

# Lintronics Advanced Memorymoog Manual



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## INTRODUCTION

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The **Lintronics Advanced MemoryMoog (LAMM)** is not just another MIDI upgrade for the Moog Memorymoog synthesizer, but rather a completely new further development of the legendary Memorymoog. These advancements do, of course, include a comprehensive MIDI upgrade, but also encompass numerous deep changes in the Memorymoog's soft- and hardware.

Our intensive study of the Memorymoog began in the middle of 1989. The Memorymoog's operating system was completely rewritten, and the hardware so thoroughly upgraded and "tweaked" that the **LAMM** has been fully freed of the glitches and problems that have plagued Memorymoog users on stage and in the studio.

Although the Memorymoog has been out of production since 1984, our upgrade is by no means antiquated or obsolete. For one, we are able to obtain most of the original replacement parts for the Memorymoog, and we have replaced the central processing unit of the Memorymoog with a more advanced CPU, which more than doubles the Memorymoog's performance. We have, however, resisted the temptation to attempt to "improve" the Memorymoog's synthesis in any fashion.

The purpose of the development of **LAMM** was not to simply endow the Memorymoog with MIDI and correct design errors, but rather to design a more clearly arranged and accessible user interface for the Memorymoog. With some pride we would say that not only does the **LAMM** possess many features not found in any other machine on the market, but also has a user interface that is so clear that an experienced user quickly finds the manual to be superfluous.

We of course often receive suggestions from users or discover new facts about the Memorymoog, and so will continually send out updates to the **LAMM**.

Users of MAC or WINDOWS computers should take note that Michael Heydn from **EMAGIC** has developed the SOUND DIVER Editor/Bankloader, which allows users to take full advantage of the **Lintronics Advanced Memorymoog**.

Wilhermsdorf, Germany  
April 25, 2024

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## QUICK REFERENCE GUIDE

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If you hate reading manuals, please read at least this page! This is a condensed primer on how to...

### ...set the MIDI channels

Transmit channel: press "C"-**5**"-ENTER, type in the transmit channel, **ENTER**.  
Receive channel: press "C"-**6**"-ENTER, type in the receive channel, **ENTER**.  
Omni off: press "C"-**9**"-ENTER-**7**"-ENTER-**0**"-ENTER.

### ...control the Moog's pitch and modulation wheels via MIDI \*)

Enable reception: press "C"-**9**"-ENTER-**1**"-ENTER-**1**"-ENTER.  
Assignment: press "C"-**9**"-ENTER-**9**"-ENTER-**1**"-ENTER, grab the pot named "Modulation Amount" and move it until a value of +1 is displayed, confirm with **ENTER**.

### ...use a velocity sensitive keyboard to control the Memorymoog \*)

Assignment: press "C"-**9**"-ENTER-**9**"-ENTER-**2**"-ENTER, move the pot to be affected by velocity until a value other than "OFF" is displayed, confirm with **ENTER**.

### ...use a pressure sensitive keyboard to control the Memorymoog \*)

Enable reception: press "C"-**9**"-ENTER-**1**"-ENTER-**5**"-ENTER.  
Assignment: press "C"-**9**"-ENTER-**9**"-ENTER-**3**"-ENTER, move the pot to be affected by Aftertouch until a value other than "OFF" is displayed, confirm with **ENTER**.

### ...change sounds via MIDI program change messages

Enable reception: press "C"-**9**"-ENTER-**4**"-ENTER-**1**"-ENTER.

### ...transmit and receive sound dumps via MIDI, system exclusive

Enable SysEx: press "C"-**9**"-ENTER-**8**"-ENTER-**1**"-ENTER.  
Dump one sound: press "C"-**7**"-ENTER.  
Dump all sounds: press "C"-**8**"-ENTER.

### ...transmit and receive all editing activity (pots, buttons and switches) via MIDI

Enable pot control: press "C"-**9**"-ENTER-**2**"-ENTER-**1**"-ENTER.  
Enable switching: press "C"-**9**"-ENTER-**3**"-ENTER-**1**"-ENTER.  
Application: This unique function allows realtime control of every pot movement or button actuation via MIDI! For example, you could record and play back all your editing performance with any MIDI sequencer. Since simple MIDI control changes are used instead of SysEx, operation is transparent, quick, reliable and memory-saving.

### ...synchronize the arpeggiator or the LFO to MIDI clock \*)

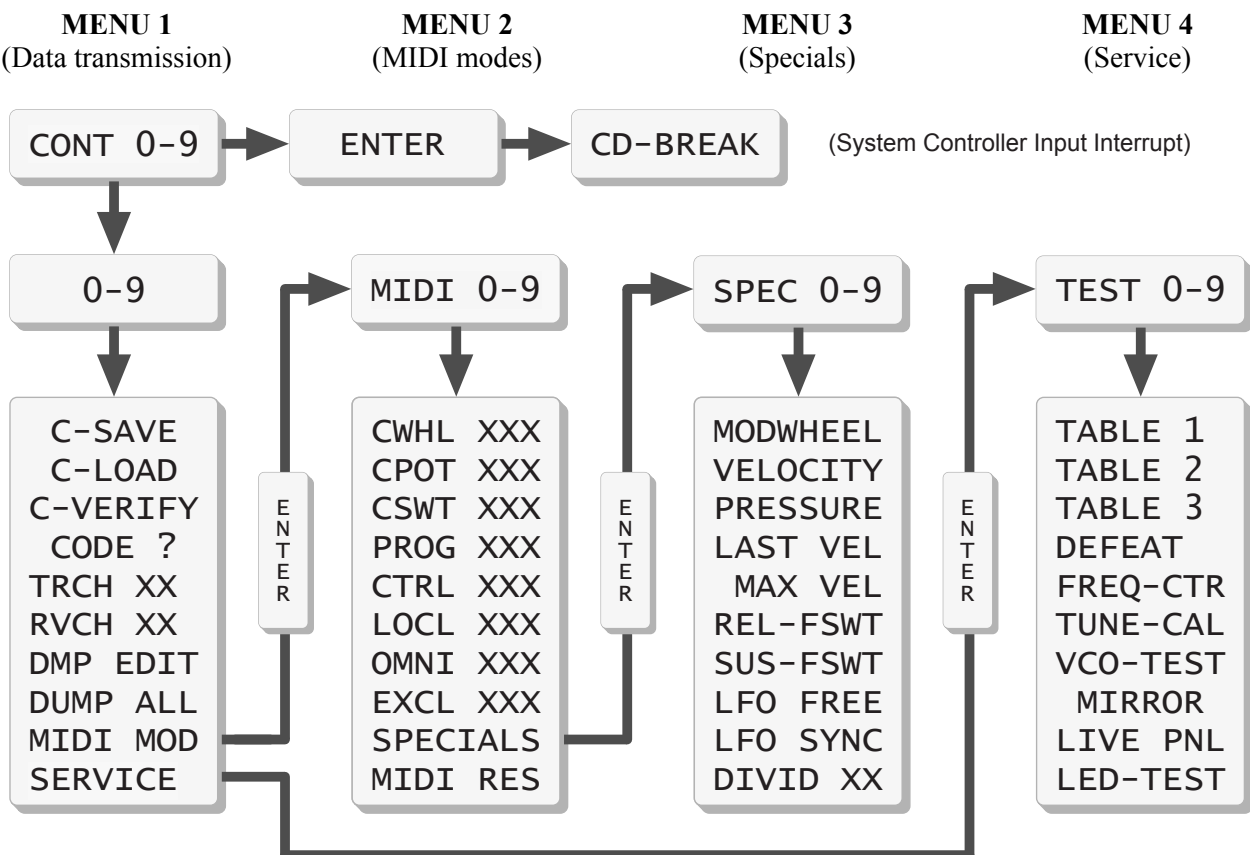
Gotcha! We suggest that you read the pages B-4 and B-9. (and what about the others?).

\*) marked settings are storable per sound.

