DOEPFER

pocketC

DOEPFER

MIDI Controller

pocket Control

Owners Manual

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Doepfer **pocket** Control

Contents

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56	38	NRPN102 MSB	
57	39	NRPN102 LSB	
58	3A	NRPN120 MSB	[EMU ABS]
59	3B	NRPN120 LSB	[EMU ABS]
60	3C	NRPN127 MSB	[Soundblaster AWE 32/64]
61	3D	NRPN127 LSB	[Soundblaster AWE 32/64]
62	3E	*free*	
63	3F	*free*	
64	40	XG Drum Pitch Coarse	
65	41	XG Drum Pitch Fine	
66	42	XG Drum Level	
67	43	XG Drum Alternate Group	
68	44	XG Drum Pan	
69	45	XG Drum Reverb Send	
70	46	XG Drum Chorus Send	
71	47	XG Drum Variation Send	
72	48	XG Drum Key Assign	
73	49	XG Drum Receive Note Off	
74	4A	XG Drum Receive Note On	
75	4B	XG Drum Filter Cutoff Frequency	
76	4C	XG Drum Filter Resonance	
77	4D	XG Drum EG Attack Rate	
78	4E	XG Drum EG Decay 1 Rate	
79	4F	XG Drum EG Deacy 2 Rate	
80	50	XG Multipart	
81	51	XG A/D	
82	52	XG Effect	
83	53	XG Effect 2-byte	
84	54	XG Reverb Type	
85	55	XG Chorus Type	
86	56	XG Variation Type	
87	57	XG EQ	
88	58	XG Insertion Effect 1	
89	59	XG Insertion Effect 2	
90	5A	XG Insertion Effect 1Type	
91	5B	XG Insertion Effect 2 Type	
92	5C	*free*	
93	5D	*free*	
94	5E	*free*	
95	5F	*free*	
96	60	GS Effect	
97	61	MC303 Global	
98	62	MC303 Channel	
99	63	*free*	
100	64	Strings	
101	65	*free*	
.	.	. *Parameter 2 values between 101 and 126 are not defined*	
.	.	. *(Reserved for future expansion)*	
126	7E	*free*	
127	7F	No Event	

Parameter 3:
Range 00 ~ 7F   The meaning of parameter 3 depends on what parameter 2 is set to.

FORWARD

How long have you wanted to:

> Control your (software) synthesizer without having to use virtual faders, and having to look at a computer screen and use a mouse?

> Use the full capability of your computer's built-in soundcard?

> Have realtime control for synths that have limited or no realtime controls

Could the control possibilities of your master keyboard be improved? Now it's time to discover new uses for real time control by using the **Doepfer Pocket Control**.

The Pocket Control

The Pocket Control (referred to as the **pocketC**) is a device, that everyone could use, such as for the computer in the studio or for live use in professional and semi-professional situations.

What can the **pocketC** do?

The **pocketC** can assign each of the 16 control knobs to individual Midi events. This Midi event controlled can be selected from a list of preset options (giving over 16,000 different event combinations), such as controllers, mono & poly aftertouch, pitch bend, RPN/NRPN, XG-SysEx, GS/XG controller, program change and even note on/off events. These events can be from any of the 16 Midi channels, or the master channel (which allows easy selection of the controlling MIDI channel). The permutation of possibilities is therefore up to 17 (channel options) * 16,000 (event combinations), which is over 250,000 possible combinations! The system is also ready to take even further SysEx messages and data formats in future updates.

The low cost of the **pocketC** allows for applications where multiple **pocketC's** can be used chained together.

Connections

The **pocketC** does not have a built in power supply (not enough room left inside!), but uses an external adaptor which can be from 7v to 12v and at least 100mA. The connection polarity is positive inner. Although the **pocketC** has a built in protection diode for protection against incorrect polarity, the **pocketC** can still be damaged by using an incorrect adaptor, so only use an approved adaptor and avoid using multi-polarity type adaptors with voltage level and polarity switching, as inadvertant settings can cause problems.

Connect the MIDI out of the controlling keyboard to the MIDI IN of the **pocketC**. The MIDI input also allows control of the **pocketC**, such as with program changes to select presets, and to receive it's own Sys-Ex messages for setting up the 128 preset memories (held in non-volatile memory).

Connect the MIDI OUT of the **pocketC** to the sequencer (computer) or sound generator MIDI in. The **pocketC** merges the incoming data with it's own data, so the MIDI OUT is a data merge of MIDI in and data generated by the **pocketC**. There is no use for a separate MIDI thru with this type of device. Note that if extremely large Sys-Ex dumps are passed through the **pocketC** then it is advisable not to move any **pocketC** knobs whilst this transmission is taking place, as the merge abilities of the **pocketC** were not intended to work whilst this kind of intense transmission is taking place.

If multiple **pocketC's** are being used then the MIDI connections can be chained together so that all the **pocketC's** produce one composite data from the last MIDI out in the chain.

Functions of the LED

The LED indicates the status of the **pocketC** in various modes. For example, under normal operation the LED indicates MIDI input activity, and also MIDI out activity when moving the control knobs on the **pocketC**. The LED also indicates:-

