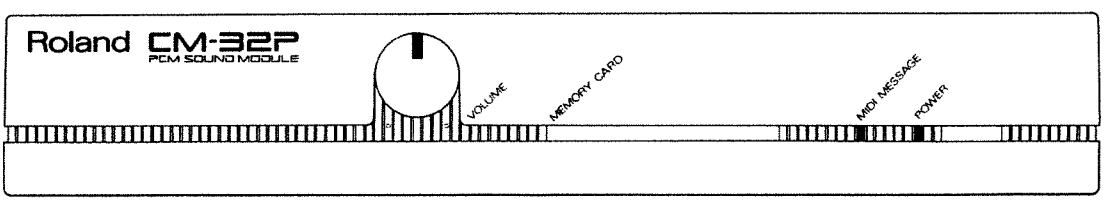
Roland

PCM SOUND MODULE

CM-32P

OWNER'S MANUAL



For the U.K.

IMPORTANT: THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.

BLUE : NEUTRAL
BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

For West Germany

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

PCM SOUND MODULE CM-32P

(Gerat Typ Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg 1046/1984

(Amtsblattverfugung)

funk-entstort ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprufung 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.

Thank you for purchasing the Roland PCM Sound Module CM-32P. To make the best use of the CM-32P, please read this owner's manual carefully.

■ *CONTENTS*

■Features of the CM-32P ····2
■Important Notes ····3

1. Panel Description ····4
(1)Front Panel ····4
(2)Rear Panel····4

2. Connections ····5

3. Structure of the CM-32P ····6
(1)PCM Sound Module ····6
(2)Structure of the Sound Modules ····6

4. Sound Selection····7
(1)Sounds of Part 1 - 6 ····7
(2)Sound Types····9
(3)How to use the PCM Cards····9

5. Control via MIDI ····10
(1)MIDI Channel of each Part ····10
(2)MIDI Messages that the individual Part can receive ····10
(3)Advanced Control via MIDI ····12

6. Default Settings at Power-on····13

7. Maximum Voices····14
(1)Partials and the maximum number of voices ····14
(2)Partial Reserve ····14

■MIDI Implementation ····15
■Specifications ····24
■CM-32P Block Diagram ····24

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

Copyright © 1989 by ROLAND CORPORATION

All rights reserved. No part of this publication may be reproduced in any form without the permission of ROLAND CORPORATION.

■*Features of the CM-32P*

The following describes the features of the CM-32P.

●Sound Module that is ideal for computer music

The CM-32P features a multi timbral sound module that consists of 6 different Parts. In other words, one CM-32P works as 6 separate sound modules. The compact and simply designed body may be ideal for computer music.

Also, the CM-32P can be used with the MT-32 to make more integrated system.

●The CM-32P adopts a PCM sound module that creates high quality sounds

The PCM sound module similar to the U-110 is built in the CM-32P, creating high quality 64 different sounds.

●The CM-32P can produce a maximum of 31 voices

Because the CM-32P can produce a maximum of 31 voices (Partials), you can enjoy high level ensemble performance.

●PCM Card

The CM-32P stores 64 different sounds, and another 64 sounds can be available using an optional PCM Card.

●The built-in Digital Reverb creates realistic reverb effect

The CM-32P's digital reverb adds spaciousness and richness to the sounds.

■ *Important Notes*

When employing an AC adaptor, make certain you use only one that has been supplied by the manufacturer. Use of any other power adaptor could result in malfunction or damage.

[Concerning the power supply]

●Whenever you make any connections with other devices, always turn off the power to all equipment first. This will help in preventing malfunction, and damage to speakers.

●Do not force the unit to share the same power outlet as one used for distortion producing devices (such as motors, variable lighting devices). Be sure to use a separate power outlet.

●Before using the AC adaptor, always make certain the voltage of the available power supply conforms to its rating.

●Do not place heavy objects onto, step on, or otherwise risk causing damage to the power cord.

●Whenever you disconnect the AC adaptor from the outlet, always grasp it by the plug, to prevent internal damage to the cord and the hazard of possible short circuits.

●If the unit is not to be used for a long period of time, unplug the cord from the socket.

[Concerning placement]

●Avoid using or storing the unit in the following places, as damage 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 humidity.

○Dusty environments.

○Places where high levels of vibration are produced.

●Placing the unit near power amplifiers or other equipment containing large transformers may induce hum.

●Should the unit be operated nearby television or radio receivers, TV pictures may show signs of interference, and static might be heard on radios. In such cases, move the unit out of proximity with such devices.

[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 thoroughly with a soft cloth.

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

[Other Precautions]

●Protect the unit from strong impact.

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

●A certain small amount of heat will be radiated from the unit, and thus should not be considered abnormal.

●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.

●Since the unit is equipped with a circuit protection device, it requires a brief interval after power is turned on before it can be operated.

1. Panel Description

(1)Front Panel

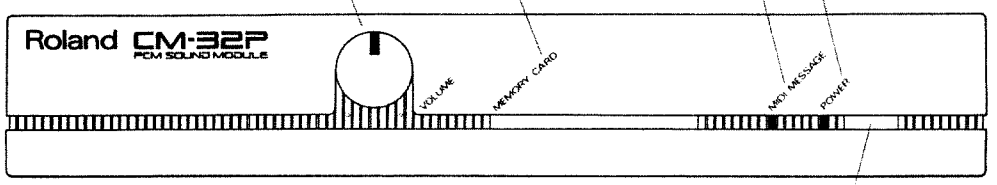
VOLUME (Volume Control Knob)
This adjusts the overall volume which is the output from the Output Jacks or Headphone Jack. Rotating the knob clockwise will increase the volume, and rotating it counterclockwise will decrease it.

* The volume balance of the individual Part can be controlled with the MIDI Volume (Control Change) messages.

MEMORY CARD (PCM Card Slot)
Insert an optional PCM Card (Sound Library : SN-U110 Series) to this slot. Using a PCM Card, you can use another 64 sounds in addition to those in the internal memory.

MIDI MESSAGE (MIDI Message Indicator)
This lights up when the MIDI message is received.

POWER (Power Indicator)
This lights up when the unit is switched on.

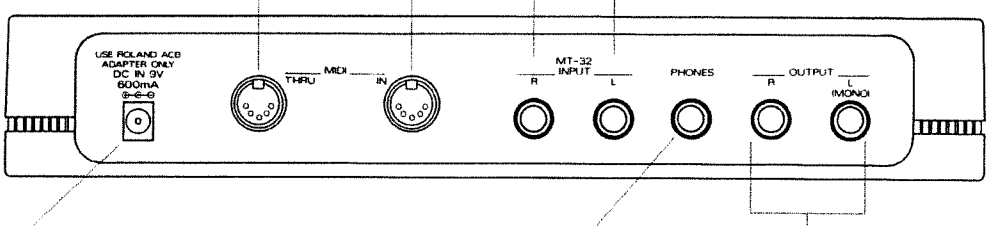


POWER SWITCH

(2)Rear Panel

MIDI IN/THRU (MIDI Sockets)
Connect MIDI devices to these sockets.

