# MB-SIDR8TR

This is a project built around making a MidiBox SID in a 3U rackmount case using the MB-6582 mainboard. This is a **huge** work in progress however feel free to contribute!

## Status

### 2011-09-06

Back at it again. I set this project down for a while to work on my band's debut album (which used more the NES than the SID). I also was feeling overwhelmed with designing the control surface stuff. But I'm back it! Worked on the LCD module and ended up trying out a 2×20 setup instead which makes the LCD control board smaller by directly mounting the LCD itself to the front panel via blind threaded screws on the back. That's the idea, anyway. This post has some good thoughts on using blind screw-holes for mounting the LCD to the front panel.

Also received some good advice in this post for using a line-drive to provide balanced outs. Thinking of using that for the passive mixer out although doing that for all inputs may require some further thought since it takes up a lot of space and pushes the limits of Eagle Standard (could modularize it though).

### 2011-05-12

Finished the wiring for the LCD module, though it's somewhat unoptimized (lots of vias). Thinking of doing it again but with a smaller wire size. The other modules should be a bit easier.

### 2011-03-31

Panel design is nearing completion, though there are a few ideas I still need to try such as some of the ones in this post. From that same post, I learned that using set screws on the back of the panel can be used to secure the panel for some of the additional screws I was going to add to the CS boards for rigidity. That means I need to go with at least a 3mm panel though, so I may need to put in a cut-out for the LCD panel on the back.

### 2011-03-26

Updated the LED Matrix board to have an option for both SMD and through-hole

### 2011-03-21

BZZT! Setbacks. Turns out I over measured the available inside space of the 3U chassis so I had to

reduce the vertical height of my control surface, which mucked things up a bit. I think I have things basically fixed, although things are a bit asymmetric vertically now which sort of bugs me. I can likely resolve that by using a smaller LCD panel - either a 4×20 with a smaller overall size or a 2×20 with a standard size. I will miss the cool progress indicator for the 4×20 but the 2×20 gives me way more colors to choose from, including cool inverted colors, oooh! See this forum post for more info.

I think I've settled on the spacers to use. I am going with male/female spacers 11/32“ (8.75mm) in length, which will be a bit less than was used for the MB-6582, meaning the buttons may stick out a bit more, but otherwise it will allow me to use a 2mm or 2.5mm front-panel. Thanks to nebula for the male/female spacers. See this forum post for more info. One thing I didn't account for was the LCD, and that may make things a little tight.

### 2011-03-17)

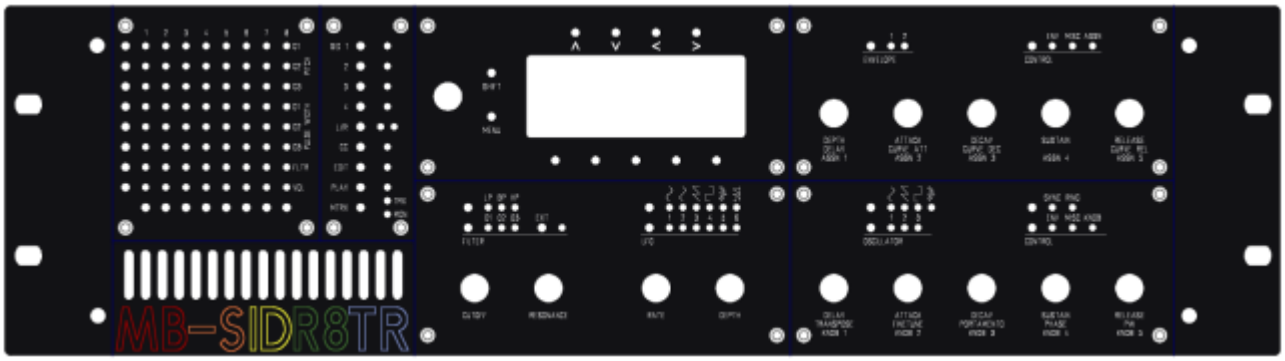
All of the boards with knobs have been designed, leaving only the LCD panel board and the SID selector board. I am behind on updating the wiki but will do so probably once I finish all the boards since I don't want ot have to re-upload revisions of the front panel or control surface PCBs as I refine the measurements and things. If anyone wants to see the work in progress, send me a PM.