Parameter 2:   Event Definition

Decimal	Hex	Definition	
0	00	Controller	
1	01	Pitch Bend	
2	02	Mono Aftertouch	
3	03	Program Change	
4	04	Poly Aftertouch	
5	05	Note On	
6	06	Note Off	
7	07	*free*	
8	08	RPN0 MSB	
9	09	RPN0 LSB	
10	0A	RPN1 MSB	
11	0B	RPN1 MSB	
12	0C	*free*	
13	0D	*free*	
14	0E	RPN127 MSB	
15	0F	RPN127 LSB	
16	10	NRPN0 MSB	
17	11	NRPN0 LSB	
18	12	NRPN1 MSB	[XG Multi / GS]
19	13	NRPN1 LSB	[XG Multi / GS]
20	14	NRPN8 MSB	
21	15	NRPN8 LSB	
22	16	NRPN9 MSB	
23	17	NRPN9 LSB	
24	18	NRPN10 MSB	
25	19	NRPN10 LSB	
26	1A	NRPN20 MSB	[XG Drum Instrument Cutoff]
27	1B	NRPN20 MSB	[XG Instruemnt Cutoff]
28	1C	NRPN21 MSB	[XG Drum Instrument Resonance]
29	1D	NRPN21 LSB	[XG Drum Instrument Resonance]
30	1E	NRPN22 MSB	[XG Drum Instrument EG Attack]
31	1F	NRPN22 LSB	[XG Drum Instrument EG Attack]
32	20	NRPN23 MSB	[XG Drum Instrument EG Decay]
33	21	NRPN23 LSB	[XG Drum Instrument EG Decay]
34	22	NRPN24 MSB	[XG/GS Drum Instrument Pitch Coarse]
35	23	NRPN24 LSB	[XG/GS Drum Instrument Pitch Coarse]
36	24	NRPN25 MSB	[XG Drum Instrument Pitch Fine]
37	25	NRPN25 LSB	[XG Drum Instrument Pitch Fine]
38	26	NRPN26 MSB	[XG/GS Drum Instrument Level]
39	27	NRPN26 LSB	[XG/GS Drum Instrument Level]
40	28	NRPN28 MSB	[XG/GS Drum Instrument Pan]
41	29	NRPN28 LSB	[XG/GS Drum Instrument Pan]
42	2A	NRPN29 MSB	[XG/GS Drum Instrument Reverb Send]
43	2B	NRPN29 LSB	[XG/GS Drum Instrument Reverb Send]
44	2C	NRPN30 MSB	[XG/GS Drum Instrument Chorus Send]
45	2D	NRPN30 LSB	[XG/GS Drum Instrument Chorus Send]
46	2E	NRPN31 MSB	[XG/GS Drum Instrument Variation Send]
47	2F	NRPN31 LSB	[XG/GS Drum Instrument Variation Send]
48	30	NRPN32 MSB	
49	31	NRPN32 LSB	
50	32	NRPN33 MSB	
51	33	NRPN33 LSB	
52	34	NRPN99 MSB	
53	35	NRPN99 LSB	
54	36	NRPN100 MSB	
55	37	NRPN100 LSB	

The Sys-Ex data can be broken down into sections, the first part is the Sys-Ex format for the **pocketC** Single Dump, which is (numbers in Hex):

F0   00   20   20   14   00   20   preset   channel (16 bytes)   data (32 bytes)   F7

F0	Sys-Ex byte
00	European Sub ID
20	Doepfer Sub ID 1
20	Doepfer Sub ID 2
14	Device "**pocketC**"
00	*reserved*
20	Command Byte "Single Dump"
00 ~ 7F	Preset Number
00	*reserved*
00 ~ 10	Parameter 1. There are 16 data bytes setting the MIDI channel of each knob, a setting of 0 sets the knob to the Master Channel.
00 ~ 7F	Parameter 2. There are 16 data bytes setting the event type for each knob, a setting of 7F defines "No Event" to the knob.
00 ~ 7F	Parameter 3. There are 16 data bytes setting the additioanl event data for each knob. The definition of parameter 3 depends on what parameter 2 is set to.
F7	EOX (End of System Exclusive)

The data that must follow is the Single Store message which is:

F0   00   20   20   14   00   30   F7

F0	Sys-Ex byte
00	European Sub ID
20	Doepfer Sub ID 1
20	Doepfer Sub ID 2
14	Device "**pocketC**"
00	*reserved*
30	Command Byte "Single Store"
00 ~ 7F	Preset Number (Must be the same as in the first message above)
00	*reserved*
F7	EOX (End of System Exclusive)

Parameter Tables

Parameter 1:   MIDI Channel

00	Master Channel
01 ~ 10	MIDI Channels 1 ~ 16
11 ~ 7F	values undefined (decimal values 17 - 127)

Power on reset - the LED will stay lit for around one second when the power is first applied to the **pocketC**.

Any error at the MIDI input

Data and status when setting the Master channel

The status of the Snapshot function

Indication that a preset has been changed

Functions of the "Snapshot" front panel switch

The front panel switch labelled "Snapshot" has various functions:

a)   to send a Snapshot of all the panel control knob settings
b)   for setting the master MIDI channel
c)   to reset the **pocketC** after a MIDI overflow at the MIDI in

To Send a snapshot

The snapshot function is not achieved by just pressing the snapshot switch, as this could be accidentally pressed too easily. So to activate the Snapshot function, first briefly press the Snapshot switch once, this causes the LED to flash, the Snapshot switch needs to be pressed again within at least one second (whilst the LED is still flashing). This then invokes the snapshot function, and the data from all 16 control knobs is transmitted from the **pocketC**.

To Set the Master Channel

The Master channel is used to select which channel the **pocketC** will transmit on when using relevant presets. Some presets (such as the MIDI volume - preset 0) has each knob on a different channel, whilst other presets have all knobs on the same channel, it is on these presets that the Master channel is used. The Master channel is also the channel which the **pocketC** will receive program change data on.

To set the Master channel, hold the snapshot switch down for at least one second and keep it held down, the LED then stays on to indicate Master channel setting mode (do not let go of the button until the required value has been selected). In this mode the control knobs become channel selectors, and do not transmit the normal control data. To select a channel, simply move one of the control knobs that relates to the channel required (to set channel 5, move control knob 5). If you accidentally move the wrong knob, just move the correct one, as it is the last knob moved that determines the actual Master channel set.

To clear an error

        To clear any MIDI input error such as a MIDI overflow (too much data in one go), press the snapshot switch briefly once (do not press it again until at least one second has passed, or this would enter the snapshot mode).

Functions of the DIP switches (rear panel)

        The eight rear panel DIP switches select settings of the **pocketC**, the settings can be looked upon as a binary number where each switch can be either on or off, this allows up to 256 functions to be selected from the eight DIP switches. The switch is referred to ON or 1, when set towards the top panel, and referred to OFF or 0 when set towards the bottom panel.

        Only seven of the switches are used to select one of the 128 presets. The eighth switch is not used at present and has no functions, but it is good practice to leave it in the OFF position, as a future update may make use of this switch position. The switches are numbered one to eight on the switch block itself, when relating the switch positions to a binary number, then the least significant bit is towards the middle of the **pocketC** and numbered 1 on the switch. It is switch number 8 that is not used.

        The factory shipped default setting is Preset number 0, which is all switches off (towards bottom) which is defined as MIDI Volume across all MIDI channels.

        The following listing, lists all the 64 presets that are shipped in the pocketC, note that the switch settings are shown with the least significant bit to the right (as would normally be shown with a binary number), so note the switch numbering which is eight to the left and one to the right, this relates to the switch position when looking at the rear panel of the **pocketC**. If holding the **pocketC,** you tip the unit up at the back to look into the DIP switches that way, you will be looking at the DIP switches the other way with one to the left and eight to the right, when doing this remember that the switch order will be the reverse. The following list of presets shows the switch position split into two groups of four, as this should help reading the switch code.

