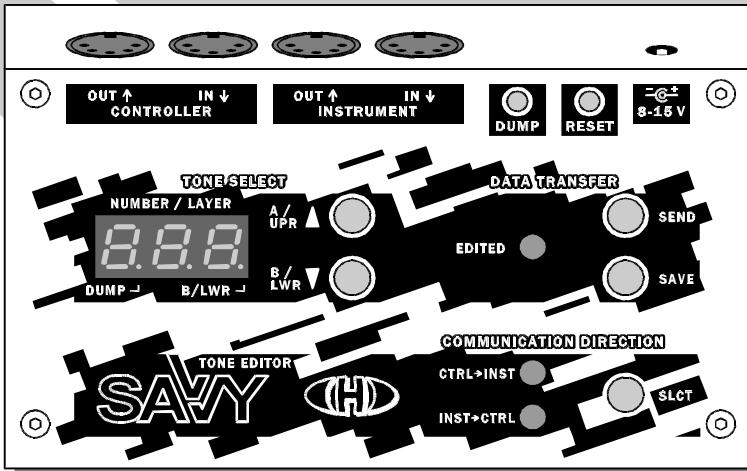


# SAVVY

## Tone Parameters Editor & Controller



MIDI System Exclusive Communication  
Yamaha V50

OS 009 ver. 2.0



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## 1 SYSEX MESSAGES STRUCTURE

For Yamaha V50, 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
09	00001001	Instrument ID = Yamaha V50	
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, 165, 157 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>1)</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
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 165 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
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

Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
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>	TRANSPOSE
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	127 <sup>2)</sup>	not used
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
d87	7F	01111111	127 <sup>2)</sup>	not used
d88	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG RATE 1
d89	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG RATE 2
d90	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG RATE 3
d91	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG LEVEL 1
d92	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG LEVEL 2
d93	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	PITCH EG LEVEL 3
d94	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: OSC FIX
d95	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: OSC FIX RANGE
d96	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: OSC FREQUENCY FINE
d97	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: OSC WAVE
d98	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: ENV GEN SHIFT
d99	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: OSC FIX
d100	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: OSC FIX RANGE
d101	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: OSC FREQUENCY FINE
d102	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: OSC WAVE
d103	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: ENV GEN SHIFT
d104	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: OSC FIX
d105	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: OSC FIX RANGE
d106	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: OSC FREQUENCY FINE
d107	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: OSC WAVE
d108	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: ENV GEN SHIFT
d109	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: OSC FIX
d110	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: OSC FIX RANGE
d111	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: OSC FREQUENCY FINE
d112	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: OSC WAVE
d113	7F	01111111	127 <sup>2)</sup>	not used
d114	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	REVERB RATE
d115	7F	01111111	127 <sup>2)</sup>	not used
d116	7F	01111111	127 <sup>2)</sup>	not used
d117	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	AFTERTOUC PITCH
d118	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	AFTERTOUC AMPLI
d119	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	AFTERTOUC PITCH BIAS
d120	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	AFTERTOUC EG BIAS



Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d121	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP4: FIX RANGE MODE
d122	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP2: FIX RANGE MODE
d123	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP3: FIX RANGE MODE
d124	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	OP1: FIX RANGE MODE
d125	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	LS SIGN (OP 1, 2, 3, 4)
d126	7F	01111111	127 <sup>2)</sup>	not used
d127	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT SEL
d128	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT BALANCE
d129	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT OUT LEVEL
d130	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT STEREO MIX
d131	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT PARAMETER 1
d132	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT PARAMETER 2
d133	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	EFFECT PARAMETER 3
d134	7F	01111111	127 <sup>2)</sup>	not used
d135	7F	01111111	127 <sup>2)</sup>	not used
d136	7F	01111111	127 <sup>2)</sup>	not used
d137	7F	01111111	127 <sup>2)</sup>	not used
d138	7F	01111111	127 <sup>2)</sup>	not used
d139	7F	01111111	127 <sup>2)</sup>	not used
d140	7F	01111111	127 <sup>2)</sup>	not used
d141	7F	01111111	127 <sup>2)</sup>	not used
d142	7F	01111111	127 <sup>2)</sup>	not used
d143	7F	01111111	127 <sup>2)</sup>	not used
d144	7F	01111111	127 <sup>2)</sup>	not used
d145	7F	01111111	127 <sup>2)</sup>	not used
d146	7F	01111111	127 <sup>2)</sup>	not used
d147	7F	01111111	127 <sup>2)</sup>	not used
d148	7F	01111111	127 <sup>2)</sup>	not used
d149	7F	01111111	127 <sup>2)</sup>	not used
d150	7F	01111111	127 <sup>2)</sup>	not used
d151	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MOD RATE
d152	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MOD DEPTH
d153	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: BRILLIANCE
d154	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MODULATOR KEYFOLLOW
d155	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: CARRIER ENV TIME
d156	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Modifier: MODULATOR ENV TIME
d157	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV ATTACK TIME
d158	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV DECAY TIME
d159	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV SUSTAIN LEVEL
d160	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: ENV RELEASE TIME