MT-32 INPUT (Input Jack)
When using this unit with the MT-32, connect this jack to the output jack of the MT-32 using an audio cable. Sounds from the MT-32 will be sent through the CM-32P's Output Jacks together with the CM-32P's own sounds.



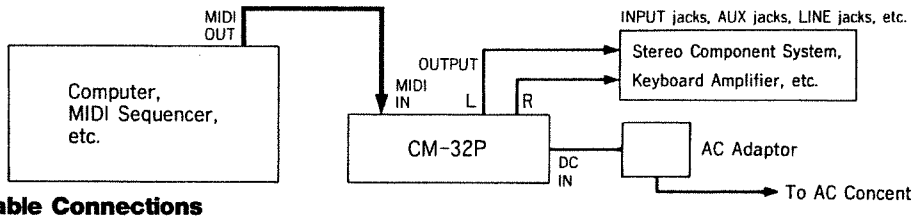
DC IN (AC Adaptor Jack)
Connect the supplied AC adaptor to this jack.

PHONES (Headphone Jack)
Connect headphones to this jack. Use headphones of 8 to 150 ohm impedance, if possible. Even while the Headphone Jack is connected, the Output Jacks send signals just the same.

OUTPUT (Output Jacks)
Sounds of the CM-32P are output through these Output Jacks. The L and R jacks are provided, so use both of them for stereo output. For mono output, use the L (MONO) jack only.

2. Connections

To play the CM-32P, connect the devices as shown below.



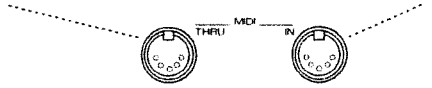
●MIDI Cable Connections

Connect the MIDI IN socket on the CM-32P to the MIDI OUT socket on the MIDI sequencer or a computer using a MIDI cable.

To use another MIDI sound module together with the CM-32P, connect it to the MIDI THRU socket. However, do not connect more than three or four MIDI devices through MIDI THRU's. If more number of devices are connected, MIDI signals may not be received correctly causing malfunction of the entire system. If you wish to set up many number of devices through MIDI, use the MIDI Thru Box.

MIDI THRU : Transmits an exact copy of the messages received at MIDI IN.

MIDI IN : Receives MIDI messages sent from an external device.

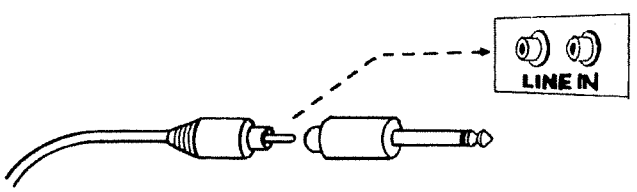


●Audio Cable Connections

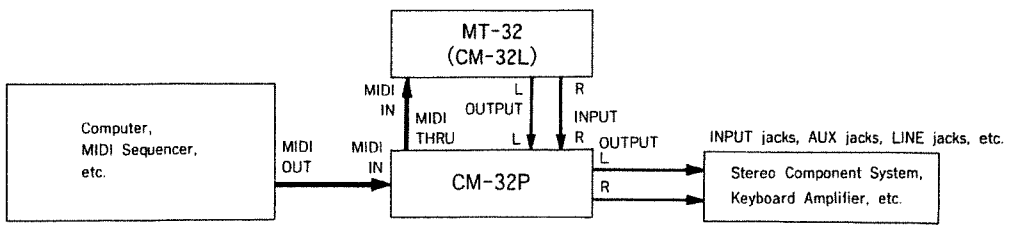
Connect the Output Jacks of the CM-32P to the input jacks of the keyboard amplifier or stereo component system using an audio cable. The CM-32P features stereo outputs, but use the L (MONO) jack only for mono output.

When connecting the CM-32P to a keyboard amplifier or an electronic piano that features an external input jack : If it features an input level selector switch, set it to "H".

When connecting the CM-32P to a stereo component system : Connect the CM-32P to the LINE IN or AUX IN (input jack). When the input jack is pin jack type, remove the adaptor from the audio cable of accessory.



To use the CM-32P with the MT-32, connect the units as shown below. Sounds from the MT-32 will be output through the Output Jacks on the CM-32P together with the CM-32P's own sounds.



3. Structure of the CM-32P

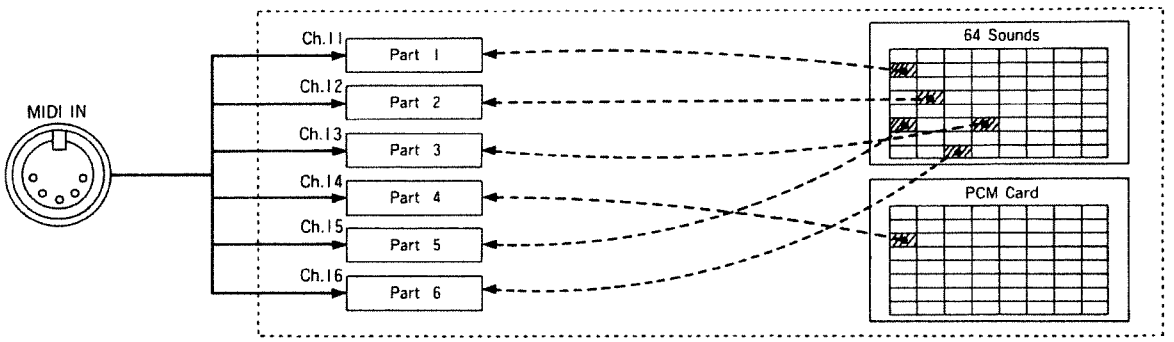
The following briefly explains the structure of the CM-32P.

(1)PCM Sound Module

PCM stands for Pulse Code Modulation. PCM sound module records real sounds such as a piano or sax digitally, and play back the recorded sounds. The PCM sound module on the CM-32P modified the recorded sounds so that even more realistic acoustic sounds can be created.

(2)Structure of the Sound Modules

The CM-32P is a multi timbral sound module that consists of 6 Parts. Each Part is controlled by information received on an individual MIDI channel. So, you must set the receive channel of each Part to the same number as the transmit channel of the external MIDI device. Using a computer or MIDI sequencer that can send more than one MIDI channel messages, you can enjoy ensemble performance with different Parts.



●Part

The CM-32P stores 64 different sounds. Any of those sounds can be assigned to each of 1 - 6 Parts. Sounds in each Part can be changed by MIDI Program Change messages.

●Partial

The CM-32P can produce a maximum of 31 voices using 31 Partials. Each sound uses a different number of Partials, and the maximum number of voices that can be played at the same time will vary depending on the number of Partials used in the sound. For details, see page 14 "7. Maximum Voices".

4. Sound Selection

The CM-32P can use the following sounds :

(1)Sounds of Part 1 - 6

The CM-32P stores 64 different PCM sounds. Using an optional PCM Card (Sound Library SN-U110 Series), another 64 sounds are available.

