

# PG-300

## SYNTHESIZER PROGRAMMER

The PG-300 is a programmer specially designed for the  $\alpha$  JUNO-1 and the  $\alpha$  JUNO-2.

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## 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 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 interferences 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.

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

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# 1 PANEL DESCRIPTION

- 43 DCO Aftersensitivity Knob
- 42 DCO ENV Mode Knob
- 41 DCO ENV Depth Knob
- 40 DCO LFO Depth Knob
- 39 DCO Range Knob

- 38 LFO Delay Knob
- 37 LFO Rate Knob

- 36 DCO SUB Oscillator  
Waveform Knob

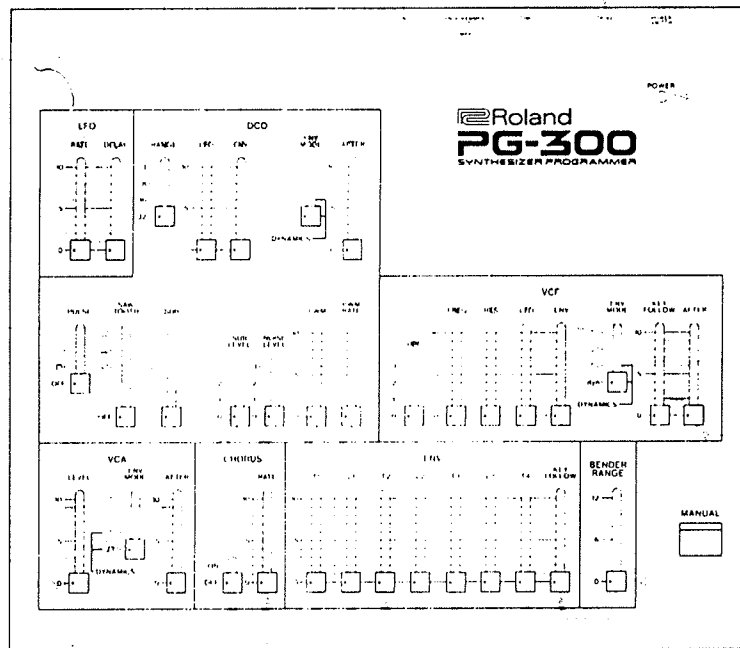
- 35 DCO Sawtooth Waveform Knob
- 34 DCO Pulse Waveform Knob

- 33 VCA Aftersensitivity Knob
- 32 VCA ENV Mode Knob
- 31 VCA Level Knob

- 30 DCO SUB Oscillator Level Knob
- 29 Chorus On/Off Knob
- 28 DCO Noise Level Knob
- 27 Chorus Rate Knob
- 26 DCO PW/PWM Depth Knob
- 25 ENV T1 Knob

- 19 ENV L3 Knob
- 20 ENV T3 Knob
- 21 ENV L2 Knob
- 22 ENV T2 Knob
- 23 ENV L1 Knob
- 24 DCO PWM Rate Knob

- 1 MIDI IN Connector
- 2 MIDI PROGRAMMER OUT Connector
- 3 MIDI THRU Connector
- 4 AC Adaptor Jack
- 5 Power Switch



- 6 Power Indicator
- 7 HPF Cutoff Frequency Knob
- 8 VCF Cutoff Frequency Knob
- 9 VCF Resonance Knob
- 10 VCF LFO Depth Knob
- 11 VCF ENV Depth Knob
- 12 VCF ENV Mode Knob
- 13 VCF Keyboard Follow Knob
- 14 VCF Aftersensitivity Knob
- 15 Manual Button
- 16 Bender Range Knob
- 17 ENV Keyboard Follow Knob
- 18 ENV T4 Knob

The PG-300 is the programmer specially designed for synthesizing the tone colors of the  $\alpha$  JUNO-1 and the  $\alpha$  JUNO-2.

By using the PG-300, a tone color can be much more easily and quickly edited or created from scratch.

This tone modifying function of the PG-300 is executed by the MIDI Exclusive messages which are the specific messages used by Roland. Therefore, the PG-300 cannot control the tone colors of other manufacturers' synthesizers. Even the Roland synthesizers cannot be used with the PG-300, unless they can recognize the MIDI Exclusive messages.

