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Operating System Version 1.400

1.) General Information

This document is prepared under great caution in a most precise manner. Several experts took care in sorting and checking the available information the best way possible.

However, we cannot guarantee that all information is absolutely correct, nor can we guarantee that there won't be changes due to further software enhancements.

All System Exclusive messages of the Wave have the following format :

Label	Bytes	Comment
SYSX	1	Always 0xF0
WALDORF	1	Always 0x3E
WAVE ID	1	Always 0x03
DEVICE ID	1	According to global parameter <Device Number>
MESSAGE ID	1	Specifies message type
LOCATION	n1	Specifies location of Dump, Number of bytes n1 depends on MESSAGE ID
DATA	n	Number of data bytes n depending on MESSAGE ID
CHKSUM	1	sum of all bytes of LOCATION and DATA truncated to 7 bit
EOX	1	0xF7

Dumps are only accepted if the DEVICE ID fits the global parameter <Device Number> or is set to 127, which means all units. If a checksum error is detected, the whole message will be ignored. An unknown message will lead to no reaction, it will be ignored completely.

In all dumps there may be unused data-bytes. Those data-bytes represent reserved, but yet unused parameters and should be set to zero.

If not indicated differently, a databyte consists of a regular MIDI-databyte (0x00 - 0x7F).

Otherwise:

ASCII: A MIDI databyte in the range of 20h..7Fh.

BYTE : Two consecutive nibbles form an 8-bit byte.
The MS nibble is sent first.

WORD : Four consecutive nibbles form a 16-bit word.
The MS nibble is sent first.

No other data formats will be provided.
Within a single message data formats may be mixed.

2.) MESSAGE IDs

Detailed information:

The difference between dumps and requests is determined by a high or low bit 6. This means: requests occupy IDM-numbers 00h to 3Fh, while the corresponding dumps have IDM-numbers 40h to 7Fh. As you can see, a dump always has the same IDM-number as it's request, the difference being a high (set) bit 6.

The Wave accepts and sends the following Dump MESSAGE IDs :

Label	Value	Bytes n1 LOCATION	Bytes n of DATA	Description
SBPR	0x00	3	256	Soundprogram
SARR	0x01	2	512	Performance
SWAVE	0x02	4	128	Wave
SWTBL	0x03	2	266	Wave control table
SVT	0x04	1	128	Velocity Curve
STT	0x05	1	256	Tuning Table
SGLB	0x06	0	384	Global Parameters
SARRMAP	0x07	0	256	Performance Program Change Map
SBPRMAP	0x08	0	256	Sound Program Change Map
SBPRPAR	0x09	3	1	Sound Parameter
SARRPAR	0x0A	1	1	Performance Parameter
SINSPAR	0x0B	2	1	Instrument/External Parameter
SBULK	0x0F	0	1	Bulk Switch on/off

*** Note ***

SARRPAR and SINSPAR Dumps cannot be sent by the Wave with the current Operating System Version, nevertheless they are properly received.

*** Note ***

Although the Wave offers Bulk Dumps of Soundbanks, Performance banks and Arrangements, there is no System Exclusive implementation for these data types.

Instead of this, the Wave sends out a sequence of single Dumps :

Dump Sequence for Soundbank :

1. Bulk switch on SBULK
2. 128 consecutive Sound Dumps SBPR
3. Bulk switch off SBULK

Dump Sequence for Performance bank :

1. Bulk switch on SBULK
2. 128 consecutive Performance Dumps SARR
3. Bulk switch off SBULK

Dump Sequence for Wavetable :

1. Wave control table dump SWTBL
2. Wave Dumps for each needed userwave SWAVE
Rom waves 0-299 will not be sent.

Dump Sequence for Arrangement :

1. Performance Dump SARR
2. Sound Dumps for each needed Sound SBPR
- *** Dump without tables stops here ***
3. Dumps of needed Velocity curves SVT
4. Dumps of needed Tuning tables STT
5. Dumps of needed Wavetables (see above) SWTBL

The Wave accepts and sends the following Request MESSAGE IDs :
 (all DATA fields have 0 Bytes)

Label	Value	Bytes	nl of LOCATION	Description

RQBPR	0x40	1		Soundprogram
RQARR	0x41	0		Performance
RQWAVE	0x42	4		Wave
RQWTBL	0x43	1		Wavetable
RQVT	0x44	1		Velocity Curve
RQTT	0x45	1		Tuning Table
RQGLB	0x46	0		Global Parameters
RQARRMAP	0x47	0		Performance Program Change Map
RQBPRMAP	0x48	0		Sound Program Change Map

3.) Detailed Messages

3.a) SBPR (Soundprogram Dump) Format :

