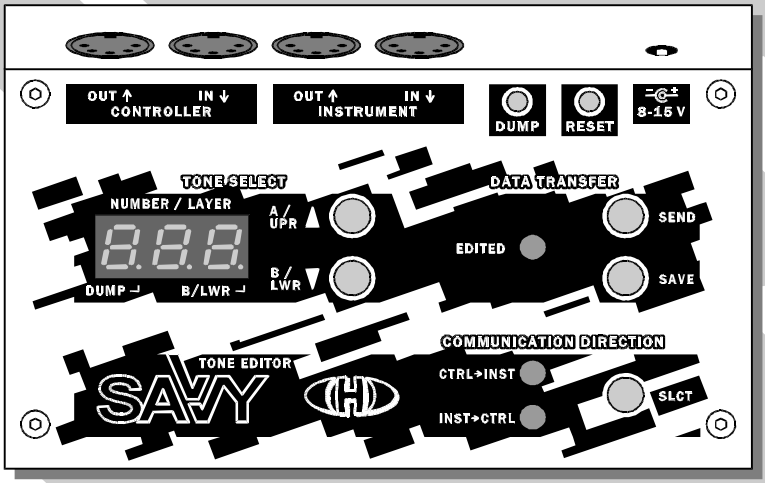
SAVVY

Tone Parameters Editor & Controller



MIDI System Exclusive Communication

Roland Juno-106, HS-60

OS 001 ver. 2.0

1 SYSEX MESSAGES STRUCTURE

For Roland Juno-106, SAVVY receives / transmits own specific SysEx messages with the following structure:

[hex]	[bin]	Byte	Range [dec]
F0	11110000	Start SysEx	
00	00000000	Manufacturer ID (always 3 byte)	
20	00100000		
21	00100001		
ii	0iiiiiii	Device ID [1])	0 ~ 15 (MIDI Chnl) / 127 (Universal)
41	01000001	Model ID	
cc	0ccc0000	Command [2])	16 / 32 / 48 / 64
01	00000001	Instrument ID = Roland Juno-106	
20	00010000	Version ID = OS ver. 2.0	
d1	0ddddddd	Data Bytes [3])	
..	....		
dn	0ddddddd		
xx	0xxxxxxx	Checksum [4])	
F7	11110111	End SysEx	

Remarks:

[1]) The 'Device ID' byte is equal to a number of active MIDI channel (00h for channel Nr. 1, 01h for channel Nr. 2 etc.) for both received and transmitted messages. For messages sent to SAVVY, universal ID 127 can also be set – "Universal ID" message will be always recognized independently on the active MIDI channel number.

[2]) The 'Command' byte specifies the message type i.e. the SAVVY activity after the whole SysEx message is received – see next chapters.

[3]) Number of databytes and their structure is variable in dependence on 'Command' byte. Length of the datablock can be 12, 57, 52 or 3 bytes.

[4]) The 'Checksum' byte confirms the validity of the SysEx message. It must be calculated as 7-bit complement of the sum of bytes from 'Model ID' to 'Data Bytes'. By other words, seven-bit sum of bytes from the 'Model ID' to 'Checksum' must be equal to zero (for the 'Checksum' calculation see also chapter 2.2).

1.1 BULK DUMP LOAD SYSTEM PARAMETERS COMMAND

By transmitting of the "**Bulk Dump Load System Parameters**" message to the device, it is allowed to change the content of system parameters memory bank saved in the device's user memory. This type of SysEx message is also sent from the device as immediate response to received "**Bulk Dump Request System Parameters**" SysEx command (see chapter 1.5). When DUMP button on the device's panel is pressed, "**Bulk Dump Load System Parameters**" message is sent from the device as one part of stream of SysEx messages.

Value of "**cc**" (Command) byte is 16 (i.e 10 hex) for "**Bulk Dump Load System Parameters**" command.

The data block "**d1…dn**" always contains 12 bytes with the following structure:

Byte	[hex]	[bin]	Range [dec]	Parameter
d1	xx	0xxxxxxx	0 ~ 15	Global Parameter: MIDI Channel
d2	00	00000000	0 [1])	not used
d3	00	00000000	0 [1])	not used
d4	xx	00f00cba		Inst → Ctrl Data Transfer Parameters:
			a: 0 ~ 1	Select Device ID for Bulk Dump
			b: 0 ~ 1	Send All CCs (Tone Change)
			c: 0 ~ 1	Send One CC (Parameter Change)
			f: 0 ~ 1	Send Manual Tone Slct as Pgm Chng

