K770-KBD

MIDI Interface for
Korg 770 / 700S / 900PS Keyboard

Model 8-430
Version 1.0

Owner's Manual

1   DEVICE DESCRIPTION

K770-KBD is a MIDI retrofit for **Korg 770 / 700S / 900PS** synthesizers.

Main features:

- **Controls the KORG's keyboard** from MIDI (receive only)
- **49 MIDI notes** (4 octaves) range
- **Transpose** function
- **Pitch bend** (up to +/- 1 Octave)
- **Aftertouch** (VCO pitch modulation up to $\pm$ 4 semitones)
- **Arpeggiator** (UP, DOWN and two UP/DOWN modes, internal and external MIDI clock syncable)
- **Hold pedal**
- **Legato pedal**
- **Local On/Off** function
- **MIDI Thru** (no MIDI Thrubox necessary)
- User **MIDI CCs control** of the interface parameters (as well as SysEx for experts)
- 128 **internal memory presets** to store the interface user settings
- Instrument's keyboard, knobs, sliders and switches **are not transmitted to MIDI**! The tone parameters **are not MIDI controllable**!
- **Original features of the Korg instrument are not changed** and the instrument can be used the same way as before the interface installation.

2   CONNECTION TO MIDI SYSTEM

The interface has connectors for both MIDI IN and combined OUT/THRU.

2.1   STANDARD WORKING MODE SET-UP

Data from host MIDI system (PC, DAW, sequencer, master keyboard, etc.) are coming to MIDI-IN input of the interface.

All MIDI data coming to MIDI input of the interface are transferred to **THRU/OUT** MIDI output of the interface unaffected (**THRU** function). The **THRU** function enables another MIDI device(s) to be connected without additional MIDI Thru-Box. MIDI input of the other (next in chain) MIDI device can be simply fed from **THRU/OUT** MIDI output of the interface - see fig. 1.

If there are no other MIDI devices to be used in chain, only MIDI-IN cable is necessary.

Figure 1 – Connection to MIDI system for standard working mode
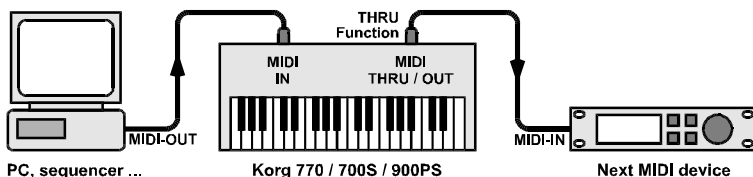
2.2 MEMORY BACK-UP SET-UP

The interface can transmit its own MIDI System Exclusive data. These messages are used for back-up / recovery of the internal memory settings.

To back-up the memory of the interface, connect interface's THRU/OUT MIDI output to MIDI input of the host system (PC, DAW, sequencer…)[1] - see fig. 2.

Figure. 2 – Connection to MIDI system for memory content transfer
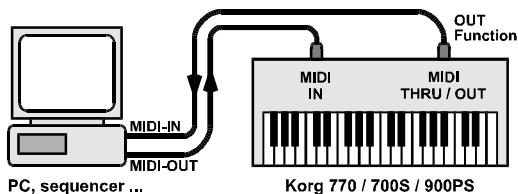
3 INTERFACE OPERATION

The interface has a single manual control element – **Reset button** – which turns the interface to "**Stand-by**" working mode. All other functions are controlled by MIDI commands. Working status of the interface is indicated by **bi-color** (red / green) **LED**.

3.1 INITIALIZATION SEQUENCE

When the instrument is switched on, the **reset sequence** of the interface **is executed automatically**. The interface is now switched in the initial "Stand-by" mode and user preset Nr. 1 is recalled. **Interface does not affect the instrument now** – i.e. the instrument can be used usual way like no MIDI interface has been installed.

3.2 OPERATION MODES

In "**Stand-by**" mode the indication LED doesn't light and MIDI data are transferred from MIDI input to MIDI-THRU/OUT output of the interface. The interface is **prepared for receiving of an acceptable MIDI Note** (see chapter 5.1.1) or **Local Off command** command (see chapter 5.1.4.1).

As soon as the valid MIDI note or MIDI Local Off is received the interface is turned to "**MIDI**" mode. The **instrument's keyboard is disconnected** (see chapter 8) and **VCO / GATE circuits are controlled by Note-On/Off** MIDI commands and various MIDI CCs (see table 4 for full list). All other control switches, knobs and sliders on the instrument's panel remain fully functional.

To return back to "**Stand-by**" mode (to control the instrument from its own keyboard again), **use CC #122** (Local Off/On – see chapter 5.1.4.1) **or press** interface's **Reset button** mounted on panel **or just switch the instrument off/on.**

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[1] **Attention!** Disable the MIDI ECHO, THRU functions of your sequencer in this case to prevent communication loops that might "freeze" your MIDI system (see chapter 9.2)!

3.3   INDICATION OF WORKING STATUS

The actual interface status is indicated by the bi-color (red / green) LED.

- "**Stand-by**" mode - the LED is **off** .
- "**MIDI**" mode - the LED lights **red** continuously.
- If the **LED indication function is enabled** (i.e. Gate, MIDI event or Arpeggio Clock) – the LED lights **green**.
- "**Error**" message - the indication LED starts to **blink yellow** (See chapter 9).

4   INTERFACE PARAMETERS

The parameters are divided **in two basic groups – global system parameters and preset parameters**. All parameters are stored in internal memory banks of the interface. There is one memory bank for global system parameters and one memory bank with 128 user presets. Content of both memory banks **can be backed-up / restored** by Bulk Dump SysEx Messages (see separate System Exclusive communication manual).

The **user preset can be changed by MIDI Program Change**[2] command.

4.1   GLOBAL SYSTEM PARAMETERS

The system parameters **control the basic functions** (e.g. MIDI Channel, etc.) of the interface independently on the actual selected preset.

Table 1 – Range of valid values and default values of system parameters			
System parameter name	Valid values	Factory Reset	
		Value	Meaning
MIDI Channel	0 ~ 15	0	MIDI Channel Nr. 1 selected
Auto Local	0 ~ 1	1	Activation by MIDI Note enabled
Auto Reset	0 ~ 1	1	Auto-reset after MIDI error enabled
Gate Interrupt Duration	0 ~ 120	10	Interrupt pulse duration is 3 ms

System parameters in system memory bank can be changed by Bulk Dump SysEx Messages only (see separate System Exclusive communication manual).

4.1.1 MIDI CHANNEL

The parameter **selects the communication MIDI channel** of the interface. It is possible to choose any of the 16 MIDI channels.

