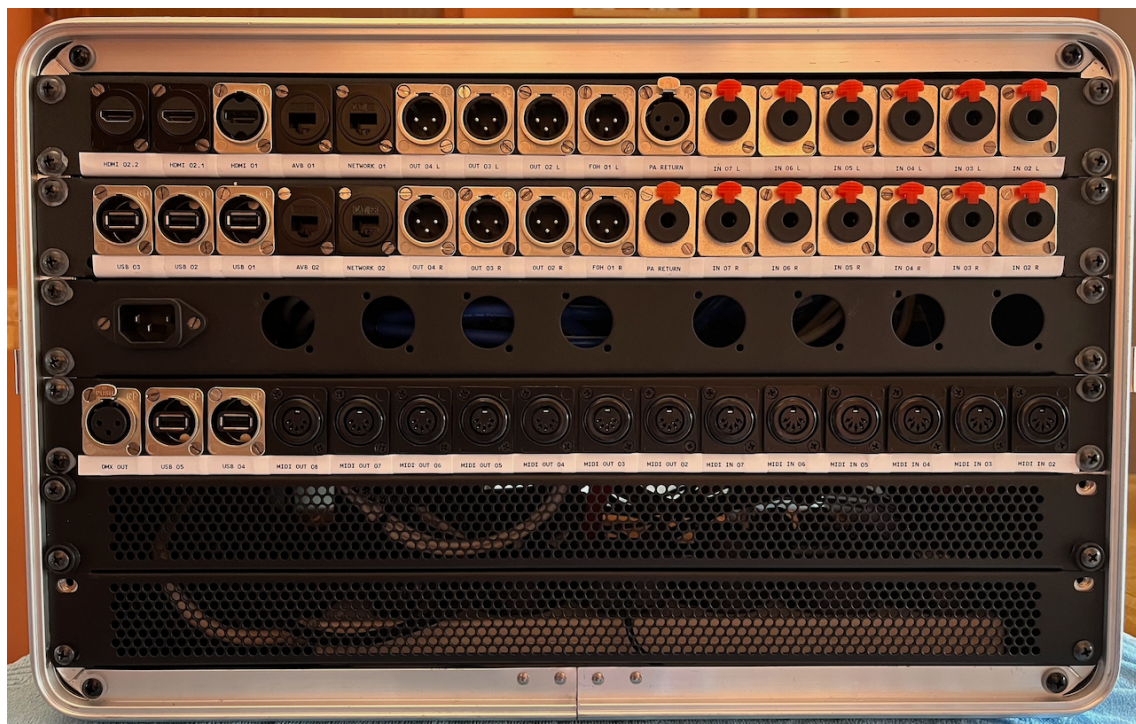


Building a Gig Rack – 2025 Version

Derek Cook © 2025



Building a Computer Based Gig Rack

In 2017 I built my first dedicated gig rack, which is documented in my [Original Gig Rack Guide](#).

Fast forward to 2025 and with my eight year old rig starting to struggle a little with what I was building into my Cantabile Songs for my [Spectral Streams](#) shows and I decided it was time to build a new one. I wanted this one to hopefully outlast my gigging days (but who knows how far away that is?), so I pushed the boat out a little in terms of overall specification to ensure that it lasts!

Before starting out on this rebuild I undertook quite a bit of research and planning to determine the best solution overall, based on the following requirements:

- Minimise the number of components in the audio chain to keep the signals as clean as possible¹.
- More flexibility with the audio inputs and outputs and how they can be routed, as the monitoring inputs and outputs on my old rack were limited by what was available on the line mixer.
- The computer is to be as fast as possible whilst still having a footprint small enough to fit in the rack.
- Retain key components from my old rig like my IEM transmitter, DMXIS interface and trusty old Nord G2 Engine.
- Move back to DIN MIDI for all of my MIDI interfacing, because I have found USB MIDI connections to be a little too unreliable for stage use. Therefore, I needed a MIDI interface with a high channel count to replace the two devices that I had in my old rack that gave me three channels².
- Ensure that the computer could be possible of running show video as well as audio and DMX which means that it needed two HDMI ports³.
- Switch effortlessly between different size keyboard rigs depending on the show I am doing.
- Have the flexibility so that I could route the outputs of my Hardware Synthesizers into Cantabile to apply additional or consistent effects processing.
- Minimise any effort in wiring the rack itself and I wanted (as per my previous rack) all connectors on the back panel and labelled to help setting up and tearing down.

I am also planning a studio redesign, and I wanted to do away with my current chain of analog line mixers so that my DAWPC has direct access to all synths and processors⁴.

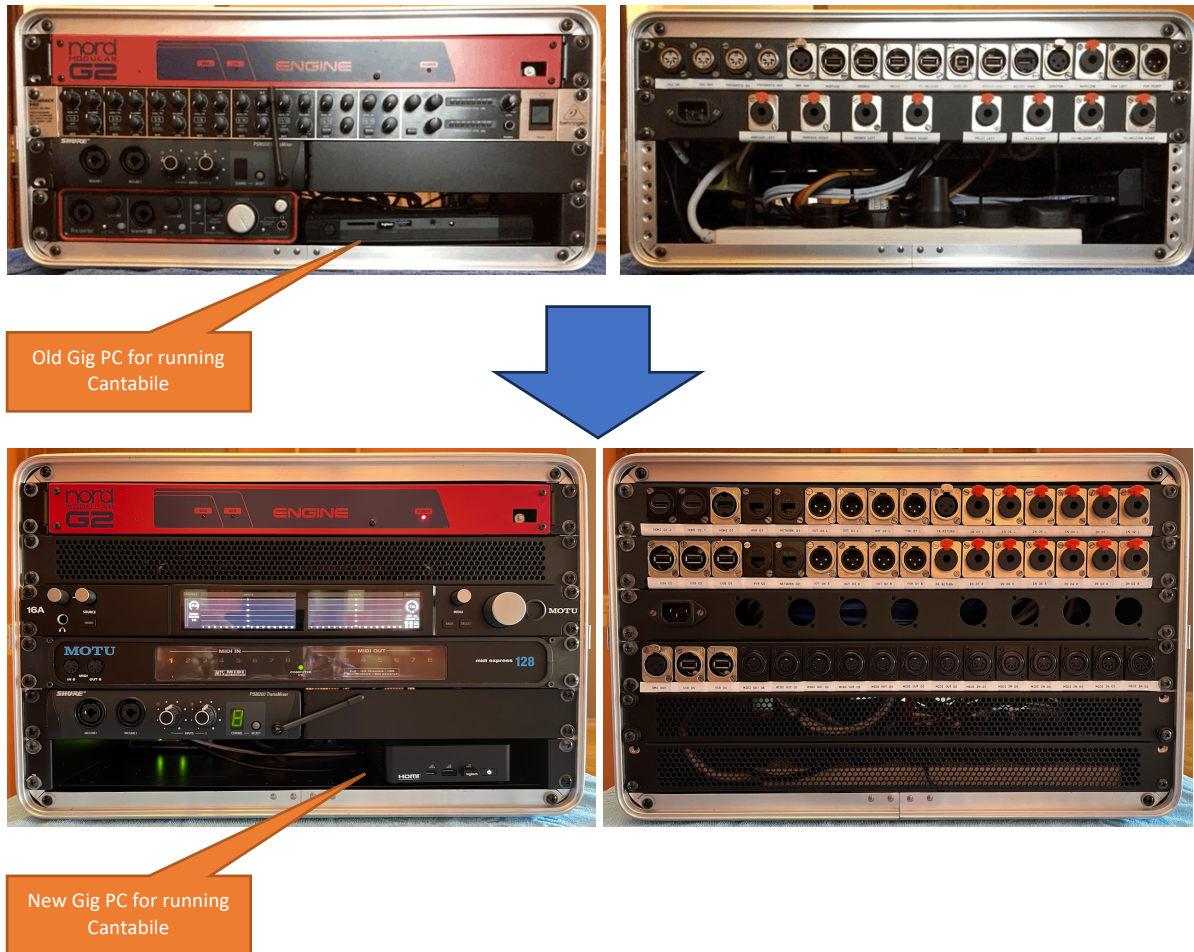
¹ In my old rig, I had a USB Audio Device, a Stereo Line Mixer, isolating transformers...

² My Focusrite Scarlett 2i4 provided 1 MIDI port, and I also had an M-AUDIO MIDISPORT 2x2 interface.

³ Once I have convinced myself that this is indeed possible with no risk of audio glitching!

⁴ Currently the outputs of my GIG Rack audio mixer go into spare channels in my main studio rack line mixer, which then goes into my current studio audio interface.

With that in mind, and jumping from my starting point to the conclusion, my old gig rack has been transformed....



It might not look that different, but it is very different in terms of performance and configurability. It is, sadly, heavier, but such is life...

This guide covers the hardware aspects of the gig rack. Please see my companion [Cantabile Guide](#) to cover the software aspects, and specifically how I am using the Cantabile Software as a live VST host.

Obviously, what goes into your specific rack will vary according to need, but the principles are the same.

Designing the Rack – Component Choices

I start off this part of the guide with my choices of equipment to go into the gig rig, and I then follow that with my overall design that I built the rack against.

It is always good to start off with an “as designed” plan/specification for what you want. However, it is equally important to document the “as built” design before you forget what changes you may have made to the design that you started with, which is one reason for this guide!

I certainly deviated from my initial plans as I went along, and my final design, which I wanted to capture before it all became hazy, may give you some ideas for your own rig.

A full list of parts used and where to get them from is given in Annex C.

Choice of Computer

my [Original Gig Rack Guide](#) went into the details of why I chose an NUC PC and Touch Monitor over a laptop or tablet PC, and over the years I think this has proved to be a good choice.

Therefore, I wanted to retain the same approach, and I wanted the computer to be small enough to be embedded in the rack (less to setup and go wrong).

After some research, I settled on the ASUS NUC14RVKU7 Core Ultra 7 as it seemed to have the right cost/performance ratio. I fitted it out with 64GB of RAM and 2TB SSD as you can never have too much of RAM and disk space, and resource needs only ever increase over time!

I also wanted the computer to be equipped with Thunderbolt as well, so I could use a Thunderbolt compatible audio interface.

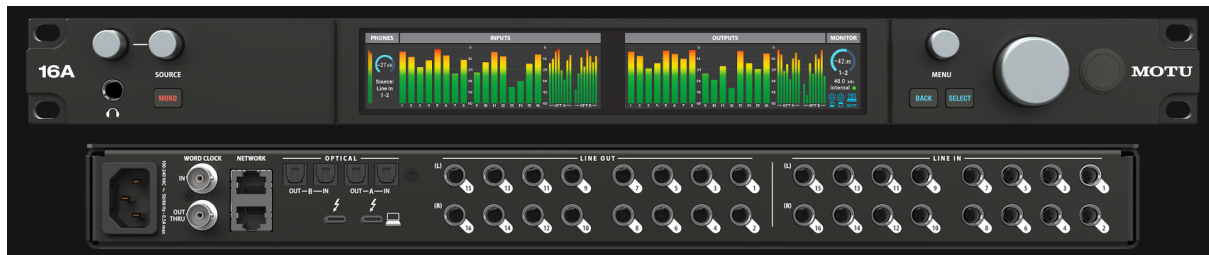


You can see that this little PC gives me plenty of USB ports, two of which are Thunderbolt compatible. I also get a network interface and two HDMI outputs all on the back panel.

There are also USB ports on the front panel, one of which I use for a wireless keyboard and mouse when needed, and this is also where I can plug in an external hard drive for disk imaging.

Choice of Audio Interface

This one was more of a tough choice! But after researching all the alternatives I settled on a [MOTU 16A](#).



I picked this interface because it:

- Supports Thunderbolt so is going to very fast at transferring multiple audio channels.
- Has a high input/output count of line level TRS connections.
- Supports the IEEE [Audio Video Bridging](#) (AVB) standard which would allow me to achieve my desire to eliminate chains of line mixers when I rebuild my studio.
- Has a very impressive amount of configurability via its CueMix Software (see Annex B).

I am not sure yet if I will use it, but there is a lot of built in DSP effects in the MOTU 16A.

Annex B details how I have setup the MOTU 16A, which will give you an idea of how powerful it is.

