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Buchla

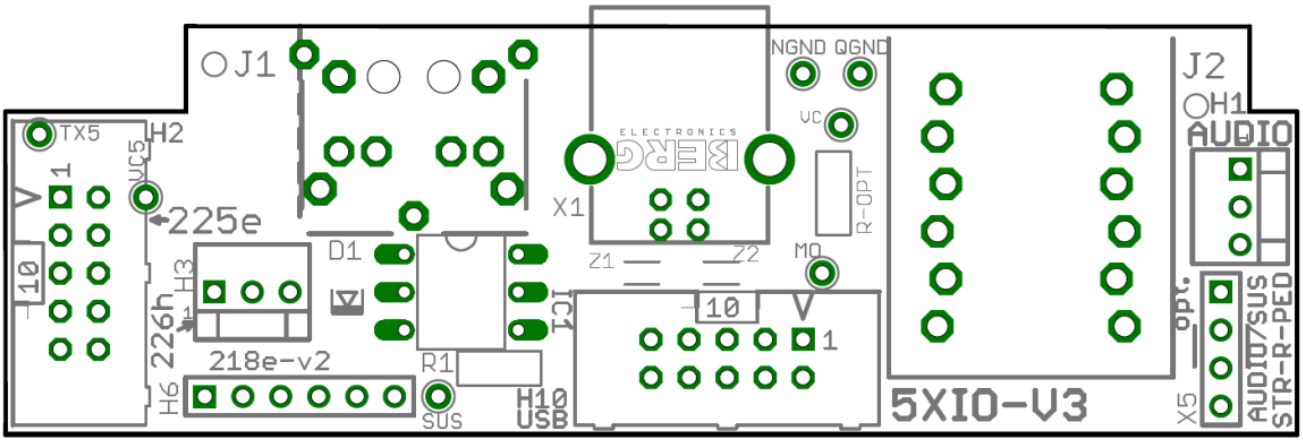
Buchla 5XIO.V3IO MIDI Plus Audio Breakout

Specifications

- 5XIO latest version with Five IO options
- MIDI Input (3.5mm) and MIDI Output
- USB-B for USB-MIDI in/out or firmware programming use
- Audio L and Audio R (or 218e Sustain)
- Audio is unbalanced; Tip/Sleeve

THE 5XIO is the latest version which covers Five IO options.

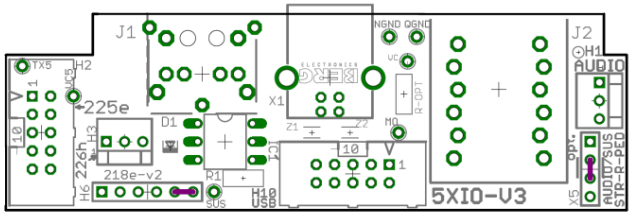
1. MIDI Input (3.5mm)
2. MIDI Output
   Use a standard type-A or the Buchla adapter for 3.5mm to DIN adaption
   For use with a 225e, 226h, *218e, *218eV3, or 208C. (225e/h and 208C are input only)
3. USB-B (USB-MIDI in/out or firmware programming use) For use with 208C (w/208MIDI board), *218eV3, 225h, or 226h.
4. Audio L
5. Audio R (or 218e Sustain)
   For use with 206e, 207e, 208, or 208C. (Audio is unbalanced; Tip/Sleeve)

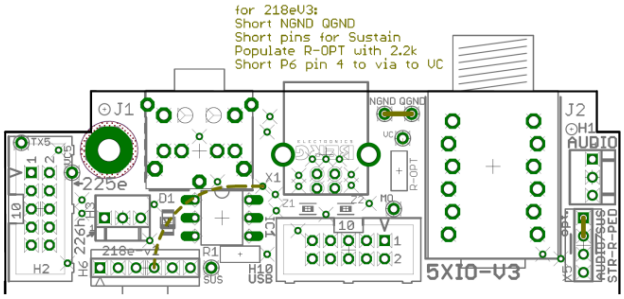


Inside headers connect to

For use with a 225e, use the 10-pin header labeled 225e on the far-left edge of the board. For a 226h use the 3-pin H3 header for 3.5mm output.
For use with a legacy 218e (v2) use the 6pin H6 header.
For use with all other MIDI inputs and outputs, use the center 10pin header.

*For 5XIO use with a 218e-V3 or legacy 218e (v2), request a 218e specific version from Buchla.
There are necessary modifications for the 218e as per below.
Default 5XIO jumpering is on the left; a modified 218e version on the right for either use with legacy 218e(-v2) or the 218e-V3.





