

JU6-KBD

MIDI Interface for
Roland Juno – 6 / 60
Keyboard

Model 8-429
Version 2.0



Owner's Manual



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1 DEVICE DESCRIPTION

JU6-KBD is a MIDI retrofit for embedding into **Roland Juno-6** and **Roland Juno-60** synthesizers. The device enables the instrument to be controlled via MIDI as a MIDI expander. JU6-KBD enables to control the instrument's **keyboard** and it also synchronizes the **arpeggiator** speed with several sources of clock. **Other** circuits of the instrument (VCF, VCA, ...) and tone parameters **are not MIDI controllable!**

The interface works in one direction only – it **only receives** MIDI data.. The Juno's keyboard and knobs / sliders / switches on control panel **are not transmitted** as a MIDI data!

All interface's functions are simply **controlled via Control Changes** (CCs) and some other basic types of MIDI commands¹. The interface has internal memory for saving of user setting of the interface parameters.

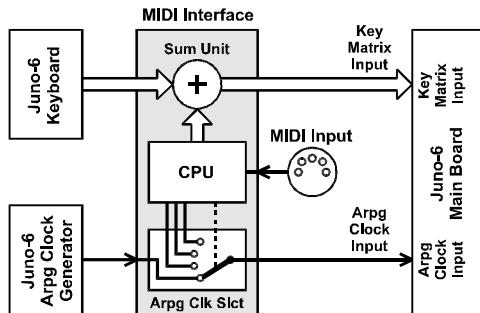
Original features of the Roland instrument are not changed and the instrument can be used the same way as before the interface installation.

1.1 INTERFACE FUNCTIONS

Simplified functional diagram of the interface is on pic. 1:

- The interface controls the keyboard in a parallel fashion with own keyboard of the instrument – the instrument's keyboard can be used **at the same time** as it is controlled by MIDI.
- The interface can synchronize the instrument's arpeggiator with four different sources of clock pulses.

Pic. 1 – Functional diagram



2 INTERFACE BASIC OPERATION

There are **no control elements or indicators** on the interface. All parameters are adjusted via MIDI commands from an external MIDI data source (PC, DAW) only.

2.1 CONNECTION TO MIDI SYSTEM

The interface **only receives MIDI data** so it is equipped only by MIDI input. Interface's MIDI input have to be connected to MIDI output of MIDI host system (PC, DAW, master keyboard ...). Standard MIDI cable² is used for connection.

¹ For experts, MIDI System Exclusive Messages communication is available for setting of the interface functions.

² The cable with DIN 41524 connectors (5-pin / 180°).

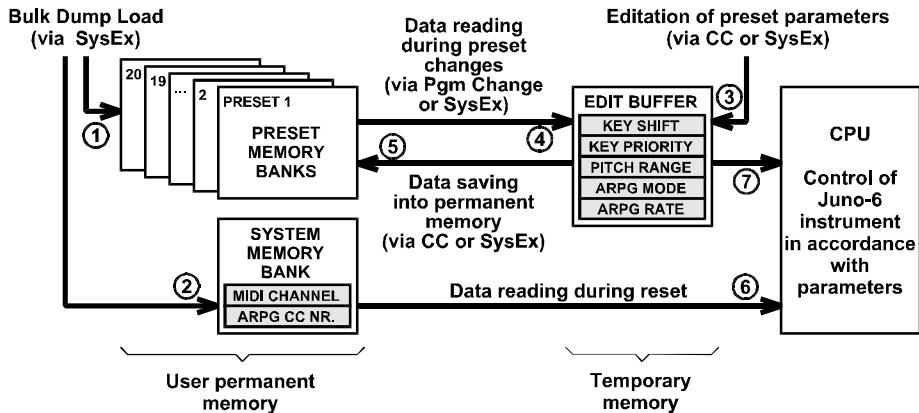
2.2 INITIALIZATION SEQUENCE

Initialization sequence of interface's CPU is launched after every start-up of the instrument. Default status of system functions is set during initialization sequence and interface's preset Nr. 1 is set as active – i.e. values of parameters stored in interface's preset memory Nr. 1 are read into edit buffer – see pic. 2.

3 PARAMETERS

The parameters settings affects significantly the incoming MIDI commands processing and the Juno-6 circuits operation. Parameters are divided in to basic groups – system parameters and preset parameters – see pic. 2.

Pic. 2 – Structure of interface's memory



All parameters are stored in memory banks in internal memory of the interface – there is one bank for system parameters and bank for 20 interface's preset parameters. The content of the memory banks can be changed by the "Bulk Dump Data Load" SysEx messages (① and ② on picture2).

Interface's preset parameters, that directly affect the sound of the instruments, can be individually adjusted in the edit buffer by the MIDI Control Changes commands (CCs) or by "Preset Parameter Change" SysEx messages (③ on picture 2). All changes can be saved in one location of the instrument's preset memory area (⑤ on picture 2).

Active interface's presets can be changed by "Program Change" MIDI channel commands or by SysEx messages (④ on picture 2).

3.1 SYSTEM PARAMETERS

The system parameters control the basic function of the interface. System parameters are always valid independently on the actual interface's preset settings – the change of the system parameters take effect the same way in all user interface's presets.

The values of system parameters, that are saved in factory or if "Factory Reset" is executed (see description of the System Exclusive communication), shows table 1.



Table 1 – Range of valid values and “Factory Reset” values of system parameters				
Parameter name	Range of valid values		“Factory Reset” values	
	[dec]	[hex]	[dec]	[hex]
MIDI Channel	0 ~ 16	00 ~ 10	0	00
Arpg CC Nr.	0 ~ 118	00 ~ 76	21	15

All system parameters can be changed only by “System Parameter Change” SysEx messages (see chapter 4.3 and MIDI System Exclusive Communication manual). Note that all changes of system parameters are activated till **after the interface reset (⑥** on picture 2) – i.e. when the instrument is switched on next time!

3.1.1 “MIDI CHANNEL” PARAMETER

This parameter sets the basic MIDI channel for communication with the MIDI control device. Any of the available 16 channels can be set, as well as MIDI OMNI mode³.

