

# Nord Stage 3 Program File Documentation

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## Let's get started

This file documents the Nord Stage 3 program file structure. It is handmade by [NUF](#) users and is not officially supported by Nord Keyboards / Clavia DMI AB. While we certainly hope this document is useful, none of the authors or contributors place any guarantees as to the accuracy of the data.

We contacted Nord Keyboards / Clavia DMI AB support about this project, and the answer was that they are fine with this project, and it can be published :)

<https://ns3-program-viewer.herokuapp.com> web application is the project behind this initiative. Source is located here: <https://github.com/Chris55/ns3-program-viewer>

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## Summary

- [Disclaimer](#)
- [Contributors](#)
- [License](#)
- [Revision](#)
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- Thanks to other NUF member(s): @rpossemo

## Revision

rev	date	description
0.1	23-Sep-2020	Draft version
0.2	26-Sep-2020	Added Delay section

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## File Structure

This mapping corresponds to the Nord Stage 3 program file (file extension ns3f).

The file version used is 3.04 (generated with OS v2.54), and the file length is 592 bytes. Some older versions have a length of 574 bytes and a smaller header.

Offset 0x04 defines the file format.

Each memory offset corresponds to an 8-bit value.

0x01 (hex) = 00000001 -> bit 0 is '1'

0x84 (hex) = 10000100 -> bit 7 and 2 are '1'

In the documentation --xxxxxx (b5-0) means Bit5 to Bit0.

offset	bits	description
0x0000	cccccccc	ascii C - 0x43, 4-byte Clavia ID
0x0001	cccccccc	ascii B - 0x42
0x0002	cccccccc	ascii I - 0x49
0x0003	cccccccc	ascii N - 0x4E
0x0004	ffffffff	(f) file format
0x0005	-----	0
0x0006	-----	0
0x0007	-----	0
0x0008	cccccccc	ascii n - 0x6E, 4-byte NS3 Program file ID
0x0009	cccccccc	ascii s - 0x73,
0x000A	cccccccc	ascii 3 - 0x33,
0x000B	cccccccc	ascii f - 0x66,
0x000C	bbbbbbbb	(b) bank lsb (0 = A, 1 = B . . . )
0x000D	-----	0
0x000E	11111111	(l) location lsb (0 = 11, 1 = 12 . . . )
0x000F	-----	0
0x0010	cccccccc	(c) program category
0x0011	-----	
0x0012	-----	
0x0013	-----	
0x0014	iiiiiii	(i) file version (16-bit)
0x0015	iiiiiii	
0x0016	-----	
0x0017	-----	
0x0018	cccccccc	CRC1 (32-bit)
0x0019	cccccccc	
0x001A	cccccccc	
0x001B	cccccccc	
0x001C	-----	
0x001D	-----	
0x001E	-----	
0x001F	-----	
0x0020	-----	
0x0021	-----	
0x0022	-----	
0x0023	-----	
0x0024	-----	
0x0025	-----	
0x0026	-----	
0x0027	-----	
0x0028	-----	
0x0029	-----	
0x002A	-----	
0x002B	-----	
0x002C	-----	0
0x002D	-----	0

offset	bits	description
0x002E	vvvvvvvv	version 16-bit integer value in Big Endian format
0x002F	vvvvvvvv	
0x0030	-----	11
0x0031	ppssssss	(p) panel, (s) split
0x0032	ssssssss	
0x0033	ssssssss	
0x0034	sddpvvvr	(d) piano layer detune, (p) organ pitch stick, (v) organ vibrato mode, (r) rotary speaker speed
0x0035	mwwaaap	(m) rotary speaker stop mode, (w) rotary speaker speed morph wheel, (a) rotary speaker speed morph after touch, (p) rotary speaker speed morph control pedal
0x0036	pp-----	
0x0037	-----	
0x0038	tttttccc	(t) transpose, (c) master clock rate
0x0039	ccccddd	(d) rotary speaker drive
0x003A	dddk-ss	(k) dual keyboard, (s) dual keyboard style
0x003B	-----	
0x003C	-----	
0x003D	-----	
0x003E	-----	
0x003F	-----	
0x0040	-----	
0x0041	-----	
0x0042	-----	
0x0043	ozzzzvzv	(o) piano on, (z) piano kb zone, (v) piano volume
0x0044	vvvvwww	(w) piano volume morph wheel
0x0045	wwwaaaa	(a) piano volume morph after touch
0x0046	aaaapppp	(p) piano volume morph control pedal
0x0047	ppppoooo	(o) piano octave shift
0x0048	pstttmmm	(p) piano pitch stick, (s) piano sustain pedal, (t) piano type, (m) piano model
0x0049	mmvviiii	(v) piano sample variation, (i) piano sample name
0x004A	iiiiiiii	
0x004B	iiiiiiii	
0x004C	iiiiiiii	
0x004D	iiisrpk	(s) piano soft release, (r) piano string resonance, (p) piano pedal noise, (k) piano kb touch
0x004E	k-ttt---	(t) piano timbre
0x004F	-----	
0x0050	-----	
0x0051	-----	
0x0052	ozzzzvzv	(o) synth on, (z) synth kb zone, (v) synth volume
0x0053	vvvvwww	(w) synth volume morph wheel
0x0054	wwwaaaa	(a) synth volume morph after touch
0x0055	aaaapppp	(p) synth volume morph control pedal
0x0056	ppppoooo	(o) synth octave shift
0x0057	ps--xxxx	(p) synth pitch stick, (s) synth sustain pedal, (x) user sample name
0x0058	xxxxxxxx	
0x0059	xxxxxxxx	
0x005A	xxxxxxxx	
0x005B	xxxxxxxx	
0x005C	xxxxxxxx	
0x005D	xxxxxxxx	
0x005E	xxxxxxxx	
0x005F	xxxxxxxx	
0x0060	xxxxxxxx	
0x0061	xxxxxxxx	
0x0062	xxxxxxxx	
0x0063	xxxxxxxx	
0x0064	xxxxxxxx	
0x0065	xxxxxxxx	

offset	bits	description
0x0066	xxxxxxxx	
0x0067	xxxxxxxx	
0x0068	xxxxxxxx	
0x0069	xxxxxxxx	
0x006A	xxxxxxxx	
0x006B	xxxxxxxx	
0x006C	xxxxxxxx	
0x006D	-----	
0x006E	-----	
0x006F	-----	
0x0070	-----	
0x0071	-----	
0x0072	-----	
0x0073	-----	
0x0074	-----	
0x0075	-----	
0x0076	-----	
0x0077	-----	
0x0078	-----	
0x0079	-----	
0x007A	-----	
0x007B	-----	
0x007C	-----	
0x007D	-----	
0x007E	-----	
0x007F	-----	
0x0080	hosrrppc	(h) synth kh hold, (o) synth arp on, (o) synth arp kb sync, (r) synth arp range, (p) synth arp pattern, (c) synth arp master clock
0x0081	rrrrrrrw	(r) synth arp rate, (w) synth arp rate morph wheel
0x0082	wwwwwwa	(a) synth arp rate morph after touch
0x0083	aaaaaaap	(p) synth arp rate morph control pedal
0x0084	pppppppv	(v) synth voice
0x0085	vggggggg	(g) synth glide
0x0086	uuvvvlll	(g) synth unison, (v) synth vibrato, (l) synth lfo wave
0x0087	mrrrrrrr	(m) synth lfo master clock, (r) synth lfo rate
0x0088	wwwwwww	(w) synth lfo rate morph wheel
0x0089	aaaaaaa	(a) synth lfo rate morph after touch
0x008A	pppppppp	(r) synth lfo rate control pedal
0x008B	aaaaaad	(a) synth mod env attack, (d) synth mod env decay
0x008C	ddddddrr	(a) synth mod env release
0x008D	rrrrrvtt	(v) synth mod env velocity, (t) synth oscillator type
0x008E	twwwwww	(w) synth oscillator 1 wave form
0x008F	ww-ccccp	(c) synth oscillator config, (c) synth pitch
0x0090	ppppplll	(l) synth oscillator control
0x0091	llllwww	(w) synth oscillator control morph wheel
0x0092	wwwwaaa	(a) synth oscillator control morph after touch
0x0093	aaaapppp	(p) synth oscillator control morph control pedal
0x0094	pppllll	(l) synth lfo mod env
0x0095	lllwwww	(w) synth lfo mod env morph wheel
0x0096	wwwwaaa	(a) synth lfo mod env morph after touch
0x0097	aaappppp	(p) synth lfo mod env morph control pedal
0x0098	ppptttff	(t) synth filter type, (f) synth filter freq
0x0099	fffffww	(w) synth filter freq morph wheel
0x009A	wwwwaaa	(a) synth filter freq morph after touch
0x009B	aaaaappp	(p) synth filter freq morph control pedal
0x009C	ppppphhh	(h) synth filter hp freq res
0x009D	hhhhwww	(w) synth filter hp freq res morph wheel
0x009E	wwwwaaa	(a) synth filter hp freq res morph after touch
0x009F	aaaapppp	(p) synth filter hp freq res morph control pedal

offset	bits	description
0x00A0	pppp1111	(l) synth filter lfo amount
0x00A1	111wwwww	(w) synth filter lfo amount morph wheel
0x00A2	wwwwaaaa	(a) synth filter lfo amount morph after touch
0x00A3	aaappppp	(p) synth filter lfo amount morph control pedal
0x00A4	pppmmmmm	(m) synth filter vel mod env amount
0x00A5	mmttddaa	(t) synth filter kb track, (d) synth filter drive, (a) synth amp env attack
0x00A6	aaaaaddd	(d) synth amp env decay
0x00A7	dddrrrrr	(r) synth amp env release
0x00A8	rrrvvsss	(r) synth amp env velocity, (s) synth sample id
0x00A9	ssssssss	
0x00AA	ssssssss	
0x00AB	ssssssss	
0x00AC	sssssf--	(f) synth fast attack
0x00AD	-----	0
0x00AE	-----	0
0x00AF	-----	0
0x00B0	-----	0
0x00B1	-----	0
0x00B2	-----	0
0x00B3	-----	0
0x00B4	-----	0
0x00B5	-----	07
0x00B6	ozzzzvzv	(o) organ on, (z) organ kb zone, (v) organ volume
0x00B7	vvvvwwww	(w) organ volume morph wheel
0x00B8	wwwwaaaa	(a) organ volume morph after touch
0x00B9	aaaapppp	(p) organ volume morph control pedal
0x00BA	ppppoooo	(o) organ octave shift
0x00BB	stttl---	(s) organ sustain-pedal, (t) organ type, (l) organ live mode
0x00BC	-----	0
0x00BD	-----	1A
0x00BE	1111www	organ preset 1 drawbar (1), (w) organ preset 1 drawbar 1 morph wheel
0x00BF	waaaaapp	(a) organ preset 1 drawbar 1 morph after touch, (p) organ preset 1 drawbar 2 morph control pedal
0x00C0	ppp2222w	organ preset 1 drawbar (2), (w) organ preset 1 drawbar 2 morph wheel
0x00C1	wwwwaaaa	(a) organ preset 1 drawbar 2 morph after touch
0x00C2	appppp33	(p) organ preset 1 drawbar 2 morph control pedal, organ preset 1 drawbar (3),
0x00C3	33wwwwa	(w) organ preset 1 drawbar 3 morph wheel, (a) organ preset 1 drawbar 3 morph after touch
0x00C4	aaaapppp	(p) organ preset 1 drawbar 3 morph control pedal
0x00C5	p4444www	organ preset 1 drawbar (4), (w) organ preset 1 drawbar 4 morph wheel
0x00C6	waaaaaap	(a) organ preset 1 drawbar 4 morph after touch, (p) organ preset 1 drawbar 4 morph control pedal,
0x00C7	pppp5555	organ preset 1 drawbar (5),
0x00C8	wwwwaaaa	(w) organ preset 1 drawbar 5 morph wheel, (a) organ preset 1 drawbar 5 morph after touch
0x00C9	aappppp6	(p) organ preset 1 drawbar 5 morph control pedal, organ preset 1 drawbar (6),
0x00CA	666wwwww	(w) organ preset 1 drawbar 6 morph wheel
0x00CB	aaaaappp	(a) organ preset 1 drawbar 6 morph after touch, (p) organ preset 1 drawbar 6 morph control pedal
0x00CC	pp7777ww	organ preset 1 drawbar (7), (w) organ preset 1 drawbar 7 morph wheel
0x00CD	wwwwaaaa	(a) organ preset 1 drawbar 7 morph after touch
0x00CE	ppppp888	(p) organ preset 1 drawbar 7 morph control pedal, organ preset 1 drawbar (8),
0x00CF	8wwwwa	(w) organ preset 1 drawbar 8 morph wheel, (a) organ preset 1 drawbar 8 morph after touch
0x00D0	aaappppp	(p) organ preset 1 drawbar 8 morph control pedal
0x00D1	9999www	organ preset 1 drawbar (9), (w) organ preset 1 drawbar 9 morph wheel
0x00D2	waaaaaap	(a) organ preset 1 drawbar 9 morph after touch, (p) organ preset 1 drawbar 9 morph control pedal

