

MC-2oh2 Hack

a utility for the Roland MC-2oh2,
a version of the Roland MC-202 synth and sequencer using Tubbutec's MC-2oh2 modification

User Documentation

v1.01

Table of Contents

User Documentation.....	1
Table of Contents.....	2
Overview & History.....	3
System Requirements.....	3
Installation.....	3
Uninstallation.....	5
Authorization & Initial Setup.....	6
Usage.....	7
Settings.....	7
MIDI Setup.....	7
Audio Setup.....	7
MC-2oh2 Data.....	7
Application Size.....	8
Sample Send Delay.....	8
Ch 1 / Ch 2 / Ch 3.....	9
Pattern.....	9
Piano Roll.....	9
Length.....	10
Accents and Portamento.....	10
Song.....	10
Scale.....	10
Randomize.....	10
Modulation.....	12
Set.....	12
Samples.....	13
Documentation & Help.....	15
About & Authorization screen.....	15
Acknowledgments & Thanks.....	16
Contact & Support.....	17
Copyright.....	17
Version History.....	17

Overview & History

In 1997, Defective Records released a crazy piece of software for the Roland MC-202 called **MC-202 Hack**. It allowed for programming of the 202's sequencer with MIDI files through its *tape input jack*, after a painstaking reverse-engineering process to decode the sequencer's tape save format. And though at the time of this writing in 2023 it is still maintained and works great on today's computer systems over 25 years later, **Tubbutec** has now created an even more stunning advance for this synth, the **MC-2oh2 modification**. And so now in partnership together with Tubbutec, Defective Records is proud to announce a brand new companion tool for it, **MC-2oh2 Hack**!

System Requirements



Macintosh

- Intel: OS X 10.11.6 or later
- Silicon: OS X 11.0 or later



Windows

- Windows 8 or later (64 bit only)

You will obviously also need a **MIDI interface** to connect your computer to your MC-2oh2. **This MIDI interface must be capable of reliable, bi-directional SysEx data transmission to your synth.** Many cheap “cable” USB interfaces (MIDI DIN plug on one end, and USB plug on the other, with a “block” in the middle) are often not capable of this – check its SysEx capabilities with another app if in doubt!

Installation



Macintosh

The Macintosh version is supplied as a Macintosh disk image file (.dmg). Just double click the downloaded file, and you will see a new window appear on your desktop. Drag the MC-2oh2 Hack application icon to the Applications window icon that you see – this will install the application on your computer:

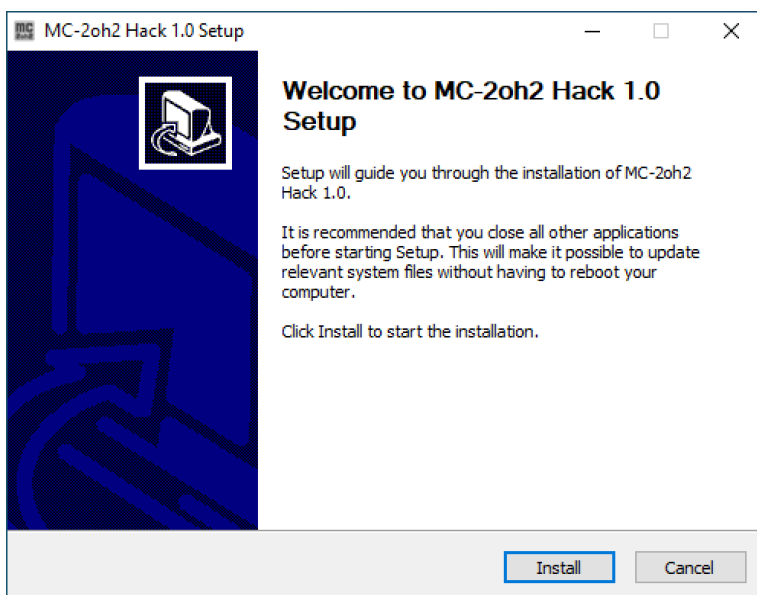


After the file has copied, you can unmount the disk image, and delete the .dmg file (or keep it somewhere safe if you'd like, for future installations).