Parameter values are 0 to 16. The values 0 to 15 represents MIDI channels 1 to 16. The value 16 is for OMNI MODE. The value of this parameter can be adjusted only with the MIDI System Exclusive message - see chapter 4.3.

All acceptable MIDI Channel commands (i.e. Note On/Off, CCs, Program Change, Pitch Bend) are received only on selected channel⁴.

3.1.2 “ARPG CC Nr.” PARAMETER

In CONTROLLER working mode (see chapter 3.2.4), clock for instrument’s arpeggiator can be controlled via user selectable MIDI CC (Control Changes).

Value of the “ARPG CC Nr.” system parameter specifies exactly number of MIDI CC what is used for function described above. Numbers from 0 to 118 can be chosen. But it is recommended not to use numbers of standard MIDI CCs (e.g. Hold, Bank Select, Modulation, etc.).

3.2 PRESET PARAMETERS

The interface’s preset parameters set function of the interface whose influence sound of the instrument. The preset parameters sets, which MIDI commands are going to control instrument’s keyboard and arpeggiator.

Table 2 – Range of valid values and “Factory Reset” values of preset parameters					
Parameter name	Range of valid values		“Factory Reset” values		Setting via MIDI CC Nr.
	[dec]	[hex]	[dec]	[hex]	
Key Shift	0 ~ 67	00 ~ 43	36	24	16
Key Priority	0 ~ 3	00 ~ 03	0	00	17
Pitch Bend Range	0 ~ 24	00 ~ 18	12	0C	18
Arpg Clock Mode	0 ~ 3	00 ~ 03	0	00	19
Arpg Clock Rate ¹⁾	0 ~ 127	00 ~ 7F	122	7A	20

Remark:

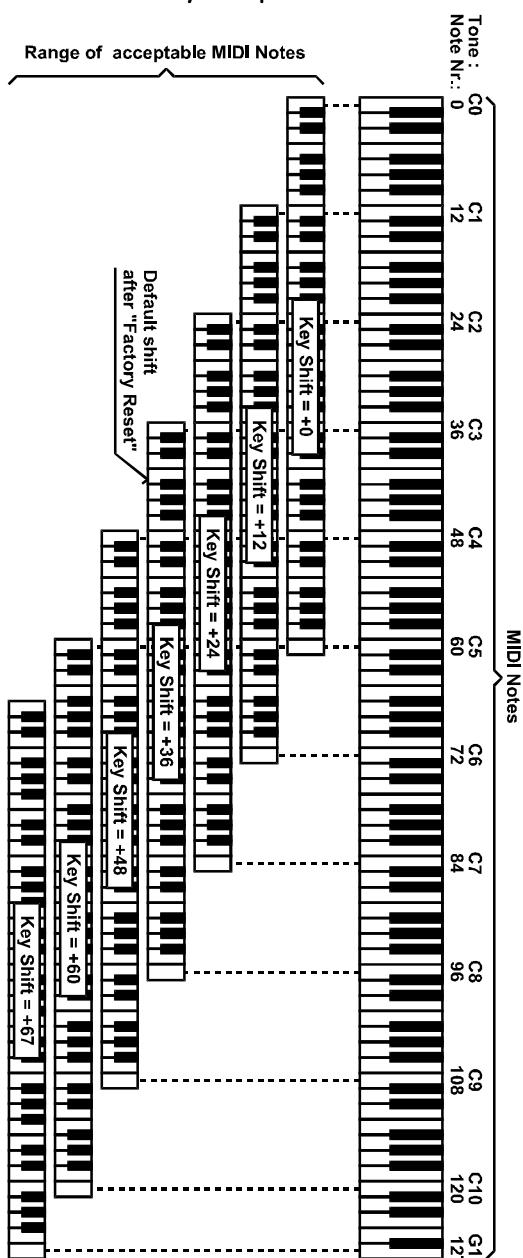
¹⁾ Parameter has no signification in “Internal” and “Controller” working modes (Arpg Clock Mode = 0 and 3)

³ OMNI mode enables the instrument to receive data on all 16 MIDI channels simultaneously.

⁴ They are received on all 16 MIDI channels in OMNI mode.



Pic. 3 – "Key Shift" parameter influence





Up to 20 setting of preset parameters can be stored in internal interface's memory. After reset or after actual preset change, data from corresponding memory area (always from preset Nr. 1 after reset) are transferred into edit buffer (**④** on picture 2). The instrument is then controlled in dependence on parameters in edit buffer.

Default values of the preset parameters stored in the interface memory after "Factory Reset" procedure are listed in table 2. The same "Factory Reset" values are stored to all 20 user presets.

Values of individual preset parameters in edit buffer are set by the MIDI CCs or by "Preset Parameter Change" SysEx messages (**③** on picture 2) It is possible to change them during the playing the instrument thus. Edited values of the parameters are stored in the edit buffer only! The content of the buffer is saved temporarily only, till the preset change or instrument switch off. To save the edited parameters, it is necessary to save them as a memory preset. There are 20 available preset spaces. Saving the values in preset memories is done by MIDI Control Changes Nr. 119 or by the MIDI System Exclusive command (**⑤** on picture 2).

3.2.1 "KEY SHIFT" PARAMETER

The Key Shift parameter transposes the instrument's keyboard in whole scale of MIDI notes. The parameter value specifies exactly the number of MIDI Note which is assigned to the lowest key of the instrument's keyboard.

Values of the "Key Shift" parameter can be from 0 to 67. If value 0 is set (transposition is 0), the lowest key of the keyboard corresponds to MIDI Note Nr. 0 and the highest key corresponds to MIDI Note Nr. 60. If value 1 of the parameter is set, (transposition is +1), the lowest key of the keyboard corresponds to MIDI Note Nr. 1 and the highest key corresponds to MIDI Note Nr. 61. Etc. up to value 67 of the parameter (transposition is +67) when the lowest key of the keyboard corresponds to MIDI Note Nr. 67 and the highest key corresponds to MIDI Note Nr. 127. See pic. 3 for more details.

The parameter value in edit buffer can be adjusted by MIDI CC #16 – see chapter 4.1.2.2.

