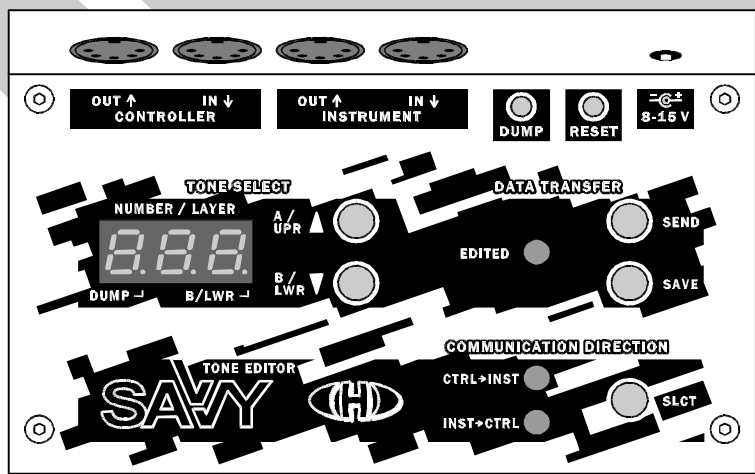


# SAVVY

## Tone Parameters Editor & Controller



MIDI System Exclusive Communication  
Yamaha DX21, DX27, DX27S, DX100

OS 008 ver. 2.0



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## 1 SYSEX MESSAGES STRUCTURE

For Yamaha DX21, 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 <sup>1)</sup>	0 ~ 15 (MIDI Chnl) / 127 (Universal)
41	01000001	Model ID = SAVVY	
cc	0ccc0000	Command <sup>2)</sup>	16 / 32 / 48 / 64
08	00001000	Instrument ID = Yamaha DX21	
20	00100000	Version ID = OS ver. 2.0	
d1	0ddddddd	Data Bytes <sup>3)</sup>	
..	.....		
dn	0ddddddd		
xx	0xxxxxxx	Checksum <sup>4)</sup>	
F7	11110111	End SysEx	

### Remarks:

<sup>1)</sup> 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.

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

<sup>3)</sup> Number of databytes and their structure is variable in dependence on 'Command' byte. Length of the datablock can be 12, 112, 105 or 3 bytes.

<sup>4)</sup> 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 1.4). 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 <sup>1)</sup>	not used
d3	00	00000000	0 <sup>2)</sup>	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	000e0cba		Ctrl → Inst Data Transfer Parameters:
			a: 0 ~ 1	Cache Modifications in Edit Buffer
			b: 0 ~ 1	Cache Macro Settings in Edit Buffer
			c: 0 ~ 1	Cache Random Setting in Edit Buffer
			e: 0 ~ 1	Accept Pgm Chng from Ctrl
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 <sup>1)</sup>	not used
d8	00	00000000	0 <sup>1)</sup>	not used
d9	00	00000000	0 <sup>1)</sup>	not used
d10	00	00000000	0 <sup>1)</sup>	not used
d11	00	00000000	0 <sup>1)</sup>	not used
d12	0x	0000xxxx	0 ~ 15	Global Parameter: Display Brightness

**Remarks:**

<sup>1)</sup> These bytes must be always equal to 0! If not, the SAVVY will not work correctly.

## 1.2 BULK DUMP LOAD INSTRUMENT PARAMETERS COMMAND

By transmitting of the "Bulk Dump Load Instrument Parameters" message to the device, it is allowed to change 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 1.4). 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 112 bytes with the following structure:

Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d1	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: ATTACK RATE
d2	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: DECAY 1 RATE
d3	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: DECAY 2 RATE
d4	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: RELEASE RATE
d5	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: DECAY 1 LEVEL
d6	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: KEYBOARD SCALING LEVEL
d7	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: KEYBOARD SCALING RATE
d8	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: EG BIAS SENS
d9	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: AMPLITUDE MOD ENABLE
d10	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: KEY VELOCITY
d11	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: OUTPUT LEVEL
d12	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: OSC FREQUENCY
d13	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: DETUNE
d14	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: ATTACK RATE
d15	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: DECAY 1 RATE
d16	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: DECAY 2 RATE
d17	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: RELEASE RATE
d18	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: DECAY 1 LEVEL
d19	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: KEYBOARD SCALING LEVEL
d20	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: KEYBOARD SCALING RATE
d21	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: EG BIAS SENS
d22	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: AMPLITUDE MOD ENABLE
d23	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: KEY VELOCITY
d24	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: OUTPUT LEVEL
d25	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: OSC FREQUENCY
d26	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: DETUNE



Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d27	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: ATTACK RATE
d28	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: DECAY 1 RATE
d29	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: DECAY 2 RATE
d30	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: RELEASE RATE
d31	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: DECAY 1 LEVEL
d32	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: KEYBOARD SCALING LEVEL
d33	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: KEYBOARD SCALING RATE
d34	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: EG BIAS SENS
d35	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: AMPLITUDE MOD ENABLE
d36	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: KEY VELOCITY
d37	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: OUTPUT LEVEL
d38	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: OSC FREQUENCY
d39	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: DETUNE
d40	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: ATTACK RATE
d41	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: DECAY 1 RATE
d42	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: DECAY 2 RATE
d43	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: RELEASE RATE
d44	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: DECAY 1 LEVEL
d45	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: KEYBOARD SCALING LEVEL
d46	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: KEYBOARD SCALING RATE
d47	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: EG BIAS SENS
d48	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: AMPLITUDE MOD ENABLE
d49	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: KEY VELOCITY
d50	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: OUTPUT LEVEL
d51	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: OSC FREQUENCY
d52	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: DETUNE
d53	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	ALGORITHM
d54	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	FEEDBACK LEVEL
d55	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LFO SPEED
d56	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LFO DELAY
d57	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LFO PITCH MOD DEPTH
d58	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LFO AMPLITUDE MOD DEPTH
d59	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LFO SYNC
d60	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LFO WAVE
d61	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH MOD SEN
d62	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	AMPLITUDE MOD SENS
d63	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	TRANPOSE
d64	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PLAY MODE POLY / MONO
d65	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH BEND RANGE
d66	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PORTAMENTO MODE
d67	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PORTAMENTO TIME
d68	7F	01111111	127 <sup>2)</sup>	not used
d69	7F	01111111	127 <sup>2)</sup>	not used
d70	7F	01111111	127 <sup>2)</sup>	not used
d71	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	CHORUS SWITCH
d72	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	MOD WHL PITCH MOD RANGE
d73	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OD WHL AMPLITUDE MOD RANGE
d74	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	BREATH CTRL PITCH MOD RNG
d75	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	BREATH CTRL AMPLITUDE MOD RNG
d76	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	BREATH CTRL PITCH BIAS RNG
d77	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	BREATH CTRL EG BIAS RNG
d78	7F	01111111	127 <sup>2)</sup>	not used
d79	7F	01111111	127 <sup>2)</sup>	not used
d80	7F	01111111	127 <sup>2)</sup>	not used
d81	7F	01111111	127 <sup>2)</sup>	not used
d82	7F	01111111	127 <sup>2)</sup>	not used
d83	7F	01111111	127 <sup>2)</sup>	not used
d84	7F	01111111	127 <sup>2)</sup>	not used
d85	7F	01111111	127 <sup>2)</sup>	not used
d86	7F	01111111	127 <sup>2)</sup>	not used



Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d87	7F	01111111	127 <sup>2)</sup>	not used
d88	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG RATE 1
d89	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG RATE 2
d90	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG RATE 3
d91	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG LEVEL 1
d92	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG LEVEL 2
d93	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG LEVEL 3
d94	7F	01111111	127 <sup>2)</sup>	not used
d95	7F	01111111	127 <sup>2)</sup>	not used
d96	7F	01111111	127 <sup>2)</sup>	not used
d97	7F	01111111	127 <sup>2)</sup>	not used
d98	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MOD RATE
d99	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MOD DEPTH
d100	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: BRILLIANCE
d101	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MODULATOR KEYFOLLOW
d102	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: CARRIER ENV TIME
d103	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MODULATOR ENV TIME
d104	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV ATTACK TIME
d105	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV DECAY TIME
d106	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV SUSTAIN LEVEL
d107	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV RELEASE TIME
d108	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: PITCH ENV TIME
d109	7F	01111111	127 <sup>2)</sup>	not used
d110	7F	01111111	127 <sup>2)</sup>	not used
d111	7F	01111111	127 <sup>2)</sup>	not used
d112	xx	0xxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	RANDOM FUNCTION

### Remarks:

<sup>1)</sup> Values 0 to 126 assign corresponding CC number to the parameter, value 127 means that no CC is assigned to the parameter.