SYSX	1	0xF0		
WALDORF		1	0x3E	
WAVE ID		1	0x03	
DEVICE ID	1	See global parameter <Device Number>		
MESSAGE ID	1	0x00 (SBPR)		
LOCATION	3	Instrument and Sound Number		
		Byte 0: Instrument number		
		Byte 1: Bank number, 0: bank A, 1: bank B		
		Byte 2: Sound Number		
DATA	256	Soundprogram data (see description below)		
CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to		
7 bit				
EOX	1	0xF7		

Format of Soundprogram :

Byte description

0	Oscillator 1	octave	(0=-2, 0x10=-1, 0x20=0, 0x30=+1, 0x40=+2)	
1	Oscillator 1	semitone	(16-112, 1 semitone equals a value of 4)	
2	Oscillator 1	detune	(14-114 represents -50...+50)	
3	Oscillator 1	bend range	(16-112 in steps of 4, represents -12...+12, 12 means global.)	
4	Oscillator 1	pitch mode	(0: norm, 1-4: random 1-4, 5: fixed)	
5	Oscillator 1	mod 1 source	(0-38, see modifier table)	
6	Oscillator 1	mod 1 control	(0-38, see modifier table)	
7	Oscillator 1	mod 1 amount	(0-127, represents -64...+63)	
8	Oscillator 1	mod 2 source	(0-38, see modifier table)	
9	Oscillator 1	mod 2 amount	(0-127, represents -64...+63)	
10	Oscillator 1	mod 2 quantize	(0-7)	
11	unused			
12	Oscillator 2	octave	(0=-2, 0x10=-1, 0x20=0, 0x30=+1, 0x40=+2)	
13	Oscillator 2	semitone		
14	Oscillator 2	detune		

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15 Oscillator 2 bend range
16 Oscillator 2 pitch mode
17 Oscillator 2 mod 1 source
18 Oscillator 2 mod 1 control
19 Oscillator 2 mod 1 amount
20 Oscillator 2 mod 2 source
21 Oscillator 2 mod 2 amount
22 Oscillator 2 mod 2 quantize
23 Oscillator 2 link      (0: off, 1: on )
24 unused
25 Wavetable             (0-127 represents wavetables 1-128)
26 Wave 1 wave pos       (0-63)
27 Wave 1 wave phase     (0-127, 0 means free start )
28 Wave 1 start mod source (0-38, see modifier table )
29 Wave 1 start mod amount (0-127, represents -64...+63 )
30 Wave 1 envel amount    (0-127, represents -64...+63 )
31 Wave 1 envel velo amount (0-127, represents -64...+63 )
32 Wave 1 kb tracking     (0-127, represents -64...+63 )
33 Wave 1 kb center (0-127, represents C-2...G9 )
34 Wave 1 mod 1 source    (0-38, see modifier table )
35 Wave 1 mod 1 control   (0-38, see modifier table )
36 Wave 1 mod 1 amount    (0-127, represents -64...+63 )
37 Wave 1 mod 2 source    (0-38, see modifier table )
38 Wave 1 mod 2 amount    (0-127, represents -64...+63 )
39 Wave 1 mod 2 quantize  (0-7)
40 Wave 1 stepped/smooth (0: stepped, 1: smooth )
41 unused
42 Wave 2 startwave
43 Wave 2 wave phase
44 Wave 2 start mod source
45 Wave 2 start mod amount
46 Wave 2 envelope amount
47 Wave 2 envelope velo amount
48 Wave 2 keytrack
49 Wave 2 keycenter
50 Wave 2 mod 1 source
51 Wave 2 mod 1 control
52 Wave 2 mod 1 amount
53 Wave 2 mod 2 source
54 Wave 2 mod 2 amount
55 Wave 2 mod 2 quantize
56 Wave 2 stepped/smooth
57 Wave 2 link           (0: off, 1: on )
58 unused
59 Wave 1 volume          (0-112, in steps of 16, => 0-7)
60 Wave 2 volume          (0-112, in steps of 16, => 0-7)
61 Noise volume           (0-112, in steps of 16, => 0-7)
62 Wave 1 volume mod source (0-38, see modifier table )
63 Wave 1 volume mod amount (8-120 in steps of 8, => -7...+7 )
64 Wave 2 volume mod source (0-38, see modifier table )
65 Wave 2 volume mod amount (8-120 in steps of 8, => -7...+7 )
66 Noise volume mod source (0-38, see modifier table )
67 Noise volume mod amount (8-120 in steps of 8, => -7...+7 )
68 Amplifier envelope amount (0-127, represents -64...+63 )
69 Amplifier envelope velocity amount (0-127, => -64...+63 )
70 Amplifier keytrack     (0-127, represents -64...+63 )
71 Amplifier keycenter    (0-127, represents C-2...G9 )
72 Amplifier mod 1 source (0-38, see modifier table )
73 Amplifier mod 1 control (0-38, see modifier table )
74 Amplifier mod 1 amount (0-127, represents -64...+63 )
75 Amplifier mod 2 source (0-38, see modifier table )