offset	bits	description
0x00D3	pppvphds	(v) organ vibrato on, (p) organ percussion on, (h) organ percussion harmonic third, (d) organ percussion decay fast, (s) organ percussion volume soft
0x00D4	-----	0
0x00D5	-----	0
0x00D6	-----	0
0x00D7	-----	0
0x00D8	-----	1A
0x00D9	1111www	organ preset 2 drawbar (1), (w) organ preset 2 drawbar 1 morph wheel
0x00DA	waaaaapp	(a) organ preset 2 drawbar 1 morph after touch, (p) organ preset 2 drawbar 2 morph control pedal
0x00DB	ppp2222w	organ preset 2 drawbar (2), (w) organ preset 2 drawbar 2 morph wheel
0x00DC	wwwaaaa	(a) organ preset 2 drawbar 2 morph after touch
0x00DE	appppp33	(p) organ preset 2 drawbar 2 morph control pedal, organ preset 2 drawbar (3),
0x00DF	33wwwwa	(w) organ preset 2 drawbar 3 morph wheel, (a) organ preset 2 drawbar 3 morph after touch
0x00E0	aaaapppp	(p) organ preset 2 drawbar 3 morph control pedal
0x00E1	p4444www	organ preset 2 drawbar (4), (w) organ preset 2 drawbar 4 morph wheel
0x00E2	waaaaap	(a) organ preset 2 drawbar 4 morph after touch, (p) organ preset 2 drawbar 4 morph control pedal,
0x00E3	pppp5555	organ preset 2 drawbar (5),
0x00E4	wwwwa	(w) organ preset 2 drawbar 5 morph wheel, (a) organ preset 2 drawbar 5 morph after touch
0x00E5	aappppp6	(p) organ preset 2 drawbar 5 morph control pedal, organ preset 2 drawbar (6),
0x00E6	666www	(w) organ preset 2 drawbar 6 morph wheel
0x00E7	aaaaapp	(a) organ preset 2 drawbar 6 morph after touch, (p) organ preset 2 drawbar 6 morph control pedal
0x00E8	pp7777w	organ preset 2 drawbar (7), (w) organ preset 2 drawbar 7 morph wheel
0x00E9	wwaaaa	(a) organ preset 2 drawbar 7 morph after touch
0x00EA	ppppp888	(p) organ preset 2 drawbar 7 morph control pedal, organ preset 2 drawbar (8),
0x00EB	8wwwwa	(w) organ preset 2 drawbar 8 morph wheel, (a) organ preset 2 drawbar 8 morph after touch
0x00EC	aaapppp	(p) organ preset 2 drawbar 8 morph control pedal
0x00ED	9999www	organ preset 2 drawbar (9), (w) organ preset 2 drawbar 9 morph wheel
0x00EE	waaaaap	(a) organ preset 2 drawbar 9 morph after touch, (p) organ preset 2 drawbar 9 morph control pedal
0x00EF	ppp----	
0x00F0	-----	
0x00F1	-----	
0x00F2	-----	
0x00F3	-----	
0x00F4	ozzz--ss	(o) extern on, (z) extern kb zone, (s) extern octave shift
0x00F5	s-----	
0x00F6	ps----mm	(p) extern pitch stick, (s) extern sustain pedal, (m) extern midi control
0x00F7	-----v	(v) extern midi cc
0x00F8	vvvvvww	(w) extern midi cc morph wheel
0x00F9	wwwwwa	(a) extern midi cc morph after touch
0x00FA	aaaaaap	(p) extern midi cc morph control pedal
0x00FB	ppppp--	
0x00FC	-----	
0x00FD	-----v	(v) extern midi program
0x00FE	wwwwwa	(a) extern midi program after touch
0x00FF	aaaaaap	(p) extern midi program control pedal
0x0100	ppppp--	
0x0101	-----v	(v) extern volume
0x0102	vvvvvww	(w) extern volume morph wheel
0x0103	wwwwwa	(a) extern volume morph after touch
0x0104	aaaaaap	(p) extern volume morph control pedal
0x0105	ppppp--	
0x0106	-----	

offset	bits	description
0x0107	-----	
0x0108	-----	
0x0109	-----	
0x010A	-----	
0x010B	ossnrtrt	(o) rotary speaker on, (s) rotary speaker source, (n) effect 1 on, (r) effect-1-source, (t) effect 1 type
0x010C	tcrtrrrr	(c) effect 1 master clock, (r) effect 1 rate
0x010D	rwwwwwww	(w) effect 1 rate morph wheel
0x010E	waaaaaaa	(a) effect 1 rate morph after touch
0x010F	appppppp	(p) effect 1 rate morph control pedal
0x0110	paaaaaaa	(a) effect 1 amount
0x0111	wwwwwww	(w) effect 1 amount morph wheel
0x0112	aaaaaaa	(a) effect 1 amount morph after touch
0x0113	pppppppp	(p) effect 1 amount morph control pedal
0x0114	osstttrr	(o) effect 2 on, (s) effect 2 source, (t) effect 2 type, (r) effect 2 rate
0x0115	rrrrraaa	(a) effect 2 amount
0x0116	aaaawwww	(w) effect 2 amount morph wheel
0x0117	wwwaaaaa	(a) effect 2 amount morph after touch
0x0118	aaaapppp	(p) effect 2 amount morph control pedal
0x0119	ppppossc	(o) delay on, (s) delay source, (m) delay master clock
0x011A	tttttttx	(t) delay tempo, (x) delay tempo lsw
0x011B	xxxxxpw	(w) delay tempo morph wheel
0x011C	wwwwwwwx	(x) delay tempo morph wheel lsw
0x011D	xxxxxpaa	(a) delay tempo morph after touch
0x011E	aaaaaxxx	(x) delay tempo morph after touch lsw
0x011F	xxxxpccc	(c) delay tempo morph control pedal
0x0120	ccccxxxx	(x) delay tempo morph control pedal lsw
0x0121	xxxmmmmm	(t) delay mix
0x0122	mmwwwww	(w) delay mix morph wheel
0x0123	wwaaaaaa	(a) delay mix morph after touch
0x0124	aapppppp	(p) delay mix morph control pedal
0x0125	ppoffbbb	(o) delay ping pong, (f) delay filter, (b) delay feedback
0x0126	bbbwww	(w) delay feedback morph wheel
0x0127	wwwwaaaa	(a) delay feedback morph after touch
0x0128	aaaapppp	(p) delay feedback morph control pedal
0x0129	ppppa---	(a) delay analog mode
0x012A	-----	
0x012B	-----	
0x012C	-----	
0x012D	-----	
0x012E	-----	
0x012F	-----	
0x0130	-----	
0x0131	-----	
0x0132	-----	
0x0133	-----	
0x0134	-----ot	(o) reverb on, (t) reverb type
0x0135	ttbrrrrr	(o) reverb bright, (r) reverb amount
0x0136	rrwwwww	(w) reverb amount morph wheel
0x0137	wwaaaaaa	(a) reverb amount morph after touch
0x0138	aapppppp	(p) reverb amount morph control pedal
0x0139	ppoccccc	(o) compressor on, (c) compressor amount
0x013A	ccf----	(f) compressor fast
0x013B	-----	Piano Panel B, same as offset 0x34, offset from Panel A is 0x107 (263 bytes)
0x013C	-----	
...		
0x0240	-----	
0x0241	-----	end of Panel B
0x0242	-----	0



offset	bits	description
0x0243	-----	0
0x0244	-----	0
0x0245	-----	0
0x0246	-----	0
0x0247	-----	0
0x0248	-----	0
0x0249	-----	0
0x024A	-----	5
0x024B	-----	0
0x024C	-----	0
0x024D	-----	0
0x024E	-----	0
0x024F	-----	0

**Extern On**

Offset in file: 0xF4 (b7)

0 = off, 1 = on

**Extern Kb Zone**

Offset in file: 0xF4 (b6-3)

See: [Organ Kb Zone](#) for detailed explanation.

**Extern Octave Shift**

Offset in file: 0xF4 (b1-0) and 0xF5 (b7)

Octave Shift = value - 6

**Extern Pitch Stick**

Offset in file: 0xF6 (b7)

0 = off, 1 = on

**Extern Sustain Pedal**

Offset in file: 0xF6 (b6)

0 = off, 1 = on

**Extern Midi Control**

Offset in file: 0xF6 (b1-0)

0 = Midi CC

1 = Program

2 = Volume

**Extern Midi CC**

Offset in file: 0xF7 (b0) and 0xF8 (b7-2)

07-bit value = 0/127

**Extern Midi Program**

Offset in file: 0xFD (b0) and 0xFE (b7-2)

07-bit value = 0/127

**Extern Volume**

Offset in file: 0x101 (b0) and 0x102 (b7-2)

07-bit value = 0/127

**Compressor On**

Offset in file: 0x139 (b5)

0 = off, 1 = on

## Compressor Amount

Offset in file: 0x139 (b4-0) and 0x13A (b7-6)

7-bit value 0/127 = 0/10

## Compressor Fast

Offset in file: 0x13A (b5)

0 = off, 1 = on

## Delay On

Offset in file: 0x119 (b3)

0 = off, 1 = on

## Delay Source

Offset in file: 0x119 (b2-1)

0 = Organ, 1, Piano, 2 = Synth

## Delay Master Clock

Offset in file: 0x119 (b0)

0 = off, 1 = on

## Delay Tempo

Offset in file:

tempo is using 14-bit

MSW 0x11A (b7-1): 7-bit value

0/127 = 1.5 s to 20 ms (same as MIDI #CC 94, see table below)

LSW 0x11A (b0) and 0x11B (b7-2): 7-bit value

LSW used for fine tempo value (only used with Tag Tempo)

When Tempo knob is used, LSW is always 0, possible MSW value:

- 0 = 1500, 1.5 s 40 bpm (1/4)
- 1 = 1420, 1.42 s 42 bpm (1/4)
- 2 = 1360, 1.36 s 44 bpm (1/4)
- 3 = 1300, 1.30 s 46 bpm (1/4)
- 4 = 1250, 1.25 s 48 bpm (1/4)
- 5 = 1200, 1.20 s 50 bpm (1/4)
- 6 = 1150, 1.15 s 52 bpm (1/4)
- 7 = 1100, 1.11 s 54 bpm (1/4)
- 8 = 1070, 1.07 s 56 bpm (1/4)
- 9 = 1030, 1.03 s 58 bpm (1/4)
- 10 = 1000, 1.00 s 60 bpm (1/4)
- 11 = 952, 952 ms 63 bpm (1/4)
- 12 = 909, 909 ms 66 bpm (1/4)
- 13 = 870, 870 ms 69 bpm (1/4)

14 = 833,833 ms 72 bpm (1/4)  
15 = 789,789 ms 76 bpm (1/4)  
16 = 750,750 ms 80 bpm (1/4)  
17 = 732,732 ms 82 bpm (1/4)  
18 = 714,714 ms 84 bpm (1/4)  
20 = 682,682 ms 88 bpm (1/4)  
21 = 667,667 ms 90 bpm (1/4)  
22 = 652,652 ms 92 bpm (1/4)  
19 = 698,698 ms 86 bpm (1/4)  
23 = 638,638 ms 94 bpm (1/4)  
24 = 625,625 ms 96 bpm (1/4)  
25 = 612,612 ms 98 bpm (1/4)  
26 = 600,600 ms 100 bpm (1/4)  
27 = 588,588 ms 102 bpm (1/4)  
28 = 577,577 ms 104 bpm (1/4)  
29 = 566,566 ms 106 bpm (1/4)  
30 = 556,556 ms 108 bpm (1/4)  
31 = 545,545 ms 110 bpm (1/4)  
32 = 541,541 ms 111 bpm (1/4)  
33 = 536,536 ms 112 bpm (1/4)  
34 = 531,531 ms 113 bpm (1/4)  
35 = 526,526 ms 114 bpm (1/4)  
36 = 522,522 ms 115 bpm (1/4)  
37 = 517,517 ms 116 bpm (1/4)  
38 = 513,513 ms 117 bpm (1/4)  
39 = 508,508 ms 118 bpm (1/4)  
40 = 504,504 ms 119 bpm (1/4)  
41 = 500,500 ms 120 bpm (1/4)  
42 = 496,496 ms 121 bpm (1/4)  
43 = 492,492 ms 122 bpm (1/4)  
44 = 488,488 ms 123 bpm (1/4)  
45 = 484,484 ms 124 bpm (1/4)  
46 = 480,480 ms 125 bpm (1/4)  
47 = 476,476 ms 126 bpm (1/4)  
48 = 472,472 ms 127 bpm (1/4)  
49 = 469,469 ms 128 bpm (1/4)  
50 = 465,465 ms 129 bpm (1/4)  
51 = 462,462 ms 130 bpm (1/4)  
52 = 458,458 ms 131 bpm (1/4)  
53 = 455,455 ms 132 bpm (1/4)  
54 = 451,451 ms 133 bpm (1/4)  
55 = 448,448 ms 134 bpm (1/4)  
56 = 444,444 ms 135 bpm (1/4)  
57 = 441,441 ms 136 bpm (1/4)  
58 = 438,438 ms 137 bpm (1/4)  
59 = 435,435 ms 138 bpm (1/4)  
60 = 432,432 ms 139 bpm (1/4)  
61 = 429,429 ms 140 bpm (1/4)  
62 = 423,423 ms 142 bpm (1/4)  
63 = 417,417 ms 144 bpm (1/4)  
64 = 411,411 ms 146 bpm (1/4)  
65 = 405,405 ms 148 bpm (1/4)  
66 = 400,400 ms 150 bpm (1/4)  
67 = 395,395 ms 152 bpm (1/4)  
68 = 390,390 ms 154 bpm (1/4)  
69 = 385,385 ms 156 bpm (1/4)  
70 = 380,380 ms 158 bpm (1/4)  
71 = 375,375 ms 80 bpm (1/8)  
72 = 366,366 ms 82 bpm (1/8)  
73 = 357,357 ms 84 bpm (1/8)  
74 = 349,349 ms 86 bpm (1/8)

```

75 = 341,341 ms 88 bpm (1/8)
76 = 333,333 ms 90 bpm (1/8)
77 = 326,326 ms 92 bpm (1/8)
78 = 319,319 ms 94 bpm (1/8)
79 = 313,313 ms 96 bpm (1/8)
80 = 306,306 ms 98 bpm (1/8)
81 = 300,300 ms 100 bpm (1/8)
82 = 288,288 ms 104 bpm (1/8)
83 = 278,278 ms 108 bpm (1/8)
84 = 268,268 ms 112 bpm (1/8)
85 = 259,259 ms 116 bpm (1/8)
86 = 250,250 ms 120 bpm (1/8)
87 = 238,238 ms 126 bpm (1/8)
88 = 227,227 ms 132 bpm (1/8)
89 = 217,217 ms 138 bpm (1/8)
90 = 197,197 ms 152 bpm (1/8)
91 = 188,188 ms 80 bpm (1/16)
92 = 179,179 ms 84 bpm (1/16)
93 = 170,170 ms 88 bpm (1/16)
94 = 163,163 ms 92 bpm (1/16)
95 = 156,156 ms 96 bpm (1/16)
96 = 150,150 ms 100 bpm (1/16)
97 = 144,144 ms 104 bpm (1/16)
98 = 139,139 ms 108 bpm (1/16)
99 = 134,134 ms 112 bpm (1/16)
100 = 129,129 ms 116 bpm (1/16)
101 = 125,125 ms 120 bpm (1/16)
102 = 119,119 ms 126 bpm (1/16)
103 = 114,114 ms 132 bpm (1/16)
104 = 109,109 ms 138 bpm (1/16)
105 = 104,104 ms 144 bpm (1/16)
106 = 99,99 ms 152 bpm (1/16)
107 = 94,94 ms 160 bpm (1/16)
108 = 83,83 ms 180 bpm (1/16)
109 = 75,75 ms 200 bpm (1/16)
110 = 68,68 ms 220 bpm (1/16)
111 = 63,63 ms 240 bpm (1/16)
112 = 58,58 ms 260 bpm (1/16)
113 = 54,54 ms 280 bpm (1/16)
114 = 50,50 ms 300 bpm (1/16)
115 = 47,47 ms 320 bpm (1/16)
116 = 44,44 ms 340 bpm (1/16)
117 = 42,42 ms 360 bpm (1/16)
118 = 39,39 ms 380 bpm (1/16)
119 = 38,38 ms 400 bpm (1/16)
120 = 34,34 ms 440 bpm (1/16)
121 = 31,31 ms 480 bpm (1/16)
122 = 30,30 ms 500 bpm (1/16)
123 = 28,28 ms 540 bpm (1/16)
124 = 26,26 ms 580 bpm (1/16)
125 = 24,24 ms 620 bpm (1/16)
126 = 22,22 ms 680 bpm (1/16)
127 = 20,20 ms 750 bpm (1/16)

```

Note: When Tap Tempo is used, LSW is different from 0.