Choice of MIDI Interface

I needed to go for an 8-port MIDI interface due to the number of devices I have (Nord G2 Engine, Roland FC300 MIDI Floor Controller and up to five keyboards).

I did research and purchase an [iConnectivity mioXL](#) as there are not many multi-port MIDI interfaces about these days.

However, I quickly came to the conclusion that my MIDI needs for my gig rack were quite simple and the flexibility of the mioXL would be better in my studio, so I swapped it for my trusty [MOTU MIDI Express 128](#) from my Studio rack.



The MIDI Express is also better with regards to the fact that most of the ports are on the rear panel, whereas the mioXL has some on the front and some on the back.

Network Connections

I need to connect the Gig rack to my video laptop when on stage. In the past I have found that whilst you should be able to connect two computers with a single cable, this was not always 100% reliable. The addition of a small network switch, such as a Netgear GS305 resolves that.



USB Connections

Whilst I intend to minimise my use of USB for connecting keyboards, there are other internal USB connection needs that required more connections than the PC can provide, so I purchased a new 7 port powered hub and routed any spare outputs to the rear panel.



HDMI Splitter

The NUC has two HDMI outputs, one of which will go to my GeChic Touch Monitor, and I have in mind (if I can prove it does not interfere with audio duties) to see if the NUC can also run the video side of the show which would remove the need for a separate laptop that is currently doing this. If I do this then the second HDMI output will go to my HD Projector, but I would also want to see what is being presented to the audience (which I can currently see from the laptop screen). Therefore, I decided that the second NUC HDMI Output should be split, so I sourced a small HDMI splitter. The splitter needs powering from a spare USB port.



Components Reused from my old Gig Rack

Nord G2 Engine

My trusty old Nord G2 Engine is a modular synth in a 1U rack. Whilst I do not use it much these days, and of course there are now plenty of VST modular synth solutions, it is still working and needs a home!



Shure PSM200 IEM Transmitter

I need an IEM so I can hear a click to play against that the audience does not hear, so I am reusing my Shure IEM system and need to install the transmitter in the gig rack.



DMXIS Transmitter

This controls my DMX lighting rig. I have the DMXIS VST plugin in a Cantabile rack, which uses MIDI notes generated from within Cantabile to select different song banks and lighting cues.



The Bonus Find for MIDI Cabling

When I built my first gig rack, I could not find any panel feed through couplers for 5 PIN DIN MIDI, so I ended up buying 5 PIN DIN D sockets and MIDI Cables. I then had to cut off one connector from each cable, strip and prepare the individual wires and solder them to a socket, and of course repeat for each cable/socket.

Which was fine for a couple of connectors/cables, but I did not want to be doing that for 13 connectors unless I really had to!

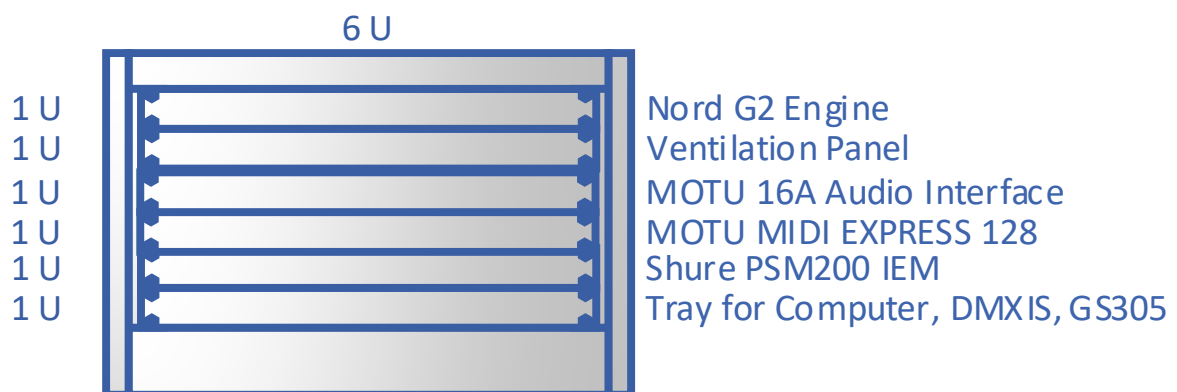
I am not sure if they were available last time around, but when searching for the components for building this new rack, I came across the following "MIDI extension cable cord" on Amazon.

Which is exactly what I wanted. They were not cheap, especially when buying 13 of them, but what a great time saver!

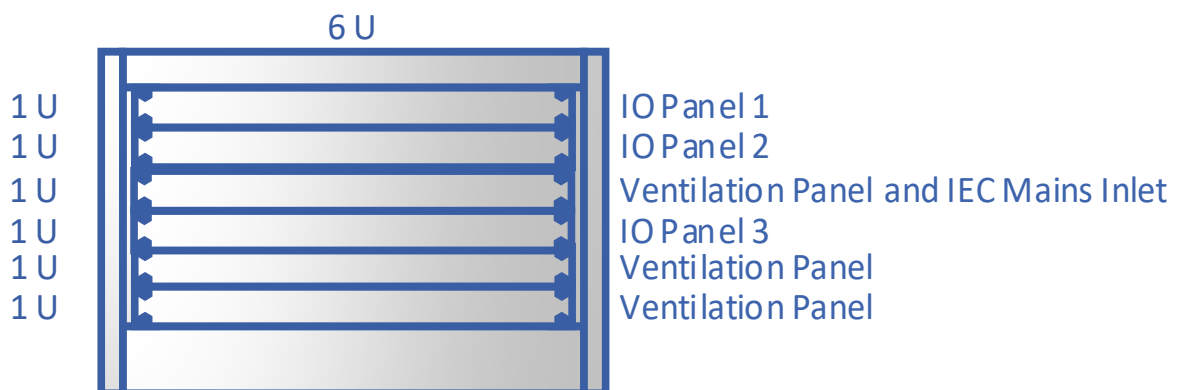


Designing the Rack – Layout of the Gig Rack

My planned front layout of the Gig Rack is given below.

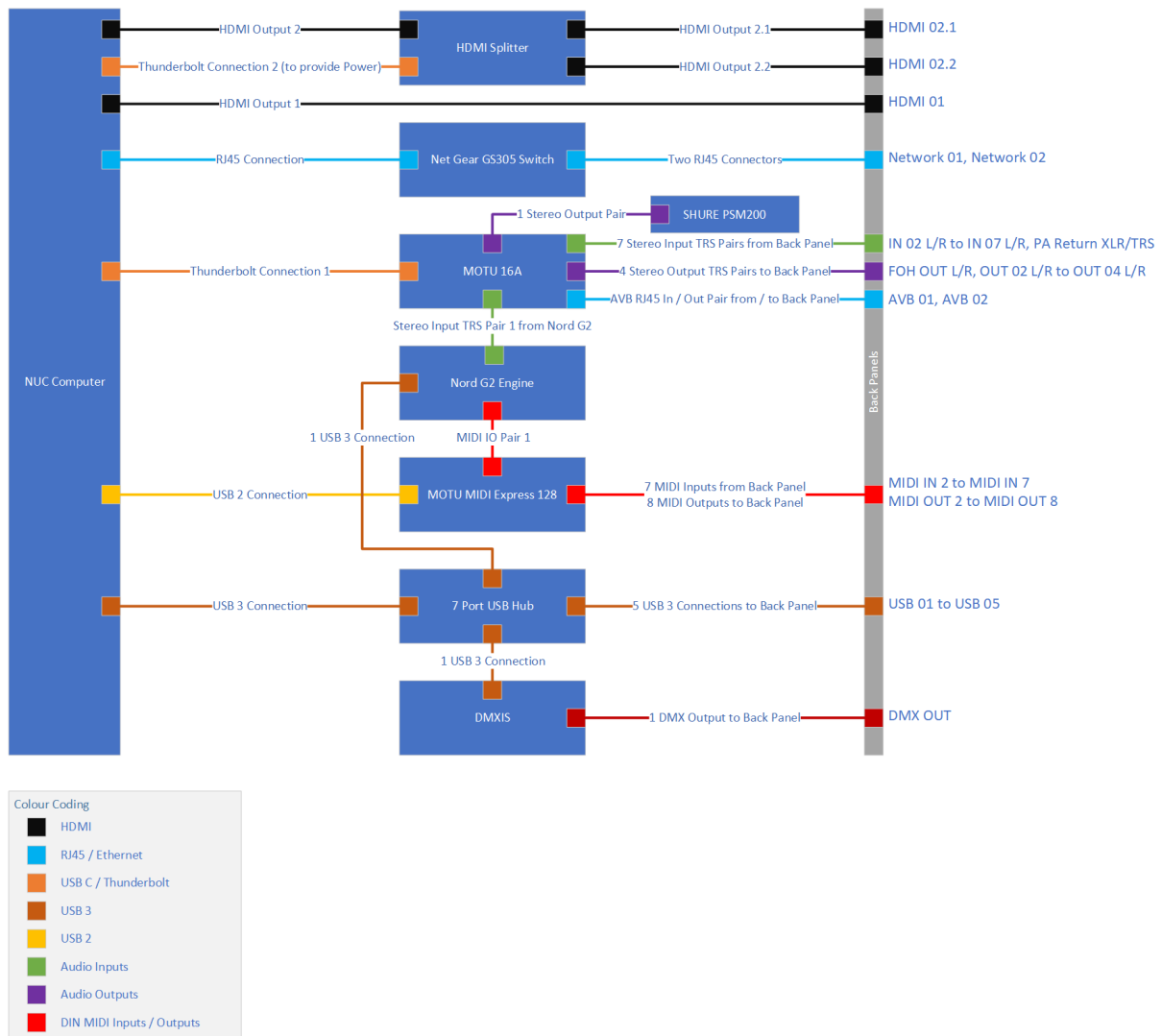


My planned rear panel layout of the Gig Rack is given below.



Designing the Rack – Block Diagram of the Gig Rack

Here is the overall block diagram of the Rack, showing all the components and how they are connected.



Designing the Rack – Rear Panel Connector Design

The table below shows the connectors on each rear panel. I will be honest and say that this went through a couple of iterations!

Note that the audio and MIDI connectors are numbered from right to left instead of the more usual left to right. The reason for this is to align with the way that the MOTU 16A and MIDI Express 128 inputs and outputs are presented on their back panels. If I had wanted the panel IO to go from left to right⁵, it would have made the wiring a rat's nest. Given I had started the right to left protocol for audio and MIDI, I kept with it for the other connector types for consistency.

The reason why the Audio input and MIDI IO channel numbers start from 02 is because my Nord G2 Engine is on Channel 01.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IO Panel 1	HDMI 02.2	HDMI 02.1	HDMI 01	AVB 01	Network 01	Audio OUT 04 L	Audio OUT 03 L	Audio OUT 02 L	Audio FOH 01 L	Audio PA RETURN	Audio IN 07 L	Audio IN 06 L	Audio IN 05 L	Audio IN 04 L	Audio IN 03 L	Audio IN 02 L
IO Panel 2	USB 03	USB 02	USB 01	AVB 02	Network 02	Audio OUT 04 R	Audio OUT 03 R	Audio OUT 02 R	Audio FOH 01 R	Audio PA RETURN	Audio IN 07 R	Audio IN 06 R	Audio IN 05 R	Audio IN 04 R	Audio IN 03 R	Audio IN 02 R
IO Panel 3	DMX OUT	USB 05	USB 04	MIDI OUT 08	MIDI OUT 07	MIDI OUT 06	MIDI OUT 05	MIDI OUT 04	MIDI OUT 03	MIDI OUT 02	MIDI IN 07	MIDI IN 06	MIDI IN 05	MIDI IN 04	MIDI IN 03	MIDI IN 02

Annex B details how I have allocated these connectors in my current live Rig.

Now this is all defined, it's now time to get into building the rack.

⁵ This is the usual engineering convention re signal flow, but I think the numbering on these units is from the perspective of channel flow being left to right on the front of the units. So logically to pair up front indications and rear connectors, the flow on the back has to be right to left.

Building the Rack – Cable Checking and Labelling

As I was going to be installing a lot of cabling inside this unit, I want to ensure that all cables are working before installing, and labelling of cables always helps from a maintenance perspective.