Keyboard / Arpeggiator Modes

| Polyphonic Keyboard Modes |          | Monophonic Keyboard Modes |          | Arpeggiator Modes |          |
|---------------------------|----------|---------------------------|----------|-------------------|----------|
| 1                         | CYCLIC   | 1                         | VOICES 1 | 1                 | UP /1    |
| 2                         | MEM-CYC  | 2                         | VOICES 2 | 2                 | DWN /1   |
| 3                         | RESET    | 3                         | VOICES 3 | 3                 | UP/DWN/1 |
| 4                         | MEM-RES  | 4                         | VOICES 4 | 4                 | UP /*    |
| 5                         | POT-LOCK | 5                         | VOICES 5 | 5                 | DWN /*   |
| 6                         | POT -ON- | 6                         | VOICES 6 | 6                 | UP/DWN/* |
| 7                         | HOLD KEY | 7                         | LATEST X | 7                 | UP/DWN/6 |
| 8                         | HOLD OFF | 8                         | LOW X    | 8                 | AUTOTRIG |
| 9                         | POT-->CV | 9                         | HIGH X   | 9                 | CLK LFO  |
| 0                         | CV-->POT | 0                         | 3/4 XXXX | 0                 | CLK MIDI |

System Controller



## 1. Power on

**Previously:** sound program number "1" would appear in the display, and the last edited sound would be overwritten with program number "1" (that means: erased).

**Now:** the last selected program and the edit buffer are retained after power off and available again after the power is turned back on.

## 2. Octave buttons in the wheel panel

**Previously:** non-programmable

**Now:** programmable on a per sound basis



## 3. Potentiometer values

**Previously:** values from 0 to 100 were shown

**Now:** the resolution has been changed from 0 to 127, which allows finer control of the parameters, and is consistent with standard MIDI values.

## 4. HOLD function

(Users who don't possess the original Memorymoog manual should be aware that there are two methods to hold intervals or chords on the Memorymoog. One either plays a chord and then hits the HOLD button, or one first presses the HOLD button and then plays the individual notes of the chord. When using the second method, the notes must be played carefully, as pressing more than one key simultaneously causes the hold function to toggle off.)

**Previously:** as explained above, pressing two keys simultaneously in the HOLD function would cause the hold function to toggle off, although the HOLD LED would remain lit.

**Now:** the hold procedure is canceled and the HOLD LED is unlit if you press two or more notes simultaneously while depressing the HOLD button. In MONO mode, the hold function is not available any more. Pressing the HOLD button in MONO mode will cause the display to read "<-- MONO" and the HOLD LED will remain unlit. Hold is kept, even if you switch to another program, unless you switch to a program which was stored in MONO mode. Pressing the MONO button will cause the hold function to be canceled.

## 5. LFO wave forms

**Previously:** only one LFO wave form was selectable.

**Now:** it's possible to mix all LFO wave forms.

## 1. Keyboard Mode (Poly Mode)

**Previously:** to change the KB Mode it was necessary to press the KB Mode switch, enter a value from 1 to 4 with the numerical keypad and then verify this entry with the **ENTER** button. The display showed only "**EDIT**", which meant that it was impossible to see which mode was currently active.

**Now:** pressing the KB Mode switch causes the current KB Mode to be displayed immediately as text. Pressing any numeric button from 0 to 9 causes the Memorymoog to enter the corresponding KB Mode directly (i.e. without **ENTER**). Pressing any button other than 0 to 9 causes the LAMM to immediately leave the KB Mode menu (all edits in KB Mode are of course retained).

The buttons 0 through 9 correspond to the following functions:

- |   |            |   |
|---|------------|---|
| 1 | CYCLIC     | cyclic mode <i>see</i> page B-3                         |
| 2 | MEM-CYC    | memory cyclic mode <i>see</i> page B-3                  |
| 3 | RESET      | reset mode <i>see</i> page B-3                          |
| 4 | MEM-RES    | memory reset mode <i>see</i> page B-3                   |
| 5 | POT-LOCK   | lock pots <i>see</i> page B-3                           |
| 6 | POT -ON-   | release pots <i>see</i> page B-3                        |
| 7 | HOLD KEY   | hold up to 6 notes <i>see</i> page B-3                  |
| 8 | HOLD OFF   | cancels previous function                               |
| 9 | POT --> CV | pots reacts immediately                                 |
| 0 | CV --> POT | pots reacts when the value agrees with the memory value |

## 2. Keyboard Mode (Mono Mode)

**Previously:** pressing the KB Mode switch would cause one of the three options "**LATEST**", "**LOW**" or "**HIGH**" to be displayed. These options corresponded to the key priority in Mono mode, i.e. whether the last, lowest, or highest key of a chord would sound. These options were selected by pressing either 1, 2 or 3 in the numeric key pad, and confirmed by pressing **ENTER**. The display would then show "**VOICES?**" whereupon one could press a numeric button from 1 to 6 to select the number of active voices, also confirmed by pressing **ENTER**.

**Now:** as before, pressing KB Mode causes "**LATEST**", "**HIGH**" or "**LOW**" to be displayed. In addition the last field in the display also shows the current number of active voices. The user interface has been simplified, as now pressing a button between 1 and 6 now selects the number of active voices, and pressing a button from 7 to 9 selects the note priority (see table below). Numeric button 0 calls the RAM check and shows the version and serial number.

Pressing one of the numerics now immediately changes the corresponding parameter without a confirmation via **ENTER**. Pressing any other button causes the Memorymoog to leave KB Mode. All edited parameters are retained.

The buttons 0 through 9 correspond to the following functions:

- |   |          |  |
|---|----------|--|
| 1 | VOICES 1 | number of the active voices  |
| 2 | VOICES 2 | number of the active voices  |
| 3 | VOICES 3 | number of the active voices  |
| 4 | VOICES 4 | number of the active voices  |
| 5 | VOICES 5 | number of the active voices  |
| 6 | VOICES 6 | number of the active voices  |
| 7 | LATEST x | x = number of the active voices  |
| 8 | LOW x    | x = number of the active voices  |
| 9 | HIGH x   | x = number of the active voices  |
| 0 | 3/1 xxxx | when the RAM check is successful, the display shows the version and serial number, otherwise ERROR Ux. |

## **Polyphonic Keyboard Modes**

The individual keyboard modes primarily affect the glide effect and panorama (stereo outputs).

### **CYCLIC**

This mode causes each keypress to be assigned to a different voice (the ordering is fixed: 1, 2, 3, 4, 5, 6, 1, 2, ...)

### **MEM-CYC**

When you repeat the same notes (up to 6) over and over again, you should always hear the same voices.

### **RESET**

This mode works in principle in the same fashion as the CYCLIC mode. The difference: playing single keys always causes voice 1 to be played. This characteristic allows monophonic type playing in poly mode. This effect is particularly useful in combination with the arpeggiator and the stereo outputs.

### **MEM-RES**

The effect is almost like that of MEM-CYC, with the difference that voice 1 sounds if you play only one note.

### **POT-LOCK**

This function is not stored per sound, but remains in effect if the Memorymoog is turned off and then later turned on again. The idea is to prevent an accidental "editing" of the Memorymoog's parameters during live work. In addition, activating POT-LOCK causes the Memorymoog's CPU to stop cyclically "polling" the pots to see if one has been moved (i.e. a parameter has been edited). This frees the CPU for other activities (for example, the arpeggiator can be used at higher rates).

### **POT-ON**

This releases the potentiometer locking.

### **HOLD KEY**

Notes from up to six voices are held until other notes are played (max. 10 keys!). If the same note key is pressed again, no trigger impulse is sent (i.e. the envelope isn't restarted). This function is programmable and storable per sound. Selecting the HOLD KEY also causes the RELEASE/SUSTAIN footswitch to be set to RELEASE.

### **HOLD OFF**

Shuts off the previous function, also causes the RELEASE/SUSTAIN footswitch to be set to RELEASE.

### **POT --> CV**

In this mode the pots reacts on the same way as a non-upgraded Memorymoog.

### **CV --> POT**

Moving a pot has no affect when the value of the pot is not the same value of the memory. As long as the values are different the display shows the sign "<>" between the values (for smooth pot movements).



## 1. Arpeggiator

Although the arpeggiator may be seen by some to be a "gimmick" or "mere" playing aid, we decided to further develop the Memorymoog's arpeggiator so that a musician can use it in a true musical setting. Pressing the arpeggiator button allows the selection of ten different functions (numerical buttons 0 through 9):

|   |          |  |
|---|----------|--|
| 1 | UP/1     | arpeggio upwards   |
| 2 | DWN/1    | arpeggio downwards   |
| 3 | UP/DWN/1 | arpeggio upwards/downwards   |
| 4 | UP/*     | sequence upwards with Split  |
| 5 | DWN/*    | sequence downwards with Split  |
| 6 | UP/DWN/* | sequence upwards/downwards with Split  |
| 7 | UP/DWN/6 | octave up/ octave down (max. 6 voices)   |
| 8 | AUTOTRIG | note repetition (max. 6 voices)  |
| 9 | CLK LFO  | LFO controls the arpeggiator   |
| 0 | CLK MIDI | MIDI clock controls the arpeggiator, the divider is selectable in the SPECIALS page. |

**Previously:** the arpeggiator function was entered by pressing the arpeggiator button, selecting the type of arpeggio with a numeric button from 1 to 9, and confirming this choice with **ENTER**. Only then was the arpeggio audible, and the display would only show the word "**EDIT**". Checking or editing one's choice was then only possible through exiting and then reentering the arpeggio function. Latched or held arpeggios (HOLD) were also handled by the arpeggio function.