<sup>2)</sup> 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 1.4). 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 105 bytes with the following structure:

Byte	[hex]	[bin]	Range	Tone Parameter
d1	xx	000000xx	0 ~ 3	BANK NUMBER <sup>1)</sup>
d2	xx	0xxxxxxx	0 ~ 127	TONE NUMBER <sup>2)</sup>
d2	xx	000xxxxx	0 ~ 31	OP4: ATTACK RATE
d3	xx	000xxxxx	0 ~ 31	OP4: DECAY 1 RATE
d4	xx	000xxxxx	0 ~ 31	OP4: DECAY 2 RATE
d5	0x	0000xxxx	0 ~ 15	OP4: RELEASE RATE
d6	0x	0000xxxx	0 ~ 15	OP4: DECAY 1 LEVEL
d7	xx	0xxxxxxx	0 ~ 99	OP4: KEYBOARD SCALING LEVEL
d8	xx	000000xx	0 ~ 3	OP4: KEYBOARD SCALING RATE
d9	0x	00000xxx	1 ~ 7	OP4: EG BIAS SENS
d10	xx	0000000x	0 ~ 1	OP4: AMPLITUDE MOD ENABLE
d11	0x	00000xxx	1 ~ 7	OP4: KEY VELOCITY



Byte	[hex]	[bin]	Range	Tone Parameter
d12	xx	0xxxxxxx	0 ~ 99	OP4: OUTPUT LEVEL
d13	xx	00xxxxxx	0 ~ 63	OP4: OSC FREQUENCY
d14	0x	00000xxx	1 ~ 6	OP4: DETUNE
d15	xx	000xxxxx	0 ~ 31	OP2: ATTACK RATE
d16	xx	000xxxxx	0 ~ 31	OP2: DECAY 1 RATE
d17	xx	000xxxxx	0 ~ 31	OP2: DECAY 2 RATE
d18	0x	0000xxxx	0 ~ 15	OP2: RELEASE RATE
d19	0x	0000xxxx	0 ~ 15	OP2: DECAY 1 LEVEL
d20	xx	0xxxxxxx	0 ~ 99	OP2: KEYBOARD SCALING LEVEL
d21	xx	000000xx	0 ~ 3	OP2: KEYBOARD SCALING RATE
d22	0x	00000xxx	1 ~ 7	OP2: EG BIAS SENS
d23	xx	0000000x	0 ~ 1	OP2: AMPLITUDE MOD ENABLE
d24	0x	00000xxx	1 ~ 7	OP2: KEY VELOCITY
d25	xx	0xxxxxxx	0 ~ 99	OP2: OUTPUT LEVEL
d26	xx	00xxxxxx	0 ~ 63	OP2: OSC FREQUENCY
d27	0x	00000xxx	1 ~ 6	OP2: DETUNE
d28	xx	000xxxxx	0 ~ 31	OP3: ATTACK RATE
d29	xx	000xxxxx	0 ~ 31	OP3: DECAY 1 RATE
d30	xx	000xxxxx	0 ~ 31	OP3: DECAY 2 RATE
d31	0x	0000xxxx	0 ~ 15	OP3: RELEASE RATE