I always pre-check cables using a Studio Spares Cable Tester, which can test your XLR, TRS Jack, DIN, USB, RJ45, Speakon and Phono connectors. Having a unit like this in my gig toolbox has proven to be invaluable over the years! The images below show me checking out MIDI, TRS and RJ45 connectors. You simply plug a cable in to the appropriate sockets and turn the rotary switch to check each core within the cable. You should only get a matching yellow and green LED for each core, and these LED indications will quickly show open circuits, short circuits between cores and cross wiring.



When it comes to cable labelling, I am lucky in that I can borrow a labeller machine from work, and so I just have to purchase my own “self-laminating” cable label cassettes for the cables and self-adhesive label cassettes for labelling the back panel. They are not cheap, but there is no substitute for well labelled cables and connectors!



If you don't have this as an option, I would still recommend that you identify the ends of the cables in some way. When I first wired my studio (many years ago), I used self-adhesive alpha/numeric labels from Maplin, which you can use to make up identifier codes.



Building the Rack – Making Up the Back Panels

This is quite a simple job, but with three backplates each with 16 feed-through connectors to fit, it is quite a long job that I decided to tackle first.

I use pre-punched 1U panels supplied by a company ESR, and selected one with 16 cutouts for the three main panels, and I retained the panel from my old rack with an IEC mains plug cut out and the mains multi-gang block already connected.



Thomann also now supply similar panels.

The cutout dimensions are a standard size for “D” connectors, and a number of “bulkhead” couplers are available, which are also known as “feed-through” connectors. These can be simply bolted to the cutout panels. ESR provide tapped plates which take M3 screws that simplify this.

Description	Image
¼" (6.25mm) Stereo Jack (TRS) coupler	
Neutrik XLR Plug	
Neutrik XLR Socket	
Neutrik USB	
Neutrik HDMI	
RJ45 Network	
MIDI Extension Cable	

This is the start of the back panel construction job – with coffee at the ready!



Work in progress with most of the audio connectors fitted.



And the finished back panels ready for use.



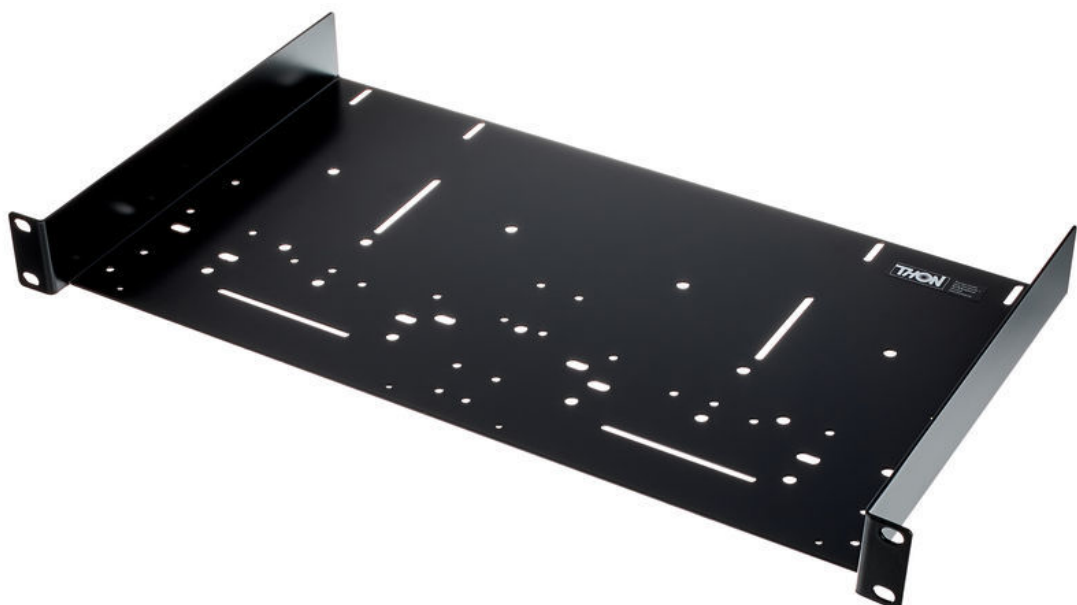
Building the Rack – Assembling the Rack

The starting point is a bare 6U 19" rack case, purchased from Thomann. Obviously, you can choose the height to suit what you need to fit in. You may need more or less rack space.



Hint: 1U is equal to 1.75" or 4.45cm. The Nord G2 in my rack takes up 1U of rack space. The [history of Racks and their dimensioning can be found on Wikipedia](#) if you are curious why we talk in U sizes!

It is quite easy to mount the items designed for rack mounting into the rack, via the tapped strips on the sides of the rack using M6 screws. However, a number of items are not rack mountable, so to mount things sturdily, I have put a "rack tray" in the base of the rack case.



You can see that it has plenty of holes that (if you are lucky) will line up with the gear that you wish to fit and any mounting system they use, or you could drill more holes as required. However, what I do for ease of maintenance and removal is fix the items mounted to the tray (computer, DMX interface, etc.) using heavy duty, self-adhesive Velcro strips.

I find this to be just as secure as bolting items down! And the benefit is they are much easier to remove if needed without any tools or having to take the rack tray out (I do carry spares of items, where I can, in case anything fails).

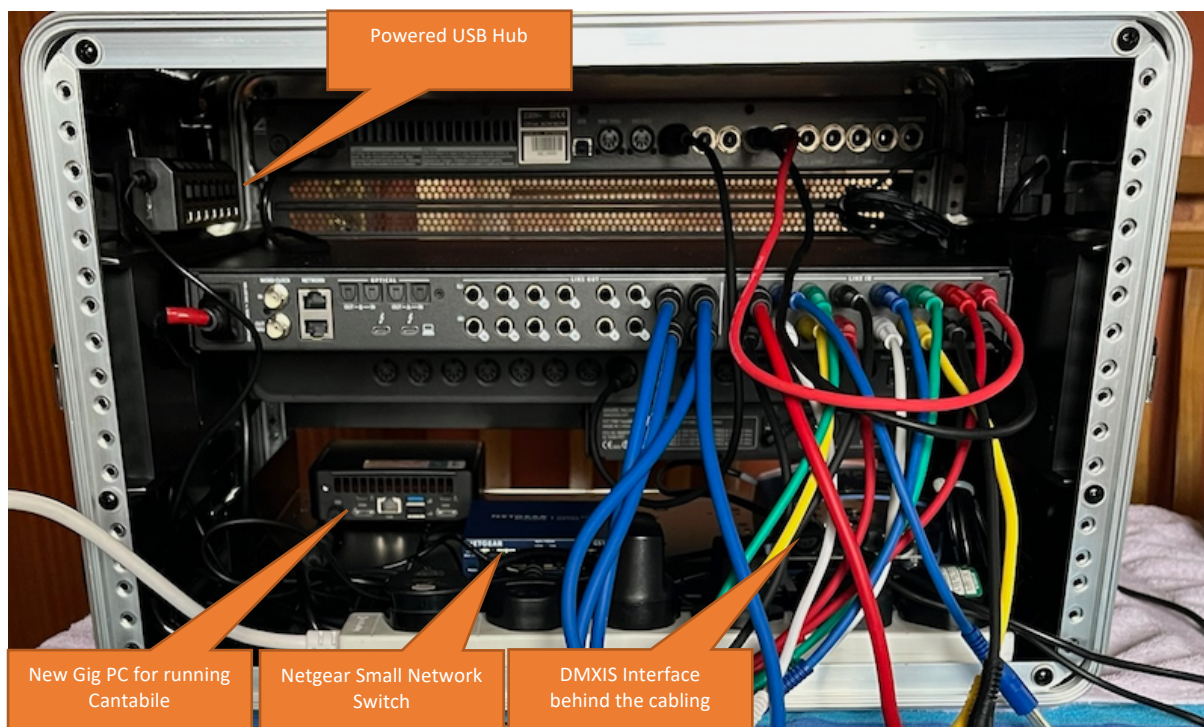
On this tray I have:

- The NUC PC.
- The DMXIS Interface.
- The Netgear Switch
- The HDMI splitter.
- The Power Strip.

And as mentioned above I used Velcro self-adhesive strips to secure the units to the tray.

I also have a USB 7 Port hub attached to the side of the case, again via self-adhesive strips

I forgot to take a picture of the unit before I started cabling the MOTU 16A, but this picture still shows the basic layout on the rack tray and where I mounted the USB Hub inside the case.



One thing not shown in this picture, because I added it later, is a HDMI output splitter for the second HDMI output.

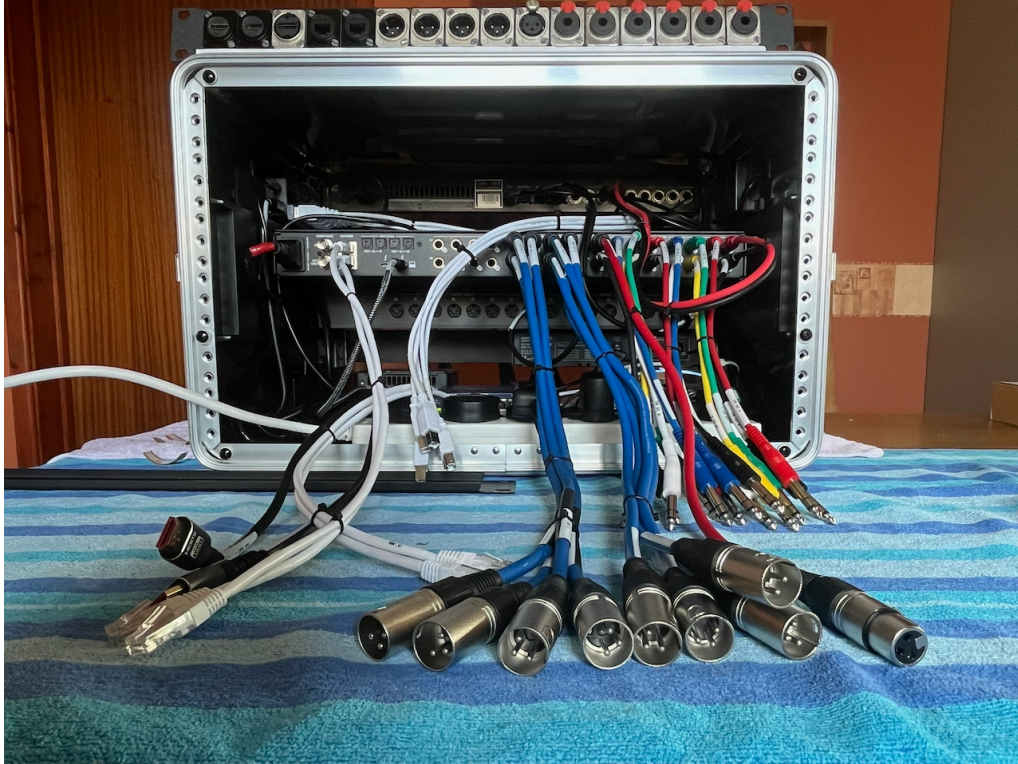
I mounted this splitter on the top of the Netgear switch as it made best sense to be there for cabling reasons. The unit needs to pick up power from a USB port. As I had committed all the USB Ports on the hub, I took the unused USB C port on the back of the NUC PC and used that.

With the rack built it is now time to start wiring it.