**Now:** pressing a numeric button from 0 to 9 after pressing the arpeggio button causes the arpeggio to become immediately audible. Arpeggios of all types can be latched or held via the HOLD KEY function (*see* page B-3). In split mode (choices 4 through 6), one can play the lower two octaves of the keyboard (up to five voices) normally, while the upper three octaves are reserved for arpeggios. In split mode, the HOLD KEY only functions to latch the arpeggio in the upper three octaves. Held keys (*see* page B-1.4) can also be held in the arpeggiator.

**Note:** Please be aware of the distinction between the HOLD KEY function and the HOLD function! All arpeggios are also retained when the Memorymoog is turned off.

## 2. Program Sequencer

The program sequencer allows the user to create a customized series of program numbers. The program sequencer is entered by pressing the "**D**" button. If no editing is done, then this function may be exited by pressing **ENTER** (the display then shows "**CD-BREAK**").

**Previously:** calling up the program sequencer when it was empty (i.e. all presets erased) would cause the Memorymoog to "crash", i.e. to become fully inoperable. The only recourse was to turn off the Memorymoog and turn it back on.

**Now:** Entering the program sequencer while it is empty simply results in the Memorymoog displaying "**CLEARED**". The program sequencer is now exited by pressing the "**D**" button a second time, upon which the Memorymoog displays "**PSEQ OFF**".

### CLK LFO

The Moog's internal LFO Clock is the source for the arpeggio speed.

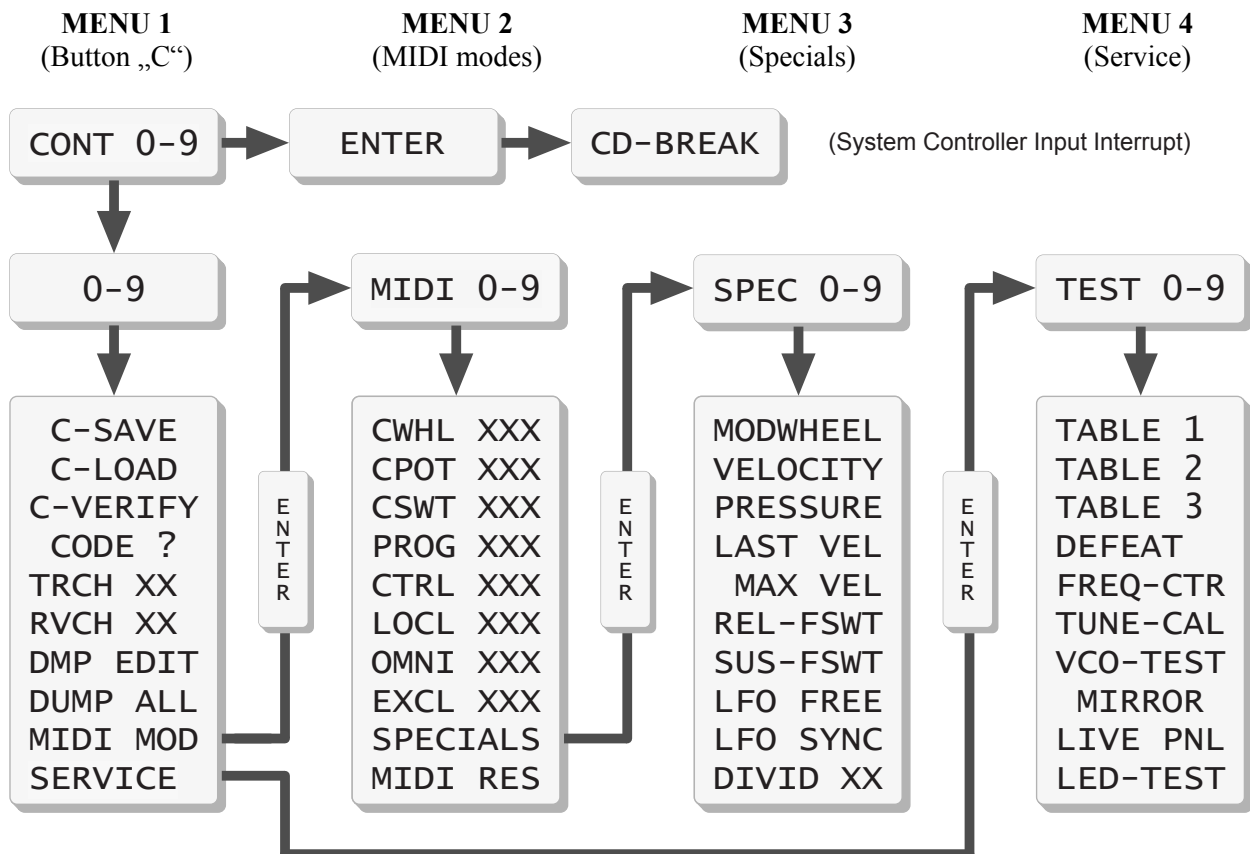
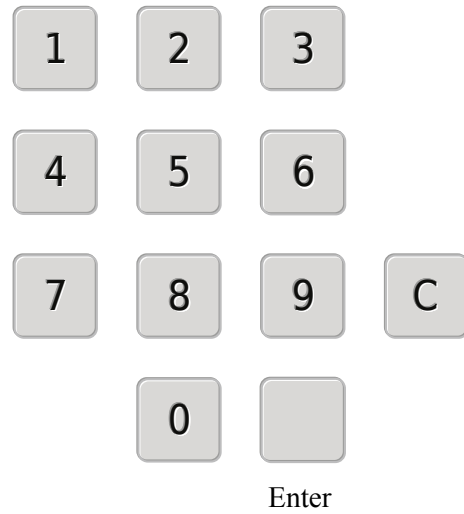
### CLK MIDI

Incoming MIDI clock messages control the arpeggio speed (the arpeggio LED will blink until a MIDI start message is recognized).

# SYSTEM CONTROLLER OVERVIEW

You can call the system controllers page with the "C" button. The display will read "CONT 0-9". To leave the system controller page without calling any system function, just press **ENTER** before pressing any numerical button (the display will read "CD-BREAK") or edit a current sound (e.g. by moving a programmable pot).

(numeric keypad layout)



## System Controller Page ("C" button)

Pressing "C" enters the system controller main menu, which consists of eight menu points and two sub-menu points. The display in this function reads "**CONT 0-9**". The menus can be exited by either pressing **ENTER** before pressing any numerical button, or by activating an editing operation.

The menu layout is as follows:

|   |          |   |
|---|----------|---|
| 1 | C-SAVE   | dump internal data to cassette recorder     |
| 2 | C-LOAD   | load internal data from cassette recorder   |
| 3 | C-VERIFY | verify cassette data                        |
| 4 | CODE ?   | input code                                  |
| 5 | TRCH xx  | display current MIDI transmit channel xx    |
| 6 | RVCH xx  | display current MIDI receive channel xx     |
| 7 | DMP EDIT | dump current sound parameters via MIDI out  |
| 8 | DUMP ALL | dump all sounds via MIDI out                |
| 9 | MIDI-MOD | enter MIDI sub-menu <i>see</i> page B-7     |
| 0 | SERVICE  | enter SERVICE sub-menu <i>see</i> page B-10 |

The desired function is selected by pressing the corresponding numeric button from 0 to 9, which causes the function name to be displayed. The function will only be executed after the **ENTER** button is pressed. You can select another function before pressing the **ENTER** button.

The functions 1 through 3 are as they were in the original Memorymoog (*please refer to the Memorymoog manual for details*).

### CODE ?

This has only been changed by the addition of a confirmation of a code change by the display "**STORED**".

### TRCH xx

The MIDI output channel is displayed as a number between 1 and 16. Pressing **ENTER** replaces the number being displayed by "\*\*". The desired MIDI output channel can then be selected via the numeric buttons. "Typos" can be simply overwritten by typing in a different number. The change takes effect only after the **ENTER** button is pressed.