d32	0x	0000xxxx	0 ~ 15	OP3: DECAY 1 LEVEL
d33	xx	0xxxxxxx	0 ~ 99	OP3: KEYBOARD SCALING LEVEL
d34	xx	000000xx	0 ~ 3	OP3: KEYBOARD SCALING RATE
d35	0x	00000xxx	1 ~ 7	OP3: EG BIAS SENS
d36	xx	0000000x	0 ~ 1	OP3: AMPLITUDE MOD ENABLE
d37	0x	00000xxx	1 ~ 7	OP3: KEY VELOCITY
d38	xx	0xxxxxxx	0 ~ 99	OP3: OUTPUT LEVEL
d39	xx	00xxxxxx	0 ~ 63	OP3: OSC FREQUENCY
d40	0x	00000xxx	1 ~ 6	OP3: DETUNE
d41	xx	000xxxxx	0 ~ 31	OP1: ATTACK RATE
d42	xx	000xxxxx	0 ~ 31	OP1: DECAY 1 RATE
d43	xx	000xxxxx	0 ~ 31	OP1: DECAY 2 RATE
d44	0x	0000xxxx	0 ~ 15	OP1: RELEASE RATE
d45	0x	0000xxxx	0 ~ 15	OP1: DECAY 1 LEVEL
d46	xx	0xxxxxxx	0 ~ 99	OP1: KEYBOARD SCALING LEVEL
d47	xx	000000xx	0 ~ 3	OP1: KEYBOARD SCALING RATE
d48	0x	00000xxx	1 ~ 7	OP1: EG BIAS SENS
d49	xx	0000000x	0 ~ 1	OP1: AMPLITUDE MOD ENABLE
d50	0x	00000xxx	1 ~ 7	OP1: KEY VELOCITY
d51	xx	0xxxxxxx	0 ~ 99	OP1: OUTPUT LEVEL
d52	xx	00xxxxxx	0 ~ 63	OP1: OSC FREQUENCY
d53	0x	00000xxx	1 ~ 6	OP1: DETUNE
d54	xx	00000xxx	0 ~ 7	ALGORITHM
d55	xx	00000xxx	0 ~ 7	FEEDBACK LEVEL
d56	xx	0xxxxxxx	0 ~ 99	LFO SPEED
d57	xx	0xxxxxxx	0 ~ 99	LFO DELAY
d58	xx	0xxxxxxx	0 ~ 99	LFO PITCH MOD DEPTH
d59	xx	0xxxxxxx	0 ~ 99	LFO AMPLITUDE MOD DEPTH
d60	xx	0000000x	0 ~ 1	LFO SYNC
d61	xx	000000xx	0 ~ 3	LFO WAVE
d62	xx	00000xxx	0 ~ 7	PITCH MOD SENS
d63	xx	000000xx	0 ~ 3	AMPLITUDE MOD SENS
d64	xx	00xxxxxx	0 ~ 48	TRANSPOSE
d65	xx	0000000x	0 ~ 1	PLAY MODE POLY / MONO
d66	xx	0000xxxx	0 ~ 12	PITCH BEND RANGE
d67	xx	0000000x	0 ~ 1	PORTAMENTO MODE
d68	xx	0xxxxxxx	0 ~ 99	PORTAMENTO TIME
d69	xx	0xxxxxxx	0 ~ 99	FOOT VOLUME RANGE
d70	xx	0000000x	0 ~ 1	SUSTAIN FOOT SWITCH
d71	xx	0000000x	0 ~ 1	PORTAMENTO FOOT SWITCH