3.2.2 "KEY PRIORITY" PARAMETER

The value of the parameter adjusts the incoming MIDI Note On/Off commands processing in case when all six tone generators of the instrument are already used (six tones is already sounding). The parameter value is from 0 to 3:

0 → LAST: Last key priority – the last pressed key always replaces the first key pressed.

1 → HIGHER: Higher key priority – if the last pressed key is of the higher tone than any of the previously pressed keys, the lowest tone key is replaced.

2 → LOWER: Lower key priority – if the last pressed key is of the lower tone than any of the previously pressed keys, the highest tone key is replaced.

3 → NONE: No priority – if all six tone generators are used, all next Note On commands are ignored at the MIDI input.

The parameter value in edit buffer can be adjusted by MIDI CC #17 – see chapter 4.1.2.2.

3.2.3 "PITCH BEND RANGE" PARAMETER

Parameter adjusts the maximum range of the pitch bend controlled by the MIDI command "Pitch Bend"⁵.

Parameter values are 0 to 24. The 0 value switches the pitch bend off - MIDI command "Pitch Bend" is ignored. The values of 1 to 24 are equal to the transposition semitones, The ±2 octave transposition is available thus.

The parameter value in edit buffer can be adjusted by MIDI CC #18 – see chapter 4.1.2.2.

⁵ Pitch Bend MIDI command affects only tones launched by MIDI Notes. Own instrument's keyboard is not affected.



3.2.4 “ARPG CLOCK MODE” PARAMETER

Parameter selects source of clock pulses for instrument’s arpeggiator. Parameter values are 0 to 3:

- 0 → INTERNAL:** Arpeggiator is controlled by original instrument’s hardware tempo generator in the same manner as without the interface⁶. Speed of arpeggio is given by potentiometer on instrument’s panel or by external clock pulses incoming to ARPEGGIO CLOCK IN connector on instrument’s rear panel.
- 1 → FIXED:** Arpeggiator is controlled by clock generator embedded in the interface. Speed of arpeggio is given by adjusting of “Arpg Clock Rate” parameter – see table 3.
- 2 → MIDI:** Rate of arpeggio is derived from MIDI Clock. Then the “Arpg Clock Rate” parameter gives interval between arpeggio clock pulses in MIDI Clock ticks – see table 3.
- 3 → CONTROLLER:** Arpeggiator is controlled directly by MIDI CC chosen by “Arpg CC Nr.” system parameter⁷. Always after this CC is received (its value isn’t significant), one clock pulse is generated.

The parameter value in edit buffer can be adjusted by MIDI CC #19 – see chapter 4.1.2.2.

3.2.5 “ARPG CLOCK RATE” PARAMETER

Parameter adjusts instrument’s arpeggio rate if the arpeggiator works in FIXED or MIDI mode (selected by the “Arpg Clock Mode” parameter.) This parameter has no influence in INTERNAL and CONTROLLER working modes.

Parameter values are 0 to 127. Conversion of the parameter value to arpeggio speed / interval shows table 3.

The parameter value in edit buffer can be adjusted by MIDI CC #20 – see chapter 4.1.2.2.

Table 3 – Conversion of “Arpg Clock Rate” parameter value to arpeggiator speed

Param. value	Mode (param. “Arpg Clk Mode”)				Param. value	Mode (param. “Arpg Clk Mode”)				
	FIXED		MIDI			FIXED		MIDI		
	Freq. [Hz]	Period [sec]	Clock Ticks	Note Duration		Freq. [Hz]	Period [sec]	Clock Ticks	Note Duration	
0	1,00	1,000	128	-	17	1,69	0,592	111	-	
1	1,03	0,970	127	-	18	1,74	0,574	110	-	
2	1,06	0,940	126	-	19	1,80	0,557	109	-	
3	1,10	0,912	125	-	20	1,85	0,540	108	-	
4	1,13	0,884	124	-	21	1,91	0,524	107	-	
5	1,17	0,857	123	-	22	1,97	0,508	106	-	
6	1,20	0,831	122	-	23	2,03	0,492	105	-	
7	1,24	0,806	121	-	24	2,09	0,477	104	-	
8	1,28	0,782	120	-	25	2,16	0,463	103	-	
9	1,32	0,758	119	-	26	2,23	0,449	102	-	
10	1,36	0,735	118	-	27	2,30	0,435	101	-	
11	1,40	0,713	117	-	28	2,37	0,422	100	-	
12	1,45	0,691	116	-	29	2,44	0,409	99	-	
13	1,49	0,670	115	-	30	2,52	0,397	98	-	
14	1,54	0,650	114	-	31	2,60	0,385	97	-	
15	1,59	0,630	113	-	32	2,68	0,373	96	1/1	
16	1,64	0,611	112	-	33	2,76	0,362	95	-	

⁶ Note that “Arpg Clock Rate” preset parameter has no influence in INTERNAL clock mode.

⁷ Note that “Arpg Clock Rate” preset parameter has no influence in CONTROLLER clock mode.



Table 3 – Conversion of “Arpg Clock Rate” parameter value to arpeggiator speed (continue)