A linear interpolation is done to define the fine tempo value.

```

if 'Delay Master Clock' is enabled 7-bit value 0/127 = 1/2 to 1/64
0 = 1/2
1 = 1/2

```

2 = 1/2  
3 = 1/2  
4 = 1/2  
5 = 1/2  
6 = 1/2  
7 = 1/2  
8 = 1/4D  
9 = 1/4D  
10 = 1/4D  
11 = 1/4D  
12 = 1/4D  
13 = 1/4D  
14 = 1/4D  
15 = 1/4D  
16 = 1/2T  
17 = 1/2T  
18 = 1/2T  
19 = 1/2T  
20 = 1/2T  
21 = 1/2T  
22 = 1/2T  
23 = 1/4S  
24 = 1/4S  
25 = 1/4S  
26 = 1/4S  
27 = 1/4S  
28 = 1/4S  
29 = 1/4S  
30 = 1/4S  
31 = 1/4  
32 = 1/4  
33 = 1/4  
34 = 1/4  
35 = 1/4  
36 = 1/4  
37 = 1/4  
38 = 1/8D  
39 = 1/8D  
40 = 1/8D  
41 = 1/8D  
42 = 1/8D  
43 = 1/8D  
44 = 1/8D  
45 = 1/8D  
46 = 1/4T  
47 = 1/4T  
48 = 1/4T  
49 = 1/4T  
50 = 1/4T  
51 = 1/4T  
52 = 1/4T  
53 = 1/8S  
54 = 1/8S  
55 = 1/8S  
56 = 1/8S  
57 = 1/8S  
58 = 1/8S  
59 = 1/8S  
60 = 1/8S  
61 = 1/8  
62 = 1/8

63 = 1/8  
64 = 1/8  
65 = 1/8  
66 = 1/8  
67 = 1/8  
68 = 1/16D  
69 = 1/16D  
70 = 1/16D  
71 = 1/16D  
72 = 1/16D  
73 = 1/16D  
74 = 1/16D  
75 = 1/16D  
76 = 1/8T  
77 = 1/8T  
78 = 1/8T  
79 = 1/8T  
80 = 1/8T  
81 = 1/8T  
82 = 1/8T  
83 = 1/16S  
84 = 1/16S  
85 = 1/16S  
86 = 1/16S  
87 = 1/16S  
88 = 1/16S  
89 = 1/16S  
90 = 1/16S  
91 = 1/16  
92 = 1/16  
93 = 1/16  
94 = 1/16  
95 = 1/16  
96 = 1/16  
97 = 1/16  
98 = 1/16T  
99 = 1/16T  
100 = 1/16T  
101 = 1/16T  
102 = 1/16T  
103 = 1/16T  
104 = 1/16T  
105 = 1/16T  
106 = 1/32  
107 = 1/32  
108 = 1/32  
109 = 1/32  
110 = 1/32  
111 = 1/32  
112 = 1/32  
113 = 1/32T  
114 = 1/32T  
115 = 1/32T  
116 = 1/32T  
117 = 1/32T  
118 = 1/32T  
119 = 1/32T  
120 = 1/32T  
121 = 1/64  
122 = 1/64  
123 = 1/64

124 = 1/64  
125 = 1/64  
126 = 1/64  
127 = 1/64

**Morph Wheel:**

0x11B (b1): polarity (1 = positive, 0 = negative)

0x11B (b0), 0x11C (b7-0), and 0x11D (b7-3): 14-bit raw value

**Morph After Touch:**

0x11D (b2): polarity (1 = positive, 0 = negative)

0x11D (b1-0), 0x11E (b7-0), and 0x11F (b7-4): 14-bit raw value

**Morph Control Pedal:**

0x11F (b3): polarity (1 = positive, 0 = negative)

0x11F (b2-0), 0x120 (b7-0), and 0x121 (b7-5): 14-bit raw value

if polarity = 1 then Morph offset value = raw value + 1

if polarity = 0 then Morph offset value = raw value - 16383

Final 'To' Morph value = 'From value (original tempo)' + 'Morph offset value'

Morph Enabled if 'From value' <> 'Morph offset value'

## Delay Ping Pong

Offset in file: 0x125 (b5)

0 = off, 1 = on

## Delay Filter

Offset in file: 0x125 (b4-3)

0 = Bypass  
1 = LP  
2 = HP  
3 = BP

## Delay Analog Mode

Offset in file: 0x129 (b3)

0 = off, 1 = on

## Delay Feedback

Offset in file: 0x125 (b2-0) and 0x126 (b7-4)

See: [Organ Volume](#) for detailed Morph explanation.

7-bit value 0/127 = 0/10

**Morph Wheel:**

0x126 (b3): polarity (1 = positive, 0 = negative)

0x126 (b2-b0) and 0x127 (b7-4): 7-bit raw value



**Morph After Touch:**

0x127 (b3): polarity (1 = positive, 0 = negative)

0x127 (b2-b0) and 0x128 (b7-4): 7-bit raw value

**Morph Control Pedal:**

0x128 (b3): polarity (1 = positive, 0 = negative)

0x128 (b2-b0) and 0x129 (b7-4): 7-bit raw value

**Delay Mix**

Offset in file: 0x121 (b4-0) and 0x122 (b7-6)

See: [Organ Volume](#) for detailed Morph explanation.

7-bit value 0/127 = 0/10

**Morph Wheel:**

0x122 (b5): polarity (1 = positive, 0 = negative)

0x122 (b4-b0) and 0x123 (b7-6): 7-bit raw value

**Morph After Touch:**

0x123 (b5): polarity (1 = positive, 0 = negative)

0x123 (b4-b0) and 0x124 (b7-6): 7-bit raw value

**Morph Control Pedal:**

0x124 (b5): polarity (1 = positive, 0 = negative)

0x124 (b4-b0) and 0x125 (b7-6): 7-bit raw value

**Effect 1 On**

Offset in file: 0x10B (b4)

0 = off, 1 = on

**Effect 1 Source**

Offset in file: 0x10B (b3-2)

0 = Organ, 1, Piano, 2 = Synth

**Effect 1 Type**

Offset 0 in file: 0x10B (b1-0) and 0x10C (b7)

0 = A-Pan

1 = Trem

2 = RM

3 = WA-WA

4 = A-WA1

5 = A-WA2

**Effect 1 Amount**

Offset in file: 0x110 (b6-0)

See: [Organ Volume](#) for detailed Morph explanation.

7-bit value 0/127 = 0/10

**Morph Wheel:**

0x111 (b7): polarity (1 = positive, 0 = negative)

0x111 (b6-b0): 7-bit raw value

**Morph After Touch:**

0x112 (b7): polarity (1 = positive, 0 = negative)

0x112 (b6-b0): 7-bit raw value

**Morph Control Pedal:**

0x113 (b7): polarity (1 = positive, 0 = negative)

0x113 (b6-b0): 7-bit raw value

**Effect 1 Rate**

Offset in file: 0x10C (b5-0) and 0x10D (b7)

See: [Organ Volume](#) for detailed Morph explanation.

7-bit value 0/127 = 0/10

if 'Effect 1 Master Clock' is enabled 7-bit value 0/127 = 4/1 to 1/32

0 = 4/1

1 = 4/1

2 = 4/1

3 = 4/1

4 = 4/1

5 = 4/1

6 = 4/1

7 = 4/1

8 = 4/1

9 = 4/1T

10 = 4/1T

11 = 4/1T

12 = 4/1T

13 = 4/1T

14 = 4/1T

15 = 4/1T

16 = 4/1T

17 = 4/1T

18 = 2/1

19 = 2/1

20 = 2/1

21 = 2/1

22 = 2/1

23 = 2/1

24 = 2/1

25 = 2/1

26 = 2/1T

27 = 2/1T

28 = 2/1T

29 = 2/1T

30 = 2/1T

31 = 2/1T

32 = 2/1T

33 = 2/1T

34 = 2/1T

35 = 1/1

36 = 1/1

37 = 1/1

38 = 1/1

39 = 1/1

40 = 1/1

41 = 1/1  
42 = 1/1  
43 = 1/1T  
44 = 1/1T  
45 = 1/1T  
46 = 1/1T  
47 = 1/1T  
48 = 1/1T  
49 = 1/1T  
50 = 1/1T  
51 = 1/1T  
52 = 1/2  
53 = 1/2  
54 = 1/2  
55 = 1/2  
56 = 1/2  
57 = 1/2  
58 = 1/2  
59 = 1/2  
60 = 1/2T  
61 = 1/2T  
62 = 1/2T  
63 = 1/2T  
64 = 1/2T  
65 = 1/2T  
66 = 1/2T  
67 = 1/2T  
68 = 1/2T  
69 = 1/4  
70 = 1/4  
71 = 1/4  
72 = 1/4  
73 = 1/4  
74 = 1/4  
75 = 1/4  
76 = 1/4  
77 = 1/4T  
78 = 1/4T  
79 = 1/4T  
80 = 1/4T  
81 = 1/4T  
82 = 1/4T  
83 = 1/4T  
84 = 1/4T  
85 = 1/4T  
86 = 1/8  
87 = 1/8  
88 = 1/8  
89 = 1/8  
90 = 1/8  
91 = 1/8  
92 = 1/8  
93 = 1/8  
94 = 1/8T  
95 = 1/8T  
96 = 1/8T  
97 = 1/8T  
98 = 1/8T  
99 = 1/8T  
100 = 1/8T  
101 = 1/8T

102 = 1/8T  
103 = 1/16  
104 = 1/16  
105 = 1/16  
106 = 1/16  
107 = 1/16  
108 = 1/16  
109 = 1/16  
110 = 1/16  
111 = 1/16T  
112 = 1/16T  
113 = 1/16T  
114 = 1/16T  
115 = 1/16T  
116 = 1/16T  
117 = 1/16T  
118 = 1/16T  
119 = 1/16T  
120 = 1/32  
121 = 1/32  
122 = 1/32  
123 = 1/32  
124 = 1/32  
125 = 1/32  
126 = 1/32  
127 = 1/32

**Morph Wheel:**

0x10D (b6): polarity (1 = positive, 0 = negative)

0x10D (b5-b0) and 0x10E (b7): 7-bit raw value

**Morph After Touch:**

0x10E (b6): polarity (1 = positive, 0 = negative)

0x10E (b5-b0) and 0x10F (b7): 7-bit raw value

**Morph Control Pedal:**

0x10F (b6): polarity (1 = positive, 0 = negative)

0x10F (b5-b0) and 0x110 (b7): 7-bit raw value

**Effect 1 Master Clock**

Offset in file: 0x10C (b6)

0 = off, 1 = on

**Effect 2 On**

Offset in file: 0x114 (b7)

0 = off, 1 = on

**Effect 2 Source**

Offset in file: 0x114 (b6-5)

0 = Organ, 1, Piano, 2 = Synth

## Effect 2 Type

Offset in file: 0x114 (b4-2)

0 = PHAS1  
1 = PHAS2  
2 = FLANG  
3 = VIBE  
4 = CHOR1  
5 = CHOR2

## Effect 2 Amount

Offset in file: 0x115 (b2-0) and 0x116 (b7-4)

See: [Organ Volume](#) for detailed Morph explanation.

7-bit value 0/127 = 0/10

Morph Wheel:

0x116 (b3): polarity (1 = positive, 0 = negative)  
0x116 (b2-b0) and 0x117 (b7-4): 7-bit raw value

Morph After Touch:

0x117 (b3): polarity (1 = positive, 0 = negative)  
0x117 (b2-b0) and 0x118 (b7-4): 7-bit raw value

Morph Control Pedal:

0x118 (b3): polarity (1 = positive, 0 = negative)  
0x118 (b2-b0) and 0x119 (b7-4): 7-bit raw value

## Effect 2 Rate

Offset in file: 0x114 (b1-0) &nd 0x115 (b7-3)

7-bit value 0/127 = 0/10

## Reverb On

Offset in file: 0x114 (b7)

0 = off, 1 = on

## Reverb Type

Offset in file: 0x134 (b0) and 0x135 (b7-6)

0 = Room 1  
1 = Room 2  
2 = Stage 1  
3 = Stage 2  
4 = Hall 1  
5 = Hall 2

## Reverb Amount

Offset in file: 0x135 (b4-0) and 0x136 (b7-6)

See: [Organ Volume](#) for detailed Morph explanation.

