

Information Sheet

for

KENTON

MSRK Module

fitted inside the

MICROMAC

D

WARNING

DO NOT ADJUST THE TRIMMERS ON THE KENTON MODULE BOARD. These are for factory setup ONLY. All adjustments to scale and tuning of the module board are made using the editing system.

This is **NOT** a manual for the MIDI on the Micromac D however it is a guide to the capabilities of the MSRK board. It is believed that only the CV and Gate connections have actually been connected inside the Micromac D, so features like the VCF control (Aux1) are not available unless you make hardware modifications to your synth.

Kenton will not engage in any discussion about the contents of this document in regard to the MSRK board inside the Micromac D (except for corrections). All support for the Micromac D including the MSRK board is intended to be provided by Ken McB. Any emails sent to Kenton regarding the Micromac D will forwarded to Ken McB for reply by him.

The information provided is a collection of extracts from appropriate Kenton documents and may not reflect absolutely the situation in the Micromac D as we do not have, and have never had, one to test.

USING THE MIDI INTERFACE

When you turn on the synthesiser for the first time, you will be in omni-off mode MIDI channel 1 for receive - See the following pages for other factory default settings. When you select a receive channel, this will be stored in memory and will be remembered for when you subsequently turn on the synth - all parameters listed on the next page are stored.

If you want to put the Micromac D back to the factory default settings at any time, switch the synth on whilst holding the red push button pressed - hold for a couple of seconds then release.

SETUP PUSH BUTTON

Two modes are available by pushing the setup push button during normal playing mode. Before you press the setup button however, make sure that no keys are pressed on the remote MIDI keyboard otherwise the results may be unpredictable. The key presses can be entered only from the remote MIDI keyboard and may be sent on any MIDI channel.

1) SET-UP MODE

For setting MIDI channels and assignments. Give the setup push button a short press (half a second) - then release. Follow this with a key press or sequence of key presses on the remote MIDI keyboard as detailed on page 2. After making a MIDI channel assignment, you will be automatically returned to playing mode but after making other assignments you will need to press the ENTER key (Top C) to return to playing mode; this is to enable you to make the multiple key presses required when re-assigning Sources to Destinations. (N.B. all set-ups are stored in non volatile memory).

2) TRANSPOSE MODE

Press and hold the setup push button for about four seconds - then release. Middle C will sound on the Micromac D and continue to sound until you press a key on the remote MIDI keyboard. Starting from middle C, pressing middle C itself gives zero transpose, pressing the G above middle C will transpose up by 7 semitones, or the F below middle C will transpose down by 7 semitones. You can set any value up to two octaves up or down - settings outside this range will be ignored. Note that transpose mode cannot be entered from set-up mode. The transpose setting will not be stored.

Function of keys during set-up mode for MSRK board inside Micromac D:

C	Receive channel	1 (default)	[Bottom C - MIDI note #36]
Db	" "	2	
D	" "	3	
Eb	" "	4	
E	" "	5	
F	" "	6	
Gb	" "	7	
G	" "	8	
Ab	" "	9	
A	" "	10	
Bb	" "	11	
B	" "	12	
C	" "	13	
Db	" "	14	
D	" "	15	
Eb	" "	16	
E	" "	sets the MIDI channel this note was received on	
F	Not Used		
Gb	" "		
G	" "		
Ab	" "		
A	" "		
Bb	" "		
B	" "		
C	Aux 1 controller – LP filter cutoff	[default cc16]	[Middle C - MIDI note #60]
Db	Aux 2 controller – Volume	[default cc 7]	
E	Aux 3 controller (unused)	[default cc18]	
Eb	Aux 4 controller (unused)	[default cc19]	
E	Aux 5 controller (synth internal modulation)	[default cc 15]	
F	MIDI LFO to Aux1 controller	[default cc17]	
Gb	MIDI LFO to CV controller	[default cc1]	
G	MIDI LFO Speed	[default cc14]	
Ab	MIDI LFO waveshape	[default cc13]	
A	MIDI LFO – MIDI Sync	[default cc12]	
Bb	Portamento on-off controller	[default cc65]	
B	Portamento rate controller	[default cc 5]	
C	Not Used		
Db	" "		
D	" "		
Eb	" "		
E	" "		
F	" "		
Gb	" "		
G	" "		
Ab	" "		
A	" "		
Bb	" "		
B	" "		
C	" "		
Db	" "		
D	" "		
Eb	" "		
E	" "		
F	" "		
Gb	" "		
G	Single trigger mode	[default]	
Ab	Multi trigger mode (on Micromac D it will always return to single trig at power-up)		
A	Pitchbend range 2 semitones (a tone)	[default]	
Bb	Pitchbend range 7 semitones (a fifth)		
B	Pitchbend range 12 semitones (one octave)		
C	ENTER key	Press & release to store & return to play mode	[Top C - MIDI note #96]