Byte	[hex]	[bin]	Range	Tone Parameter
d72	0x	0000000x	0 ~ 1	CHORUS SWITCH
d73	xx	0xxxxxxx	0 ~ 99	MOD WHL PITCH MOD RANGE
d74	xx	0xxxxxxx	0 ~ 99	MOD WHL AMPLITUDE MOD RNG
d75	xx	0xxxxxxx	0 ~ 99	BREATH CTRL PITCH MOD RANGE
d76	xx	0xxxxxxx	0 ~ 99	BREATH CTRL AMPLITUDE MOD RANGE
d77	xx	0xxxxxxx	0 ~ 99	BREATH CTRL PITCH BIAS RANGE
d78	xx	0xxxxxxx	0 ~ 99	BREATH CTRL EG BIAS RANGE
d79	xx	0xxxxxxx	32 ~ 127	VOICE NAME 1 <sup>3)</sup>
d80	xx	0xxxxxxx	32 ~ 127	VOICE NAME 2 <sup>3)</sup>
d81	xx	0xxxxxxx	32 ~ 127	VOICE NAME 3 <sup>3)</sup>
d82	xx	0xxxxxxx	32 ~ 127	VOICE NAME 4 <sup>3)</sup>
d83	xx	0xxxxxxx	32 ~ 127	VOICE NAME 5 <sup>3)</sup>
d84	xx	0xxxxxxx	32 ~ 127	VOICE NAME 6 <sup>3)</sup>
d85	xx	0xxxxxxx	32 ~ 127	VOICE NAME 7 <sup>3)</sup>
d86	xx	0xxxxxxx	32 ~ 127	VOICE NAME 8 <sup>3)</sup>
d87	xx	0xxxxxxx	32 ~ 127	VOICE NAME 9 <sup>3)</sup>
d88	xx	0xxxxxxx	32 ~ 127	VOICE NAME 10 <sup>3)</sup>
d89	xx	0xxxxxxx	0 ~ 99	PITCH EG RATE 1
d90	xx	0xxxxxxx	0 ~ 99	PITCH EG RATE 2
d91	xx	0xxxxxxx	0 ~ 99	PITCH EG RATE 3
d92	xx	0xxxxxxx	0 ~ 99	PITCH EG LEVEL 1
d93	xx	0xxxxxxx	0 ~ 99	PITCH EG LEVEL 2
d94	xx	0xxxxxxx	0 ~ 99	PITCH EG LEVEL 3
d95	40	01000000	64 <sup>4)</sup>	not used
d96	40	01000000	64 <sup>4)</sup>	not used
d97	40	01000000	64 <sup>4)</sup>	not used
d98	40	01000000	64 <sup>4)</sup>	not used
d99	xx	0xxxxxxx	0 ~ 127	Modifier: MOD RATE
d100	xx	0xxxxxxx	0 ~ 127	Modifier: MOD DEPTH
d101	xx	0xxxxxxx	0 ~ 127	Modifier: BRILLIANCE
d102	xx	0xxxxxxx	0 ~ 127	Modifier: MODULATOR KEYFOLLOW
d103	xx	0xxxxxxx	0 ~ 127	Modifier: CARRIER ENV TIME
d104	xx	0xxxxxxx	0 ~ 127	Modifier: MODULATOR ENV TIME

**Remarks:**

- <sup>1)</sup> The 'Bank Number' byte specifies what tone data memory bank will be affected by the SysEx message.
- <sup>2)</sup> The 'Tone Number' byte specifies what part of selected tone data memory bank (i.e. what tone number of active tone bank) will be affected by the SysEx message.
- <sup>3)</sup> All ASCII codes are enabled.
- <sup>4)</sup> These bytes must be always equal to 64! If not, the SAVVY will not work correctly.

## 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	00xx0000	16 / 32 / 48 ~ 51 <sup>1)</sup>	Bank Type
d3	xx	0xxxxxxx	0 or 0 ~ 127 <sup>2)</sup>	Bank Part Number



### Remarks:

<sup>1)</sup> 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 ~ 51 (i.e 30 hex to 33 hex) is for a Tone Data Bank Nr. 1 to 4.

<sup>2)</sup> If Bank Type byte is 48 to 51 (i.e. Tone Data Bank Nr. 1 to 4), 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	00xx0000	16 / 32 / 48 ~ 51 <sup>1)</sup>	Bank Type
d3	xx	0xxxxxxx	0 or 0 ~ 127 <sup>2)</sup>	Bank Part Number

### Remarks:

<sup>1)</sup> 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 ~ 51 (i.e 30 hex to 33 hex) is for a Tone Data Bank Nr. 1 to 4.

<sup>2)</sup> If Bank Type byte is 48 to 51 (i.e. Tone Data Bank Nr. 1 to 4), 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.

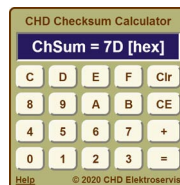
### 2.2 CHECKSUM CALCULATOR

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](http://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.



Tone Parameters Editor & Controller  
Model TPE-1 Nr. 8-361 / Bios v. 1.00 / OS Nr. 008 v. 2.0  
Document: 8361100-00820\_sysex

Manufacturer:  
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**SAVVY**

Tone Parameters Editor & Controller