**Bescheinigung des Herstellers /Importeurs**

Hiermit wird bescheinigt, daß der/die/das  
**ROLAND SYNTHESIZER PROGRAMMER PG-300**  
(Gerät, Typ, Bezeichnung)

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in Übereinstimmung mit den Bestimmungen der  
**Amtsbl. Vfg 1046 / 1984**  
(Amtsblattnummer)

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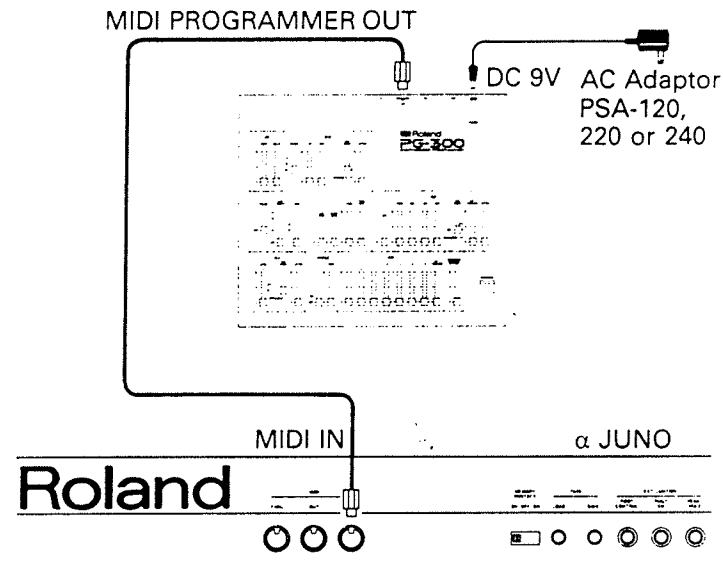
funk-entstört ist.  
 Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes  
 angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung  
 der Bestimmungen eingeräumt.

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Roland Corporation Osaka / Japan  
Name des Herstellers/Importeurs

## 2 OPERATION

To use the PG-300 in the setup with the  $\alpha$  JUNO, set the MIDI channel of the  $\alpha$  JUNO to 1. (Refer to the  $\alpha$  JUNO's owner's manual.)



However, it is also possible to set the receive channel of the  $\alpha$  JUNO other than 1. (Refer to "Changing MIDI Channels" on page 6.)

# 1 PANEL DESCRIPTION

**1** MIDI IN Connector  
**2** MIDI PROGRAMMER OUT Connector  
**3** MIDI THRU Connector  
**4** AC Adaptor Jack  
**5** Power Switch

**6** Power Indicator  
**7** HPF Outoff Frequency Knob  
**8** VCF Cutoff Frequency Knob  
**9** VCF Resonance Knob  
**10** VCF LFO Depth Knob  
**11** VCF ENV Depth Knob  
**12** VCF ENV Mode Knob  
**13** VCF Keyboard Follow Knob  
**14** VCF Aftertouch Sensitivity Knob

**15** Manual Button  
**16** Bender Range Knob  
**17** ENV Keyboard Follow Knob  
**18** ENV T4 Knob  
**19** ENV L3 Knob  
**20** ENV T3 Knob  
**21** ENV L2 Knob  
**22** ENV T2 Knob  
**23** ENV L1 Knob  
**24** DCO PWM Rate Knob

**25** EVN T1 Knob  
**26** DCO PW/PWM Depth Knob  
**27** Chorus Rate Knob  
**28** DCO Noise Level Knob  
**29** Chorus On/Off Knob  
**30** DCO SUB Oscillator Level Knob

**31** VCA Level Knob  
**32** VCA ENV Mode Knob  
**33** VCA Aftertouch Sensitivity Knob

**34** DCO Pulse Waveform Knob  
**35** DCO Sawtooth Waveform Knob  
**36** DCO SUB Oscillator Waveform Knob

**37** LFO Rate Knob  
**38** LFO Delay Knob

**39** DCO Range Knob  
**40** DCO LFO Depth Knob  
**41** DCO ENV Depth Knob  
**42** DCO ENV Mode Knob  
**43** DCO Aftertouch Sensitivity Knob

## 1. Power Up

### OPERATION

Switch on the  $\alpha$  JUNO, then the PG-300.

The Power Indicator **(i)** will light up.

## 2. Tone Edit

This Tone Edit function is useful for slightly modifying the tone color.

### OPERATION

- ① Select the tone color to be modified on the  $\alpha$  JUNO.
- ② Using the knobs on the Programmer, edit the tone color.

If you move a desired knob even slightly, its setting position of that tone color will be deleted and ready to be manually controlled.

\* This Editing function does not automatically re-write the existing tone color, therefore, if calling the same tone color later, the unchanged original

tone color will be heard. To retain the edited tone color, take an appropriate writing procedure on the  $\alpha$  JUNO.

\* While editing a parameter with the PG-300, even if the current set positions of the knobs or switches are exactly what you desire, change the position once then return it. Otherwise, the parameter value might not be affected by the PG-300, thereby remain unchanged.