Byte	[hex]	[bin]	Range [dec]	Parameter
d5	xx	00fedc0a		Ctrl → Inst Data Transfer Parameters:
			a: 0 ~ 1	Cache Modifications in Edit Buffer
			c: 0 ~ 1	Cache Random Setting in Edit Buffer
			d: 0 ~ 1	Transfer Pgm Chng from Ctrl to Inst
			e: 0 ~ 1	Accept Pgm Chng from Ctrl
			f: 0 ~ 1	Send Manual Tone Slct as Pgm Chng
d6	0x	0000dcba		Global Parameters:
			a: 0 ~ 1	MIDI Errors Auto Reset
			b: 0 ~ 1	Remember Last Tone
			c: 0 ~ 1	Tone Number Format
			d: 0 ~ 1	Use Bank Select Command
d7	00	00000000	0 [1])	not used
d8	00	00000000	0 [1])	not used
d9	00	00000000	0 [1])	not used
d10	00	00000000	0 [1])	not used
d11	00	00000000	0 [1])	not used
d12	0x	0000xxxx	0 ~ 15	Global Parameter: Display Brightness

Remarks:

[1]) These bytes must be always equal to 0! If not, the SAVVY will not work correctly.

1.2 BULK DUMP LOAD INSTRUMENT PARAMETERS COMMAND

the content of instrument parameters memory bank saved in the device's user memory. This type of SysEx message is also sent from the device as immediate response to received "**Bulk Dump Request Instrument Parameters**" SysEx command (see chapter 1.5). When DUMP button on the device's panel is pressed, "**Bulk Dump Load Instrument Parameters**" message is sent from the device as one part of stream of SysEx messages.

Value of "**cc**" (Command) byte is 32 (i.e 20 hex) for "**Bulk Dump Load Instrument Parameters**" command.

The data block "**d1…dn**" always contains 57 bytes with the following structure:

Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d1	xx	0xxxxxxx	0 ~ 126 / 127 [1])	LFO RATE
d2	xx	0xxxxxxx	0 ~ 126 / 127 [1])	LFO DELAY
d3	xx	0xxxxxxx	0 ~ 126 / 127 [1])	DCO LFO
d4	xx	0xxxxxxx	0 ~ 126 / 127 [1])	DCO PWM
d5	xx	0xxxxxxx	0 ~ 126 / 127 [1])	NOISE LEVEL
d6	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCF CUTOFF
d7	xx	0xxxxxxx	0 ~ 126 / 127 [1])	RESONANCE
d8	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCF ENV
d9	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCF LFO
d10	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCF KYBD
d11	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCA LEVEL
d12	xx	0xxxxxxx	0 ~ 126 / 127 [1])	ENV ATTACK
d13	xx	0xxxxxxx	0 ~ 126 / 127 [1])	ENV DECAY
d14	xx	0xxxxxxx	0 ~ 126 / 127 [1])	ENV SUSTAIN
d15	xx	0xxxxxxx	0 ~ 126 / 127 [1])	ENV RELEASE
d16	xx	0xxxxxxx	0 ~ 126 / 127 [1])	DCO SUB LEVEL
d17	xx	0xxxxxxx	0 ~ 126 / 127 [1])	DCO RANGE
d18	xx	0xxxxxxx	0 ~ 126 / 127 [1])	DCO PULSE
d19	xx	0xxxxxxx	0 ~ 126 / 127 [1])	DCO SAW
d20	xx	0xxxxxxx	0 ~ 126 / 127 [1])	CHORUS
d21	xx	0xxxxxxx	0 ~ 126 / 127 [1])	PWM MODE
d22	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCF ENV MODE
d23	xx	0xxxxxxx	0 ~ 126 / 127 [1])	VCA MODE
d24	xx	0xxxxxxx	0 ~ 126 / 127 [1])	HPF CUTOFF

Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d25	7F	01111111	127 [2])	not used
d26	7F	01111111	127 [2])	not used
d27	7F	01111111	127 [2])	not used
d28	7F	01111111	127 [2])	not used
d29	7F	01111111	127 [2])	not used
d30	7F	01111111	127 [2])	not used
d31	7F	01111111	127 [2])	not used
d32	7F	01111111	127 [2])	not used
d33	7F	01111111	127 [2])	not used
d34	7F	01111111	127 [2])	not used
d35	7F	01111111	127 [2])	not used
d36	7F	01111111	127 [2])	not used
d37	7F	01111111	127 [2])	not used
d38	7F	01111111	127 [2])	not used
d39	7F	01111111	127 [2])	not used
d40	7F	01111111	127 [2])	not used
d41	7F	01111111	127 [2])	not used
d42	7F	01111111	127 [2])	not used
d43	xx	0xxxxxxx	0 ~ 126 / 127 [1])	Modifier: MOD RATE
d44	xx	0xxxxxxx	0 ~ 126 / 127 [1])	Modifier: MOD DEPTH
d45	xx	0xxxxxxx	0 ~ 126 / 127 [1])	Modifier: BRILLIANCE
d46	xx	0xxxxxxx	0 ~ 126 / 127 [1])	Modifier: BASS BOOST
d47	xx	0xxxxxxx	0 ~ 126 / 127 [1])	Modifier: ENV TIME
d48	7F	01111111	127 [2])	not used
d49	7F	01111111	127 [2])	not used
d50	7F	01111111	127 [2])	not used
d51	7F	01111111	127 [2])	not used
d52	7F	01111111	127 [2])	not used
d53	7F	01111111	127 [2])	not used
d54	7F	01111111	127 [2])	not used
d55	7F	01111111	127 [2])	not used
d56	7F	01111111	127 [2])	not used
d57	xx	0xxxxxxx	0 ~ 126 / 127 [1])	RANDOM FUNCTION