Creating your own presets

New presets can be created or present ones can be altered, though it is recommended to dump all new presets into locations 65 ~ 127.
Every knob of the **pocketC** can be assigned with three 7-bit parameters (between 0 and 127), these parameters define the MIDI event transmitted by the knobs. Each preset can be dumped into the **pocketC** by a System Exclusive message. This is a two stage process, first the data is sent to the **pocketC** (Single Dump) and then a second message stores the data into non-volatile memory (Single Store). The data is only stored if the preset number is the same in both the Single Dump and Single Store messages are the same.

Parameter 1:
This first parameter defines the MIDI channel that the event will be transmitted on (values 1 ~ 16), or if the event will use the Master Channel (value set to 0).

Parameter 2:
The second parameter describes the type of event. The **pocketC** does not allow you to program any MIDI string, but uses one of it's 128 preset events (which is the number set with parameter 2). This list of events include controllers, pitch bend, mono & poly aftertouch, note on, note off, RPN's and many NRPN's along with some more complex Sys-Ex strings for controlling Roland GS and Yamaha XG instruments.

Parameter 3:
The third parameter is an extension of parameter 2, many events need two values to determine the event, for example, if a value of 00 is set in parameter 2 (which is controller) then parameter 3 sets the controller number (perhaps a value of 7 to define Volume events).

The Sys-Ex message can be generated within a sequencer program (it is best to use Hex if possible), or the default file Pc_xxx.mid on the enclosed disk can be used as a basis for editing. This default file contains the following message (Hex):

F0 00 20 20 14 00 20 **00** 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 07 07 07 07 07 07 07
07 07 07 07 07 07 07 07 F7

F0 00 20 20 14 00 30 **00** 00 F7

The first message is the Single Dump and the second message is the Single Store. Please note, that this default is about to overwrite preset number 00, shown in bold above as the eighth data byte. It is an idea to experiment with preset 127 (set the data to Hex 7F), but don't forget to change the value in both strings. The function of this default dump is to set the knobs to MIDI volume on their own channels - this is actually the preset data in preset 00 anyway.

Preset 64   Yamaha 01V   [Control]   (Master Channel)

Knob 1	Stereo In Level	Controller 16
Knob 2	Stereo Out Level	Controller 21
Knob 3	Stereo Out Balance	Controller 67
Knob 4	Stereo Out 2 Cue	Controller 82
Knob 5	Stereo In to Cue	Controller 75
Knob 6	Send 4 Level	Controller 20
Knob 7	Send 3 Level	Controller 19
Knob 8	Internal FX 1 Type	Controller 20 (?)
Knob 9	Send 3 to Cue	Controller 80
Knob 10	Send 4 to Cue	Controller 81
Knob 11	Send 3/4 Balance	Controller 66
Knob 12	FX Return 1 Level	Controller 17
Knob 13	FX Return 2 Level	Controller 18
Knob 14	FX Return 1 to Cue	Controller 78
Knob 15	FX Return 2 to Cue	Controller 79
Knob 16	Internal FX 2 Type	Controller 21 (?)

Presets 65 ~ 128 are undefined, though as new presets are created, they can be loaded into the **pocketC** by a Sys-Ex MIDI file. The enclosed disk includes new presets, with details in the README.TXT file .

Troubleshooting

There will be times when the **pocketC** does not seem to be working as expected, before suspecting a faulty **pocketC**, the checklist below should help resolve the problem.

• Is the **pocketC** powered up correctly? There is no actual power indicator on the **pocketC**, but the LED is always active. Moving a knob will flash the LED (the LED does not flash if the knob has not been assigned a function), or briefly pressing the Snapshot switch will cause the LED to flash for around a second as the **pocketC** resets.

• Is the **pocketC** set to the correct preset? Maybe one of the dip switches has moved accidentally or a MIDI program change has set a new preset up. Check the dip switch settings.

• Is the **pocketC** set to the correct MIDI channel? Many presets make use of the Master Channel, there is no way of checking what the Master Channel is set to (other than monitoring the transmitted data), so the best procedure here is to set the Master Channel again to double check it is correct. Hold the Snapshot switch down for at least a second, and whilst keeping it down move the relevant knob that corresponds to the required MIDI channel. Make sure you do not move another knob after this before releasing the Snapshot switch, as it is the last knob moved that sets the Master Channel.

• Problems with Sys-Ex transfers? Remember that the **pocketC** always merges it's own data with MIDI input data, this can cause a MIDI loop when receiving Sys-Ex, therefore you may find it best to disconnect the MIDI out of the **pocketC** when sending it Sys-Ex messages, or at least make sure the transmitting device is not MIDI thru enabled.

• You cannot get the **pocketC** to make the Coffee. Er ... no, the **pocketC** actually cannot do this unless you have a MIDI controlled kettle...