The following are the 64 PCM sounds stored in the internal memory :

PROG#	TONE	Ptl#	Tone Type	Split/ Threshold	Contents
1/00H	A.PIANO 1	2	V-MIX		Mellow tone
2/01H	A.PIANO 2	2	V-MIX		
3/02H	A.PIANO 3	2	V-MIX		Bright tone
4/03H	A.PIANO 4	2	V-MIX		Honky tonk piano
5/04H	A.PIANO 5	1	SINGLE		Soft touch
6/05H	A.PIANO 7	1	SINGLE		Hard touch
7/06H	A.PIANO 9	1	SINGLE		Hard touch and bright tone
8/07H	E.PIANO 1	2	V-MIX		Soft and hard touch
9/08H	E.PIANO 3	2	DETUNE		Soft touch
10/09H	E.PIANO 5	2	DETUNE		Hard touch
11/0AH	A.GUITAR 1	1	SINGLE		
12/0BH	A.GUITAR 3	2	DUAL		
13/0CH	A.GUITAR 4	2	DUAL		Includes the sound one octave lower
14/0DH	E.GUITAR 1	1	V-SW	v=100	Mute/Non-mute
15/0EH	E.GUITAR 2	1	SINGLE		Mute
16/0FH	SLAP 3	1	SINGLE	B 2(47)	Thump/pull ＊The keys more than F#4(66) contains the harmonics sound.
17/10H	SLAP 4	2	DETUNE	B 2(47)	
18/11H	SLAP 5	1	V-SW	v=100	
19/12H	SLAP 6	1	V-SW	v=100	Slow attack/Fast attack ＊The keys more than F#4(66) contains the harmonics sound.
20/13H	SLAP 9	1	SINGLE	B 2(47)	Thump/pull ＊The keys more than C#4(61) contains the harmonics sound.
21/14H	SLAP 10	2	DETUNE	B 2(47)	
22/15H	SLAP 11	1	V-SW	v=100	
23/16H	SLAP 12	1	V-SW	v=100	Slow attack/Fast attack ＊The keys more than C#4(61) contains the harmonics sound.
24/17H	FINGERED 1	1	SINGLE		＊The keys more than C#5(73) contains the harmonics sound.
25/18H	FINGERED 2	2	DETUNE		
26/19H	PICKED 1	1	SINGLE		
27/1AH	PICKED 2	2	DETUNE		
28/1BH	FRETLESS 1	1	SINGLE		＊The keys more than D#6(87) contains the harmonics sound.
29/1CH	AC.BASS	2	V-MIX		Fret-noise is slightly mixed.
30/1DH	CHOIR 1	1	SINGLE		Long release
31/1EH	CHOIR 2	1	SINGLE		Short release
32/1FH	CHOIR 3	2	DUAL		Long release (Includes the sound one octave lower)
33/20H	CHOIR 4	2	DUAL		Short release (Includes the sound one octave lower)
34/21H	STRINGS 1	1	SINGLE		Long release

PROG#	TONE	Ptl#	Tone Type	Split/ Threshold	Contents
35/22H	STRINGS 2	1	SINGLE		Short release
36/23H	STRINGS 3	2	DUAL		Long release (Includes the sound one octave lower)
37/24H	STRINGS 4	2	DUAL		Short release (Includes the sound one octave lower)
38/25H	E.ORGAN 2	2	DETUNE		
39/26H	E.ORGAN 4	2	DETUNE		
40/27H	E.ORGAN 6	2	DETUNE		
41/28H	E.ORGAN 8	2	DETUNE		
42/29H	E.ORGAN 9	2	DUAL		
43/2AH	E.ORGAN 10	2	DUAL		
44/2BH	E.ORGAN 11	2	DUAL		
45/2CH	E.ORGAN 12	2	DUAL		
46/2DH	E.ORGAN 13	2	DUAL		
47/2EH	SOFT TP 1	1	SINGLE		
48/2FH	SOFT TP 3	1	SINGLE		Sforzand piano
49/30H	TP / TRB 1	1	SINGLE		
50/31H	TP / TRB 2	1	SINGLE		Mellow tone
51/32H	TP / TRB 3	1	SINGLE		Bright tone
52/33H	TP / TRB 4	1	SINGLE		Sforzand piano
53/34H	TP / TRB 5	2	DETUNE		
54/35H	TP / TRB 6	2	DUAL		Includes the sound one octave lower
55/36H	SAX 1	1	SINGLE		
56/37H	SAX 2	1	SINGLE		Mellow tone
57/38H	SAX 3	1	SINGLE		Bright tone
58/39H	SAX 5	2	DUAL		Includes the sound one octave lower
59/3AH	BRASS 1	1	SINGLE		
60/3BH	BRASS 2	1	SINGLE		Sforzand piano
61/3CH	BRASS 3	2	DUAL		Includes the sound one octave lower
62/3DH	BRASS 4	2	DUAL		BRASS & SAX
63/3EH	BRASS 5	2	DUAL		TP / TRB & SAX
64/3FH	ORCHE HIT	1	SINGLE		
65/40H : 128/7FH	PCM Card				

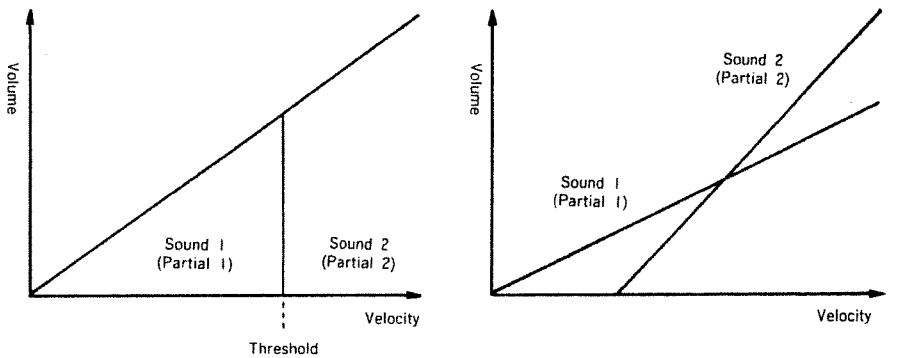
PROG#: MIDI Program Change Number (decimal indication / hexadecimal indication).
Ptl#: The number of partials used for a sound.

* The Program Change numbers 65 - 128 can select sounds on a PCM Card.

(2)Sound Types

There are five sound types depending how the sound uses partials.

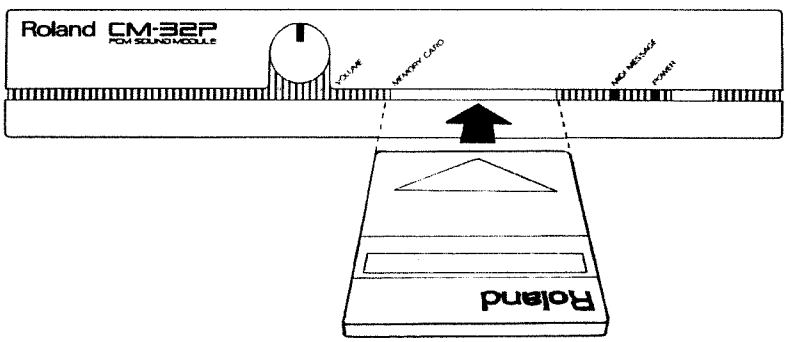
Tone Type	Ptl#	Contents
SINGLE	1	Sound made of one partial.
DETUNE	2	Sound made of two slightly different pitches.
DUAL	2	Sound made of two different sounds.
V-SW (Velocity Switch)	1	One of two sounds is played depending on the strength of the keyboard playing (see the picture shown below).
V-MIX (Velocity Mix)	2	The volume balance of two sounds is changed depending on the velocity value (see the picture shown below).