ASSIGNING MIDI CONTROLLERS TO PARAMETERS

- 1) To re-assign MIDI controllers for the controllers available on page 3:
 - a) press the setup push button to enter set-up mode (short press and release)
 - b) send the controller you want to assign by moving the knob or slider on your MIDI controller (e.g. cc#20)
 - c) press a key on your remote keyboard to select the item you want to control with it (e.g. MIDI LFO speed)
 - d) either hit Top C to enter/exit and store, or go back to stage b) to assign another controller to an item.
- 2) If you use a controller (such as MIDI LFO speed) - the value set can be stored by entering and then exiting setup mode – in other words, give the setup push button a short press, then press top C to exit. All changes made will be stored.
- 3) Receive channel setting will return you directly to playing mode, all other keys will let you stay in SET-UP mode until you press the ENTER key (Top C).
- 4) The ENTER key (Top C) also performs a “reset all controllers” function – OFF in most cases, but ON for volume, and centre for pitch bender.
- 5) If you want to put the MIDI back to the default settings at any time, switch the Micromac D on whilst holding the setup push button pressed – hold for a couple of seconds then release.
- 6) During set-up mode, the retrofit will receive on ALL MIDI channels.

OTHER INFORMATION

The internal MIDI syncable LFO can be controlled as follows:

MIDI LFO to CV controller	[default CC1]
MIDI LFO Speed	[default CC14]
MIDI LFO waveshape	[default CC13]
MIDI LFO – MIDI Sync	[default CC12]

List of all CC controllable parameters

Aux 1 controller – LP filter cutoff	[default cc16]
Aux 2 controller – Volume	[default cc 7]
Aux 3 controller (unused)	[default cc18]
Aux 4 controller (unused)	[default cc19]
Aux 5 controller (synth internal modulation - unused)	[default cc 15]
MIDI LFO to Aux1 controller	[default cc17]
MIDI LFO to CV controller	[default cc1]
MIDI LFO Speed	[default cc14]
MIDI LFO waveshape	[default cc13]
MIDI LFO – MIDI Sync	[default cc12]
Portamento on-off controller	[default cc65]
Portamento rate controller	[default cc 5]

The controller numbers can be changed from their defaults see assigning MIDI controllers (above)

PARAMETERS of the MSRK board in the Micromac D

Below is a list of parameters available to edit using SysEx on the MSRK module board fitted inside the Micromac D. Note that many are not applicable to the Micromac D as they have not been connected inside the synth – for example all the Aux1, Aux 2, Aux3 controls. Also the components for Aux5 (control of the synth's internal LFO) are not fitted as those functions were not required on the Micromac D. So if you find something doesn't work, don't assume that the MIDI board is faulty, all boards have all been thoroughly checked.

Menu

Address Parameter (default)

CV & Gate Outputs -

A 00 MIDI receive channel (default :1)

Range 1 to 16

- Sets the MIDI receive channel.

A 01 Retrig Time (default: off)

Range off [off] and 1 to 25 (0.2mS to 5mS)

- If set to off (normal trigger mode), the gate just stays on when a new note is played. (no re-trigger)

If set to a number, a valid new note will briefly turn off the gate to retrigger the envelope generators of your mono-synth. (multiple trigger). The numbers relate to the off time in 0.2mS steps approximately.

A 02 Note priority (default: new)

The following can be selected:

New note priority [nn]

Low note priority [lo]

High note priority [hi]

- Sets the note priority for the converter.

If set to "nn" then the newest valid note played takes precedence.

If set to "lo" then the lowest valid note played takes precedence.

If set to "hi" then the highest valid note played takes precedence.

NB The MSRK BOARD has a 5 note buffer memory so that trill effects can be achieved.

A 03 Pitchbend range (default: 2)

Range 0 to 12 semitones.

- The pitch bend range can be changed in semitone steps from zero to 12 semitones

A 04 Portamento controller number (default: 65)

- Sets which MIDI controller will turn on/off the portamento function.

The following can be selected:

On [on] always on

Off [of] always off

Auto portamento [AU] normally off but legato playing turns portamento on

MIDI controllers #0 to 119 data values of 64 and above =on, 63 and below =off

The standard MIDI controller for portamento on/off is #65 which is the default, but with this command, the MSRK BOARD allows you to use another controller, direct control or Auto Portamento if you wish.