4.1.2 AUTO LOCAL

The parameter enables **automatic activation of the interface** to the "**MIDI**" mode after the first valid Note-On MIDI command is received (the MIDI Note must be sent on actual MIDI channel and its number must be in valid range). If the parameter it is set to "Off", the automatic activation of the "**MIDI**" mode is disabled.

4.1.3 AUTO RESET

The parameter enables **automatic reset** of the interface if a **MIDI communication problem occurs**. If the parameter is set to "On" and an error in the MIDI communication occurs, the interface stops operating and returns to basic stand-by mode automatically. If the parameter is set to "Off", standard error procedures will be executed (see chapter 9).

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[2] After the interface reset, preset Nr. 1 is always selected.

4.1.4 GATE INTERRUPT DURATION

The parameter defines duration of **interrupt pulses for instrument's envelope retriggering** generated by the interface for non-legato playing style **while the arpeggio is on**.

Remark: *Duration of generated interrupt pulses need not be changed from the factory pre-defined setting in most cases. Only if the instrument reacts unreliable (i.e. some pulses are omitted and the arpeggiator runs irregularly) it is necessary to adjust the duration of the clock pulses. If that situation occurs, see chapter 13.*

4.2 PRESET PARAMETERS

The **preset parameters** define **how the MIDI commands are controlling VCO / GATE circuits** of the instrument.

Preset parameters values **can be modified by MIDI CCs** in a real time during playing the instrument (see table below). After the factory reset, the following values are stored in all 128 user presets:

Table 2 – Range of valid values and a default values of preset parameters				
Preset parameter name	**Valid values**	**Factory Reset**		**Controlled by CC Nr.**
		Value	**Meaning**	
Key Shift	0 ~ 79	48	MIDI Notes from Nr. 48 to Nr. 96 are accepted	16
Pitch Bend Range	0 ~ 12	12	Detuning up to ±12 semitones	17
Aftertouch Bend Range	0 ~ 127	64	Channel Aftertouch has no effect to VCOs	18
Note Buffer Size	0 ~ 6	6	The buffer keeps last eight received MIDI notes	19
Arpeggio Mode	0 ~ 4	0	Arpeggiator off	20
Arpeggio Clock Source	0 ~ 2	0	Internal clock	21
Arpeggio Rate	0 ~ 127	90	Clock frequency 8 Hz / period 0,125 sec (Internal)	22
Indicator Mode	0 ~ 3	1	"Gate" status indication	23

Any user **modifications are stored in an edit buffer only** and remain valid until the instrument is switched off or the interface reset by Reset button or a actual preset number is changed.

To store the edited parameter values in the memory permanently, it is necessary to **save** them. To do so use either **MIDI CC #119** to save in the **active preset** (see chapter 5.1.4.2)[3].

Memory backup / restore function for any of the 128 memory banks is also supported (see separate System Exclusive communication manual).

4.2.1 KEY SHIFT (CC #16)

The interface accepts **48 MIDI notes i.e. four octaves keyboard range**. The acceptable **range can be shifted / transposed by Key Shift parameter** in whole range of MIDI notes. Each value corresponds to one semitone. Valid range of the parameter is from 0 to 79 (equal to 0 to +79 semitones).

If no shift is chosen (i.e. parameter value is equal to 0), lowest key corresponds to MIDI note Nr. 0 and highest key corresponds to MIDI note Nr. 48. If shift is +1 semitone (parameter value is equal to 1), lowest key corresponds to MIDI note Nr. 1 and highest key corresponds to MIDI note Nr. 49, etc. up to +79 semitones shift (parameter value is equal to 79). In the other words, **value of the parameter is equal to number of the lowest acceptable MIDI note** (see fig. 3).

This parameter is active only in the "**MIDI**" working mode of the interface. The parameter value can be controlled by **MIDI CC Nr. 16** - see chapter 5.1.4.2.

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[3] To save in any of the 128 user presets directly, use special SysEx command (see separate System Exclusive communication manual).

Figure 3 – "Key Shift" parameter
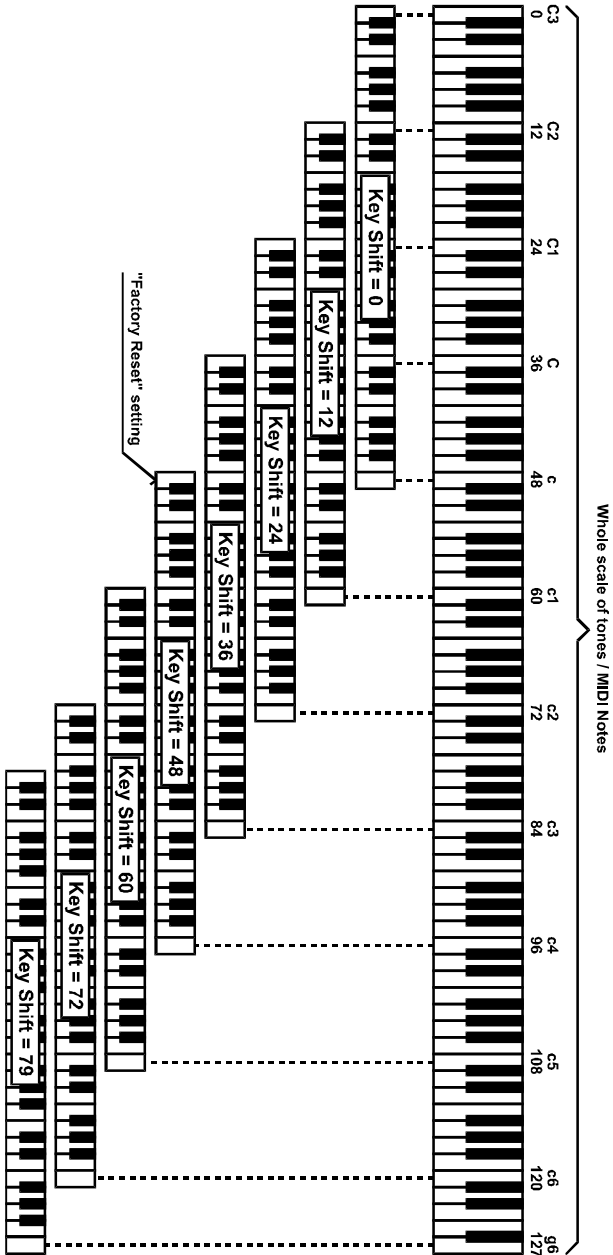
4.2.2 PITCH BEND RANGE (CC #17)

The parameter **sets the maximum range** of detuning by the **Pitch Bend** (Pitch Wheel) MIDI command. Value of the parameter is from 0 to 12. If the value is set to 0, the detuning is disabled and the Pitch Bend command is ignored. Values 1 - 12 sets the maximum detune range in semitones, i.e. **±1 octave** for the value equal to 12[4].