Windows

The Windows version is supplied as a compressed .zip file. Unzip the file, and you will be left with a file called MC-2oh2 Hack Installer.exe. Double click this file to run the installer, agree to let the app make “changes to your device,” and then follow the installer instructions:



After installation, you will find a shortcut available to launch the MC-2oh2 Hack application in the Windows Start menu and on the Desktop.

Uninstallation



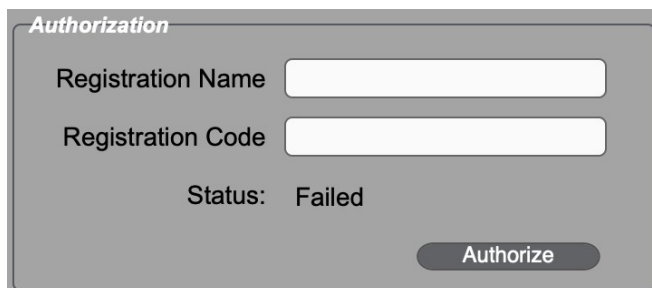
Macintosh – Just drag the MC-2oh2 Hack application out of the Applications folder to the Trash.



Windows – Use either the Windows Add/Remove Programs control panel to remove the application, or use the Uninstall shortcut in the Windows Start menu.

Authorization & Initial Setup

You'll need to authorize MC-2oh2 Hack before being able to use it. Start the application and you'll find yourself at the About & Authorization screen:

A screenshot of the 'Authorization' window. It has a title bar 'Authorization'. Inside, there are two text input fields: 'Registration Name' and 'Registration Code'. Below them, the 'Status' is displayed as 'Failed'. At the bottom right, there is an 'Authorize' button.

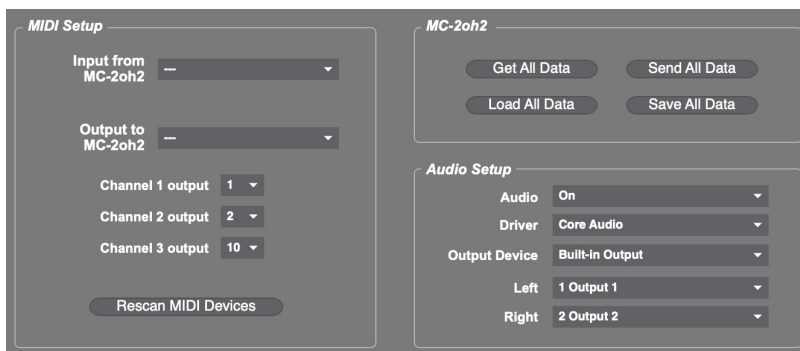
Enter your Registration Name and Registration Code, and then click the Authorize button. Be careful, cApiTaliZation MaTteRs! If successful, the Status field will change to “Registered”, and you will see a “Use the App!” button, which when clicked will allow you to begin to use the software. If not successful, you will be left at the Authorization screen to try again.

To verify your authorization status, or to remind yourself of your Registration Name and Code, you can select the About MC-2oh2 Hack menu item to be brought back to the About & Authorization screen at any time. You can also click the MC-2oh2 Hack logo in the upper left of the app to do the same thing.

Upon successful first authorization, you'll be placed on the Settings tab, where you must set up MIDI communication with your MC-2oh2. **For MC-2oh2 Hack to work properly, you must enable the application to both send and receive MIDI to/from the MC-2oh2.** So be sure to select the MIDI device that corresponds to your MC-2oh2 in **both** the Input and Output drop down menus in the MIDI Setup section. **Also be sure to specify the MIDI Channel outputs for each of the 3 sequencer channels, that your MC-2oh2 is set to.** This will allow you to preview your sequences within the app directly on the MC-2oh2. These settings are automatically saved so you'll only need to set them this initial time.

You should also set up your Audio Preferences as desired in the Audio Setup section – this will allow you to preview samples on the Sample tab.

You're now ready to go! Click one of the other tabs to start working with your MC-2oh2.

A screenshot showing two side-by-side settings panels. The left panel is titled 'MIDI Setup' and contains dropdown menus for 'Input from MC-2oh2' and 'Output to MC-2oh2', three dropdowns for 'Channel 1 output' (set to 1), 'Channel 2 output' (set to 2), and 'Channel 3 output' (set to 10), and a 'Rescan MIDI Devices' button. The right panel is titled 'MC-2oh2' and contains four buttons: 'Get All Data', 'Send All Data', 'Load All Data', and 'Save All Data'. Below this is an 'Audio Setup' section with dropdowns for 'Audio' (set to On), 'Driver' (set to Core Audio), 'Output Device' (set to Built-in Output), 'Left' (set to 1 Output 1), and 'Right' (set to 2 Output 2).