The level (velocity) where two sounds are switched is called threshold. "v=＊＊" in the Sound List represents the velocity value at the threshold.

(3)How to use the PCM Cards

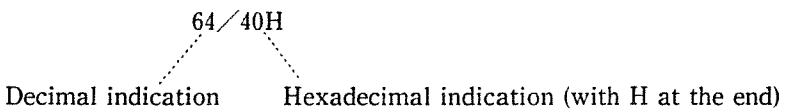
When using an optional PCM Card, insert the card securely into the card slot in correct directions.



5. Control via MIDI

The following explains the MIDI messages that the CM-32P uses and how to use the messages.

* The following indicates the values of MIDI messages in decimal and hexadecimal. You may use either of them depending on the MIDI device you use.



(1)MIDI Channel of each Part

The MIDI channel of each Part of the CM-32P is set as shown below. You must set the transmit channel of the external MIDI device to the receive channel of the relevant Part.

Part	MIDI Channel
Part 1	11
Part 2	12
Part 3	13
Part 4	14
Part 5	15
Part 6	16

(2)MIDI messages that the individual Part can receive

Each Part can receive the following MIDI messages :

●Note Messages

Note messages are for playing the keyboard.

●Pitch Bender Messages

Pitch Bender messages control the Pitch Bend lever or Pitch Bend wheel, changing the pitch continuously.

●Program Change Messages

These are for changing sounds. The sounds in the Part that receives Program Change messages will change depending the received Program Change numbers.

* Roland uses Program Change numbers 1 to 128, but some software or sequencers use 0 to 127 numbers. So please be careful.

●Control Change Messages

These are for controlling various parameters and functions. Each Control number has its own function. The CM-32P can receive the following Control Change messages :

Modulation (Control Number : 1/01H)
This controls the depth of vibrato effect. This value is set individually for each sound.

Data Entry (Control Number : 6/06H)
This is used for setting the RPN.

Volume (Control Number : 7/07H)
This controls the volume of each Part, adjusting the volume balance between Parts. The actual volume is determined by values of expression (Control Number 11), volume (Control Number 7) and Master Volume (Exclusive messages) and the position of Volume contorl knob.

Pan (Control Number : 10/0AH)
This controls the sound positioning of stereo output.

Expression (Control Number : 11/0BH)
This controls the volume of each Part. The actual volume is determined by the values of expression (Contorl number 11), volume (Control Number 7) and Master Volume (Exclusive messages) and the position of Volume contorl knob.

Hold 1 (Control Number : 64/40H)
This sustains the sound currently played, just like a damper pedal of a piano.

RPN (Control Number : 100/64H & 101/65H)
RPN stands for Registered Parameter Number. In the CM-32P, the bender range of each Part can be controlled with the RPN number 0, Pitch Bend Sensitivity.

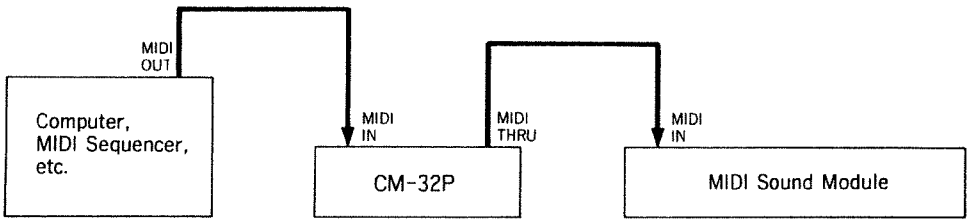
Reset All Controllers (Control Number : 121/79H)
This returns the Modulation, Expression, Hold 1 and Pitch Bender parameters to the default settings. The Part received this message will be set as shown below :

Modulation	0/00 H	Min
Expression	127/7 FH	Max
Hold 1	0/00 H	Off
Pitch Bender	±0/2000 H	Center

(3)Advanced Control via MIDI

●Using another MIDI sound module

If you wish to increase the number of sounds using another MIDI sound module, make connections as follows. Set the MIDI receive channel of the connected sound module to a number other than the MIDI receive channel used for the CM-32P(1 - 10).



●Bender Range Control with RPN

The CM-32P allows you to control the bender range of each Part using the RPN (Registered Parameter Number). To do that, send Control Change messages from an external MIDI device in the sequence as shown below :

① RPN MSB (Control Number : 100/64H) 0/00H
② RPN LSB (Control Number : 101/65H) 0/00H
③ Data Entry (Control Number : 6/06H) vv

* vv is the value of the bender range to be set. It can be set in semi-tone steps within 1 octave (0 - 12/00H - 0CH)

<Example> To set the bender range of Part 4 (MIDI channel 14) to 12 (1 octave) :

	MIDI ch	Control Number	Data	MIDI Message
①RPN MSB	14	100/64 H	0/00 H	BDH, 64H, 00H
②RPN LSB	14	101/65 H	0/00 H	BDH, 65H, 00H
③Data Entry	14	6/06 H	12/0 CH	BDH, 06H, 0CH

* Some types of MIDI sequencer transmits Control Change numbers of the same step (timing) in the sequence of a smaller number to a larger number. If you use this type of sequencer, be sure to set it so that the Control Change will be sent in the sequence of RPN MSB - RPN LSB - Data Entry by shifting the position of the RPN forward, etc.

●Control Using the Exclusive Messages

Exclusive messages are messages exclusive to a particular manufacturer, such as sound data and setup data. Various parameters can be controlled using the Exclusive messages.

For details, see the MIDI Implementation at the back of this owner's manual.

6. Default Settings at Power-on

The CM-32P is default to the following values. (Any programs you have made will be erased when the unit is switched off.)

	Sound	Pan	Volume	Expression
Part 1	FRETLESS 1	64/40 H	100/64 H	127/7 FH
Part 2	CHOIR 1	81/51 H	100/64 H	127/7 FH
Part 3	A. PIANO 1	64/40 H	100/64 H	127/7 FH
Part 4	E. ORGAN 1	99/63 H	100/64 H	127/7 FH
Part 5	E. GUITAR 1	27/1BH	100/64 H	127/7 FH
Part 6	SOFT TP 1	45/2 DH	100/64 H	127/7 FH

7. Maximum Voices

As previously explained in "3. Structure of the CM-32P", a sound is made of number of Partials and the CM-32P produces sounds using Partials. The maximum voices that it can produce simultaneously will vary depending on the number of Partials used for the sound. The following explains the relation between the Partials and the maximum voices of the CM-32P.