This parameter is active only in the "**MIDI**" working mode of the interface. The parameter value can be controlled by **MIDI CC Nr. 17** - see chapter 5.1.4.2.

4.2.3 AFTERTOUCH BEND RANGE (CC #18)

Frequency of the **VCO can be detuned** ("bent") by **Channel Afterouch** MIDI command. The parameter sets the amount of Channel Afterouch command modulation of the VCO frequency. Maximal VCO frequency shift is **±4 semitones**[4].

This parameter is active only in the "**MIDI**" working mode of the interface. The parameter value can be controlled by **MIDI CC Nr. 18** – see chapter 5.1.4.2.

The parameter value can be set in range of 0 to 127. If the value is **equal to 64**, Channel Afterouch MIDI command

Figure 4 – "Aftertouch Bend Range" parameter

doesn't affect instrument's VCO frequency. For parameter values **from 65 to 127**, VCO frequency is increased (**bent up**). For parameter values **from 63 to 0**, VCO frequency is decreased (**bent down**) - see fig. 4.

4.2.4 NOTE BUFFER SIZE (CC #19)

Although the Korg 770 / 700 / 700S / 900PS / M500 is a monophonic instrument, the **interface memorizes the last active MIDI Note-On commands** in its internal buffer. The size of the buffer can be set by the "Note Buffer Size" parameter in the range from 2 to 8 notes. If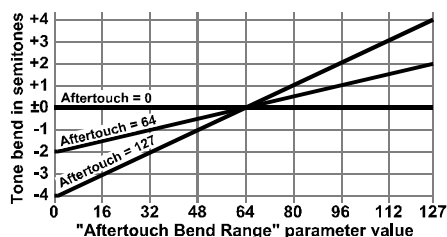 more keys (than the defined range) are pressed and hold on the master keyboard in sequence and the last played key is released, the interface returns back to the previous pressed note (key). If more MIDI notes (than the defined range) has been received, the last received note replaces the first received note - last received note has the highest priority.

If arpeggiator is active, this note memory buffer **holds the chord to be arpeggiated**.

Value of the parameter is 0 to 6. It correcponds to the buffer size from 2 to 8 notes (value 0 for 2 notes, 1 for 3 notes, etc. up to value 6 for 8 notes). The parameter value can be controlled by **MIDI CC Nr. 19** – see chapter 5.1.4.2.

4.2.5 ARPEGGIO MODE (CC #20)

There are five arpeggiator modes available:

- "**Off**" (parameter value 0) – the arpeggiator is off
- "**Up**" (parameter value 1) – tones from **first** received Note (pressed key) to **last** received Note.
- "**Down**" (parameter value 2) – tones from **last** received Note (pressed key) to **first** received Note
- "**Up-Down 1**" (parameter value 3) – tones from **first** received Note (pressed key) to **last** received Note and then in **opposite direction**
- "**Up-Down 2**" (parameter value 4) – tones from **first** received Note (pressed key) to **last** received Note and then in **opposite direction** (Similar to "Up-Down 1", but first and last received Notes of the chord are not repeated).

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[4] The detune range of the VCO is limited for the tones near the lowest and highest end of the keyboard range. This limitation is caused by the construction of the Korg instrument.

Figure 5 – Arpeggio modes example

The interface **memorizes from two to eight**[5] **active MIDI Notes** for the arpeggio play mode[6]. The arpeggiated chord can content from two up to eight tones thus. Note that the arpeggio chord **tones are played in the order they were received** (from the first to the last or vice versa) and **not in their pitch order** (from the low to the high or vice versa)!

The parameter value can be controlled by **MIDI CC Nr. 20** – see chapter 5.1.4.2.

4.2.6 ARPEGGIO CLOCK SOURCE (CC #21)

The arpeggiator rate can be synchronized from various tempo sources:

- "**Internal**" (parameter value 0) – **internal clock generator**. The fixed tempo is set by Arpeggio Rate parameter (see chapter 4.2.7).
- "**MIDI Clock**" (parameter value 1) – **external MIDI clock**[7]. MIDI Clock dividing ratio (relative arpeggio speed) is set/adjusted by Arpeggio Rate parameter (see chapter 4.2.7).
- "**CC**" (parameter value 2) – a **special mode** where the arpeggiator is **controlled directly by CC #22**. Each time the CC #22 is received (any value), one clock pulse is generated and shifts the playing tone to the next tone in the chord[8].

The parameter value can be controlled by **MIDI CC Nr. 21** – see chapter 5.1.4.2.

4.2.7 ARPEGGIO RATE (CC #22)

The parameter selects the **rate of synchronization clock pulses for arpeggiator** if "Internal" or "MIDI Clock" modes are active (see Arpeggio Clock Source section above). The parameter is ignored in "CC" mode.

Arpeggio Rate parameter values are 0 to 127 for "Internal" and "MIDI Clock" modes.

Table 3 (see next page) shows selected **most common MIDI clock synchronization coversion rates** . For detailed table of all possible values and times for both "MIDI Clock" and "Internal" modes see appendix – chapter 12.

The parameter value can be controlled by **MIDI CC Nr. 22** - see chapter 5.1.4.2.

4.2.8 INDICATOR MODE (CC #23)

The parameter sets the function of interface's green LED indicator. Four functions are available:

- "**Off**" (parameter value 0) – The green LED indicator is **turned off**
- "**Gate**" (parameter value 1) - The green LED indicator is copying the **status of envelope generator** – GATE signal.
- "**MIDI Event**" (parameter value 2) - The green LED indicates **acceptable incoming MIDI commands**.

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[5] Number of memorized MIDI notes is set by Note Buffer Size parameter (see chapter 4.2.4).
[6] The arpeggiator works only with MIDI Notes. It cannot be activated for KORG's own keyboatd!
[7] Typically DAW or hardware MIDI sequencer or drum machine. Please check the documentation of your DAW/Sequencer how to set up the MIDI clock correctly.
[8] This setting can be used for special effects – irregular runing of the arpeggiator.

- **"Arpg Clock"** (parameter value 3) - The green LED indicates clock pulses for arpeggiator for all three Arpeggio Clock sources.

The parameter value can be controlled by **MIDI CC Nr. 23** – see chapter 5.1.4.2.