7-bit value 0/127 = 0/10

Morph Wheel:

0x136 (b5): polarity (1 = positive, 0 = negative)

0x136 (b4-b0) and 0x137 (b7-6): 7-bit raw value

Morph After Touch:

0x137 (b5): polarity (1 = positive, 0 = negative)

0x137 (b4-b0) and 0x138 (b7-6): 7-bit raw value

Morph Control Pedal:

0x138 (b5): polarity (1 = positive, 0 = negative)

0x138 (b4-b0) and 0x139 (b7-6): 7-bit raw value

## Reverb Bright

Offset in file: 0x135 (b5)

0 = off, 1 = on

## Rotary Speaker On

Offset in file: 0x10b (bit7)

0 = off, 1 = on

## Rotary Speaker Source

Offset in file: 0x10b (b6 and b5)

0 = Organ, 1, Piano, 2 = Synth

## Rotary Speaker Drive

Offset in file: 0x39 (b2 to b0) and 0x3a (b7 to b4)

7-bit value 0/127 converted to 0/10

Note: Panel A value is used for panel A & B

## Rotary Speaker Stop Mode

Offset in file: 0x35 (bit7)

0 = enabled (Speed Stop), 1 = disabled (Speed Slow)

Note: Panel A value is used for panel A & B

## Rotary Speaker Speed

Offset in file: 0x34 (bit0)

0 = Slow/Stop, 1 = Fast

Morph Wheel: 0x35 (b6-4)

Morph After Touch: 0x35 (b3-1)

Morph Control Pedal: 0x35 (b0) and 0x36 (b7-6)

011 = 0x03 = morph off

100 = 0x04 = morph on

Note: Panel A value is used for panel A & B

## Organ On

Offset in file: 0xB6 (b7)

0 = off, 1 = on

## Organ Kb Zone

Offset in file: 0xB6 (b6-3)

value		value
-----	----	-----
x000 0xxx	0	o---
x000 1xxx	1	-o--
x001 0xxx	2	--o-
x001 1xxx	3	---o
x010 0xxx	4	oo--
x010 1xxx	5	-oo-
x011 0xxx	6	--oo
x011 1xxx	7	ooo-
x100 0xxx	8	-ooo
x100 1xxx	9	oooo

## Organ Volume

Offset in file:

Volume:

0xB6 (b2-b0), 0xB7 (b7-4): 7-bit = 0/127 range

- 0 = Off
- 1 = -84.2 dB
- 2 = -72.1 dB
- 3 = -65.1 dB
- 4 = -60.1 dB
- 5 = -56.2 dB
- 6 = -53.0 dB
- 7 = -50.3 dB
- 8 = -48.0 dB
- 9 = -46.0 dB
- 10 = -44.2 dB
- 11 = -42.5 dB
- 12 = -41.0 dB
- 13 = -39.6 dB
- 14 = -38.3 dB
- 15 = -37.1 dB
- 16 = -36.0 dB
- 17 = -34.9 dB
- 18 = -33.9 dB
- 19 = -33.0 dB
- 20 = -32.1 dB
- 21 = -31.1 dB
- 22 = -30.5 dB
- 23 = -29.7 dB
- 24 = -28.9 dB
- 25 = -28.2 dB
- 26 = -27.6 dB
- 27 = -26.9 dB
- 28 = -26.3 dB
- 29 = -25.7 dB
- 30 = -25.1 dB
- 31 = -24.5 dB
- 32 = -23.9 dB
- 33 = -23.4 dB

34 = -22.9 dB  
35 = -22.4 dB  
36 = -21.9 dB  
37 = -21.4 dB  
38 = -21.0 dB  
39 = -20.5 dB  
40 = -20.1 dB  
41 = -19.6 dB  
42 = -19.2 dB  
43 = -18.8 dB  
44 = -18.4 dB  
45 = -18.0 dB  
46 = -17.6 dB  
47 = -17.3 dB  
48 = -16.9 dB  
49 = -16.5 dB  
50 = -16.2 dB  
51 = -15.8 dB  
52 = -15.5 dB  
53 = -15.2 dB  
54 = -14.9 dB  
55 = -14.5 dB  
56 = -14.2 dB  
57 = -13.9 dB  
58 = -13.6 dB  
59 = -13.3 dB  
60 = -13.0 dB  
61 = -12.7 dB  
62 = -12.5 dB  
63 = -12.2 dB  
64 = -11.9 dB  
65 = -11.6 dB  
66 = -11.4 dB  
67 = -11.1 dB  
68 = -10.9 dB  
69 = -10.6 dB  
70 = -10.3 dB  
71 = -10.1 dB  
72 = -9.9 dB  
73 = -9.6 dB  
74 = -9.4 dB  
75 = -9.1 dB  
76 = -8.9 dB  
77 = -8.7 dB  
78 = -8.5 dB  
79 = -8.2 dB  
80 = -8.0 dB  
81 = -7.8 dB  
82 = -7.6 dB  
83 = -7.4 dB  
84 = -7.2 dB  
85 = -7.0 dB  
86 = -6.8 dB  
87 = -6.6 dB  
88 = -6.4 dB  
89 = -6.2 dB  
90 = -6.0 dB  
91 = -5.8 dB  
92 = -5.6 dB  
93 = -5.4 dB  
94 = -5.2 dB



95 = -5.0 dB  
96 = -4.9 dB  
97 = -4.7 dB  
98 = -4.5 dB  
99 = -4.3 dB  
100 = -4.2 dB  
101 = -4.0 dB  
102 = -3.8 dB  
103 = -3.6 dB  
104 = -3.5 dB  
105 = -3.3 dB  
106 = -3.1 dB  
107 = -3.0 dB  
108 = -2.8 dB  
109 = -2.7 dB  
110 = -2.5 dB  
111 = -2.3 dB  
112 = -2.2 dB  
113 = -2.0 dB  
114 = -1.9 dB  
115 = -1.7 dB  
116 = -1.6 dB  
117 = -1.4 dB  
118 = -1.3 dB  
119 = -1.1 dB  
120 = -1.0 dB  
121 = -0.8 dB  
122 = -0.7 dB  
123 = -0.6 dB  
124 = -0.4 dB  
125 = -0.3 dB  
126 = -0.1 dB  
127 = 0.0 dB

**Morph Wheel:**

0xB7 (b3): polarity (1 = positive, 0 = negative)

0xB7 (b2-b0), 0xB8 (b7-b4): 7-bit raw value

**Morph After Touch:**

0xB8 (b3): polarity (1 = positive, 0 = negative)

0xB8 (b2-b0), 0xB9 (b7-b4): 7-bit raw value

**Morph Control Pedal:**

0xB9 (b3): polarity (1 = positive, 0 = negative)

0xB9 (b2-b0), 0xBA (b7-b4): 7-bit raw value

if polarity = 1 then Morph offset value = raw value + 1

if polarity = 0 then Morph offset value = raw value - 127

Final 'To' Morph value = 'From value (original volume)' + 'Morph offset value'

Morph Enabled if 'From value' <> 'Morph offset value'

**Organ Octave Shift**

Offset in file: 0xBA (b3-0)

Octave Shift = value - 6

**Organ Pitch Stick**

Offset in file: 0x34 (b4)

0 = off, 1 = on

## Organ Sustain Pedal

Offset in file: 0xBB (b7)

0 = off, 1 = on

## Organ Type

Offset in file: 0xBB (b6/5/4)

0 = B3

1 = Vox

2 = Farfisa

3 = Pipe1

4 = Pipe2

## Organ Drawbars Preset 1

Offset in file: 0xBE

Drawbar value range is 0/8.

For Vox Organ each value is converted to 0/1: 0 (if value < 4) else 1

For Farfisa Organ drawbar 8 is not used and forced to 0

Drawbar 1: 0xBE (b7-4)

Morph Wheel: 0xBE (b3-0) and 0xBF (b7)

Morph After Touch: 0xBF (b6-2)

Morph Control Pedal: 0xBF (b1-0) and 0xC0 (b7-5)

Drawbar 2: 0xC0 (b4-1)

Morph Wheel: 0xC0 (b0) and 0xC1 (b7-4)

Morph After Touch: 0xC1 (b3-0) and 0xC2 (b7)

Morph Control Pedal: 0xC2 (b6-2)

Drawbar 3: 0xC2 (b1-0) and 0xC3 (b7-6)

Morph Wheel: 0xC3 (b5-1)

Morph After Touch: 0xC3 (b0) and 0xC4 (b7-4)

Morph Control Pedal: 0xC4 (b3-0) and 0xC5 (b7)

Drawbar 4: 0xC5 (b6-3)

Morph Wheel: 0xC5 (b2-0) and 0xC6 (b7-6)

Morph After Touch: 0xC6 (b5-b1)

Morph Control Pedal: 0xC6 (b0) and 0xC7 (b7-4)

Drawbar 5: 0xC7 (b3-0)

Morph Wheel: 0xC8 (b7-3)

Morph After Touch: 0xC8 (b2-0) and 0xC9 (b7-6)

Morph Control Pedal: 0xC9 (b5-1)

Drawbar 6: 0xC9 (b0) and 0xCA (b7-5)

Morph Wheel: 0xCA (b4-0)

Morph After Touch: 0xCB (b7-3)

Morph Control Pedal: 0xCB (b2-0) and 0xCC (b7-6)

Drawbar 7: 0xCC (b5-2)

Morph Wheel: 0xCC (b1-0) and 0xCD (b7-5)

Morph After Touch: 0xCD (b4-0)

Morph Control Pedal: 0xCE (b7-3)

Drawbar 8: 0xCE (b2-0) and 0xCF (b7)

Morph Wheel: 0xCF (b6-2)

Morph After Touch: 0xCF (b1-0) and 0xD0 (b7-5)  
 Morph Control Pedal: 0xD0 (b4-0)

Drawbar 9: 0xD1 (b7-4)  
 Morph Wheel: 0xD1 (b3-0) and 0xBF (b7)  
 Morph After Touch: 0xD2 (b6-2)  
 Morph Control Pedal: 0xD2 (b1-0) and 0xD3 (b7-5)

Morph value is on 5-bit  
 b4 is polarity  
 b3-0 is raw 4-bit value

if polarity = 1 then Morph offset value = raw value + 1  
 if polarity = 0 then Morph offset value = raw value - 8

Final 'To' Morph value = 'From value (original volume)' + 'Morph offset value'  
 Morph Enabled if 'From value' <> 'Morph offset value'

## Organ Drawbars Preset 2

Offset in file: 0xD9

Drawbar value range is 0/8.

For Vox Organ each value is converted to 0/1: 0 (if value < 4) else 1

For Farfisa Organ drawbar 8 is not used and forced to 0

Drawbar 1: 0xD9 (b7-4)  
 Morph Wheel: 0xD9 (b3-0) and 0xDA (b7)  
 Morph After Touch: 0xDA (b6-2)  
 Morph Control Pedal: 0xDA (b1-0) and 0xDB (b7-5)

Drawbar 2: 0xDB (b4-1)  
 Morph Wheel: 0xDB (b0) and 0xDC (b7-4)  
 Morph After Touch: 0xDC (b3-0) and 0xDD (b7)  
 Morph Control Pedal: 0xDD (b6-2)

Drawbar 3: 0xDD (b1-0) and 0xDE (b7-6)  
 Morph Wheel: 0xDE (b5-1)  
 Morph After Touch: 0xDE (b0) and 0xDF (b7-4)  
 Morph Control Pedal: 0xDF (b3-0) and 0xE0 (b7)

Drawbar 4: 0xE0 (b6-3)  
 Morph Wheel: 0xE0 (b2-0) and 0xE1 (b7-6)  
 Morph After Touch: 0xE1 (b5-b1)  
 Morph Control Pedal: 0xE1 (b0) and 0xE2 (b7-4)

Drawbar 5: 0xE2 (b3-0)  
 Morph Wheel: 0xE3 (b7-3)  
 Morph After Touch: 0xE3 (b2-0) and 0xE4 (b7-6)  
 Morph Control Pedal: 0xE4 (b5-1)

Drawbar 6: 0xE4 (b0) and 0xE5 (b7-5)  
 Morph Wheel: 0xE5 (b4-0)  
 Morph After Touch: 0xE6 (b7-3)  
 Morph Control Pedal: 0xE6 (b2-0) and 0xE7 (b7-6)

Drawbar 7: 0xE7 (b5-2)  
 Morph Wheel: 0xE7 (b1-0) and 0xE8 (b7-5)  
 Morph After Touch: 0xE8 (b4-0)  
 Morph Control Pedal: 0xE9 (b7-3)

Drawbar 8: 0xE9 (b2-0) and 0xEA (b7)  
Morph Wheel: 0xEA (b6-2)  
Morph After Touch: 0xEA (b1-0) and 0xEB (b7-5)  
Morph Control Pedal: 0xEB (b4-0)

Drawbar 9: 0xEC (b7-4)  
Morph Wheel: 0xEC (b3-0) and 0xED (b7)  
Morph After Touch: 0xED (b6-2)  
Morph Control Pedal: 0xED (b1-0) and 0xEF (b7-5)

Morph value is on 5-bit  
b4 is polarity  
b3-0 is raw 4-bit value

if polarity = 1 then Morph offset value = raw value + 1  
if polarity = 0 then Morph offset value = raw value - 8

Final 'To' Morph value = 'From value (original volume)' + 'Morph offset value'  
Morph Enabled if 'From value' <> 'Morph offset value'

## Organ Live Mode

Offset in file: 0xBB (b3) (NS3 Compact model only)

0 = off, 1 = on

## Organ Vibrato On

Offset in file: 0xD3 (b4)

0 = off, 1 = on

## Organ Vibrato Mode

Offset in file: 0x34 (b3-1)

0 = V1  
1 = C1  
2 = V2  
3 = C2  
4 = V3  
5 = C3

if Organ type is Pipe1 or Pipe2, only C1 is allowed  
if Organ type is Farfisa, mode C1/V3 are not available  
if Organ type is Vox, mode C1/C2/C3 are not available  
if Organ type is B3, all mode are available

## Organ Percussion On

Offset in file: 0xD3 (b3)

0 = off, 1 = on

only if Organ type is B3

## Organ Percussion Volume Soft

Offset in file: 0xD3 (b0)

0 = off, 1 = on

only if Organ type is B3

## Organ Percussion Decay Fast

Offset in file: 0xD3 (b1)

0 = off, 1 = on

only if Organ type is B3

## Organ Percussion Harmonic Third

Offset in file: 0xD3 (b2)

0 = off, 1 = on

only if Organ type is B3

## Panel Enabled And Selection

Offset in file 0x31

Enabled (b6-5):

0 = A only

1 = B only

2 = A & B

Selected Panel (b7):

A = 0, B = 1 (not used here)

Note: if Dual Keyboard is On, both panel are enabled.

## Piano On

Offset in file: 0x43 (b7)

0 = off, 1 = on

## Piano Kb Zone

Offset in file: 0x43 (b6-3)

See: [Organ Kb Zone](#) for detailed explanation.

## Piano Volume

Offset in file: 0x43 (b2-0), 0x44 (b7-4)

See: [Organ Volume](#) for detailed explanation.