### RVCH xx

This is fully analogous to the TRCH function, with the difference that the MIDI receive channel is modified.

### DMP EDIT

The currently edited (edit buffer) sound is transmitted via MIDI system exclusive after the **ENTER** button is pressed.

### DUMP ALL

All sounds including the edit buffer are sent via system exclusive through the MIDI out port. The display shows "**ACTIVE**" for approximately four seconds, and the Memorymoog audio output is muted during the transfer.

## System Controller MIDI-Mode sub-menu ("C" - "9" - Enter)

The numeric buttons 0 through 9 correspond to the following menu layout in the MIDI mode sub-menu:

|   |          |  |
|---|----------|--|
| 1 | CWHL xxx | wheels on/off (MIDI in)                    |
| 2 | CPOT xxx | potentiometers on/off (MIDI in/out)        |
| 3 | CSWT xxx | switches on/off (MIDI in/out)              |
| 4 | PROG xxx | program change on/off (MIDI in/out)        |
| 5 | CTRL xxx | remaining controllers on/off (MIDI in/out) |
| 6 | LOCL xxx | local on/off (MIDI in/out)                 |
| 7 | OMNI xxx | omni mode on/off                           |
| 8 | EXCL xxx | system exclusive on/off (MIDI in/out)      |
| 9 | SPECIALS | SPECIALS sub-menu                          |
| 0 | MIDI-RES | MIDI reset                                 |

The desired function is selected by pressing the corresponding numeric button, which causes the current state to be displayed ("xxx" is either "ON" or "OFF"). One can change the selection as often as desired; the function is executed only after **ENTER** is pressed. For the functions 1 through 8, the displayed state is replaced by "-?-". The button 1 then selects the "ON" state for the function, any other numeric button means "OFF". The choice must be confirmed with **ENTER**.

### **CWHL xxx**

Pitch and modulation wheel data at the MIDI IN port are either accepted or ignored.

### **CPOT xxx**

Transfer of changes to the potentiometer values via MIDI in and out is either permitted or ignored according to this setting.

### **CSWT xxx**

Transfer of button actuation via MIDI In or Out is permitted or ignored according to this setting.

### **PROG xxx**

MIDI program changes (in/out) enabled or disabled.

### **CTRL xxx**

Aftertouch and all remaining controller values are either transferred or not according to this setting. This includes, for example, footswitches, All notes off, etc. (*see* the MIDI Appendix).

### **LOCL xxx**

The Memorymoog keyboard is activated or deactivated according to this setting (the Memorymoog powers on in LOCAL ON mode).

### **OMNI xxx**

The MIDI omni mode is activated or deactivated by this setting. This does not alter the stored MIDI in channel (RVCH).

### **EXCL xxx**

Allows or prevents the transmission and reception of MIDI SYSEX data.

### **MIDI-RES**

The MIDI reset function sets all of the previous eight options to "ON", sets the MIDI receive and transmit channels to 01, deactivates external potentiometer control for the mod. wheel, velocity and pressure, sets the arpeggio clock to the LFO, and sets the divider to 1. These functions are executed after **ENTER** is pressed, and the display shows "**EDIT**".

## System Controller Specials ("C" - "9" - Enter - "9" - Enter)

The numeric buttons in this sub-menu correspond to the following functions:

- |   |          |  |
|---|----------|--|
| 1 | MODWHEEL | external mod. wheel controls a pot (MIDI in) |
| 2 | VELOCITY | external velocity controls a pot (MIDI in)   |
| 3 | PRESSURE | external pressure controls a pot (MIDI in)   |
| 4 | LAST VEL | last velocity value effective                |
| 5 | MAX VEL  | highest velocity value effective             |
| 6 | REL-FSWT | footswitch controls release                  |
| 7 | SUS-FSWT | footswitch controls sustain                  |
| 8 | LFO FREE | the LFO is not synchronized                  |
| 9 | LFO SYNC | MIDI clock synchronizes the LFO              |
| 0 | DIVID xx | MIDI clock divider (01-16)                   |

The items in the SPECIALS menu are intended to increase the expressiveness of the Memorymoog. External MIDI controllers can be freely assigned to potentiometers, and then used to control the values of these pots. Keying a numerical value and pressing **ENTER** brings the user to the desired function. Edits can be stored per program. Exiting this mode is accomplished by either selecting another edit function on the Memorymoog, or pressing the "C" button followed by the **ENTER** button (the display will show "**CD-BREAK**").

### MODWHEEL

The display shows from left to right: "**M**" (for mod. wheel), the stored pot number (32 to 62), and the amount of control (-7 to +7). To assign the mod. wheel to a pot, just move this pot and choose the amount. The display readout will follow your tweaking. With amount values from +1 to +7, incoming mod. wheel messages will add to the pre-programmed pot position. With amount values from -1 to -7, incoming modwheel messages will be subtracted from the pre-programmed pot position. If the amount is set to OFF=0, incoming MIDI control change #1 messages will be ignored totally.

Note: If you want the modulation wheel of an external synth to work solely as a remote control of the MOOG's wheel, assign the modulation wheel to the "Modulation Amount" pot or to an unused pot (e.g. "Footpedal 2 Amount") with a value of -1 or +1.

### VELOCITY

Same as MODWHEEL, but velocity is used to control the pots and the display shows "**V**" instead of "**M**".

### PRESSURE

Same as MODWHEEL, but channel pressure is used to control the pots and the display shows "**P**" instead of "**M**".

### LAST VEL

The last received velocity value determines the overall velocity, even for several keys or for keys that have already been held.

### MAX VEL

If several keys are played simultaneously, the highest of their velocity values is valid for all of them.

**REL-FSWT**

A footswitch plugged into the footswitch jack in the rear of the Moog or an incoming MIDI controller #64 message will affect RELEASE.

**SUS-FSWT**

A footswitch or an incoming controller #64 message will affect the HOLD KEY function but with no canceling of old notes when playing new ones. As long as the footswitch is held down, a maximum of 10 notes can be played from which always the last 6 notes will sound.

Note: The on/off condition of the sustain pedal is stored with each sound. If you store a sound with the sustain pedal being pressed, this sound will have immediate sustain whenever you recall it - even if you don't touch the pedal.

**LFO FREE**

The LFO is not synchronized by MIDI clock.

**LFO SYNC**

Incoming MIDI clock messages synchronize the LFO. The speed rate is dependent on the divider.

**DIVID xx**

The time base of the incoming MIDI Clock can be divided by 1 to 16 to slow down the arpeggio. Just dial the value and press **ENTER**. (A setting of 1 will produce the highest, a setting of 16 the lowest possible LFO (or arpeggio) speed relating to MIDI Clock speed.)

## System Controller Service ("C" - "0" - Enter)

The Memorymoog is, as are all high quality musical instruments, susceptible to environment changes such as humidity, temperature, dust or dirt. Thus like any sensitive musical instrument, the Memorymoog should be periodically adjusted and checked out by a qualified technician. To make servicing easier, a couple of new functions were implemented in the Advanced Memorymoog. As these functions are intended for technicians only, they are listed below but not explained in detail.

|   |          |  |
|---|----------|--|
| 1 | TABLE 1  | load service table #1 of the service manual              |
| 2 | TABLE 2  | load service table #2 of the service manual              |
| 3 | TABLE 3  | load service table #3 of the service manual              |
| 4 | DEFEAT ? | block voice cards <i>see</i> original service manual     |
| 5 | FREQ-CTR | adjust center frequency of OSC2 and OSC3                 |
| 6 | TUNE-CAL | scale center Autotune values                             |
| 7 | VCO-TEST | calibrate the oscillators <i>see</i> org. service manual |
| 8 | MIRROR   | VCO test with LED display upside down                    |
| 9 | LIVE PNL | load basic settings including current pot positions      |
| 0 | LED-TEST | start test sequence for all LEDs                         |

## MIDI APPENDIX

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**Note:** The **Lintronics Advanced Memorymoog** sends only one MIDI status byte between two active sensing messages or until any other status byte occurs. This method reduces data flow and saves time. All values are displayed in hexadecimal and, if appropriate, decimal.