## 3. Creating a new Tone Color

This function is useful for synthesizing a tone color from scratch.

### OPERATION

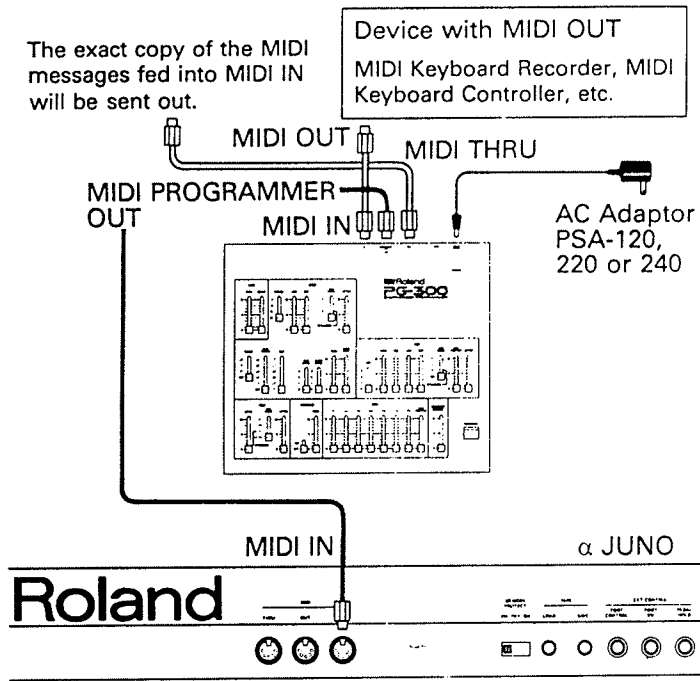
Push the Manual Button **(B)**.

Now, the whole panel setting of the PG-300 decides the tone color. That is, existing tone color in memory has nothing to do with your sound synthesis. You can make a complete new tone color from scratch.

\* The tone color you have synthesized will not be retained unless a proper writing procedure is taken on the  $\alpha$  JUNO. The writing operation, however, inevitably erases a tone color.

### 3 APPLICATION

#### 1. Controlling the $\alpha$ JUNO with MIDI Keyboard Recorder



To control the  $\alpha$  JUNO with a MIDI device, connect the MIDI OUT of the MIDI device to the MIDI IN Connector ① on the Programmer.

\* The PG-300's MIDI messages for tone color editing and the messages fed into the MIDI IN are mixed and sent through the MIDI OUT.

#### 2. Changing MIDI Channels

By using the DCO SUB Oscillator Level Knob ⑩ and the DCO Noise Level Knob ⑪, you can set any of the MIDI Channels 1 to 16. (See the Table 1 shown below.)

#### OPERATION

- ① Turn the PG-300 off.

With the aid of the table shown below, set the two switches to the appropriate numbers.

	MIDI Channel															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DCO SUB Oscillator Level Knob ⑩	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3
DCO Noise Level Knob ⑪	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3

\* If you switch the PG-300 off while playing the keyboard, various troubles will occur, such as the played keys keep crying even after the keys are released.

- ② While holding the Manual Button ⑫ down, switch the PG-300 on.

Now, set the  $\alpha$  JUNO to the same MIDI Channel as you have set in above operation.

## IMPORTANT NOTES

### POWER

- When setting up the PG-300 with the  $\alpha$  JUNO, turn both of them off.
- This unit might not work properly if turned on immediately after turned off. If this happens, simply turn it off and turn it on again a few seconds later.
- Be sure to use the supplied AC Adaptor. Using any other adaptor may cause trouble.

### LOCATION

- Avoid using the  $\alpha$  JUNO in excessive heat or humidity or where it may be affected by direct sunlight or dust.

### CLEANING

- Clean the unit with only soft cloth and mild detergent.
- Do not use solvents such as THINNER.