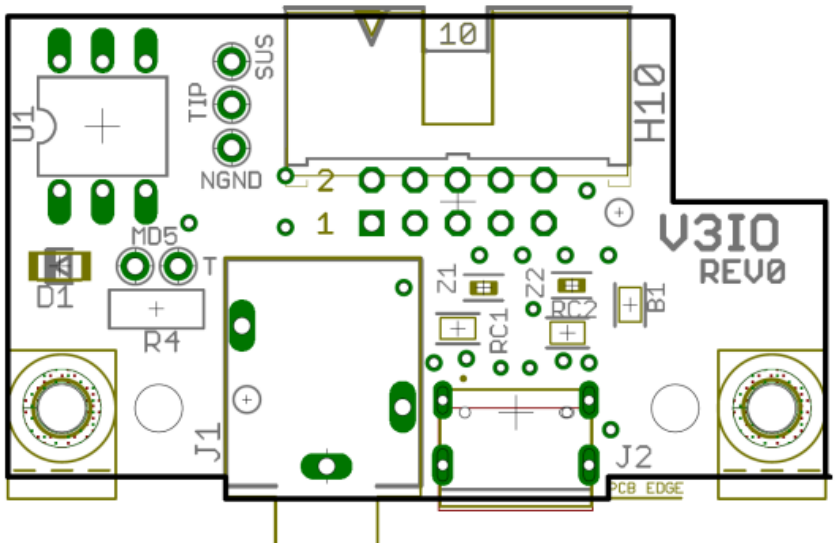
Explanation of the 4-pin header/2-pin jumper:
Notice that there is a jumper between labeled STR-R-PED:

- R (middle position) is the default position for normal Right output.
- PED is the position to use the R connector for 218e Sustain. Z
- STR is the position to get stereo audio out the “L” connector. This is way to get stereo while using the R jack for sustain.

To eliminate noise from the MIDI input to a 208C getting into its pitch control, a jumper from pin 5 to 6 on H6 is required.

V3IO for the small ports

Another IO board that can be used is the V3IO “Bust-out” board. It is designed with the 218e-V3 in mind. It uses a USB-C connector and 3.5mm to connect USB-MIDI (in and out) and sustain to a 218e-V3. It can also be modified to provide USB-MIDI In and 3.5mm MIDI input to a 208C. These are normally configured at Buchla USA.



[Jump “SUS” pad to “TIP” pad for sustain OR; Jump “T” pad to “MD5” pad for 3.5mm MIDI In.]

The cables that connect the panels to the module.

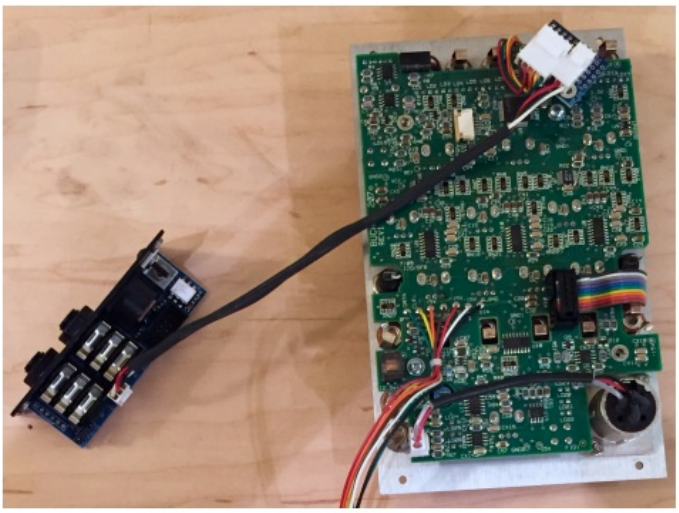
- 3-pin AUDIO cable: The 3-pin connectors are polarized so that the cable can only be inserted one way.
- 10-pin MIDI input cables: Connect the back of the 225e MIDI I/O panel with the provided
- 10-pin IDC cable. For the 225h, 226h, or 208MIDI, the 10pin cable will also connect the USB-MIDI.

Legacy module connections:

- 218e 6-pin MIDI connections: For MIDI input and output as well as sustain pedal input, there is a 6pin SIP connector.

- 226h 3-pin MIDI output cable: This is a simple 3pin SIP cable. The 3-pin connectors are polarized so that the cable can only be inserted one way.