A 05 Portamento time / rate (default :60)

Range 1 to 127

- Sets the portamento (glide or slide) time. This can also be adjusted in real time over MIDI using controller #5 (portamento time). This number is just a value, it is not calibrated in mS or any other unit. To turn portamento off, set portamento controller (parameter 05) to off, don't use this parameter.

A 06 Portamento type (default : fixed rate)

The following can be selected:

Fixed rate [Fr]

Fixed time [Ft]

- Fixed rate causes the portamento to slide at the rate set in 06, so that the slide time is proportional to the interval between the start and finish notes.

- Fixed time will attempt to keep the time taken for the slide to be constant, regardless of the interval between the start and finish notes. (In extreme cases this is not always possible)

A 07 LFO to CV controller number (default: 1)

Sets which controller will affect modulation amount of the CV output. The following can be selected:

Off [oFF]

Pitch bend [Pbd]

Velocity [VEL]

Aftertouch [AFt]

MIDI controllers 0 to 119

A 08 LFO to CV minimum value (default: 0)

Range 0 to 127

- Sets the level for LFO to CV modulation when the MIDI controller source is at its minimum.

Note that minimum can be set above maximum so that the controller works backwards.

Why would I want to do this? – You may want a pre-set amount of modulation applied at all times

A 09 LFO to CV maximum value (default: 63)

Range 0 to 127

- Sets the level for LFO to CV modulation when the MIDI controller source is at its maximum.

Note that minimum can be set above maximum so that the controller works backwards.

Why would I want to do this? – The modulation amount at mod-wheel maximum may be too great or too little

A 10 LFO to CV reset value (default: 0)

Range 0 to +127

- Sets the level the LFO to CV modulation will reset to when the *MSRK BOARD* is powered on or when it receives a controller reset MIDI command or a new setup is loaded from memory. This is equivalent to a MIDI message of this value being received, so it will be influenced by min and max settings above.

Why would I want to do this? – You may want a pre-set amount of modulation that can however be turned off later using the mod wheel

A 11 Coarse Tune / Transpose (default: 0)

Range -24 to +24

- Changing this will change the tuning of the mono-synth in semi-tone steps. If your synth does not play C when you play a MIDI C (note#36), use this to make it as near as possible.

Why would I want to do this? – Your synth might not play a C when zero volts CV is applied to it, either because it is out of adjustment, or maybe it was designed that way (e.g. Minimoog – zero volts = F)

A 12 Fine tune (default: 0)

Range -127 to +127 (approximately a semitone each way – use P12 above if you need more)
- Fine tunes the mono-synth. This moves all notes up and down by the same amount.

A 13 Scale (default: 0)

Range -127 to +127
- This is used to tune in the octave scaling of your analogue synth. It will only need adjusting if your synth sounds out of tune as you play further up the keyboard (see 'Tuning in Your Analogue Synth'). - Check whether CV type select has been set correctly (see 'P 15' below).
Note C (MIDI note#36) will not move (assuming transpose is not in operation) so get that in tune first then tune the C two octaves above that by using this parameter.

A 14 CV – Hz/V – 1.2V/oct select (default: CV)

- This should be set to V/oct [CV] for connecting to most synths, such as Roland, SCI, Octave, Oberheim or Moog synths. Set it to Hz/V [Hz] if you are using either Yamaha or Korg mono-synths (except the Monopoly which is volt per octave). A very small number of synths use 1.2 volts per octave [12] (one tenth of a volt per semitone) – in which case select this option.

A 15 Gate type select (default: G 05)

- you can select the following types for the GATE output:

Gate V-Trig +5v	[g 05]
Gate V-Trig +10v	[g 10]
Gate V-Trig max	[g 12] (just over 11v)

Gate is the most common signal used for telling a synth when to play its note. The 10v level Gate is suitable for most synths, such as Roland, SCI, ARP, Oberheim. The 5V level gate may be needed for synths that require a lower gate voltage such as the SH-101.

S-trig +5v pull-up	[S 05]
S-trig +10v pull-up	[S 10]
S-trig max pull-up	[S 12] (just over 11v)

S-trig +5v pullup would be used for most Moogs & Korgs, and the Yamaha CS range instead of Gate.

AUX1 output

A 16 AUX 1 controller number (default: 16)

- Sets which MIDI controller will control the auxiliary output. The following can be selected:

Off	[oFF]
Pitch bend	[Pbd]
Velocity	[VEL]
Aftertouch	[Aft]
MIDI controllers	0-119

A 17 AUX 1 minimum value (default: 0)

Range -27 to +100
- Sets the level for the Auxiliary output when the MIDI controller source is at its minimum.
A value of 10 is approximately 1 volt – so 100 is approx. 10 volts and –27 is approx. –2.7 volts
Note that minimum can be set above maximum so that the controller works backwards.