Morph Wheel:

0x44 (b3): polarity (1 = positive, 0 = negative)

0x44 (b2-b0), 0x45 (b7-b4): 7-bit raw value

Morph After Touch:

0x45 (b3): polarity (1 = positive, 0 = negative)

0x45 (b2-b0), 0x46 (b7-b4): 7-bit raw value

Morph Control Pedal:

0x46 (b3): polarity (1 = positive, 0 = negative)

0x46 (b2-b0), 0x47 (b7-b4): 7-bit raw value

## Piano Octave Shift

Offset in file: 0x47 (b3-0)

Octave Shift = value - 6

## Piano Pitch Stick

Offset in file: 0x48 (b7)

0 = off, 1 = on

## Piano Sustain Pedal

Offset in file: 0x48 (b6)

0 = off, 1 = on

## Piano Type

Offset in file: 0x48 (b5-3)

0 = Grand  
1 = Upright  
2 = Electric  
3 = Clav  
4 = Digital  
5 = Misc

## Piano Model

Offset in file: 0x48 (b2-0) and 0x49 (b7-6)

0x00 0x00: model 1  
0x00 0x01: model 2  
.. and so on  
0x02 0x01: model 10

## Piano Name

Offset in file: 0x49 (b3-0) to 0x4D (b7-3)

32-bit Nord Sample ID

## Piano Timbre

Offset in file: 0x4E (b5-3)

Grand, Upright, Digital, Misc Piano, and Harpsichord:

0 = None  
1 = Soft  
2 = Mid  
3 = Bright

Electric Piano

0 = None  
1 = Soft  
2 = Mid  
3 = Bright  
4 = Dyno1  
5 = Dyno2

Clavinet

0 = None  
1 = Soft  
2 = Treble  
3 = Soft+Treble  
4 = Brilliant  
5 = Soft+Brill  
6 = Treble+Brill  
7 = Soft+Trb+Brill

## Piano KB Touch

Offset in file: 0x4D (b0) and 0x4E (b7)

0 = Normal  
1 = KB Touch 1  
2 = Touch 2  
3 = Touch 3

## Piano Layer Detune

Offset in file: 0x34 (b6-5)

0 = Off  
1 = 1  
2 = 2  
3 = 3

Note: This parameter is common for both Panel. Layer Detune setting cannot be different for each panel, only offset 0x34 is used.

## Piano Soft Release

Offset in file: 0x4D (b4)

0 = off, 1 = on

Not available on Clavinet and Digital Piano

## Piano Pedal Noise

Offset in file: 0x4D (b2)

0 = off, 1 = on

Only on Grand, Upright, and Electric piano.

## Piano String Resonance

Offset in file: 0x4D (b3)

0 = off, 1 = on

Only on Grand and Upright piano.

## File Version

Offset in file: 0x14 and 0x15

16-bit integer value in Little Endian format, ex 304 = v3.04

Notes:

From [<https://www.nordkeyboards.com/products/nord-stage-3/nord-stage-3-update-history>] (<https://www.nordkeyboards.com/products/nord-stage-3/nord-stage-3-update-history>)

Programs stored with OS version

OS version	Program version
v0.92 (2017-06-15)	v3.00
v1.36 (2018-02-07)	v3.01
v1.50 (2018-10-22)	v3.02
vx.xx	v3.03
vx.xx	v3.04

## File Format

Offset in file: 0x04

0 = header type 0 - legacy mode no CRC (Byte 0x18 to 0x2B are missing) 1 = header type 1 - default mode with additional bytes 0x18 to 0x2B (20 bytes).

## Transpose

Offset in file: 0x38 (b7-3)

Enabled: 0x38 (b7) Value: 0x38 (b6-3)

7xxx xxxx : Transpose Off/On

x654 3xxx : Transpose value

Test1: F8 38 : Transpose Off

Test2: 0D 80 : Transpose -6 semi

Test3: 0D 88 : Transpose -5 semi

Test4: 0D A8 : Transpose -1 semi

Test5: 0D B8 : Transpose +1 semi

Test6: 0D D8 : Transpose +5 semi

Test7: 0D E0 : Transpose +6 semi

## Split

Offset in file: 0x31 (b4 to b0) to 0x34 (b7 only)

0x31	0x32	0x33	0x34	description
xxx4 3210	7654 3210	7654 3210	7xxx xxxx	
xxx4 xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	split off/on
xxxx 321x	xxxx xxxx	xxxx xxxx	xxxx xxxx	low off/on, mid off/on, high off/on
xxxx xxx0	765x xxxx	xxxx xxxx	xxxx xxxx	low note (0 = F2, 1 = C3, 9 = C7)
xxxx xxxx	xxx4 321x	xxxx xxxx	xxxx xxxx	mid note
xxxx xxxx	xxxx xxx0	765x xxxx	xxxx xxxx	high note
xxxx xxxx	xxxx xxxx	xxx5 4xxx	xxxx xxxx	low width (0 = 1, 1 = 6, 2 = 12)
xxxx xxxx	xxxx xxxx	xxxx x32x	xxxx xxxx	mid width
xxxx xxxx	xxxx xxxx	xxxx xxx0	7xxx xxxx	high width

Test1: 06 07 20 01 : Split Off

Test2: 16 07 20 01 : Width Off 1 1  
Note -- C4 C7

Test3: 1E 07 20 01 : Width 1 1 1  
Note F2 C4 C7

Test4: 1E 07 28 01 : Width 6 1 1  
Note F2 C4 C7

Test5: 1E 07 30 01 : Width 12 1 1  
Note F2 C4 C7

Test6: 18 07 30 01 : Width 12 Off Off  
Note F2 -- --

Test7: 18 27 30 01 : Width 12 Off Off  
Note C3 -- --

Test8: 18 47 30 01 : Width 12 Off Off  
Note F3 -- --

Test9: 18 67 30 01 : Width 12 Off Off



```

Note  C4  --  --

Test10: 18 87 30 01 : Width 12  Off Off
Note  F4  --  --

Test11: 18 A7 30 01 : Width 12  Off Off
Note  C5  --  --

Test12: 18 C7 30 01 : Width 12  Off Off
Note  F5  --  --

Test13: 18 E7 30 01 : Width 12  Off Off
Note  C6  --  --

Test14: 19 07 30 01 : Width 12  Off Off
Note  F6  --  --

Test15: 19 27 30 01 : Width 12  Off Off
Note  C7  --  --

Test16: 1B 27 30 01 : Width 12  Off 1      ! From test 15 to 16 only High Width was changed manually !
Note  F6  --  C7      ! Note Low in file is C7 but fixed on display to F6...

Test17: 1B 27 30 81 : Width 12  Off 6
Note  F6  --  C7

Test18: 1B 27 31 01 : Width 12  Off 12
Note  F6  --  C7

Test19: 1C 23 30 01 : Width 12  1  Off
Note  C3  F3  --      ! Note Mid in file is C3 but fixed on display to F3 !

```

## Master Clock Rate

Offset in file: 0x38 (b2-0) 0x39 (b7-3)

bpm = value + 30

## Dual Keyboard

Offset in file 0x3A (b3)

0 = Off

1 = On

Note: if Dual Keyboard is On, both panel are enabled.

## Dual Keyboard Style

Offset in file 0x3A (b1-0)

0 = Panel

1 = Organ

2 = Piano

3 = Synth

## Program Category

Offset in file: 0x10

0 = Acoustic

1 = Bass

2 = Wind

4 = Fantasy  
5 = FX  
6 = Lead  
7 = Organ  
8 = Pad  
10 = Pluck  
11 = String  
12 = Synth  
13 = Vocal  
14 = User  
17 = None  
21 = Grand  
22 = Upright  
23 = EPiano1  
24 = EPiano2  
27 = Clavinet  
28 = Harpsi  
30 = Arpeggio  
255 = Undefined

## Synth Filter Type

Offset in file: 0x98 (b4-2)

0 = LP12  
1 = LP24  
2 = Mini Moog  
3 = LP+HP  
4 = BP24  
5 = HP24

## Synth Filter Kb Track

Offset in file: 0xA5 (b5-4)

0 = Off  
1 = 1/3  
2 = 2/3  
3 = 1

## Synth Filter Drive

Offset in file: 0xA5 (b3-2)

0 = Off  
1 = 1  
2 = 2  
3 = 3

## Synth Filter LFO Amount

Offset in file: 0xA0 (b3-0) and 0xA1 (b7-5)

**See:** [Organ Volume](#) for detailed Morph explanation.

0/127 value = 0 / 10

Morph Wheel:

0xA1 (b4): polarity (1 = positive, 0 = negative)  
0xA1 (b3-b0), 0xA2 (b7-b5): 7-bit raw value

Morph After Touch:

0xA2 (b4): polarity (1 = positive, 0 = negative)  
0xA2 (b3-b0), 0xA3 (b7-b5): 7-bit raw value

Morph Control Pedal:

0xA3 (b4): polarity (1 = positive, 0 = negative)

0xA3 (b3-b0), 0xA4 (b7-b5): 7-bit raw value

## Synth Filter Vel Mod Env Amount

Offset in file: 0xA4 (b4-0) and 0xA5 (b7-6)

Filter modulation (vel/env mod) is using this single 7-bit value to define two settings with a single k

Input Value is not the direct midi value as usual, instead it is coded on a special 0/120 range:

0 = 10.0 (100% left value) 'Vel Amount'

60 = 0.0 for both values

120 = 10.0 (100% right value) 'Mod Env Amount'

## Synth Filter Freq

Offset in file: 0x98 (b1-0) and 0x99 (b7-3)

See: [Organ Volume](#) for detailed Morph explanation.

0/127 value = 14 Hz / 21 kHz

0 = 14 Hz

1 = 15 Hz

2 = 15 Hz

3 = 16 Hz

4 = 17 Hz

5 = 18 Hz

6 = 19 Hz

7 = 21 Hz

8 = 22 Hz

9 = 23 Hz

10 = 24 Hz

11 = 26 Hz

12 = 28 Hz

13 = 29 Hz

14 = 31 Hz

15 = 33 Hz

16 = 35 Hz

17 = 37 Hz

18 = 39 Hz

19 = 41 Hz

20 = 44 Hz

21 = 46 Hz

22 = 49 Hz

23 = 52 Hz

24 = 55 Hz

25 = 58 Hz

26 = 62 Hz

27 = 65 Hz

28 = 69 Hz

29 = 73 Hz

30 = 78 Hz

31 = 82 Hz

32 = 87 Hz

33 = 92 Hz

34 = 98 Hz

35 = 104 Hz

36 = 110 Hz

37 = 117 Hz

38 = 123 Hz

39 = 131 Hz

40 = 139 Hz  
41 = 147 Hz  
42 = 156 Hz  
43 = 165 Hz  
44 = 175 Hz  
45 = 185 Hz  
46 = 196 Hz  
47 = 208 Hz  
48 = 220 Hz  
49 = 233 Hz  
50 = 247 Hz  
51 = 262 Hz  
52 = 277 Hz  
53 = 294 Hz  
54 = 311 Hz  
55 = 330 Hz  
56 = 349 Hz  
57 = 370 Hz  
58 = 392 Hz  
59 = 415 Hz  
60 = 440 Hz  
61 = 466 Hz  
62 = 494 Hz  
63 = 523 Hz  
64 = 554 Hz  
65 = 587 Hz  
66 = 622 Hz  
67 = 659 Hz  
68 = 698 Hz  
69 = 740 Hz  
70 = 784 Hz  
71 = 831 Hz  
72 = 880 Hz  
73 = 932 Hz  
74 = 988 Hz  
75 = 1.0 kHz  
76 = 1.1 kHz  
77 = 1.2 kHz  
78 = 1.2 kHz  
79 = 1.3 kHz  
80 = 1.4 kHz  
81 = 1.5 kHz  
82 = 1.6 kHz  
83 = 1.7 kHz  
84 = 1.8 kHz  
85 = 1.9 kHz  
86 = 2.0 kHz  
87 = 2.1 kHz  
88 = 2.2 kHz  
89 = 2.3 kHz  
90 = 2.5 kHz  
91 = 2.6 kHz  
92 = 2.8 kHz  
93 = 3.0 kHz  
94 = 3.1 kHz  
95 = 3.3 kHz  
96 = 3.5 kHz  
97 = 3.7 kHz  
98 = 4.0 kHz  
99 = 4.2 kHz  
100 = 4.4 kHz

101 = 4.7 kHz  
102 = 5.0 kHz  
103 = 5.3 kHz  
104 = 5.6 kHz  
105 = 5.9 kHz  
106 = 6.3 kHz  
107 = 6.6 kHz  
108 = 7.0 kHz  
109 = 7.5 kHz  
110 = 7.9 kHz  
111 = 8.4 kHz  
112 = 8.9 kHz  
113 = 9.4 kHz  
114 = 10 kHz  
115 = 11 kHz  
116 = 11 kHz  
117 = 12 kHz  
118 = 13 kHz  
119 = 13 kHz  
120 = 14 kHz  
121 = 15 kHz  
122 = 16 kHz  
123 = 17 kHz  
124 = 18 kHz  
125 = 19 kHz  
126 = 20 kHz  
127 = 21 kHz

\* Morph Wheel:

0x99 (b2): polarity (1 = positive, 0 = negative)

0x99 (b1-b0), 0x9A (b7-b3): 7-bit raw value

Morph After Touch:

0x9A (b2): polarity (1 = positive, 0 = negative)

0x9A (b1-b0), 0x9B (b7-b3): 7-bit raw value

Morph Control Pedal:

0x9B (b2): polarity (1 = positive, 0 = negative)

0x9B (b1-b0), 0x9C (b7-b3): 7-bit raw value

## Synth Filter HP Freq Res

Offset in file: 0x9C (b2-0) and 0x9D (b7-4)

for 'LP+HP' filter

=> Frequency High Pass value: 0/127 value = 14 Hz / 21 kHz

0 = 14 Hz  
1 = 15 Hz  
2 = 15 Hz  
3 = 16 Hz  
4 = 17 Hz  
5 = 18 Hz  
6 = 19 Hz  
7 = 21 Hz  
8 = 22 Hz  
9 = 23 Hz  
10 = 24 Hz  
11 = 26 Hz  
12 = 28 Hz  
13 = 29 Hz

14 = 31 Hz  
15 = 33 Hz  
16 = 35 Hz  
17 = 37 Hz  
18 = 39 Hz  
19 = 41 Hz  
20 = 44 Hz  
21 = 46 Hz  
22 = 49 Hz  
23 = 52 Hz  
24 = 55 Hz  
25 = 58 Hz  
26 = 62 Hz  
27 = 65 Hz  
28 = 69 Hz  
29 = 73 Hz  
30 = 78 Hz  
31 = 82 Hz  
32 = 87 Hz  
33 = 92 Hz  
34 = 98 Hz  
35 = 104 Hz  
36 = 110 Hz  
37 = 117 Hz  
38 = 123 Hz  
39 = 131 Hz  
40 = 139 Hz  
41 = 147 Hz  
42 = 156 Hz  
43 = 165 Hz  
44 = 175 Hz  
45 = 185 Hz  
46 = 196 Hz  
47 = 208 Hz  
48 = 220 Hz  
49 = 233 Hz  
50 = 247 Hz  
51 = 262 Hz  
52 = 277 Hz  
53 = 294 Hz  
54 = 311 Hz  
55 = 330 Hz  
56 = 349 Hz  
57 = 370 Hz  
58 = 392 Hz  
59 = 415 Hz  
60 = 440 Hz  
61 = 466 Hz  
62 = 494 Hz  
63 = 523 Hz  
64 = 554 Hz  
65 = 587 Hz  
66 = 622 Hz  
67 = 659 Hz  
68 = 698 Hz  
69 = 740 Hz  
70 = 784 Hz  
71 = 831 Hz  
72 = 880 Hz  
73 = 932 Hz  
74 = 988 Hz

75 = 1.0 kHz  
76 = 1.1 kHz  
77 = 1.2 kHz  
78 = 1.2 kHz  
79 = 1.3 kHz  
80 = 1.4 kHz  
81 = 1.5 kHz  
82 = 1.6 kHz  
83 = 1.7 kHz  
84 = 1.8 kHz  
85 = 1.9 kHz  
86 = 2.0 kHz  
87 = 2.1 kHz  
88 = 2.2 kHz  
89 = 2.3 kHz  
90 = 2.5 kHz  
91 = 2.6 kHz  
92 = 2.8 kHz  
93 = 3.0 kHz  
94 = 3.1 kHz  
95 = 3.3 kHz  
96 = 3.5 kHz  
97 = 3.7 kHz  
98 = 4.0 kHz  
99 = 4.2 kHz  
100 = 4.4 kHz  
101 = 4.7 kHz  
102 = 5.0 kHz  
103 = 5.3 kHz  
104 = 5.6 kHz  
105 = 5.9 kHz  
106 = 6.3 kHz  
107 = 6.6 kHz  
108 = 7.0 kHz  
109 = 7.5 kHz  
110 = 7.9 kHz  
111 = 8.4 kHz  
112 = 8.9 kHz  
113 = 9.4 kHz  
114 = 10 kHz  
115 = 11 kHz  
116 = 11 kHz  
117 = 12 kHz  
118 = 13 kHz  
119 = 13 kHz  
120 = 14 kHz  
121 = 15 kHz  
122 = 16 kHz  
123 = 17 kHz  
124 = 18 kHz  
125 = 19 kHz  
126 = 20 kHz  
127 = 21 kHz

for all other filters

=> Resonance: 0/127 value = 0 / 10

## Synth On

Offset in file: 0x52 (b7)

0 = off, 1 = on

## Synth Kb Zone

Offset in file: 0x52 (b6-3)

See: [Organ Kb Zone](#) for detailed explanation.