# Setting Memo

**LFO**

RATE DELAY

RANGE LFO ENV

DYNAMICS

**VCF**

FREQ RES LFO ENV

HPF

ENV MODE KEY FOLLOW AFTER

DYNAMICS

**PULSE** **SAW TOOTH** **SUB**

OFF

ON

**SUB LEVEL** **NOISE LEVEL**

3 2 1 0

3 2 1 0

**PWM** **PWM RATE**

10 5 0

10 5 0

**VCA**

LEVEL ENV MODE AFTER

DYNAMICS

**CHORUS**

RATE

ON OFF

**ENV**

T1 L1 T2 L2 T3 L3 T4 L4

KEY FOLLOW

**BENDER RANGE**

12 6 0

MANUAL

Title: \_\_\_\_\_

Model: \_\_\_\_\_

Memory, Cartridge ( ) \_\_\_\_\_

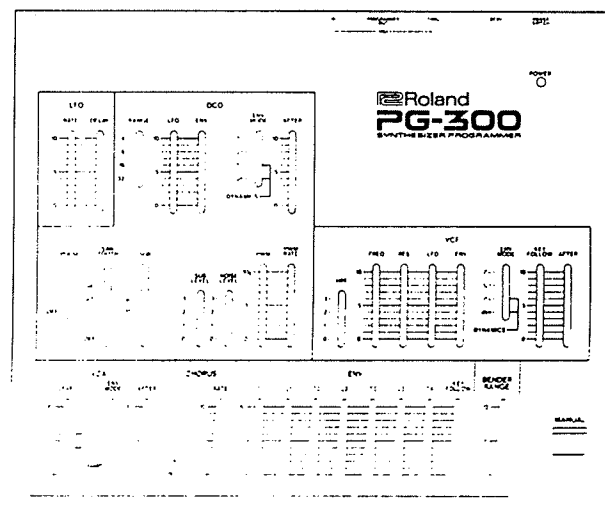
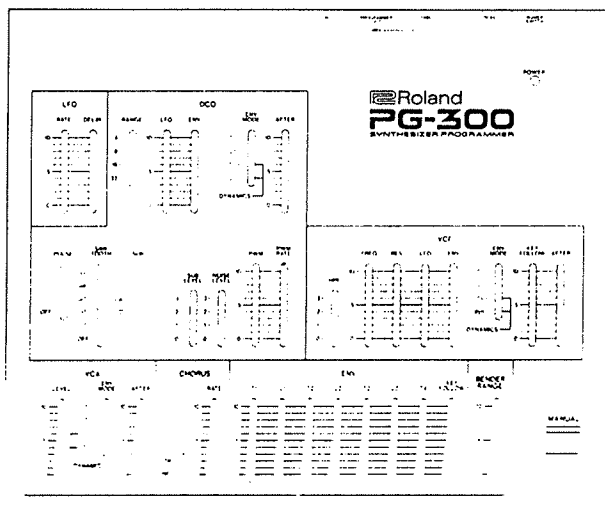
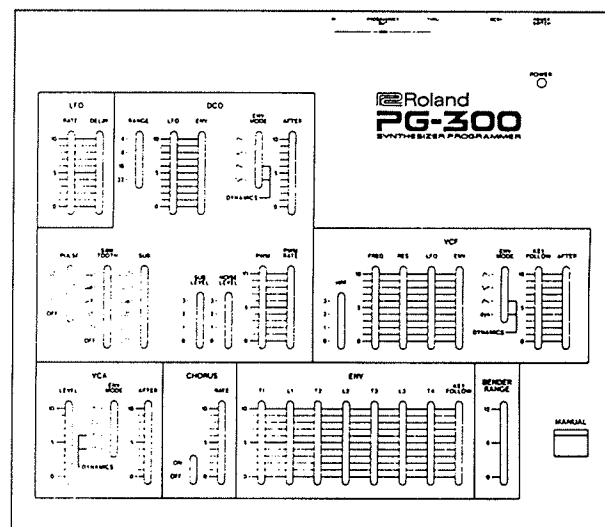
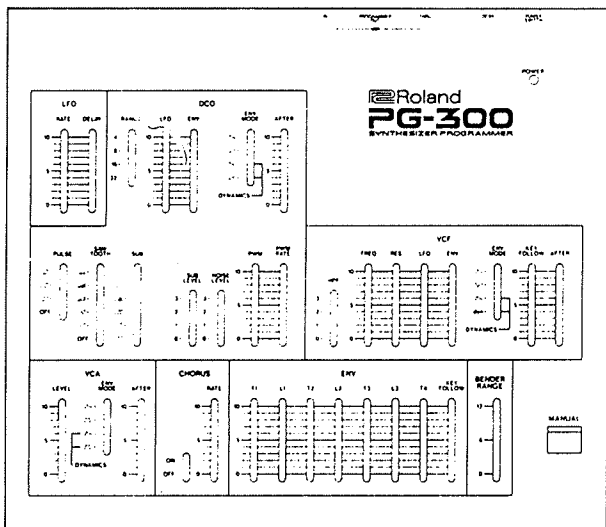
Bank: \_\_\_\_\_ Patch: \_\_\_\_\_