(1)Partials and the maximum number of voices

The CM-32P allows you to use 31 Partials at the same time.
For example, if you play three sounds which are made of two Partials, six Partials will be used altogether (2 Partials × 3). In other words, when the CM-32P is used as a multi timbral sound module, it uses (the number of Partials assigned to Part 1) × (the number of voices currently playing in Part 1), that is the total number of Partials used in each Part.
As long as you are using up to 31 Partials, there is no inconvenience caused. You may use all the Partials in one Part, if you like.

(2)Partial Reserve

The CM-32P can play any sound in any Part within 31 voices (Partials). However, if you try to use more Partials, the Partial Reserve function sets the number of Partials which can be used for a certain Part prior to the other Parts. In other words, even when more key messages than reserved are sent, they will be put to work in the more important Part without being cut.

The Partial Reserve of the CM-32P is preprogrammed as shown below. The number of Partials in each Part represents the number of Partials which can be reserved on top of the maximum number of Partials. You may consider the Partial Reserve first, then determine what phrases should be played in what Part.

Part 1	2
Part 2	8
Part 3	21
Part 4	0
Part 5	0
Part 6	0

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

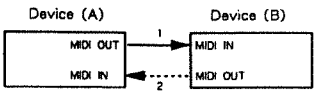
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory - resident records - - waveform and tone data, switch status, and parameters, for example - - to specific locations in a machine - dependent address space, thereby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

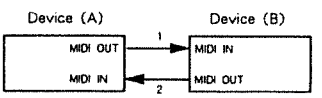


Connection at point 2 is essential for "Request data" procedures. (See Section 3.)

≠ 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.

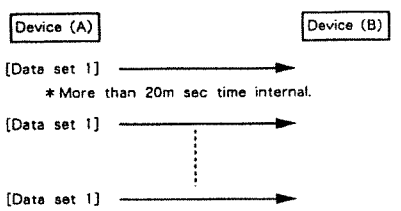
The MIDI standards inhibit non - real time messages from interrupting an exclusive one. This fact is inconvenient for the devices that support a "soft - through" mechanism. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent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

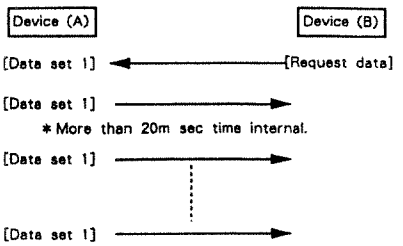
*A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before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

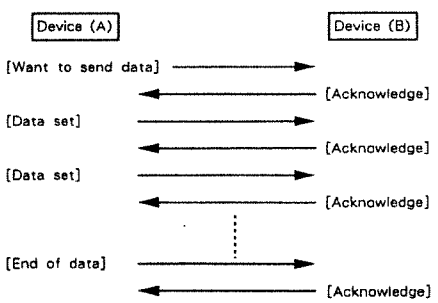
- a WSD or RQD message has specified an illegal data address or size.
- the device is not ready for communication.
- an illegal number of addresses or data has been detected.
- data transfer has been terminated by an operator.
- a communications error has occurred.

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.

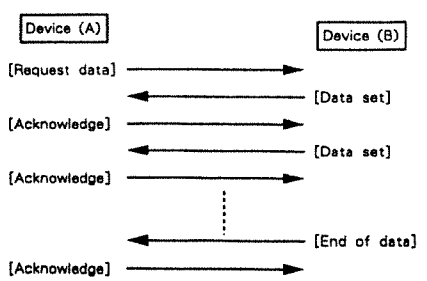
Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

Example of Message Transactions

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

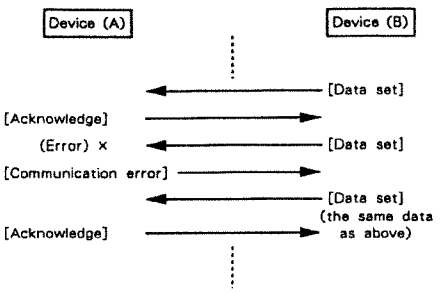


●Device (A) requests and receives data from device (B).

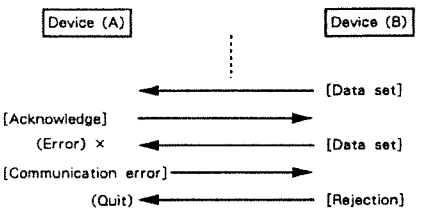


●Error occurs while device (A) is receiving data from device (B).

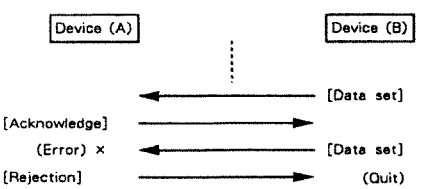
1) Data transfer from device (A) to device (B).



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



3) Device (A) immediately quits data transfer.



PCM SOUND MODULE
Model CM – 32P

MIDI Implementation

Date : Apr. 18. 1989
Version : 1.00

1. RECOGNIZED 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 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 0H - FH (1 - 16)

*Key range depending on the tone. When note numbers are outside of the key range, they are transposed to the nearest octave inside the range.

■ Control change

● Modulation Depth

Status	Second	Third
BnH	01H	vvH

vv = Modulation depth 00H - 7FH (0 - 127)
n = MIDI Channel 0H - FH (1 - 16)

● Data Entry

Status	Second	Third
BnH	06H	vvH

vv = Value of a parameter specified by RPN.(See description in RPN MSB.)
n = MIDI Channel 0H - FH (1 - 16)

● Main Volume

Status	Second	Third
BnH	07H	vvH

vv = Volume Value 00H - 7FH (0 - 127)
n = MIDI Channel 0H - FH (1 - 16)

Controls the volume of a Part accessible through the received MIDI channel. The maximum volume is determined by Master volume and Expression message.

● Panpot

Status	Second	Third
BnH	0AH	vvH

vv = Panpot Value 00H - 7FH (0 - 127)
n = MIDI Channel 0H - FH (1 - 16)

Orientation of sound is as follows.
127 = LEFT, 64 = CENTER, 0 = RIGHT

● Expression

Status	Second	Third
BnH	0BH	vvH

vv = Expression 00H - 7FH (0 - 127)
n = MIDI Channel 0H - FH (1 - 16)

Controls the volume of a Part accessible through the received MIDI channel. The maximum volume is determined by Master volume and Main Volume message.

● Hold – 1

Status	Second	Third
BnH	40H	vvH

vv = 00H - 3FH : off
vv = 40H - 7FH : on
n = MIDI Channel 0H - FH (1 - 16)

● RPN LSB

Status	Second	Third
BnH	64H	vvH

vv = The lower byte of a parameter number controlled by RPN. (Refer to RPN MSB.)
n = MIDI Channel 0H - FH (1 - 16)

● RPN MSB

Status	Second	Third
BnH	65H	vvH

vv = The upper byte of a parameter number controlled by RPN.
n = MIDI Channel 0H - FH (1 - 16)

Using MIDI RPN, CM – 32P parameters can be controlled by Control change message. RPN MSB and LSB specify the parameter to be controlled while Data entry sets the parameter value.
Effective RPN to CM – 32P is Bender range.

