfer.



Foot Controller + RRC TO MIDI Converter

Model FC-100MK II + RMC-1

MIDI Implementation

Date : Jan. 25 1989

Version : 1.00

Function ...		Transmitted	Recognized	Remarks
Basic Channel	Default	1 – 16	1 – 16	Memorized
	Changed	1 – 16	1 – 16	
Mode	Default	×	OMNI ON/OFF	Memorized
	Messages	×	×	
	Altered	*********	×	
Note Number		×	×	
	True Voice	*********	×	
Velocity	Note ON	×		
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	×	
Control Change	0 – 95	○EXP 1	×	*
	0 – 95	○EXP 2	×	*
	0 – 95	○C pedal (latch)	×	*
	0 – 95	○C pedal (unlatch)	×	*
Prog Change		○ (0 – 127)	○ (0 – 127)	
	True #	*********	0 – 127	
System Exclusive		○	○	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Message	Local ON/OFF	×	×	
	All Notes OFF	×	×	
	Active Sense	○	×	
	Reset	×	×	
Notes		FC-100MK II is able to connect other MIDI units through RMC-1. *It is possible to change Control Number between 0 to 95 and to remain that in memory. But the Control Number which is assigned to each pedal is only one.		

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

○ : Yes
× : No

Foot Controller + RRC TO MIDI Converter

Model FC-100MK II + RMC-1

MIDI Implementation

Date : Jan. 25 1989

Version : 1.00

FC－100MKII is able to connect other MIDI units through RRC TO MIDI CONVERTER (RMC－1).

In Following sentences the number with H at the end is hexadecimal, the number with B at the end is binary, and the number with nothing at the end is decimal.

Next names is changed to following omissive names ; Control pedal to C_pedal, Group pedal to G_pedal, Bank pedal to B_pedal.

1. TRANSMITTED DATA

Control Change

Status	Second	Third
BnH	ccH	vvH

n = MIDI Basic Channel	0H － FH (1 － 16)
cc = Control Number	00H － 5FH (0 － 95)
vv = Control Value	00H － 7FH (0 － 127)

This message is transmitted when C_pedal or expression pedals are treated.

Program Change

Status	Second
CnH	ppH

n = MIDI Basic Channel	0H － FH (1 － 16)
pp = Program Number	00H － 5FH (0 － 95)

This message is transmitted when the patch of FC－100MKII is changed.

System Exclusive

Status
F0H : System Exclusive
...
F7H : EOX (End Of System Exclusive)

This message is transmitted when remote controlled pedals are treated.
Refer to "Roland exclusive Messages" and after Sections 3.

Active Sensing

Status
FEH : Active Sensing

This message is transmitted every 300msec during no message.

2. RECOGNIZED RECEIVE DATA

Program Change

Status	Second
CnH	ppH

pp = Program Number	00H － 5FH (0 － 95)
n = MIDI Basic Channel	0H － FH (1 － 16)

FC－100MKII changes the indication of its own patch when it recognizes this message.

System Exclusive

Status
F0H : System Exclusive
...
F7H : EOX (End Of System Exclusive)

Refer to "Roland exclusive Messages" and after Sections 3.

3. EXCLUSIVE COMMUNICATION

All exclusive communications are based on the following structure.
(Roland Exclusive Format Type IV - One Way Transmit)
Refer to "Roland exclusive Messages"

Byte	Description
F0H	Exclusive statu
41H	Roland－ID #
0nH	Device－ID # = MIDI basic channel where n + 1 = channel #
29H	Model－ID # (FC－100MKII)
aaH	Command－ID #
[bbH	Address] [ ] depend on Command－ID
[ccH	Data]
[:	]
[ddH	Checksum]
F7H	EOX (End of System Exclusive)

Summed value of the all bytes between Command－ID and EOX must be 00H (7bits).
It does not include Command－ID and EOX. Refer to Sections 6.