Parameter value	Interval between clock pulses in partial notes										
	1/2	1/2 triplet	1/4	1/4 triplet	1/8	1/8 triplet	1/16	1/16 triplet	1/32	1/32 triplet	1/64 triplet
32	2	3	4	6	8	12	16	24	32	48	96
64	-	2	-	4	-	8	-	16	-	32	64
80	1	-	2	3	4	6	8	12	16	24	48
96	-	1	-	2	-	4	-	8	-	16	32
104	-	-	1	-	2	3	4	6	8	12	24
112	-	-	-	1	-	2	-	4	-	8	16
116	-	-	-	-	1	-	2	3	4	6	12
120	-	-	-	-	-	1	-	2	-	4	8
122	-	-	-	-	-	-	1	-	2	3	6
124	-	-	-	-	-	-	-	1	-	2	4
125	-	-	-	-	-	-	-	-	1	-	3
126	-	-	-	-	-	-	-	-	-	1	2
127	-	-	-	-	-	-	-	-	-	-	1

Table 3 – Conversion of the Arpeggio Rate parameter value to length of arpeggiator interval for MIDI Clock source

5 MIDI IMPLEMENTATION

5.1 CHANNEL COMMANDS

The interface recognizes "**Note-Off**", "**Note-On**", "**Control Changes (CCs)**", "**Channel Aftertouch**", "Pitch Bend" and "**Program Change**" channel MIDI commands. All MIDI channel commands are received on the MIDI channel defined by the global system parameter MIDI Channel.

5.1.1 NOTE ON / OFF

The interface accepts Note-On and Note-Off commands (last note priority) **in the range of max. 48 notes** (i.e. 4 octaves). Accepted note numbers are defined by the Key Shift preset parameter (see chapter 4.2.1).

The received MIDI Notes are kept in the note buffer. Max. number of memorized notes is set by Note Buffer Size preset parameter (see chapter 4.2.4).

Note-On MIDI command is also used for **automatic activation of the interface** to "MIDI" working mode (see chapter 4.1.2).

5.1.2 CHANNEL AFTERTOUCH

Channel Aftertouch command **can affect instrument's VCO** accordingly to the Aftertouch Bend Range preset parameter setting (see chapter 4.2.3).

5.1.3 PITCH BEND

Pitch Bend (Wheel) command can control instrument's VCO accordingly to the Pitch Bend Range preset parameter setting (see chapter 4.2.2).

5.1.4 CONTROL CHANGES (CCs)

The interface **recognizes standard MIDI controllers** (CC) Nr. 64, 68, 120, 121, 122, 123 and individually defined CCs Nr. 16 to 23 and 119 (for details see table 4 and description below).

CC Nr.	Name	Function	Valid value
		Table 4 – Acceptable CCs overview	
16 [1]	Key Shift	Controls "Key Shift" preset parameter	0 ~ 127, see table 5
17 [1]	Pitch Bend Range	Controls "Pitch Bend Range" preset parameter	0 ~ 127, see table 6
18 [1]	Aftertouch Bend Range	Controls "Aftertouch Bend" preset parameter	0 ~ 63 = negative 64 = off 65 ~ 127 = positive
19 [1]	Note Buffer Size	Controls "Note Buffer Size" preset parameter	0 ~ 127, see table 7
20 [1]	Arpeggio Mode	Controls "Arpeggio Mode" preset parameter	0 ~ 25 = Off 26 ~ 51 = Up 52 ~ 76 = Down 77 ~ 102 = Up-Down 1 103 ~ 127 = Up-Down 2
21 [1][2]	Arpeggio Clock Source	Controls "Arpeggio Clock Source" preset parameter	0 ~ 42 = Internal 43 ~ 85 = MIDI Clock 86 ~ 127 = CC
22 [1][2]	Arpeggio Rate	Controls "Arpeggio Rate" preset parameter or generates one clock pulse	0 ~ 127, see table 3 and 8
23 [1]	Indicator Mode	Controls "Indicator Mode" preset parameter	0 ~ 31 = Off 32 ~ 63 = Gate 64 ~ 95 = MIDI Event 96 ~ 127 = Arpg Clock
64 [1]	Hold	Standard MIDI function	0 ~ 63 = Off 64 ~ 127 = On
68 [1]	Legato	Standard MIDI function	0 ~ 63 = Off 64 ~ 127 = On
119 [1]	Save Preset	Saves edited parameters in the buffer to actual preset memory location	0 = Not significant 1 ~ 127 = Save
120 [1]	All Sound Off	Standard MIDI function	0
121 [1]	Reset All Controllers	Standard MIDI function	0
122	Local Off / On	Standard MIDI function	0 ~ 63 = Off 64 ~ 127 = On
123 [1]	All Notes Off	Standard MIDI function	0

Remarks:
[1] The CC is only relevant in "MIDI" working mode of the interface (works only with MIDI Notes).
[2] The CC is only relevant if "Arpeggio Mode" is not "Off".

5.1.4.1 STANDARD CONTROLLERS

CC #64 – Hold

The controller works standard way: **holds tone generator** of the instrument (active) during the Hold pedal is pressed. Values from 64 to 127 are recognized as on-status, values from 0 to 63 as off-status.

CC #68 – Legato

The controller works standard way: **frequency of instrument's tone generator is changed without envelope generator retiggering** (i.e. the instrument is playing legato). Values from 64 to 127 are recognized as on-status, values from 0 to 63 as off-status.

The CC #68 works also when the interface's arpeggiator is on (in all arpeggiator modes except "Off" mode).

CC #120 – All Sound Off (ASO)

The instrument is muted (GATE signal is switched off immediately after reception of this controller – independently on MIDI Note-On commands received previously.

Note that the value of this CC must be always zero.

CC #121 – Reset All Controllers (RAC)

MIDI CCs and all other controls are set to their initial status after reception of this controller:

- CC#64 Hold → off (value 0)
- CC#68 Legato → off (value 0)
- Pitch Bend (Pitch Wheel) → middle position (value 4096)

Note that the value of the CC #121 must be always 0.

CC #122 – Local On / Off

Local On/Off is the **only MIDI CC working in both "Stand-by" and "MIDI"** working modes of the interface.

For the values from 0 to 63 (i.e. "Local Off"), instrument's keyboard is disconnected and it is controlled by Note On/Off MIDI commands ("**MIDI**" working mode).

Values from 64 to 127 (i.e. "Local On") returns control back to the instrument's keyboard ("**Stand-by**" working mode).

CC #123 – All Notes Off (ANO)

The instrument is muted (GATE signal is switched off immediately after reception of this controller – independently on MIDI Note-On commands received previously.

Note that the value of this CC must be always zero.

5.1.4.2 CONTROLLERS FOR PRESET PARAMETERS EDITING AND SAVING

CC #16 – Key Shift

CC #16 controls **Key Shift parameter** (see chapter 4.2.1). Conversion of CC #16 value to the parameter value shows table 5 (see next page).

CC #17 – Pitch Bend Range

CC #17 controls the **Pitch Bend Range parameter** (see chapter 4.2.2). Conversion of CC #17 value to the parameter value shows table 6 (see next page).