206e/207e AUDIO



For use with a 207e or 206e, you replace the 5pin audio output cable with this little board as pictured. Restore the audio to the panel by inserting the 207e or 206e audio cable back in to the right angle 5pin header and then insert a 3pin cable into the 3pin header and plug the other end into the 22X-I-O.
A note about unused holes: There is a large mounting hole for a standoff, but as pictured, a standoff should be unnecessary. Friction holds the adapter firmly. But if your system is subject to an unusual amount of vibration and you are concerned, request a 1/2″ M-F standoff then bend up the 3-pin header to accommodate the screw head. (The 10 small holes are a footprint for the unusual use of 10 pin header connection to a 227e's four ¼" output I-O connection, of which only two outputs would then be used.)

The different legacy panels

There are three older MIDI I/O panels that work in a Buchla boat

1. The original 225e MIDI I/O panel that only has MIDI input
2. The h-MIDI panel made primarily for the 225h, 226h, or 208MIDI (208C), and can be made to provide MIDI in and out for a 218e.
3. The 22X-I-O Panel that comes with newer 225e's and can be used with the 208MIDI (208C) also includes some flexibility in the use of it's ¼" connectors with a 206/7e,

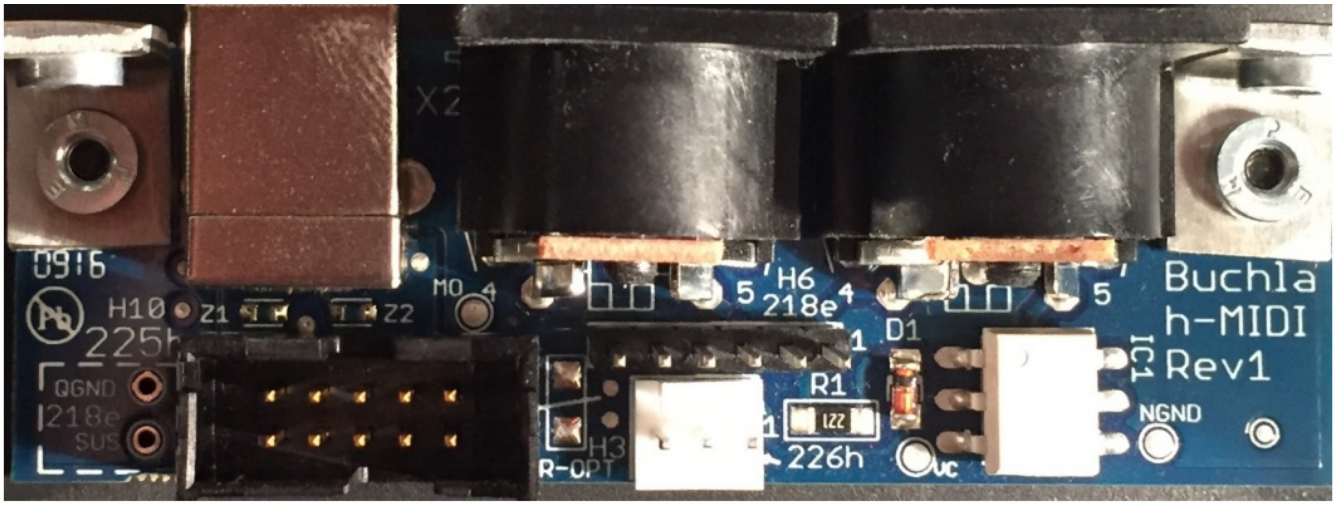
208, 208C, or 218e.

Simply use the I/O panel and cable that your module was supplied with or, for more specifics, continue reading.

The original 225e panel

The original 225e panel is simple: only the DIN MIDI input is implemented, and the connection is made with the 10-pin cable. This only works with the 225e. Additional MIDI Output and USB outputs were not implemented. This assembly is out of production in favor of more flexible options.

The h-MIDI panel for the 226h and 225h.