List of presets 1 ~ 64

Switch Pos. 8765 4321	Preset Number	Description	MIDI Channel
0000 0000	Preset 0	Volume (control 7)	Channels 1 - 16
0000 0001	Preset 1	Pan (control 10)	Channels 1 - 16
0000 0010	Preset 2	Filter Cutoff (control 74)	Channels 1 - 16
0000 0011	Preset 3	Resonance (control 71)	Channels 1 - 16
0000 0100	Preset 4	Volume (control 7) /Pan (control 10)	Channels 1 - 8
0000 0101	Preset 5	Volume (control 7) /Pan (control 10)	Channels 9 - 16
0000 0110	Preset 6	Filter Cutoff (control 74) /Resonance (control 71)	Channels 1 - 8
0000 0111	Preset 7	Filter Cutoff (control 74) /Resonance (control 71)	Channels 9 - 16
0000 1000	Preset 8	Control 0 - 15	Masterchannel
0000 1001	Preset 9	Control 16 - 31	Masterchannel
0000 1010	Preset 10	Control 32 - 47	Masterchannel
0000 1011	Preset 11	Control 48 - 63	Masterchannel
0000 1100	Preset 12	Control 64 - 79	Masterchannel
0000 1101	Preset 13	Control 80 - 95	Masterchannel
0000 1110	Preset 14	Control 96 - 111	Masterchannel
0000 1111	Preset 15	Control 112 - 127	Masterchannel
0001 0000	Preset 16	GS/XG General controls	Masterchannel
0001 0001	Preset 17	AWE/SB 1 (Filter, LFO2, ENV1)	Masterchannel
0001 0010	Preset 18	AWE/SB 2 (LFO1, ENV 1)	Masterchannel
0001 0011	Preset 19	AWE/SB 3 (LFO2, ENV 2)	Masterchannel
0001 0100	Preset 20	AWE/SB 4 (Tuning, Modulation)	Masterchannel
0001 0101	Preset 21	AWE/SB 5 (Filter, Effects, Portamento, Aftertouch)	Masterchannel
0001 0110	Preset 22	GS/XG Drum Pitch	Masterchannel
0001 0111	Preset 23	GS/XG Drum Level	Masterchannel
0001 1000	Preset 24	GS/XG Drum Pan	Masterchannel
0001 1001	Preset 25	GS/XG Drum Reverb Levels	Masterchannel
0001 1010	Preset 26	GS/XG Drum Chorus Levels	Masterchannel
0001 1011	Preset 27	GS/XG Drum Delay/Variation Levels	Masterchannel
0001 1100	Preset 28	XG Drum Filter Cutoff	Masterchannel
0001 1101	Preset 29	XG Drum Filter Resonance	Masterchannel
0001 1110	Preset 30	XG Drum Envelope Attack	Masterchannel
0001 1111	Preset 31	XG Drum Envelope Decay	Masterchannel
0010 0000	Preset 32	XG Multi-Part Level	Channels 1 - 16
0010 0001	Preset 33	XG Multi-Part Pan	Channels 1 - 16
0010 0010	Preset 34	XG Multi-Part Reverb Send	Channels 1 - 16
0010 0011	Preset 35	XG Multi-Part Chorus Send	Channels 1 - 16
0010 0100	Preset 36	XG Multi-Part Dry Level	Channels 1 - 16
0010 0101	Preset 37	XG Multi-Part Variation Level	Channels 1 - 16
0010 0110	Preset 38	XG Low EQ Gain	Channels 1 - 16
0010 0111	Preset 39	XG Low EQ Frequency	Channels 1 - 16
0010 1000	Preset 40	XG High EQ Gain	Channels 1 - 16

00101001	Preset 41	XG High EQ Frequency	Channels 1 - 16
00101010	Preset 42	XG A/D 1&2, W1-12 Level	Masterchannel
00101011	Preset 43	XG A/D 1&2, W1-12 Pan	Masterchannel
00101100	Preset 44	XG A/D 1&2, W1-12 Reverb Send	Masterchannel
00101101	Preset 45	XG A/D 1&2, W1-12 Chorus Send	Masterchannel
00101110	Preset 46	XG A/D 1&2, W1-12 Variation Send	Masterchannel
00101111	Preset 47	XG A/D 1&2, W1-12 Dry Level	Masterchannel
00110000	Preset 48	XG EQ	Masterchannel
00110001	Preset 49	XG Reverb Parameters	Masterchannel
00110010	Preset 50	XG Chorus Parameters	Masterchannel
00110011	Preset 51	XG Variation Effect Parameters	Masterchannel
00110100	Preset 52	XG Insert Effect 1 Parameters	Masterchannel
00110101	Preset 53	XG Insert Effect 2 Parameters	Masterchannel
00110110	Preset 54	XG Insertion 2	Masterchannel
00110111	Preset 55	GS Reverb/Chorus	Masterchannel
00111000	Preset 56	General Reset Strings	Masterchannel
00111001	Preset 57	Rebirth Controls	Masterchannel
00111010	Preset 58	Yamaha CS1X Controls	Masterchannel
00111011	Preset 59	Waldorf Pulse Controls	Masterchannel
00111100	Preset 60	Ensoniq ASR-X controls	Masterchannel
00111101	Preset 61	Doepfer MAQ 16/3 Control 1	Masterchannel
00111110	Preset 62	Doepfer MAQ 16/3 Control 2	Masterchannel
00111111	Preset 63	Kawai K5000 Macro Control Box (MCB10)	Masterchannel
01000000	Preset 64	Yamaha 01v Control	Masterchannel

Presets 00 to 64 are available on the supplied disk for dumping into the **pocketC** by system exclusive (in SMF format), this allows the presets to be returned to their factory shipped state should they get accidentally altered. Presets 65 to 127 are left blank for your own custom requirements, though the supplied disk may contain additional presets. The "README.TXT" file gives further information and descriptions of these presets. New presets will be developed, and these will become available free on the Doepfer web site at:-

www.doepfer.de

Preset 61	**Doepfer MAQ16/3 1**	**[Controller]**	**(Master Channel)**
Knob 1	Velocity Row 1	[Controller 0]	
Knob 2	Velocity Row 2	[Controller 1]	
Knob 3	Velocity Row 3	[Controller 2]	
Knob 4	Gate Time Row 1	[Controller 7]	
Knob 5	Gate Time Row 2	[Controller 8]	
Knob 6	Gate Time Row 3	[Controller 9]	
Knob 7	Program Change Row 3	[Controller 30]	
Knob 8	Tempo	[Controller 3]	
Knob 9	Step Position Row 1	[Controller 4]	
Knob 10	Step Position Row 2	[Controller 5]	
Knob 11	Step Position Row 3	[Controller 6]	
Knob 12	Note Time Row 1	[Controller 10]	
Knob 13	Note Time Row 2	[Controller 11]	
Knob 14	Note Time Row 3	[Controller 12]	
Knob 15	Program Change Row 1	[Controller 28]	
Knob 16	Program Change Row 2	[Controller 29]	

Preset 62	**Doepfer MAQ16/3 2**	**[Controller]**	**(Master Channel)**
Knob 1	First Step Row 1	[Controller 13]	
Knob 2	First Step Row 2	[Controller 14]	
Knob 3	First Step Row 3	[Controller 15]	
Knob 4	Run Mode Row 1	[Controller 19]	
Knob 5	Run Mode Row 2	[Controller 20]	
Knob 6	Run Mode Row 3	[Controller 21]	
Knob 7	Program Change Row 3	[Controller 30]	
Knob 8	Tempo	[Controller 3]	
Knob 9	Last Step Row 1	[Controller 16]	
Knob 10	Last Step Row 2	[Controller 17]	
Knob 11	Last Step Row 3	[Controller 18]	
Knob 12	Midi-Channel Row 1	[Controller 22]	
Knob 13	Midi-Channel Row 2	[Controller 23]	
Knob 14	Midi-Channel Row 3	[Controller 24]	
Knob 15	Program Change Row 1	[Controller 28]	
Knob 16	Program Change Row 2	[Controller 29]	

Presets 62 ~ 63 provide the MAQ16/3 with advanced realtime control with features that may not have been apparent that the MAQ16/3 could do. Converts an MAQ16/3 into a Super MAQ 16/3 !