Remarks:

[1]) Values 0 to 126 assign corresponding CC number to the parameter, value 127 means that no CC is assigned to the parameter.

[2]) These bytes must be always equal to 127! If not, the SAVVY will not work correctly.

1.3 BULK DUMP LOAD TONE DATA COMMAND

By transmitting of the "**Bulk Dump Load Tone Data**" message to the device, it is allowed to change the content of one part of tone data memory bank saved in the device's user memory. This type of SysEx message is also sent from the device as immediate response to received "**Bulk Dump Request Tone Data**" SysEx command (see chapter 1.5). When DUMP button on the device's panel is pressed, "**Bulk Dump Load Tone Data**" messages are sent from the device for each of stored tones as 128 parts of stream of SysEx messages.

Value of "**cc**" (Command) byte is 48 (i.e 30 hex) for "**Bulk Dump Load Tone Data**" command.

The data block "**d1...dn**" always contains 52 bytes with the following structure:

Byte	[hex]	[bin]	Range [dec]	Tone Parameter
d1	xx	00000xxx	0 ~ 6	BANK NUMBER [1])
d2	xx	0xxxxxxx	0 ~ 127	TONE NUMBER [2])
d3	xx	0xxxxxxx	0 ~ 127	LFO RATE
d4	xx	0xxxxxxx	0 ~ 127	LFO DELAY
d5	xx	0xxxxxxx	0 ~ 127	DCO LFO

Byte	[hex]	[bin]	Range [dec]	Tone Parameter
d6	xx	0xxxxxxx	0 ~ 108	DCO PWM
d7	xx	0xxxxxxx	0 ~ 127	NOISE LEVEL
d8	xx	0xxxxxxx	0 ~ 127	VCF CUTOFF
d9	xx	0xxxxxxx	0 ~ 127	RESONANCE
d10	xx	0xxxxxxx	0 ~ 127	VCF ENV
d11	xx	0xxxxxxx	0 ~ 127	VCF LFO
d12	xx	0xxxxxxx	0 ~ 127	VCF KYBD
d13	xx	0xxxxxxx	0 ~ 127	VCA LEVEL
d14	xx	0xxxxxxx	0 ~ 127	ENV ATTACK
d15	xx	0xxxxxxx	0 ~ 127	ENV DECAY
d16	xx	0xxxxxxx	0 ~ 127	ENV SUSTAIN
d17	xx	0xxxxxxx	0 ~ 127	ENV RELEASE
d18	xx	0xxxxxxx	0 ~ 127	DCO SUB LEVEL
d19	0x	000000xx	0 ~ 2	DCO RANGE
d20	0x	0000000x	0 ~ 1	DCO PULSE
d21	0x	0000000x	0 ~ 1	DCO SAW
d22	0x	000000xx	0 ~ 2	CHORUS
d23	0x	0000000x	0 ~ 1	PWM MODE
d24	0x	0000000x	0 ~ 1	VCF ENV MODE
d25	0x	0000000x	0 ~ 1	VCA MODE
d26	0x	000000xx	0 ~ 3	HPF CUTOFF
d27	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR1)
d28	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR2)
d29	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR3)
d30	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR4)
d31	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR5)
d32	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR6)
d33	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR7)
d34	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR8)
d35	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR9)
d36	xx	0xxxxxxx	32 ~ 127 [4]	TONE NAME (CHR10)
d37	40	01000000	64 [3]	not used
d38	40	01000000	64 [3]	not used
d39	40	01000000	64 [3]	not used
d40	40	01000000	64 [3]	not used
d41	40	01000000	64 [3]	not used
d42	40	01000000	64 [3]	not used
d43	40	01000000	64 [3]	not used
d44	40	01000000	64 [3]	not used
d45	xx	0xxxxxxx	0 ~ 127	Modifier: MOD RATE
d46	xx	0xxxxxxx	0 ~ 127	Modifier: MOD DEPTH
d47	xx	0xxxxxxx	0 ~ 127	Modifier: BRILLIANCE
d48	xx	0xxxxxxx	0 ~ 127	Modifier: BASS BOOST
d49	xx	0xxxxxxx	0 ~ 127	Modifier: ENV TIME
d50	40	01000000	64 [3]	not used
d51	40	01000000	64 [3]	not used
d52	40	01000000	64 [3]	not used

Remarks:

[1]) The 'Bank Number' byte specifies what tone data memory bank will be affected by the SysEx message.