CC #18 – Aftertouch Bend Range

CC #18 controls the **Aftertouch Bend Range parameter** (see chapter 4.2.3). Value of CC #18 is equal to the parameter value directly - values from 0 to 63 decrease the tone pitch, values from 65 to 127 increase the tone pitch and for value 64, the tone pitch is not affected by Channel Aftertouch MIDI command.

CC #19 – Note Buffer Size

CC #19 controls the **Note Buffer Size parameter** (see chapter 4.2.4). Conversion of CC #19 value to the parameter value shows table 7 (see next page).

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

Table 6 – Conversion of CC #17 value to Pitch Bend Range parameter value									
CC value	Param. value	CC value	Param. value	CC value	Param. value	CC value	Param. value	CC value	Param. value
0 ~ 9	0	30 ~ 39	3	60 ~ 68	6	89 ~ 98	9	119 ~ 127	12
10 ~ 19	1	40 ~ 49	4	69 ~ 78	7	99 ~ 108	10		
20 ~ 29	2	50 ~ 59	5	79 ~ 88	8	109 ~ 118	11		

Table 7 – Conversion of CC #19 value to Note Buffer Size parameter value							
CC value	Param. value	CC value	Param. value	CC value	Param. value	CC value	Param. value
0 ~ 18	0 (2 notes)	37 ~ 54	2 (4 notes)	74 ~ 91	4 (6 notes)	110 ~ 127	6 (8 notes)
19 ~ 36	1 (3 notes)	55 ~ 73	3 (5 notes)	92 ~ 109	5 (7 notes)		

CC #20 – Arpeggio Mode

CC #20 controls the **Arpeggio Mode parameter** (see chapter 4.2.5). Note that CC #20 values from 0 to 25 correspond to "Off" mode, 26 to 51 to "Up" mode, 52 to 76 to "Down" mode, 77 to 102 to "Up-Down 1" mode and 103 to 127 to "Up-Down 2" mode.

CC #21 – Arpeggio Clock Source

CC #21 controls the **Arpeggio Clock Source parameter** (see chapter 0). Note that CC #21 values from 0 to 42 correspond to "Internal" source, 43 to 85 to "MIDI Clock" source and 86 to 127 to "CC" source.

CC #22 – Arpeggio Rate

Function of CC #22 **depends on type of arpeggiator clock source** set by the Arpeggio Clock Source parameter (see chapter 0).

In "**Internal**" and "**MIDI Clock**" modes, CC #22 controls the **Arpeggio Rate parameter** (i.e. rate of clock pulses – see chapter 4.2.7). Value of CC #22 is equal to the parameter value directly.

In "**CC**" mode, **each time the CC #22 is received** (any value), one arpeggio **clock pulse is generated**, i.e. next tone of the arpeggio sequence is played.

CC #23 – Indicator Mode

CC #23 controls the **Indicator Mode parameter** (see chapter 4.2.8). Note that CC#53 values from 0 to 31 correspond to "Off" mode, 32 to 63 to "Gate" mode, 64 to 95 to "MIDI Event" mode and 96 to 127 to "Arpg Clock" mode of the parameter.

CC #119 – Preset Save

Content of the preset edit buffer can be **saved to user preset memory** by CC #119. Acceptable range of CC #119 value is 1 to 127. Value equal 0 is ignored. The data are saved **to actual preset number** selected previously by MIDI Program Change command[9].

5.1.5 PROGRAM CHANGE

Program Change command **selects the user parameter presets**. All program numbers from 0 to 127 are accepted, corresponding to presets numbers from 1 to 128.

5.2 COMMON SYSTEM COMMANDS

5.2.1 CLOCK

If any other clock source than "MIDI Clock" is selected by Arpeggio Clock Source parameter, MIDI Clock commands are ignored.

If "**MIDI Clock**" source is set, the interface receives MIDI Clock commands for the arpeggiator synchronization – the **arpeggiator is synchronized with the tempo of played song**. Rate of the arpeggio is controlled by the Arpeggio Rate parameter (see table 3).

5.2.2 SYSTEM RESET

When the System Reset command is received, a **complete hardware reset** of the interface is executed (the same as after the instrument is switched on or the RESET button is pressed) and the interface is switched to "Stand-by" mode.

5.3 SYSTEM EXCLUSIVE MESSAGES

The System Exclusive communication enables user to adjust the values of global system parameters in system memory bank or to rewrite content of partial preset in preset memory bank. Further it is possible 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 separate manual.

For easier creation of SysEx messages, please use the software generator available at manufacturer's web pages: **www.chd-el.cz** (see chapter 7).

If you need to calculate simply the "Checksum" byte necessary for any SysEx message, you can use a special software calculator:
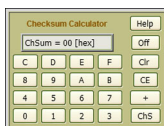
The calculator is based on Java script so it can be launched under any operation system (PC, MAC, ...) which includes a web browser (Opera, Firefox, Chrome, ...). The Calculator is available at manufacturer's web pages.

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[9] Note that after the reset of the interface (in stand-by mode), preset Nr. 1 is selected automatically.

6   MIDI IMPLEMENTATION CHART

MIDI IMPLEMENTATION CHART

Device : K770-KBD   **Date : 3 / 2019**

Model : 8-430   **Version : 1.0**

Function		Transmission	Reception	Remarks
Basic	Default	X	1~16	[1])
Channel	Changed	X	1~16	[1])
Mode	Default	X	Mode 3	Not Altered
	Messages	X	X	
Note Number		X	0~127	[2])
Velocity	Note ON	X	X	
	Note OFF	X	X	
After	Key's	X	X	
Touch	Channel's	X	O	[2])
Pitch Bender		X	O	[2])
Control Changes	16	X	O	Key Shift [3])
	17	X	O	Pitch Bend Range [3])
	18	X	O	Aftertouch Bend Range [3])
	19	X	O	Note Buffer Size [3])
	20	X	O	Arpeggio Mode [3])
	21	X	O	Arpeggio Clock Source [3])
	22	X	O	Arpeggio Rate [3])
	23	X	O	Indicator Mode [3])
	64	X	O	Hold
	68	X	O	Legato
	119	X	O	Save Preset [3])
	120	X	O	All Sound Off
	121	X	O	Reset All Controllers
Program Change		X	0~127	
System Exclusive		O	O	See description
System	Song Position	X	X	
Common	Song Select	X	X	
	Tune	X	X	
System	Clock	X	O	
Real Time	Command	X	X	
Others	Local ON/OFF	X	O	
	All Notes Off	X	O	
	Active Sensing	X	X	
	Reset	X	O	

Notes : [1]) User defineable by device's system parameters.
 [2]) Depend on setting of device's preset parameters.
 [3]) Own CC, see chapter 5.1.4.2.