Preset 63	**Kawai K5000 (MCB10)**	**[Controller]**	**(Master Channel)**
Knob 1	Filter Cutoff	[Controller 74]	
Knob 2	Filter Resonance	[Controller 77]	
Knob 3	Formant Filter Speed	[Controller 19]	
Knob 4	Formant Filter Depth	[Controller 75]	
Knob 5	Formant Filter Bias	[Controller 18]	
Knob 6	Envelope Attack	[Controller 73]	
Knob 7	Envelope Decay	[Controller 78]	
Knob 8	Envelope Release	[Controller 72]	
Knob 9	Harmonics Low	[Controller 16]	
Knob 10	Harmonics High	[Controller 17]	
Knob 11	Even / Odd Harmonics Balance	[Controller 71]	
Knob 12	Velocity Depth	[Controller 76]	
Knob 13	User 1	[Controller 80]	
Knob 14	User 2	[Controller 81]	
Knob 15	User 3	[Controller 82]	
Knob 16	User 4	[Controller 83]	

Preset 63 emulates every function of the Kawai MCB10 Macro Control Box designed for the K5000 range.

Preset 58	Yamaha CS1X control	[NRPN / Controller]	(Master Channel)
Knob 1	Filter Cutoff	[Controller 74]	
Knob 2	Filter Resonance	[Controller 71]	
Knob 3	Vibrato Rate	[NRPN]	
Knob 4	Vibrato Depth	[NRPN]	
Knob 5	Vibrato Delay	[NRPN]	
Knob 6	Envelope Attack	[Controller 73]	
Knob 7	Amplitude Envelope Decay	[NRPN]	
Knob 8	Envelope Release	[Controller 72]	
Knob 9	Pitch Bend	[Pitch Bend]	
Knob 10	Knob 3 Parameter	[Controller 17]	
Knob 11	Knob 6 Parameter	[Controller 18]	
Knob 12	Reverb Send	[Controller 91]	
Knob 13	Chorus Send	[Controller 93]	
Knob 14	Delay/Variation Send	[Controller 94]	
Knob 15	Pan	[Controller 10]	
Knob 16	Volume	[Controller 7]	

Preset 59	Waldorf Pulse Control	[Controller]	(Master Channel)
Knob 1	Filter Cutoff	[Controller 50]	
Knob 2	Filter Resonance	[Controller 56]	
Knob 3	Filter Cutoff Keytrack	[Controller 51]	
Knob 4	Envelope 1 Sensitivity	[Controller 52]	
Knob 5	Envelope 1 Attack	[Controller 14]	
Knob 6	Envelope 1 Decay	[Controller 15]	
Knob 7	Envelope 1 Sustain	[Controller 16]	
Knob 8	Envelope 1 Release	[Controller 17]	
Knob 9	LFO 1 Speed	[Controller 24]	
Knob 10	LFO 2 Speed	[Controller 26]	
Knob 11	VCF Modulation Amount	[Controller 25]	
Knob 12	Portamento Time	[Controller 5]	
Knob 13	Envelope 2 Attack	[Controller 18]	
Knob 14	Envelope 2 Decay	[Controller 19]	
Knob 15	Envelope 2 Sustain	[Controller 20]	
Knob 16	Envelope 2 Release	[Controller 21]	

Preset 60	Ensoniq ASR-X	[NRPN / Controller]	(Master Channel)
Knob 1	Filter Cutoff	[Controller 74]	
Knob 2	Filter Resonance	[Controller 71]	
Knob 3	Vibrato Rate	[Controller 75]	
Knob 4	Vibrato Depth	[NRPN]	
Knob 5	Vibrato Delay	[NRPN]	
Knob 6	Filter Envelope Attack	[NRPN]	
Knob 7	Filter Envelope Decay	[NRPN]	
Knob 8	Filter Envelope Release	[NRPN]	
Knob 9	Pitch Bend	[Pitch Bend]	
Knob 10	Modulation	[Controller 1]	
Knob 11	Envelope Attack	[Controller 73]	
Knob 12	Envelope Decay	[Controller 76]	
Knob 13	Envelope Release	[Controller 72]	
Knob 14	Velocity Sensitivity	[NRPN]	
Knob 15	Portamento Time	[Controller 5]	
Knob 16	Volume	[Controller 7]	

Description of presets

Preset 0:	Volume	[controller 7]	(Channels 1-16)
Preset 1:	Pan	[controller 10]	(Channels 1-16)
Preset 2:	Filter Cutoff	[controller 74]	(Channels 1-16)
Preset 3:	Filter resonance	[controller 71]	(Channels 1-16)

Presets 0 ~ 3 use a single controller type, with each knob relating to it's corresponding MIDI channel, this allows full control of 16 parts within a multitimbral sound generator, or realtime mixing in sequencer automation.

Preset 4:	Volume / Pan	[controller 7 / 10]	(Channels 1-8)
Preset 5:	Volume / Pan	[controller 7 / 10]	(Channels 9-16)
Preset 6:	Filter Cutoff / Resonance	[controller 74 / 71]	(Channels 1-8)
Preset 7:	Filter Cutoff / Resonance	[controller 74/ / 71]	(Channels 9-16)

Presets 4 ~ 7 use two controllers, one across the top row of knobs and the other across the bottom row. With Preset 4, the top row is MIDI controller 7 (Volume) with the MIDI channel corresponding to the knob number, whilst the lower row is MIDI controller 10 (Pan) on the same channel as the knob above it, hence knob 9 is channel 1, knob 10 is channel 2 etc. Preset 5 follows the same idea except the MIDI channel is channels 9 to 16, so the actual MIDI channel relates to the lower knob numbers. Preset 6, again follows the same idea as Preset 4 except the top row is MIDI controller 74 (Filter Cut off) and the lower row is controller 71 (Filter Resonance), and finally Preset 7 is the same as Preset 6 except the channels are 9-16.