## Parts

- 3U Chassis - Jameco Part # 132848
- Encoders: I am planning on using similar ones to the MB-6852. You can find Eagle parts for these at the MidiBox parts library.

## Panels

This is the current iteration of the panel, though alternative designs can be found on the forum post relating to this project as well.




frontpanel-rev2.zip

## Boards

Here are the collection of boards required to populate the control surface. Since a single-board

solution would be quite expensive (starting with the full version of EagleCAD), the design is more similar to the standard C64-based control surface in that various parts of the control surface can be populated using smaller boards.

That said, since the MB-6582R uses the MB-6582 mainboard, the wiring reflects the use of LED and button arrays. The wiring can be found here at the following:

- mb-6582_cs_dout_wiring.pdf
- mb-6582_cs_din_wiring.pdf
- Encoder Assignments

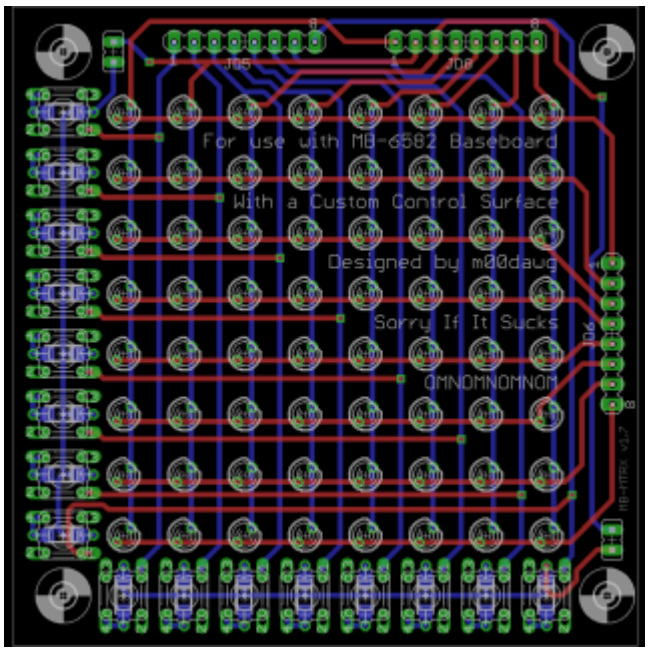
From the MB-6582 page:

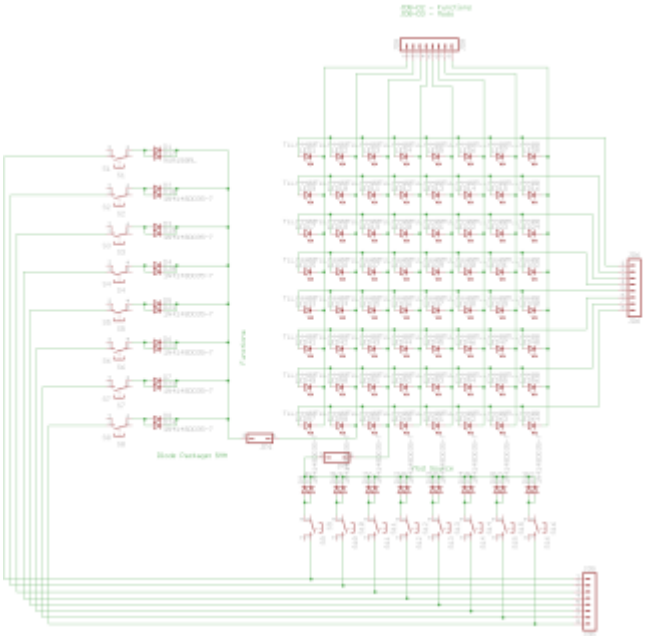
- “LFO Sin” and “LFO Tri” are swapped and “Sync”, “CC”, “Edit”, “Play” are in the wrong order (should be “Play”, “Edit”, “CC”, “Sync”)
- The menu button should be at the intersection of “JD8-D3 & JD5-D3” NOT “JD8-D3 & JD5-D4”

Further details can be found on the MB-6582 wiki page.