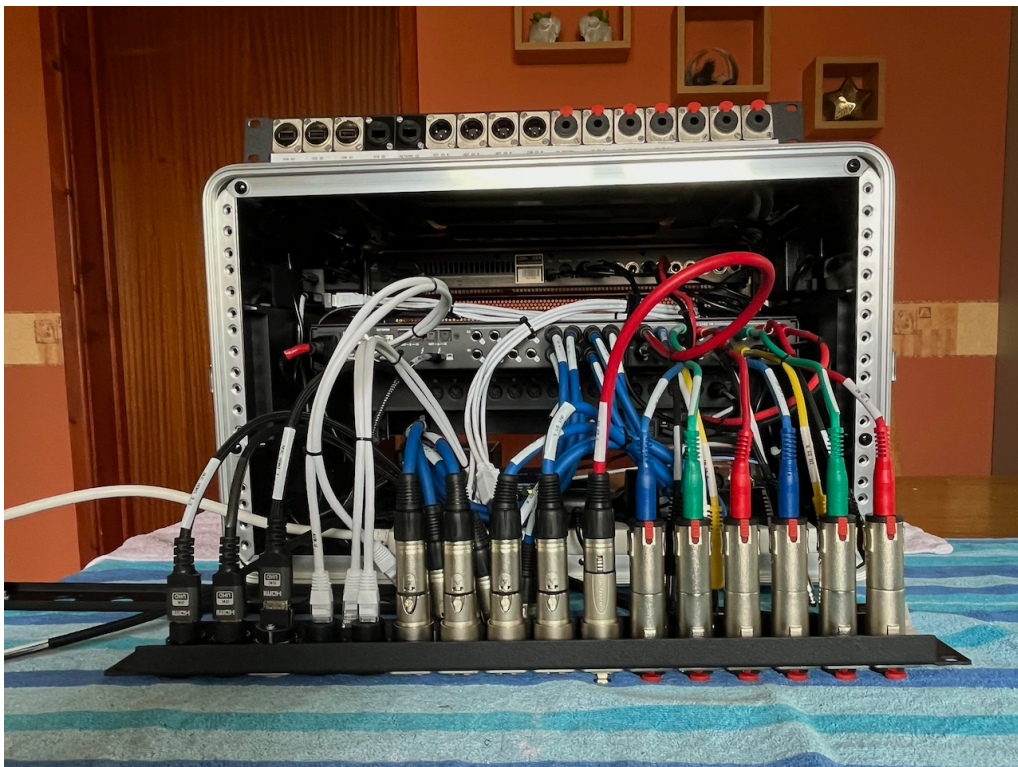


Building the Rack – Wiring the Rack

There is quite a bit to do here, albeit quite a simple task. You can see I have been using short pre-made cables, labelling them, and wiring them into logical groups of cables just to stop the inside of the rack becoming a complete rat's nest.



Here is the first backplate completed and ready for fitting.



I did have a small problem in that the MOTU 16A is quite a deep unit, so couldn't have a backplate with the feedthrough couplers directly behind it, but the plate I have for the IEC mains connector goes in place quite nicely there as can be seen below, and whilst I could have blanked off the unused connector cutouts, I decided to keep them open to provide for some airflow. You can also see I have been using self-adhesive labels to label the connectors.



Building the Rack – Testing the Rack

Part way through the build, I decided to do some initial testing just to make sure everything was working. Prior to the build, I had preinstalled most of the software I needed onto the NUC computer just plugged into my studio network, to save some time whilst I was waiting for the other components to arrive.

Below you can see my GeChic Monitor with Cantabile displayed, and I am using the second HDMI output to show the MOTU 16A CueMix application on the left and the Nord G2 Editor Application on the right. I was using the Nord G2 to generate a sequence that was being fed through the 16A to test it was working at least on its headphone output, and running Cantabile and one of my songs with backing sequences to check the host out.

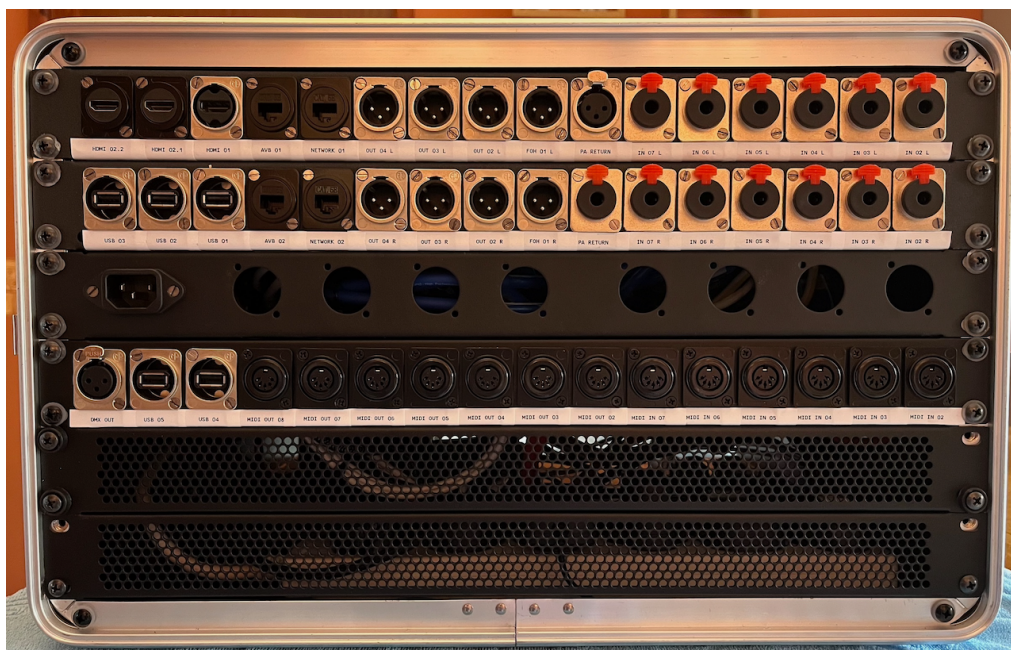


Building the Rack – Final Assembly

All was good at this point, so I carried on and completed the build and ended up with the rack assembled as shown at the start of the guide.



The finished back panel configuration is shown below. You can see I have used some 1U Ventilation Panels to finish it off. Due to the curvature at the bottom of the rack, I had to do a little bit of filing on the lower corners of the bottom panel to make it fit.



So, there you have it. One Gig Rack rebuilt, which will hopefully be good for another 8 years!

The Gig Rack in Use

As I said at the start of this guide, I wanted the flexibility with the new rack to “mix and match” different setups depending on what I need for a gig.

I had three standard configurations in mind that I can choose from:

- A small size rig with two keyboards
- A medium size rig with three keyboards
- My full size rig with five keyboards

Each is shown and explained below. I also have pre-wired cable looms between the units to make setup and teardown easy, with the cabling grouped to support the three configurations.

The pictures below are from when I did a test setup of all three rigs in the hallway of my house – a large hallway is a blessing for when I need to do this!

The Gig Rack in Use – Gig Rig Configuration 1

This is my small size configuration, for example when I play in Welsh Floyd where most of the sounds are coming from the Kronos (for historical reasons and no need to reprogram!) with some Hammond Organ and Farfisa and Binson Echorec being provided via VSTs in Cantabile.

Cantabile is also running the backing tracks, click track and providing DMX to my lighting rig as per my [Cantabile and DMXIS Guide](#), and sending control signals to a video laptop as per my [Using Cantabile with the Cantabile Media Server Guide](#).

You can see the GeChic Touch Monitor behind the keyboards that allows me to keep an eye on what Cantabile is doing and see the show notes; during a gig all control is provided via my trusty Roland FC300 MIDI foot controller and either the Montage or Kronos control surfaces.



The Gig Rack in Use – Gig Rig Configuration 2

This is my medium size configuration. With my Spectral Streams show, sometimes I am asked to do a slot within a festival and keep the stage footprint to a minimum (as there will be backline and drums on stage for all the bands).

I can only ever start first with the setup time I need, but I need to be off stage in 20 minutes. The addition of my fantastic Novation Summit to my two board rig along with all the VSTs in Cantabile allows me to do a cut down version of my main Spectral Streams Set.

You can see I have put the gig rack under the keyboards to save some stage space.



The Gig Rack in Use – Gig Rig Configuration 3

And finally, this is my large rig for when I do my solo shows in Spectral Streams and have the stage all to myself!

In these shows I will also have a laptop sitting on top of the Gig Rack for providing generative video visuals to a HDMI projector.

I love lots of complex layers and all songs use a combination of the hardware synths and VSTs in Cantabile.

Cantabile will be running my backing loops as per my [Using MuLab 9 Within Cantabile Guide](#), generating DMX to my lighting rig as per my [Cantabile and DMXIS Guide](#) and generating commands to drive [Imaginando Visual Synthesizer](#) running on the laptop to create the video visuals for the show.



Annex A – Channel Allocations

This section covers how I have allocated the input and output channels in my rig. It is always good to document this.

I have not made specific reference to instruments on the channel IO as that could change over time.

My cable looms are labelled with the general rack IO names at the rack end of the loom and the specific instrument names on the instrument end.

Table items shaded in grey are internal to the rack.

MOTU 16A Audio Inputs

MOTU 16A Inputs	Back Panel	Connector Type	Allocation
01, 02	N/A Internal Cabling	TRS x 2	Clavia Nord G2 Engine Output L/R
03, 04	Audio IN 02 L / R	TRS x 2	Yamaha Montage M7 Output L/R
05, 06	Audio IN 03 L / R	TRS x 2	Korg Kronos X61 Output L/R
07, 08	Audio IN 04 L / R	TRS x 2	ASM Hydrasynth Deluxe Output L/R
09, 10	Audio IN 05 L / R	TRS x 2	Novation Summit Output L/R
11, 12	Audio IN 06 L / R	TRS x 2	Sequential Prophet X Output L/R
13, 14	Audio IN 07 L / R	TRS x 2	Boss SY-1000 Guitar Synthesizer Output L/R ⁶
15	PA Return	XLR F	Monitor Input (E.g. from PA Mixer Send)
16	PA Return	TRS	Monitor Input (E.g. from PA Mixer Send), or Boss SY-1000 Sub Output (Mono)

MOTU 16A Audio Outputs

MOTU 16A Outputs	Back Panel	Connector Type	Allocation
01, 02	FOH 01 L/R	XLR M x 2	Front of House Mix Stereo
03, 04	OUT 02 L/R	XLR M x 2	Click Track 1 Stereo
05	OUT 03 L	XLR M	Click Track 2 Mono
06	OUT 03 R	XLR M	Click Track 3 Mono
07	OUT 04 L	XLR M	Stage Monitor 1 Mono
08	OUT 04 R	XLR M	Stage Monitor 2 Mono
09, 10	N/A Internal Cabling	XLL M x 2	Shure PSM200 IEM Inputs
11, 12	N/A Internal Cabling	TRS x 2	Reserved for Clavia Nord G2 Engine Inputs
13, 14	N/A Unused	Unused	Unused
15, 16	N/A Unused	Unused	Unused

⁶ I am not using this yet, but plan to as I expand the show, as I would like to get some ambient guitar in there.

MOTU MIDI EXPRESS 128 MIDI Inputs and Outputs

MOTU MIDI EXPRESS 128	Back Panel	Connector Type	Allocation
01 IN	N/A Internal Cabling	5 Pin DIN	Clavia Nord G2 Engine MIDI OUT
02 IN	MIDI 02 IN	5 Pin DIN	Yamaha Montage M7 MIDI OUT
03 IN	MIDI 03 IN	5 Pin DIN	Korg Kronos X61 MIDI OUT
04 IN	MIDI 04 IN	5 Pin DIN	Roland FC300 MIDI OUT
05 IN	MIDI 05 IN	5 Pin DIN	ASM Hydrasynth Deluxe MIDI OUT
06 IN	MIDI 06 IN	5 Pin DIN	Novation Summit MIDI OUT
07 IN	MIDI 07 IN	5 Pin DIN	Sequential Prophet X MIDI OUT
08 IN	N/A ⁷	5 Pin DIN	Boss SY-1000 MIDI OUT (not used live ⁸)
01 OUT	N/A Internal Cabling	5 Pin DIN	Clavia Nord G2 Engine MIDI IN
02 OUT	MIDI 02 OUT	5 Pin DIN	Yamaha Montage M7 MIDI IN
03 OUT	MIDI 03 OUT	5 Pin DIN	Korg Kronos X61 MIDI IN
04 OUT	MIDI 04 OUT	5 Pin DIN	Roland FC300 MIDI IN (not used live ⁹)
05 OUT	MIDI 05 OUT	5 Pin DIN	ASM Hydrasynth Deluxe MIDI IN
06 OUT	MIDI 06 OUT	5 Pin DIN	Novation Summit MIDI IN
07 OUT	MIDI 07 OUT	5 Pin DIN	Sequential Prophet X MIDI IN
08 OUT	MIDI 08 OUT	5 Pin DIN	Boss SY-1000 MIDI IN

HDMI Outputs

HDMI	Back Panel	Connector Type	Allocation
PC HDMI 1	HDMI 01	HDMI	GeChic Touch Monitor 1 HDMI IN (Cantabile)
PC HDMI 2	N/A Internal Cabling	HDMI	Splitter HDMI In
Splitter HDMI 1	HDMI 02.1	HDMI	GeChic Touch Monitor 2 HDMI IN (Visual Synthesizer)
Splitter HDMI 1	HDMI 02.2	HDMI	Projector for show Visuals

DMX Outputs

DMX	Back Panel	Connector Type	Allocation
DMXIS OUT	DMX OUT	XLR F	To DMX Lighting Rig

⁷ This MIDI Port only appears on the front panel of the MOTU MIDI Express 128.