RPN MSB	RPN LSB	Data Entry	Description
00H	00H	vvH	Bender Range vv = 0 - 12 Unit in semitone, 1 octaves maximum

● Resets All Controllers

Status	Second	Third
BnH	79H	00H

n = MIDI Channel 0H - FH (1 - 16)

Sets eatch of the following controls as follows.

Controller	setting
Modulation Depth	MIN (0)
Expression	MAX (127)
Hold 1	OFF (0)
Pitch Bender Change	CENTER

■ Program change

Status	Second
CnH	ppH

pp = Program Number 0H - 7FH (1 - 128)
n = MIDI Channel 0H - FH (1 - 16)

■Pitch Bender change

Status	Second	Third
EnH	llH	mmH

ll = Pitch Bender change value (Lower byte) 00H - 7FH (0 - 127)
mm = Pitch Bender change value (Upper byte) 00H - 7FH (0 - 127)
n = MIDI Channel 0H - FH (1 - 16)

■Mode message

All notes off

Status	Second	Third
BnH	7BH	00H

n = MIDI Channel 0H - FH (1 - 16)

Turns off all notes that have been turned on by MIDI Note on.

● OMNI OFF

Status	Second	Third
BnH	7CH	00H

n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 32P remains in mode 3 (omni off, poly).

● OMNI ON

Status	Second	Third
BnH	7DH	00H

n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 32P remains in mode 3 (omni off, poly).

● MONO

Status	Second	Third
BnH	7EH	mmH

mm = MONO Channel range ignored
n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 32P remains in mode 3 (omni off, poly).

● POLY

Status	Second	Third
BnH	7FH	00H

n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 32P remains in mode 3 (omni off, poly).

■Exclusive

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

Using exclusive message, individual parameters in a patch can be transferred to CM - 32P.
Refer to Roland Exclusive Messages and Sections 2 and 3.

■Active sensing

Status	
FEH	: Active Sensing

Once recieving this message, the CM - 32P expects to accept status or data in sequence, at last within 300 msec intervals.
If the unit fails to recieve a message within 300 msec after previous one, it judges there is a problem somewhere in MIDI path, muting the current sound and setting each of controllers as below, then stopping 300 msec interval monitoring of incoming signal.

Controller	setting
Modulation Depth	MIN (0)
Expression	MAX (127)
Hold 1	OFF (0)
Pitch Bender Change	CENTER

2. EXCLUSIVE COMMUNICATION

Parameters for patches can be transferred to CM - 32P through Exclusive message.
Model - ID # of CM - 32P is 16H.
Device - ID # of CM - 32P is 10H.

■One way communication

Data set 1 DT1 12H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
10H	Device ID	
16H	Model ID	
12H	Command ID (DT1)	
aaH	Address MSB	* 2 - 1
aaH	Address	
aaH	Address LSB	
ddH	Data	* 2 - 2
:	:	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

*2 - 1 Address and Address size must cover the memory location where data exist.

*2 - 2 When comming data are for partial reserve of the system parameter, CM - 32P will make these reserves effective only after receiving all the data.

3. PARAMETER ADDRESS MAP

Addresses are represented in 7 - bit hexadecimal.

Address	MSB		LSB
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7 - bit Hexadecimal	AA	BB	CC

■Parameter base address

Start address	Description	
50 00 00	Patch temporary area(part 1)	*3-1
50 00 15	Patch temporary area(part 2)	
50 00 2A	Patch temporary area(part 3)	
50 00 3F	Patch temporary area(part 4)	
50 00 54	Patch temporary area(part 5)	
50 00 69	Patch temporary area(part 6)	
51 00 00	Patch memory #1	*3-2
51 00 13	Patch memory #2	
:	:	
51 12 5A	Patch memory #127	
51 12 6D	Patch memory #128	
52 00 00	System area	*3-3
7F xx xx	All parameter reset	*3-4

*3 - 1 Patch temporary area

Offset address		Description	
00 00	0000 000a	TONE MEDIA	0 - 1 (Internal, Card)
00 01	0aaa aaaa	TONE NUMBER	0 - 127 (1 - 128)
00 02	000a aaaa	KEY SHIFT	0 - 24 (-12 - +12)
00 03	0aaa aaaa	FINE TUNE	0 - 100 (-50 ~ +50)
00 04	0000 aaaa	BENDER RANGE	0 - 12
00 05	0aaa aaaa	KEY RANGE LOWER	0 - 127 (C -1 - G 9)
00 06	0aaa aaaa	KEY RANGE UPPER	0 - 127 (C -1 - G 9)
00 07	0000 00aa	ASSIGN MODE	0 ~ 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 08	0000 000a	REVERB SWITCH	0 - 1 (OFF, ON)
00 09	0000 aaaa	VELOCITY SENS	0 - 15
00 0A	0aaa aaaa	ENV ATTACK RATE	0 - 127
00 0B	0aaa aaaa	ENV RELEASE RATE	0 - 127
00 0C	0aaa aaaa	LFO RATE	0 - 127
00 0D	0000 aaaa	LFO AUTO DELAY TIME	0 - 15
00 0E	0000 aaaa	LFO AUTO RISE TIME	0 - 15
00 0F	0000 aaaa	LFO AUTO DEPTH	0 - 15
00 10	0000 aaaa	LFO MAN RISE TIME	0 - 15
00 11	0000 aaaa	LFO MAN DEPTH	0 - 15
00 12	00aa aaaa	DETUNE DEPTH	0 - 50
00 13	0aaa aaaa	PANPOT	0 - 127 (R - L)
00 14	0aaa aaaa	OUTPUT LEVEL	0 - 100
Total size		00 00 15	

*3 - 2 Patch memory

Offset address		Description	
00 00	0000 000a	TONE MEDIA	0 - 1 (Internal, Card)
00 01	0aaa aaaa	TONE NUMBER	0 - 127 (1 -128)
00 02	000a aaaa	KEY SHIFT	0 - 24 (-12 - +12)
00 03	0aaa aaaa	FINE TUNE	0 - 100 (-50 - +50)
00 04	0000 aaaa	BENDER RANGE	0 - 12
00 05	0aaa aaaa	KEY RANGE LOWER	0 - 127 (C -1 - G 9)
00 06	0aaa aaaa	KEY RANGE UPPER	0 - 127 (C -1 - G 9)
00 07	0000 00aa	ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 08	0000 000a	REVERB SWITCH	0 - 1 (OFF, ON)
00 09	0000 aaaa	VELOCITY SENS	0 - 15
00 0A	0aaa aaaa	ENV ATTACK RATE	0 - 127
00 0B	0aaa aaaa	ENV RELEASE RATE	0 - 127
00 0C	0aaa aaaa	LFO RATE	0 - 127
00 0D	0000 aaaa	LFO AUTO DELAY TIME	0 - 15
00 0E	0000 aaaa	LFO AUTO RISE TIME	0 - 15
00 0F	0000 aaaa	LFO AUTO DEPTH	0 - 15
00 10	0000 aaaa	LFO MAN RISE TIME	0 - 15
00 11	0000 aaaa	LFO MAN DEPTH	0 - 15
00 12	00aa aaaa	DETUNE DEPTH	0 - 50
Total size		00 00 13	