Memo: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## 4 SPECIFICATIONS

### • Front Panel

- LFO Rate Knob
- LFO Delay Knob
- DCO Range Knob
- DCO LFO Depth Knob
- DCO ENV Depth Knob
- DCO ENV Mode Knob
- DCO Aftertouch Sensitivity Knob
- DCO Pulse Waveform Knob
- DCO Sawtooth Waveform Knob
- DCO Sub Oscillator Waveform Knob
- DCO Sub Oscillator Level Knob
- DCO Noise Level Knob
- DCO PW/PWM Depth Knob
- DCO PWM Rate Knob
- HPF Cutoff Frequency Knob
- VCF Cutoff Frequency Knob
- VCF Resonance Knob
- VCF LFO Depth Knob
- VCF ENV Depth Knob
- VCF ENV Mode Knob
- VCF Keyboard Follow Knob
- VCF Aftertouch Sensitivity Knob
- VCA ENV Mode Knob
- VCA Aftertouch Sensitivity Knob
- VCA Level Knob

- Chorus On/Off Knob
- Chorus Rate Knob
- ENV T1 Knob
- ENV L1 Knob
- ENV T2 Knob
- ENV L2 Knob
- ENV T3 Knob
- ENV L3 Knob
- ENV T4 Knob
- ENV Keyboard Follow Knob
- Bender Range Knob
- Manual Button
- Power Indicator

### • Rear Panel

- Power Switch
- AC Adaptor Jack
- MIDI IN Connector
- MIDI PROGRAMMER OUT Connector
- MIDI THRU Connector

- **Consumption** 200 mA (DC 9V)
- **Weight** 1.7 kg/3 lb 12 oz (without the Adaptor)
- **Dimensions** 267(W) × 55(H) × 238(D)mm  
10-1/2" × 2-1/8" × 9-1/8"
- **Accessories** AC Adaptor PSA-120, 220 or 240  
MIDI/SYNC Cable × 1

26	ENV T1	0 - 127 (ATTACK TIME )
27	ENV L1	0 - 127 (ATTACK LEVEL)
28	ENV T2	0 - 127 (BREAK TIME )
29	ENV L2	0 - 127 (BREAK LEVEL)
30	ENV T3	0 - 127 (DECAY TIME )
31	ENV L3	0 - 127 (SUSTAIN LEVEL)
32	ENV T4	0 - 127 (RELEASE TIME )
33	ENV KEY FOLLOW	0 - 127
34	CHORUS RATE	0 - 127
35	BENDER RANGE	0 - 12
36	- 45	
TONE NAME		
		0 - 63 (TONE NAME table)
		0=A 16=Q 32=r 48=w
		1=B 17=R 33=h 49=x
		2=C 18=S 34=i 50=y
		3=D 19=T 35=j 51=z
		4=E 20=U 36=k 52=0
		5=F 21=V 37=l 53=1
		6=G 22=W 38=m 54=2
		7=H 23=X 39=n 55=3
		8=I 24=Y 40=o 56=4
		9=J 25=Z 41=p 57=5
		10=K 26=a 42=q 58=6
		11=L 27=b 43=r 59=7
		12=M 28=c 44=s 60=8
		13=N 29=d 45=t 61=9
		14=O 30=e 46=u 62=space
		15=P 31=f 47=v 63=-

### 3.2.3 When 'WRITE Button' is pressed in the CM Bulk\*Dump Mode.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0111	Operation code = BLD (bulk dump)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0100 0000	Level # = 3 ( MKS-50 only )
g 0000 0001	Group #
h 0000 0000	Extension of program #
i 0000 0000	Program #
j 0000 vvvv	16 sets of CHORD MEMORY data *4 ( 192 bytes )
k 1111 0111	End of System Exclusive

#### Notes :

\*1 The Program # (i) represents the first TONE or PATCH number of the TONE or PATCH data sets (j). The 4 sets of TONE or PATCH data are sequentially transmitted. TONE or PATCH data is sent in four-bit nibbles, right justified, least significant nibble sent first. Each TONE or PATCH data consists of 32 bytes. The Bulk Dump message repeats 16 times.