Preset 8:	general controllers	[controllers 0 - 15]	(Master channel)
Preset 9:	general controllers	[controllers 16 - 31]	(Master channel)
Preset 10:	general controllers	[controllers 32 - 47]	(Master channel)
Preset 11:	general controllers	[controllers 48 - 63]	(Master channel)
Preset 12:	general controllers	[controllers 64 - 79]	(Master channel)
Preset 13:	general controllers	[controllers 80 - 95]	(Master channel)
Preset 14:	general controllers	[controllers 96 - 111]	(Master channel)
Preset 15:	general controllers	[controllers 112 - 127]	(Master channel)

Presets 8 ~ 15 are general controller sets, which transmit on the Master Channel. Where the receiving MIDI device can be programmed to any controller it can receive, these presets maybe the only presets needed, although preset 8 is perhaps best avoided for general use as it includes controller 0 (could trigger MIDI program bank changes) and controller 1 which is the mod wheel, although of course there may be instances when MIDI controller 1 is required, such as adding a modulation wheel function to a keyboard (such as a digital piano). Preset 12 also needs to be used with caution, as controller 64 is defined as the sustain/damper pedal function, and most devices will always receive this controller as Damper or Hold.

Preset 16:	GS / XG general controls	[NRPN / controllers]	(Master channel)

Preset 16 has the top row of knobs transmitting relevant NRPN controller data for GS/XG instruments, and the lower row is general controllers:-

Knob 1	Filter Cutoff	[NRPN]
Knob 2	Filter Resonance	[NRPN]
Knob 3	Vibrato Rate	[NRPN]
Knob 4	Vibrato Depth	[NRPN]
Knob 5	Vibrato Delay	[NRPN]
Knob 6	EG- Attack	[NRPN]
Knob 7	EG Decay	[NRPN]
Knob 8	EG Release	[NRPN]
Knob 9	Pitch Bend	[PitchBend]
Knob 10	Modulation	[Controller 1]
Knob 11	Portamento Time	[Controller 5]
Knob 12	Reverb Send Level	[Controller 91]
Knob 13	Chorus Send Level	[Controller 93]
Knob 14	Delay/Var Send Level	[Controller 94]
Knob 15	Pan	[Controller 10]
Knob 16	Volume	[Controller 7]

Preset 17:	Soundblaster AWE 32/64 1	[NRPN]	(Master channel)
Knob 1	Filter Cutoff Coarse		
Knob 2	Filter Resonance Coarse		
Knob 3	Vibrato Rate Coarse (LFO 2)		
Knob 4	Vibrato Depth Coarse (LFO 2)		
Knob 5	Vibrato Delay Coarse (LFO 2)		
Knob 6	Envelope 1 Attack Time Coarse		
Knob 7	Envelope 1 Decay Time Coarse		
Knob 8	Envelope 1 Release Time Coarse		
Knob 9	Filter Cutoff Fine		
Knob 10	Filter Resonance Fine		
Knob 11	Vibrato Rate Fine (LFO 2)		
Knob 12	Vibrato Depth Fine (LFO 2)		
Knob 13	Vibrato Delay Fine (LFO 2)		
Knob 14	Envelope 1 Attack Time Fine		
Knob 15	Envelope 1 Decay Time Fine		
Knob 16	Envelope 1 Release Time Fine		

Preset 18:	Soundblaster AWE 32/64 2	[NRPN]	(Master channel)
Knob 1	LFO 1 Delay Time Coarse		
Knob 2	LFO 1 Frequency Coarse		
Knob 3	Envelope 1 Delay Time Coarse		
Knob 4	Envelope 1 Attack Time Coarse		
Knob 5	Envelope 1 Hold Time Coarse		
Knob 6	Envelope 1 Decay Time Coarse		
Knob 7	Envelope 1 Sustain Level Coarse		
Knob 8	Envelope 1 Release Time Coarse		
Knob 9	LFO 1 Delay Time Fine		
Knob 10	LFO 1 Frequency Fine		
Knob 11	Envelope 1 Delay Time Fine		
Knob 12	Envelope 1 Attack Time Fine		
Knob 13	Envelope 1 Hold Time Fine		
Knob 14	Envelope 1 Decay Time Fine		
Knob 15	Envelope 1 Sustain Level Fine		
Knob 16	Envelope 1 Release Time Fine		

Preset 19:	Soundblaster AWE 32/64 3	[NRPN]	(Master channel)
Knob 1	LFO 2 Delay Coarse		
Knob 2	LFO 2 Frequency Coarse		
Knob 3	Envelope 2 Delay Time Coarse		
Knob 4	Envelope 2 Attack Time Coarse		
Knob 5	Envelope 2 Hold Time Coarse		
Knob 6	Envelope 2 Decay Time Coarse		
Knob 7	Envelope 2 Sustain Level Coarse		
Knob 8	Envelope 2 Release Time Coarse		
Knob 9	LFO 2 Delay Fine		
Knob 10	LFO 2 Frequency Fine		
Knob 11	Envelope 2 Delay Time Fine		
Knob 12	Envelope 2 Attack Time Fine		
Knob 13	Envelope 2 Hold Time Fine		
Knob 14	Envelope 2 Decay Time Fine		
Knob 15	Envelope 2 Sustain Time Fine		
Knob 16	Envelope 2 Release Time Fine		

Preset 55	GS Reverb / Chorus	[NRPN]	(Master Channel)
Knob 1	Reverb Preset		
Knob 2	Reverb Character		
Knob 3	Reverb Low Pass Filter		
Knob 4	Reverb Level		
Knob 5	Reverb Time		
Knob 6	Reverb Delay Feedback		
Knob 7	Reverb to Chorus		
Knob 8	*undefined*		
Knob 9	Chorus Preset		
Knob 10	Chorus Low Pass Filter		
Knob 11	Chorus Level		
Knob 12	Chorus Feedback		
Knob 13	Chorus Delay		
Knob 14	Chorus Rate		
Knob 15	Chorus Depth		
Knob 16	Chorus to Reverb		

Preset 56	General Control strings	[Sys-Ex / Controller]	(Master Channel)
Knob 1	GM Reset	[Sys-Ex]	
Knob 2	GS Reset	[Sys-Ex Roland]	
Knob 3	XG Reset	[Sys-Ex Yamaha]	
Knob 4	All Sounds Off	[Controller]	
Knob 5	All Controllers Reset	[Controller]	
Knob 6	All Notes Off	[Controller]	
Knob 7	Omni Off	[Controller]	
Knob 8	Omni On	[Controller]	
Knob 9	Mono On	[Controller]	
Knob 10	Poly On	[Controller]	
Knob 11	*undefined*		
Knob 12	*undefined*		
Knob 13	*undefined*		
Knob 14	*undefined*		
Knob 15	*undefined*		
Knob 16	*undefined*		