Param. value	Mode (param. “Arpg Clk Mode”)				Param. value	Mode (param. “Arpg Clk Mode”)				
	FIXED		MIDI			FIXED		MIDI		
	Freq. [Hz]	Period [sec]	Clock Ticks	Note Duration		Freq. [Hz]	Period [sec]	Clock Ticks	Note Duration	
34	2,85	0,351	94	-	76	10,39	0,096	52	-	
35	2,94	0,340	93	-	77	10,72	0,093	51	-	
36	3,03	0,330	92	-	78	11,05	0,090	50	-	
37	3,13	0,320	91	-	79	11,40	0,088	49	-	
38	3,22	0,310	90	-	80	11,76	0,085	48	1/2	
39	3,32	0,301	89	-	81	12,12	0,082	47	-	
40	3,43	0,292	88	-	82	12,50	0,080	46	-	
41	3,54	0,283	87	-	83	12,89	0,078	45	-	
42	3,65	0,274	86	-	84	13,30	0,075	44	-	
43	3,76	0,266	85	-	85	13,71	0,073	43	-	
44	3,88	0,258	84	-	86	14,14	0,071	42	-	
45	4,00	0,250	83	-	87	14,58	0,069	41	-	
46	4,12	0,242	82	-	88	15,04	0,066	40	-	
47	4,25	0,235	81	-	89	15,51	0,064	39	-	
48	4,39	0,228	80	-	90	16,00	0,063	38	-	
49	4,52	0,221	79	-	91	16,50	0,061	37	-	
50	4,67	0,214	78	-	92	17,01	0,059	36	-	
51	4,81	0,208	77	-	93	17,54	0,057	35	-	
52	4,96	0,202	76	-	94	18,09	0,055	34	-	
53	5,12	0,195	75	-	95	18,66	0,054	33	-	
54	5,28	0,189	74	-	96	19,24	0,052	32	1/2 ³	
55	5,44	0,184	73	-	97	19,85	0,050	31	-	
56	5,61	0,178	72	-	98	20,47	0,049	30	-	
57	5,79	0,173	71	-	99	21,11	0,047	29	-	
58	5,97	0,168	70	-	100	21,77	0,046	28	-	
59	6,16	0,162	69	-	101	22,45	0,045	27	-	
60	6,35	0,158	68	-	102	23,15	0,043	26	-	
61	6,55	0,153	67	-	103	23,87	0,042	25	-	
62	6,75	0,148	66	-	104	24,62	0,041	24	1/4	
63	6,96	0,144	65	-	105	25,39	0,039	23	-	
64	7,18	0,139	64	1/1 ³	106	26,19	0,038	22	-	
65	7,41	0,135	63	-	107	27,00	0,037	21	-	
66	7,64	0,131	62	-	108	27,85	0,036	20	-	
67	7,88	0,127	61	-	109	28,72	0,035	19	-	
68	8,12	0,123	60	-	110	29,62	0,034	18	-	
69	8,38	0,119	59	-	111	30,55	0,033	17	-	
70	8,64	0,116	58	-	112	31,50	0,032	16	1/4 ³	
71	8,91	0,112	57	-	113	32,49	0,031	15	-	
72	9,19	0,109	56	-	114	33,50	0,030	14	-	
73	9,48	0,106	55	-	115	34,55	0,029	13	-	
74	9,77	0,102	54	-	116	35,63	0,028	12	1/8	
75	10,08	0,099	53	-	117	36,75	0,027	11	-	



Table 3 – Conversion of “Arpg Clock Rate” parameter to arpeggiator speed (continue)										
Param. value	Mode (param. “Arpg Clk Mode”)				Param. value	Mode (param. “Arpg Clk Mode”)				
	FIXED		MIDI			FIXED		MIDI		
	Freq. [Hz]	Period [sec]	Clock Ticks	Note Duration		Freq. [Hz]	Period [sec]	Clock Ticks	Note Duration	
118	37,90	0,026	10	-	123	44,21	0,023	5	-	
119	39,08	0,026	9	-	124	45,59	0,022	4	$1/10^3$	
120	40,30	0,025	8	$1/8^3$	125	47,01	0,021	3	$1/32$	
121	41,56	0,024	7	-	126	48,49	0,021	2	$1/32^3$	
122	42,86	0,023	6	$1/16$	127	50,00	0,020	1	$1/64^3$	

4 MIDI IMPLEMENTATION

The interface has only the MIDI input so it only receives MIDI commands. The interface recognizes Channel commands, Common System commands and System Exclusive messages.

4.1 CHANNEL COMMANDS

The interface receives MIDI channel commands on the channel defined by the system parameter “MIDI Channel” (see chapter 3.1.1).

4.1.1 NOTE ON/OFF

Interface receives Note On/Off in range of 61 MIDI Notes. The “Key Shift” preset parameter defines assignment of acceptable MIDI notes numbers to instrument’s keys.

When six valid MIDI notes are received (all six tone generators are sounding), all following received MIDI Note commands are processed according to “Key Priority” preset parameter setting.

4.1.2 CONTROL CHANGES - CCs

Interface recognizes standard MIDI Control Changes Nr. 64, 120, 121, 123. Other CCs are used for temporary adjusting the parameters in edit buffer (controllers 16 – 20, 119). Besides this, one controller selected by user can be used for direct control of arpeggiator clock (see chapters 3.1.2 and 3.2.4).

4.1.2.1 STANDARD CONTROLLERS

CC #64 – Hold

The CC #64 works in a standard way: Holds the tone generators sounding⁸ when the “Hold” pedal is pressed⁹. Values 64 to 127 of the CC #64 are recognized as ON (pedal pressed), values 0 to 63 are recognized as OFF (pedal released).

⁸ Hold MIDI command affects only tones launched by MIDI Notes. Own instrument’s keyboard is not affected.

⁹ If the CC #64 is active (ON) and the Note On command for an already playing note is received, the envelope generator is **not triggered** again - percussive sounds **will not be played** this way.



Table 4 – Acceptable CC overview

CC Nr.	Name	Function	Valid value
CC #16 ¹⁾	Key Shift	Controls "Key Shift" interface's preset parameter (See chapter 3.2.1)	0 ~ 127
CC #17 ¹⁾	Key Priority	Controls "Key Priority" interface's preset parameter (See chapter 3.2.2)	0 ~ 31 = Last 32 ~ 63 = Higher 64 ~ 95 = Lower 96 ~ 127 = None
CC #18 ¹⁾	Pitch Bend Range	Controls "Pitch Bend Range" interface's preset parameter (See chapter 3.2.3)	0 ~ 127
CC #19	Arpg Clock Mode	Controls "Arpg Clock Mode" interface's preset parameter (See chapter 3.2.4)	0 ~ 31 = Internal 32 ~ 63 = Fixed 64 ~ 95 = MIDI 96 ~ 127 = CC
CC #20	Arpg Clock Rate	Controls "Arpg Clock Rate" preset parameter (See chapter 3.2.5)	0 ~ 127
CC #64 ¹⁾	Hold	Standard MIDI function	0 ~ 63 = Off 64 ~ 127 = On
CC #119	Save Preset	Saves edited interface's parameters in the buffer to a preset memory in preset memory bank	0 ~ 19 = Preset number 20 ~ 127 = Unused
CC #120 ¹⁾	All Sound Off	Standard MIDI function	0
CC #121	Reset All Controllers	Standard MIDI function	0
CC #123 ¹⁾	All Notes Off	Standard MIDI function	0
CC #... ²⁾	All Notes Off	Controls (launches) clock pulse for arpeggiator	0 ~ 127

Remarks:

¹⁾ The CC is only relevant for received MIDI notes, not for own instrument's keyboard

²⁾ Number of the CC is defined by the "ARPG CC Nr." system parameter

CC #120 – All Sound Off

When CC #120 is received, all tone generators are muted independently if they are active by "Note On" command or the "Hold" controller¹⁰.