Usage

Settings

This tab allows one to view and adjust MC-2oh2 Hack's MIDI and Audio parameters, manage all MC-2oh2 data at once, and set the Application Size. The details surrounding the initial MIDI and Audio setup were covered in the prior section, Authorization & Initial Setup.

MIDI Setup

This section allows for MIDI set up to establish bi-directional communication with the MC-2oh2 to edit and preview its parameters. See the Authorization & Initial Setup section above for more details. The three Channel output parameters allow to specify the proper MIDI channel for each of the three MC-2oh2 sequencer channels. Making sure these are correct will ensure that you can preview the sequence patterns in MC-2oh2 Hack in real time on the MC-2oh2.

You can also preview sequences if desired using your computer's built-in General MIDI instruments. On Mac, select the AU DLS Synth 1 output device; on Windows, select the Microsoft GS Wavetable Synth entry. Note that this is helpful primarily in instances where your MC-2oh2 may not be available, as all of the other realtime previewing functions will require bi-directional communication with your MC-2oh2, and therefore having it be selected as the MIDI Output device.

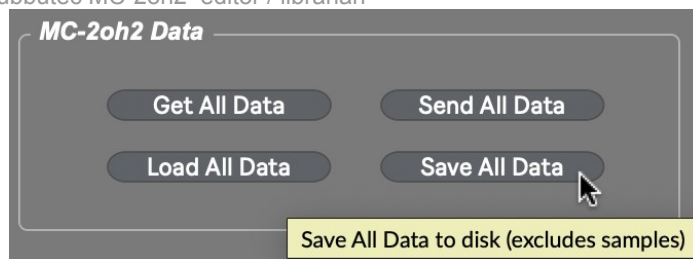
If you made changes to your MIDI environment after you've started MC-2oh2 Hack, you can press the Rescan MIDI Devices button to update the app. You'll need to respecify all the MIDI devices in the drop down menus if so.

Audio Setup

This section allows you to choose the appropriate audio Driver, Output Device and Channels for your system, as well as enabling audio output within the application. Ensuring these settings are correct will allow you to preview audio samples you plan to upload to the MC-2oh2.

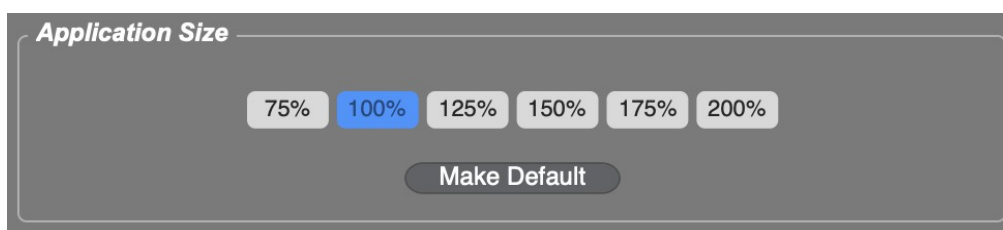
MC-2oh2 Data

This section allows you to Get All Data from the MC-2oh2 all at once, rather than individual portions at a time, as possible in other parts of the app. Similarly, you can Send All Data to the MC-2oh2. You can also Save All or Load All data to or from disk on your computer, in the form of a SysEx file. For all of the above functions, it should be noted that they do **NOT** include sample data – this is managed separately, on the Samples tab.



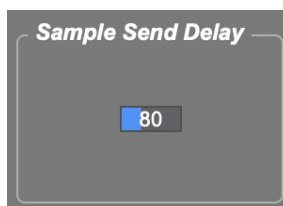
Application Size

MC-2oh2 Hack allows you to scale the application window smaller or larger depending on your screen resolution and personal preference. If you select a size that it is too large for your current display, you will be shown an alert instead. You can set your preference as the default by pressing the Make Default button – each time the application is started subsequently, it will open at that size:



Sample Send Delay

Samples are sent from MC-2oh2 Hack to the MC-2oh2 in specific sized-blocks of data; these must be spaced apart by some time to allow the MC-2oh2's microprocessor to process the incoming data. This parameter allows for adjusting of this delay value. The default setting is 120 milliseconds; you can decrease this value, to shorten the time it takes to upload the samples to the MC-2oh2. Be sure that the samples sound OK after uploading if you try this however. The setting of this value is stored between sessions of MC-2oh2 Hack use.