[2]) The 'Tone Number' byte specifies what part of selected tone data memory bank (i.e. what tone number) will be affected by the SysEx message.

[3]) These bytes must be always equal to 64! If not, the SAVVY will not work correctly.

[4]) All ASCII characters with codes 32 to 127 can be used.

1.4 BULK DUMP REQUEST COMMAND

When the "**Bulk Dump Request**" SysEx message is sent to the device, the device responds immediately with "**Bulk Dump Load**" message (see above). This message contents data from requested memory bank saved in the device's user memory.

Value of "**cc**" (Command) byte is 64 (i.e 40 hex) for "**Bulk Dump Request**" command.

The data block "**d1…dn**" always contains 3 bytes the following structure:

Byte	[hex]	[bin]	Range	Meaning
d1	01	00000001		Sub-command: Bulk Dump Request
d2	xx	00xxxxxx	16 / 32 / 48 ~ 54 [1])	Bank Type
d3	xx	0xxxxxxx	0 or 0 ~ 127 [2])	Bank Part Number

Remarks:

[1]) The 'Bank Type' byte specifies the memory area for the command processing: 16 (i.e 10 hex) is for System Parameters Bank, 32 (i.e 20 hex) is for Instrument Parameters Bank and 48 ~ 54 (i.e 30 hex to 36 hex) is for a Tone Data Bank Nr. 1 to 7.

[2]) If Bank Type byte is 48 to 54 (i.e. Tone Data Bank Nr. 1 to 7), the 'Bank Part Number' byte specifies number of requested tone in the selected bank exactly (0 to 127). If 'Bank Type' byte is 16 or 32, the 'Bank Part Number' byte must be always equal to 0.

1.5 BULK DUMP INITIALIZE COMMAND

When the "**Bulk Dump Initialize**" SysEx message is sent to the device, data in requested memory bank in the device's user memory are rewritten with default "factory reset" data . Original data are lost!

Value of "**cc**" (Command) byte is 64 (i.e 40 hex) for "**Bulk Dump Initialize**" command.

The data block "**d1…dn**" always contains 3 bytes the following structure:

Byte	[hex]	[bin]	Range	Meaning
d1	00	00000000		Sub-command: Initialize
d2	xx	00xxxxxx	16 / 32 / 48 ~ 54 [1])	Bank Type
d3	xx	0xxxxxxx	0 or 0 ~ 127 [2])	Bank Part Number

Remarks:

[1]) The 'Bank Type' byte specifies the memory area for the command processing: 16 (i.e 10 hex) is for System Parameters Bank, 32 (i.e 20 hex) is for Instrument Parameters Bank and 48 ~ 54 (i.e 30 hex to 36 hex) is for a Tone Data Bank Nr. 1 to 7.

[2]) If Bank Type byte is 48 to 54 (i.e. Tone Data Bank Nr. 1 to 7), the 'Bank Part Number' byte specifies number of requested tone in the selected bank exactly (0 to 127). If 'Bank Type' byte is 10 or 32, the 'Bank Part Number' byte must be always equal to 0.

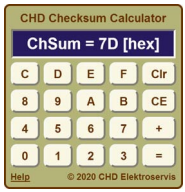
2 SYSEX MESSAGES CREATING

2.1 SYSEX MESSAGES GENERATORS

As a support for the users we have made special software generators to create any SysEx messages to control the SAVVY editor. Usage of these generators is very easy for any user. Please see Manual Supplement for detailed description of SysEx Messages Generator.

2.2 CHECKSUM CALCULATOR

If you want to create a SysEx message yourself, you need to calculate the 'Checksum' byte. This is difficult for most musicians because calculation with hexadecimal / binary numbers is necessary. For easy calculation of the checksum, special software **Checksum Calculator** is prepared.



The Checksum Calculator is based on Java scripts so it can run on any computer with web browser (Windows, OSX, etc.). Note that scripts and ActiveX elements must be enabled in the web browser for proper function of the calculator.

The Checksum Calculator is available at our website (www.chd-el.cz) on Support page.

The Checksum Calculator works on-line or it can be downloaded to your computer and then launched from it.


SAVVY
Tone Parameters Editor & Controller