## LED Matrix

This is a proposed layout for an LED matrix board to be used coupled with the above panel design. While other boards can likely be made from home using various methods, it might be wise to have this one printed. Note that this design currently has the mounting holes up higher than the current design of the front panel. The mounting holes were moved down on the panel so the design was more uniform. Modify per your needs!



Eagle

A Bulk Order is being organized is you are interested in obtaining your own board at a better price than doing a single board one-off. If you want to know more about the latest happenings, check out this forum post.

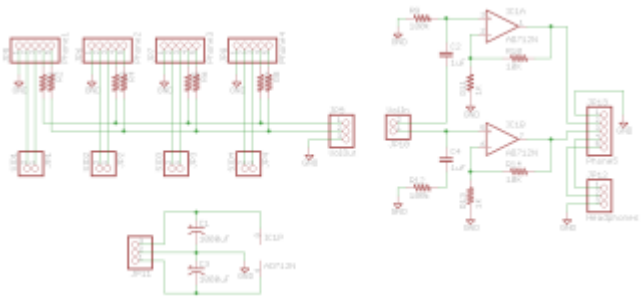
**Parts List**

| Part | Description | Mouser | Farnell |
|---|---|---|---|
| S1-S16 | 6mm x 6mm Tactile Switch | | |
| D1-D16 | SMD Switching Diode | 1N4148W-V-GS08 | 13114\|1n4148w-v-gs08\|\|S\|e\|5480397067\|1469425 |
| LED1-LED64 | 3mm LED | | |
| JD5, JD6, JD8 | SIL Pin Header | | |

Note that other SMD diodes may work, such as Mini-MELF.

## AudioBus

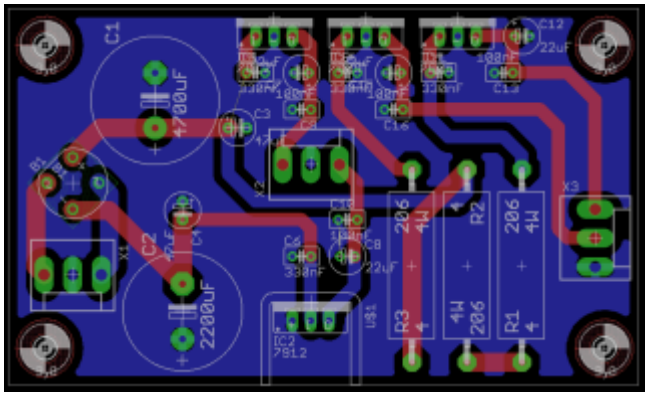
Since I wanted to use external filters and have both a front and rear mixed out, I thought it best to create my own passive mixer board. It combines the passive mixer idea from the MB-6582 with the CMoy amp. I opted to go with the CMoy design because it is easy, effective, and can function both as a headphone and pre-amp.