4. COMMUNICATION FORMAT

4.1 Request (One way) RQ1 11H

(Recognized only)

Byte	Description
F0H	Exclusive status
41H	Roland－ID #
0nH	Device－ID # = MIDI basic channel where n + 1 = channel #
29H	Model－ID # (FC－100MKII)
aaH	Command－ID # (RQ1)
bbH	Address
ccH	Data size
ddH	Checksum
F7H	End of System Exclusive

4.2 Data set (One way) DT1 12H

(Transmitted and Recognized)

Byte	Description
F0H	Exclusive status
41H	Roland－ID #
0nH	Device－ID # = MIDI basic channel where n + 1 = channel #
29H	Model－ID # (FC－100MKII)
aaH	Command－ID #
bbH	Address
ccH	Data
:	Data
ddH	Checksum
F7H	End of System Exclusive

5. ADDRESS MAPPING OF PARAMETERS

< Address for Error Message >

FC－100MKII Transmits the data of this address as DATA SET when error is caused.

Address	Data and Description	
00H	0000 sitrB	ERROR FLAG
	||||-------	Usual : 0	Relieve buffer overflow : 1
	|||-------	Usual : 0	Transmit buffer overflow : 1
	||--------	Usual : 0	Internal buffer overflow : 1
	|---------	Usual : 0	Serial I/O overrun framing error : 1

< Address for "REQUEST DATA" > **01H － 07H**

FC－100MKII transmits data of each address as DATA SET after recognizing REQUEST DATA.

Address	Data and Description	
01H	0000 0010B	VERSION NUMBER
		PRESENT MODE
02H	0000 0000B	MODE 0 (RRC foot pedal mode)
	0000 0001B	MODE 1 (MIDI foot pedal mode)
	0000 0010B	MODE 2 (RRC foot pedal mode with remote controlled c_pedal)
	0000 0011B	MODE 3 (MIDI foot pedal mode with remote controlled c_pedal)
	0000 0100B	MODE 4 (RRC all remote control mode)
03H	0000 aaaaB	MIDI BASIC CHANNEL
04H	0111 1111B	OMNI ON
	0000 0000B	OFF
05H	0111 1111B	MIDI MIX ON
	0000 0000B	OFF
06H	0aaa aaaaB	EXP_1 VALUE
	0111 1111B	not connecting pedals
07H	0aaa aaaaB	EXP_2 VALUE
	0111 1111B	not connecting pedals

< Address for the status of pedal > **08H － 1DH**

FC－100MKII only transmits data of each address as "DATA SET".

Address	Data and Description			
08H	0111 1111B	C_PEDAL STATUS < LATCH MODE >	F.F. SET	**Refer to note 1
	0000 0000B		F.F. RESET	
09H	0111 1111B	B_PEDAL STATUS < LATCH MODE >	F.F. SET	
	0000 0000B		F.F. RESET	
0AH	0111 1111B	G_PEDAL STATUS < LATCH MODE >	F.F. SET	
	0000 0000B		F.F. RESET	
0BH	0111 1111B	C_PEDAL STATUS < UNLATCH MODE >	F.F. SET	**Refer to note 1
	0000 0000B		F.F. RESET	
0CH	0111 1111B	B_PEDAL STATUS < UNLATCH MODE >	F.F. SET	
	0000 0000B		F.F. RESET	
0DH	0111 1111B	G_PEDAL STATUS < UNLATCH MODE >	F.F. SET	
	0000 0000B		F.F. RESET	
		NUMBER_PEDAL STATUS < LATCH MODE >		**Refer to note 1
0EH	0111 1111B	1_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
0FH	0111 1111B	2_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
10H	0111 1111B	3_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
11H	0111 1111B	4_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
12H	0111 1111B	5_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
13H	0111 1111B	6_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
14H	0111 1111B	7_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
15H	0111 1111B	8_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
		NUMBER_PEDAL STATUS < UNLATCH MODE >		**Refer to note 1
16H	0111 1111B	1_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
17H	0111 1111B	2_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
18H	0111 1111B	3_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
19H	0111 1111B	4_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
1AH	0111 1111B	5_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
1BH	0111 1111B	6_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
1CH	0111 1111B	7_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	
1DH	0111 1111B	8_PEDAL	F.F. SET	
	0000 0000B		F.F. RESET	

< Address for "DATA SET" > **1EH － 30H**

FC－100MKII recognizes "DATA SET" and changes data of each address. But the changed data is temporary. Backup memory doesn't change.