## Synth Volume

Offset in file: 0x52 (b2-0) and 0x53 (b7-4)

See: [Organ Volume](#) for detailed explanation.

Morph Wheel:

0x53 (b3): polarity (1 = positive, 0 = negative)

0x53 (b2-b0), 0x54 (b7-b4): 7-bit raw value

Morph After Touch:

0x54 (b3): polarity (1 = positive, 0 = negative)

0x54 (b2-b0), 0x55 (b7-b4): 7-bit raw value

Morph Control Pedal:

0x55 (b3): polarity (1 = positive, 0 = negative)

0x55 (b2-b0), 0x56 (b7-b4): 7-bit raw value

## Synth Octave Shift

Offset in file: 0x56 (b3-0)

Octave Shift = value - 6

## Synth Pitch Stick

Offset in file: 0x57 (b7)

0 = off, 1 = on

## Synth Sustain Pedal

Offset in file: 0x57 (b6)

0 = off, 1 = on

## Synth Kb Hold

Offset in file: 0x80 (b7)

0 = off, 1 = on

## Synth Voice

Offset in file: 0x84 (b0) and 0x85 (b7)

0 = Poly

1 = Legato

2 = Mono

## Synth Glide

Offset in file: 0x85 (b6 to b0) 7 bits, range 0/10

0/127 value = 0 / 10



## Synth Unison

Offset in file: 0x86 (b7/6)

0 = Off  
 1 = 1  
 2 = 2  
 3 = 3

## Synth Vibrato

Offset in file: 0x86 (b5/4/3)

0 = Off  
 1 = Delay 1  
 2 = Delay 2  
 3 = Delay 3  
 4 = Wheel  
 5 = After Touch

## Synth Oscillator Type

Offset in file: 0x8D (b1/0) and 0x8E (b7)

0 = Classic  
 1 = Wave  
 2 = Formant  
 3 = Super  
 4 = Sample

## Synth Oscillator 1 Wave Form

Offset in file: 0x8E (b3-0) and 0x8F (b7/6)

ID	Classic	Wave	Formant	Super
--	-----	-----	-----	-----
0	Sine	Wave 2nd Harm	Format Wave Aaa	Super Wave Saw
1	Triangle	Wave 3rd Harm	Format Wave Eee	Super Wave Saw 2
2	Saw	Wave 4th Harm	Format Wave Iii	Super Wave Square
3	Square	Wave 5th Harm	Format Wave Ooo	Super Wave Square 2
4	Pulse 33	Wave 6th Harm	Format Wave Uuu	Super Wave Bright
5	Pulse 10	Wave 7th Harm	Format Wave Yyy	Super Wave Bright 2
6	ESaw	Wave 8th Harm	Format Wave A0	Super Wave Strings
7	ESquare	Wave Organ 1	Format Wave AE	Super Wave Organ
8		Wave Organ 2	Format Wave OE	
9		Wave Principal		
10		Wave Flute 1		
11		Wave Flute 2		
12		Wave Clarinet 1		
13		Wave Clarinet 2		
14		Wave Alto Sax		
15		Wave Tenor Sax		
16		Wave 2nd Spectra		
17		Wave 3rd Spectra		
18		Wave 4th Spectra		
19		Wave 5th Spectra		
20		Wave 6th Spectra		
21		Wave 7th Spectra		
22		Wave 8th Spectra		
23		Wave Saw Random		
24		Wave Saw Bright		
25		Wave Sqr Bright		
26		Wave Saw NoFund		
27		Wave EPiano 1		

28			Wave EPiano 2	
29			Wave EPiano 3	
30			Wave DX 1	
31			Wave DX 2	
32			Wave Full Tines	
33			Wave Ac Piano	
34			Wave Ice 1	
35			Wave Ice 2	
36			Wave Clavinet 1	
37			Wave Clavinet 2	
38			Wave Clavinet 3	
39			Wave Triplets	
40			Wave Bell	
41			Wave Bar 1	
42			Wave Bar 2	
43			Wave Tines	
44			Wave Marimba	
45			Wave Tubular Bells	

## Synth Oscillator Config

Offset in file: 0x8F (b4-1)

0 = None  
 1 = Pitch  
 2 = Shape  
 3 = Sync  
 4 = Detune  
 5 = MixSin  
 6 = MixTri  
 7 = MixSaw  
 8 = MixSqr  
 9 = MixBell  
 10 = MixNs1  
 11 = MixNs2  
 12 = FM1  
 13 = FM2  
 14 = RM

## Synth Oscillator Control

Offset in file: 0x90 (b2/1/0) and 0x91 (b7/6/5/4)

See: [Organ Volume](#) for detailed Morph explanation.

Type	Midi value conversion
Pitch (1)	0/127 => 0/24
Shape (2)	0/127 => 0/100 %
Sync (3)	0/127 => 0/10
Detune (4)	0/127 => 0/4
Mix* (5 to 11)	0/127 => 100/0 to 0/100
FM & RM (12 to 14)	0/127 => 0/100 %

Morph Wheel:

0x91 (b3): polarity (1 = positive, 0 = negative)

0x91 (b2-b0), 0x92 (b7-b4): 7-bit raw value

Morph After Touch:

0x92 (b3): polarity (1 = positive, 0 = negative)

0x92 (b2-b0), 0x93 (b7-b4): 7-bit raw value

Morph Control Pedal:

0x93 (b3): polarity (1 = positive, 0 = negative)  
0x93 (b2-b0), 0x94 (b7-b4): 7-bit raw value

## Synth Pitch

Offset in file: 0x8f (b0) and 0x90 (b7-3)

Midi value = 6-bit value + b0 forced to zero to have a standard Midi 7-bit value  
value conversion: -12 (Sub) to +48

## Synth LFO Mod Env

Offset in file: 0x94 (b3-0) and 0x95 (b7-5)

Osc modulation (lfo/env mod) is using this single 7-bit value to define two settings with a single knob

Input Value is not the direct midi value as usual, instead it is coded on a special 0/120 range:

0 = 10.0 (100% left value) 'LFO Amount'

60 = 0.0 for both values

120 = 10.0 (100% right value) 'Mod Env Amount'

## Synth Fast Attack

Offset in file: 0xAC (b2)

0 = off, 1 = on

## Synth Mod Env Attack

Offset in file: 0x8B (b7-1)

0/127 value = 0.5 ms / 45 s

0 = 0.5 ms

1 = 0.6 ms

2 = 0.7 ms

3 = 0.9 ms

4 = 1.1 ms

5 = 1.3 ms

6 = 1.5 ms

7 = 1.8 ms

8 = 2.1 ms

9 = 2.5 ms

10 = 3.0 ms

11 = 3.5 ms

12 = 4.0 ms

13 = 4.7 ms

14 = 5.5 ms

15 = 6.3 ms

16 = 7.3 ms

17 = 8.4 ms

18 = 9.7 ms

19 = 11 ms

20 = 13 ms

21 = 14 ms

22 = 16 ms

23 = 19 ms

24 = 21 ms

25 = 24 ms

26 = 27 ms

27 = 31 ms

28 = 34 ms

29 = 39 ms

30 = 43 ms

31 = 49 ms

32 = 54 ms  
33 = 61 ms  
34 = 68 ms  
35 = 75 ms  
36 = 84 ms  
37 = 93 ms  
38 = 103 ms  
39 = 114 ms  
40 = 126 ms  
41 = 139 ms  
42 = 153 ms  
43 = 169 ms  
44 = 186 ms  
45 = 204 ms  
46 = 224 ms  
47 = 246 ms  
48 = 269 ms  
49 = 295 ms  
50 = 322 ms  
51 = 352 ms  
52 = 384 ms  
53 = 419 ms  
54 = 456 ms  
55 = 496 ms  
56 = 540 ms  
57 = 586 ms  
58 = 636 ms  
59 = 690 ms  
60 = 748 ms  
61 = 810 ms  
62 = 876 ms  
63 = 947 ms  
64 = 1.02 s  
65 = 1.10 s  
66 = 1.19 s  
67 = 1.28 s  
68 = 1.38 s  
69 = 1.49 s  
70 = 1.60 s  
71 = 1.72 s  
72 = 1.85 s  
73 = 1.99 s  
74 = 2.13 s  
75 = 2.28 s  
76 = 2.45 s  
77 = 2.62 s  
78 = 2.81 s  
79 = 3.00 s  
80 = 3.21 s  
81 = 3.43 s  
82 = 3.66 s  
83 = 3.91 s  
84 = 4.17 s  
85 = 4.45 s  
86 = 4.74 s  
87 = 5.05 s  
88 = 5.37 s  
89 = 5.72 s  
90 = 6.08 s  
91 = 6.47 s  
92 = 6.87 s

93 = 7.30 s  
94 = 7.75 s  
95 = 8.22 s  
96 = 8.72 s  
97 = 9.25 s  
98 = 9.80 s  
99 = 10 s  
100 = 11 s  
101 = 12 s  
102 = 12 s  
103 = 13 s  
104 = 14 s  
105 = 15 s  
106 = 15 s  
107 = 16 s  
108 = 17 s  
109 = 18 s  
110 = 19 s  
111 = 20 s  
112 = 21 s  
113 = 22 s  
114 = 24 s  
115 = 25 s  
116 = 26 s  
117 = 27 s  
118 = 29 s  
119 = 30 s  
120 = 32 s  
121 = 34 s  
122 = 35 s  
123 = 37 s  
124 = 39 s  
125 = 41 s  
126 = 43 s  
127 = 45 s

## Synth Mod Env Decay

Offset in file: 0x8B (b0) and 0x8C (b7-2)

0/127 value = 3.0 ms / 45 s (Sustain)

0 = 3.0 ms  
1 = 3.5 ms  
2 = 4.0 ms  
3 = 4.6 ms  
4 = 5.3 ms  
5 = 6.0 ms  
6 = 6.9 ms  
7 = 7.9 ms  
8 = 9.0 ms  
9 = 10 ms  
10 = 12 ms  
11 = 13 ms  
12 = 15 ms  
13 = 17 ms  
14 = 19 ms  
15 = 21 ms  
16 = 23 ms  
17 = 26 ms  
18 = 29 ms  
19 = 33 ms

20 = 36 ms  
21 = 41 ms  
22 = 45 ms  
23 = 50 ms  
24 = 55 ms  
25 = 61 ms  
26 = 68 ms  
27 = 75 ms  
28 = 82 ms  
29 = 91 ms  
30 = 100 ms  
31 = 110 ms  
32 = 120 ms  
33 = 132 ms  
34 = 144 ms  
35 = 158 ms  
36 = 173 ms  
37 = 188 ms  
38 = 206 ms  
39 = 224 ms  
40 = 244 ms  
41 = 265 ms  
42 = 288 ms  
43 = 313 ms  
44 = 340 ms  
45 = 368 ms  
46 = 399 ms  
47 = 432 ms  
48 = 467 ms  
49 = 505 ms  
50 = 545 ms  
51 = 588 ms  
52 = 634 ms  
53 = 683 ms  
54 = 736 ms  
55 = 792 ms  
56 = 851 ms  
57 = 915 ms  
58 = 983 ms  
59 = 1.05 s  
60 = 1.13 s  
61 = 1.21 s  
62 = 1.30 s  
63 = 1.39 s  
64 = 1.49 s  
65 = 1.59 s  
66 = 1.70 s  
67 = 1.82 s  
68 = 1.94 s  
69 = 2.07 s  
70 = 2.21 s  
71 = 2.36 s  
72 = 2.51 s  
73 = 2.67 s  
74 = 2.85 s  
75 = 3.03 s  
76 = 3.22 s  
77 = 3.42 s  
78 = 3.64 s  
79 = 3.86 s  
80 = 4.10 s

81 = 4.35 s  
82 = 4.61 s  
83 = 4.89 s  
84 = 5.18 s  
85 = 5.49 s  
86 = 5.81 s  
87 = 6.15 s  
88 = 6.50 s  
89 = 6.88 s  
90 = 7.27 s  
91 = 7.68 s  
92 = 8.11 s  
93 = 8.57 s  
94 = 9.04 s  
95 = 9.54 s  
96 = 10 s  
97 = 11 s  
98 = 11 s  
99 = 12 s  
100 = 12 s  
101 = 13 s  
102 = 14 s  
103 = 14 s  
104 = 15 s  
105 = 16 s  
106 = 17 s  
107 = 18 s  
108 = 19 s  
109 = 20 s  
110 = 20 s  
111 = 22 s  
112 = 23 s  
113 = 24 s  
114 = 25 s  
115 = 26 s  
116 = 27 s  
117 = 29 s  
118 = 30 s  
119 = 31 s  
120 = 33 s  
121 = 34 s  
122 = 36 s  
123 = 38 s  
124 = 39 s  
125 = 41 s  
126 = 43 s  
127 = 45 s