A 18 AUX 1 maximum value (default: 100)

Range -27 to +100

- Sets the level for the Auxiliary output when the MIDI controller source is at its maximum.

A value of 10 is approximately 1 volt – so 100 is approx. 10 volts and –27 is approx. –2.7 volts.

Note that minimum can be set above maximum so that the controller works backwards.

A 19 AUX 1 reset value (default: 0)

Range 0 to 127

- Sets the level the Auxiliary output will reset to when the *MSRK BOARD* is powered on or when it receives a controller reset MIDI command or a new setup is loaded from memory. This is equivalent to a MIDI message of this value being received, so it will be influenced by min and max settings above.

A 20 Key scale to AUX 1 (default: 0)

Range 0 to 127

- Sets the amount of key scaling which is applied to the Aux output (for opening the filter up as you play notes further up the keyboard. *Most synths do this internally even when connected to a CV converter – however not all do, a particular exception being the Sequential Pro-One. This feature enables key-scale to filter, even when not otherwise available on the synth.*

A 21 LFO to AUX 1 controller (default: 17)

- Sets which Controller will control the LFO depth applied to the AUX1 output.

The following can be selected:

Off	[oFF]
Pitch bend	[Pbd]
Velocity	[VEL]
Aftertouch	[AFt]
MIDI controllers	0 to 119

A 22 LFO to AUX 1 minimum value (default: 0)

Range 0 to 127

- Sets the level for LFO to AUX modulation when the MIDI controller source is at its minimum.

Note that minimum can be set above maximum so that the controller works backwards.

A 23 LFO to AUX 1 maximum value (default: 64)

Range 0 to 127

- Sets the level for LFO to AUX modulation when the MIDI controller source is at its maximum.

Note that minimum can be set above maximum so that the controller works backwards.

A 24 LFO to AUX 1 reset value (default: 0)

Range 0 to 127

- Sets the level the LFO to AUX1 modulation will reset to when the *MSRK BOARD* is powered on or when it receives a controller reset MIDI command or a new setup is loaded from memory. This is equivalent to a MIDI message of this value being received, so it will be influenced by min and max settings above.

LFO control

A 25 LFO rate / speed (default :111) [approx 6.25Hz]










- Sets the speed of the LFO. Range approx 0.1Hz to 100Hz.

Range 0 to 191

Note: This number is just a numeric value for reference purposes only. It is not calibrated in mS or any other unit. The scale is roughly logarithmic. Approximately 0=0.1Hz 66=1Hz 129=10Hz 191=100Hz

A 26 LFO waveshape (default :TR)

- Sets the LFO waveshape. All waveshapes modulate CV and/or Aux1 any value between 0 to a positive value, except triangle, which modulates positive and negative. The following may be selected: (the downward arrow (↓) indicates the default trigger point when in MIDI sync mode). Note that the sync point can be changed using parameter #33 – LFO Sync Start Point.

Triangle	[TR]		Sawtooth up [SU]	
Sawtooth down	[SD]		PulseWidth 10% [10]	
PulseWidth 20%	[20]		PulseWidth 30% [30]	
PulseWidth 40%	[40]		Square [50]	
Sample & Hold (actually a new S/H level for each trigger)	[SH]		(Pseudo random)	

A 27 LFO MIDI SYNC (default: oFF)

Range, off [oFF], 1 to 96

- Allows the LFO waveform to be synchronised to MIDI clock, with a variable divide ratio. The LFO waveform will automatically adjust its length so that it will start at the beginning of a bar, and last for whatever musical time it is set for (see below for divide ratios).

A divide ratio can be set, so the LFO only re-triggers every so many MIDI clock messages. MIDI sends 24 clocks per quarter note. So if divide is set to 1, there will be 1 cycle of the LFO for every 1 MIDI clock. (i.e. 24 cycles per quarter note). If set to 24, there will be 1 cycle of the LFO for every 24 MIDI clocks. (i.e. 1 cycle of the LFO per quarter note).

Below is a table of values you can set the divide ratio to obtain LFO cycles of various musical lengths:

Note type:	Divide ratio:
Semibreve	96
Minim	48
Crotchets	24
Crotchet triplets	16
Quavers	12
Quaver triplets	8
Semiquavers	6
Semiquaver triplets	4
Demisemiquavers	3
Demisemiquaver triplets	2

Do not use low divide ratios at high clock speeds (particularly 1) and switch off if not using.

A 28 LFO Sync Start Point (default :0)

- Sets where the waveform will start when MIDI sync is active or Key-On reset is on.

Range 0 to 255

A 29 Key-On resets LFO Wave (default :off)

The following can be selected:

Off [oFF]
On [on]

- When on, the LFO waveform is reset to the selected start point whenever a new note is played.