d161	xx	0xxxxxxxx	0 ~ 126 / 127 <sup>1)</sup>	Macro: PITCH ENV TIME
d162	7F	01111111	127 <sup>2)</sup>	not used
d163	7F	01111111	127 <sup>2)</sup>	not used
d164	7F	01111111	127 <sup>2)</sup>	not used
d165	xx	0xxxxxxxx	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 158 bytes with the following structure:

Byte	[hex]	[bin]	Range	Tone Parameter
d1	xx	00000xxx	0 ~ 6	BANK NUMBER <sup>1)</sup>
d2	xx	0xxxxxxx	0 ~ 127	TONE NUMBER <sup>2)</sup>
d3	xx	000xxxxx	0 ~ 31	OP4: ATTACK RATE
d4	xx	000xxxxx	0 ~ 31	OP4: DECAY 1 RATE
d5	xx	000xxxxx	0 ~ 31	OP4: DECAY 2 RATE
d6	0x	0000xxxx	0 ~ 15	OP4: RELEASE RATE
d7	0x	0000xxxx	0 ~ 15	OP4: DECAY 1 LEVEL
d8	xx	0xxxxxxx	0 ~ 99	OP4: KEYBOARD SCALING LEVEL
d9	0x	00000xxx	0 ~ 3	OP4: KEYBOARD SCALING RATE
d10	0x	00000xxx	0 ~ 7	OP4: EG BIAS SENS
d11	0x	0000000x	0 ~ 1	OP4: AMPLITUDE MOD ENABLE
d12	0x	0000xxxx	0 ~ 14	OP4: KEY VELOCITY
d13	xx	0xxxxxxx	0 ~ 99	OP4: OUTPUT LEVEL
d14	xx	00xxxxxx	0 ~ 63	OP4: OSC FREQUENCY
d15	0x	00000xxx	0 ~ 6	OP4: DETUNE
d16	xx	000xxxxx	0 ~ 31	OP2: ATTACK RATE
d17	xx	000xxxxx	0 ~ 31	OP2: DECAY 1 RATE
d18	xx	000xxxxx	0 ~ 31	OP2: DECAY 2 RATE
d19	0x	0000xxxx	0 ~ 15	OP2: RELEASE RATE
d20	0x	0000xxxx	0 ~ 15	OP2: DECAY 1 LEVEL
d21	xx	0xxxxxxx	0 ~ 99	OP2: KEYBOARD SCALING LEVEL
d22	0x	000000xx	0 ~ 3	OP2: KEYBOARD SCALING RATE
d23	0x	00000xxx	0 ~ 7	OP2: EG BIAS SENS
d24	0x	0000000x	0 ~ 1	OP2: AMPLITUDE MOD ENABLE
d25	0x	0000xxxx	0 ~ 14	OP2: KEY VELOCITY
d26	xx	0xxxxxxx	0 ~ 99	OP2: OUTPUT LEVEL
d27	xx	00xxxxxx	0 ~ 63	OP2: OSC FREQUENCY
d28	0x	00000xxx	0 ~ 6	OP2: DETUNE
d29	xx	000xxxxx	0 ~ 31	OP3: ATTACK RATE
d30	xx	000xxxxx	0 ~ 31	OP3: DECAY 1 RATE
d31	xx	000xxxxx	0 ~ 31	OP3: DECAY 2 RATE
d32	0x	0000xxxx	0 ~ 15	OP3: RELEASE RATE
d33	0x	0000xxxx	0 ~ 15	OP3: DECAY 1 LEVEL
d34	xx	0xxxxxxx	0 ~ 99	OP3: KEYBOARD SCALING LEVEL
d35	0x	000000xx	0 ~ 3	OP3: KEYBOARD SCALING RATE
d36	0x	00000xxx	0 ~ 7	OP3: EG BIAS SENS
d37	0x	0000000x	0 ~ 1	OP3: AMPLITUDE MOD ENABLE
d38	0x	0000xxxx	0 ~ 14	OP3: KEY VELOCITY
d39	xx	0xxxxxxx	0 ~ 99	OP3: OUTPUT LEVEL
d40	xx	00xxxxxx	0 ~ 63	OP3: OSC FREQUENCY
d41	0x	00000xxx	0 ~ 6	OP3: DETUNE
d42	xx	000xxxxx	0 ~ 31	OP1: ATTACK RATE
d43	xx	000xxxxx	0 ~ 31	OP1: DECAY 1 RATE
d44	xx	000xxxxx	0 ~ 31	OP1: DECAY 2 RATE
d45	0x	0000xxxx	0 ~ 15	OP1: RELEASE RATE
d46	0x	0000xxxx	0 ~ 15	OP1: DECAY 1 LEVEL
d47	xx	0xxxxxxx	0 ~ 99	OP1: KEYBOARD SCALING LEVEL
d48	0x	000000xx	0 ~ 3	OP1: KEYBOARD SCALING RATE