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76 Amplifier mod 2 amount (0-127, represents -64...+63 )
77 unused
78 Filter mode (0: lowpass, 1: Highpass, 2: Bandpass, 3: Dual )
79 Lowpass filter frequency (0-127)
80 Filter resonance (0-127)
81 Filter envelope amount (0-127, represents -64...+63 )
82 Filter velocity amount (0-127, represents -64...+63 )
83 Filter keytrack (0-127, represents -64...+63 )
84 Filter keycenter (0-127, represents C-2...G9 )
85 Filter mod 1 source (0-38, see modifier table )
86 Filter mod 1 control (0-38, see modifier table )
87 Filter mod 1 amount (0-127, represents -64...+63 )
88 Filter mod 2 source (0-38, see modifier table )
89 Filter mod 2 amount (0-127, represents -64...+63 )
90 Filter resonance mod source (0-38, see modifier table )
91 Filter resonance mod control (0-38, see modifier table )
92 Filter resonance mod amount (0-127, represents -64...+63 )
93 Dual mode highpass frq (0-127)
94 Dual mode highpass envelope select (0: Amp, 1: Filter, 2: Wave, 1:
Free )
95 Dual mode highpass envelope amount (0-127, represents -64...+63 )
96 Dual mode highpass velocity amount (0-127, represents -64...+63 )
97 Dual mode highpass keytrack (0-127, represents -64...+63 )
98 Dual mode highpass keycenter (0-127, represents C-2...G9 )
99 Dual mode highpass mod 1 source (0-38, see modifier table )
100 Dual mode highpass mod 1 control (0-38, see modifier table )
101 Dual mode highpass mod 1 amount (0-127, represents -64...+63 )
102 Dual mode highpass mod 2 source (0-38, see modifier table )
103 Dual mode highpass mod 2 amount (0-127, represents -64...+63 )
104 Bandpass filter bandwidth (0-127)
105 unused
106 Amplifier envelope attack (0-127)
107 Amplifier envelope decay (0-127)
108 Amplifier envelope sustain (0-127)
109 Amplifier envelope release (0-127)
110 Amplifier envelope attack mod source (0-38, see modifier table )
111 Amplifier envelope attack mod amount (0-127, represents -64...+63 )
112 Amplifier envelope decay mod source (0-38, see modifier table )
113 Amplifier envelope decay mod amount (0-127, represents -64...+63 )
114 Amplifier envelope sustain mod source (0-38, see modifier table )
115 Amplifier envelope sustain mod amount (0-127, represents -64...+63 )
116 Amplifier envelope release mod source (0-38, see modifier table )
117 Amplifier envelope release mod amount (0-127, represents -64...+63 )
118 unused
119 Filter envelope delay (0-127)
120 Filter envelope attack (0-127)
121 Filter envelope decay (0-127)
122 Filter envelope sustain (0-127)
123 Filter envelope release (0-127)
124 unused
125 unused
126 Filter envelope attack mod source (0-38, see modifier table )
127 Filter envelope attack mod amount (0-127, represents -64...+63 )
128 Filter envelope decay mod source (0-38, see modifier table )
129 Filter envelope decay mod amount (0-127, represents -64...+63 )
130 Filter envelope sustain mod source (0-38, see modifier table )
131 Filter envelope sustain mod amount (0-127, represents -64...+63 )
132 Filter envelope release mod source (0-38, see modifier table )
133 Filter envelope release mod amount (0-127, represents -64...+63 )
134 unused