Ch 1 / Ch 2 / Ch 3

The Channel tabs, Ch 1, Ch 2 and Ch 3, allow you to view and edit the three separate sequences that are stored in the MC-2oh2. Changes you make here are previewable in real-time on the MC-2oh2, so long as the Output Channel settings are correctly specified on the Settings tab.

Pattern

This section allows you to select which MC-2oh2 pattern to view and edit for each of its three independent sequencer channels. After selecting the desired pattern from the dropdown menu, click Get or Send to retrieve or send the pattern from or to the MC-2oh2. Load and Save allow you to retrieve or store sequences from or to your computer as SysEx files.

You can select how many Steps (from 1 to 64) your sequence will contain. You will see the piano roll grid update as you change this value.

Clock Divide allows you to divide the clock signals into subdivisions.

The transport icons in this section are specific for the currently selected Channel; there are also global transport buttons above in the top grey banner section of the application, that apply to all the Channels together (along with a global Tempo parameter). Finally, the Direction dropdown menu allows you to select Forward, Backward, or Ping Pong modes.



Piano Roll

You can visualize and edit a sequences notes in the piano roll section. To move a note for a particular step, simply drag it up or down to a new location, or just click in the desired location. To create a new note, double click; this will create a note with Length 4 (see next section). To delete a note, simply double click it again – this will preserve the note location, but change its length to 0, effectively deleting it.

To zoom the display in or out, place the mouse in the keyboard section on the left, click and drag left to zoom out, or right to zoom in. In addition, clicking the Fit button will automatically zoom the grid to fit all currently programmed notes. Activating the Fold toggle button will only display those note rows that are currently programmed in the sequence.

Please note that the piano roll in MC-2oh2 Hack extends from C-2 to C8, whereas the synth itself goes from C0 to C10. There are different interpretations of the MIDI standard, and unfortunately the tool I used to create the software (Cycling 74's Max) interprets it the first way, whereas Tubbutec interprets it as the 2nd way. I'll try to address this in a future update – but until then, notes will appear two octaves “off” within MC-2oh2 Hack.

Length

Each note can have 4 different lengths, from 1 to 4. Select the desired length on the vertical grid under each note. Having no items selected in the Length grid will silence the note, effectively a length of 0. You can click and drag across the Length grid to select multiple note lengths at once.

Accents and Portamento

At the bottom of the screen you can specify the various Accent types as well Portamento for each note. Click once to activate, click again to deactivate. As in the Length section, you can click and drag across multiple notes if desired.

Song

The Song section allows you to view and edit each Channel's associated Song information. Clicking the Get or Send buttons will retrieve or send the Song from or to the MC-2oh2. You can Load or Save a Song from / to your computer in SysEx format with the Load and Save buttons.


The Length of the Song is specified by the number listed, and can range from 1 to 64 steps. The associated list to the left of this parameter will update as you change the Length. Each entry in the grid represents a Sequence number; the Song will play each Pattern listed in the grid in order.

Scale

The Scale section allows you constrain the notes played by your MC-2oh2 to the selected Scale. Adjusting those parameters will allow you to hear the scaled notes immediately on your MC-2oh2, and you will see the modified Scaled Note value displayed as the sequence progresses through each step. However, be aware that the displayed notes in the piano roll will *not* update, *until* you choose to commit to the scaled values, by clicking the Commit Scaled button. In addition, should you choose to Send or Save the sequence, you must first Commit the notes, in order to ensure that what you hear is what will be sent to the MC-2oh2 or saved in the SysEx file. This approach allows you to preview many different scale variations of the original sequence, before permanently altering the notes and committing to the scaled variation.

Note that Channel 3 does not include a Scale function, as it is meant for drums primarily.

Randomize

The Randomize section allows you to randomize note values, their lengths, and their various accent or portamento parameters. Clicking the dice icon will perform the randomization. 