* Internal Tone list

No.	TONE	TYPE	No.	TONE	TYPE
01	A. Piano 1	V-MIX	43	AC. Bass	V-MIX
02	A. Piano 2	V-MIX	44	Choir 1	SINGLE
03	A. Piano 3	V-MIX	45	Choir 2	SINGLE
04	A. Piano 4	V-MIX	46	Choir 3	DUAL
05	A. Piano 5	SINGLE	47	Choir 4	DUAL
06	A. Piano 6	DETUNE	48	Strings 1	SINGLE
07	A. Piano 7	SINGLE	49	Strings 2	SINGLE
08	A. Piano 8	DETUNE	50	Strings 3	DUAL
09	A. Piano 9	SINGLE	51	Strings 4	DUAL
10	A. Piano 10	DETUNE	52	E. Organ 1	SINGLE
11	E. Piano 1	V-MIX	53	E. Organ 2	DETUNE
12	E. Piano 2	SINGLE	54	E. Organ 3	SINGLE
13	E. Piano 3	DETUNE	55	E. Organ 4	DETUNE
14	E. Piano 4	SINGLE	56	E. Organ 5	SINGLE
15	E. Piano 5	DETUNE	57	E. Organ 6	DETUNE
16	A. Guiter 1	SINGLE	58	E. Organ 7	SINGLE
17	A. Guiter 2	DETUNE	59	E. Organ 8	ETUNE
18	A. Guiter 3	DUAL	60	E. Organ 9	DUAL
19	A. Guiter 4	DUAL	61	E. Organ 10	DUAL
20	A. Guiter 5	V-SW	62	E. Organ 11	DUAL
21	E. Guiter 1	V-SW	63	E. Organ 12	DUAL
22	E. Guiter 2	SINGLE	64	E. Organ 13	DUAL
23	E. Guiter 3	SINGLE	65	Soft Tp 1	SINGLE
24	E. Guiter 4	DETUNE	66	Soft Tp 2	DETUNE
25	Slap 1	SINGLE	67	Soft Tp 3	SINGLE
26	Slap 2	DETUNE	68	Tp/Trb 1	SINGLE
27	Slap 3	SINGLE	69	Tp/Trb 2	SINGLE
28	Slap 4	DETUNE	70	Tp/Trb 3	SINGLE
29	Slap 5	V-SW	71	Tp/Trb 4	SINGLE
30	Slap 6	V-SW	72	Tp/Trb 5	DETUNE
31	Slap 7	SINGLE	73	Tp/Trb 6	DUAL
32	Slap 8	DETUNE	74	Sax 1	SINGLE
33	Slap 9	SINGLE	75	Sax 2	SINGLE
34	Slap 10	DETUNE	76	Sax 3	SINGLE
35	Slap 11	V-SW	77	Sax 4	DETUNE
36	Slap 12	V-SW	78	Sax 5	DUAL
37	Fingered 1	SINGLE	79	Brass 1	SINGLE
38	Fingered 2	DETUNE	80	Brass 2	SINGLE
39	Picked 1	SINGLE	81	Brass 3	DUAL
40	Picked 2	DETUNE	82	Brass 4	DUAL
41	Fretless 1	SINGLE	83	Brass 5	DUAL
42	Fretless 2	DETUNE	84	Orche Hit	SINGLE

*3 - 3 System area

The total number of Partial reserves for 6 parts must be 31 or less. All Partial reserves must be sent as a package of 6 parts.

Offset address		Description	
00 00	0aaa aaaa	MASTER TUNE	0 - 127 (432.1Hz - 457.6Hz)
00 01	0000 00aa	REVERB MODE	0 3 (ROOM, HALL Plate, Tap delay)
00 02	0000 0aaa	REVERB TIME	0 - 7 (1 - 8)
00 03	0000 0aaa	REVERB LEVEL	0 - 7
00 04	00aa aaaa	PARTIAL RESERVE (PART 1)	0 - 31
00 05	00aa aaaa	PARTIAL RESERVE (PART 2)	0 - 31
00 06	00aa aaaa	PARTIAL RESERVE (PART 3)	0 - 31
00 07	00aa aaaa	PARTIAL RESERVE (PART 4)	0 - 31
00 08	00aa aaaa	PARTIAL RESERVE (PART 5)	0 - 31
00 09	00aa aaaa	PARTIAL RESERVE (PART 6)	0 - 31
00 0A	000a aaaa	MIDI CHANNEL (PART 1)	0 - 16 (1 - 16 ,OFF)
00 0B	000a aaaa	MIDI CHANNEL (PART 2)	0 - 16 (1 - 16 ,OFF)
00 0C	000a aaaa	MIDI CHANNEL (PART 3)	0 - 16 (1 - 16 ,OFF)
00 0D	000a aaaa	MIDI CHANNEL (PART 4)	0 - 16 (1 - 16 ,OFF)
00 0E	000a aaaa	MIDI CHANNEL (PART 5)	0 - 16 (1 - 16 ,OFF)
00 0F	000a aaaa	MIDI CHANNEL (PART 6)	0 - 16 (1 - 16 ,OFF)
00 10	0aaa aaaa	MASTER VOLUME	0 - 100
Total size		00 00 11	

When the Receive channel of the part is altered, Reset all controllers and All notes off messages for this part are performed.

*3 - 4 All Parameters Reset

Tone temporary, Patch temporary, System and Patch memory area will be initialized by sending data to this address.
And sets eatch of the following controls as follows.

Controller	setting
Modulation Depth	MIN (0)
Expression	MAX (127)
Hold 1	OFF (0)
Pitch Bender Change	CENTER

And turns off all notes that have been turned on.

Address Map

Address	Block	Sub Block	Reference
50 00 00	Patch Temp.	Part 1	3-1
		Part 2	
		:	
		Part 5	
		Part 6	
51 00 00	Patch Memory	# 1	3-2
		# 2	
		:	
		#127	
		#128	
52 00 00	System Area		3-3
7F xx xx	All Parameters Reset		3-4

PCM SOUND MODULE
Model CM – 32P

MIDI Implementation Chart

Date : Apr. 18. 1989
Version : 1.00

Function ...		Transmitted	Recognized	Remarks
Basic Channel	Default	×	11 – 16	
	Changed	×	×	
Mode	Default	×	3	
	Messages	×	×	
	Alterd	*********	×	
Note Number		×	0 – 127	
	True Voice	*********	*1	
Velocity	Note ON	×	○ v = 1 – 127	
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	○	
Control Change	1	×	○	Modulation
	2 – 5	×	×	
	6	×	*2	Data Entry
	7	×	○	Volume
	8, 9	×	×	
	10	×	○	Pan
	11	×	○	Expression
	12 – 63	×	×	
	64	×	○	Hold 1
	65 – 99	×	×	
	100, 101	×	*2 (0)	RPN LSB, MSB
	102 – 120	×	×	
	121	×	○	Reset All Controllers
Prog Change		×	○ 0 – 127	
	True #	*********	0 – 127	
System Exclusive		×	○	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Messages	Local ON/OFF	×	×	
	All Notes OFF	×	○ (123 – 127)	
	Active Sense	×	○	
	Reset	×	×	

Notes

*1 Varies depending on the tone.
*2 RPN = Registered Parameter Number
RPN # 0 : Pitch Bend Sensitivity
The value of parameter is to be determined by entering data.