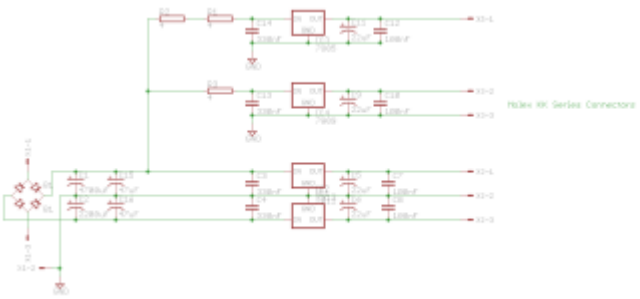


I am still working on the board design but once it is complete, I will post it here. The board may end up being two boards depending on how bulky it is. I wanted to use PCB mount audio jacks (basically Neutriks from the MB-6582 and Sammich synths) and was planning on using the audio jacks themselves to suspend the board up since I was going to mount my audio jacks probably towards the center of the rear panel (to leave room down below for other boards). I also have not figured out if cable distance is going to be an issue or anything like that.

## Power

The power board supplies +/- 12V, +9V and +5V. +12V might be able to be used for a SID-6581 but the board is really optimized around suppling +9V (in other words, 8580/6852 SIDs). This board is based off northernlightx's Complete PSU with a few modifications. The +/- 12V is for adding AOUT modules (namely for SSM 2044 filters). **NOTE** Be sure to use at least one fuse! Putting one on for the main supply before going to the transformer is a very very good idea!





pwr-eagle-rev2.zip

As an alternative, there is a wonderful discussion on the forums about using a modern switching the supply. The idea being that modern switching supplies switch at a frequency far higher than most practical uses of the SID (particularly when given it's noise floor). I have not made up my mind about it yet, however, because the supply discussed switches at 132kHz, which is out of the range of human hearing, but not out of the range of some modern samplers. The only time that I can think would be of significance is when sampling at a grossly high rate (such as 192kHz) and manipulating the audio enough to lower the noise floor to audible levels (say by slowing the audio down, and thus the sampling rate, to a large amount).

That's a pretty pathological case so, for all intents and purposes, the Mean Well supplies mentioned on the forum post (such as this) should be well suitable for the SIDR8TR. I have not decided on what I am going to do yet since the switching supplies are smaller, though linear supplies are more fun :) I think I will compromise and go with a switching supply but use some additional filtering caps, most notably tantalum and perhaps ceramic caps. I don't have a way of testing how much they attenuate the noise but poking around online does show that tantalum caps seem like they would do the trick. I was mostly thinking of adding them as peace of mind :)

### Useful Links

- http://midibox.org/forums/topic/15235-custom-power-supply-for-mb6582/page__st__20

### Parts List

| Part | Description | Allied Part No |
|---|---|---|
| C1 | 4700uF Electrolytic Capacitor | 613-0203 |
| C2 | 2200uF Electrolytic Capacitor | 613-0201 |
| C3, C4 | 47uF Electrolytic Capacitor | 613-0112 |
| C5, C6, C11, C14 | 330nF Ceramic Capacitor | 507-0238 |
| C7, C8, C12, C15 | 22uF Electrolytic Capacitor | 613-0712 |
| C9, C10, C13, C16 | 100nF Ceramic Capacitor | 507-0211 |
| R1, R2, R3 | 4 Ohm, 5 Watt Power Resistor | 296-5275 |
| IC1 | 7812 Voltage Regulator | 568-0489 |
| IC2 | 7912 Voltage Regulator | 935-3055 |
| IC3 | 7809 Voltage Regulator | 568-0960 |
| IC4 | 7805 Voltage Regulator | 568-0488 |
| B1 | Rectifier (1.5A) | 935-6268 |

| Part | Description | Allied Part No |
|---|---|---|
| X1, X2, X3 | KK-156 Molex Headers | 863-0328 |
| 9x | Crimp Pins | 863-0435 |
| 3x | Pin housing | 863-0414 |
| 1-4x | TO-220 Heatsink | 619-0127 |
| Transformer | 24VCT / 50VA | 967-7285 |
| Crimp Connectors | (For Transformer | ?? |
| Fuse Holder | | Radio Shack |

# Props

Thanks to TK, Wilba, SmashTV, and nILS for their help, inventions, and support. Without them, this would not have been possible!

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Last update: **2011/09/11 21:07**