Byte	[hex]	[bin]	Range	Tone Parameter
d49	0x	00000xxx	0 ~ 7	OP1: EG BIAS SENS
d50	0x	0000000x	0 ~ 1	OP1: AMPLITUDE MOD ENABLE
d51	0x	0000xxxx	0 ~ 14	OP1: KEY VELOCITY
d52	xx	0xxxxxxx	0 ~ 99	OP1: OUTPUT LEVEL
d53	xx	00xxxxxx	0 ~ 63	OP1: OSC FREQUENCY
d54	0x	00000xxx	0 ~ 6	OP1: DETUNE
d55	0x	00000xxx	0 ~ 7	ALGORITHM
d56	0x	00000xxx	0 ~ 7	FEEDBACK LEVEL
d57	xx	0xxxxxxx	0 ~ 99	LFO SPEED
d58	xx	0xxxxxxx	0 ~ 99	LFO DELAY
d59	xx	0xxxxxxx	0 ~ 99	LFO PITCH MOD DEPTH
d60	xx	0xxxxxxx	0 ~ 99	LFO AMPLITUDE MOD DEPTH
d61	0x	0000000x	0 ~ 1	LFO SYNC
d62	0x	000000xx	0 ~ 3	LFO WAVE
d63	0x	00000xxx	0 ~ 7	PITCH MOD SENS
d64	0x	000000xx	0 ~ 3	AMPLITUDE MOD SENS
d65	xx	00xxxxxx	0 ~ 48	TRANSPOSE
d66	0x	0000000x	0 ~ 1	PLAY MODE POLY / MONO
d67	0x	0000xxxx	0 ~ 12	PITCH BEND RANGE
d68	0x	0000000x	0 ~ 1	PORTAMENTO MODE
d69	xx	0xxxxxxx	0 ~ 99	PORTAMENTO TIME
d70	xx	0xxxxxxx	0 ~ 99	FOOT VOLUME RANGE
d71	0x	0000000x	0 ~ 1	FOOT SWITCH
d72	00	00000000	0 <sup>3</sup> )	not used
d73	00	00000000	0 <sup>3</sup> )	not used
d74	xx	0xxxxxxx	0 ~ 99	MOD WHL PITCH MOD RANGE
d75	xx	0xxxxxxx	0 ~ 99	MOD WHL AMPLITUDE MOD RNG
d76	xx	0xxxxxxx	0 ~ 99	BREATH CTRL PITCH MOD RANGE
d77	xx	0xxxxxxx	0 ~ 99	BREATH CTRL AMPLITUDE MOD RANGE
d78	xx	0xxxxxxx	0 ~ 100	BREATH CTRL PITCH BIAS RANGE
d79	xx	0xxxxxxx	0 ~ 99	BREATH CTRL EG BIAS RANGE
d80	xx	0xxxxxxx	32 ~ 127	VOICE NAME 1 <sup>4</sup> )
d81	xx	0xxxxxxx	32 ~ 127	VOICE NAME 2 <sup>4</sup> )
d82	xx	0xxxxxxx	32 ~ 127	VOICE NAME 3 <sup>4</sup> )
d83	xx	0xxxxxxx	32 ~ 127	VOICE NAME 4 <sup>4</sup> )
d84	xx	0xxxxxxx	32 ~ 127	VOICE NAME 5 <sup>4</sup> )
d85	xx	0xxxxxxx	32 ~ 127	VOICE NAME 6 <sup>4</sup> )
d86	xx	0xxxxxxx	32 ~ 127	VOICE NAME 7 <sup>4</sup> )
d87	xx	0xxxxxxx	32 ~ 127	VOICE NAME 8 <sup>4</sup> )
d88	xx	0xxxxxxx	32 ~ 127	VOICE NAME 9 <sup>4</sup> )
d89	xx	0xxxxxxx	32 ~ 127	VOICE NAME 10 <sup>4</sup> )
d90	xx	0xxxxxxx	0 ~ 99	PITCH EG RATE 1
d91	xx	0xxxxxxx	0 ~ 99	PITCH EG RATE 2
d92	xx	0xxxxxxx	0 ~ 99	PITCH EG RATE 3
d93	xx	0xxxxxxx	0 ~ 99	PITCH EG LEVEL 1
d94	xx	0xxxxxxx	0 ~ 99	PITCH EG LEVEL 2
d95	xx	0xxxxxxx	0 ~ 99	PITCH EG LEVEL 3
d96	0x	0000000x	0 ~ 1	OP4: OSC FIX
d97	0x	00000xxx	0 ~ 7	OP4: OSC FIX RANGE
d98	0x	0000xxxx	0 ~ 15	OP4: OSC FREQUENCY FINE
d99	0x	00000xxx	0 ~ 7	OP4: OSC WAVE
d100	0x	000000xx	0 ~ 3	OP4: ENV GEN SHIFT
d101	0x	0000000x	0 ~ 1	OP2: OSC FIX
d102	0x	00000xxx	0 ~ 7	OP2: OSC FIX RANGE
d103	0x	0000xxxx	0 ~ 15	OP2: OSC FREQUENCY FINE
d104	0x	00000xxx	0 ~ 7	OP2: OSC WAVE
d105	0x	000000xx	0 ~ 3	OP2: ENV GEN SHIFT
d106	0x	0000000x	0 ~ 1	OP3: OSC FIX
d107	0x	00000xxx	0 ~ 7	OP3: OSC FIX RANGE
d108	0x	0000xxxx	0 ~ 15	OP3: OSC FREQUENCY FINE