Used short cuts:

| short cuts | description  |
|------------|--|
| n          | MIDI channel   |
| tt         | note number  |
| vv         | value (velocity, program number, switch number etc.) |
| dd         | data   |
| cc         | controller number                                    |
| ls/ms      | least significant byte / most significant byte       |
| Amt.       | amount   |
| Freq.      | frequency  |
| Mod.       | modulation   |

| Byte | function | range (vv) | notes |
|------|----------|------------|-------|
|------|----------|------------|-------|

### Note Off

|    |                  |                         |                          |
|----|------------------|-------------------------|--------------------------|
| 8n | n = MIDI channel | 0-F (0-15)              |                          |
| tt | note number      | 00-7F (0-127)           | 24 = note c <sup>1</sup> |
| vv | velocity         | 00-7F (0-127)           |                          |
|    | Transmit:        | range tt: 24-60 (36-96) | vv = 7F (127)            |
|    | Receive:         | range tt: 24-63 (36-99) | velocity is ignored      |

### Note On

|    |                  |                         |                          |
|----|------------------|-------------------------|--------------------------|
| 9n | n = MIDI channel | 0-F (0-15)              |                          |
| tt | note number      | 00-7F (0-127)           | 24 = note c <sup>1</sup> |
| vv | velocity         | 00-7F (0-127)           |                          |
|    | Transmit:        | range tt: 24-60 (36-96) | vv = 64 (100)            |
|    | Receive:         | range tt: 24-63 (36-99) | vv = 0 (note off)        |

### Key Pressure

|    |                  |                                 |                          |
|----|------------------|---------------------------------|--------------------------|
| An | n = MIDI channel | 0-F (0-15)                      |                          |
| tt | note number      | 00-7F (0-127)                   | 24 = note c <sup>1</sup> |
| vv | pressure value   | 00-7F (0-127)                   |                          |
|    | Transmit:        | key pressure is not transmitted |                          |
|    | Receive:         | key pressure is ignored         |                          |



| Byte              | function         | range (vv)    | notes |
|-------------------|------------------|---------------|-------|
| <b>Controller</b> |                  |               |       |
| Bn                | n = MIDI channel | 0-F (0-15)    |       |
| cc                | control change   | 00-7F (0-127) |       |
| vv                | value            | 00-7F (0-127) |       |

| Byte    | function            | range (vv)          | notes                                  |
|---------|---------------------|---------------------|--|
| 01 (1)  | Modulation Wheel    | 00-7F (0-127)       | Receive only                           |
| 02 (2)  | Breath (Footp.1)    | 00-7F (0-127)       | Receive only                           |
| 04 (4)  | Pedal (Footp.1)     | 00-7F (0-127)       | Receive only                           |
| 05 (5)  | Glide Amt.          | 00-7F (0-127)       | Receive only                           |
| 07 (7)  | Volume Amt.         | 00-7F (0-127)       | Receive, routed to programmable volume |
| 1E (30) | Switch On (button)  | <i>see</i> chart #1 | Transmit / Receive                     |
| 1F (31) | Switch Off (button) | <i>see</i> chart #1 | Transmit / Receive                     |

Note: The following controller numbers are used to control the pots of the Memorymoog!

| cc      | function           | range (vv)    | notes              |
|---------|--------------------|---------------|--------------------|
| 20 (32) | Glide Amt          | 00-7F (0-127) | Transmit / Receive |
| 21 (33) | OSC 2 Freq. Low    | 00-1F (0-31)  | Transmit / Receive |
| 22 (34) | Pitch Bend Amt     | 00-7F (0-127) | Transmit / Receive |
| 23 (35) | Modulation Amt.    | 00-7F (0-127) | Transmit / Receive |
| 24 (36) | Foot Pedal 1 Amt.  | 00-7F (0-127) | Transmit / Receive |
| 25 (37) | Foot Pedal 2 Amt.  | 00-7F (0-127) | Transmit / Receive |
| 26 (38) | LFO Mod.-Rate      | 00-7F (0-127) | Transmit / Receive |
| 27 (39) | OSC 3 Freq. Low    | 00-1F (0-31)  | Transmit / Receive |
| 28 (40) | V-Mod. OSC 3 Amt.  | 00-7F (0-127) | Transmit / Receive |
| 29 (41) | V-Mod. Filter Env. | 00-7F (0-127) | Transmit / Receive |
| 2A (42) | OSC 1 Pulse Width  | 00-7F (0-127) | Transmit / Receive |
| 2B (43) | OSC 2 Freq. High   | 00-7F (0-127) | Transmit / Receive |
| 2C (44) | OSC 2 Pulse Width  | 00-7F (0-127) | Transmit / Receive |
| 2D (45) | OSC 3 Freq. High   | 00-7F (0-127) | Transmit / Receive |
| 2E (46) | OSC 3 Pulse Width  | 00-7F (0-127) | Transmit / Receive |
| 2F (47) | OSC 1 Amt.         | 00-7F (0-127) | Transmit / Receive |
| 30 (48) | OSC 2 Amt.         | 00-7F (0-127) | Transmit / Receive |
| 31 (49) | OSC 3 Amt.         | 00-7F (0-127) | Transmit / Receive |
| 32 (50) | Noise Amt.         | 00-7F (0-127) | Transmit / Receive |
| 33 (51) | Cutoff             | 00-7F (0-127) | Transmit / Receive |
| 34 (52) | Emphasis           | 00-7F (0-127) | Transmit / Receive |
| 35 (53) | VCF Contour Amt.   | 00-7F (0-127) | Transmit / Receive |
| 36 (54) | VCF Attack         | 00-7F (0-127) | Transmit / Receive |
| 37 (55) | VCF Decay          | 00-7F (0-127) | Transmit / Receive |
| 38 (56) | VCF Sustain        | 00-7F (0-127) | Transmit / Receive |
| 39 (57) | VCF Release        | 00-7F (0-127) | Transmit / Receive |
| 3A (58) | VCA Attack         | 00-7F (0-127) | Transmit / Receive |
| 3B (59) | VCA Decay          | 00-7F (0-127) | Transmit / Receive |
| 3C (60) | VCA Sustain        | 00-7F (0-127) | Transmit / Receive |
| 3D (61) | VCA Release        | 00-7F (0-127) | Transmit / Receive |

## MIDI-Controller (continuation)

| cc       | function               | range (vv)          | notes                  |
|----------|------------------------|---------------------|------------------------|
| 3E (62)  | Programmable Volume    | 00-7F (0-127)       | Transmit / Receive     |
| 40 (64)  | Release / Sustain      | 00-3F=Off, 40-7F=On | Transmit / Receive     |
| 41 (65)  | Glide Footswitch       | 00-3F=Off, 40-7F=On | Transmit / Receive     |
| 45 (69)  | Hold Key               | 00-3F=Off, 40-7F=On | Receive only           |
| 7A (122) | Local On / Off         | 00=Off, 01-7F=On    | Transmit / Receive     |
| 7B (123) | All Notes Off          | ignored             | Transmit (0) / Receive |
| 7C (124) | Notes / Controller Off | ignored             | Receive only           |
| 7D (125) | Notes / Controller Off | ignored             | Receive only           |
| 7E (126) | Notes / Controller Off | ignored             | Receive only           |
| 7F (127) | Notes / Controller Off | ignored             | Receive only           |

| Byte                  | function                  | range (vv)   | notes                                  |
|-----------------------|---------------------------|--------------|--|
| <b>Program Change</b> |                           |              |  |
| Cn                    | n = MIDI channel          | 0-F (0-15)   |  |
| vv                    | program number            | 00-63 (0-99) | 64-7F is ignored or is not transmitted |
|                       | Transmit and Receive:     |              |  |
|                       | vv= 0 switches to program | 1            |  |
|                       | vv=62 switches to program | 99           |  |
|                       | vv=63 switches to program | 0            |  |

### Channel Pressure (Aftertouch)

|    |                  |                                     |  |
|----|------------------|-------------------------------------|--|
| Dn | n = MIDI channel | 0-F (0-15)                          |  |
| vv | value            | 00-7F (0-127)                       |  |
|    | Transmit:        | channel pressure is not transmitted |  |
|    | Receive:         | <i>see</i> MIDI Specials            |  |

### Pitch Wheel

|    |   |                              |  |
|----|---|------------------------------|--|
| En | n = MIDI channel                          | 0-F (0-15)                   |  |
| ls | value (MSB)                               | 00-7F (0-127)                |  |
| ms | value (LSB)                               | 00-7F (0-127)                |  |
|    | Receive (pitch wheel is not transmitted): |                              |  |
|    | LSB/MSB = 00-00                           | lowest pitch wheel position  |  |
|    | LSB/MSB = 00-40                           | default pitch wheel position |  |
|    | LSB/MSB = 7F-7F                           | highest pitch wheel position |  |

Note: Bit 0 and bit 1 of value (LSB) are ignored, i.e. the pitch bend resolution is 12 bits.