## Synth Mod Env Release

Offset in file: 0x8C (b1-0) and 0x8D (b7-3)

0/127 value = 3.0 ms / 45 s (Inf)

0 = 3.0 ms  
1 = 3.5 ms  
2 = 4.0 ms  
3 = 4.6 ms  
4 = 5.3 ms  
5 = 6.0 ms  
6 = 6.9 ms  
7 = 7.9 ms

8 = 9.0 ms  
9 = 10 ms  
10 = 12 ms  
11 = 13 ms  
12 = 15 ms  
13 = 17 ms  
14 = 19 ms  
15 = 21 ms  
16 = 23 ms  
17 = 26 ms  
18 = 29 ms  
19 = 33 ms  
20 = 36 ms  
21 = 41 ms  
22 = 45 ms  
23 = 50 ms  
24 = 55 ms  
25 = 61 ms  
26 = 68 ms  
27 = 75 ms  
28 = 82 ms  
29 = 91 ms  
30 = 100 ms  
31 = 110 ms  
32 = 120 ms  
33 = 132 ms  
34 = 144 ms  
35 = 158 ms  
36 = 173 ms  
37 = 188 ms  
38 = 206 ms  
39 = 224 ms  
40 = 244 ms  
41 = 265 ms  
42 = 288 ms  
43 = 313 ms  
44 = 340 ms  
45 = 368 ms  
46 = 399 ms  
47 = 432 ms  
48 = 467 ms  
49 = 505 ms  
50 = 545 ms  
51 = 588 ms  
52 = 634 ms  
53 = 683 ms  
54 = 736 ms  
55 = 792 ms  
56 = 851 ms  
57 = 915 ms  
58 = 983 ms  
59 = 1.05 s  
60 = 1.13 s  
61 = 1.21 s  
62 = 1.30 s  
63 = 1.39 s  
64 = 1.49 s  
65 = 1.59 s  
66 = 1.70 s  
67 = 1.82 s  
68 = 1.94 s



69 = 2.07 s  
70 = 2.21 s  
71 = 2.36 s  
72 = 2.51 s  
73 = 2.67 s  
74 = 2.85 s  
75 = 3.03 s  
76 = 3.22 s  
77 = 3.42 s  
78 = 3.64 s  
79 = 3.86 s  
80 = 4.10 s  
81 = 4.35 s  
82 = 4.61 s  
83 = 4.89 s  
84 = 5.18 s  
85 = 5.49 s  
86 = 5.81 s  
87 = 6.15 s  
88 = 6.50 s  
89 = 6.88 s  
90 = 7.27 s  
91 = 7.68 s  
92 = 8.11 s  
93 = 8.57 s  
94 = 9.04 s  
95 = 9.54 s  
96 = 10 s  
97 = 11 s  
98 = 11 s  
99 = 12 s  
100 = 12 s  
101 = 13 s  
102 = 14 s  
103 = 14 s  
104 = 15 s  
105 = 16 s  
106 = 17 s  
107 = 18 s  
108 = 19 s  
109 = 20 s  
110 = 20 s  
111 = 22 s  
112 = 23 s  
113 = 24 s  
114 = 25 s  
115 = 26 s  
116 = 27 s  
117 = 29 s  
118 = 30 s  
119 = 31 s  
120 = 33 s  
121 = 34 s  
122 = 36 s  
123 = 38 s  
124 = 39 s  
125 = 41 s  
126 = 43 s  
127 = 45 s

## Synth Mod Env Velocity

Offset in file: 0x8D (b2)

0 = off, 1 = on

## Synth Amp Env Attack

Offset in file: 0xA5 (b1-0) and 0xA6 (b7-3)

0/127 value = 0.5 ms / 45 s

0 = 0.5 ms  
1 = 0.6 ms  
2 = 0.7 ms  
3 = 0.9 ms  
4 = 1.1 ms  
5 = 1.3 ms  
6 = 1.5 ms  
7 = 1.8 ms  
8 = 2.1 ms  
9 = 2.5 ms  
10 = 3.0 ms  
11 = 3.5 ms  
12 = 4.0 ms  
13 = 4.7 ms  
14 = 5.5 ms  
15 = 6.3 ms  
16 = 7.3 ms  
17 = 8.4 ms  
18 = 9.7 ms  
19 = 11 ms  
20 = 13 ms  
21 = 14 ms  
22 = 16 ms  
23 = 19 ms  
24 = 21 ms  
25 = 24 ms  
26 = 27 ms  
27 = 31 ms  
28 = 34 ms  
29 = 39 ms  
30 = 43 ms  
31 = 49 ms  
32 = 54 ms  
33 = 61 ms  
34 = 68 ms  
35 = 75 ms  
36 = 84 ms  
37 = 93 ms  
38 = 103 ms  
39 = 114 ms  
40 = 126 ms  
41 = 139 ms  
42 = 153 ms  
43 = 169 ms  
44 = 186 ms  
45 = 204 ms  
46 = 224 ms  
47 = 246 ms  
48 = 269 ms  
49 = 295 ms  
50 = 322 ms

51 = 352 ms  
52 = 384 ms  
53 = 419 ms  
54 = 456 ms  
55 = 496 ms  
56 = 540 ms  
57 = 586 ms  
58 = 636 ms  
59 = 690 ms  
60 = 748 ms  
61 = 810 ms  
62 = 876 ms  
63 = 947 ms  
64 = 1.02 s  
65 = 1.10 s  
66 = 1.19 s  
67 = 1.28 s  
68 = 1.38 s  
69 = 1.49 s  
70 = 1.60 s  
71 = 1.72 s  
72 = 1.85 s  
73 = 1.99 s  
74 = 2.13 s  
75 = 2.28 s  
76 = 2.45 s  
77 = 2.62 s  
78 = 2.81 s  
79 = 3.00 s  
80 = 3.21 s  
81 = 3.43 s  
82 = 3.66 s  
83 = 3.91 s  
84 = 4.17 s  
85 = 4.45 s  
86 = 4.74 s  
87 = 5.05 s  
88 = 5.37 s  
89 = 5.72 s  
90 = 6.08 s  
91 = 6.47 s  
92 = 6.87 s  
93 = 7.30 s  
94 = 7.75 s  
95 = 8.22 s  
96 = 8.72 s  
97 = 9.25 s  
98 = 9.80 s  
99 = 10 s  
100 = 11 s  
101 = 12 s  
102 = 12 s  
103 = 13 s  
104 = 14 s  
105 = 15 s  
106 = 15 s  
107 = 16 s  
108 = 17 s  
109 = 18 s  
110 = 19 s  
111 = 20 s

112 = 21 s  
113 = 22 s  
114 = 24 s  
115 = 25 s  
116 = 26 s  
117 = 27 s  
118 = 29 s  
119 = 30 s  
120 = 32 s  
121 = 34 s  
122 = 35 s  
123 = 37 s  
124 = 39 s  
125 = 41 s  
126 = 43 s  
127 = 45 s

## Synth Amp Env Decay

Offset in file: 0xA6 (b2-0) and 0xA7 (b7-4)

0/127 value = 3.0 ms / 45 s (Sustain)

0 = 3.0 ms  
1 = 3.5 ms  
2 = 4.0 ms  
3 = 4.6 ms  
4 = 5.3 ms  
5 = 6.0 ms  
6 = 6.9 ms  
7 = 7.9 ms  
8 = 9.0 ms  
9 = 10 ms  
10 = 12 ms  
11 = 13 ms  
12 = 15 ms  
13 = 17 ms  
14 = 19 ms  
15 = 21 ms  
16 = 23 ms  
17 = 26 ms  
18 = 29 ms  
19 = 33 ms  
20 = 36 ms  
21 = 41 ms  
22 = 45 ms  
23 = 50 ms  
24 = 55 ms  
25 = 61 ms  
26 = 68 ms  
27 = 75 ms  
28 = 82 ms  
29 = 91 ms  
30 = 100 ms  
31 = 110 ms  
32 = 120 ms  
33 = 132 ms  
34 = 144 ms  
35 = 158 ms  
36 = 173 ms  
37 = 188 ms  
38 = 206 ms

39 = 224 ms  
40 = 244 ms  
41 = 265 ms  
42 = 288 ms  
43 = 313 ms  
44 = 340 ms  
45 = 368 ms  
46 = 399 ms  
47 = 432 ms  
48 = 467 ms  
49 = 505 ms  
50 = 545 ms  
51 = 588 ms  
52 = 634 ms  
53 = 683 ms  
54 = 736 ms  
55 = 792 ms  
56 = 851 ms  
57 = 915 ms  
58 = 983 ms  
59 = 1.05 s  
60 = 1.13 s  
61 = 1.21 s  
62 = 1.30 s  
63 = 1.39 s  
64 = 1.49 s  
65 = 1.59 s  
66 = 1.70 s  
67 = 1.82 s  
68 = 1.94 s  
69 = 2.07 s  
70 = 2.21 s  
71 = 2.36 s  
72 = 2.51 s  
73 = 2.67 s  
74 = 2.85 s  
75 = 3.03 s  
76 = 3.22 s  
77 = 3.42 s  
78 = 3.64 s  
79 = 3.86 s  
80 = 4.10 s  
81 = 4.35 s  
82 = 4.61 s  
83 = 4.89 s  
84 = 5.18 s  
85 = 5.49 s  
86 = 5.81 s  
87 = 6.15 s  
88 = 6.50 s  
89 = 6.88 s  
90 = 7.27 s  
91 = 7.68 s  
92 = 8.11 s  
93 = 8.57 s  
94 = 9.04 s  
95 = 9.54 s  
96 = 10 s  
97 = 11 s  
98 = 11 s  
99 = 12 s

100 = 12 s  
101 = 13 s  
102 = 14 s  
103 = 14 s  
104 = 15 s  
105 = 16 s  
106 = 17 s  
107 = 18 s  
108 = 19 s  
109 = 20 s  
110 = 20 s  
111 = 22 s  
112 = 23 s  
113 = 24 s  
114 = 25 s  
115 = 26 s  
116 = 27 s  
117 = 29 s  
118 = 30 s  
119 = 31 s  
120 = 33 s  
121 = 34 s  
122 = 36 s  
123 = 38 s  
124 = 39 s  
125 = 41 s  
126 = 43 s  
127 = 45 s

## Synth Amp Env Release

Offset in file: 0xA7 (b3-0) and 0xA8 (b7-5)

0/127 value = 3.0 ms / 45 s

0 = 3.0 ms  
1 = 3.5 ms  
2 = 4.0 ms  
3 = 4.6 ms  
4 = 5.3 ms  
5 = 6.0 ms  
6 = 6.9 ms  
7 = 7.9 ms  
8 = 9.0 ms  
9 = 10 ms  
10 = 12 ms  
11 = 13 ms  
12 = 15 ms  
13 = 17 ms  
14 = 19 ms  
15 = 21 ms  
16 = 23 ms  
17 = 26 ms  
18 = 29 ms  
19 = 33 ms  
20 = 36 ms  
21 = 41 ms  
22 = 45 ms  
23 = 50 ms  
24 = 55 ms  
25 = 61 ms  
26 = 68 ms

27 = 75 ms  
28 = 82 ms  
29 = 91 ms  
30 = 100 ms  
31 = 110 ms  
32 = 120 ms  
33 = 132 ms  
34 = 144 ms  
35 = 158 ms  
36 = 173 ms  
37 = 188 ms  
38 = 206 ms  
39 = 224 ms  
40 = 244 ms  
41 = 265 ms  
42 = 288 ms  
43 = 313 ms  
44 = 340 ms  
45 = 368 ms  
46 = 399 ms  
47 = 432 ms  
48 = 467 ms  
49 = 505 ms  
50 = 545 ms  
51 = 588 ms  
52 = 634 ms  
53 = 683 ms  
54 = 736 ms  
55 = 792 ms  
56 = 851 ms  
57 = 915 ms  
58 = 983 ms  
59 = 1.05 s  
60 = 1.13 s  
61 = 1.21 s  
62 = 1.30 s  
63 = 1.39 s  
64 = 1.49 s  
65 = 1.59 s  
66 = 1.70 s  
67 = 1.82 s  
68 = 1.94 s  
69 = 2.07 s  
70 = 2.21 s  
71 = 2.36 s  
72 = 2.51 s  
73 = 2.67 s  
74 = 2.85 s  
75 = 3.03 s  
76 = 3.22 s  
77 = 3.42 s  
78 = 3.64 s  
79 = 3.86 s  
80 = 4.10 s  
81 = 4.35 s  
82 = 4.61 s  
83 = 4.89 s  
84 = 5.18 s  
85 = 5.49 s  
86 = 5.81 s  
87 = 6.15 s

88 = 6.50 s  
89 = 6.88 s  
90 = 7.27 s  
91 = 7.68 s  
92 = 8.11 s  
93 = 8.57 s  
94 = 9.04 s  
95 = 9.54 s  
96 = 10 s  
97 = 11 s  
98 = 11 s  
99 = 12 s  
100 = 12 s  
101 = 13 s  
102 = 14 s  
103 = 14 s  
104 = 15 s  
105 = 16 s  
106 = 17 s  
107 = 18 s  
108 = 19 s  
109 = 20 s  
110 = 20 s  
111 = 22 s  
112 = 23 s  
113 = 24 s  
114 = 25 s  
115 = 26 s  
116 = 27 s  
117 = 29 s  
118 = 30 s  
119 = 31 s  
120 = 33 s  
121 = 34 s  
122 = 36 s  
123 = 38 s  
124 = 39 s  
125 = 41 s  
126 = 43 s  
127 = 45 s

## Synth Amp Env Velocity

Offset in file: 0xA8 (b4-3)

0 = Off  
1 = 1  
2 = 2  
3 = 3

## Synth Lfo Wave

Offset in file: 0x86 (b2-0)

0 = Triangle  
1 = Saw  
2 = Neg Saw  
3 = Square  
4 = S/H



## Synth Lfo Rate

Offset in file: 0x87 (b6-0)

See: [Organ Volume](#) for detailed Morph explanation.