To connect the 225h to the MIDI 5-pin DIN and USB connectors, use H10, the 10-pin header labeled “225h”.
For 5-pin DIN MIDI output of the 226h use connector H3 labeled “226h” h-MIDI board. This connection is made with a 3-pin keyed cable. The 3-pin connectors are polarized so that the cable can only be inserted one way.
For USB-MIDI output of the 226h, use H10. It is NOT possible to share the USB port between a 226h AND a 225h. Use of H10 for 226h USB-MIDI precludes any connection of
a 225h.

h-MIDI for 225e: (Only for Rev5 and higher)
The 22X-I-O will be included with new 225’s, but the 225e Rev 5 and higher can also

use the h-MIDI panel for MIDI input simply using the 10-pin header H10. See the back to the 225e to read the revision number. Using the h-MIDI panel could be useful if you have both a 225e and 226h in a system.
If you have 225e Rev4 or below, it will require some thought. The 10pin of the h-MIDI board is NOT compatible with the 225e Rev4 and lower. But the connection easily made using the pins 1 and 2 labeled for the 218e and the connecting to 225e header at P7 header on the back of the 225e.
This 2-pin option leaves open the possibility of the connecting the 226h, 225e (any Rev), and even the 225h simultaneously.)

h-MIDI panel for a 218e:
To get MIDI In and MIDI out for a 218e, use “h-MIDI” IO board header H6. This header connects MIDI In and MIDI Out for 5-pin DIN connections (not USB) via the 6-pin connector
from the 218e .
A DIY mounted ¼” jack can be wired to the h-MIDI panel for a sustain pedal if it is wired to pads on the left side of the board labeled “218 Sustain” (You may need to get a blank panel and drill a hole for a panel mounted ¼” connector.)

h-MIDI panel for 208MIDI (208C daughter card): To get both DIN and USB-MIDI IN to the 208MIDI board, use the h-MIDI adaptor and the 10pin header. (For MIDI In only; there is no
MIDI output available on the 208MIDI.)

Buchia 1/4″ and MIDI adapter

The 22X-I-O panel also a flexible I/O panel, but was designed for 2 main uses:

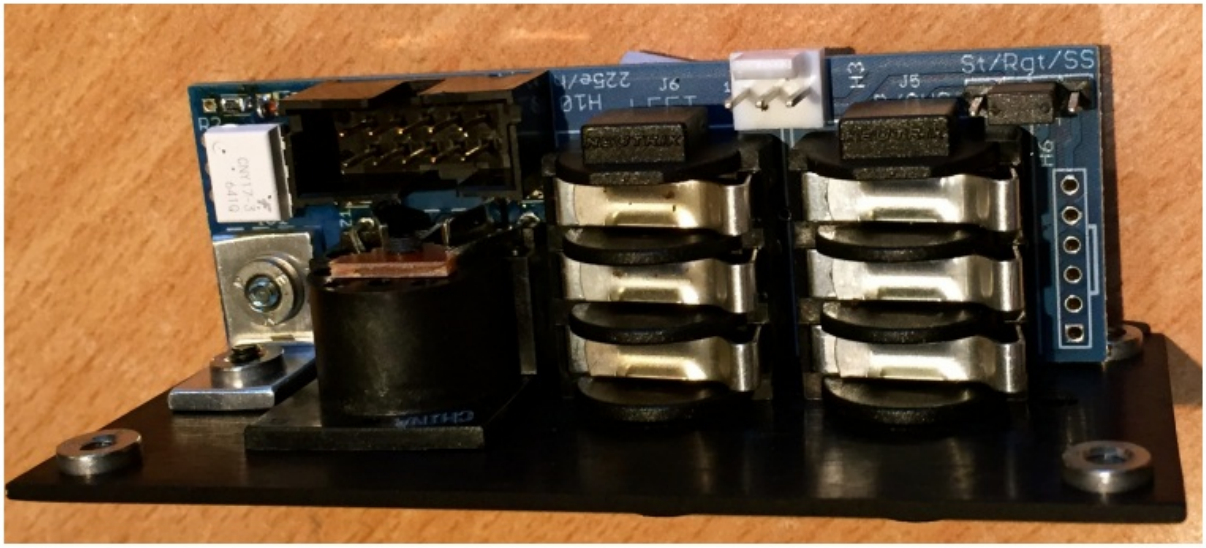
1. 225e/h MIDI input
2. 207e/206e ¼” breakout

You may plug use it for either MIDI input or audio output, or both simultaneously.
Pictured from left to right: MIDI In for 225e or 225h / Left audio / Right audio

For use with a 225e (or 225h), use the 10pin header to connect the 5-pin DIN MIDI input.

Audio: For use with a 207e or 206e, you replace the 5pin audio output cable with this the board just like the 5XIO Audio connection.
For use with a 225e or 225h, use the 10pin header (H10) to connect the 5-pin DIN MIDI input.