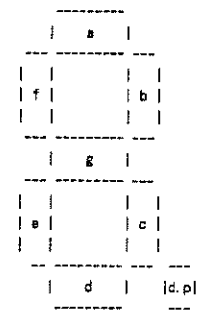
Address	Data and Description		
		MODE	**Refer to note 2
1EH	0000 0000B	MODE 0 (RRC foot pedal mode)	
	0000 0001B	MODE 1 (MIDI foot pedal mode)	
	0000 0010B	MODE 2 (RRC foot pedal mode with remote controlled C_pedal)	
	0000 0011B	MODE 3 (MIDI foot pedal mode with remote controlled C_pedal)	
	0000 0100B	MODE 4 (RRC all remote controlled mode)	
1FH	01xx xxxxB	MIDI MIX ON	
	00xx xxxxB	OFF	
20H	0aaa aaaaB	C_PEDAL CONTROL NUMBER IN LATCH MODE (00H - 5FH)	:validity in MODE 0 or 1
21H	0aaa aaaaB	C_PEDAL CONTROL NUMBER IN UNLATCH MODE (00H - 5FH)	
22H	0aaa aaaaB	EXP1 CONTROL NUMBER (00H - 5FH)	:validity in ALL MODE
23H	0aaa aaaaB	EXP2 CONTROL NUMBER (00H - 5FH)	:validity in ALL MODE
24H	01xx xxxxB	C_PEDAL INDICATOR ON	:validity in MODE 2 , 3 or 4
	00xx xxxxB	OFF	
		NUMBER_PEDAL INDICATOR	:validity in MODE 4
25H	0xxx pqrs8		
		||||------- 5_PEDAL INDICATOR ON : 1 OFF : 0	
		|||------- 6_PEDAL INDICATOR ON : 1 OFF : 0	
		||-------- 7_PEDAL INDICATOR ON : 1 OFF : 0	
		|--------- 8_PEDAL INDICATOR ON : 1 OFF : 0	
26H	0xxx pqrs8		
		||||------- 1_PEDAL INDICATOR ON : 1 OFF : 0	
		|||------- 2_PEDAL INDICATOR ON : 1 OFF : 0	
		||-------- 3_PEDAL INDICATOR ON : 1 OFF : 0	
		|--------- 4_PEDAL INDICATOR ON : 1 OFF : 0	

		BANK DISPLAY SEGMENTS	:validity in MODE 4
27H	0xxx abcdB		**Refer to note 3
		||||-------- SEGMENT_d ON : 1 OFF : 0	
		|||--------- SEGMENT_c ON : 1 OFF : 0	
		||---------- SEGMENT_b ON : 1 OFF : 0	
		|---------- SEGMENT_a ON : 1 OFF : 0	
28H	0xxx efgpB		
		||||-------- SEGMENT_dp ON : 1 OFF : 0	
		|||--------- SEGMENT_g ON : 1 OFF : 0	
		||---------- SEGMENT_f ON : 1 OFF : 0	
		|---------- SEGMENT_e ON : 1 OFF : 0	
29H	0xxx xxabB	G_PEDAL INDICATOR	:validity in MODE 4
		||-------- INDICATOR B ON : 1 OFF : 0	
		|--------- INDICATOR A ON : 1 OFF : 0	
2AH	01xx xxxxB	BANK INDICATOR BRINK ON	:validity in MODE 4
	00xx xxxxB	OFF	
		INTERNAL F.F.	:validity in MODE 4
2BH	0xxx pqrsB		**Refer to note 1
		||||-------- 5_PEDAL F.F. SET : 1 RESET : 0	
		|||--------- 6_PEDAL F.F. SET : 1 RESET : 0	
		||---------- 7_PEDAL F.F. SET : 1 RESET : 0	
		|---------- 8_PEDAL F.F. SET : 1 RESET : 0	
2CH	0xxx pqrsB		
		||||-------- 1_PEDAL F.F. SET : 1 RESET : 0	
		|||--------- 2_PEDAL F.F. SET : 1 RESET : 0	
		||---------- 3_PEDAL F.F. SET : 1 RESET : 0	
		|---------- 4_PEDAL F.F. SET : 1 RESET : 0	
2DH	0xxx xgbcB		
		|||-------- C_PEDAL F.F. SET : 1 RESET : 0(valid bit in MODE 2, 3, 4)	
		||--------- B_PEDAL F.F. SET : 1 RESET : 0	
		|---------- G_PEDAL F.F. SET : 1 RESET : 0	
		OUTPUT MODE RESISTOR	:valicity in MODE 4
2EH	0xxx pqrsB		**Refer to note 4
		||||-------- 5_PEDAL LATCH : 1 UNLATCH : 0	
		|||--------- 6_PEDAL LATCH : 1 UNLATCH : 0	
		||---------- 7_PEDAL LATCH : 1 UNLATCH : 0	
		|---------- 8_PEDAL LATCH : 1 UNLATCH : 0	
2FH	0xxx pqrsB		
		||||-------- 1_PEDAL LATCH : 1 UNLATCH : 0	
		|||--------- 2_PEDAL LATCH : 1 UNLATCH : 0	
		||---------- 3_PEDAL LATCH : 1 UNLATCH : 0	
		|---------- 4_PEDAL LATCH : 1 UNLATCH : 0	
30H	0xxx xgbcB		
		|||-------- C_PEDAL LATCH : 1 UNLATCH : 0(valid bit in MODE 2, 3, 4)	
		||--------- B_PEDAL LATCH : 1 UNLATCH : 0	
		|---------- G_PEDAL LATCH : 1 UNLATCH : 0	