Preset 57	Rebirth Control	[Controller]	(Master Channel)
Knob 1	Synth 1 Filter Cutoff	[Controller 25]	
Knob 2	Synth 1 Filter Resonance	[Controller 26]	
Knob 3	Synth 1 Envelope Mod	[Controller 27]	
Knob 4	Synth 1 Decay	[Controller 28]	
Knob 5	Synth 2 Filter Cutoff	[Controller 32]	
Knob 6	Synth 2 Filter Resonance	[Controller 33]	
Knob 7	Synth 2 Envelope Mod	[Controller 34]	
Knob 8	Synth 2 Decay	[Controller 35]	
Knob 9	Synth 1 Accent	[Controller 29]	
Knob 10	Synth 2 Accent	[Controller 36]	
Knob 11	Drum BD Tone	[Controller 39]	
Knob 12	Drum BD Decay	[Controller 40]	
Knob 13	Drum SD Snappy	[Controller 43]	
Knob 14	Synth 1 Mix Level	[Controller 11]	
Knob 15	Synth 2 Mix Level	[Controller 14]	
Knob 16	Drum Mix Level	[Controller 17]	

Preset 52: XG Effects - Variation   [NRPN]   (Master Channel)

Knob 1	Variation Type
Knob 2	Variation Parameter 1
Knob 3	Variation Parameter 2
Knob 4	Variation Parameter 3
Knob 5	Variation Parameter 4
Knob 6	Variation Parameter 6
Knob 7	Variation Parameter 7
Knob 8	Variation Parameter 11
Knob 9	Variation Parameter 12
Knob 10	Variation Parameter 13
Knob 11	Variation Parameter 14
Knob 12	Variation Parameter 15
Knob 13	Variation Amount to Reverb
Knob 14	Variation Amount to Chorus
Knob 15	Variation Return
Knob 16	Variation Pan

Preset 53: XG Effects - Insert effect 1   [NRPN]   (Master Channel)

Knob 1	Insert 1 Type
Knob 2	Insert 1 Parameter 1
Knob 3	Insert 1 Parameter 2
Knob 4	Insert 1 Parameter 3
Knob 5	Insert 1 Parameter 4
Knob 6	Insert 1 Parameter 5
Knob 7	Insert 1 Parameter 6
Knob 8	Insert 1 Parameter 7
Knob 9	Insert 1 Parameter 8
Knob 10	Insert 1 Parameter 9
Knob 11	Insert 1 Parameter 10
Knob 12	Insert 1 Parameter 11
Knob 13	Insert 1 Parameter 12
Knob 14	Insert 1 Parameter 13
Knob 15	Insert 1 Parameter 14
Knob 16	Insert 1 Parameter 15

Preset 54 XG Effects - Insert effect 2   [NRPN]   (Master Channel)

Knob 1	Insert 2 Type
Knob 2	Insert 2 Parameter 1
Knob 3	Insert 2 Parameter 2
Knob 4	Insert 2 Parameter 3
Knob 5	Insert 2 Parameter 4
Knob 6	Insert 2 Parameter 5
Knob 7	Insert 2 Parameter 6
Knob 8	Insert 2 Parameter 7
Knob 9	Insert 2 Parameter 8
Knob 10	Insert 2 Parameter 9
Knob 11	Insert 2 Parameter 10
Knob 12	Insert 2 Parameter 11
Knob 13	Insert 2 Parameter 12
Knob 14	Insert 2 Parameter 13
Knob 15	Insert 2 Parameter 14
Knob 16	Insert 2 Parameter 15

Preset 20: Soundblaster AWE 32/64 4   [NRPN]   (Master channel)

Knob 1	Master Tuning Coarse
Knob 2	LFO 1 to Pitch Coarse
Knob 3	LFO 2 to Pitch Coarse
Knob 4	Envelope 1 to Pitch Coarse
Knob 5	LFO 1 to Volume Coarse
Knob 6	LFO 1 to Filter Cutoff Coarse
Knob 7	Envelope 1 to Filter Cutoff Coarse
Knob 8	*undefined*
Knob 9	Master Tuning Fine
Knob 10	LFO 1 to Pitch Fine
Knob 11	LFO 2 to Pitch Fine
Knob 12	Envelope 1 to Pitch Fine
Knob 13	LFO 1 to Volume Fine
Knob 14	LFO 1 to Filter Cutoff Fine
Knob 15	Envelope 1 to Filter Cutoff Fine
Knob 16	*undefined*

Preset 21: Soundblaster AWE 32/64 5   [NRPN / Controller]   (Master channel)

Knob 1	Filter Cutoff Coarse	[NRPN]
Knob 2	Filter Resonance Coarse	[NRPN]
Knob 3	Modulation	[Controller 1]
Knob 4	Reverb Send Coarse	[NRPN]
Knob 5	Chorus Send Coarse	[NRPN]
Knob 6	Portamento	[Controller 5]
Knob 7	Balance	[Controller 8]
Knob 8	Expression	[Controller 11]
Knob 9	Filter Cutoff Coarse	[NRPN]
Knob 10	Filter Resonance Coarse	[NRPN]
Knob 11	Mono Aftertouch	[Mono Aftertouch]
Knob 12	Reverb Send Fine	[NRPN]
Knob 13	Chorus Send Fine	[NRPN]
Knob 14	Portamento Off/On	[Controller 65]
Knob 15	Pan	[Controller 10]
Knob 16	Volume	[Controller 7]

Presets 17 ~ 21 are specific NRPN controllers that control the specified functions on the Sound Blaster AWE 32/64 soundcards.

Preset 22:	**GS/XG Drum Pitch**	**[NRPN]**	**(Master channel)**
Preset 23:	**GS/XG Drum Level**	**[NRPN]**	**(Master channel)**
Preset 24:	**GS/XG Drum Pan**	**[NRPN]**	**(Master channel)**
Preset 25:	**GS/XG Drum Reverb Send**	**[NRPN]**	**(Master channel)**
Preset 26:	**GS/XG Drum Chorus Send**	**[NRPN]**	**(Master channel)**
Preset 27:	**GS/XG Drum Delay/Var. Send**	**[NRPN]**	**(Master channel)**

Presets 22 ~ 27 control the drum kit, which would normally require the master channel to be set to channel 10. The knobs all relate to the same drums on these presets as shown below, with each preset controlling Pitch, Level, Pan, Reverb Send, Chorus Send or Delay/Var. Send depending on the preset selected.