CC #121 – Reset All Controllers

When this controller is received, the CC #64 "Hold" is switched off and the "Pitch Bend" controller is set to the center position.

CC #123 – All Notes Off

When CC #123 is received, all tone generators are muted if the "Hold" controller is inactive. If the "Hold" is active "All Notes Off" command is executed after the "Hold" pedal release¹¹.

4.1.2.2 OWN CONTROLLERS

These parameters set values of the interface's preset parameters. Value of the parameters in edit buffer are adjusted only temporarily; until the next change or the instrument restart.

¹⁰ All Sound Off MIDI command affects only tones launched by MIDI Notes. Own instrument's keyboard is not affected.

¹¹ All Notes Off MIDI command affects only tones launched by MIDI Notes. Own instrument's keyboard is not affected.

**CC #16 – Own controller : Key Shift**

The received value 0 to 127 of the CC #16 adjusts the "Key Shift" preset parameter. Since the "Key Shift" parameter can be only form 0 to 67, value of the CC #16 is converted to this range – see table 4.

Table 4 – Conversion of CC #16 value to "Key Shift" parameter value (in semitones)															
CC #16	Shift	CC #16	Shift	CC #16	Shift	CC #16	Shift	CC #16	Shift	CC #16	Shift	CC #16	Shift	CC #16	Shift
0	+0	16	+8	32	+17	48	+25	64	+34	80	+42	96	+51	112	+59
1	+0	17	+9	33	+17	49	+26	65	+34	81	+43	97	+51	113	+60
2	+1	18	+9	34	+18	50	+26	66	+35	82	+43	98	+52	114	+60
3	+1	19	+10	35	+18	51	+27	67	+35	83	+44	99	+52	115	+61
4	+2	20	+10	36	+19	52	+27	68	+36	84	+44	100	+53	116	+61
5	+2	21	+11	37	+19	53	+28	69	+36	85	+45	101	+53	117	+62
6	+3	22	+11	38	+20	54	+28	70	+37	86	+45	102	+54	118	+62
7	+3	23	+12	39	+20	55	+29	71	+37	87	+46	103	+54	119	+63
8	+4	24	+12	40	+21	56	+29	72	+38	88	+46	104	+55	120	+63
9	+4	25	+13	41	+21	57	+30	73	+38	89	+47	105	+55	121	+64
10	+5	26	+13	42	+22	58	+30	74	+39	90	+47	106	+56	122	+64
11	+5	27	+14	43	+22	59	+31	75	+39	91	+48	107	+56	123	+65
12	+6	28	+14	44	+23	60	+31	76	+40	92	+48	108	+57	124	+65
13	+6	29	+15	45	+23	61	+32	77	+40	93	+49	109	+57	125	+66
14	+7	30	+15	46	+24	62	+32	78	+41	94	+49	110	+58	126	+66
15	+7	31	+16	47	+24	63	+33	79	+41	95	+50	111	+58	127	+67

CC #17 – Own controller : Key Priority

The received value 0 to 127 of the CC #17 adjusts the "Key Priority" preset parameter. Since the "Key Priority" parameter can be only form 0 to 3, value of the CC #17 is converted to this range – see table 5.

Table 5 – Conversion of CC #17 value to "Key Priority" parameter value			
CC #17	Priority	CC #17	Priority
0 ~ 31	Last	64 ~ 95	Lower
32 ~ 63	Higher	96 ~ 127	None

CC 18 – Own controller : Pitch Bend Range

The received value 0 to 127 of the CC #18 adjusts the "Pitch Wheel Range" preset parameter. Since the "Key Priority" parameter can be only form 0 to 24, value of the CC #18 is converted to this range – see table 6.

Table 6 – Conversion of CC #18 value to "Pitch Wheel Range" parameter value (in semitones)									
CC #18	Range	CC #18	Range	CC #18	Range	CC #18	Range	CC #18	Range
0 ~ 4	±0	25 ~ 29	±5	50 ~ 54	±10	75 ~ 79	±15	100 ~ 104	±20
5 ~ 9	±1	30 ~ 34	±6	55 ~ 59	±11	80 ~ 84	±16	105 ~ 109	±21
10 ~ 14	±2	35 ~ 39	±7	60 ~ 64	±12	85 ~ 89	±17	110 ~ 114	±22
15 ~ 19	±3	40 ~ 44	±8	65 ~ 69	±13	90 ~ 94	±18	115 ~ 119	±23
20 ~ 24	±4	45 ~ 49	±9	70 ~ 74	±14	95 ~ 99	±19	120 ~ 127	±24

CC 19 – Own controller: Arpg Clock Mode

The received values of CC #19 adjusts the “Arpg Clock Mode” preset parameter - see table 7. Value of the parameter in edit buffer is adjusted only temporarily; until the next change or instrument restart.

Table 7 – Conversion of CC #19 value to “Arpeggio Clock Mode” parameter value

CC #19	Mode	CC #19	Priority
0 ~ 31	Internal	64 ~ 95	MIDI
32 ~ 63	Fixed	96 ~ 127	Controller

CC #20 – Own controller : Arpg Clock Rate

The received values from 0 to 127 of the CC #20 corresponds to the "Arpg Clock Rate" parameter value directly. The CC #20 has an influence only if the arpeggiator works in FIXED or MIDI modes (see chapter 3.2.4).