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135 Wave envelope time 1 (0-127)
136 Wave envelope level 1 (0-127)
137 Wave envelope time 2 (0-127)
138 Wave envelope level 2 (0-127)
139 Wave envelope time 3 (0-127)
140 Wave envelope level 3 (0-127)
141 Wave envelope time 4 (0-127)
142 Wave envelope level 4 (0-127)
143 Wave envelope time 5 (0-127)
144 Wave envelope level 5 (0-127)
145 Wave envelope time 6 (0-127)
146 Wave envelope level 6 (0-127)
147 Wave envelope time 7 (0-127)
148 Wave envelope level 7 (0-127)
149 Wave envelope time 8 (0-127)
150 Wave envelope level 8 (0-127)
151 Wave envelope time mod source (0-38, see modifier table)
152 Wave envelope time mod amount (0-127, represents -64...+63)
153 Wave envelope level mod source (0-38, see modifier table)
154 Wave envelope level mod amount (0-127, represents -64...+63)
155 Wave envelope key off point (0-7 represents point 1-8)
156 Wave envelope loop start point (0-7 represents point 1-8)
157 Wave envelope loop on/off (0: off,1: on)
158 unused
159 Free envelope time 1 (0-127)
160 Free envelope level 1 (0-127)
161 Free envelope time 2 (0-127)
162 Free envelope level 2 (0-127)
163 Free envelope time 3 (0-127)
164 Free envelope level 3 (0-127)
165 Free envelope time 4 (0-127)
166 Free envelope level 4 (0-127)
167 Free envelope time mod source (0-38, see modifier table)
168 Free envelope time mod amount (0-127, represents -64...+63)
169 Free envelope level mod source (0-38, see modifier table)
170 Free envelope level mod amount (0-127, represents -64...+63)
171 Free envelope zero axis (0-127, represents -64...+63)
172 Lfo 1 rate (0-127)
173 Lfo 1 shape (0: sine, 1:tri, 2: saw,3: pulse,4: random, 5: S&H)
174 Lfo 1 symmetry (0-127, represents -64...+63)
175 Lfo 1 humanize (0-7)
176 Lfo 1 rate mod source (0-38, see modifier table)
177 Lfo 1 rate mod amount (0-127, represents -64...+63)
178 Lfo 1 level mod source (0-38, see modifier table)
179 Lfo 1 level mod control (0-38, see modifier table)
180 Lfo 1 level mod amount (0-127, represents -64...+63)
181 Lfo 1 sync (0: off, 1: on)
182 Lfo 2 rate
183 Lfo 2 shape
184 Lfo 2 symmetry
185 Lfo 2 humanize
186 Lfo 2 rate mod source
187 Lfo 2 rate mod amount
188 Lfo 2 level mod source
189 Lfo 2 level mod control
190 Lfo 2 level mod amount
191 Lfo 2 sync
192 Control ramp trigger source (0-38, see modifier table)
193 Control ramp rate (0-127, represents -64...+63)

194 Panning source 1 (0-38, see modifier table)

195 Panning control 1 (0-38, see modifier table)
 196 Panning amount 1 (0-127, represents -64...+63)
 197 Panning source 2 (0-38, see modifier table)
 198 Panning amount 2 (0-127, represents -64...+63)

 199 Control comparator source (0-38, see modifier table)
 200 Control comparator threshold (0-127, represents -64...+63)
 201 Control mixer source 1 (0-38, see modifier table)
 202 Control mixer amount 1 (0-127, represents -64...+63)
 203 Control mixer source 2 (0-38, see modifier table)
 204 Control mixer amount 2 (0-127, represents -64...+63)
 205 Control mixer source 2 (0-38, see modifier table)
 206 Control mixer amount 2 (0-127, represents -64...+63)

 207 Control delay source (0-38, see modifier table)
 208 Control delay time (0-127)
 209 Control delay t mod source (0-38, see modifier table)
 210 Control delay t mod amount (0-127, represents -64...+63)

 211 Control shaper source (0-38, see modifier table)
 212 Control shaper ref point 1 (0-127, represents -64...+63)
 213 Control shaper ref point 2 (0-127, represents -64...+63)
 214 Control shaper ref point 3 (0-127, represents -64...+63)
 215 Control shaper ref point 4 (0-127, represents -64...+63)
 216 Control shaper ref point 5 (0-127, represents -64...+63)
 217 Control shaper ref point 6 (0-127, represents -64...+63)
 218 Control shaper ref point 7 (0-127, represents -64...+63)
 219 Control shaper ref point 8 (0-127, represents -64...+63)
 220 Control shaper ref point 9 (0-127, represents -64...+63)

 221 Sample & hold source (0-38, see modifier table)
 222 Sample & hold rate (0-127)
 223 Sample & hold rate mod source (0-38, see modifier table)
 224 Sample & hold rate mod amount (0-127, represents -64...+63)
 225 unused

 226 Aux level mod source (0-38, see modifier table)
 227 Aux level mod control (0-38, see modifier table)
 228 Aux level mod amount (0-127, represents -64...+63)
 229 Aux level min (0-127)
 230 unused
 231 unused
 232 unused

 233 Glide mode (1: Porta, 2: Gliss., 3: MIDI Porta, 4: MIDI Gliss.,
 5: Fingered Porta, 6: Fingered Glissando)
 234 Glide rate (0-127)
 235 Glide slope (0: Time, 1: Distance)
 236 Glide time mod source (0-38, see modifier table)
 237 Glide time mod amount (0-127, represents -64...+63)
 238 Glide on/off (0: off, 1: on)
 239 Valid flag (0x55)
 240-255 Name (ASCII)

Modifier table:

Index	Modifier
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-----
0      Lfo 1
1      Lfo 2
2      Volume Envelope
3      Filter Emvelope
4      Wave Envelope
5      Free Envelope
6      Ctrl Ramp
7      Ctrl Mixer
8      Ctrl Delay
9      Ctrl Shaper
10     Ctrl Sample & Hold
11     Comparator Pos
12     Comparator Neg
13     Keytrack
14     Velocity
15     Release Velocity
16     Channel Pressure
17     Poly Pressure
18     Playspeed
19     More Keys
20     Less Keys
21     Pitch Bend
22     Modwheel
23     Free Wheel Up
24     Free Wheel Down
25     Free Wheel Bipolar
26     Sustain
27     Pedal 1
28     Pedal 2
29     Button 1
30     Button 2
31     Volume Ctrl (7)
32     Pan Ctrl
33     Breath Control
34     Control X
35     Control Y
36     Midi Clock
37     Minimum
38     Maximum
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3.b) SARR (Performance Dump)
Format :