Global

A 30 Continue = start - (default: on)

- Sets how MIDI Continue messages are treated. The following can be selected:

Off [oFF]
On [on]

- when set to on, all continue messages are treated as if they were MIDI start messages.

- when set to off, continue messages will only be treated as start if immediately preceded by a song position pointer = zero message. Some sequencers use this instead of a start message.

A 31 Clock1 divide ratio - (default: d2)

available values c24, c48 & d2 to d24,

- sets the ratio of MIDI clocks to output pulses from the Clock1 output.

c24 – special drum machine mode – outputs 24 cpqn – used for many drum machines

c48 – special drum machine mode – outputs 48 cpqn – for Linn & Oberheim drum machines

N.B. Some drum machines use other values e.g. the Roland CR78 uses 12 cpqn (div ratio 2)

If set to 2, there will 12 pulses from the clock1 output for every 24 MIDI clocks = 12 cpqn

If set to 24, there will be 1 pulse from the clock pulse output for every 24 MIDI clocks = 1 cpqn

(Note there are 24 MIDI clocks per quarter note)

Below is a table of values you can set the divide ratio to in order to obtain a clock pulse at various musical time intervals:-

Note type	Divide ratio	CPQN (clocks per quarter note)
Crotchets (quarter notes)	24	1
Crotchet triplets	16	
Quavers (eighth notes)	12	2
Quaver triplets	8	
Semiquavers (sixteenths)	6	4
Semiquaver triplets	4	6
Demisemiquavers	3	8
Demisemiquaver triplets	2	12

AUX outputs

A 32 AUX 2 controller number (default: 7)

- Sets which MIDI controller will control the auxiliary output. The following can be selected:

Off [oFF]
Pitch bend [Pbd]
Velocity [VEL]
Aftertouch [AFt]
MIDI controllers 0-119

A 33 AUX 2 reset value (default: 127)

Range 0 to 127

- Sets the level the Auxiliary output will reset to when the *MSRK board* is powered on or when it receives a controller reset MIDI command or a new setup is loaded from memory. This is equivalent to a MIDI message of this value being received, so it will be influenced by min and max settings above.

A 34 **AUX 3 controller number (default: 18)**

- Sets which MIDI controller will control the auxiliary output. The following can be selected:

Off	[oFF]
Pitch bend	[Pbd]
Velocity	[VEL]
Aftertouch	[AFt]
MIDI controllers	0-119

A 35 **AUX 3 reset value (default: 0)**

Range 0 to 127

- Sets the level the Auxiliary output will reset to when the *MSRK board* is powered on or when it receives a controller reset MIDI command or a new setup is loaded from memory. This is equivalent to a MIDI message of this value being received, so it will be influenced by min and max settings above.

OTHER USEFUL INFO

The MSRK board / Micromac D will always respond to controller #64 (sustain pedal)

Always leave parameter 32 (LFO MIDI sync) set to OFF unless you are actually using it. It uses a lot of processor power, particularly at high clock speeds with low settings such as 1 or 2.

SYSEX CONTROL for the MSRK board in the MICROMAC D

The *MSRK board* can be controlled by SysEx (System Exclusive) messages in the following formats:

The first five bytes of SysEx for the MSRK board are always the same for all data types

- [1] 0F0h - Sysex command
- [2] 00h - Company ident first byte
- [3] 20h - Company ident second byte
- [4] 13h - Company ident third byte
- [5] 10h - Product code – MSRK board
- [6] zzh - where zz is 0 - 0Fh = device number 1-16 or 7Fh = firmware upgrade

For program dump request:

- [7] 10h - program dump request
- [8] xx - prog number to dump from (1 to 40) or 0 = edit buffer (current)
- [9] 0F7h - end of exclusive

The *MSRK board* responds by sending a program dump in the format given below for dump receive

For program dump receive:

- [7] 40h - program dump receive
 - [8] xx - prog number to dump from (1 to 40) or 0 = edit buffer (current)
 - [9] 0uuuuuuu - where uuuuuuu = high 7 bits of data
 - [10] 0hhhhhhh - where hhhhhh = low 7 bits of data
- 9 & 10 above are repeated 48 times (for 48 bytes of data)
- [105] 0F7h - end of exclusive (total bytes 105)

For firmware upgrade:

- [7 to 65406] = 65400 bytes - where 57225 bytes of 8 bit code are packed as 65400 bytes of 7 bits
- [65407] 0F7h - end of exclusive (total bytes 65407)

Note that *MSRK board* must start receiving the firmware upgrade within 20 seconds after power-up, otherwise it will be ignored.