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   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.
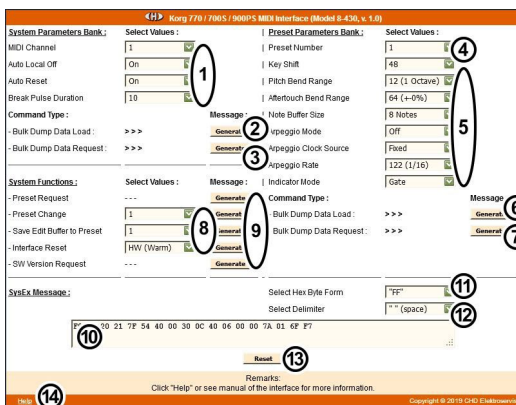
The generator is based on Java scripts so it can run on any computer with web browser (Windows, OSX, etc.)[10]. To send the generated commands you will also need an utility to send the generated text[11] as a MIDI SysEx dump (see chapter 7.2 for recommended software[12]).

7.1   USAGE OF SYSEX MESSAGES GENERATOR

Visit our website and download the "**K770-KBD_syxgen.zip**" archive. Expand the archive to a selected folder on your computer's hard drive (i.e. "**K770-KBD.html**" and "**K770-KBD_help.html**" files and "**media**" sub-folder).

To launch the SysEx messages generator, simply open the "**K770-KBD.html**" file in your web browser (e.g. by clicking on the file icon). The generator window opens (fig. 6).

7.1.1   SYSTEM PARAMETERS SETTING

To change / adjust the system parameters (System Parameters Bank section of the generator window, fig. 6):

1. Select requested values of all system parameters ①.
2. Click the "**Bulk Dump Data Load - Generate**" button ②.
3. The required hexadecimal SysEx message is generated as a text in text field on bottom of the window ⑩.
4. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software.
5. Send the message to the interface.
6. Press interface's RESET button or switch the instrument off and then on again after a moment. Now the interface starts operation with the new system parameters settings.

7.1.2   SYSTEM PARAMETERS REQUEST

To request actual system parameters values (System Parameters Bank section of the generator window, fig. 6):

1. Click the "Bulk Dump Data Request - Generate" button ③.
2. The required hexadecimal SysEx message is generated as a text in text field on bottom of the window ⑩.
3. Copy the text in clipboard (CTRL+C) and paste (CTRL+V) to a MIDI Sysex software.
4. Send the message to the interface.
5. The interface responds immediately – it sends "Bulk Dump Data Load" type SysEx message.
6. Now you can save the received message in your computer for further use.

Figure 6 – SysEx Generator window

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[10] Note that scripts and ActiveX elements must be enabled in web browser for proper function of the generator.
[11] 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.
[12] 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.

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7.1.3 PRESET PARAMETERS SETTING

To change / adjust parameters of a preset (Preset Parameters Bank section of the generator window, fig. 6):

1. Select number of requested preset ④.
2. Select values of **all** parameters ⑤.
3. Click the "Bulk Dump Data Load - Generate" button ⑥.
4. The required hexadecimal SysEx message is generated as a text in text field on bottom of the window ⑩.
5. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software.
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 changed preset is recalled.

7.1.4 PRESET PARAMETERS REQUEST

To request actual parameters of a preset (Preset Parameters Bank section of the generator window, fig. 6):

1. Select number of requested preset ④.
2. Click the "**Bulk Dump Data Request - Generate**" button ⑦.
3. The required hexadecimal SysEx message is generated as a text in text field on bottom of the window ⑩.
4. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software.
5. Send the message to the interface.
6. The interface responds immediately – it sends "**Bulk Dump Data Load**" type SysEx message.
7. Now you can save the received message in your computer for further use.

7.1.5 GLOBAL SYSTEM FUNCTIONS PROCESSING

To execute a process with interface's presets etc. (System Functions section of the generator window, fig. 6):

1. Select value or type[13] of one requested global function ⑧.
2. Click the corresponding "**Generate**" button (in the same row) ⑨.
3. The required hexadecimal SysEx message is generated as a text in text field on bottom of the window ⑩.
4. **Copy** the text in clipboard (CTRL+C) and **paste** (CTRL+V) to a MIDI Sysex software.
5. Send the message to the interface.
6. The interface executes requested function immediately.

7.1.6 OTHER FUNCTIONS

1. Select "**Hex Byte Form**" ⑪ and "**Delimiter**" character ⑫ as required for your MIDI SysEx software[14]. Default setting of the generator is optimized for the recommended utility (see chapter 7.2). However some DAW or MIDI SysEx utilities require different format of the generated text message.
2. To clear the text field and return all values to their defaults, click the "**Reset**" button ⑬.
3. "**Help**" link ⑭ opens new window with brief help.

7.2   RECOMMENDED MIDI SOFTWARE

The hexadecimal MIDI SysEx messages created in the Generators (as described in chapter 7.1) 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 MIDI[15] 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. This is a freeware for commercial, non-profit or private use.

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[13] For details about Global System Functions, see separate manual of MIDI System Exclusive communication.
[14] See the documentation of your DAW for required format. Form of hex bytes and delimiter must be set before a Generate button is pressed.

7.2.1 SETTING UP THE COMPUTER AND SOFTWARE

1. Download the **Pocket MIDI** utility at **https://www.morson.jp/pocketmidi-webpage/**
2. Install the utility in your computer.
3. Select the MIDI interface **Outputs** to device where the interface is connected to[16] (drop-down menu **Views → MIDI Settings → Input Port / Output Port**).
4. Connect the computer with the interface (accordingly to the fig. 7)[17].
5. Send and receive required SysEx messages to / from the interface

Figure 7 – Connection for Bulk Dump
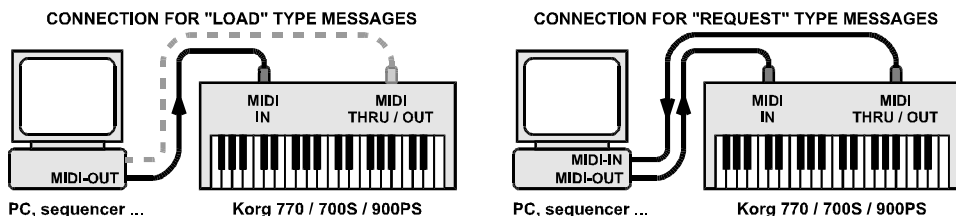
7.2.2 SEND THE TEXT SYSEX MESSAGE TO THE INTERFACE

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

1. Generate required ("**Load**" or "**Function**" type) SysEx message in the SysEx Messages Generator (as described in Chapter 7.1)[18].
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).