## System Exclusive

| Byte              | function   | notes                   |
|-------------------|--|-------------------------|
| <b>Sound Dump</b> |  |                         |
| F0 (240)          | system exclusive status (start)                      |                         |
| 04 (4)            | MOOG identification                                  |                         |
| 00 (0)            | <b>Lintronics Advanced Memorymoog</b> identification |                         |
| vv                | program number 00-64 (0-100),                        | 64 (100) = sound buffer |
| dd                | data (54 bytes)                                      |                         |
| ..                |  |                         |
| ..                | <i>see</i> chart #2                                  |                         |
| dd                |  |                         |
| F7 (247)          | End of Exclusive                                     |                         |

### Transmit:

The "**DUMP ALL**" functions transmits all 101 Memorymoog sounds (100 programs and the sound buffer).

### Receive:

To manage incoming data, 50ms pause between two sound dumps are necessary. During reception, the display shows "**PRG-EXCL**" if SysEx is enabled, otherwise you'd get a "**DISABLED**" message.

| Byte                 | function   | notes         |
|----------------------|--|---------------|
| <b>System Errors</b> |  |               |
| F0 (240)             | system exclusive status (start)                      | Transmit only |
| 04 (4)               | MOOG identification                                  |               |
| 00 (0)               | <b>Lintronics Advanced Memorymoog</b> identification |               |
| vv                   | error number   |               |
| F7 (247)             | end of exclusive (EOX)                               |               |

### Transmit (System errors are not received):

vv=7B (123): Memorymoog is locked.

vv=7D (125): Memorymoog is busy.

vv=7E (126): counter error, more or less than 54 data bytes.

vv=7F (127): no error, last dump has been successfully received.

| <b>Byte</b>           | <b>function</b>  | <b>notes</b>  |
|-----------------------|--|---------------|
| <b>Tune Request</b>   |  |               |
| F6 (246)              | activates Autotune   | Receive only  |
| <b>Clock</b>          |  |               |
| F8 (248)              | synchronizes the LFO and the arpeggiator   | Receive only  |
| <b>Start</b>          |  |               |
| FA (250)              | switches the arpeggiator LED from flash to a constant light when MIDI clock is active. | Receive only  |
| <b>Continue</b>       |  |               |
| FB (251)              | switches the arpeggiator LED from flash to a constant light when MIDI clock is active. | Receive only  |
| <b>Stop</b>           |  |               |
| FC (252)              | switches the arpeggiator LED from constant light to a flash when MIDI clock is active. | Receive only  |
| <b>Active Sensing</b> |  |               |
| FE (254)              | is sent every 150ms.   | Transmit only |

## CHART 1 (SWITCH REMOTE)

---

The **Lintronics Advanced Memorymoog** allows MIDI control of all its switches via MIDI controller numbers #30 and #31. Controller #30 is always used to set a switch to its ON position, controller #31 sets a switch to OFF. **Attention:** The controller value (!) determines which switch is affected. For example, if you want to turn GLIDE on, send a MIDI controller #30 message with a value of 27 to the Moog: Bn 1E 1B (n = MIDI channel).

| Byte    | function                   | notes              |
|---------|----------------------------|--------------------|
| 01 (1)  | button "A"                 | Transmit / Receive |
| 02 (2)  | button "B"                 | Transmit / Receive |
| 03 (3)  | button "C"                 | Transmit / Receive |
| 04 (4)  | button "D"                 | Transmit / Receive |
| 05 (5)  | LFO OSC 2                  | Transmit / Receive |
| 06 (6)  | LFO Positive Sawtooth Wave | Transmit / Receive |
| 07 (7)  | button "3"                 | Transmit / Receive |
| 08 (8)  | button "6"                 | Transmit / Receive |
| 09 (9)  | button "9"                 | Transmit / Receive |
| 0A (10) | Enter                      | Transmit / Receive |
| 0B (11) | LFO OSC 1                  | Transmit / Receive |
| 0C (12) | LFO Triangle Wave          | Transmit / Receive |
| 0D (13) | button "2"                 | Transmit / Receive |
| 0E (14) | button "5"                 | Transmit / Receive |
| 0F (15) | button "8"                 | Transmit / Receive |
| 10 (16) | button "0"                 | Transmit / Receive |
| 11 (17) | LFO OSC 3                  | Transmit / Receive |
| 12 (18) | LFO Negative Sawtooth Wave | Transmit / Receive |
| 13 (19) | button "1"                 | Transmit / Receive |
| 14 (20) | button "4"                 | Transmit / Receive |
| 15 (21) | button "7"                 | Transmit / Receive |
| 16 (22) | Record / Interlock         | Transmit / Receive |
| 17 (23) | LFO Pulse Width 1          | Transmit / Receive |
| 18 (24) | LFO Square Wave            | Transmit / Receive |
| 19 (25) | Mono                       | Transmit / Receive |
| 1A (26) | Hold                       | Transmit / Receive |
| 1B (27) | Glide                      | Transmit / Receive |
| 1C (28) | Foot Pedal 2 OSC 2         | Transmit / Receive |
| 1D (29) | LFO Pulse Width 3          | Transmit / Receive |
| 1E (30) | LFO Filter                 | Transmit / Receive |
| 1F (31) | Multiple Trigger           | Transmit / Receive |
| 20 (32) | KB-Mode                    | Transmit / Receive |
| 21 (33) | V-Mod. Pulse Width 1       | Transmit / Receive |
| 22 (34) | Foot Pedal 2 Modulation    | Transmit / Receive |
| 23 (35) | LFO Pulse Width 2          | Transmit / Receive |
| 24 (36) | LFO Sample & Hold          | Transmit / Receive |
| 25 (37) | Foot Pedal 1 Filter        | Transmit / Receive |
| 26 (38) | Arpeggiator                | Transmit / Receive |
| 27 (39) | V-Mod. Filter              | Transmit / Receive |
| 28 (40) | V-Mod. OSC 1 Frequency     | Transmit / Receive |
| 29 (41) | Foot Pedal 1 Volume        | Transmit / Receive |
| 2A (42) | Contour OSC 3 Amount       | Transmit / Receive |
| 2B (43) | KB-Out                     | Transmit / Receive |
| 2C (44) | Auto Tune                  | Transmit / Receive |

## CHART 1 (SWITCH REMOTE)

---

| Byte    | function                     | notes              |
|---------|------------------------------|--------------------|
| 2D (45) | V-Mod. Pulse Width 2         | Transmit / Receive |
| 2E (46) | V-Mod. OSC 2 Frequency       | Transmit / Receive |
| 2F (47) | Foot Pedal 1 Pitch           | Transmit / Receive |
| 30 (48) | Invert                       | Transmit / Receive |
| 31 (49) | Octave OSC 1 2'              | Transmit / Receive |
| 32 (50) | Octave OSC 1 4'              | Transmit / Receive |
| 33 (51) | Octave OSC 1 8'              | Transmit / Receive |
| 34 (52) | Octave OSC 1 16'             | Transmit / Receive |
| 35 (53) | Hold Key                     | Receive only       |
| 36 (54) | Arpeggiator MIDI Clock Sync. | Receive only       |
| 37 (55) | Octave OSC 2 2'              | Transmit / Receive |
| 38 (56) | Octave OSC 2 4'              | Transmit / Receive |
| 39 (57) | Octave OSC 2 8'              | Transmit / Receive |
| 3A (58) | Octave OSC 2 16'             | Transmit / Receive |
| 3B (59) | LFO MIDI Clock Sync.         | Receive only       |
| 3C (60) | LFO Reset / Zero Start       | Receive only       |
| 3D (61) | Octave OSC 3 2'              | Transmit / Receive |
| 3E (62) | Octave OSC 3 4'              | Transmit / Receive |
| 3F (63) | Octave OSC 3 8'              | Transmit / Receive |
| 40 (64) | Octave OSC 3 16'             | Transmit / Receive |
| 41 (65) | OSC 3 Low                    | Transmit / Receive |
| 42 (66) | OSC 3 Keyboard Control       | Transmit / Receive |
| 43 (67) | OSC 1 Square Wave            | Transmit / Receive |
| 44 (68) | OSC 1 Sawtooth Wave          | Transmit / Receive |
| 45 (69) | OSC 1 Triangle Wave          | Transmit / Receive |
| 46 (70) | Sync. 2 to 1                 | Transmit / Receive |
| 47 (71) | KB-Track 1/3                 | Transmit / Receive |
| 48 (72) | KB-Track 2/3                 | Transmit / Receive |
| 49 (73) | OSC 3 Square Wave            | Transmit / Receive |
| 4A (74) | OSC 3 Sawtooth Wave          | Transmit / Receive |
| 4B (75) | OSC 3 Triangle Wave          | Transmit / Receive |
| 4C (76) | Octave "-1"                  | Transmit / Receive |
| 4D (77) | ADSR Release                 | Transmit / Receive |
| 4E (78) | ADSR Keyboard Follow         | Transmit / Receive |
| 4F (79) | OSC 2 Square Wave            | Transmit / Receive |
| 50 (80) | OSC 2 Sawtooth Wave          | Transmit / Receive |
| 51 (81) | OSC 2 Triangle Wave          | Transmit / Receive |
| 52 (82) | Octave "0"                   | Transmit / Receive |
| 53 (83) | ADSR Return to Zero          | Transmit / Receive |
| 54 (84) | ADSR Unconditional Contour   | Transmit / Receive |

Note: There must be an interval of at least 20ms between two switch remote messages. To edit sounds via MIDI it is sometimes more convenient to use system exclusive messages. One system exclusive sound dump takes about 192ms, that makes 5 dumps per second. If you want to edit a system exclusive dump, please refer to chart #2.