note 1) "F.F.(flip – flop)" is the symbol that express the state of pedals. Setting F.F. means the pedal is on and resetting F.F. means the pedal is off. The state of F.F. is regardless of lighting INDICATOR.

note 2) Changing MODE (0 – 4), FC – 100MKII set the control number of each MODE on a next state.
MODE 0 • MODE 2 • MODE 4 ••••••• Backup memory of RRC mode.
MODE 1 • MODE 3 •••••••••••••••• Backup memory of MIDI mode.
And after recognizing "remote controlled mode" FC – 100MKII transmits the data of remote controlled pedals as the exclusive message. Getting in MODE 2 • 3 • 4 the data of remote controlled pedals is set 0 about INTERNAL F.F., OUTPUT MODE RESISTOR, INDICATOR ON/OFF and BRINK.

note 3) Bank display segments call like under figure.



note 4) "OUTPUT MODE RESISTOR" expresses the method of outputting data ; latch or unlatch.

note 5) When MIDI MIX is on, FC – 100MKII transmits all signals that one from MIDI IN and from itself is mixed except for Active Sensing and Undefined Status.

note 6) Only one Controll Number can be assigned to each pedal. So using the pedal to which Controll Number between 32 to 63 (20H – 3FH) is assigned, FC100 – MKII cannot transmitting each data of MSB at a time.

6. CHART OF VALID EXCLUSIVE MESSAGES

FC – 100MKII has the restriction of transmiting and recognizing exclusive messages.

Address	Discripotion
00H	When error causes, FC-100MKII transmits DATA SET. Error flag is resetted after transmitting. Recognizing REQUEST DATA FC-100MKII transmits DATA SET. but its data is always 00H.
01H – 07H	Recognizing REQUEST DATA, FC-100MKII transmits DATA SET about the address that appointed by REQUEST DATA.
08H – 1DH	FC-100MKII transmits DATA SET about a state of the remote controled pedals. But DATA SET is unable to be transmitted if REQUEST DATA is recognized.
1EH – 30H	Recognizing REQUEST DATA, FC-100MKII houses data in the address that appointed by REQUEST DATA and set itself up as data expresses. FC-100MKII doesn't transmit any messages if REQUEST DATA is recognized.

7. QUICK CHART OF EXCLUSIVE MESSAGE

		Recognizable by FC-100MKII		
		To get data of address	To change data of address (Single)	To change data of address (Consecutive)
1	Exclusive Status	F0H		
2	Roland ID	41H		
3	MIDI Basic Channel	**H <00H - 0FH> (Need to fit)	**H <00H - 0FH> (Need to fit except RRC mode)	
4	Model ID	29H		
5	Command ID	11H <REQUEST DATA>	12H <DATA SET>	
6	First address	**H <01H - 07H>	**H <1EH - 30H>	
7	Data	**H (Number of address need)	**H (New address data)	**H .... **H (A series of new data)
8	Checksum	**H (depend on 6&7)	**H <Free> (Not recognized)	
9	End Of System Exclusive	F7H		

/// About Checksum ///

Checksum is instituted to check up received data. If received data aren't true, those aren't recognized. Sending REQUEST DATA to FC-100MKII, we have to adjust checksum to a correct number. (Transmitted data by FC-100MKII is given a correct checksum automatically.)