0/127 value = 0.03 Hz / 523 Hz

0	=	0.03	Hz
1	=	0.03	Hz
2	=	0.03	Hz
3	=	0.04	Hz
4	=	0.04	Hz
5	=	0.04	Hz
6	=	0.05	Hz
7	=	0.05	Hz
8	=	0.05	Hz
9	=	0.06	Hz
10	=	0.06	Hz
11	=	0.07	Hz
12	=	0.07	Hz
13	=	0.08	Hz
14	=	0.09	Hz
15	=	0.09	Hz
16	=	0.10	Hz
17	=	0.11	Hz
18	=	0.12	Hz
19	=	0.13	Hz
20	=	0.14	Hz
21	=	0.15	Hz
22	=	0.16	Hz
23	=	0.17	Hz
24	=	0.19	Hz
25	=	0.20	Hz
26	=	0.22	Hz
27	=	0.24	Hz
28	=	0.26	Hz
29	=	0.28	Hz
30	=	0.30	Hz
31	=	0.32	Hz
32	=	0.35	Hz
33	=	0.38	Hz
34	=	0.41	Hz
35	=	0.44	Hz
36	=	0.47	Hz
37	=	0.51	Hz
38	=	0.55	Hz
39	=	0.60	Hz
40	=	0.64	Hz
41	=	0.70	Hz
42	=	0.75	Hz
43	=	0.81	Hz
44	=	0.88	Hz
45	=	0.95	Hz
46	=	1.0	Hz
47	=	1.1	Hz
48	=	1.2	Hz
49	=	1.3	Hz
50	=	1.4	Hz
51	=	1.5	Hz
52	=	1.6	Hz
53	=	1.8	Hz
54	=	1.9	Hz

55 = 2.0 Hz  
56 = 2.2 Hz  
57 = 2.4 Hz  
58 = 2.6 Hz  
59 = 2.8 Hz  
60 = 3.0 Hz  
61 = 3.2 Hz  
62 = 3.5 Hz  
63 = 3.8 Hz  
64 = 4.1 Hz  
65 = 4.4 Hz  
66 = 4.8 Hz  
67 = 5.2 Hz  
68 = 5.6 Hz  
69 = 6.0 Hz  
70 = 6.5 Hz  
71 = 7.0 Hz  
72 = 7.6 Hz  
73 = 8.2 Hz  
74 = 8.8 Hz  
75 = 9.5 Hz  
76 = 10 Hz  
77 = 11 Hz  
78 = 12 Hz  
79 = 13 Hz  
80 = 14 Hz  
81 = 15 Hz  
82 = 16 Hz  
83 = 18 Hz  
84 = 19 Hz  
85 = 21 Hz  
86 = 22 Hz  
87 = 24 Hz  
88 = 26 Hz  
89 = 28 Hz  
90 = 30 Hz  
91 = 33 Hz  
92 = 35 Hz  
93 = 38 Hz  
94 = 41 Hz  
95 = 45 Hz  
96 = 48 Hz  
97 = 52 Hz  
98 = 56 Hz  
99 = 61 Hz  
100 = 65 Hz  
101 = 71 Hz  
102 = 76 Hz  
103 = 82 Hz  
104 = 89 Hz  
105 = 96 Hz  
106 = 104 Hz  
107 = 112 Hz  
108 = 121 Hz  
109 = 131 Hz  
110 = 141 Hz  
111 = 153 Hz  
112 = 165 Hz  
113 = 178 Hz  
114 = 192 Hz  
115 = 208 Hz

116 = 224 Hz  
117 = 242 Hz  
118 = 262 Hz  
119 = 283 Hz  
120 = 305 Hz  
121 = 330 Hz  
122 = 356 Hz  
123 = 385 Hz  
124 = 415 Hz  
125 = 449 Hz  
126 = 484 Hz  
127 = 523 Hz

if LFO Master Clock is On, 0/127 value = 4/1 to 1/64 Master Clock Division

0 = 4/1  
1 = 4/1  
2 = 4/1  
3 = 4/1  
4 = 4/1  
5 = 4/1  
6 = 4/1  
7 = 4/1  
8 = 4/1T  
9 = 4/1T  
10 = 4/1T  
11 = 4/1T  
12 = 4/1T  
13 = 4/1T  
14 = 4/1T  
15 = 4/1T  
16 = 2/1  
17 = 2/1  
18 = 2/1  
19 = 2/1  
20 = 2/1  
21 = 2/1  
22 = 2/1  
23 = 2/1T  
24 = 2/1T  
25 = 2/1T  
26 = 2/1T  
27 = 2/1T  
28 = 2/1T  
29 = 2/1T  
30 = 2/1T  
31 = 1/1  
32 = 1/1  
33 = 1/1  
34 = 1/1  
35 = 1/1  
36 = 1/1  
37 = 1/1  
38 = 1/1T  
39 = 1/1T  
40 = 1/1T  
41 = 1/1T  
42 = 1/1T  
43 = 1/1T  
44 = 1/1T  
45 = 1/1T

46 = 1/2  
47 = 1/2  
48 = 1/2  
49 = 1/2  
50 = 1/2  
51 = 1/2  
52 = 1/2  
53 = 1/2T  
54 = 1/2T  
55 = 1/2T  
56 = 1/2T  
57 = 1/2T  
58 = 1/2T  
59 = 1/2T  
60 = 1/2T  
61 = 1/4  
62 = 1/4  
63 = 1/4  
64 = 1/4  
65 = 1/4  
66 = 1/4  
67 = 1/4  
68 = 1/4T  
69 = 1/4T  
70 = 1/4T  
71 = 1/4T  
72 = 1/4T  
73 = 1/4T  
74 = 1/4T  
75 = 1/4T  
76 = 1/8  
77 = 1/8  
78 = 1/8  
79 = 1/8  
80 = 1/8  
81 = 1/8  
82 = 1/8  
83 = 1/8T  
84 = 1/8T  
85 = 1/8T  
86 = 1/8T  
87 = 1/8T  
88 = 1/8T  
89 = 1/8T  
90 = 1/8T  
91 = 1/16  
92 = 1/16  
93 = 1/16  
94 = 1/16  
95 = 1/16  
96 = 1/16  
97 = 1/16  
98 = 1/16T  
99 = 1/16T  
100 = 1/16T  
101 = 1/16T  
102 = 1/16T  
103 = 1/16T  
104 = 1/16T  
105 = 1/16T  
106 = 1/32

107 = 1/32  
108 = 1/32  
109 = 1/32  
110 = 1/32  
111 = 1/32  
112 = 1/32  
113 = 1/32T  
114 = 1/32T  
115 = 1/32T  
116 = 1/32T  
117 = 1/32T  
118 = 1/32T  
119 = 1/32T  
120 = 1/32T  
121 = 1/64  
122 = 1/64  
123 = 1/64  
124 = 1/64  
125 = 1/64  
126 = 1/64  
127 = 1/64

**Morph Wheel:**

0x88 (b7): polarity (1 = positive, 0 = negative)

0x88 (b6-b0): 7-bit raw value

**Morph After Touch:**

0x89 (b7): polarity (1 = positive, 0 = negative)

0x89 (b6-b0): 7-bit raw value

**Morph Control Pedal:**

0x8A (b7): polarity (1 = positive, 0 = negative)

0x8A (b6-b0): 7-bit raw value

## Synth Lfo Master Clock

Offset in file: 0x87 (b7)

0 = off, 1 = on

## Synth Arp On

Offset in file: 0x80 (b6)

0 = off, 1 = on

## Synth Arp Rate

Offset in file: 0x81 (b7-1)

See: [Organ Volume](#) for detailed Morph explanation.

0/127 value = 16 bpm / Fast 5

0 = 16 bpm  
1 = 16 bpm  
2 = 18 bpm  
3 = 20 bpm  
4 = 24 bpm  
5 = 26 bpm  
6 = 28 bpm  
7 = 30 bpm  
8 = 34 bpm

9 = 36 bpm  
10 = 38 bpm  
11 = 42 bpm  
12 = 44 bpm  
13 = 46 bpm  
14 = 48 bpm  
15 = 50 bpm  
16 = 54 bpm  
17 = 56 bpm  
18 = 58 bpm  
19 = 60 bpm  
20 = 62 bpm  
21 = 64 bpm  
22 = 66 bpm  
23 = 68 bpm  
24 = 70 bpm  
25 = 72 bpm  
26 = 74 bpm  
27 = 76 bpm  
28 = 78 bpm  
29 = 78 bpm  
30 = 80 bpm  
31 = 82 bpm  
32 = 84 bpm  
33 = 86 bpm  
34 = 86 bpm  
35 = 88 bpm  
36 = 90 bpm  
37 = 92 bpm  
38 = 94 bpm  
39 = 94 bpm  
40 = 96 bpm  
41 = 98 bpm  
42 = 100 bpm  
43 = 100 bpm  
44 = 102 bpm  
45 = 104 bpm  
46 = 106 bpm  
47 = 108 bpm  
48 = 108 bpm  
49 = 110 bpm  
50 = 112 bpm  
51 = 114 bpm  
52 = 116 bpm  
53 = 118 bpm  
54 = 120 bpm  
55 = 122 bpm  
56 = 124 bpm  
57 = 126 bpm  
58 = 128 bpm  
59 = 130 bpm  
60 = 132 bpm  
61 = 134 bpm  
62 = 138 bpm  
63 = 140 bpm  
64 = 142 bpm  
65 = 146 bpm  
66 = 148 bpm  
67 = 152 bpm  
68 = 154 bpm  
69 = 158 bpm

70 = 162 bpm  
71 = 166 bpm  
72 = 170 bpm  
73 = 174 bpm  
74 = 178 bpm  
75 = 182 bpm  
76 = 186 bpm  
77 = 190 bpm  
78 = 196 bpm  
79 = 200 bpm  
80 = 204 bpm  
81 = 210 bpm  
82 = 216 bpm  
83 = 220 bpm  
84 = 226 bpm  
85 = 232 bpm  
86 = 238 bpm  
87 = 244 bpm  
88 = 252 bpm  
89 = 258 bpm  
90 = 266 bpm  
91 = 274 bpm  
92 = 282 bpm  
93 = 290 bpm  
94 = 298 bpm  
95 = 308 bpm  
96 = 318 bpm  
97 = 328 bpm  
98 = 338 bpm  
99 = 350 bpm  
100 = 362 bpm  
101 = 376 bpm  
102 = 392 bpm  
103 = 410 bpm  
104 = 428 bpm  
105 = 450 bpm  
106 = 472 bpm  
107 = 494 bpm  
108 = 520 bpm  
109 = 546 bpm  
110 = 574 bpm  
111 = 602 bpm  
112 = 632 bpm  
113 = 662 bpm  
114 = 696 bpm  
115 = 728 bpm  
116 = 762 bpm  
117 = 798 bpm  
118 = 834 bpm  
119 = 872 bpm  
120 = 910 bpm  
121 = 950 bpm  
122 = 990 bpm  
123 = Fast 1  
124 = Fast 2  
125 = Fast 3  
126 = Fast 4  
127 = Fast 5

if Arpeggiator Master Clock is On, 0/127 value = 1/2 to 1/32 Master Clock Division

0 = 1/2  
1 = 1/2  
2 = 1/2  
3 = 1/2  
4 = 1/2  
5 = 1/2  
6 = 1/2  
7 = 1/2  
8 = 1/2  
9 = 1/2  
10 = 1/2  
11 = 1/2  
12 = 1/2  
13 = 1/2  
14 = 1/2  
15 = 1/2T  
16 = 1/2T  
17 = 1/2T  
18 = 1/2T  
19 = 1/2T  
20 = 1/2T  
21 = 1/2T  
22 = 1/2T  
23 = 1/2T  
24 = 1/2T  
25 = 1/2T  
26 = 1/2T  
27 = 1/2T  
28 = 1/2T  
29 = 1/4  
30 = 1/4  
31 = 1/4  
32 = 1/4  
33 = 1/4  
34 = 1/4  
35 = 1/4  
36 = 1/4  
37 = 1/4  
38 = 1/4  
39 = 1/4  
40 = 1/4  
41 = 1/4  
42 = 1/4  
43 = 1/4T  
44 = 1/4T  
45 = 1/4T  
46 = 1/4T  
47 = 1/4T  
48 = 1/4T  
49 = 1/4T  
50 = 1/4T  
51 = 1/4T  
52 = 1/4T  
53 = 1/4T  
54 = 1/4T  
55 = 1/4T  
56 = 1/4T  
57 = 1/8  
58 = 1/8  
59 = 1/8  
60 = 1/8



61 = 1/8  
62 = 1/8  
63 = 1/8  
64 = 1/8  
65 = 1/8  
66 = 1/8  
67 = 1/8  
68 = 1/8  
69 = 1/8  
70 = 1/8  
71 = 1/8  
72 = 1/8T  
73 = 1/8T  
74 = 1/8T  
75 = 1/8T  
76 = 1/8T  
77 = 1/8T  
78 = 1/8T  
79 = 1/8T  
80 = 1/8T  
81 = 1/8T  
82 = 1/8T  
83 = 1/8T  
84 = 1/8T  
85 = 1/8T  
86 = 1/16  
87 = 1/16  
88 = 1/16  
89 = 1/16  
90 = 1/16  
91 = 1/16  
92 = 1/16  
93 = 1/16  
94 = 1/16  
95 = 1/16  
96 = 1/16  
97 = 1/16  
98 = 1/16  
99 = 1/16  
100 = 1/16T  
101 = 1/16T  
102 = 1/16T  
103 = 1/16T  
104 = 1/16T  
105 = 1/16T  
106 = 1/16T  
107 = 1/16T  
108 = 1/16T  
109 = 1/16T  
110 = 1/16T  
111 = 1/16T  
112 = 1/16T  
113 = 1/16T  
114 = 1/32  
115 = 1/32  
116 = 1/32  
117 = 1/32  
118 = 1/32  
119 = 1/32  
120 = 1/32  
121 = 1/32

122 = 1/32  
123 = 1/32  
124 = 1/32  
125 = 1/32  
126 = 1/32  
127 = 1/32

**Morph Wheel:**

0x81 (b0): polarity (1 = positive, 0 = negative)  
0x82 (b7-b1): 7-bit raw value

**Morph After Touch:**

0x82 (b0): polarity (1 = positive, 0 = negative)  
0x83 (b7-b1): 7-bit raw value

**Morph Control Pedal:**

0x83 (b0): polarity (1 = positive, 0 = negative)  
0x84 (b7-b1): 7-bit raw value

**Synth Arp Kb Sync**

Offset in file: 0x80 (b5)

0 = off, 1 = on

**Synth Arp Master Clock**

Offset in file: 0x80 (b0)

0 = off, 1 = on

**Synth Arp Range**

Offset in file: 0x80 (b4-3)

0 = 1 Octave  
1 = 2 Octaves  
2 = 3 Octaves  
3 = 4 Octaves

**Synth Arp Pattern**

Offset in file: 0x80 (b2-1)

0 = Up  
1 = Down  
2 = Up/Down  
3 = Random