The note randomizer will randomly select a note between the minimum and maximum note ranges specified on either side of the dice icon.

The note length randomizer will select from Lengths between 0 and 4, based on the relative probability selected in the grid just to the right of the dice icon. For example, if you want to only select between

MC-2oh2 Hack – a Roland/Tubbutec MC-2oh2 editor / librarian

note off's (0 length) and full note duration (4 length), lower the levels for 1, 2 and 3 to 0%, and increase the values for 0 and 4 to 100%.

The Accent and Portamento randomizers allow you to select the percent probability of the parameter being on, from 0% to 100%.

Modulation

The modulation tab allows you modify a number of modulation parameters in real-time on the MC-2oh2, including Filter and PulseWidth LFOs and ADSRs, as well as Filter Accent and Noise values.

Set

These modulation values can be either retrieved or sent to the MC-2oh2 using the Get or Send buttons in this section. In addition, these values can be retrieved or saved to computer disk as SysEx files using the Load or Save buttons. It's important to note that in addition to these values, the Clock Divide parameters for each of the three Channels are also managed using these functions. The MC-2oh2 refers to these values as “Set” parameters.

Samples

The MC-2oh2 allows you to upload user-selected samples to it, for use with Channel 3 sequences. There are 12 available sample slots, spanning a full octave. The samples are then repeated across the entire range of available notes.

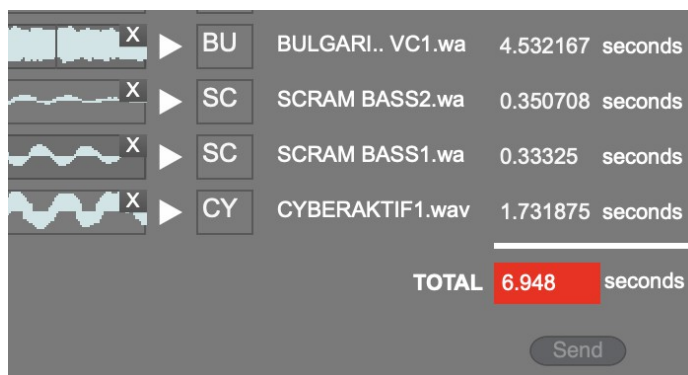
To assign a sample to one of the 12 available slots, drag a WAV or AIFF audio file from your computer to one of the rows next to the keyboard representation on the Samples tab. You will see the slot highlight blue, at which point you can drop the file. Once dropped, it will be converted to the format required by the MC-2oh2; depending on the sample length, this can take some time, so be patient. Once complete, you will see a graphic representation of the waveform, and can audition it using the play button immediately next to it. A two character abbreviation is pre-populated using the first two letters of the filename (also shown immediately to the right), but you can modify the abbreviation to whatever you would like. These will be displayed on the MC-2oh2.



To ensure that you can hear the sample, be sure that the audio is enabled within the application, and that the volume is turned up. You can see these controls in the lower left corner of the screen:



The maximum total sample duration time available on the MC-2oh2 is 2.72 seconds; if you load samples within MC-2oh2 Hack that exceed that amount of time, you'll see the total time area turn red, and the Send button will be disabled:



You can delete a sample from a slight by clicking the X in the top right corner of its waveform display. You can also use a sample more than once, and it will not consume more available time on the MC-2oh2 if you do so.



You can zoom in or out of the waveform display by Command (Mac) or Control (Win) clicking on it, and dragging up or down. You can also move the display by Command/Control clicking and dragging left or right.

You can highlight a portion of a sample by clicking and dragging on its waveform display. Playing the sample at that point will preview only the selected portion of the sample, and this is also what will play back on the MC-2oh2 for that sample slot. **Note however that the full sample will still be transmitted to the MC-2oh2.** So it is wise to trim your samples using an external editor before importing into MC-2oh2 Hack, to consume the smallest space possible. To revert to playback of the full sample after having selected a portion of the sample, simply click once on the waveform.