For info change:

- [7] 20h - info change
- [8] 0uuuuuuu - where uuuuuuu = high 7 bits of parameter address (always zero for MSRK board)
- [9] 0hhhhhhh - where hhhhhh = low 7 bits of parameter address
- [10] 0uuuuuuu - where uuuuuuu = high 7 bits of data (either 0 or 1 for MSRK board)
- [11] 0hhhhhhh - where hhhhhh = low 7 bits of data (see later for further explanation and examples)
- [12] 0F7h - end of exclusive

The *MSRK board* responds by changing the specified data and updating the display if necessary. Parameter data are accessed at the following addresses:-

Address	Function	Range	Notes (see end)
00	Receive chan	0 - 15	{ 1 }
01	trig / retrig	0 - 25	
02	note priority	0 - 2	
03	pitchbend range	0 - 24	
04	portamento cont #	253 - 0 - 119	{ 3 }
05	portamento time / rate	0 - 127	
06	portamento type	0 - 1	0=fixed rate / 1= fixed time
07	LFO to CV depth controller #	252 - 0 - 119	{ 4 }
08	LFO to CV min val	0 - 127	
09	LFO to CV max val	0 - 127	
10	LFO to CV reset val	0 - 127	

11	coarse tune / transpose	232 > 0 > 24	{ 2 }
12	fine tune val	129 > 0 > 127	129>0 = -ve
13	scale val	129 > 0 > 127	129>0 = -ve
14	v/o or hzv or 1.2v select	0 - 2	
15	gate select	0 - 4	
16	Aux1 Cont #	252 > 0 > 119	{ 6 }
17	Aux1 min val	0 - 127	
18	Aux1 max val	0 - 127	
19	Aux1 reset val	0 - 127	
20	Key scale to Aux	0 - 127	
21	LFO to Aux1 cont #	252 - 0 - 119	{ 4 }
22	LFO to Aux1 min val	0 - 127	
23	LFO to Aux1 max val	0 - 127	
24	LFO to Aux1 reset value	0 - 127	
25	Lfo speed	0 - 191	
26	Lfo waveshape	0 - 8	{ 7 }
27	Lfo MIDI sync	0 - 96	{ 8 }
28	Lfo sync start point	0 - 255	
29	Key-on resets LFO wave	0 - 1	{ 10 }
30	cont = start	0 - 1	{ 11 }
31	Clock divide	0 - 24	{ 9 }
32	Aux2 Cont #	251 > 0 > 119	{ 6 }
33	Aux2 Reset value	1 - 127	
34	Aux3 Cont #	251 > 0 > 119	{ 6 }
35	Aux3 Reset value	1 - 127	

{ NOTES }

- { 1 } Data 0 - 15 corresponds to MIDI channels 1 - 16
- { 2 } 232 = -24 semitones 0 = no transpose 24 = + 24 semitones - 25 to 231 are invalid
- { 3 } 253=pmt off 254=pmt on 255=auto pmt & 0 - 119
- { 4 } 252=ignore 253=pitchbend 254=velocity 255=aftertouch & 0 - 119
- { 5 } 0= -64 64=0 127=+63
- { 6 } 252=ignore 253=p.bend 254=vel 255=aft & 0 - 119
- { 7 } 0= triangle 1= saw up 2= saw down 3= 10% pulse etc. as display
- { 8 } 1 - 96 corresponds to sync divide 1 to 96 and 0 = off
- { 9 } 0 - 23 corresponds to arpeggio divide 1 to 24
- { 10 } 0=off 1=on
- { 11 } 0 = continue ignored 1 = continue=start

All SysEx addresses and data are range checked and out-of-range values will either be ignored or adjusted to give a valid response.

SysEx device number cannot be changed on this product

SysEx examples

The high *BIT* of any byte within a SysEx string MUST always be zero (not a 1). In other words: You can't send any value greater than 7F (127 decimal) inside a SysEx string - that is why the high byte is there for addresses and data – so you shift the 1 into the high byte. So for example:

126 decimal = 7E hex sent as 00 7E (high byte, low byte)
 127 decimal = 7F hex sent as 00 7F (high byte, low byte)
 128 decimal = 80 hex sent as 01 00 (high byte, low byte)
 129 decimal = 81 hex sent as 01 01 (high byte, low byte)

188 decimal = BC hex sent as 01 3C (high byte, low byte)

254 decimal = FE hex sent as 01 7E (high byte, low byte)
 255 decimal = FF hex sent as 01 7F (high byte, low byte)

For changing the MIDI receive channel to 3 you should send the following (although see page 2 for the easier non-SysEx way)

