INTRODUCTION TO MIDI OPERATION   M5000

The M5000 has standard MIDI In/Out/Thru connectors located on the rear panel. This chapter describes MIDI operation of the M5000, which you will see is quite extensive.

MIDI operation of the M5000 allows you to do the following:

- Control algorithm-parameters using MIDI Controllers.

- Recall programs using MIDI Program Change.

- Re-map programs (useful e.g. for associating a program with a synthesizer preset).

- Communicate using MIDI System-Exclusives (for software-developers... see the end of this chapter).

If you wish to fully understand MIDI as such, there are a number of books on the subject available at music stores. However, you will not need a thorough understanding of MIDI to utilize the features discussed in this chapter.

APPLICATIONS AND MIDI

As you know, multiple applications (DSP-cards) can be running at the same time. All applications share the same MIDI input/output, but it is vital to understand that each application has its own completely individual MIDI-setup. Each application has individual input/output channels and Program Maps. MIDI data received at MIDI In is actually fed into all applications, and MIDI output from all applications is merged and transmitted at MIDI Out.

Please note, that the System-Exclusive Device# (which is used to identify the M5000 when it is being controlled from a Macintosh or PC-editor) is set for the entire M5000 frame. You can still access each individual DSP-card, but this is controlled from the editor.

SETTING UP THE M5000 FOR MIDI OPERATION

Press the UTILITY button, and then turn the PROGRAM knob until the MIDI menu appears. Press the <Page button as many times as possible. You will now see the following (actual values may be different, but that is quite OK):

MIDI INPUT Page:

```
INPUT  CTL.IN  PRG.IN  PRG.BANK MENU
ch1    on      on      ROM      MIDI
```

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The **INPUT** knob selects on which channel the M5000 is to receive MIDI data. If the knob is turned fully counter-clockwise, 'omni-mode' is selected. In this case, the M5000 receives MIDI data on all channels.

When **CTL.IN** (Controller Input) is enabled, the M5000 will respond to MIDI Controller messages. Controllers are used for changing algorithm-parameters (more on this below in 'MIDI Controllers').

When **PRG.IN** (Program Input) is enabled, the M5000 will respond to MIDI Program Change commands. If the **PRG.MAP** (Program Map as described below) is enabled, any received Program Change is modified to select a different program as specified in the Program Map.

PRG.BANK selects which bank presets are recalled from with the Program Change command.

MIDI OUTPUT Page:

OUTPUT	PRG.OUT	OFFST-O	OFFST-I	MENU
ch 1	off	-1	1	MIDI

The **OUTPUT** knob selects on which MIDI channel a MIDI Program-Change will be output, if a preset is recalled on the front panel.

The **PRG.OUT** knob selects whether or not a MIDI Program Change will be issued when a program is recalled.

OFFST-O (Output-offset)

OFFST-I (Input-offset).

OFFST-O and **OFFST-I** (output and input offsets) are provided, because different manufacturers implement program changes differently. It is a typical problem that your sequencer may number programs from 1 to 128, while your effect-processor may number programs from 0 to 127. The fix for this is the **offset**. The input-offset is added to the number of the program you wish to recall. With the settings shown above, program #5 is recalled when you ask for program #5 on your sequencer, which is the most natural way. Without the offset, program #4 would be recalled when you ask for program #5.

The output-offset works in the opposite way, because the program-change is going in the opposite direction.

You can also use the offsets to access a completely different range of programs. With an input-offset of 101, you can recall presets 101 and upwards by asking for presets 1 and upwards (which MIDI normally would make impossible).

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PROGRAM CHANGES

When Program Input is enabled (see above), the M5000 will respond to Program Changes received via MIDI.

If the Program Map is disabled, the M5000 will respond normally to Program Changes (with regard to the offset, of course). Otherwise, the Program Map must be defined on the following page:

Program Map Page:

```
PRG.IN  MAPS TO PRESET  PRG.MAP MENU
1    no chg.       off    MIDI
```

The **PRG.IN** knob decides which preset you would like to remap.

The **MAPS TO PRESET** selects which preset will be recalled when the **PRG.IN** preset is recalled. If 'no chg.' is selected, nothing will happen when the **PRG.IN** preset is recalled.

PRG.MAP enables/disables the program map.

The Program Map can be cleared on the following page:

MIDI Utility-Page:

```
SELECT FUNCTION PRESS DO      MENU
CLEAR PRG. MAP              MIDI
```

Turn this knob to select one of the following functions:

CLEAR PRG.MAP

LOAD SETUP FROM CARD

SAVE SETUP TO CARD

LOAD SETUP FROM DISK

SAVE SETUP TO DISK

Press DO to engage the function.

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MIDI CONTROLLERS

The M5000 allows you to control any parameter of any algorithm with a fixed set of controllers.

A MIDI controller is essentially a knob (such as a modulation wheel) which goes smoothly from 0 (min.) to 127 (max.). Real-time MIDI control allows you to control a given parameter (e.g. REVERB MIX, OUTPUT LEVEL, REVERB DECAY etc.) with a controller. In the following, each parameter of each algorithm is listed with the associated controller#.