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SYSX      1      0xF0
WALDORF   1      0x3E
WAVE ID    1      0x03
DEVICE ID  1      according to global parameter <Device Number>
MESSAGE ID 1      0x01 ( SARR )
LOCATION    2      Bank and performance number
              Byte 0:   Bank number, 0: bank A, 1: bank B
              Byte 1:   Performance number 0-127 according to Performances
1-128
DATA      512    Performance data ( see description below )
CHKSUM    1      sum of all bytes of DATA and LOCATION, truncated to
7 bit

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Format of Performance data :

Byte description

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0   Instruments master volume    (0-127)
1   Externals master volume      (0-127)
2   Free wheel up                (MIDI controllers 0-100 )
3   Free wheel down              (MIDI controllers 0-100 )
4   Button 1                     (MIDI controllers 0-100 )
5   Button 2                     (MIDI controllers 0-100 )
6   Button 1 mode                (0: touch, 1: toggle )
7   Button 2 mode                (0: touch, 1: toggle )
8   Fader 1 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
9   Fader 1 control (0-127, see Fader control table )
10  Fader 2 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
11  Fader 2 control (0-127, see Fader control table )
12  Fader 3 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
13  Fader 3 control (0-127, see Fader control table )
14  Fader 4 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
15  Fader 4 control (0-127, see Fader control table )
16  Fader 5 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
17  Fader 5 control (0-127, see Fader control table )
18  Fader 6 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
19  Fader 6 control (0-127, see Fader control table )
20  Fader 7 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
21  Fader 7 control (0-127, see Fader control table )
22  Fader 8 assign (0-15, 0-7: instr. 1-8, 8-15: external 1-8)
23  Fader 8 control (0-127, see Fader control table )
24  Main edit active instrument number (0-7: instr. 1-8 )
25  unused
26  Pedal 1 MIDI controller (0-120)
27  Pedal 2 MIDI controller (0-120)
28  Controller X                 (0-120)
29  Controller Y                 (0-120)
30  Aux master Volume            (0-127)
31  unused
32-47 Multi program name        (ASCII)
    48 Valid flag ( 0x55 )
49-63 unused
64-95 Instrument 1 data ( see Instrument data description )
96-127 Instrument 2 data ( see Instrument data description )
128-159 Instrument 3 data ( see Instrument data description )
160-191 Instrument 4 data ( see Instrument data description )
192-223 Instrument 5 data ( see Instrument data description )
224-255 Instrument 6 data ( see Instrument data description )
256-287 Instrument 7 data ( see Instrument data description )
288-319 Instrument 8 data ( see Instrument data description )
320-343 External 1 data ( see External data description )
344-367 External 2 data ( see External data description )
368-391 External 3 data ( see External data description )
392-415 External 4 data ( see External data description )
416-439 External 5 data ( see External data description )
440-463 External 6 data ( see External data description )
464-487 External 7 data ( see External data description )
488-511 External 8 data ( see External data description )

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Format of Instrument Data:

Byte	description
0	Sound number (0-127 represents 1-128)
1	Sound Bank (0: bank A, 1: bank B)
2	Midi Channel (0-16, 0: Base,)
3	Source (0: Off, 1: Keys, 2: Midi, 3: Mix)
4	Volume (0-127)
5	Pan (0-127, represents -64...+63)
6	Pan Mode (0: off, 1: on, 2: inverse)
7	Aux Volume (0-127)
8	unused
9	Transpose offset (4-124, represents -60...+60)
10	Detune (14-114, represents -50...+50)
11	MIDI Output Port (0: off, 1: A, 2: B, 3: A+B)
12	Audio Routing (1-4, 1: Aux only, 2: main, 3: sub 1, 4: sub 2)
13	Status (0: On/Solo, 1: Mute)
14	Edit Enable (0: off, 1: on)
15	Voice Allocation Mode (0-22, 0: dynamic, 1-16: poly1-16, 17: last retri, 18: low retri, 19: high retri, 20: last single, 21: low single, 22: high single trigger)
16	Audio Input (0-4, 0: off, 1-4: Input 1-4)
17	Key Limit Low (0-127, represents C-2...G9)
18	Key Limit High (0-127, represents C-2...G9)
19	Velocity Limit Low (1-127)
20	Velocity Limit High (1-127)
21	Velocity Table (0-11, 0: global, 1: lin+, 2: lin-, 3: exp+, 4: exp-, 5: xfade+, 6: xfade-, 7: full, 8-11: user1-user4)
22	Temperment (0-11, 0: global, 1: lin+, 2: hmt, 3: lin-, 4-7: rand1-rand4, 8-11: user1-user4)
23	unused
24	Midi Filters Bitvector (bit set = on, bit cleared = off)
	Bit Switch
0	Prog. Change on/off
1	Pitch Wheel on/off
2	Modwheel on/off
3	After Touch on/off
4	Volume Ctrl on/off
5	Sustain Pedal on/off
6	Panning Ctrl on/off
7	Always cleared
25-31	unused