### #2 Patch Parameter

#	Function	Value
0	TONE NUMBER	0 - 63 TONE-a Group 64 - 127 TONE-b Group
1	KEY RANGE ( LOW )	12 - 108 ( note no. )
2	KEY RANGE ( HIGH )	13 - 109 ( note no. )
3	PORTAMENTO TIME	0 - 127
4	PORTAMENTO	0 = OFF 1 = ON
5	MODULATION SENSITIVITY	0 - 127
6	KEY SHIFT	0 - 12 ( + 12 semitone ) 127 - 116 ( - 12 semitone )
7	VOLUME	0 - 127
8	DETUNE	0 - 63 ( + 25 cent ) 127 - 65 ( - 25 cent )
9	MIDI FUNCTION	bit ( 0 = on, 1 = off )
		6 AFTER TOUCH
		5 PITCH BENDER CHANGE
		4 EXCLUSIVE
		3 HOLD
		2 MODULATION
		1 VOLUME
		0 PORTAMENTO
10	MONO BENDER RANGE	0 - 12 ( 12 semitone )
11	CHORD MEMORY	0 - 15
12	KEY ASSIGN MODE	bit 6 5 0 0 POLY MODE 1 0 CHORD MEMORY 1 1 MONO MODE
13 - 22	PATCH NAME	bit 4 - 0 ignored 0 - 63 (see TONE NAME table)

### #3 Chord parameter

#	Function	Value
0 - 5	CHORD NOTE NO.	36 - 84 ( sounded note ) 127 ( dummy )

### 3.2 Bulk Dump ( BLD )

\*Bulk Dump has no relation with the EXCL in the PATCH MIDI function.

#### 3.2.1 When 'WRITE Button' is pressed in the TONE Bulk\*Dump Mode.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0111	Operation code = BLD (bulk dump)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0010 0000	Level # = 1
g 0000 0001	Group #
h 0000 0000	Extension of program #
i 00pp pppp	Program # ( pppppp = n#4 : n = 0 - 15 )
j 0000 vvvv	4 sets of TONE data ( 256 bytes ) *1, *2
k 1111 0111	End of System Exclusive

#### 3.2.2 When 'WRITE Button' is pressed in the PATCH Bulk\*Dump Mode.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0111	Operation code = BLD (bulk dump)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0011 0000	Level # = 2 ( MKS-50 only )
g 0000 0001	Group #
h 0000 0000	Extension of program #
i 00pp pppp	Program # ( pppppp = n#4 : n = 0 - 15 )
j 0000 vvvv	4 sets of PATCH data ( 256 bytes ) *1, *3
k 1111 0111	End of System Exclusive

msb	lsb
byte	: 7 : 6 : 5 : 4 : 3 : 2 : 1 : 0 :
0	: DCO AFTER DEPTH : VCF KEY FOLLOW
1	: VCF AFTER DEPTH : VCA AFTER DEPTH
2	: ENV KEY FOLLOW : DCO BENDER RANGE
3	: *** : DCO LFO MOD DEPTH
4	: b00 : DCO ENV MOD DEPTH
5	: b01 : DCO PULSE PW/PWM DEPTH
6	: b02 : DCO PWM RATE
7	: b03 : VCF CUTOFF FREQ
8	: b04 : VCF RESONANCE
9	: b05 : VCF ENV MOD DEPTH
10	: b06 : VCF LFO MOD DEPTH
11	: b07 : VCA LEVEL
12	: b08 : LFO RATE
13	: b09 : LFO DELAY
14	: b10 : ENV T1
15	: b11 : ENV L1
16	: b12 : ENV T2
17	: b13 : ENV L2
18	: b14 : ENV T3
19	: b15 : ENV L3
20	: b16 : ENV T4
21	: b17 : *** : TONE NAME - 1
22	: b18 : *** : TONE NAME - 2
23	: b19 : *** : TONE NAME - 3
24	: b20 : *** : TONE NAME - 4
25	: b21 : *** : TONE NAME - 5
26	: b22 : *** : TONE NAME - 6
27	: c 0 : TONE NAME - 7
28	: c 3 : TONE NAME - 8
29	: c 5 : TONE NAME - 9
30	: c 7 : TONE NAME - 10
31	: 0 ( TONE DATA code )

\*\*\* : 0, ignored if received

#### Switch bit

b00	CHORUS	0 = OFF 1 = ON
b01	DCO ENV MODE	ENV normal ENV inverted ENV normal with dynamics ENV inverted with dynamics
b03	VCF ENV MODE	ENV normal ENV inverted ENV normal with dynamics dynamics
b05	VCA ENV MODE	ENV GATE ENV with dynamics GATE with dynamics
b07	DCO WAVEFORM	0 SUB 1 2 3 4 5
b10	DCO WAVEFORM	0 SAWTOOTH 1 2 3 4 5
b13	DCO WAVEFORM	0 PULSE 1 2 3
b15	HPF CUTOFF	0 FREQ 1 2 3

b17 b18	0 0	DCO RANGE	4'
	0 1		8'
	1 0		16'
	1 1		32'
b19 b20	0 0	DCO SUB LEVEL	0
	0 1		1
	1 0		2
	1 1		3
b21 b22	0 0	DCO NOISE LEVEL	0
	0 1		1
	1 0		2
	1 1		3
c7 c6 c5 c4 c3 c2 c1 c0	0 v v v v v v v v	CHORUS RATE	vvvvvvv = 0 - 127