How to calculate checksum.

At first calculate [C.S.].
[First Address] + [Data] + [C.S.] = 00H
Checksum is [C.S.] without the MSB (most significant bit).

< EXAMPLE >

```
          0010 1101B   (2DH)     First Address
          0000 1111B   (0FH)     Data
        + 1100 0100B   (C4H)     C.S. --------+
       --------------------------             |
          0000 0000B   (00H)                  |
                                              |
          1100 0100B   (44H)     Checksum <---+
```

Messages showing under is samples of recognizable exclusive messages.
** ..... Keep fitting " **H" at MIDI basic channel (00H - 0FH) except RRC mode.
++ ..... Free number between 00H to 0FH
** ..... New data
-- ..... Free number between 00H to 7FH

**** EXCLUSIVE MESSAGE ****

```
To get data of VERSION NUMBER     : F0 41 ** 29 11 01 01 7E F7 (Hex)
              MODE                : F0 41 ** 29 11 02 01 7D F7 (Hex)
              MIDI BASIC CHANNEL  : F0 41 ** 29 11 03 01 7C F7 (Hex)
              OMNI ON/OFF         : F0 41 ** 29 11 04 01 7B F7 (Hex)
              MIDI MIX ON/OFF     : F0 41 ** 29 11 05 01 7A F7 (Hex)
              EXP_1 VALUE         : F0 41 ** 29 11 06 01 79 F7 (Hex)
              EXP_2 VALUE         : F0 41 ** 29 11 07 01 78 F7 (Hex)

To get data of address 00H - 07H  : F0 41 ** 29 11 00 08 7B F7 (Hex)
               address 03H - 05H  : F0 41 ** 29 11 03 03 7A F7 (Hex)
        (A sample of DATA SET coming back from FC-100MKII when we request data of
        address 03H - 05H from RRC mode.)
           MIDI basic channel : 2 , OMNI ON , MIDI MIX OFF
               F0 41 00 29 12 03 01 7F 00 7D F7 (Hex)
                                 | | | | |-------- Checksum
                                 | | | |---------- Data at address 05H
                                 | | |------------ Data at address 04H
                                 | |-------------- Data at address 03H
                                 |---------------- Address number of next byte

To change data of MODE            : F0 41 ** 29 12 1E ¥¥ -- F7 (Hex)
                  MIDI MIX ON/OFF : F0 41 ** 29 12 1F ¥¥ -- F7 (Hex)
                  C_pedal C_No. (LAT): F0 41 ** 29 12 20 ¥¥ -- F7 (Hex)
                  C_pedal C_No. (UNL): F0 41 ** 29 12 21 ¥¥ -- F7 (Hex)
                  EXP_1. C_No.    : F0 41 ** 29 12 22 ¥¥ -- F7 (Hex)
                  EXP_2. C_No.    : F0 41 ** 29 12 23 ¥¥ -- F7 (Hex)
                  C_pedal LED     : F0 41 ** 29 12 24 ¥¥ -- F7 (Hex)
                  No_pedal LED (5-8): F0 41 ++ 29 12 25 ¥¥ -- F7 (Hex)
                  No_pedal LED (1-4): F0 41 ++ 29 12 26 ¥¥ -- F7 (Hex)
                  BANK LED (abcd) : F0 41 ++ 29 12 27 ¥¥ -- F7 (Hex)
                  BANK LED (efgh) : F0 41 ++ 29 12 28 ¥¥ -- F7 (Hex)
                  G_pedal LED     : F0 41 ++ 29 12 29 ¥¥ -- F7 (Hex)
                  BANK LED BRINK  : F0 41 ++ 29 12 2A ¥¥ -- F7 (Hex)
                  INTERNAL FF(5-8) : F0 41 ++ 29 12 2B ¥¥ -- F7 (Hex)
                  INTERNAL FF(1-4) : F0 41 ++ 29 12 2C ¥¥ -- F7 (Hex)
                  INTERNAL FF(GBC) : F0 41 ++ 29 12 2D ¥¥ -- F7 (Hex)
                  OUTPUT MODE(5-8) : F0 41 ++ 29 12 2E ¥¥ -- F7 (Hex)
                  OUTPUT MODE(1-4) : F0 41 ++ 29 12 2F ¥¥ -- F7 (Hex)
                  OUTPUT MODE(GBC) : F0 41 ++ 29 12 30 ¥¥ -- F7 (Hex)

INDICATOR All ON                  : F0 41 ++ 29 12 24 40 0F 0F 0F 0F 03 -- F7 (Hex)
              All OFF             : F0 41 ++ 29 12 24 00 00 00 00 00 00 -- F7 (Hex)
BANK DISPLAY shows "0"            : F0 41 ++ 29 12 27 0F 0C -- F7 (Hex)
               shows "1"          : F0 41 ++ 29 12 27 06 00 -- F7 (Hex)
               shows "2"          : F0 41 ++ 29 12 27 0D 0A -- F7 (Hex)
               shows "3"          : F0 41 ++ 29 12 27 0F 02 -- F7 (Hex)
               shows "4"          : F0 41 ++ 29 12 27 06 06 -- F7 (Hex)
               shows "5"          : F0 41 ++ 29 12 27 0B 06 -- F7 (Hex)
               shows "6"          : F0 41 ++ 29 12 27 0B 0E -- F7 (Hex)
               shows "7"          : F0 41 ++ 29 12 27 0E 00 -- F7 (Hex)
               shows "8"          : F0 41 ++ 29 12 27 0F 0E -- F7 (Hex)
               shows "9"          : F0 41 ++ 29 12 27 0F 06 -- F7 (Hex)
INTERNAL F.F. All SET             : F0 41 ++ 29 12 2B 0F 0F 07 -- F7 (Hex)
              All RESET           : F0 41 ++ 29 12 2B 00 00 00 -- F7 (Hex)
All pedals change LATCH           : F0 41 ++ 29 12 2E 0F 0F 07 -- F7 (Hex)
                  change UNLATCH  : F0 41 ++ 29 12 2E 00 00 00 -- F7 (Hex)
```