Byte	[hex]	[bin]	Range	Tone Parameter
d109	0x	00000xxx	0 ~ 7	OP3: OSC WAVE
d110	0x	000000xx	0 ~ 3	OP3: ENV GEN SHIFT
d111	0x	0000000x	0 ~ 1	OP1: OSC FIX
d112	0x	00000xxx	0 ~ 7	OP1: OSC FIX RANGE
d113	0x	0000xxxx	0 ~ 15	OP1: OSC FREQUENCY FINE
d114	0x	00000xxx	0 ~ 7	OP1: OSC WAVE
d115	00	00000000	0 <sup>3)</sup>	not used
d116	0x	00000xxx	0 ~ 7	REVERB RATE
d117	xx	0xxxxxxx	0 ~ 99	FC PITCH
d118	xx	0xxxxxxx	0 ~ 99	FC AMPLI
d119	xx	0xxxxxxx	0 ~ 99	AFTERTOUC PITCH
d120	xx	0xxxxxxx	0 ~ 99	AFTERTOUC AMPLI
d121	xx	0xxxxxxx	0 ~ 100	AFTERTOUC PITCH BIAS
d122	xx	0xxxxxxx	0 ~ 99	AFTERTOUC EG BIAS
d123	0x	0000000x	0 ~ 1	OP4: FIX RANGE MODE
d124	0x	0000000x	0 ~ 1	OP2: FIX RANGE MODE
d125	0x	0000000x	0 ~ 1	OP3: FIX RANGE MODE
d126	0x	0000000x	0 ~ 1	OP1: FIX RANGE MODE
d127	0x	0000xxxx	0 ~ 15	LS SIGN (OP 1, 2, 3, 4)
d128	00	00000000	0 <sup>3)</sup>	not used
d129	xx	00xxxxxxx	0 ~ 32	EFFECT SEL
d130	xx	0xxxxxxx	0 ~ 100	EFFECT BALANCE
d131	xx	0xxxxxxx	0 ~ 100	EFFECT OUT LEVEL
d132	0x	0000000x	0 ~ 1	EFFECT STEREO MIX
d133	xx	0xxxxxxx	0 ~ 75	EFFECT PARAM 1
d134	xx	0xxxxxxx	0 ~ 99	EFFECT PARAM 2
d135	xx	0xxxxxxx	0 ~ 99	EFFECT PARAM 3
d136	00	00000000	0 <sup>3)</sup>	not used
d137	00	00000000	0 <sup>3)</sup>	not used
d138	00	00000000	0 <sup>3)</sup>	not used
d139	00	00000000	0 <sup>3)</sup>	not used
d140	00	00000000	0 <sup>3)</sup>	not used
d141	00	00000000	0 <sup>3)</sup>	not used
d142	00	00000000	0 <sup>3)</sup>	not used
d143	00	00000000	0 <sup>3)</sup>	not used
d144	00	00000000	0 <sup>3)</sup>	not used
d145	00	00000000	0 <sup>3)</sup>	not used
d146	00	00000000	0 <sup>3)</sup>	not used
d147	00	00000000	0 <sup>3)</sup>	not used
d148	00	00000000	0 <sup>3)</sup>	not used
d149	40	01000000	64 <sup>5)</sup>	not used
d150	40	01000000	64 <sup>5)</sup>	not used
d151	40	01000000	64 <sup>5)</sup>	not used
d152	40	01000000	64 <sup>5)</sup>	not used
d153	xx	0xxxxxxx	0 ~ 127	Modifier: MOD RATE
d154	xx	0xxxxxxx	0 ~ 127	Modifier: MOD DEPTH
d155	xx	0xxxxxxx	0 ~ 127	Modifier: BRILLIANCE
d156	xx	0xxxxxxx	0 ~ 127	Modifier: MODULATOR KEYFOLLOW
d157	xx	0xxxxxxx	0 ~ 127	Modifier: CARRIER ENV TIME
d158	xx	0xxxxxxx	0 ~ 127	Modifier: MODULATOR ENV TIME

### 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 tone data memory bank (i.e. what tone number) will be affected by the SysEx message.
- 3) These bytes must be always equal to zero! If not, the SAVVY will not work correctly.
- 4) All ASCII codes are enabled.
- 5) 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	00xxxxxxx	16 / 32 / 48 ~ 49 <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 ~ 49 (i.e 30 hex to 31 hex) is for Tone Data Bank Nr. 1 to 2.

<sup>2)</sup> If Bank Type byte is 48 to 54 (i.e. Tone Data Bank Nr. 1 to 2), the 'Bank Part Number' byte specifies number of requested tone 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	00xxxxxxx	16 / 32 / 48 ~ 49 <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 ~ 49 (i.e 30 hex to 31 hex) is for a Tone Data Bank Nr. 1 to 2.

<sup>2)</sup> If Bank Type byte is 48 to 49 (i.e. Tone Data Bank Nr. 1 to 2), 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.

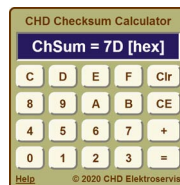
### 2.2 CHECKSUM CALCULATOR

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. 009 v. 2.0  
Document: 8361100-00920\_sysex

Manufacturer:  
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**SAVY**

Tone Parameters Editor & Controller