

Note: CC's are only accepted when the Bit One is in Lower, Edit (Address) mode.

Function	CC # Dec/Hex	Parm #	Value Interpretation (range used is always 0-127)
DCO1 Octave	14/0E	23-26	0-31: 32', 32-63: 16', 64-95: 8', 96-127: 4'
DCO1 Freq offset	15/0F	31	0-127: Maps to 0-11
DCO1 Tri Wave	16/10	27	0-63: Disable, 64-127 Enable
DCO1 Saw Wave	17/11	28	0-63: Disable, 64-127 Enable
DCO1 Pulse Wave	18/12	29	0-63: Disable, 64-127 Enable
DCO1 Pulse Width	19/13	32	0-127: Maps to 0-30
DCO1 Dyn PW	20/14	33	0-127
DCO2 Octave	21/15	34-37	0-31: 32', 32-63: 16', 64-95: 8', 96-127: 4'
DCO2 Freq offset	22/16	42	0-127: Maps to 0-11
DCO2 Tri Wave	23/17	38	0-63: Disable, 64-127 Enable
DCO2 Saw Wave	24/18	39	0-63: Disable, 64-127 Enable
DCO2 Pulse Wave	25/19	40	0-63: Disable, 64-127 Enable
DCO2 Pulse Width	26/1A	43	0-127: Maps to 0-30
DCO2 Dyn PW	27/1B	44	0-127
DCO1 ADSR	28/1C	30	0-63: Off, 64-127 On
DCO2 ADSR	29/1D	41	0-63: Off, 64-127 On
VCF Attack	30/1E	12	0-127
VCF Dyn Attack	31/1F	17	0-127
VCF Decay	32/20	13	0-127
VCF Sustain	33/21	14	0-127
VCF Release	34/22	15	0-127
VCF Env Amt	35/23	20	0-127
VCF Dyn Env Amt	36/24	21	0-127
VCF Env Polarity	37/25	22	0-63: Positive, 64-127: Negative
VCF Key tracking	38/26	16	0-127
VCA Dyn Attack	39/27	45	0-127
VCA Decay	40/28	48	0-127
VCA Sustain	41/29	49	0-127
VCA Dyn Env Amt	42/2A	46	0-127
LF01 mods DCO1	43/2B	4	0-63: Off, 64-127 On
LF01 mods DCO2	44/2C	5	0-63: Off, 64-127 On
LF01 mods VCF	45/2D	6	0-63: Off, 64-127 On
LF01 mods VCA	46/2E	7	0-63: Off, 64-127 On
LF01 waveform	47/2F	1-3	0-31: Off ,32-63:Tri,64-95:UpSaw,96-127:Square Note: Turning waveform off also clears destinations Clearing all of the dest bits will also disable it.
LF01 rate	48/30	10	0-127
LF01 dynamic rate	49/31	11	0-127
LF01 delay	50/32	9	0-127
LF01 depth	51/33	8	0-127
LF02 mods DCO1	52/34	54	0-63: Off, 64-127 On

LFO2 mods DCO2	53/35	55	0-63: Off, 64-127 On
LFO2 mods VCF	54/36	56	0-63: Off, 64-127 On
LFO2 mods VCA	55/37	57	0-63: Off, 64-127 On
LFO2 waveform	56/38	51-53	0-31: Off ,32-63:Tri,64-95:DnSaw,96-127:Square
			Note: Turning waveform off also clears destinations
			Clearing all of the dest bits will also disable it.
LFO2 rate	57/39	60	0-127
LFO2 dynamic rate	58/3A	61	0-127
LFO2 delay	59/3B	59	0-127
LFO2 depth	60/3C	58	0-127
Sustain	64/40		0-127 Sustain pedal, handled by original Bit01 code
VCF Resonance	71/47	19	0-127
VCA Release	72/48	50	0-127
VCA Attack	73/49	47	0-127
VCF Cutoff	74/4A	18	0-127
All notes off	123/7B		Value not used, handled by original Bit01 code

Decimal	Hex	Equivalent
00	00	
32	20	
64	40	
96	60	

CC's are only enabled in Lower, Address (Edit) mode.

Note: To edit a parameter with the +/- buttons, you must first select the parameter with the buttons on the Bit. When a CC is handled, the display is updated to show the parameter number and the new value. This is not the same as selecting that parameter with the Bit front panel. The Crumar Bit firmware does not know about the CC code at all, so it doesn't think any parameter has been selected, and the +/- buttons are disabled.

When configuring a controller to use the CC's, assign parameters that map to just a few values to switches, NOT to sliders. Using a slider for something like the LFO waveform will send many identical requests to the synth as it is moved in-between the threshold values. The synth doesn't detect that the same option is being selected each time, so a lot of time may be wasted processing CC's that don't change anything. Also, in the case of something like the LFO waveform, the firmware may also reset certain LFO variables each time the waveform is selected, even if it was the same one that was already selected. This is because with the original controls there was no way to select the same option over and over again, so the firmware was not designed to handle this.

When sending CC's to any synthesizer based on a 1980's CPU, it will always be possible to send CC's faster than the synth can handle them. It takes about 1 mSec to send a three-byte CC message over legacy MIDI. So with a computer it is possible to send roughly 1000 CC's per second. If it takes the synth more than 1 mSec to process that CC, it will quickly fall behind. Even using a stand-alone controller, if you move a slider quickly, you can send hundreds of CC's at a very fast rate. Some CC's can be processed very quickly. Others require more code to execute for each change.

If your unit has been modified to change MIDI thru to a second MIDI out, you can save your patches as sysex now.

To save all patches as 60 separate MIDI sysex packets, Press Tape, then Upper. The Bit One will reboot after sending the MIDI data, as it would after finishing a tape operation. The sysex file should be 3600 bytes in length. To re-load the patches, with memory un-protected, simply send the MIDI sysex packets to the Bit One. The patches are saved as 60 individual sysex program packets, not all in one packet. The format is the same as is documented in the Bit One owner's manual. Note that the Bit One patch sysex header contains a MIDI channel in it, which must match the current setting in order for the patch to be loaded. The new firmware uses the current MIDI channel in the sysex packet header. So to load dumped sysex patches, the MIDI channel must be set to what it was at the time they were dumped. The Bit One actually only has 60 user patches, despite what the manual says.

The following other changes have been made in the new firmware:

- 1) OMNI MIDI mode is disabled at power up. (was enabled)
- 2) MIDI program changes are enabled at power up. (was disabled)
- 3) Previous MIDI receive channel setting now retained when power is off. (was set to 1)
- 4) There is now a way to hold the DAC at its maximum value (0xFF) for testing/calibration. To do this, press Tape, then press and hold 9. The value will be held as long as 9 is pressed. The synth will reboot when 9 is released.

Enabling MIDI sustain CC's disables the pedal input jack, so I left it disabled at boot.

The new firmware is based on the A3 Crumar firmware which added these parameters, which can be selected using the front panel:

- Parameter 62 MIDI sustain pedal CC enable/disable (enabling it disables the pedal input jack)
- Parameter 63 MIDI program change message enable/disable
- Parameter 64 MIDI Omni mode enable/disable
- Parameter 65 MIDI receive channel set