---
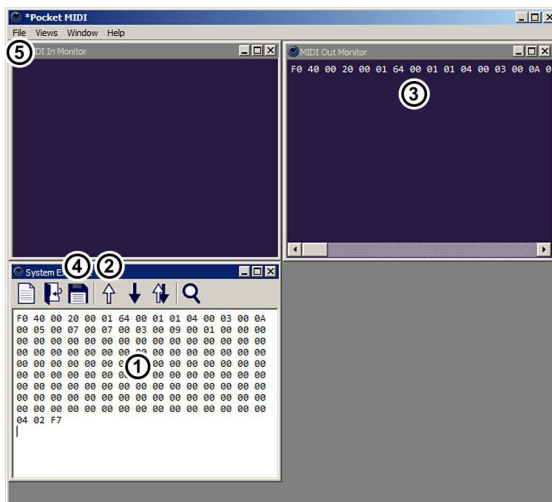
[15] Pocket MIDI is Copyright © MORSON JAPAN Co.,Ltd. All rights reserved.
[16] Computer's MIDI interface must be active / switched on and all necessary MIDI drivers correctly installed.
[17] MIDI cable from interface's MIDI output to computer's MIDI input is not necessary for "Load" type messages but it can remain connected. There is no need to disconnect it.
[18] 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.

7.2.3 REQUEST THE SYSEX DATA FROM THE INTERFACE

Basic procedure to request a SysEx data from a MIDI device and to record the received data:

1. Generate required ("**Request**" or "**Function**"[19] type) SysEx message in the SysEx Messages Generator (as described in Chapter 7.1)[20].

2. **Copy** the text in clipboard (CTR+C) and **paste** (CTRL+V) in "System Exclusive" window ①.

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. The interface responds with "**Load**" type SysEx message. The received message appears in the "**MIDI In Monitor**" window ④.

6. Click on the "**MIDI In Monitor**" window heading and **Save** the data (File downdrop menu ⑤) as a *.pocketmidi file for future use.

7. Alternatively you can **copy** the **data** (CTRL+C) from "**MIDI In Monitor**" window ④ and paste (CTRL+V) to any text editor and **save** as a *.txt or **document file.**

---
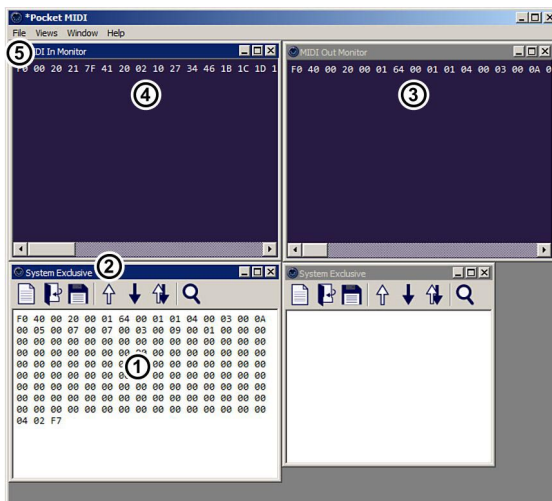
8   LIMITATION OF THE INTERFACE OPERATION

Maximal possible range of the instrument's VCO is **four octaves**. It conforms to range of acceptable MIDI Notes. So a **limitation of instrument's VCO detuning by Pitch Bend and Channel Aftertouch** MIDI commands **can occur** on notes near the low and high ends of the 4-octave range when the requested detuning is larger than the instrument's VCO capabilities.

Maximal speed of arpeggiator is limited by the hardware construction of the instrument. If MIDI song tempo used for synchronization is extremely fast, the arpeggiator can work irregularly or some tones might be omitted especially if very short arpeggio note length is set. In such case, adjustment of the Gate Interrupt Duration system parameter can help (see chapter 13).

Do not press keys on the Korg's keyboard during the MIDI control. **It might cause small but audible detuning** of the VCO.

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[19] **Preset Request** or **SW Version Request** functions.
[20] The correct "**FF**" Hex Byte Form and "**' (space)**" for Delimiter are the initial values after the generator is launched, so there is no need to change them for Pocket MIDI.

9   ERROR MESSAGES

9.1   ERROR STATUS INDICATION

If any fatal error occurs during the interface operation, the interface disconnects itself from instrument's circuits and stops the MIDI communication. However, the instrument still can be controlled by its own keyboard, panel knobs, sliders and switches.

The error status is indicated by blinking indication LED (yellow blinking). The number of LED blinks is indicating the error type:

- The LED blinks 2x → error in MIDI communication with host system (e.g. input or output MIDI data buffer overflow).

   The error can be solved automatically if "Auto Reset" system parameter is set "On" (see chapter 4.1.3). In that case the interface returns automatically to basic stand-by mode.

- The LED blinks 3x, 4x or 5x → errors in internal communication between interface's CPU and peripheral circuits (DAC, EEPROM).

   These errors are fatal. If these errors occur, the interface must be reset to restore the operation. It is necessary to turn the instrument off and on after a while.

9.2   ERRORS CAUSED BY MIDI LOOP

When K770-KBD / KM500-KBD interface is controlled by a sequencer (HW or SW) and the devices are connected bi-directionally (with both MIDI cables) and the sequencer isn't set correctly, communication loop might occur and the entire MIDI system "freezes". It is caused that all MIDI data incoming from sequencer to interface's input are transferred to interface's output (THRU function) and back to the sequencer. This causes infinite cyclic transfer of the same MIDI data.

To avoid this situation, throughput of MIDI data from input to output must be turned off in the DAW / Sequencer. This function is usually called MIDI ECHO or MIDI THRU. Check the user manual of your DAW / Sequencer.

10   TECHNICAL SPECIFICATION

MIDI bus :	fully according to MIDI Manufacturer Association standards
MIDI connectors :	2x DIN 41524 (5 pins / 180°)
Transit data delay MIDI IN → THRU :	max. 1 ms, typ. 0,32 ms
Electrical design :	under the regulations of the ČSN EN 60335-1+A55, ČSN EN 60335-2-45
EMC :	under the regulations of the ČSN EN 55014, ČSN EN 55020
Operating environment :	standard
Range of operating temperature :	+10 to +35 °C
Relative environmental humidity :	up to 85 %
Printed circuits board dimensions :	70 x 60 mm

INFORMATION FOR USERS ON DISPOSAL OF OLD EQUIPMENT AND BATTERIES [EUROPEAN UNION ONLY]

Equipment bearing these symbols should not be disposed as general household waste.

You should look for appropriate recycling facilities and systems for the disposal of these products.

Notice: The sign Pb below the symbol for batteries indicates that this battery contains lead.

11   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/she 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.

