

# Schmidt Synthesizer Feature Requests

Pascal J. Bourguignon

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## 1 Schimdt\_Manual\_E\_121\_Web.pdf Errata

- In the MIDI parameter sections, several occurrences of the mapping for oscillators contain a typo "Osz2" for "Osz3":

```
00: Osz1
01: Osz2
10: Osz2
11: Osz4
```

- Everywhere, the abbreviated time unit "second" shall be written in lower case, for example: 2ms...21s The upper-case "S" represents the electric conductance unit "Siemens".
- Several occurrences of "Dacay2" -> "Decay 2"
- page 110: Apparently, the DF2 section header is missing; the parameters from the bottom of this page from Velocity 126, and top of page 111 seem to be related to DF2.
- Glide/bend and Pitch Bend ranges are not disjoint! 1...28 should probably be 15...28.
- Missing a section explaining the format of the SysEx messages, (see below reverse-engineered documentation "Schmidt Synthesizer SysEx Headers").

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## 2 Feature requests

### 2.1 User Interface

#### 2.1.1 Writing Programs

When writing a program to a new position, it would be useful to display the name of the program in the destination slot. (And since we have space on the screen in small font, why not also display the name of the source program).

Instead of:

```
+-----+
| Write Single |
|   Bank 1 - 1 |
| => Bank 1 - 100 |
|-----|
|Bn/Pre^v:Destination |
|Exit:Quit Write:Write|
+-----+
```

Display:

```
+-----+
|Single 1:001 -> 1:100|
| Schmidt TW |
|-> Sound 100 |
|-----|
|Bnk/Pre^v:Destination|
|Exit:Quit Write:Write|
+-----+
```

Similarly for Saving/Writing Multi presets, and for the Clipboard.

#### 2.1.2 Showing Parameter Value

In Pot Mode = Catch, it would be nice if the value of the parameter was displayed as soon as a potentiometer is turned, before the value is caught and changed.

### 2.2 Real time Controls Assignments

It would be nice to be able to assign the real time controls to more than a single parameter at a time. While I realize that this may require extending

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the format of the program sysex, it would be worth it being able to assign those real time controls (including the CV modifiers B1-B4), each to at least 8 different parameters, and, when the half-range directions (00+ 00- +00 -00) are used, to at least 4 different parameters in each direction simultaneously (4 parameters in the + direction, and 4 different parameters in the - direction).

For example, we may want to assign the modulation wheel simultaneously to the cutoff of the five filters:

VCF 1 cutoff	-..+	25%
VCF 2 cutoff	+...-	75%
DF 1 cutoff	0...+	33%
DF 2 cutoff	0...-	100%
VCF 3 cutoff	0...+	125%

Currently we can assign the controllers in a single direction (00+ 00- +00 -00), but in this case, the other direction (or the other half-range) is useless. In that case we would want to be able to specify at the same time a  $\pm 00$  and a  $00\pm$  direction, and for both direction, up to 4 parameters.

For example, we may want to assign the Y axis this way:

00+	OSZ 1 Vibrato Depth	100%
00+	OSZ 2 Vibrato Depth	75%
00+	OSZ 3 Vibrato Depth	50%
00+	OSZ 4 Vibrato Depth	33%
+00	VCF 1 Cutoff	100%
+00	VCF 2 cutoff	75%
-00	VCF 3 cutoff	100%
-00	VCF 4 cutoff	33%

so moving the stick down would change the vcf cutoffs, while moving it up would change the vibrato depth.

## 2.3 CV Modifiers

To be able to fully use the capabilities of the Expressive Touché (with 4 CV outputs), it would be nice if it was possible to assign input B4 to any parameter like B1-B3, instead of just to the volume. (ie. add Mod.ExtB4 to the modulators). <https://www.expressivee.com/touche/overview>

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## 2.4 MIDI Implementation

It would be useful to provide several sysex message to be able to command program and bank reading and writing (dumping and reception/saving), so that a librarian software may be implemented.

- The MIDI sysex messages to request programs (single, multi) and banks dumps are not specified.
- The MIDI sysex messages to command writing a program or a bank are not specified.
- The format of the MIDI sysex bank dumps message is not specified.

## 2.5 Firmware Update

It doesn't seem to work on the USB port, only on the MIDI port. It should work on the USB port too.

Notice: the first byte after F0 in the SysEx messages is usually a byte identifying the manufacturer. In the case of bank dump SysEx, the byte 7D is used (for Non-Commercial use), but in the case of firmware updates, it's 07, which means Kurzweil. <https://www.midi.org/specifications/item/manufacturer-id-numbers> It would be preferable to keep 7D (Non-Commercial use) until Schmidt is allocated a Manufacturer ID.