F0 00 20 13 10 00 20 00 00 00 02 F7

F0 - begin SysEx
00 20 13 - Kenton manufacturer code
10 - MSRK module product code
00 - device number
20 - info change
00 - high byte of address (always zero)
00 - low byte of address (00 for rx chan)
00 - high byte of data (always 00 or 01)
02 - low byte of data (02 for channel 3)
F7 - End of SysEx

For setting LFO speed to 191

F0 00 20 13 10 00 20 00 19 01 3F F7

F0 - begin SysEx
00 20 13 - Kenton manufacturer code
10 - MSRK module product code
00 - device number
20 - info change
00 - high byte of address (always zero)
19 - low byte of address (25 decimal = 19 hex for LFO speed)
01 - high byte of data (01 = +128)
3F - low byte of data (191 minus 128 = 63 decimal = 3F hex)
F7 - End of SysEx

For setting Aux1 controller to Velocity (although note that Aux1 is not factory wired to VCF so will not work without modification)

F0 00 20 13 10 00 20 00 10 01 7E F7

F0 - begin SysEx
00 20 13 - Kenton manufacturer code
10 - MSRK module product code
00 - device number
20 - info change
00 - high byte of address (always zero)
10 - low byte of address (16 decimal = 10 hex for Aux1 controller)
01 - high byte of data (01 = +128)
7E - low byte of data (254 minus 128 = 126 decimal = 7E hex)
F7 - End of SysEx

Note that any changes made via SysEx will not be saved for the next time you power the unit up, they are considered to be transient. If you want to save them you'll need to enter setup mode with quick press of the push button and then exit again using top C (MIDI note 96)

Also note some settings are overridden by a setup routine for tuning to the synth (you must never adjust the trimmers that are on the module - they are factory set and should stay that way).

These are:

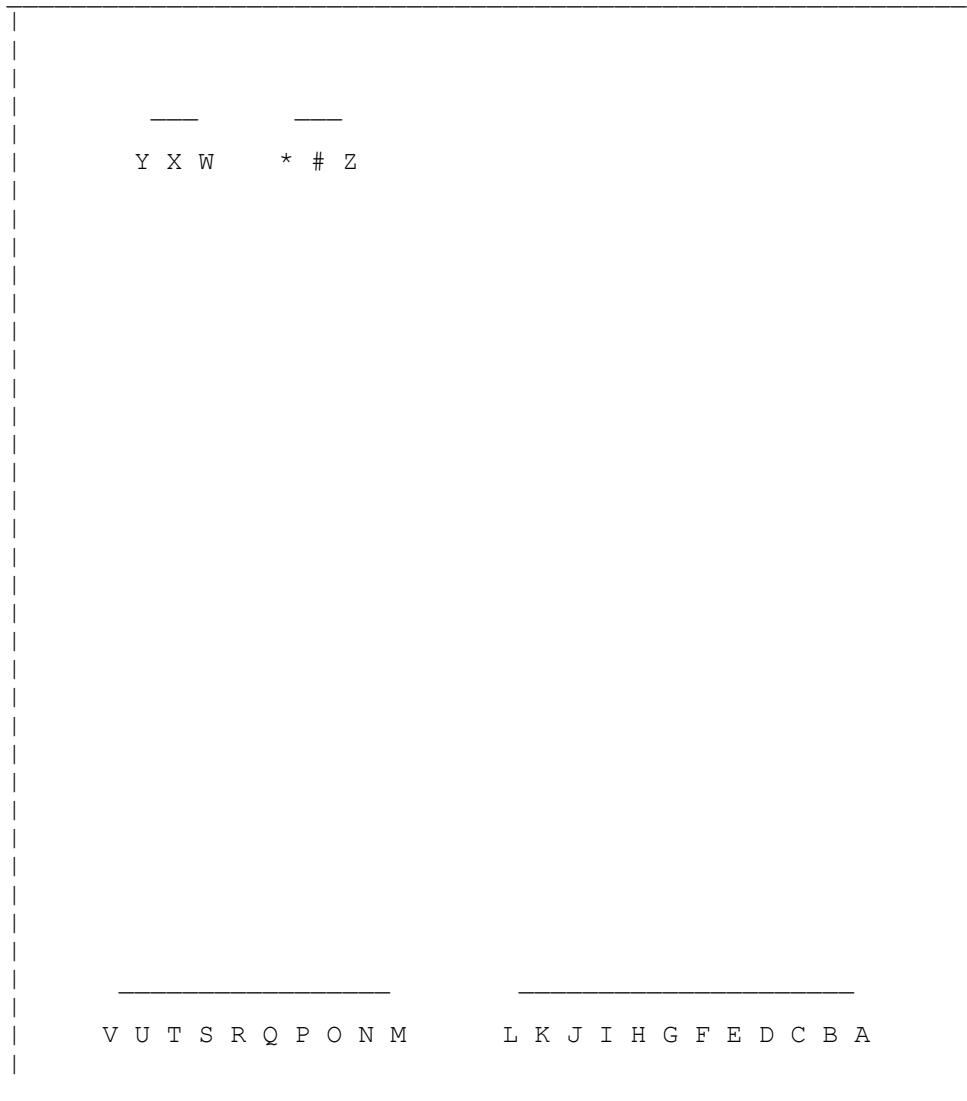
Fine Tune, Coarse Tune (transpose), Scale, CV/HzV, Gate type, Retrig time, and possibly others.