## CHART 2 (SYSTEM EXCLUSIVE DATA FORMAT)

### List of symbols:

| symbol | meaning               |
|--------|-----------------------|
| ↑      | high active           |
| ↓      | low active            |
| ↗      | raising sawtooth      |
| ↘      | falling sawtooth      |
| ▭      | square                |
| △      | triangle              |
| LSB    | Least Significant Bit |
| MSB    | Most Significant Bit  |

### System Exclusive Data Format

| Data | D7 | D6  | D5                       | D4   | D3   | D2            | D1                            | D0             |
|------|----|---|--------------------------|--|--|---------------|-------------------------------|----------------|
| 5    | 0  | x   | OSC 3 Octave 00 - 11     |  | OSC 2 Octave 00 - 11                         |               | OSC 1 Octave 00 - 11          |                |
| 6    | 0  | Arpeggio ↑                                  | Glide ↑                  | x  | Mono-Voices 001=1 Voice 110=6 Voices         |               |                               | x              |
| 7    | 0  | KB Modes 00 - 11                            |                          | x  | Mono Modes 00 - 11                           |               | Key Out ↓                     | Release ↑      |
| 8    | 0  | Hold Key ↑                                  | Arpeggio Modes 000 - 111 |  |  | Mono ↓        | Multi. Trig. ↑                | Sustain ↑      |
| 9    | 0  | KB Follow ↓                                 | x                        | Octave -1 ↑                                    | x  | x             | x                             | x              |
| 10   | 0  | VM PW 1 ↓                                   | Cont. OSC 3 ↓            | x  | x  | Invert ↑      | VM Filter ↓                   | x              |
| 11   | 0  | ↘ LFO ↓                                     | x                        | x  | 1  | VM Freq. 1 ↓  | VM Freq. 2 ↓                  | VM PW 2 ↓      |
| 12   | 0  | x   | x                        | Filter LFO ↓                                   | S&H LFO ↓                                    | △ LFO ↓       | ▭ LFO ↓                       | ↗ LFO ↓        |
| 13   | 0  | x   | OSC 2 LFO ↓              | OSC 1 LFO ↓                                    | OSC 3 LFO ↓                                  | PW 1 LFO ↓    | PW 3 LFO ↓                    | PW 2 LFO ↓     |
| 14   | 0  | FP 1 Pitch ↓                                | FP 2 Mod. ↓              | FP 1 Filter ↓                                  | FP 2 OSC 2 ↓                                 | FP 1 Vol. ↓   | 0                             | x              |
| 15   | 0  | ↗ OSC 2 ↑                                   | △ OSC 2 ↑                | ▭ OSC 1 ↑                                      | ↗ OSC 1 ↑                                    | △ OSC 1 ↑     | x                             | x              |
| 16   | 0  | KB Control ↑                                | ▭ OSC 3 ↑                | ↗ OSC 3 ↑                                      | △ OSC 3 ↑                                    | x             | x                             | ▭ OSC 2 ↑      |
| 17   | 0  | -- Divider (0-15) -----> LSB                |                          | Sync. 2 to 1 ↑                                 | Mod. Wheel +/-                               | x             | KB Track 2/3 ↑                | KB Track 1/3 ↑ |
| 18   | 0  | Unc. Contour ↑                              | LFO Reset ↑              | Velocity +/-                                   | MIDI Start ↑                                 | ARP M-Sync. ↑ | MSB <----Clock Divider (0-15) |                |
| 19   | 0  | -----> LSB                                  | Pressure +/-             | MIDI Clock ↑                                   | 1  | LFO M-Sync. ↑ | Low ↑                         | Return to 0 ↑  |
| 20   | 0  | MSB <----- Mod. Wheel Amt. (0-7) -----> LSB |                          |  | MSB <----- Mod. Wheel Pot. No. (0-30) -----> |               |                               |                |
| 21   | 0  | --Velocity Amt. (0-7) ----> LSB             |                          | MSB <----- Velocity Pot. No. (0-30) -----> LSB |  |               |                               |                |

## CHART 2 (SYSTEM EXCLUSIVE DATA FORMAT)

| Data | D7 | D6                                      | D5   | D4                                      | D3                                     | D2                                | D1                           | D0         |
|------|----|---|--|---|--|-----------------------------------|------------------------------|------------|
| 22   | 0  | -----> LSB                              | MSB <----- Pressure Pot. No. (0-30) -----> LSB |   |  |                                   | MSB <-----                   |            |
| 23   | 0  | ----- Glide -----> LSB                  |  |   |  | MSB <---- Pressure Amt. (0-7)     |                              |            |
| 24   | 0  | Bit 3 Lo Freq. 2                        | Bit 2 Lo Freq. 2                               | Bit 1 Lo Freq. 2                        | Bit 0 Lo Freq. 2                       | MSB <----- Glide -----            |                              |            |
| 25   | 0  | ----- Pitch Bend Amt. -----> LSB        |  |   | x                                      | x                                 | x                            | x          |
| 26   | 0  | ----- Mod. Amt. -----> LSB              |  | MSB <----- Pitch Bend Amt. -----        |  |                                   |                              |            |
| 27   | 0  | -----> LSB                              | MSB <----- Modulation Amt. -----               |   |  |                                   |                              |            |
| 28   | 0  | MSB <----- Foot Pedal 1 Amt. -----      |  |   |  |                                   |                              |            |
| 29   | 0  | ----- Foot Pedal 2 Amt. -----> LSB      |  |   |  |                                   |                              |            |
| 30   | 0  | ----- Modulation Rate -----> LSB        |  |   |  |                                   |                              | MSB <----- |
| 31   | 0  | x                                       | Bit 3 Lo Freq. 3                               | Bit 2 Lo Freq. 3                        | Bit 1 Lo Freq. 3                       | Bit 0 Lo Freq. 3                  | MSB <---- Modulation Rate -- |            |
| 32   | 0  | ----- Voice Mod. OSC 3 Amt. -----> LSB  |  |   |  | x                                 | x                            | x          |
| 33   | 0  | ----- Voice Mod. Filter Env. -----> LSB |  |   | MSB <----- Voice Mod. OSC 3 Amt. ----- |                                   |                              |            |
| 34   | 0  | ----- OSC 1 PW -----> LSB               |  | MSB <----- Voice Mod. Filter Env. ----- |  |                                   |                              |            |
| 35   | 0  | -----> LSB                              | MSB <----- OSC 1 Pulse Width -----             |   |  |                                   |                              |            |
| 36   | 0  | MSB <----- OSC 2 Freq. High Byte -----  |  |   |  |                                   |                              |            |
| 37   | 0  | ----- OSC 2 Pulse Width -----> LSB      |  |   |  |                                   |                              |            |
| 38   | 0  | ----- OSC3 Freq. High Byte -----> LSB   |  |   |  |                                   |                              | MSB <----- |
| 39   | 0  | ----- OSC 3 Pulse Width -----> LSB      |  |   |  | MSB <--OSC 3 Freq. Hi Byte -      |                              |            |
| 40   | 0  | ----- OSC 1 Amt. -----> LSB             |  |   | MSB <----- OSC 3 Pulse Width -----     |                                   |                              |            |
| 41   | 0  | ----- OSC 2 Amt. -----> LSB             |  |   | MSB <----- OSC 1 Amt. -----            |                                   |                              |            |
| 42   | 0  | ----- OSC 3 Amt. -----> LSB             |  | MSB <----- OSC 2 Amt. -----             |  |                                   |                              |            |
| 43   | 0  | -----> LSB                              | MSB <----- OSC 3 Amt. -----                    |   |  |                                   |                              |            |
| 44   | 0  | MSB <----- Noise Amt. -----             |  |   |  |                                   |                              |            |
| 45   | 0  | ----- VCF Cutoff -----> LSB             |  |   |  |                                   |                              |            |
| 46   | 0  | ----- VCF Emphasis -----> LSB           |  |   |  |                                   |                              | MSB <----- |
| 47   | 0  | ----- VCF Contour Amt. -----> LSB       |  |   |  | MSB <---- VCF Emphasis --         |                              |            |
| 48   | 0  | ----- VCF Attack -----> LSB             |  |   |  | MSB <----- VCF Contour Amt. ----- |                              |            |
| 49   | 0  | ----- VCF Decay -----> LSB              |  |   | MSB <----- VCF Attack -----            |                                   |                              |            |
| 50   | 0  | ----- VCF Sustain -----> LSB            |  | MSB <----- VCF Decay -----              |  |                                   |                              |            |