CC #119 – Own controller : Save Preset

With help of CC # 119, it is allowed to store data from temporary edit buffer to a permanent interface's user preset in preset memory bank.

The received value of the CC #119 specifies number of user preset to which the data will be stored. Acceptable values are from 0 to 19 (0 for preset Nr. 1, 1 for preset Nr. 2, etc. up to 19 for preset Nr. 20). Other values of the controller have no signification and they are ignored.

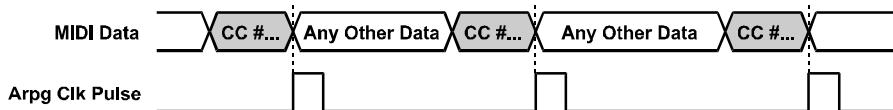
Immediately after CC #119 with acceptable value (0 to 19) is received, content of edit buffer is saved to corresponding (1 to 20) user preset memory.

CC @ Arpg CC Nr. – Freely definable own controller : Arpeggio Controller

Freely definable CC @ Arpg CC Nr. (i.e. CC Nr. chosen by the “ARPG CC Nr.” system parameter) controls clock pulses for the arpeggiator of Juno-6 directly if “Arpg Clock Mode” parameter of actual preset set to CONTROLLER¹².

If that condition is satisfied, one arpeggiator synchronization clock pulse is generated anytime when the defined CC (of any value) is received by the interface (see pic. 4).

Pic. 4 – Function of Freely definable CC



4.1.3 PROGRAM CHANGE

“Program Change” command has a standard function - it changes actual interface’s preset number¹³ (see ④ on pic. 2). Range of acceptable values of “Program Change” command is from 0 to 19. It corresponds to numbers of the interface’s presets from 1 to 20. “Program Change” commands with values from 20 to 127 are ignored.

¹² If this way of the arpeggiator control is used, MIDI CC #20 (Arpg Clock Rate) is ignored!

¹³ The “Program Change” command works with the interface’s presets only. It doesn’t change patches of the instrument!



4.1.4 PITCH BEND

"Pitch Bend" ("Pitch Wheel") command has a standard function - it changes the tune¹⁴ of the notes played¹⁵. The minimal / maximal range of bend is adjusted by the "Pitch Wheel Range" parameter and it can be from ±0 to ±24 semitones.

4.2 COMMON SYSTEM COMMANDS

The interface uses only "MIDI Clock" synchronization pulses and "System Reset". All other Common System commands are ignored.

4.2.1 CLOCK

If any other mode than MIDI mode is chosen by „Arpg Clock Mode“ preset parameter, MIDI Clock commands are ignored.

In MIDI mode, the interface receives MIDI Clock commands and it derives synchronization pulses for arpeggiator from them - the arpeggiator is synchronized with tempo of played song. Speed of the arpeggiator is then controlled by "Arpg Clock Rate" parameter (see chapter 3.2.5).

Maximal speed of arpeggiator is limited by the hardware construction of the instrument. This may also cause that when the MIDI song has very high tempo, the synchronized arpeggio tones might be irregular or some tones might be omitted.

4.2.2 RESET

The complete interface reset is done after receiving "Reset" command - all functions are adjusted to their default values and data of preset Nr. 1 are read to edit buffer. The interface goes to the same status as after the instrument is switched on.

4.3 SYSTEM EXCLUSIVE MESSAGES

The System Exclusive communication enables user to adjust the values of all preset parameters in edit buffer and values of system parameters in system memory bank. Further it is possible to rewrite content of partial preset memory banks or to store data from edit buffer to any preset memory bank. Also, actual preset can be changed or if necessary, hardware reset or total "Factory" reset can be done. System Exclusive communication is described in detail in standalone manual.

¹⁴ Since the interface does not have direct access to the control voltage (CV) of the tone generators, the tone is not detuned continuously but in semitone steps. Together with the tuning changes, the envelope generators are triggered.

¹⁵ The Pitch Bend command is valid only for tones activated by MIDI Notes. It doesn't work with tones activated from own keyboard of the instrument.



5 SYSEX MESSAGES GENERATOR

As a support for the users we have made software generator to create System Exclusive messages to control the interface. Any necessary SysEx message can be created with this generator without difficult calculating of binary or hexadecimal numbers.

The generator is based on Java scripts so it can run on any computer with web browser (Windows, OSX, etc.)¹⁶. To send the generated commands you will also need an utility to send the generated text¹⁷ as a MIDI SysEx dump (see chapter 6 for recommended software¹⁸).

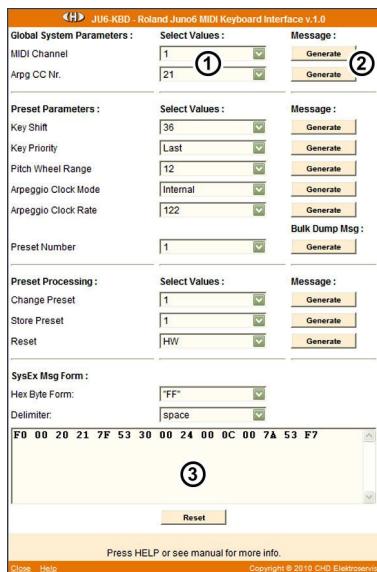
Visit our website and download the “ju6kbd_syxgen.zip” archive. Expand the archive to a selected folder on your computer’s hard drive (i.e. “ju6kbd.html” and “ju6kbd_help.html” files and “media” sub-folder).

To launch the SysEx messages generator, simply open the “ju6kbd.html” file in your web browser (e.g. by clicking on the file icon). The generator window opens.

5.1 SYSTEM PARAMETERS SETTING

To change / adjust the system parameters:

1. Select value of one requested system parameter ①.
2. Click the corresponding “Generate” button ②.
3. The hexadecimal MIDI SysEx message is generated as a text in text field on bottom of the window ③.
4. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software¹⁹.
5. Send the message to the interface.
6. Switch the Juno instrument off and then on again after a moment. Now the interface starts operation with the new system parameters settings.