⁸ I do not envisage a use case where I would be using this output live.

⁹ When on stage I only need an input from the FC300, but this port is required if, for example, I needed to update the FC300 configuration whilst I was away from the studio.

Network Connections

Source	Back Panel	Connector Type	Allocation
PC Network	N/A Internal Cabling	RJ45	GS305 1
GS305 2	Network 01	RJ45	Studio Network Switch
GS305 3	Network 02	RJ45	Reserved
MOTU 16A U	AVB 01	RJ45	AVB Network Switch
MOTU 16A L	AVB 02	RJ45	Reserved

USB Connections

Source	Back Panel	Connector Type	Allocation
PC USB 2	N/A Internal Cabling	USB A	MOTU MIDI Express 128
PC USB 3	N/A Internal Cabling	USB A	USB Hub
PC USB C 1	N/A Internal Cabling	USB C / TB	MOTU 16A
PC USB C 2	N/A Internal Cabling	USB C / TB	HDMI Splitter (providing a power feed)
Hub USB 1	N/A Internal Cabling	USB A	DMXIS
Hub USB 2	N/A Internal Cabling	USB A	Clavia Nord G2
Hub USB 3	USB 01	USB A	GeChic Touch Monitor USB Mouse/Keyboard Emulator ¹⁰
Hub USB 4	USB 02	USB A	Reserved
Hub USB 5	USB 03	USB A	Reserved
Hub USB 6	USB 04	USB A	Reserved
Hub USB 7	USB 05	USB A	Reserved

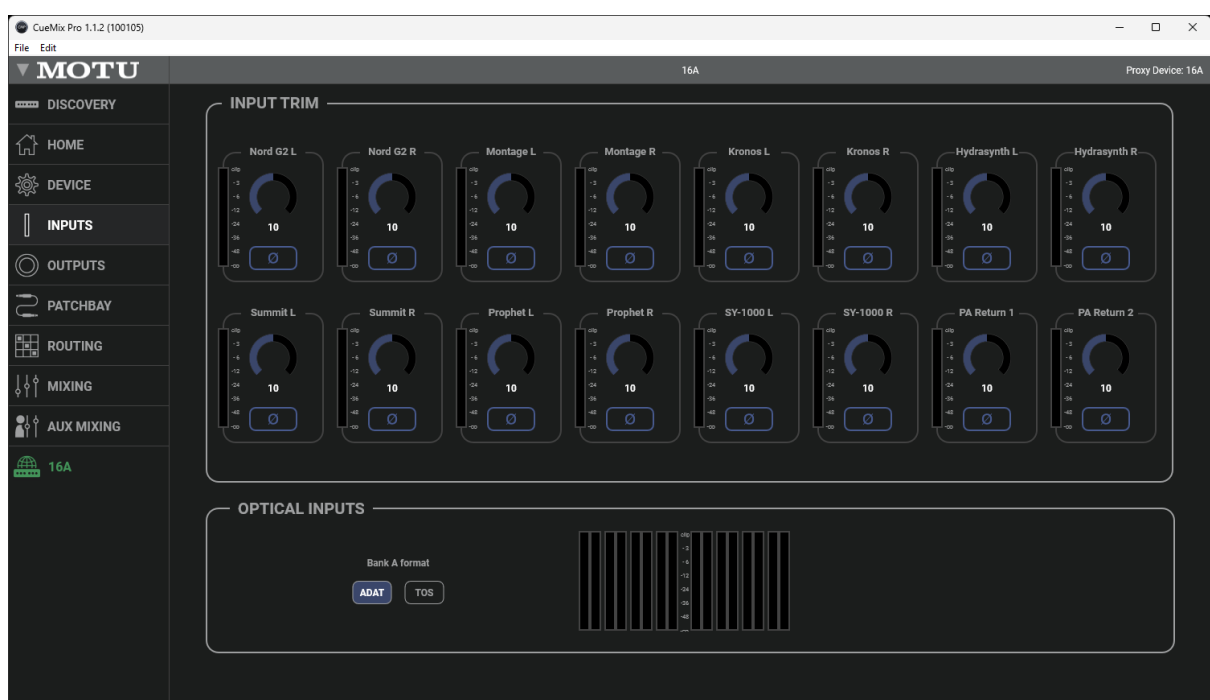
¹⁰ This can also provide power to the GeChic if the USB Cable is relatively short, but the GeChic Monitor is a little power hungry, and it is best to provide it with a direct power source as well.

Annex B – MOTU 16A Configuration

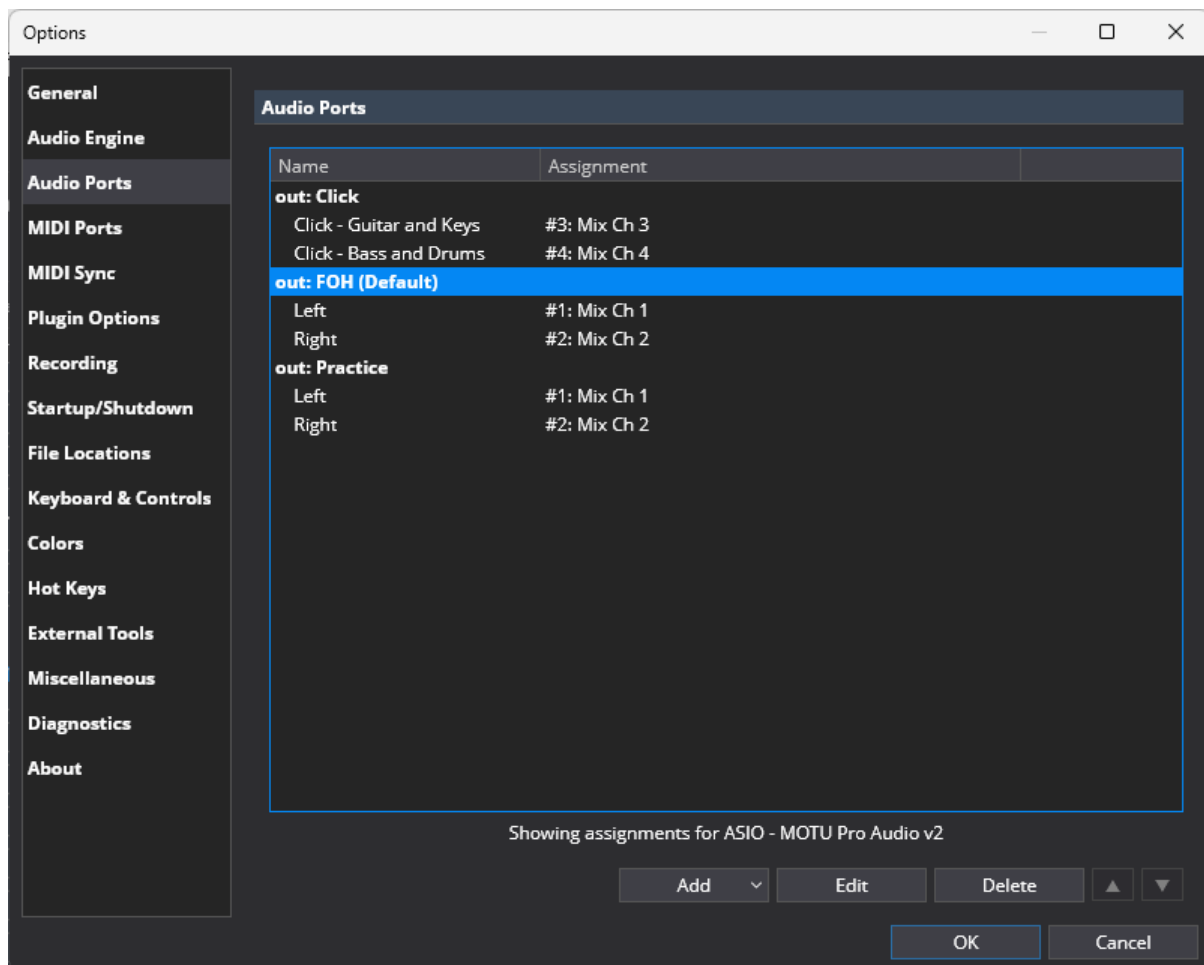
This section documents how I have configured the MOTU 16A. Whilst I saved the configuration I have made to an internal preset and to file, it is always good to have a record of the configuration, and in working through documenting this, I identified some improvements for consistency and understanding.

Here is the panel for the device inputs. You can see, one great advantage of going the Digital Mixing route is that you can give everything meaningful names, and all of my input channels have the name of what is currently connected in.

Here you also have the option of trimming the inputs and performing phase inversion if needed.



The MOTU 16A is also taking **Host Inputs** from Cantabile. I have the audio ports in Cantabile setup as follows. The naming that shows in Cantabile is a little different to what you see in the MOTU 16A CueMix application. Essentially a **Mix Ch** in Cantabile is equivalent to a **Host Output** in the CueMix application.



Here is the output configuration, again with all outputs meaningfully named.

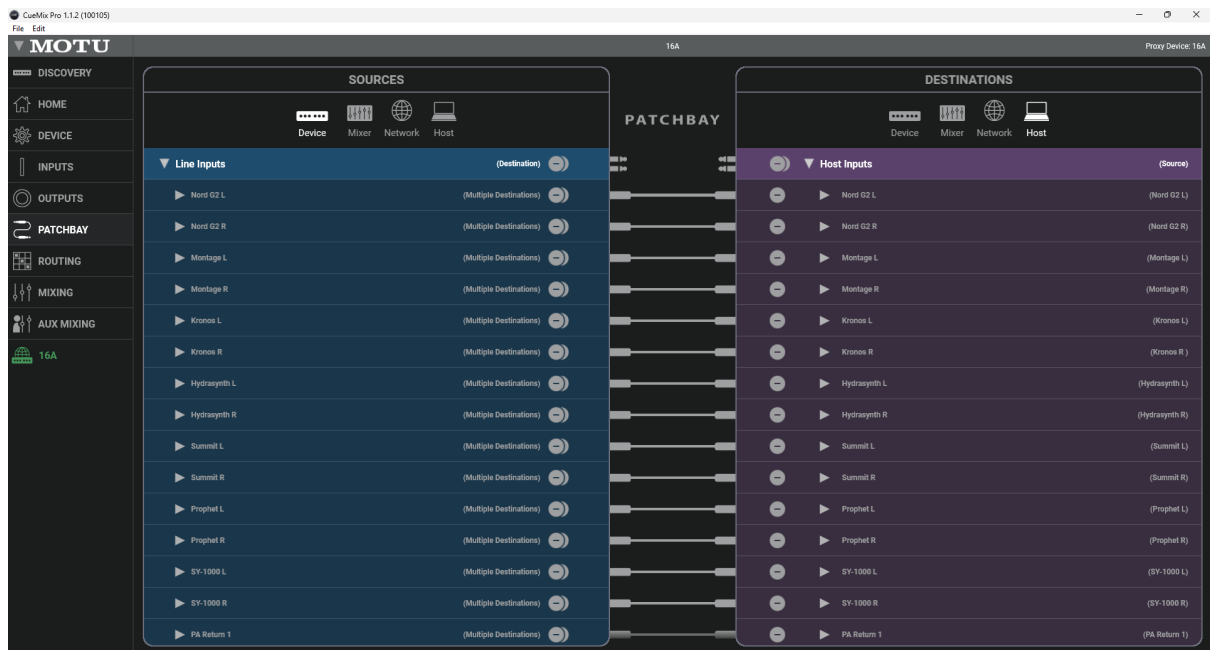
You can also see here that for the IEM Outputs to the PSM200 IEM Transmitter, I have trimmed the output gain back a little as without the trim even setting a lower gain in the mixer was still overloading the PSM200.