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

○ : Yes
× : No

■ *Specifications*

CM-32P PCM Sound Module

Sound Module:
PCM system (maximum number of voices: 31)

Part:
Parts 1 - 6

Power:
9V DC (ACB Series AC adaptor)

Consumption:
600mA (9V DC)

Dimensions:
284 (W) × 239 (D) × 46 (H) mm
11-3/16" × 9-1/4" × 1-2/3"

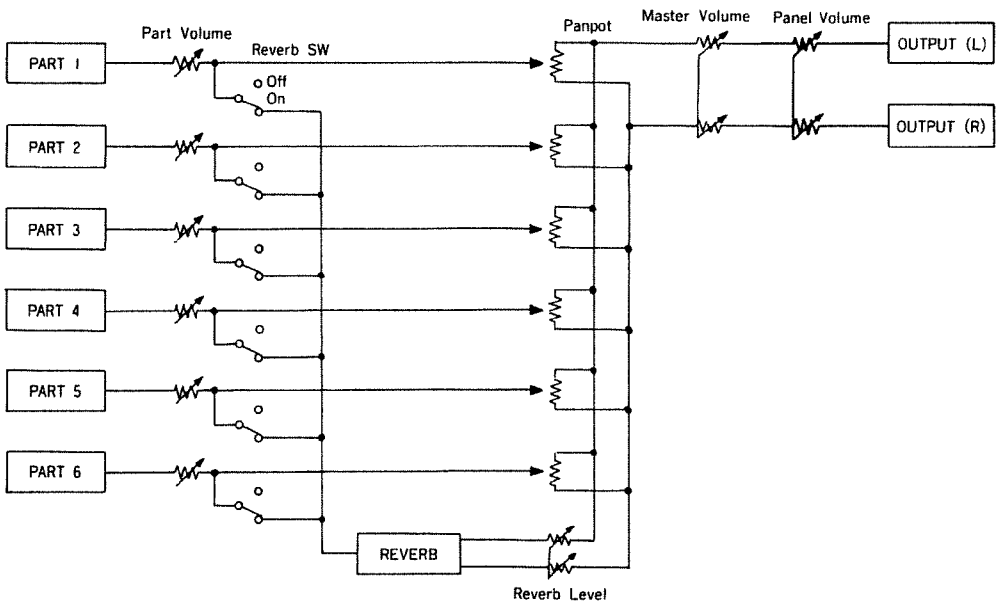
Weight:
1.8kg/3 lb 15 oz

Accessories:
AC Adaptor
MIDI Cable (1 pc.)
Connection Cord (2 pcs.)
Owner's Manual
Guidebook for MIDI

Options:
PCM Card (SN-U110 Series)

* The specifications for this product are subject to change without prior notice, in the interest of improvement.

■ *CM-32P Block Diagram*



Information

- Please use this AC adaptor only with the specified device.
- Please use the AC Adaptor of an appropriate voltage (120, 220 or 240) depending on the voltage system in your country.
- When the device is not used for a long period, be sure to disconnect the AC adaptor (Power Supply Unit) from the wall outlet.
- When you need repair service, call your local Roland Service Station as shown below or the authorized Roland distributer in your country.

U. S. A.

Roland Corp US
7200 Dominion Circle
Los Angeles, CA. 90040-3647
U. S. A.
☎ (213) 685-5141

CANADA

Roland Canada Music Ltd.
(Head Office)
13880 Mayfield Place
Richmond B. C., V6V 2E4
CANADA
☎ (604) 270-6626

Roland Canada Music Ltd.
3469 rue Ashby,
St Laurent,
Quebec H4R 2C1
CANADA
☎ (514) 335-2009

Roland Canada Music Ltd.
Unit B-12, 1515 Matheson Blvd
Mississauga, Ontario L4W 2P5
CANADA
☎ (416) 625-4880

AUSTRALIA

Roland Corporation
(Australia) Pty. Ltd.
(Head Office)
38 Campbell Avenue
Dee Why West. NSW 2099
AUSTRALIA
☎ (02) 982-8266

Roland Corporation
(Australia) Pty. Ltd.
(Melbourne Office)
50 Garden Street
South Yarra, Victoria 3141
AUSTRALIA
☎ (03) 241-1254

NEW ZEALAND

Roland Corporation (NZ) Ltd.
97 Mt. Eden Road, Mt, Eden,
Auckland 3
NEW ZEALAND
☎ (09) 398-715

UNITED KINGDOM

Roland (UK) Ltd.
Amalgamated Drive
West Cross Centre, Brentford,
Middlesex TW8 9EZ,
UNITED KINGDOM
☎ (01) 568-4578

WEST GERMANY

Roland Elektronische
Musikinstrumente
Handelsgesellschaft mbH.
Oststrasse 96,
2000 Norderstedt
WEST GERMANY
☎040/52 60 09 25

BELGIUM/HOLLAND/ LUXEMBOURG

Roland Benelux N. V.
Houtstraat 1
B-2431 Oevel-Westerlo
BELGIUM
☎014-58 45 39

DENMARK

Roland Scandinavia A/S
Langebrogade 6, 1937,
DK-1023 Copenhagen K.
DENMARK
☎ (01) 95 31 11

SWEDEN

Roland Scandinavia A/S
Swedish Sales Office
DanvikCenter 28A, 2tr,
S-131 30 Nacka,
SWEDEN
☎08-702 00 20

NORWAY

Benum Music A/S
Haakon den godes Vei 14
N-0319 Oslo 3,
NORWAY
(Box 145 Vindern, N-0319
Oslo 3 NORWAY)
☎02 141266

FINLAND

OY Musiikki Fazer Musik AB
Takomotie 3
00380 Helsinki 38,
FINLAND
☎05 56551

ITALY

Roland Italy S. P. A.
Via Gallarate 58
20151 Milano
ITALY
☎02-3086849

SWITZERLAND

Musitronic AG
Gerberstrasse 5, CH-4410
Liestal
SWITZERLAND
☎061/921 16 15

FRANCE

Musikengro
102, Avenue Jean-Jaures
69367 Lyon Cedex 07
FRANCE
☎ (7) 858-54 60

Musikengro
(Paris Office)
Centre Region Parisienne
41 rue Charles-Fourier,
94400 Vitry s/Seinc
FRANCE
☎ (1) 4680 86 62

SPAIN

Vietronic S. A.
Bolivia 239
08020 Barcelona
SPAIN
☎34-307 47 12

AUSTRIA

E. Dematte & Co.
Nue-Rum Siemens-Strasse 4
A-6021 Innsbruck box 591
AUSTRIA
☎43 (05222) 63 4510

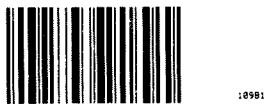
GREECE

A. ANDREADES & Co. Ltd.
Fidiou Str., 106 78
Athens
GREECE
☎3620130

Roland®

2603011201

UPC 2603011201



CM-32P

Roland Corporation

2603011201 '89-8-A3-21SY