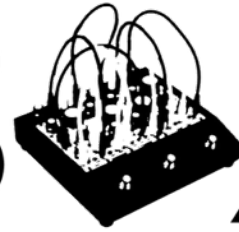


PATCH BOX



MODULAR EFFECTS PEDALS

MANUAL AND PATCH GUIDE

Important Instructions – PLEASE READ



Read Instructions:

Please read the Patch Box Modular Effects Enclosure manual completely before use and retain for future reference.

IMPORTANT Ribbon Cable Power Information:

The Patch Box combines a set of individual modules to create a complete system. The individual modules can be rearranged, removed, and replaced with any compatible eurorack modules from Pittsburgh Modular and other manufacturers.

The Patch Box uses a standard 16 pin eurorack power ribbon cable to connect the modules to the internal bipolar +12v / -12v / +5v power supply. Please pay very close attention to the orientation of the ribbon cable when adding and removing modules. The stripe on the ribbon cable marks -12v. This stripe needs to line up with the -12v pins on the power rail and the -12v pins on the module. **Failure to match up the pins correctly can result in damage to one or all the modules in the Patch Box.** On the power rail, the -12v pins are clearly labeled. On the individual modules, the positive and negative sides of the pin connectors are labeled next to the power header on either the top or bottom of the PCB.

Do **NOT** remove individual modules from the Patch Box while synthesizer is plugged in.

Do **NOT** unplug ribbon cables from the Patch Box or individual modules while the Patch Box is plugged in.

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Case and Power Specifications



Patch Box Package Contents

- 1x Patch Box Modular Effects Enclosure
- 1x External DC Power Adapter

Patch Box Case and Power Supply Info

- External Dimensions: 9.5" w x 9" d x 2.25" h
- 42 hp Space Available for Modules
- 9 Sliding Square Nuts Per Rail
- 42mm Depth Available for Modules
- +12v / -12v / +5v Power Included

External Power Adapter:

- Connection: 2.1mm Barrel Type
- Output: 15V DC / Rated 2.6A to 5A

Front Panel Controls

SWITCH 1 - Patchable footswitch can be used as on/off or A/B switch.

SWITCH 2 - Patchable footswitch can be used as on/off or A/B switch.

BYPASS - True bypass circuit enables or disables the entire Patch Box.

GAIN Knob - Controls the gain of the 1/4" input jack. Signal begins to overdrive after 12 o'clock.

OUTPUT Knob - Controls the output level of the Patch Box.

INPUTS Jacks - Dual buffered jacks carry the preamp output signal. Patch into the signal input of installed modules or the OUT jack.

EXP 1 Jack- Output of Expression pedal 1. Outputs a voltage between 0-5v used to control one or more voltage controllable parameters of the installed modules.

EXP 2 Jack- Output of Expression pedal 2. Outputs a voltage between 0-5v used to control one or more voltage controllable parameters of the installed modules.

MULTIPLE Jacks- Used to split an audio or control signal. Patch a signal in and use the remaining two jacks as copies of the input signal.

SWITCH 1 Jacks- Used to patch through SWITCH 1. The center jack is always active so pressing footswitch 1 switches between activating the left and center jacks (LED off) or the right and center jacks (LED on).

SWITCH 2 Jacks- Used to patch through SWITCH 2. The center jack is always active so pressing footswitch 2 switches between activating the left and center jacks (LED off) or the right and center jacks (LED on).

OUT Jack- Passed audio from modules through the Output level control to the rear mounted 1/4" output jack.



Rear Panel Controls

INPUT Jack - 1/4" unbalanced instrument input.

OUTPUT Jack - 1/4" unbalanced guitar or line level output.

15V DC Power Jack - 2.1mm barrel connector for external 15v DC 2.6 to 5A adapter.

EXP 1 Jack - Balanced 1/4" input for universal expression pedal such as the Moog EP-3 or M-Audio EX-P expression pedals. When using the Moog EP-3, place the switch on the bottom of the expression pedal to the "normal" position.

EXP 2 Jack - Balanced 1/4" input for universal expression pedal such as the Moog EP-3 or M-Audio EX-P expression pedals. When using the Moog EP-3, place the switch on the bottom of the expression pedal to the "normal" position.



An Introduction to Modular Patching

The Pittsburgh Modular Patch Box Modular Effects Enclosure offers unique access to a wide variety of analog and digital modular effects. Total control of not only the audio path but also a layer of voltages used to control the parameters of the installed effects modules.

Once the effects modules are added, plugging in a few patch cables opens the Pittsburgh Modular Patch Box to complex experimentation by offering unlimited control over both the control and audio signal paths. Assigning controls to one of the external expression pedal inputs, or rerouting audio or control signals using the patchable footswitches opens up a new world of hands free, sonic manipulation.

The Patch Box signal path is divided into two types of signals: audio signals and control voltages. The audio signal is the sound that is produced. The audio signal path starts at a sound source. This can be the 1/4' audio input jack, LFO running at audio rate, or the resonance of a self oscillating filter. The audio signal is then patched through other modules used to shape the sound such a filter, delay, crusher, reverb, phase shifter, or other effects module.