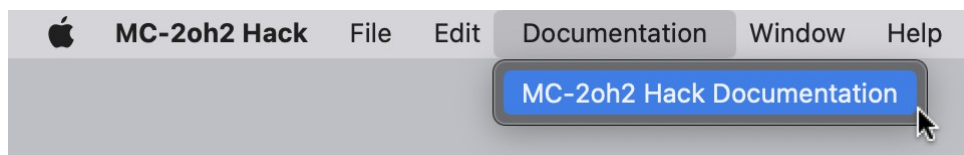
Currently, if dragging a sample onto the app that is significantly greater than a few seconds long, know that it can cause the app to hang for quite a while while it attempts the conversion – so again, consider which samples you are using ahead of time!

To upload the samples to the MC-2oh2, simply click the Send button. If the samples sound “glitchy” after uploading, check the value of the Sample Send Delay on the Settings tab. See details above in the Settings section.

It is important to note that samples are **not** included when using the Get All Data / Send All Data functions on the Settings tab.

Documentation & Help

MC-2oh2 Hack can launch its full documentation (this document) from within the application itself; just go to the Documentation menu, and choose “MC-2oh2 Hack Documentation”. This will launch a PDF viewing application in which to view the documentation:



About & Authorization screen

The About MC-2oh2 Hack menu item (in the MC-2oh2 Hack menu on Macintosh, and in the Help menu on Windows) will replace the MC-2oh2 Hack main screen with the About & Authorization screen. In addition to the Authorization information described earlier, it shows version and copyright information about the application, and has direct links to the MC-2oh2 Hack home and support pages. You can also get the About & Authorization screen by clicking the MC-2oh2 Hack letters on the left of the grey banner at the top of the application.



You can also link to either the Tubbutec or Defective Records home pages by clicking their respective logos on the right side of the application's grey banner at the top:



Acknowledgments & Thanks

MC-2oh2 Hack was only made possible because of the invaluable help I got from several people along the way, to whom I'm extremely grateful!

* **Tobias Münzer**, owner of Tubbutec, for his incredible MC-2oh2 modification for the MC-202, and who embraced the idea of a software tool for it immediately when he announced the mod. He was extremely patient with me as I went through early iterations of the software, and when I pushed him for documentation for it even before the mod was done! Thanks again Tobi!

* Beta Testers: Tobias Münzer (Tubbutec), Maciek Polak (Analogia.pl and Pin Park), and Kay Knofe (LPZW Modules). Thank you for all the testing!

* MC-2oh2 Hack was created using Cycling '74's Max (<https://cycling74.com/>) software. In addition, it uses, with permission, some 3rd party external objects – I'm indebted to their creators for them:

- min.environment, by Tim Place
- stricmp, getpaths, creatfolder, by Jan Schacher
 - <https://www.jasch.ch/dl>
 - Jasch externals are LGPL licensed, <http://www.gnu.org/licenses/lgpl.html>
- Modal Object Library, by VJ Manzo
 - <https://www.vjmanzo.com/mol/>
 - <http://www.gnu.org/licenses/lgpl.html>
- Lbyte, by Peter Elsea
 - <http://artsites.ucsc.edu/EMS/music/research/lobjects.readme.html>
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 - THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

* MC-2oh2 Hack uses the SoX cross platform command line utility, to convert audio files into different formats.

- <https://sox.sourceforge.net/> It is licensed under [GPL 2.0 or later](#)

* Tomaradze for his Roland MC-202 font.

- No modifications were made
- https://fontstruct.com/fontstructions/show/518647/roland_mc_202 Available publicly under [Creative Commons](#) licensing

* Thanks to everyone at Cycling '74 and on the Max forums for their help with Max questions.

Contact & Support

Support Forum

<https://defectiverecords.com/forum/categories/mc-2oh2-hack>

Dan Nigrin

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Copyright

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Version History

Version 1.01 (April 27, 2023)

- Corrected bug in which all parameters on Modulation tab being sent over MIDI channel 1, rather than the MIDI channel specified by whatever Channel 1 output is set to on Settings tab.
- Corrected bug that incorrectly placed user on Samples tab, rather than Settings tab, on first run of application
- Now Apple Silicon native, no longer needs to be run under Rosetta 2
- Built with Max version 8.5.4 (c7692d66011)

Version 1.0 (April 3, 2023)

- First release version
- Built with Max version 8.5.3 (aaa2fd49a64)

Version 1.0 Beta versions 1-17 (December 24, 2022 – March 18, 2023)

- Versions for external beta tester testing

Version 1.0 Alphas (October 2019 – December 2022)

- First versions for internal testing