The monitor gain is by default allocated to the first two outputs, which is my Front of House (FOH) Mix. This can be controlled from the front panel. Likewise the same is true of the Headphone output.

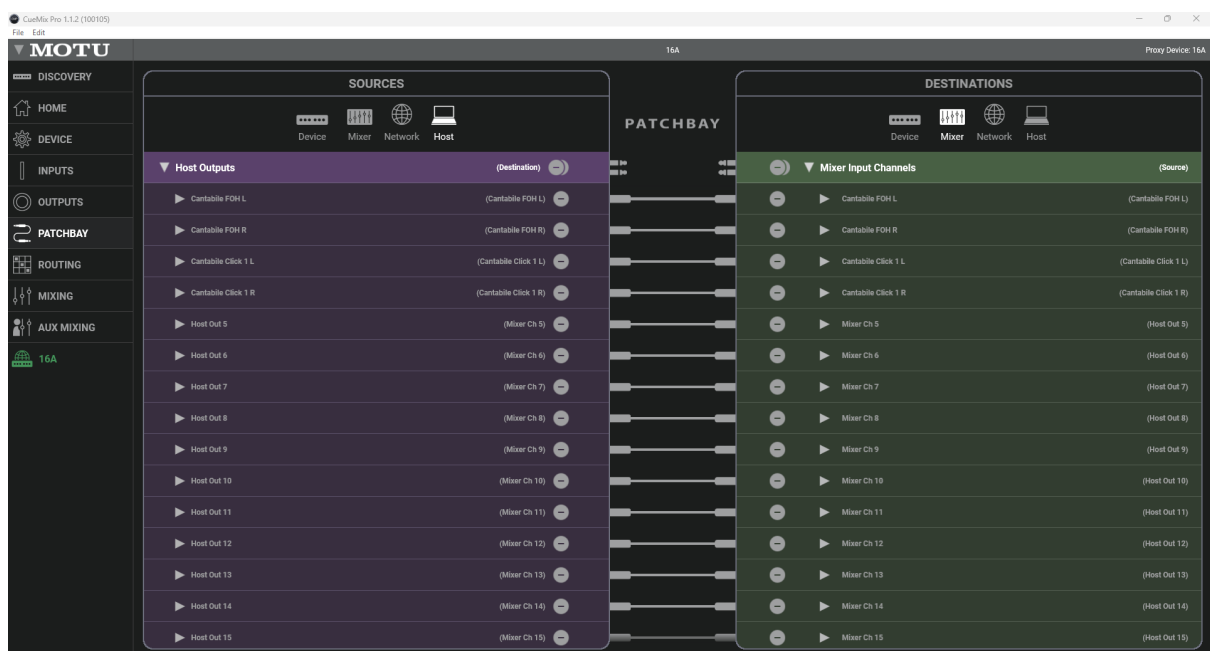


The CueMix Patch Bay is where you can make your connections.

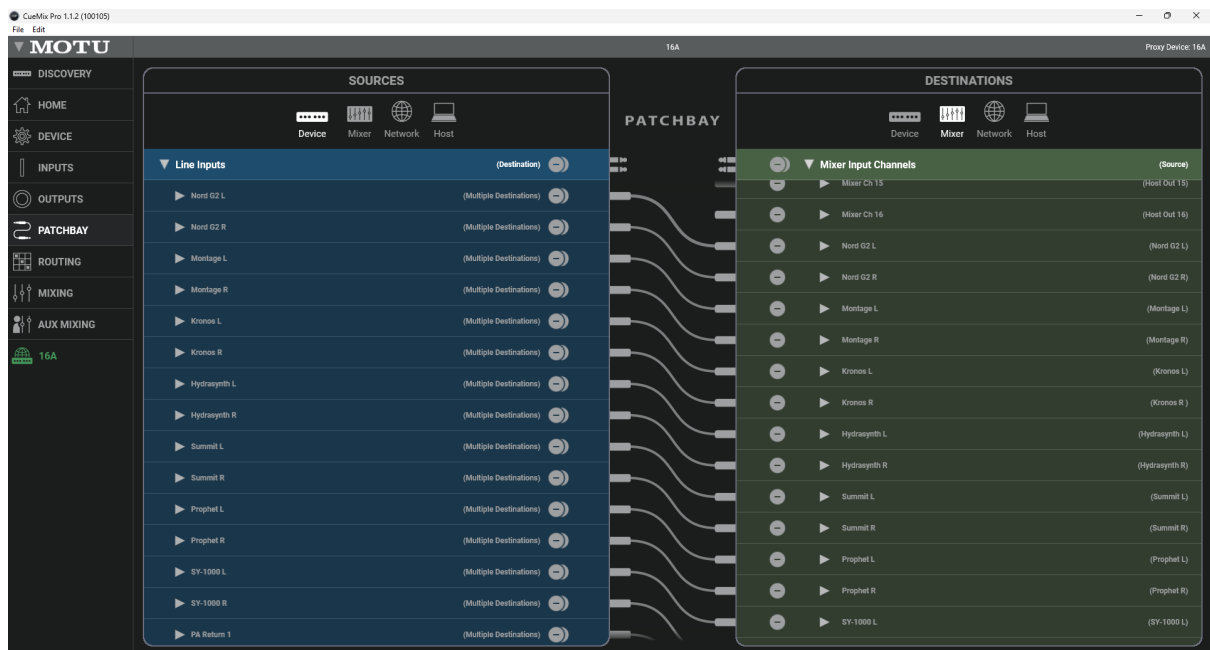
This CueMix Patch Bay combination shows how I have assigned the MOTU 16A Line Inputs from the external devices to MOTU 16A Host Inputs. With the Host being Cantabile, I could set up the Cantabile Audio Input Ports if I wished to do some in the box processing of my synthesizers. E.g. My Prophet X has only two effects slots, and maybe I wanted to do more processing of the sound, which I could do via Effects VSTs within Cantabile.



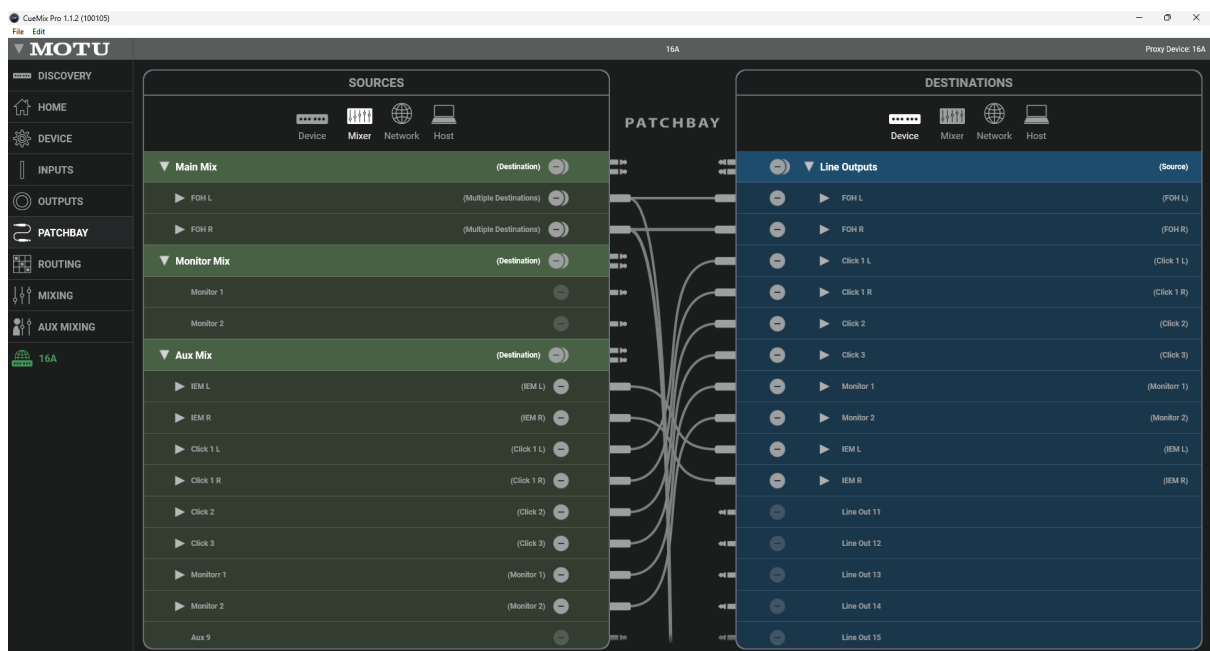
This CueMix Patch Bay combination shows the routing of MOTU 16A Host Outputs from Cantabile to the MOTU 16A Mixer Input Channels. I only have four host outputs assigned as two stereo pairs: **Cantabile FOH L/R** and **Cantabile Click L/R**.



This CueMix Patch Bay combination shows the routing of MOTU16A Line Inputs to the MOTU 16A Mixer Input Channels.

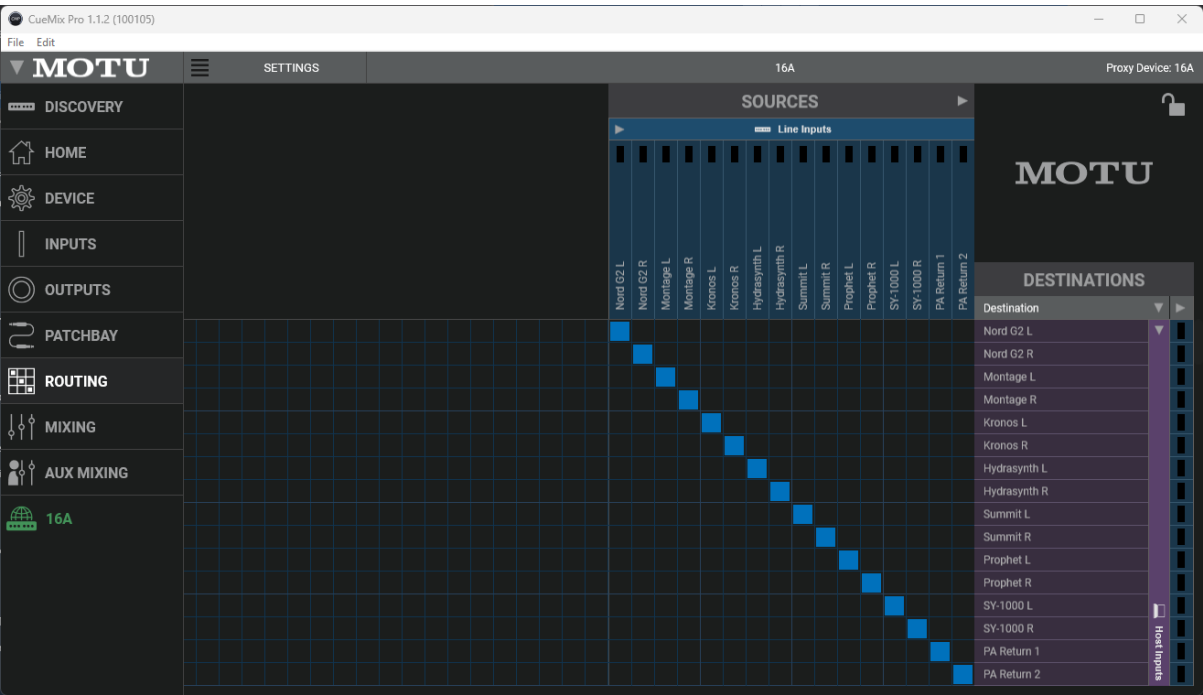


This CueMix Patch Bay combination shows I connect MOTU 16A Mixer Outputs to MOTU 16A Line Outputs.