12   APPENDIX – ARPEGGIO CLOCK RATE SELECTION

Table 8 – Conversion of "Arpeggio Rate" parameter value to clock pulses rate									
Param. value	Source (param. "Arpeggio Clock Source")				Param. value	Source (param. "Arpeggio Clock Source")			
	Internal		MIDI Clock			Internal		MIDI Clock	
	Freq. [Hz]	Period [sec]	Period [ticks]	Note length		Freq. [Hz]	Period [sec]	Period [ticks]	Note length
0	0,50	2,000	128	-	20	1,11	0,902	108	-
1	0,52	1,908	127	-	21	1,15	0,871	107	-
2	0,55	1,822	126	-	22	1,19	0,842	106	-
3	0,57	1,742	125	-	23	1,23	0,814	105	-
4	0,60	1,667	124	-	24	1,27	0,788	104	-
5	0,63	1,597	123	-	25	1,31	0,762	103	-
6	0,65	1,531	122	-	26	1,36	0,738	102	-
7	0,68	1,468	121	-	27	1,40	0,714	101	-
8	0,71	1,409	120	-	28	1,45	0,691	100	-
9	0,74	1,354	119	-	29	1,49	0,670	99	-
10	0,77	1,301	118	-	30	1,54	0,649	98	-
11	0,80	1,252	117	-	31	1,59	0,629	97	-
12	0,83	1,204	116	-	32	1,64	0,610	96	1/1
13	0,86	1,160	115	-	33	1,69	0,591	95	-
14	0,90	1,117	114	-	34	1,74	0,573	94	-
15	0,93	1,077	113	-	35	1,80	0,556	93	-
16	0,96	1,038	112	-	36	1,85	0,539	92	-
17	1,00	1,002	111	-	37	1,91	0,523	91	-
18	1,03	0,967	109	-	38	1,97	0,508	90	-
19	1,07	0,933	108	-	39	2,03	0,493	89	-

Table 8 – Conversion of "Arpeggio Rate" parameter value to clock pulses rate (Continue)								
	Source (param. "Arpeggio Clock Source")					Source (param. "Arpeggio Clock Source")		
Param. value	Internal		MIDI Clock		Param. value	Internal		MIDI Clock	
	Freq. [Hz]	Period [sec]	Period [ticks]	Note length		Freq. [Hz]	Period [sec]	Period [ticks]	Note length
40	2,09	0,479	88	-	84	6,87	0,146	44	-
41	2,15	0,465	87	-	85	7,05	0,142	43	-
42	2,22	0,451	86	-	86	7,23	0,138	42	-
43	2,28	0,438	85	-	87	7,42	0,135	41	-
44	2,35	0,426	84	-	88	7,61	0,131	40	-
45	2,42	0,414	83	-	89	7,80	0,128	39	-
46	2,49	0,402	82	-	90	8,00	0,125	38	-
47	2,56	0,391	81	-	91	8,21	0,122	37	-
48	2,63	0,380	80	-	92	8,42	0,119	36	-
49	2,71	0,369	79	-	93	8,63	0,116	35	-
50	2,78	0,359	78	-	94	8,85	0,113	34	-
51	2,86	0,349	77	-	95	9,08	0,110	33	-
52	2,94	0,340	76	-	96	9,31	0,107	32	$1/2^3$
53	3,03	0,330	75	-	97	9,54	0,105	31	-
54	3,11	0,321	74	-	98	9,79	0,102	30	-
55	3,20	0,313	73	-	99	10,03	0,100	29	-
56	3,29	0,304	72	-	100	10,29	0,097	28	-
57	3,38	0,296	71	-	101	10,55	0,095	27	-
58	3,47	0,288	70	-	102	10,81	0,092	26	-
59	3,57	0,280	69	-	103	11,08	0,090	25	-
60	3,67	0,273	68	-	104	11,36	0,088	24	1/4
61	3,77	0,266	67	-	105	11,65	0,086	23	-
62	3,87	0,258	66	-	106	11,94	0,084	22	-
63	3,97	0,252	65	-	107	12,24	0,082	21	-
64	4,08	0,245	64	$1/1^3$	108	12,55	0,080	20	-
65	4,19	0,239	63	-	109	12,86	0,078	19	-
66	4,31	0,232	62	-	110	13,18	0,076	18	-
67	4,42	0,226	61	-	111	13,51	0,074	17	-
68	4,54	0,220	60	-	112	13,85	0,072	16	$1/4^3$
69	4,66	0,215	59	-	113	14,19	0,070	15	-
70	4,78	0,209	58	-	114	14,55	0,069	14	-
71	4,91	0,204	57	-	115	14,91	0,067	13	-
72	5,04	0,198	56	-	116	15,28	0,065	12	1/8
73	5,18	0,193	55	-	117	15,66	0,064	11	-
74	5,31	0,188	54	-	118	16,05	0,062	10	-
75	5,45	0,183	53	-	119	16,45	0,061	9	-
76	5,60	0,179	52	-	120	16,86	0,059	8	$1/8^3$
77	5,74	0,174	51	-	121	17,27	0,058	7	-
78	5,89	0,170	50	-	122	17,70	0,056	6	1/16
79	6,05	0,165	49	-	123	18,14	0,055	5	-
80	6,20	0,161	48	1/2	124	18,59	0,054	4	$1/16^3$
81	6,36	0,157	47	-	125	19,05	0,052	3	1/32
82	6,53	0,153	46	-	126	19,52	0,051	2	$1/32^3$
83	6,70	0,149	45	-	127	20,00	0,050	1	$1/64^3$

13   APPENDIX – GATE INTERRUPT DURATION SETTING

Since the Korg instrument contains an obsolete electronic components, it works slowly and there are very large tolerance range of its circuits function. If the instrument reacts irregulary in an arpeggio mode or during non-legato playing style, try to set a longer gate interrupt pulse than the default factory seres value with the "Gate Interrupt Duration" system parameter.

The interrupt pulse duration is defined by the following formula:

Interrupt pulse duration   =   ({the parametr value} + 5) / 5   [in milliseconds]

The parameter allows to set the duration in range from 1 to 25 milliseconds. Default duration set in production (during factory reset) is 3 ms what suits for almost all instruments.

Note that longer pulse duration stabilizes irregular arpeggiator running but is simultaneously limits the maximum achievable speed of the arpeggiator and non-legato playing style! When setting up the parameter, a certain compromise needs to be made between reliability and maximum achievable speed.

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

⟨HD⟩

KORG 770 / 700 / 700S / 900PS MIDI Interface
Model K770-KBD, Nr. 8-430, ver. 1.00
Document: 843010_manual

Manufacturer: CHD Elektroservis, Czech Republic

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