Explanation of the 4-pin header/2-pin jumper:
Notice that there is a two pin jumper between pins 2 and 3 (the middle) of the header labeled: “St/Rgt/SS”. This “Rgt” position this connects the Right audio output to Right ¼” jack. This is the normal position.



If the jumper was in the “St” [Stereo] position (connecting pins 3 and 4) then the left audio jack becomes a Stereo output.

Alternative uses for 22X-I-O

Uses with a 218e (v2):

If the jumper was in the “SS” [Sustain Switch] position (connecting pins 3 and pin 4) then the right jack becomes the Sustain pedal input for a 218e.

This requires that H6 be stuffed with an appropriate header and connected to the 218e.

If that is done, then the MIDI input will also connect to the 218e through the 6pin cable.

Uses with a 208: If you are lucky enough to have a boat deep enough to fit a 2013-2019 era 208, then the audio from the 208 can connect to H3 for audio output for a 200e boat.

Uses with the 208C:

You can use the 22X-I-O for ¼” audio outputs for a 208C as with the 208.

Also for 208C’s with a 208MIDI daughterboard, you can use the 22X-I-O 10pin header for DIN MIDI In. If you don’t use USB-MIDI then this option gives you both the audio output

and the MIDI input.

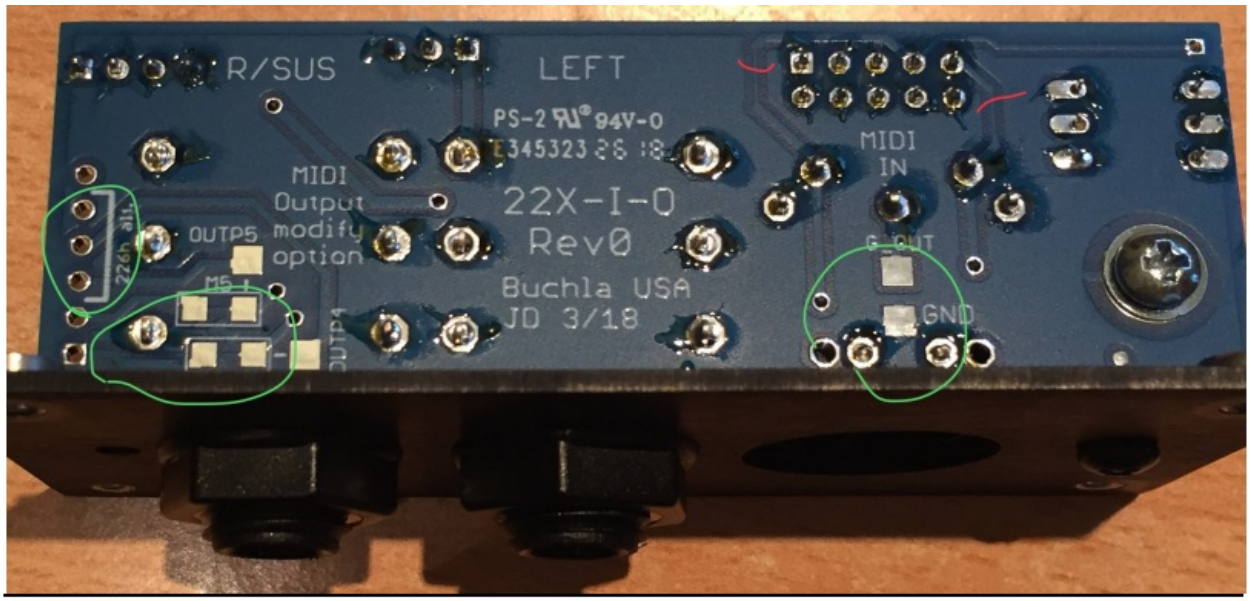
Direct to DIY hole option:

225e 2-pin MIDI input options for DIY 5pin DIN panel mounting: Optionally on the back of a 225e it would be sufficient to use the 2-pin header connection. On the back of the 225e there are pads for a 2-pin connection for MIDI In at header labeled P7. Pins 1 and 2 of this connection can directly connect to pins 4 and 5 of a 5-pin DIN jack. Note: This is the same for pins 1 and 2 of any header labeled for the 218e MIDI connection.

The Sustain jack connections can also be made with 2-pin connections to a part of the 6-pin connector on a 218e or optional 6-pin on a 218eV3.