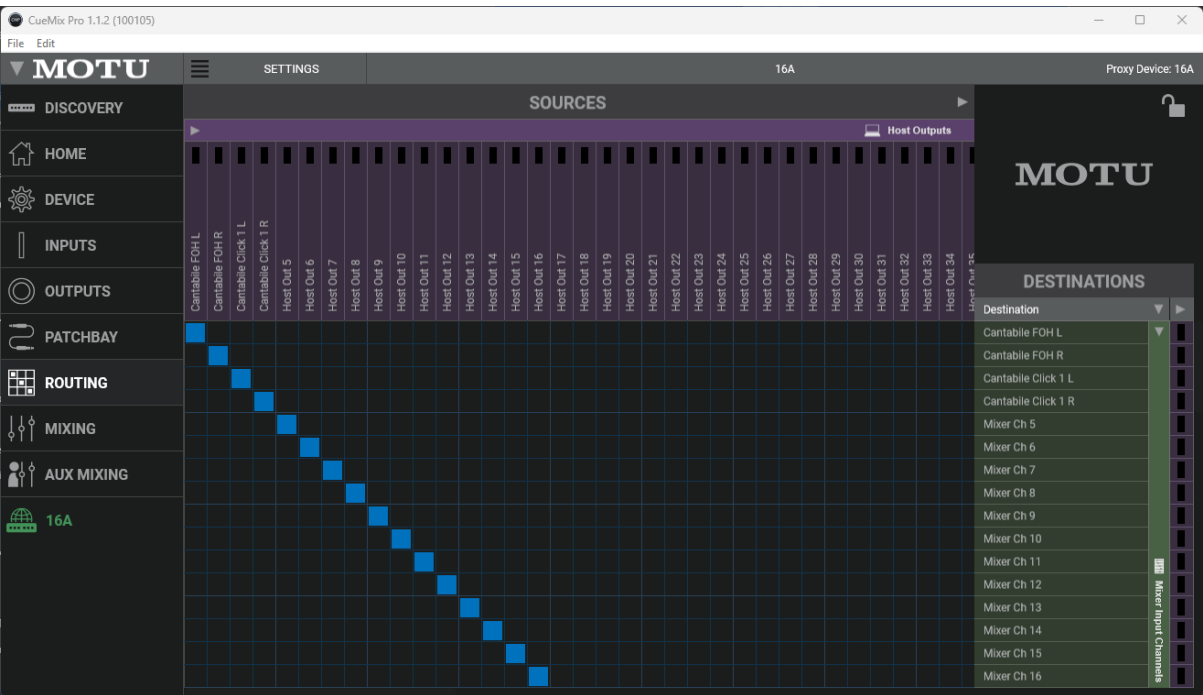


The MOTU CueMix Routing table is a handy alternative to the Patch Bay view to show what you have connected to what in a matrix style. In the Settings tab (hidden) you can show/hide what you want to see.

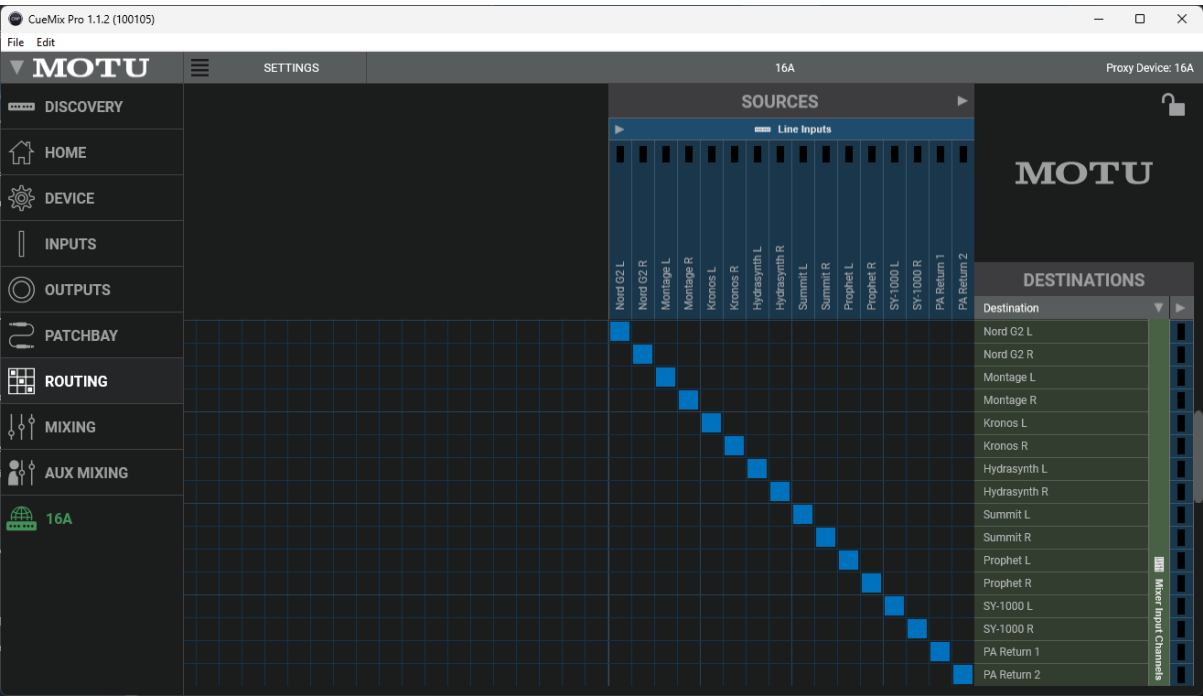
This CueMix Routing Combination shows the MOTU 16A Line Input sources at the top in blue and the MOTU 16A Host Input Channel destinations to the right in Purple.



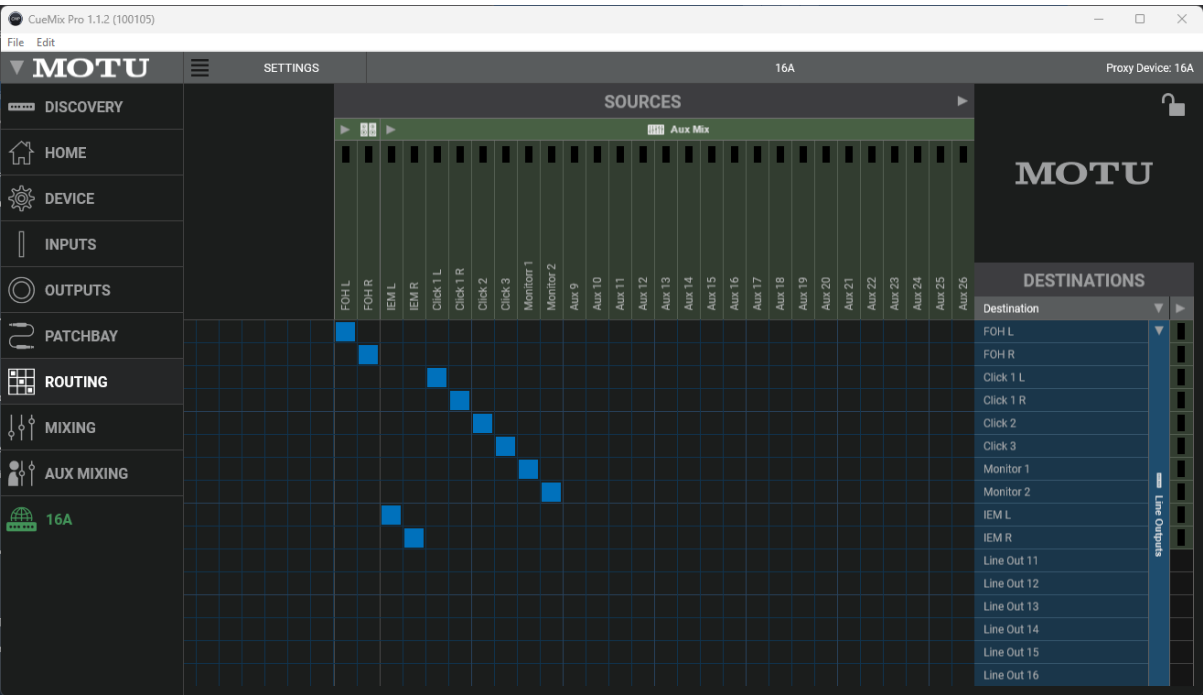
This CueMix Routing Combination shows the MOTU 16A Host Output Connections (from Cantabile) at the top in purple to the MOTU 16A Mixer Input Channels to the right in green.



This CueMix Routing Combination shows the MOTU 16A Line Input Sources in blue at the top routed to the MOTU 16A Mixer Input Channels in green to the right.



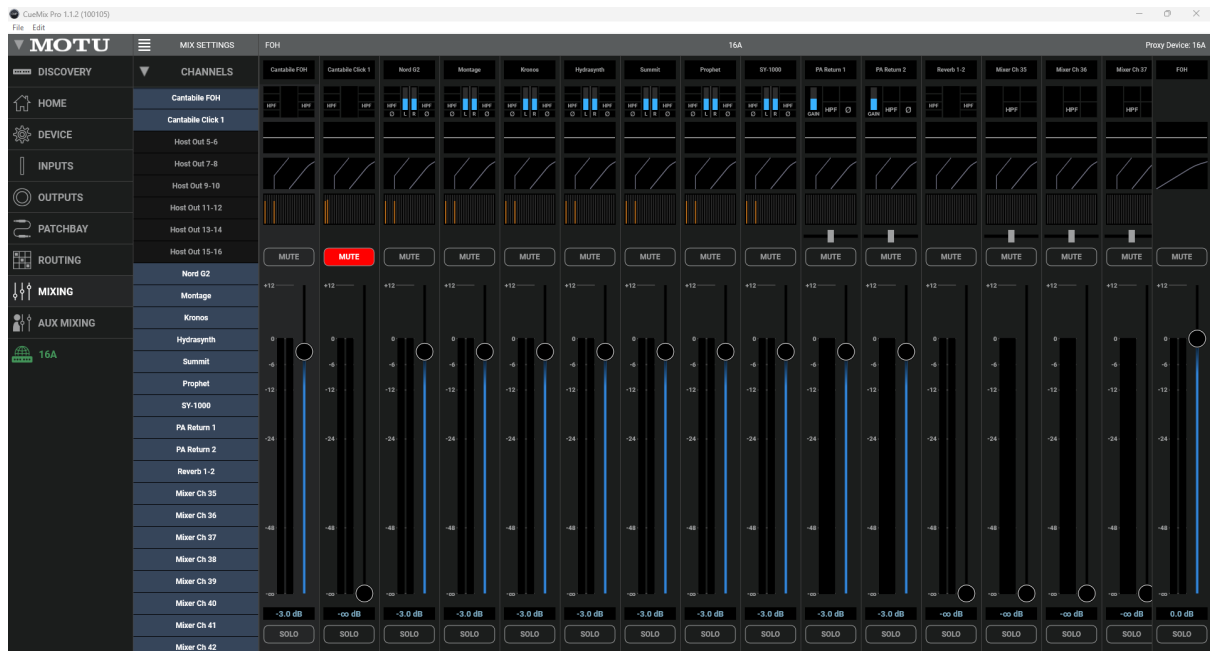
This CueMix Routing Combination shows the MOTU 16A Main and named Aux busses (at the top in green) routed to the MOTU 16A outputs (to the right in blue).



With all the routing sorted, it's now time to look at the Main and Aux Mixing busses.

The **Main Mixing Bus** is fixed to the first two outputs of the 16A, which I have allocated as the **FOH Bus**, and is given below, showing:

- Cantabile FOH is the main output of Cantabile¹¹.
- Cantabile Click 1 is the click output of Cantabile¹², which is muted, and the gain is set to infinity as you do not want the click going to FOH.
- The Synthesizer channels.
- The Bus gain channel on the far right.



The MOTU 16A has a number of Auxiliary Busses, which you set up as needed for your own purposes, I have allocated the Auxiliary Busses as follows.

AUX BUS	Name	Stereo/Mono	Allocation
AUX 1-2	IEM	Stereo	The mix to my Shure PSM200 IEM
AUX 3-5	Click 1	Stereo	The mix to the Click 1 Output
AUX 5	Click 2	Mono	Reserved
AUX 6	Click 3	Mono	Reserved
AUX 7	Monitor 1	Mono	The mix to my Floor Wedge Monitor
AUX 8	Monitor 2	Mono	Reserved

All other Aux busses are currently unused.