#3 PATCH data format

byte	msb	7	6	5	4	3	2	1	0	lsb
0	:	:	:	:	:	:	:	:	:	:
1	:	:	:	:	:	:	:	:	:	:
2	:	:	:	:	:	:	:	:	:	:
3	:	:	:	:	:	:	:	:	:	:
4	:	:	:	:	:	:	:	:	:	:
5	:	:	:	:	:	:	:	:	:	:
6	:	:	:	:	:	:	:	:	:	:
7	:	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:	:
9	:	:	:	:	:	:	:	:	:	:
10	:	:	:	:	:	:	:	:	:	:
11	:	:	:	:	:	:	:	:	:	:
12	:	:	:	:	:	:	:	:	:	:
13	:	:	:	:	:	:	:	:	:	:
14	:	:	:	:	:	:	:	:	:	:
15	:	:	:	:	:	:	:	:	:	:
16	:	:	:	:	:	:	:	:	:	:
17	:	:	:	:	:	:	:	:	:	:
18	:	:	:	:	:	:	:	:	:	:
19	:	:	:	:	:	:	:	:	:	:
20	:	:	:	:	:	:	:	:	:	:
21	:	:	:	:	:	:	:	:	:	:
22	:	:	:	:	:	:	:	:	:	:
23	:	:	:	:	:	:	:	:	:	:
24	:	:	:	:	:	:	:	:	:	:
25	:	:	:	:	:	:	:	:	:	:
26	:	:	:	:	:	:	:	:	:	:
27	:	:	:	:	:	:	:	:	:	:
28	:	:	:	:	:	:	:	:	:	:
29	:	:	:	:	:	:	:	:	:	:
30	:	:	:	:	:	:	:	:	:	:
31	:	:	:	:	:	:	:	:	:	:

\*\*\* : 0, ignored if received

Switch bit

b00	EXP.MODE	0 = NORMAL 1 = EXP.
b01 b02	KEY ASSIGN MODE	POLY
0		CHORD MEMORY
1		MONO ( 6 voice range )
b03	PORTAMENTO	0 = OFF 1 = ON

#4 CHORD MEMORY data is sent in four-bit nibbles, right justified, least significant nibble sent first. ( 6 bytes/(one CHORD MEMORY data) \* 16 = 96 bytes )

4. RECOGNIZED EXCLUSIVE MESSAGES

4.1 All Parameters ( APR )

\*Received if EXCL in the PATCH MIDI function is on.

4.1.1 All Tone Parameters with Tone names ( APR )

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0010 0000	Level # = 1
g 0000 0001	Group #
h 0vvv vvvv	Value ( 0 - 127 ) #1
i 00tt tttt	In sequence (36 bytes total) Tone name ( 0 - 63 )
j 1111 0111	In sequence (10 bytes total) End of System Exclusive

4.1.2 All Tone Parameters without Tone names ( APR )

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0010 0000	Level # = 1
g 0000 0001	Group #
h 0vvv vvvv	Value ( 0 - 127 ) #1
i 1111 0111	In sequence (36 bytes total) End of System Exclusive

4.1.3 Individual Tone Parameter ( IPR )

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0110	Operation code = IPR (individual parameter)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0010 0000	Level # = 1
g 0000 0001	Group #
h 00pp pppp	Parameter # ( 0 - 35 ) #1
i 0vvv vvvv	Value ( 0 - 127 )
j 1111 0111	End of System Exclusive

4.1.4 All Patch Parameters with Patch names ( APR )

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0011 0000	Level # = 2 ( used MKS-50 only )
g 0000 0001	Group #
h 0vvv vvvv	Value ( 0 - 127 ) #2
i 00tt tttt	In sequence (13 bytes total) Tone name ( 0 - 63 )
j 1111 0111	In sequence (10 bytes total) End of System Exclusive

4.1.5 Individual Patch Parameter ( IPR )

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0110	Operation code = IPR (individual parameter)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0011 0000	Level # = 2 ( MKS-50 only )
g 0000 0001	Group #
h 0000 pppp	Parameter # ( 0 - 12 ) #2
i 0vvv vvvv	Value ( 0 - 127 )
j 1111 0111	End of System Exclusive

4.1.6 All Chord Memory Parameters ( APR )

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0100 0000	Level # = 3 ( used MKS-50 only )
g 0000 0001	Group #
h 0vvv vvvv	Value ( 0 - 127 ) #3
i 00tt tttt	In sequence (6 bytes total)
j 1111 0111	End of System Exclusive

Notes :

- #1 See Tone Parameter in 3.1 All Parameter ( APR )
- #2 See Patch Parameter in 3.1 All Parameter ( APR )
- #3 See Chord Parameter in 3.1 All Parameter ( APR )

4.2 Bulk Dump ( BLD )

\*Bulk Dump has no relation with the EXCL in the PATCH MIDI function.