Alternative use of the 22X-I-O for 226h output (with 206/7e ¼” audio):

The h-MIDI panel is more complete as MIDI interface, but if you want to use the audio output connections and 226h MIDI output on the same panel, this can be done using the 22X-I-O board by modifying the board: shorting bottom side pads/positions M5 and M4 and connecting G_out and GND pads all using three 1206 0-ohm resistors. Then inserting a 3pin header for the MIDI connection to the 226h where labeled “226h”, and cutting the MIDI In wires (see red lines) to H10 as pictured below all on the bottom side.



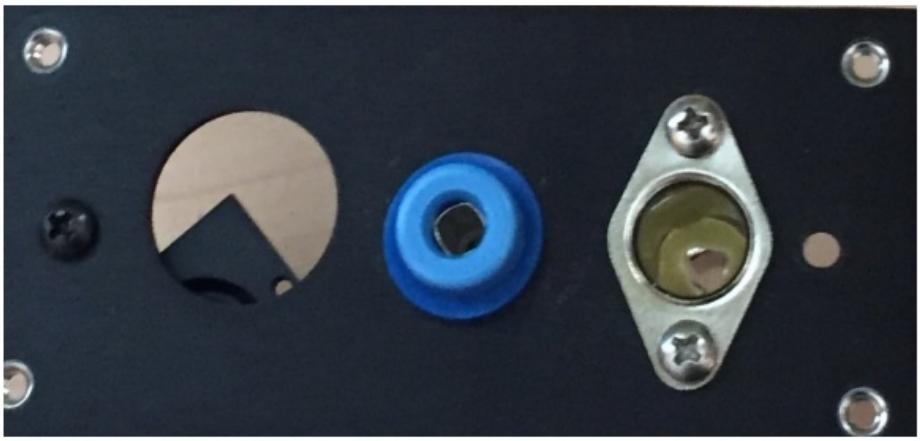
272e:

Using the 5XIO panel:

The left audio jack can be removed from its stack and replaced with a 272e antenna connection. There are drill targets for the mounting. And the banana connection can be drilled where per the 5/16” target on the back side.

Alternative 22X-I-O panel as a 272e antenna panel

The 22X-I-O panel can be used for the 272e by using a washer or nut on the 12v banana connection and drilling small mounting holes for the antenna connector



This can be combined with an old 225e I/O board with the unused MIDI out jack is removed and the USB position is nibbled to make room for the antenna mount

FAQ's about the different legacy MIDI connector boards

Can I connect the 225e to the Easel MIDI input?

Yes. If you have the connector that is labeled "225h/e" on the newer Easel power supplies, this is the simple connection. This connector can connect MIDI input to either the 225h or 225e. If you have any older Easel power supply without this connector, you can use the 2-pin header labeled J3 (used to connect MIDI to the 218 Rev1.) Using that older 2-pin header on the older Easel power supplies requires using the 2-pin P7 header on the back of the 225e.

Why aren't the 225e and other MIDI inputs ALWAYs compatible on the 10pin connector?

The first design of the 225e had a pinout that did not agree with proper USB implementation and USB was not as supported as hoped on that chip. When USB1.0 was integrated back on to the h-series MIDI I/O cable, a new pinout was

devised that's been used ever since.

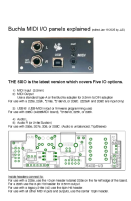
Does this apply to a 3-Boat power supply?

Yes. Most of these connections can be found on a 3-boat power supply board. Look at the labels for the connectors. But there is also space for an I-O panel. If you desire USB-MIDI input the 225h and USB-MIDI OUT of the 226h in a 3-boat? Use the I-O hole with an h-MIDI panel for your second USB-MIDI connector.

If I see the connectors I need on the boat I'm using, should I used those instead of an I-O panel?

Yes, use those first. These panels are not always needed. Many boats already include these connections on their power supplie boards. If you don't need the I-O panel, then save that area for some future expansion and save your panel for some other use.

Documents / Resources

	Buchla 5XIO.V3IO MIDI Plus Audio Breakout [pdf] User Guide 218e, 218eV3, 225e, 226h, 208C, 5XIO.V3IO MIDI Plus Audio Breakout, 5XIO.V3IO, MIDI Plus Audio Breakout, Plus Audio Breakout, Audio Break out, Breakout

References

- User Manual

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208C, 218e, 218eV3, 225e, 226h, 5XIO.V3IO, 5XIO.V3IO MIDI Plus Audio Breakout, Audio Breakout, Breakout, Buchla, MIDI Plus Audio Breakout, Plus Audio Breakout

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