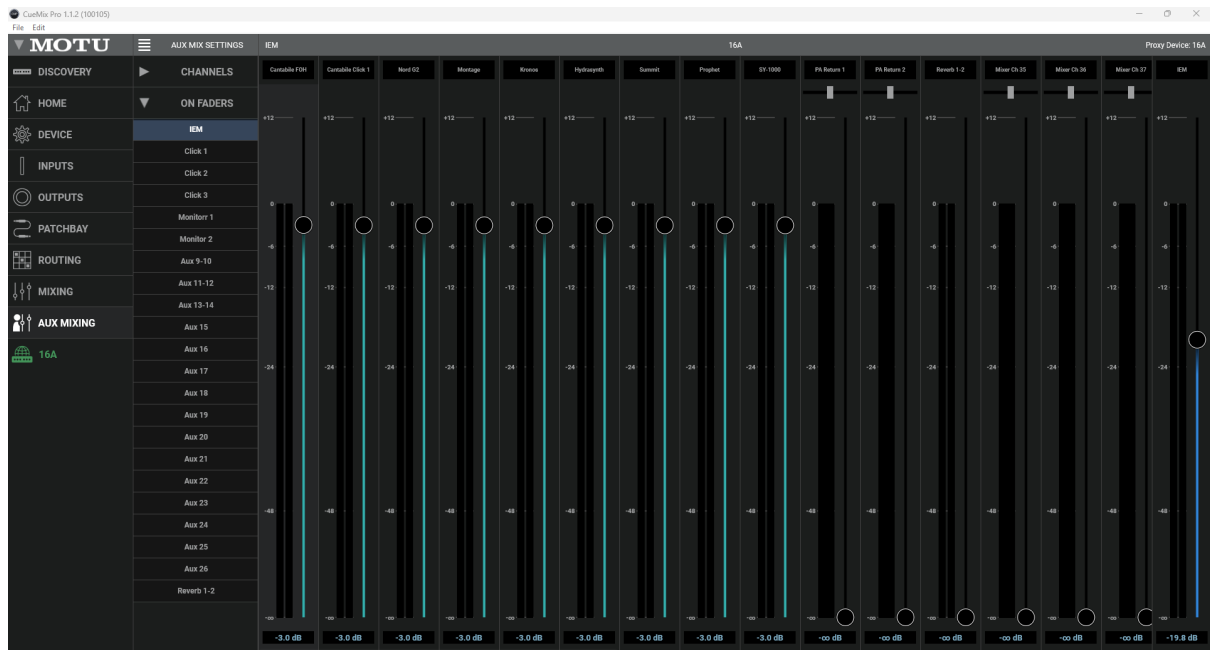
¹¹ All the audio output from VSTs and Media Players, etc. are routed to this Cantabile Output.

¹² This is the Metronome click I set up in either a Media player or within the MuLab loop that I run within Cantabile.

The **IEM AUX Bus** is given below, showing

- Cantabile FOH is the main output of Cantabile.
- Cantabile Click 1 is the click output of Cantabile.
- The Synthesizer channels.
- The Bus gain channel on the far right.

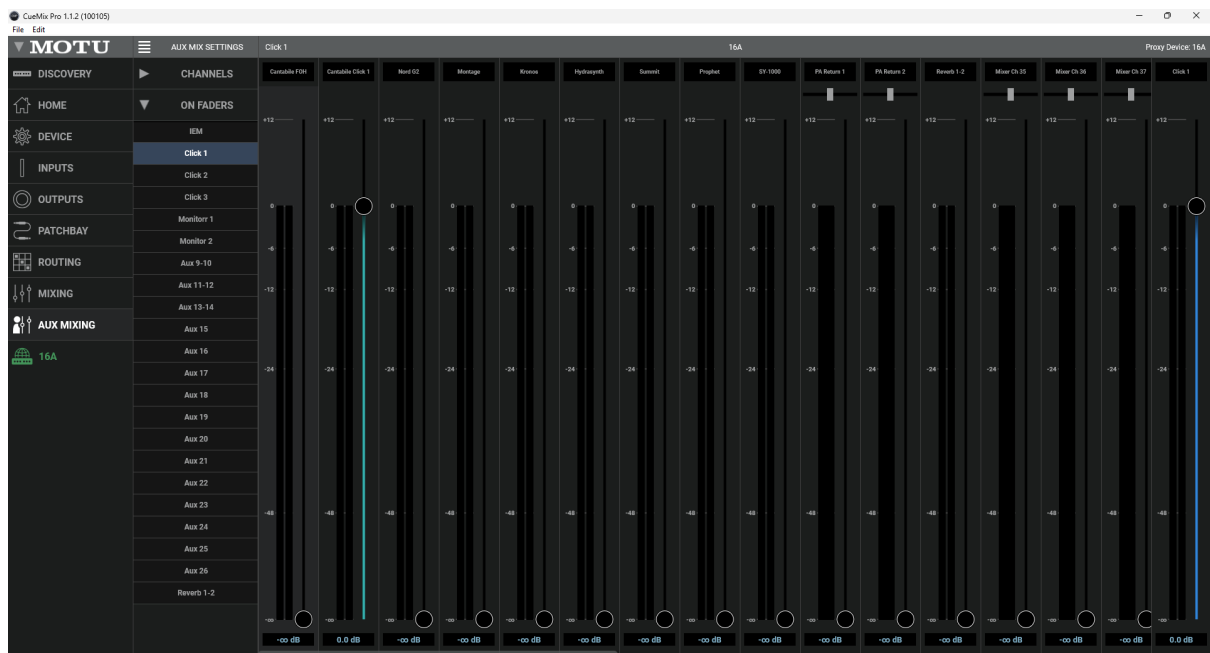
For this mix to my IEM, I need the click output from Cantabile as well as Cantabile's main output and all of the instruments.



The **Click 1 Bus** is given below, showing

- Cantabile FOH is the main output of Cantabile.
- Cantabile Click 1 is the click output of Cantabile.
- The Synthesizer channels.
- The Bus gain channel on the far right.

For this mix, Just the Click 1 Output from Cantabile output is needed.

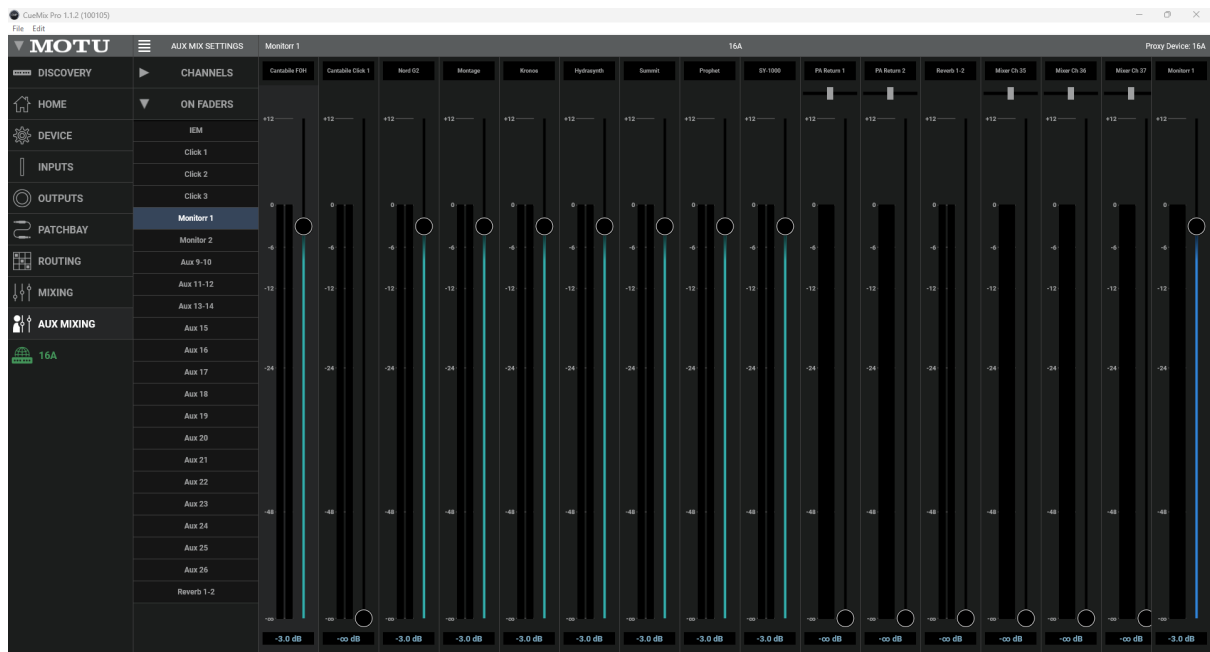


The **Click 2** and **Click 3** Aux busses are currently unused. I would use them in a band context if other members in the band wanted different click cues that I would setup in Cantabile. I would also have to set up additional audio ports in Cantabile and set them up in the MOTU 16A routing.

The **Monitor 1 Bus** is given below, showing

- Cantabile FOH is the main output of Cantabile.
- Cantabile Click 1 is the click output of Cantabile, which is muted¹³ as you do not want the click going to the Wedge Monitor¹⁴.
- The Synthesizer channels.
- The Bus gain channel on the far right.

The **Monitor 1** Aux bus goes to the Monitor 1 output, which I sent to my Stage Wedge Monitor.



The **Monitor 2** Aux bus is currently unused. I would use it in a band context if other members in the band wanted different monitor mix that I would setup in Cantabile. I would also have to set up additional audio ports in Cantabile and set them up in the MOTU 16A routing.

¹³ Gain set to infinity as AUX Busses have no mute switch.

¹⁴ I only have one ear bud in from my IEM belt pack, and prefer to have a stage wedge for other ear and I also then get the ambience of the room. Some people do not recommend this and even say it can cause hearing damage, but I have found no problems with it as the volume on stage is not high.

Annex C – Parts List

Item	Supplier	Stock Number
Thomann Rack Case 6U	Thomann	
Adam Hall 87221VR Rack Plate	Thomann	
Thon Rack Adapter 1U 25	Thomann	
C14 Panel Mount IEC Plug	RS	488-191
IEC Insulating Boot	RS	526-0724
Pre-Punched 1U Panel for 16 D-Type XLR Connectors	ESR	406-736
Pre-Punched 1U Panel for 8 D-Type XLR Connectors and 1 x IEC Inlet	ESR	406-734
Neutrik MFD M3 Mounting Frame for D-Type Connectors	ESR	406-885
6.35mm Stereo Bulkhead Socket - Socket	ESR	075-525
Neutrik NA3MDF 3-Pin Male XLR to 3-Pin Female XLR Panel-Mount Adaptor	Amazon	
Neutrik NA3FDM 3-Pin Female XLR to 3-Pin Male XLR Panel-Mount Adaptor	Amazon	
Neutrik NAUSB-W USB A to USB B Chassis Mounting Coupler	Amazon	
Neutrik NAHDMI-W 1.3 Feedthrough Adaptor with D-Shape Housing	Amazon	
D Type RJ45 Coupler, Panel Mount Connector Bulkhead Pass Through Socket	Amazon	
MEIRIYFA MIDI DIN 5Pin Extension Cable Cord, D-Type Panel	Amazon	
TRS to TRS Jack 0.3M Leads	Amazon	
TRS to XLR Male 0.5M leads	Amazon	
TRS to XLR Female 0.5M leads	Amazon	
Thunderbolt 0.5M Lead	Amazon	
HDMI 0.5M Lead	Amazon	
BMP21 Brady Cable Labeller	RS	819-9808
Brady B-427 Black on White, Transparent Label Printer Tape (Self Laminating)	RS	694-9134
Brady B-499 Black on Black on White Label Printer Tape	RS	694-9100
Heavy Duty Velcro	Amazon	
Cable Ties Bulk Pack	Amazon	
Asus RNUC14RVKU7 Core Ultra 7 fully assembled PC	Ambros	
GeChic On-Lap 1303I Full HD Portable Display Monitor	Amazon	
MOTU16A	Thomann	
RSHTECH USB Hub Powered 7 Port USB 3.0 Data Hub	Amazon	
NEWCARE HDMI Splitter 1 in 2 out, HDMI Splitter for Dual Monitors	Amazon	
Netgear GD305 Switch	Amazon	