If you get into a knot, you can always put the module back to its defaults by holding the setup button pressed while you power-on.

If you want to control filter cutoff of the Micromac you should use AUX 1 output of the board - that's connection 'R' - connection diagram later in this document.

Connection info for MSRK5v20 version board

Viewed from the component side of the board, connections are as follows:



Connections for K1 (A is pin 1)

- A POWER IN + (UNREG DC BETWEEN 9V AND 35V)
- B GROUND
- C GATE (+5V)
- D S-TRIG (opto collector)
- E S-TRIG (opto emitter)
- F TRIG (opto collector)
- G TRIG (opto emitter)
- H ARP CLOCK (+5V)
- I STOP START (+5V)
- J GATE DETECT (GROUND THIS PIN OR LEAVE O/C)
- K PUSH BUTTON - CONNECT BUTTON BETWEEN HERE AND GROUND
(pressing button puts MIDI board into setup mode)
- L GROUND

Connections for K5 (M is pin 1)

M CV IN FROM SYNTH (voltage from synth keyboard - used to go to osc)
N CV OUT - (CV for driving synth oscillators)
O MOD IN FROM SYNTH (signal from wiper of synth mod wheel)
P MOD OUT (wire that used to go to wiper of mod wheel)
Q LFO PICKUP (LFO signal from hot pin of mod wheel)
R AUX 1 - CC#16 - can also be modulated by internal LFO using CC#17
S AUX 2 - CC#7 - 0 - 12.7V
T AUX 3 - CC#18 - 0 - 12.7V
U AUX 4 - CC#19 - 0 - 12.7V
V GROUND

Connections for K3 (W is pin 1)

W MIDI OUT DIN SOCKET PIN 4
X MIDI OUT DIN SOCKET PIN 2
Y MIDI OUT DIN SOCKET PIN 5

Connections for K2 (Z is pin 1)

Z MIDI IN DIN SOCKET PIN 4
NOT USED
* MIDI IN DIN SOCKET PIN 5

To gain MIDI control of filter cutoff (VCF)

The filter of the Micromac is not wired to the MSRK board but easily can be. You just need to connect connection 'R' through a 100K resistor to the summing point of the VCF circuit.

To locate the summing point, find the wiper (centre) connection of the VCF pot on the synth, it will be connected to a resistor. Find this resistor and find where it goes to - this will be the summing point. Connect the signal from the MSRK board through a 100K resistor (1/4 or 1/8th watt) to this summing point,

MIDI CONTROLLER NUMBERS AND THEIR STANDARD FUNCTIONS

Controller Number		Control Function
Decimal	Hex	
0	00H	Bank select MSB
1	01H	Modulation wheel/lever
2	02H	Breath controller
3	03H	Undefined
4	04H	Foot controller
5	05H	Portamento time
6	06H	Data entry MSB
7	07H	Main volume
8	08H	Balance
9	09H	Undefined
10	0AH	Pan
11	0BH	Expression controller
12-15	0C-0FH	Undefined
16-19	10-13H	General purpose controllers (1-4)
20-31	14-1FH	Undefined
32-63	20-3FH	LSB for controllers 0-31
64	40H	Damper pedal (sustain) (Hold 1)
65	41H	Portamento on/off
66	42H	Sostenuto on/off
67	43H	Soft pedal
68	44H	Undefined
69	45H	Hold 2
70-79	46-4FH	Undefined
80-83	50-53H	General purpose controllers (5-8)
84-90	54-5AH	Undefined
91	5BH	External effects depth
92	5CH	Tremolo depth
93	5DH	Chorus depth
94	5EH	Celeste (detune) depth
95	5FH	Phaser depth
96	60H	Data increment
97	61H	Data decrement
98	62H	Non-registered parameter number LSB
99	63H	Non-registered parameter number MSB
100	64H	Registered parameter number LSB
101	65H	Registered parameter number MSB
102-119	66-78H	Undefined
120-127	79-7FH	Reserved for channel mode messages

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