SPECIFICATIONS

- **Switches**
  - Number Pedals (1 – 8)
  - Bank Pedal
  - Control Pedal
  - Group Pedal
  - Mode Selector

- **Indicators**
  - Number Indicators (1 – 8)
  - Control Indicator
  - Group Indicators (A/B)
  - Point

- **Display**
  - Bank Display

- **Jacks**
  - RRC OUT Connector
  - Expression Pedals (1, 2)
  - Tuner's Signal Out

Power: Supplied from the connected device via the RRC cable.

Consumption: 110 mA

Output Load Impedance of the Tuner's Signal Out: More than 10 k Ω

Dimensions: 490 (W) × 50 (H) × 180 (D) mm / 19-5/16" × 2" × 7-1/16"

Weight: 2.6 kg / 4 lb 13 oz

Accessory: 7.5 m RRC Cable × 1
MIDI Guidebook

★ **Options**
- Expression Pedal
  - Roland EV-5
  - BOSS EV-10
- RRC TO MIDI Converter
  - Roland RMC-1

* Specifications are subject to change without notice.

For West Germany

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

ROLAND FOOT CONTROLLER FC-100MKII

(Gerät. Typ. Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg 1046/1984

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Roland Corporation Osaka/Japan

Name des Herstellers/Importeurs

For the USA

RADIO AND TELEVISION INTERFERENCE

WARNING — This equipment has been verified to comply with the limits for a Class B computing device, pursuant to Subpart J, of Part 15, of FCC rules. Operation with non-certified or non-verified equipment is likely to result in interference to radio and TV reception.

The equipment described in this manual generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, of Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such a interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by the following measure:

- Disconnect other devices and their input/output cables one at a time. If the interference stops, it is caused by either the other device or its I/O cable. These devices usually require Roland designated shielded I/O cables. For Roland devices, you can obtain the proper shielded cable from your dealer. For non Roland devices, contact the manufacturer or dealer for assistance.
  If your equipment does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures.
- Turn the TV or radio antenna until the interference stops.
- Move the equipment to one side or the other of the TV or radio.
- Move the equipment farther away from the TV or radio.
- Plug the equipment into an outlet that is on a different circuit than the TV or radio. (That is, make certain the equipment and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV. If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission:
  "How to Identify and Resolve Radio — TV Interference Problems"
  This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

For Canada

CLASS B **NOTICE**

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASSE B **AVIS**

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Réglement des signaux parasites par le ministère canadien des Communications.

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