Since MIDI controllers always go from 0 to 127, they are scaled to fit with the associated parameter. 0 represents the lowest possible value of the parameter, while 127 represents the highest possible value of the parameter. Setting REVERB MIX to 0 thus results in 0%, while 127 results in 100%.

REVERB-1 & REVERB-2:

Parameter	Controller#	Parameter	Controller#
MIX	10	HICUT	21
INLEV	11	ATT	22
OUTLEV	12	LO-XOVR	23
DECAY	13	HI-XOVR	24
x LOW	14	INITLEV	25
x HIGH	15	REVLEV	26
DIFFUSE	16	I-XFEED	27
SHAPE	17	REVDIFF •	28
x SIZE	18	BUILDUP •	29
PREDLY	19	IATTACK •	30
REVFEED	20	IDECAY •	31

Parameters marked with • are only available in REVERB-2.

REVERB-3:

Parameter	Controller#	Parameter	Controller#
MIX	10	LM-XOVR	19
INLEV	11	HI-XOVR	20
OUTLEV	12	PREDLY	21
DECAY	13	DISTANS	22
x LOW	14	HICUT	23
x LOMID	15	ATT	24
x HIGH	16	MODRATE	25
DIFFUSE	17	MODDPTH	26
LO-XOVR	18	DIFTYPE	27

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NONLIN-1:

Parameter	Controller#	Parameter	Controller#
MIX	10	LOCUT	17
INLEV	11	HICUT	18
OUTLEV	12	DIFFUSE	19
PREDLY	13	PREDIFF	20
ATTACK	14	DIFTYPE	21
HOLD	15	WIDTH	22
RELEASE	16		

CHORUS-1:

Parameter	Controller#	Parameter	Controller#
MIX	10	SPEED	16
INLEV	11	DEPTH	17
OUTLEV	12	FBLOCUT	18
PHASE	13	FBHICUT	19
DELAY	14	HICUT	20
FB	15	ATT	21

DELAY-1:

Parameter	Controller#	Parameter	Controller#
MIX	10	FB	15
INLEV	11	FBLOCUT	16
OUTLEV	12	FBHICUT	17
LDELAY	13	HICUT	18
RDELAY	14	ATT	19

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DELAY-2:

Parameter	Controller#	Parameter	Controller#
MIX	10	DEPTH	22
INLEV	11	PHASE	23
OUTLEV	12	INV-PAN	24
DELAY1	13	FB1	25
DELAY2	14	FB2	26
HICUT	15	XFB12	27
ATT	16	XFB21	28
LEVEL1	17	LOFB	29
PAN1	18	HIFB	30
LEVEL2	19	LOXOVR	31
PAN2	20	HIXOVR	32
SPEED	21		

REVPITCH:

Parameter	Controller#	Parameter	Controller#
MIX	10	HICUT2	23
INLEV	11	ATT2	24
OUTLEV	12	FB1	25
PITCH1	13	FB2	26
FINE1	14	XFB12	27
PITCH2	15	XFB21	28
FINE2	16	AMBMIX	29
LEVEL1	17	PREDLY	30
PAN1	18	SHAPE	31
LEVEL2	19	SIZE	32
PAN2	20	PITCDLY	33
HICUT1	21	PITCCFT	34
ATT1	22		

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PITCH-1:

Parameter	Controller#	Parameter	Controller#
MIX	10	HICUT2	23
INLEV	11	ATT2	24
OUTLEV	12	FB1	25
PITCH1	13	FB2	26
FINE1	14	XFB12	27
PITCH2	15	XFB21	28
FINE2	16	DELAY1	29
LEVEL1	17	DELAY2	30
PAN1	18	DGSPEED	31
LEVEL2	19	POLYSPD	32
PAN2	20	POLYDLY	33
HICUT1	21	DGFILT	34
ATT1	22		

PITCH-2:

Parameter	Controller#	Parameter	Controller#
MIX	10	HICUT	17
INLEV	11	ATT	18
OUTLEV	12	DGSPEED	19
PITCH	13	POLYSPD	20
FINE	14	POLYDLY	21
FB	15	DGFILT	22
DELAY	16		

AMBIENCE:

Parameter	Controller#	Parameter	Controller#
MIX	10	LOCUT	17
INLEV	11	LOATT	18
OUTLEV	12	HICUT	19
SHAPE	13	HIATT	20
SIZE	14	SPEED	21
PREDLY	15	DEPTH	22
WIDTH	16	PDLYMUL	23

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TAPFAC-1:

Parameter	Controller#	Parameter	Controller#
MIX	10	LEVEL9	44
INLEV	11	LEVEL10	45
OUTLEV	12	LEVEL11	46
SCALE	13	LEVEL12	47
PREDLY	14	LEVEL13	48
WIDTH	15	LEVEL14	49
LASTTAP	16	LEVEL15	50
CURTAP	17	LEVEL16	51
DELAY1	18	LEVEL17	52
DELAY2	19	LEVEL18	53
DELAY3	20	PAN1	54
DELAY4	21	PAN2	55
DELAY5	22	PAN3	56
DELAY6	23	PAN4	57
DELAY7	24	PAN5	58
DELAY8	25	PAN6	59
DELAY9	26	PAN7	60
DELAY10	27	PAN8	61
DELAY11	28	PAN9	62
DELAY12	29	PAN10	63
DELAY13	30	PAN11	64
DELAY14	31	PAN12	65
DELAY15	32	PAN13	66
DELAY16	33	PAN14	67
DELAY17	34	PAN15	68
DELAY18	35	PAN16	69
LEVEL1	36	PAN17	70
LEVEL2	37	PAN18	71
LEVEL3	38	LOCUT	72
LEVEL4	39	LOATT	74
LEVEL5	40	HICUT	75
LEVEL6	41	HIATT	76
LEVEL7	42	SPEED	77
LEVEL8	43	DEPTH	78

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DYNAMIC1:

Parameter	Controller#	Parameter	Controller#
MIX	10	M-LIMREL	45
INLEV	11	M-EXPTHR	46
OUTLEV	12	M-EXPRATIO	47
BALANCE	13	M-EXPATCK	48
LOWCUT	14	M-EXPREL	49
LMXOVR	15	M-EXPRANGE	50
MHXOVR	16	M-LEVEL	51
SOFTCLIP	17	M-CREST	52
L-COMTHR	18	M-DELAY	53
L-COMRATIO	19	M-LIMDLY	54
L-COMATCK	20	M-SFTKNEE	55
L-COMREL	21	M-METERS	56
L-LIMTHR	22	M-REF0DB	57
L-LIMRATIO	23	H-COMTHR	58
L-LIMATCK	24	H-COMRATIO	59
L-LIMREL	25	H-COMATCK	60
L-EXPTHR	26	H-COMREL	61
L-EXPRATIO	27	H-LIMTHR	62
L-EXPATCK	28	H-LIMRATIO	63
L-EXPREL	29	H-LIMATCK	64
L-EXPRANGE	30	H-LIMREL	65
L-LEVEL	31	H-EXPTHR	66
L-CREST	32	H-EXPRATIO	67
L-DELAY	33	H-EXPATCK	68
L-LIMDLY	34	H-EXPREL	69
L-SFTKNEE	35	H-EXPRANGE	70
L-METERS	36	H-LEVEL	71
L-REF0DB	37	H-CREST	72
M-COMTHR	38	H-DELAY	73
M-COMRATIO	39	H-LIMDLY	74
M-COMATCK	40	H-SFTKNEE	75
M-COMREL	41	H-METERS	76
M-LIMTHR	42	H-REF0DB	77
M-LIMRATIO	43	PARLNK	78
M-LIMATCK	44	NOMDELAY	79

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TOOLBOX:

Parameter	Controller#	Parameter	Controller#
MIX	10	EQTYPE2	40
INLEV	11	EQFREQ2	41
OUTLEV	12	PWIDTH2	42
INSON	13	NWIDTH2	43
BAL	14	PGAIN2	44
MONO	15	NGAIN2	45
LRSWAP	16	EQON2	46
ID_PHASE	17	EQTYPE3	47
DITHER	18	EQFREQ3	48
DITTYP	19	PWIDTH3	49
MSON	20	NWIDTH3	50
MSANGLE	21	PGAIN3	51
FADECURVE	22	NGAIN3	52
FADER	23	EQON3	53
METER	24	EQTYPE4	54
RANGE	25	EQFREQ4	55
TICKS	26	PWIDTH4	56
HOLD	27	NWIDTH4	57
LDELAY	28	SSLOPE4	58
RDELAY	29	CSLOPE4	59
EQTYPE1	30	PGAIN4	60
EQFREQ1	31	NGAIN4	61
PWIDTH1	32	SGAIN4	62
NWIDTH1	33	EQON4	63
SSLOPE1	34	LPPM	64
CSLOPE1	35	RPPM	65
PGAIN1	36	CORR	66
NGAIN1	37	CORLEG	67
SGAIN1	38	FADVAL	68
EQON1	39		

SYSTEM-EXCLUSIVES

System-Exclusives (Sysex for short) is a subset of the MIDI-protocol, which allows software-developers (who are writing a Mac or PC-based editor) to communicate with the M5000 in a very technical manner (giving total control over the M5000). The Sysex-documentation is of a very technical nature, which is why it isn't described in this manual. The M5000 System-Exclusive Manual is available at any TC-office.

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MIDI System-Exclusive Page:

SYSEX ID#	MENU
0	MIDI

Turn the **Device#** knob to set the device-number of this M5000.

The Device# is all you'll ever need to know about Sysex. This number must be set to same value both on your Macintosh/PC-editor and on your M5000 in order for them to be able to 'find' each other.

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