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### 3 Schmidt Synthesizer SysEx Messages

This section should be completed and added to the user manual.

#### 3.1 SysEx Format for Firmware Updates

MIDI SysEx header:

```
F0          System Exclusive
07          Kurtzveil
0d
07
07
03
03
0f ...
```

```
V1.21_panel.syx  f0 07 0d 07 07 03 03 0f 0f 0f 0f 0f 0f 0f 0f
V1.21_system.syx f0 07 0d 07 07 03 03 0f 0f 0f 0f 0f 0f 0f 0f
V1.21_voice.syx  f0 07 0d 07 07 03 03 0f 0f 0f 0f 0f 0f 0f 0f
V1.22_panel.syx  f0 07 0d 07 07 03 03 0f 0f 0f 0f 0f 0f 0f 0f
V1.22_voice.syx  f0 07 0d 07 07 03 03 0f 0f 0f 0f 0f 0f 0f 0f
V1.23_system.syx f0 07 0d 07 07 03 03 0f 0f 0f 0f 0f 0f 0f 0f
```

#### 3.2 SysEx Format for Single Bank

##### 3.2.1 MIDI SysEx Format

1. Bank Dump

- MIDI SysEx header:

```
F0          System Exclusive
7D          Non-Commercial SysEx
77
33
07          bank number 00 - 07 (for bank 1 to 8).
00 00
```

- 
- Single Bank Data:  
65536 octets. Each octet encodes a quad between 0 and 15 (00H...0FH).  
Two successive octets are combined in little-endian order to form  
a data octet: 0w 0x 0y 0z ... encode xw zy ..., resulting into  
32768 octet of bank data block.
  - MIDI SysEx trailer:

```
05 0E 03 02      check-sum?
F7               EOX (End of Exclusive)
```

### 3.2.2 Bank Data Block Format

A Single Bank Block contains 32768 octets: the concatenation of 128 program data blocks of 256 octets each.

The last byte contains a check-sum computed as the arithmetic sum of all the octets in the bank data block, modulo 256.

### 3.2.3 Program Data Block Format

The program parameters are numbered as documented for the NPRN MIDI messages sent and received when modifying the parameters of the current program. Here is the list of documented parameters:

Number of parameters: 203

- 1: (vcf 1) ENV Depth
- 2: (vcf 2) ENV Depth
- 3: (vcf 1) Cutoff
- 4: (vcf 2) Cutoff
- 5: (df 1) Cutoff
- 6: (df 2) Cutoff
- 7: (osz 3) Main Pitch
- 8: (osz 4) Main Tune
- 11 - 26: Program Name.
- 29: (special) Preset LED Color
- 30: (special) Preset Screen Color
- 31: (vcf 1/2) VCF12 LFO-Sync-Mode
- 32: (master-env/vca) Sound Volume
- 33: (master-env/vca) Attack
- 34: (master-env/vca) Decay
- 35: (master-env/vca) Sustain

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36: (master-env/vca) Release  
37: (master-env/vca) Release-Level  
38: (group 1/2) Group 1 Velocity  
39: (group 1/2) Group 2 Velocity  
40: (vcf 1) Attack  
41: (vcf 1) Decay 1  
42: (vcf 1) Sustain  
43: (vcf 1) Release  
44: (vcf 2) Attack  
45: (vcf 2) Decay 1  
46: (vcf 2) Sustain  
47: (vcf 2) Release  
48: (group 1/2) Min Man/Fade-Controls  
49: (group 1/2) Group 1/2 Man-Mix  
50: (group 1/2) Group 1/2 Fade-Time  
51: (group 1/2) Group 1/2 Fade-Delay  
52: (group 1/2) Panorama-Controls  
53: (group 1/2) Group 1 Pan-Offset  
54: (group 1/2) Group 2 Pan-Offset  
55: (group 1/2) Panorama-LFO-Depth  
56: (group 1/2) Panorama-LFO-Rate  
57: (group 1/2) LFO-Controls  
58: (group 1/2) Mix-LFO-Depth  
59: (group 1/2) Mix-LFO-Rate  
60: (master-env/vca) Soft/VCA-VCF12-Retrigger  
61: (vcf 1/2) VCF12 Decay2  
62: (vcf 1) Decay 2  
63: (vcf 2) Decay 2  
64: (vcf 1) ENV Destination (Velocity)  
65: (vcf 2) ENV Destination (Velocity)  
66: (vcf 1) ENV Velocity-Depth  
67: (vcf 2) ENV Velocity-Depth  
68: (vcf 2) ENV-Trigger-Repeat-Rate  
69: (vcf 1) Trigger Delay  
70: (vcf 2) Trigger Delay  
71: (glide/bend) Glide Depth  
72: (osz 1234) Unison Tune (Mono)  
73: (osz 1234) Single Fine Tune  
74: (osz 1234) Single Transpose  
75: (vcf 1) Resonance