Format of External Data:

Byte	description
0	Program number (0-127)
1	Bank (0: bank A, 1: bank B)

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2    Channel      (0-16, 0: base)
3    Volume       (0-127)
4    Panning (0-127, 0:off, 1-127 => 163 - r63)
5    Modwheel scale (13-114, 13: off, 14-114 => -200%...+200%)
6    Pitchbend scale (13-114, 13: off, 14-114 => -200%...+200%)
7    Transpose offset (4-124, represents -60...+60)
8    Detune       (14-114, represents -50...+50)
9    MIDI Output Port (0: off, 1: A, 2: B, 3: A+B)
10   Status       (0: On/Solo, 1:Mute)
11   unused
12   Key Limit Low  (0-127, represents C-2...G9 )
13   Key Limit High (0-127, represents C-2...G9 )
14   Velocity Limit Low (1-127)
15   Velocity Limit High (1-127)
16   Velocity Table (0-11, 0: global, 1: lin+, 2: lin-, 3: exp+, 4:
exp-,

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5: xfade+, 6: xfade-, 7: full, 8-11: user1-user4 )

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17   unused
18   Midi Filters Bitvector ( bit set = on, bit cleared = off )
    Bit Switch

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-----
0    Prog. Change  on/off
    1 Free Wheel  on/off
    2 Buttons      on/off
    3 Aftertouch   on/off
    4 Pedal 1      on/off
    5 Pedal 2      on/off
    6 Sustain Pedal on/off
    7 Always cleared
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19   Keys on/off

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20-23 unused
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3.c) SWAVE (Wave Data Dump)

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Format :
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--
SYSX      1      0xF0
WALDORF    1      0x3E
WAVE ID    1      0x03
DEVICE ID  1      according to global parameter <Device Number>
MESSAGE ID 1      0x02 ( SWAVE )
LOCATION     4      Wave number in format WORD ( 0 - 1299 )
DATA       128    64 Wavesamples in format BYTE
CHKSUM      1      sum of all bytes of DATA and LOCATION, truncated to
7 bit
EOX         1      0xF7
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3.d) SWTBL (Wavetable Dump)

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Format :
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--
SYSX      1      0xF0
WALDORF    1      0x3E
WAVE ID    1      0x03

```

```

    DEVICE ID  1      according to global parameter <Device Number>
    MESSAGE ID 1      0x03 ( SWTB )
    LOCATION   1      Wavetable number (64-127)
    DATA      276    Wave control table ( see description below )
    CHKSUM     1      sum of all bytes of DATA and LOCATION, truncted to
7 bit
    EOX        1      0xF7
-----

```

--

Wave control table format :

Byte description

```

-----
0-8  Wavetable Name      ( ASCII )
9    valid flag          ( 0x55 )
10-275  64 Wavenumbers in format WORD.
        If a Wavenumber is not in the range from 0 to 1299,
        this waveposition will be interpolated between the
        previous and the following defined position except
        for the last three positions, which then will become
        a tri, saw and a square wave.
-----

```

--

*** Important Note ! ***

Anytime a Wave control table is dumped, all user Waves used by this table will be dumped too.

3.e) SVT (Velocity curve Dump)

Format :

```

-----
    SYSX        1      0xF0
    WALDORF     1      0x3E
    WAVE ID     1      0x03
    DEVICE ID   1      according to global parameter <Device Number>
    MESSAGE ID  1      0x04 ( SVT )
    LOCATION    1      Velocity curve number ( 0-3, represents curve 1-4 )
    DATA       128    Value for each incoming Velocity (1-127)
    CHKSUM      1      sum of all bytes of DATA and LOCATION, truncted to
7 bit
    EOX         1      0xF7
-----

```

--

3.f) STT (Tuning table Dump)

Format :