¹⁶ Note that scripts and ActiveX elements must be enabled in web browser for proper function of the generator.

¹⁷ The generated format of the message is **text**. The text can not be saved as a *.syx or *.mid file directly, hence a text to SysEx utility is needed.

¹⁸ It is not necessary to use the recommended utility. The same function is provided by various DAW and MIDI SysEx softwares. For required text format and instructions check the documentation of your DAW/software.

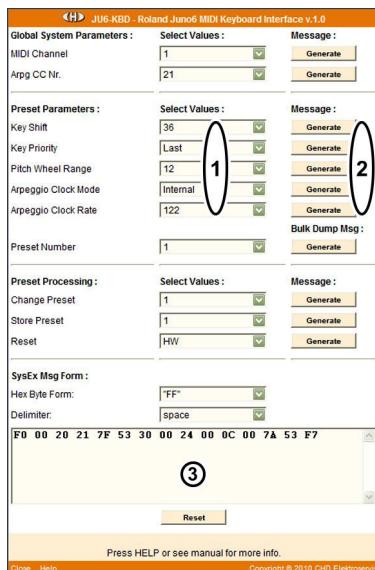
¹⁹ See chapter 6.2 for recommended MIDI SysEx software.



5.2 INDIVIDUAL PRESET PARAMETER SETTING

To change / adjust one interface's preset parameter in edit buffer:

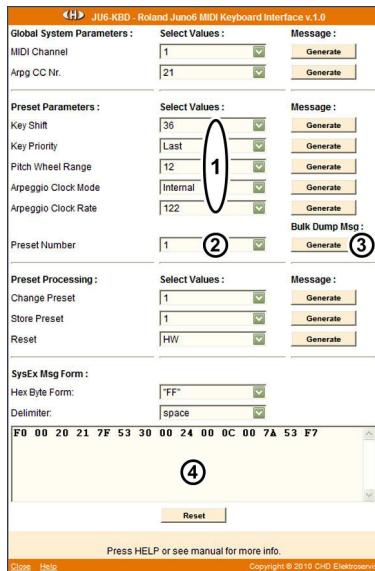
1. Select value of one requested preset parameter ①.
2. Click the corresponding "Generate" button ②.
3. The hexadecimal MIDI SysEx message is generated as a text in text field on bottom of the window ③.
4. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software²⁰.
5. Send the message to the interface.
6. The interface starts operation with the new preset parameter immediately. No reset is necessary.
7. Note that the parameter value is changed only in edit buffer. For saving to permanent memory, see chapters 4.1.2.2 and 5.4.



5.3 BULK DUMP ALL PRESET PARAMETERS

To change / adjust all interface's preset parameters in preset memory:

1. Select values of all preset parameters ①.
2. Select number of requested preset ②.
3. Click the "Generate" button ③.
4. The hexadecimal MIDI SysEx message is generated as a text in text field on bottom of the window ④.
5. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software²¹.
6. Send the message to the interface.
7. The interface stores new values of parameters to chosen permanent preset memory.
8. Note that the changes becomes audible till after the preset is recalled.



²⁰ See chapter 6.2 for recommended MIDI SysEx software.

²¹ See chapter 6.2 for recommended MIDI SysEx software.



5.4 PRESET FUNCTION PROCESSING

To execute a process with interface's presets:

1. Select value or type of one requested preset function ①.
2. Click the corresponding "Generate" button ②.
3. The hexadecimal MIDI SysEx message is generated as a text in text field on bottom of the window ③.
4. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software²².
5. Send the message to the interface.
6. The interface executes requested function immediately.

Remarks:

"Change Preset" function is equivalent to standard "**Program Change**" MIDI command (see chapter 4.1.3).

Instead of "**Save Preset**" SysEx function, a preset can be saved to permanent memory also with CC #119 (see chapter 4.1.2.2).

The screenshot shows the JU6-KBD software interface. The main window title is "JU6-KBD - Roland Juno6 MIDI Keyboard Interface v.1.0". The "Preset Processing" section contains fields for "Change Preset" (set to 1), "Store Preset" (set to 1), and "Reset" (set to HW). Below this is the "SysEx Msg Form" section with "Hex Byte Form" set to "FF" and "Delimiter" set to "space". A large text area at the bottom displays the generated SysEx message: F0 00 20 21 7F 53 30 00 24 00 0C 00 7A 53 F7. The number ③ is circled around this message. At the bottom right are "Reset", "Press HELP or see manual for more info.", "Close", and "Help" buttons. Copyright © 2010 CHD Elektroservis is visible in the bottom right corner.

5.5 OTHER FUNCTIONS

Select "**Hex Byte Form**" ① and "**Delimiter**" character ② as required for your MIDI SysEx software²³. Default setting of the generator is optimized for the recommended **Pocket MIDI** utility (see Chapter 5). However some DAW or MIDI SysEx utilities require different format of the generated text message. Required form of hex bytes and delimiter must be set before a Generate button is pressed.

To clear the text field and return all values to their defaults, click the "**Reset**" button ③.

"**Help**" link ④ opens new window with brief help.

"**Close**" link ⑤ closes browser panel with this SysEx Generator window.

This screenshot is identical to the one above, showing the JU6-KBD software interface. It highlights specific elements with circled numbers: ① points to the "Hex Byte Form" dropdown containing "FF"; ② points to the "Delimiter" dropdown containing "space"; ③ points to the "Reset" button; ④ points to the "Help" link; and ⑤ points to the "Close" link. The rest of the interface and message content are the same as the first screenshot.

²² See chapter 6.2 for recommended MIDI SysEx software.

²³ See the documentation of your DAW for required format.



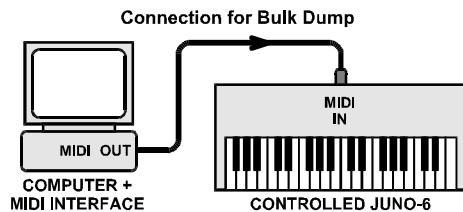
6 RECOMMENDED MIDI SOFTWARE

The hexadecimal MIDI SysEx messages created in the Generators (as described in chapter 5) are in plain text format. The text can not be saved as a *.syx or *.mid file directly, hence a text to SysEx capable utility or DAW is needed.