Knob 1	Bass Drum	Knob 9	Bongo
Knob 2	Snare Drum	Knob 10	Conga
Knob 3	Tom	Knob 11	Timbale
Knob 4	Hi-Hat	Knob 12	Hi Q
Knob 5	Hand Clap	Knob 13	Seq Click
Knob 6	Rim Shot	Knob 14	Finger Snap
Knob 7	Crash Cymbal	Knob 15	Click Noise
Knob 8	Ride Cymbal	Knob 16	Tambourine

Preset 28:	**XG Drum Filter Cut Off**	**[NRPN]**	**(Master channel)**
Preset 29:	**XG Drum Filter Resonance**	**[NRPN]**	**(Master channel)**
Preset 30:	**XG Drum Envelope Attack**	**[NRPN]**	**(Master channel)**
Preset 31:	**XG Drum Envelope Decay**	**[NRPN]**	**(Master channel)**

Presets 28 ~ 31 control the drum kit, which would normally require the master channel to be set to channel 10. The knobs all relate to the same drums on these presets as shown above, with each preset controlling Filter Cut Off, Filter Resonance, Envelope Attack or Envelope Decay depending on the preset selected.

Preset 32:	**XG Multi-Part Volume Level**	**[NRPN]**	**(Channels 1 -16)**
Preset 33:	**XG Multi-Part Pan**	**[NRPN]**	**(Channels 1 -16)**
Preset 34:	**XG Multi-Part Reverb Send**	**[NRPN]**	**(Channels 1 -16)**
Preset 35:	**XG Multi-Part Chorus Send**	**[NRPN]**	**(Channels 1 -16)**
Preset 36:	**XG Multi-Part Dry Level**	**[NRPN]**	**(Channels 1 -16)**
Preset 37:	**XG Multi-Part Variation Send**	**[NRPN]**	**(Channels 1 -16)**
Preset 38:	**XG Multi-Part Low EQ Gain**	**[NRPN]**	**(Channels 1 -16)**
Preset 39:	**XG Multi-Part Low EQ Frequency**	**[NRPN]**	**(Channels 1 -16)**
Preset 40:	**XG Multi-Part High EQ Gain**	**[NRPN]**	**(Channels 1 -16)**
Preset 41:	**XG Multi-Part High EQ Frequency**	**[NRPN]**	**(Channels 1 -16)**

Presets 32 ~ 41 control the XG parts, with each knob controlling the corresponding MIDI channel. Each preset controls either Part volume, pan, reverb send, chorus send, dry level, variation effect send, low eq gain, low eq frequency, high eq gain or high eq frequency.

Preset 42:	**XG Multi-Part Effects**	**[Sys-Ex]**	**(Master Channel)**

Knob 1	High EQ Frequency
Knob 2	Low EQ Frequency
Knob 4	Dry
Knob 5	*undefined*
Knob 6	*undefined*
Knob 7	*undefined*
Knob 8	*undefined*
Knob 9	Hi Eq Gain
Knob 10	Low Eq Gain
Knob 11	*undefined*
Knob 12	Reverb
Knob 13	Chorus
Knob 14	Variation
Knob 15	Pan
Knob 16	Level

Preset 42 offers general effects control for an XG instrument.

Preset 43:	**XG A/D & Wave Level**	**[NRPN]**	**(Master Channel)**
Preset 44:	**XG A/D & Wave Pan**	**[NRPN]**	**(Master Channel)**
Preset 45:	**XG A/D & Wave Reverb Send**	**[NRPN]**	**(Master Channel)**
Preset 46:	**XG A/D & Wave Chorus Send**	**[NRPN]**	**(Master Channel)**
Preset 47:	**XG A/D & Wave Variation Send**	**[NRPN]**	**(Master Channel)**
Preset 48:	**XG A/D & Wave Dry Level**	**[NRPN]**	**(Master Channel)**

Presets 43 ~ 48 control the A/D inputs 1 and 2 as well as the 12 wave channels on relevant Yamaha sound cards. These relevant controls are shown below. Note that knobs 15 and 16 have no defined function for these presets.

Knob 1	A/D Input 1	Knob 8	W6
Knob 2	A/D Input 2	Knob 9	W7
Knob 3	W1	Knob 10	W8
Knob 4	W2	Knob 11	W9
Knob 5	W3	Knob 12	W10
Knob 6	W4	Knob 13	W11
Knob 7	W5	Knob 14	W12

Preset 49:	**XG Effects - EQ**	**[NRPN]**	**(Master Channel)**

Knob 1	EQ Gain 1
Knob 2	EQ Frequency 1
Knob 3	EQ Q1
Knob 4	EQ Gain 2
Knob 5	EQ Frequency 2
Knob 6	EQ Q2
Knob 7	EQ Gain 5
Knob 8	EQ Frequency 5
Knob 9	EQ Gain 3
Knob 10	EQ Frequency 3
Knob 11	EQ Q3
Knob 12	EQ Gain 4
Knob 13	EQ Frequency 4
Knob 14	EQ Q4
Knob 15	EQ Q5
Knob 16	EQ Type

Preset 50:	**XG Effects - Reverb**	**[NRPN]**	**(Master Channel)**

Knob 1	Reverb Type
Knob 2	Reverb Parameter 1
Knob 3	Reverb Parameter 2
Knob 4	Reverb Parameter 3
Knob 5	Reverb Parameter 4
Knob 6	Reverb Parameter 5
Knob 7	Reverb Parameter 6
Knob 8	Reverb Parameter 7
Knob 9	Reverb Parameter 8
Knob 10	Reverb Parameter 9
Knob 11	Reverb Parameter 10
Knob 12	Reverb Parameter 11
Knob 13	Reverb Parameter 13
Knob 14	Reverb Parameter 15
Knob 15	Reverb Return
Knob 16	Reverb Pan

Preset 51:	**XG Effects - Chorus**	**[NRPN]**	**(Master Channel)**

Knob 1	Chorus Type
Knob 2	Chorus Parameter 1
Knob 3	Chorus Parameter 2
Knob 4	Chorus Parameter 3
Knob 5	Chorus Parameter 4
Knob 6	Chorus Parameter 6
Knob 7	Chorus Parameter 7
Knob 8	Chorus Parameter 8
Knob 9	Chorus Parameter 9
Knob 10	Chorus Parameter 10
Knob 11	Chorus Parameter 11
Knob 12	Chorus Parameter 12
Knob 13	Chorus Parameter 13
Knob 14	Chorus Amount to Reverb
Knob 15	Chorus Return
Knob 16	Chorus Pan