```

-----
    SYSX        1      0xF0
    WALDORF     1      0x3E
    WAVE ID     1      0x03
    DEVICE ID   1      according to global parameter <Device Number>
    MESSAGE ID  1      0x05 ( STT )
    LOCATION    1      Tuning table number ( 0-3, represents tables 1-4 )
    DATA       256    128 entries for MIDI keys 0-127, each entry consists of

```

) one byte defining the note (0-127, represents C-2...G9)
 and one byte defining detune (14-114 represents -50...+50)
)
 7 bit CHKSUM 1 sum of all bytes of DATA and LOCATION, truncated to
 EOX 1 0xF7

 --

3.g) SGLB (Global Parameter Dump)

Format :

 --
 SYSX 1 0xF0
 WALDORF 1 0x3E
 WAVE ID 1 0x03
 DEVICE ID 1 according to global parameter <Device Number>
 MESSAGE ID 1 0x06 (SGLB)
 LOCATION 0
 DATA 384 Global Parameters (see table)
 CHKSUM 1 sum of all bytes of DATA and LOCATION, truncated to
 7 bit EOX 1 0xF7

 --

Description of Global Parameters :

Byte description

 --
 0 global stereo width (0-127 represents 163 - r64)
 1 master tune (14-114 represents -50...+50)
 2 global bend range (16-112 in steps of 4, represents -12...+12)
 3 global Tuning table (0-3 represents table 1-4)
 4 global Velocity cuve (0-3 represents curve 1-4)
 5 program change voice mode (0: ring, 1: shut)
 6 performance program change map on/off (0: off, 1: on)
 7 sound program change map on/off (0: off, 1: on)
 8 local on/off (0: off, 1: on)
 9 panel transmit (0: off, 1: on)
 10 unused
 11 System Volume to Externals (0: off, 1: on)
 12 Display mode (0: normal, 1: inverse)
 13 Base channel (0-16, 0: omni)
 14 unused
 15 Device Number (0-127, 127 means all units)
 16 unused
 17 unused
 18 System volume (0-127)
 19 Bank switch receive (0: off, 1: on)
 20 Display Knobs mode (0: Icon, 1: Text)
 21 Send Active Sensing (0: off, 1: on)
 22 Transmit Running Status (0: off, 1: on)
 23 unused
 24 unused
 25 Keyboard shift (52: octave down, 64: normal, 76: oct. up)
 26 Global Parameters Valid flag (0x55)
 27 Show SysEx changes (0: off, 1: on)
 28 Pedal 1 polarity (0: closing switch, 1: opening switch)

29 Glide window length (0-10)
 30 HMT mode (0-15, see HMT mode table)
 31 HMT Scale (0-10)
 32 Bank number (0: A, 1: B)
 33 Pedal 2 polarity (0: closing switch, 1: opening switch)
 34 Pedal 3 polarity (0: closing switch, 1: opening switch)
 35 System Exclusive MIDI out port (0: off, 1: A, 2: B)
 36-63 unused
 64-383 32 MIDI Channel Names, first 16 for Port A, each name consists
 of 9 ASCII characters and a terminating 0.

HMT mode table:

Value	Description
-------	-------------

0	Standard
1	Standard with natural 7th
2	Horizontal
3	C major / A minor
4	G major / E minor #
5	D major / B minor ##
6	A major / F# minor ###
7	E major / C# minor ####
8	B major / G# minor #####
9	F# major / D# minor #####
10	Gb major / Eb minor bbbbbb (same as F# major / D# minor)
11	Db major / Bb minor bbbbbb
12	Ab major / F minor bbbb
13	Eb major / C minor bbb
14	Bb major / G minor bb
15	F major / d minor b

3.h) SARRMAP (Performance Program Change Map Dump)

Format :

SYSX	1	0xF0
WALDORF	1	0x3E
WAVE ID	1	0x03
DEVICE ID	1	according to global parameter <Device Number>
MESSAGE ID	1	0x07 (SARRMAP)
LOCATION	0	
DATA	256	128 entries for Program change 1-128, each entry consists of one byte defining the Bank (0: A, 1: B) and one byte defining the Performance number (0-127 represents 1-128)
CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to 7 bit
EOX	1	0xF7

3.i) SBPRMAP (Sound Program Change Map Dump)

Format :

SYSX	1	0xF0
------	---	------

	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x08 (SBPRMAP)
	LOCATION	0	
	DATA	256	128 entries for Program change 1-128, each entry consists of one byte defining the Bank (0: A, 1: B) and one byte defining the Sound number (0-127 represents 1-128)
7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

3.k) SBPRPAR (Sound parameter Dump)

Format :

	SYSX	1	0xF0
	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x09 (SBPRPAR)
	LOCATION	3	byte 0 : instrument number (0-7, represents 1-8) byte 1-2 : offset of parameter (see Sound Dump format) in format BYTE (0-255)
	DATA	1	New value of parameter defined by location
7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

3.l) SARRPAR (Performance parameter Dump)

Format :

	SYSX	1	0xF0
	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x0A (SARRPAR)
	LOCATION	1	offset of parameter (see Performance Data format)
	DATA	1	New value of parameter defined by location
7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

3.m) SINSPAR (Instrument / External parameter Dump)

Format :

	SYSX	1	0xF0
	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x0B (SINSPAR)

LOCATION	2	byte 0 : instrument number (0-7, for Instruments 1-8, 8-15 for Externals 1-8)
		byte 1 : offset of parameter (see Inst./Ext. Data

format)

DATA	1	New value of parameter defined by location
CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to

7 bit

EOX	1	0xF7
-----	---	------

--

3.n) SBULK (Bulk Switch on/off)

Format :

--

SYSX	1	0xF0
WALDORF	1	0x3E
WAVE ID	1	0x03
DEVICE ID	1	according to global parameter <Device Number>
MESSAGE ID	1	0x0F (SBULK)
LOCATION	0	
DATA	1	0: Bulk Dump off, (default), Incoming Dumps will go to an Editbuffer, if available. 1: Bulk on, Incoming Dumps will replace the original Data.
CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to

7 bit

EOX	1	0xF7
-----	---	------

--

4.) Detailed Requests

4.a) RQBPR (Soundprogram Dump Request)

Format :

--

SYSX	1	0xF0
WALDORF	1	0x3E
WAVE ID	1	0x03
DEVICE ID	1	See global parameter <Device Number>
MESSAGE ID	1	0x40 (RQBPR)
LOCATION	1	Instrument number
DATA	0	
CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to

7 bit

EOX	1	0xF7
-----	---	------

--

4.b) RQARR (Performance Dump Request)

Format :

--

SYSX	1	0xF0
WALDORF	1	0x3E
WAVE ID	1	0x03
DEVICE ID	1	according to global parameter <Device Number>