Pocket MIDI²⁴ is a utility that can be used to send the text as a SysEx message. It is a simple MIDI monitoring tool for both Windows and Mac OSX platforms. **Pocket MIDI** is a freeware for commercial, non-profit or private use.

6.1 SETTING UP THE COMPUTER²⁵ AND SOFTWARE

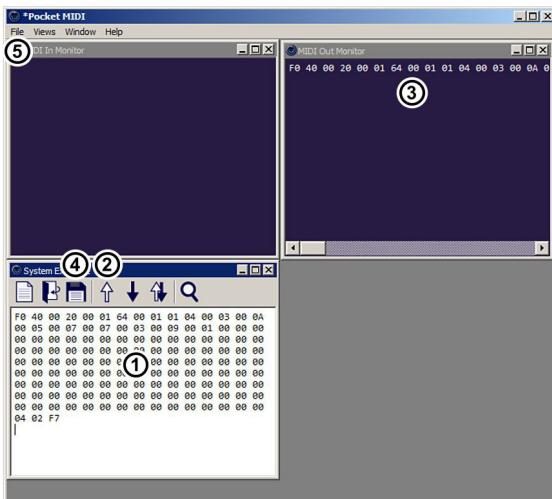
1. Download the **Pocket MIDI** utility at <https://www.morson.jp/pocketmidi-webpage/>
2. Install the utility in your computer.
3. Connect the instrument with JU6-KBD interface accordingly to the picture “**Connection for Bulk Dump**”.
4. Select the MIDI interface **Outputs** to device where the interface is connected to (drop-down menu **Views → MIDI Settings → Input Port / Output Port**).



6.2 SEND THE TEXT SYSEX MESSAGE TO THE INTERFACE

Basic procedure to send any SysEx data to a MIDI device:

1. Generate required SysEx message in the SysEx Messages Generator (as described in Chapter 5)²⁶.
2. **Copy** the text in clipboard (CTR+C) and **paste** (CTRL+V) in “**System Exclusive**” window①.
3. Click the “↑” (“**Transmit**”) arrow ② to send the data to the interface.
4. The sent message appears in the “**MIDI Out Monitor**” window ③.
5. Alternatively you can **save the file** for future use (either by the floppy icon ④ as a *.txt file or in the drop-down “**File**” menu ⑤ as a *.pocketmidi file).



²⁴ Pocket MIDI is Copyright © MORSON JAPAN Co.,Ltd. All rights reserved.

²⁵ Computer MIDI interface must be active / switched on and all necessary MIDI drivers correctly installed.

²⁶ The correct “FF” Hex Byte Form and “ ‘ (space)” for Delimiter are the initial values after the SysEx Generator is launched, so there is no need to change them for Pocket MIDI.



7 APPENDICES

7.1 MIDI IMPLEMENTATION CHART

Device : JU6-KBD

Date : 4 / 2010

Model : 8-429

Version : 1.0

Function		Transmission	Reception	Remarks
Basic Channel	Default Changed	X X	1~16 1~16	¹⁾
Mode	Default Messages	X	Mode 3 X	²⁾
Note Number		X	0~127	³⁾
Velocity	Note ON Note OFF	X X	X X	
After Touch	Key's Channel's	X X	X X	
Pitch Bender		X	O	
Control Changes	16 17 18 19 20 64 119 120 121	X X X X X X X X	O O O O O O O O	Own CC – Key Shift Own CC – Key Priority Own CC – Pitch Bend Range Own CC – Arpg Clock Mode Own CC – Arpg Clock Rate Hold Own CC – Save Preset All Sound Off Reset All Controllers
Program Change		X	O	0~19
System Exclusive		X	O	See description
System Common	Song Position Song Select Tune	X X X	X X X	
System Real Time	Clock Command	X X	O X	
Others	Local ON/OFF All Notes Off Active Sensing Reset	X X X X	X O X O	

Notes :

¹⁾ Can be changed by SysEx Msg

²⁾ Can be changed to Mode 1 by SysEx Msg

³⁾ Only 61 Notes can be accepted at a time - range depends on "Key Shift" parameter setting

Mode 1 : **OMNI ON, POLY**Mode 2 : **OMNI ON, MONO**

O : Yes

Mode 3 : **OMNI OFF, POLY**Mode 4 : **OMNI OFF, MONO**

X : No



7.2 ERROR STATUS INDICATION

If any fatal errors occur during the interface operation (eg. error in MIDI communication), the software stops automatically the device and the user is informed by the permanently sounding tone generators C2 + D#2 + F#2.

In that case, it is necessary to reset the interface for proper operation refresh - it is necessary turn the instrument off and turn it on repeatedly after a moment.

7.3 WARRANTY CONDITIONS

The equipment is provided with **thirty-months warranty** starting from the date of the equipment take-over by the customer. This date must be specified on warranty list together with dealer's confirmation.

During this period of time, all defects of equipment or its accessories, caused by defective material or faulty manufacturing, will be removed free of charge.

Warranty repair is asserted by the customer against the dealer.

Warranty period is to be extended for the time period, during which the product was under the warranty repair.

The relevant legal regulations take effect in case of cancellation of purchase contract.

The customer will lose the right for free warranty repair, if he will not be able to submit properly filled out warranty list or if the defects of the product had been caused by:

- unavoidable event (natural disaster),
- connecting the device to the incorrect supply voltage,
- inputs or outputs overloading by connecting the signals source or load source with not-corresponding characteristics etc.,
- faulty equipment operation, which is at variance with the instructions referred-to in the operating manual,
- mechanical damage caused by consumer during transportation or usage of equipment,
- unprofessional interference with the equipment or by equipment modification without manufacturer's approval.

This manual in PDF form is available at manufacturer's web pages.



ROLAND JUNO-6 / JUNO-60 MIDI Interface

Model JU6-KBD, Nr. 8-429, ver. 2.00

Document: 842920_manual

Manufacturer: CHD Elektroservis, Czech Republic

www.chd-el.cz info@chd-el.cz