4.2.1 When 'WRITE Button' is pressed in the TONE Bulk\*Load Mode.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0111	Operation code = BLD (bulk dump)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0010 0000	Level # = 1
g 0000 0001	Group #
h 0000 0000	Extension of program #
i 00pp pppp	Program #
j 0000 tttt	Some sets of TONE data #1, #2
k 1111 0111	End of System Exclusive

4.2.2 When 'WRITE Button' is pressed in the PATCH Bulk\*Load Mode.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0111	Operation code = BLD (bulk dump)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0010 0000	Level # = 2 ( MKS-50 only )
g 0000 0001	Group #
h 0000 0000	Extension of program #
i 00pp pppp	Program #
j 0000 vvvv	same set of PATCH data #1, #2
k 1111 0111	End of System Exclusive

4.2.3 When 'WRITE Button' is pressed in the CM BulkLoad Mode.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0111	Operation code = BLD (bulk dump)
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0100 0000	Level # = 3 ( MKS-50 only )
g 0000 0001	Group #
h 0000 0000	Extension of program #
i 0000 0000	Program #
j 0000 vvvv	16 sets of CHORD MEMORY data ( 192 bytes ) #4
k 1111 0111	End of System Exclusive

Notes :

- #1 The Program # is recognized as the first TONE or PATCH number of the TONE or PATCH data sets. 32 bytes are recognized as a set of TONE or PATCH data. TONE or PATCH data is received in four-bit nibbles, right justified, least significant nibble received first.
- #2 See 3.2 Bulk Dump, to understand the TONE data format.
- #3 See 3.2 Bulk Dump, to understand the PATCH data format.
- #4 See 3.2 Bulk Dump, to understand the CHORD MEMORY data format.

5. HANDSHAKING COMMUNICATION

5.1 Message type

5.1.1 Want to send a file (WSF)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0000	Operation code = WSF
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 1111 0111	End of System Exclusive

5.1.2 Request a file (RQF)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0001	Operation code = RQF
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 1111 0111	End of System Exclusive

5.1.3 Data (DAT)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0010	Operation code = DAT
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 0000 tttt	4 sets of TONE or PATCH data ( 256 bytes ), CHORD MEMORY data ( 192 bytes )
g 00ss ssss	Check sum
h 1111 0111	End of System Exclusive

Notes :

- Each data are sent in four-bit nibbles, right justified, least significant nibble sent first.
- PATCH or CHORD MEMORY data is valid only for MKS-50.
- See 3.2 Bulk Dump, to understand each data format.
- Summed value of the all bytes in data and the check sum must be 0 (7bits).

5.1.4 Acknowledge (ACK)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0011	Operation code = ACK
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 1111 0111	End of System Exclusive

5.1.5 End of file (EOF)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0101	Operation code = EOF
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 1111 0111	End of System Exclusive

5.1.6 Communication error (ERR)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 1110	Operation code = ERR
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 1111 0111	End of System Exclusive

5.1.7 Rejection (RJC)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 1111	Operation code = RJC
d 0000 nnnn	Unit # = MIDI basic channel, nnnn = 0 - 15 where nnnn + 1 = channel #
e 0010 0011	Format type ( JU-1, JU-2, HS-10, HS-80, MKS-50 )
f 1111 0111	End of System Exclusive

5.2 Sequence of communication

5.2.1 In the 'Dump' mode.

this unit	message	objective unit
	WSF ----->	
	<----- ACK or ( RQF )	
	DAT ----->	
	<----- ACK	
	:	
	:	
	DAT ----->	
	<----- ACK	
	EOF ----->	
	<----- ACK	

5.2.2 In the 'Load' mode.

this unit	message	objective unit
	RQF ----->	
	( <----- WSF	
	ACK -----> )	
	<----- DAT	
	ACK ----->	
	:	
	:	
	<----- DAT	
	ACK ----->	
	<----- EOF	
	ACK ----->	

Notes :

- \* This unit sends RJC and the sequence is discontinued when it receives ERR or detects some error.
- \* This unit sends RJC when the sequence is discontinued manually.
- \* This unit stops the sequence if the unit receives RJC.