```

MESSAGE ID 1      0x41 ( RQARR )
LOCATION      2      Bank and performance number
              Byte 0:   Bank number, 0: bank A, 1: bank B
              Byte 1:   Performance number 0-127 according to Performances
1-128
DATA          0
CHKSUM        1      sum of all bytes of DATA and LOCATION, truncated to
7 bit
EOX           1      0xF7
-----

```

4.c) RQWAVE (Wave Data Dump Request)

Format :

```

-----
--
SYSX          1      0xF0
WALDORF        1      0x3E
WAVE ID        1      0x03
DEVICE ID     1      according to global parameter <Device Number>
MESSAGE ID    1      0x42 ( RQWAVE )
LOCATION       4      Wave number in format WORD ( 0 - 1299 )
DATA          0
CHKSUM        1      sum of all bytes of DATA and LOCATION, truncated to
7 bit
EOX           1      0xF7
-----

```

4.d) RQWTB (Wavetable Dump Request)

Format :

```

-----
--
SYSX          1      0xF0
WALDORF        1      0x3E
WAVE ID        1      0x03
DEVICE ID     1      according to global parameter <Device Number>
MESSAGE ID    1      0x43 ( RQWTB )
LOCATION       1      Wavetable number (64-127)
DATA          0
CHKSUM        1      sum of all bytes of DATA and LOCATION, truncated to
7 bit
EOX           1      0xF7
-----

```

4.e) RQVT (Velocity curve Dump Request)

Format :

```

-----
--
SYSX          1      0xF0
WALDORF        1      0x3E
WAVE ID        1      0x03
DEVICE ID     1      according to global parameter <Device Number>
MESSAGE ID    1      0x44 ( RQVT )
LOCATION       1      Velocity curve number ( 0-3, represents curve 1-4 )
DATA          0

```

7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

--

4.f) RQTT (Tuning table Dump Request)

Format :

--

	SYSX	1	0xF0
	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x45 (RQTT)
	LOCATION	1	Tuning table number (0-3, represents tables 1-4)
	DATA	0	
7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

--

4.g) RQGLB (Global Parameter Dump Request)

Format :

--

	SYSX	1	0xF0
	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x46 (RQGLB)
	LOCATION	0	
	DATA	0	
7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

--

4.h) RQARRMAP (Performance Program Change Map Dump Request)

Format :

--

	SYSX	1	0xF0
	WALDORF	1	0x3E
	WAVE ID	1	0x03
	DEVICE ID	1	according to global parameter <Device Number>
	MESSAGE ID	1	0x47 (RQARRMAP)
	LOCATION	0	
	DATA	0	
7 bit	CHKSUM	1	sum of all bytes of DATA and LOCATION, truncated to
	EOX	1	0xF7

--

4.i) RQBPRMAP (Sound Program Change Map Dump Request)

Format :

```
-----  
--  
  SYSX          1      0xF0  
  WALDORF        1      0x3E  
  WAVE ID        1      0x03  
  DEVICE ID     1      according to global parameter <Device Number>  
  MESSAGE ID    1      0x48 ( RQBPRMAP )  
  LOCATION      0  
  DATA          0  
  CHKSUM        1      sum of all bytes of DATA and LOCATION, truncted to  
7 bit  
  EOX           1      0xF7  
-----  
--
```