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76: (vcf 1) Filter Mode (LP-BP-HP)  
77: (vcf 2) Resonance  
78: (vcf 2) Filter Mode (LP-BP-HP)  
79: (vcf 1/2) Input Source  
80: (df 1/2) Input Source  
81: (vcf 1/2) Input B Filter/Level Mod  
82: (vcf 1) Input Level A  
83: (vcf 1) Input Level B  
84: (vcf 2) Input Level A  
85: (vcf 2) Input Level B  
86: (vcf 1) Level B Mod Time Out  
87: (vcf 2) Level B Mod Time Out  
88: (vcf 1) Velocity  
89: (vcf 2) Velocity  
90: (vcf 1) Key Follow  
91: (vcf 2) Key Follow  
92: (df 1) Input Level A  
93: (df 1) Input Level B  
94: (df 2) Input Level A  
95: (df 2) Input Level B  
96: (vcf 1) Input Level DF1 Out  
97: (vcf 2) Input Level DF1 Out  
98: (group 1/2) Group 1 Out DF 1 Level  
99: (group 1/2) Group 2 Out DF 2 Level  
100: (vcf 1/2 df 1/2) LFO Source  
101: (vcf 1) LFO Control/Mode  
102: (vcf 2) LFO Control/Mode  
103: (vcf 1) LFO Depth  
104: (vcf 2) LFO Depth  
105: (vcf 1) LFO Rate  
106: (vcf 2) LFO Rate  
107: (vcf 1) LFO Time  
108: (vcf 2) LFO Time  
109: (group 1/2) Input/Output  
110: (group 1/2) VCF3 Group 1/2 Out  
111: (group 1/2) Group 1 Out VCF3 Level  
112: (group 1/2) Group 2 Out VCF3 Level  
113: (group 1/2) VCF3 Cutoff  
114: (group 1/2) DF 1/2 Group 1/2 Out  
115: (group 1/2) Group 1 Out DF 1 Distortion

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116: (group 1/2) Group 2 Out DF 2 Distortion  
117: (df 2) Assign DF1 Value  
118: (df 1) Space  
119: (df 1) Key Follow  
120: (df 1) Velocity  
121: (df 1) ENV Depth  
122: (df 1) LFO Depth  
123: (df 1) LFO Rate  
124: (df 2) Space  
125: (df 2) Key Follow  
126: (df 2) Velocity  
127: (df 2) ENV Depth  
128: (df 2) LFO Depth  
129: (df 2) LFO Rate  
130: (df 1/2) ENV-Mode/DF1->2 Assign  
131: (df 1/2) Resonance  
132: (df 1) Mode/Mulator-Settings  
133: (df 2) Mode/Mulator-Settings  
134: (df 1) ENV Mode:ADR : ENV Attack; ENV Mode:Ramp : CLK-Rate  
135: (df 2) ENV Mode:ADR : ENV Attack; ENV Mode:Ramp : CLK-Rate  
136: (df 1) ENV Mode:ADR : ENV Decay; ENV Mode:Ramp : Quantize  
137: (df 2) ENV Mode:ADR : ENV Decay; ENV Mode:Ramp : Quantize  
138: (df 1) ENV Mode:ADR : ENV Release; ENV Mode:Ramp : #Repeats  
139: (df 2) ENV Mode:ADR : ENV Release; ENV Mode:Ramp : #Repeats  
140: (df 1) ENV Trigger Delay  
141: (df 2) ENV Trigger Delay  
142: (df 1) Ramp Nr  
143: (df 2) Ramp Nr  
145: (glide/bend) Single Mode/Glide Mode  
146: (glide/bend) Glide Time Filter  
147: (glide/bend) Glide Time OSZ  
148: (glide/bend) Pitch Bend  
149: (osz 1) Detune  
150: (osz 1) Detune Fine/KBD Scale/Wave  
151: (osz 1) Octave/Sub Octave  
152: (osz 1) Noise Modulation  
153: (osz 1) Semitone  
154: (osz 123) PWM Settings  
155: (osz 1) PWM Center  
156: (osz 1) PWM LFO-Rate