## CHART 2 (SYSTEM EXCLUSIVE DATA FORMAT)

| Data | D7 | D6                                   | D5                            | D4                                   | D3                           | D2                         | D1 | D0         |
|------|----|--------------------------------------|-------------------------------|--------------------------------------|------------------------------|----------------------------|----|------------|
| 51   | 0  | -----> LSB                           | MSB <----- VCF Sustain -----> |                                      |                              |                            |    |            |
| 52   | 0  | MSB <----- VCF Release ----->        |                               |                                      |                              |                            |    |            |
| 53   | 0  | ----- VCF Attack -----> LSB          |                               |                                      |                              |                            |    |            |
| 54   | 0  | ----- VCA Decay -----> LSB           |                               |                                      |                              |                            |    | MSB <----- |
| 55   | 0  | ----- VCA Sustain -----> LSB         |                               |                                      |                              | MSB <----- VCA Decay ----- |    |            |
| 56   | 0  | ----- VCA Release -----> LSB         |                               |                                      | MSB <----- VCA Sustain ----- |                            |    |            |
| 57   | 0  | ----- Programmable Volume -----> LSB |                               |                                      | MSB <----- VCA Release ----- |                            |    |            |
| 58   | 0  | x                                    | x                             | MSB <----- Programmable Volume ----- |                              |                            |    |            |

## 1.1 Stereo Outputs

There is an expansion slot for the original Moog MIDI interface on the rear panel. The **Lintronics Advanced Memorymoog** system uses this slot for the MIDI in jack, the MIDI out jack, two output jacks and one input jack. You can plug a high impedance stereo headphone into the stereo output. The second port is used to split the stereo signal of the stereo output into two mono outputs. The volume of the stereo output can be controlled with the programmable volume pot. It is also possible to store the volume per program.

Panorama is fixed to the following values:

|         | Output A | Output B |
|---------|----------|----------|
| Voice 1 | 60 %     | 40 %     |
| Voice 2 | 40 %     | 60 %     |
| Voice 3 | 75 %     | 25 %     |
| Voice 4 | 25 %     | 75 %     |
| Voice 5 | 100 %    | 0 %      |
| Voice 6 | 0 %      | 100 %    |

## 1.2 MIDI connectors IN/OUT

The MIDI in port receives data from an external MIDI device which is to control the **Lintronics Advanced Memorymoog**. The MIDI out jack transmits data corresponding to all Memorymoog operations (for example playing on the keyboard or editing any program).

## 1.3 Power supply

During the upgrade procedure, the power supply is checked for cold soldered joints. This increases its reliability and road-worthiness.

## 1.4 Voice Cards

All six voice cards are removed, tested, repaired if necessary and modified for the new **Lintronics** autotune algorithm. This algorithm makes the autotune procedure more precise and guarantees long-time stability of the oscillators.

## 1.5 Demux Board

The Demux Board is removed, tested for cold soldered joints, repaired if necessary and modified for pitch bend, modulation wheel, foot pedal 1 and the octave switch.

## 1.6 Common Analog Board

This board is also removed, tested for cold soldered joints etc., repaired if necessary and prepared for pitch bend, modulation wheel, transpose, foot pedal 1, stereo outputs and the octave switch. **Lintronics** also modifies the octave switch function to increase the sound quality, especially when playing sounds with extremely high filter emphasis setting.

## 1.7 Octave Board

The octave board is modified to store the octave setting with each program.

### 2.1 Digital Board

The digital board is removed and modified. (Since the reset circuit of the original Memorymoog was not very reliable, it crashed and lost its sounds often when problems occurred in the power supply.)

### 2.2 Filter Input

External audio signals can be fed through the Moog's VCF and VCA circuitry (including envelopes and LFO) with an optional filter input board which is located on the Memorymoog's expansion slot (1/4" standard phone jack, mono).

Note: The best signal-to-noise ratio can be achieved at a signal input level of +6dB.

### 2.3 CV-OUT jack modification

The normal Memorymoog transmits only keyboard and glide voltages through the CV-OUT jack. With the optional CV-OUT modification, the **Advanced Memorymoog** adds pitch bend, octave, tune and modulation voltages.

(This is particularly useful when driving a Minimoog from the CV-OUT. The Minimoog's 3rd oscillator must no longer be reserved for modulation and can be used as a sound source.)

### 2.4 Control Panel

All pots and the two front panel boards are removed, the pots are tested, cleaned and, if necessary, replaced. Missing knobs and switches are replaced with original Moog spare parts.

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# MIDI Implementation Chart

Lintronics Advanced Memorymoog

Date: Thu, April 25, 2024

| Function           |  | Transmitted                      | Recognized             | Remarks           |
|--------------------|--|----------------------------------|------------------------|-------------------|
| Basic Channel      | Default Changed  | 1-16<br>1-16                     | 1-16<br>1-16           | memorized         |
| Mode               | Default Messages Altered                               | 3<br>x<br>*****                  | 1, 3<br>x<br>x         | memorized         |
| Note Number        | True Voice   | 36-96<br>*****                   | o v = 127<br>o         |                   |
| Velocity           | Note On<br>Note Off                                    | o 9nH, v = 100<br>o 8nH, v = 127 | o v = 1-127<br>o       |                   |
| After Touch        | Key's<br>Ch's  | x<br>X                           | x<br>o                 |                   |
| Pitch Bender       |  | X                                | o                      | 12 bit resolution |
| Control Change     | 1  | x                                | o                      | Modulation Wheel  |
|                    | 2  | x                                | o                      | Breath Control    |
|                    | 4  | x                                | o                      | Pedal             |
|                    | 5  | x                                | o                      | Glide Amount      |
|                    | 7  | x                                | o                      | Volume            |
|                    | 30   | o                                | o                      | Switch On *1      |
|                    | 31   | o                                | o                      | Switch Off *1     |
|                    | 32-63  | o                                | o                      | Pots *2           |
|                    | 64   | o                                | o                      | Sustain           |
|                    | 65   | o                                | o                      | Glide On/Off      |
| 69                 | x  | o                                | Hold Key               |                   |
| 122-123            | o  | o                                | Local/All Notes Off    |                   |
| 124-127            | O  | o                                | Notes/Controller Off   |                   |
| Program Change     | True #   | o 0-99                           | o 0-99<br>1-99, 0      |                   |
| System Exclusive   |  | O                                | o                      | *3                |
| System Common      | Song Pos.<br>Song Sel.<br>Tune                         | x<br>x<br>X                      | x<br>x<br>o            |                   |
| System Clock       |  | x                                | o                      | *4                |
| Real Time Commands |  | X                                | o                      | *4                |
| Auxiliary Messages | Local On/Off<br>All Notes Off<br>Active Sense<br>Reset | o<br>o<br>o<br>X                 | o<br>o<br>x<br>x       |                   |
| <b>Notes:</b>      | *1 see chart on page C-6/C-7                           |                                  | Mode 1: Omni On, Poly  |                   |
|                    | *2 see chart on page C-2/C-3                           |                                  | Mode 2: Omni On, Mono  | o: yes            |
|                    | *3 see chart on page C-8/C-9/C-10                      |                                  | Mode 3: Omni Off, Poly | x: no             |
|                    | *4 affects the LFO/Arpeggiator                         |                                  | Mode 4: Omni Off, Mono |                   |