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157: (osz 1) PWM LFO-Depth  
158: (osz 2) PWM Center  
159: (osz 2) PWM LFO-Rate  
160: (osz 2) PWM LFO-Depth  
161: (osz 3) PWM Center  
162: (osz 3) PWM LFO-Rate  
163: (osz 3) PWM LFO-Depth  
164: (osz 1) Multi PWM Width Center  
165: (osz 1) Multi PWM Space Center  
166: (osz 1) Multi PWM Width LFO Rate  
167: (osz 1) Multi PWM Width LFO Depth  
168: (osz 1) Multi PWM Space LFO Rate  
169: (osz 1) Multi PWM Space LFO Depth  
170: (osz 1) Multi PWM Diffuse/Mode  
171: (osz 1) Multi PWM LFO Vel/Mode/Kbd  
172: (osz 2) Detune  
173: (osz 2) Detune Fine/KBD Scale/Wave  
174: (osz 2) Octave/Sub Octave  
175: (osz 2) Noise Modulation  
176: (osz 2) Semitone  
177: (osz 3) Detune  
178: (osz 3) Semitone  
179: (osz 3) Noise Modulation  
180: (osz 3) Wave  
181: (osz 3) Detune Fine/KBD Scale/Octave  
182: (osz 3) Subosz Osz3/Sync/Add.Pitch Mod  
183: (osz 3) LFO  
184: (osz 3) FM Depth Osz2  
185: (osz 3) Fine Pitch  
186: (osz 3) Velocity  
187: (osz 3) LFO Depth  
188: (osz 3) LFO Rate  
189: (osz 4) Fine Tune  
190: (osz 4) Velocity  
191: (osz 4) KBD Scale  
192: (osz 4) Noise Modulation  
193: (osz 4) Wave Preset A/B  
194: (osz 4) Octave/Mode  
195: (osz 4) A/B Mix Settings  
196: (osz 4) A/B Mix

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197: (osz 4) A/B Mix Rate  
 198: (osz 1) Vibrato Depth  
 199: (osz 2) Vibrato Depth  
 200: (osz 3) Vibrato Depth  
 201: (osz 4) Vibrato Depth  
 202: (osz 1) Vibrato Rate  
 203: (osz 2) Vibrato Rate  
 204: (osz 3) Vibrato Rate  
 205: (osz 4) Vibrato Rate  
 206: (osz 1) Vibrato Wave  
 207: (osz 2) Vibrato Wave  
 208: (osz 3) Vibrato Wave  
 209: (osz 4) Vibrato Wave  
 210: (osz 1) Envelope Depth  
 211: (osz 2) Envelope Depth  
 212: (osz 3) Envelope Depth  
 213: (osz 4) Envelope Depth  
 214: (osz 1) Envelope Time  
 215: (osz 2) Envelope Time  
 216: (osz 3) Envelope Time  
 217: (osz 4) Envelope Time  
 218: (osz 1) Env Destination/Mode  
 219: (osz 2) Env Destination/Mode  
 220: (osz 3) Env Destination/Mode  
 221: (osz 4) Env Destination/Mode  
 222: (osz 1234) Vibrato Assign  
 223: (osz 1234) Envelop Assign

The first 8 parameters are encoded over 9 bits; the less-significant 8 bits are stored in the octet at the NPRN index (W). The 9th bits, the most significant bits of each of those 8 parameters are collected in a single octet, stored at the index 9 (H).

The name of the program is stored on the 16 octets from 11 to 26 (N); the 7 less significant bits of each octets contain a Schmidt character code; the most significant bits are combined to forms two more 7-bit Schmidt character codes. Thus a program name has therefore 18 characters.

The Schmidt character code is indicated in the following table: the character codes are in the order of the characters as they are scanned when entering the program name in the Schmidt Synthesizer display.

0: space

---

1: A	27: a	53: 0	79: ;
2: B	28: b	54: 1	80: <
3: C	29: c	55: 2	81: =
4: D	30: d	56: 3	82: >
5: E	31: e	57: 4	83: ?
6: F	32: f	58: 5	84: @
7: G	33: g	59: 6	85: [
8: H	34: h	60: 7	86: \
9: I	35: i	61: 8	87: ]
10: J	36: j	62: 9	88: ^
11: K	37: k	63: !	89: _
12: L	38: l	64: "	90: ‘
13: M	39: m	65: #	91: {
14: N	40: n	66: \$	92:
15: O	41: o	67: %	93: }
16: P	42: p	68: &	94: ~
17: Q	43: q	69: ’	
18: R	44: r	70: (	
19: S	45: s	71: )	
20: T	46: t	72: *	
21: U	47: u	73: +	
22: V	48: v	74: ,	
23: W	49: w	75: -	
24: X	50: x	76: .	
25: Y	51: y	77: /	
26: Z	52: z	78: :	

The other parameters are either continuous parameters (potentiometers) encoded on an octet, or switch parameters encoded in bitfields packed into octets (\\*, and C for the color bytes).

```

_WWWWWWWH_NNNNNNNNNNNNNNNN_CC*****
*****
*****_*****
*****_-----

```

The remaining bytes ( ) are undocumented and not yet reverse-engineered.