Control voltages (CV) manipulate the audio signal in several different ways. Gates are represented by a high (on) or low (off) control voltage. A gate can be generated using a pulse or square wave from an LFO (low frequency oscillator), or by using the gate output of an envelope follower module. A gate signal can be sent to the CV input of any module. Modulation sources can be static DC voltages from an expression pedal or variable AC voltages such as an LFO or audio signal. As an example, a control voltage from the output of an expression pedal can be patched into the frequency cutoff CV input of a Filter module to create a traditional wah-wah effect. Modulation can also come from a low frequency oscillator (LFO) module or the output of an envelope follower. Using an envelope follower such as the Pittsburgh Modular Detect module, creates a modulation source based on the amplitude of the incoming audio signal. This allows the performer to control any voltage controllable parameter with the variable loudness of a performance.

Audio signals also make a great control voltage source for more extreme modulation. As always, experimentation is essential to getting the most out of the Patch Box and installed modules.

Installing Modules

Adding new modules to the Patch Box is a simple process. Please follow the instructions below to ensure that new modules are installed safely and correctly.

Experiment with system layout by resting a few modules in the case before installation.

1. Unplug the power adapter from the back of the case.
2. Flip over the case and carefully remove the bottom of the Patch Box by first unscrewing the 4 feet and 2 additional screws on the bottom of the Patch Box.
3. Insert the necessary power ribbon cables into the power headers.
4. Carefully reattach the bottom of the Patch Box. Make sure the internal ribbon cable and black ground wire are safely inside the case before screwing the 4 feet and additional 2 screws into the bottom panel.
5. Flip the case back to right side up.
6. Install modules one at a time. First plug the module into a power ribbon cable. The red stripe on the ribbon cable marks -12v. This stripe needs to line up with the -12v pins on the module. Failure to match up the pins correctly can result in damage to one or all the modules connected to the power supply.
7. Use a small tool to line up the needed sliding square nuts close to where the module will be mounted.
8. Attach the module to the sliding nuts using the included panel screws. If installing more than 1 module, do not tighten down the panel screws until all the modules are installed. This will allow some room to shift the modules as needed.
9. Once all the new modules are installed, plug in the power adapter and switch on the case. Carefully test each module to ensure it is working as expected.



Working Inside the Patch Box

The following pages contain many examples of how to patch the the Patch Box. These examples showcase the flexibility of the Patch Box system and focus on the features included with the Patch Box enclosure. The modules within your system may be different then the modules used in the examples but the principals discussed will easily translate to any set of modules installed in your Patch Box.

Use the patches provided as a teaching tool. Once you have set up a patch, adjust knobs and remove cables from the Patch Box while referencing the module description pages within the manual. This will help you develop an understanding of what function each part of the patch is performing. The red patch cables are used in the examples to represent CV signals and green patch cables are used to represent audio signals. The blue dots represent the relevant control settings. These dots are meant to represent a starting point and are not definitive settings. Experimentation is essential.

The patch guide provides at least one "Test Patch" for each feature of the Patch Bo. These patches showcase the core functionality as well as additional uses for the highlighted feature. In general, the test patches will provide a way to focus attention on the capabilities of a single feature of the Patch Box enclosure and may not provide results that would be considered musical.

Working with individual features can be fun but the true power of any modular instrument comes when different modules start to interact. Patching the output of one module to the input of another is a fundamental part of modular synthesis. Even though the Patch Box is designed to be a tabletop modular effects system, the patches can become complex quickly. Any output can be patched to any input. Understanding the capabilities and functionality of the enclosure and each installed module will allow even the most complex patches to be understood easily.

If you come up with a good patch, we want to try it! Send all your interesting patches to info@pittsburghmodular.com.

Default Patch (Preamp Overdrive)

The default Patch Box patch does not require any modules. Plug a guitar or other instrument into the 1/4" input on the rear of the Patch Box enclosure. This will turn on the unit. Next, plug the output of the Patch Box into an amplifier, mixer, or audio interface.

With the Patch bypass foot switch LED off, the Patch Box circuitry is bypassed. Press the [BYPASS] button to turn on the red bypass LED and engage the Patch Box circuitry. Use an 1/8" patch cable to patch between one of the [INPUTS] and output [OUT] jacks.

The [GAIN] knob offers a clean boost until the knob reaches around 12 o'clock. After 12 o'clock, the preamp begins to add a smooth overdrive. Once the [GAIN] is set, adjust the [OUTPUT] knob to match levels with the bypassed signal by switching between the active and bypassed sounds using the [BYPASS] button.

This patch does not utilize the expression pedal inputs or footswitches.



Patching a Module

Patching a module between the preamp and the output is the basis of the Patch Box functionality and the simplest patch that includes installed modules. Use a patch cable to patch between one of the INPUTS and the input jack of an effects module. In the example we have patched the INPUTS into the input jack of a Filter module. The output of the Filter module is then patched into the OUT jack of the Patch Box. The signal then passes through the OUTPUT level knob into the 1/4" output on the rear of the enclosure.

This patch does not utilize the expression pedal inputs or footswitches.



Utilizing an Expression Pedal

The expression inputs on the rear of the Patch Box are used for controlling the parameters of installed modules during a performance. The Expression inputs create a 0-5v signal that can be patched into a CV input of any installed module.

The expression patch example uses the basic “Patching a Module” patch but adds a patch cable connecting EXP 1 to the Frequency CV input of the Filter module. For this to work an expression pedal such as the Moog EP-3 needs to be plugged into the EXP1 input on the rear of the Patch Box. The Frequency CV input attenuverter knob of the Filter module is used to set the range and polarity of the expression signal.

FYI.... An attenuverter is a knob that zeros out at 12 o'clock. Turn the knob to the right of 12 o'clock to add signal and turn the knob left of 12 o'clock to add inverted signal.

This patch does not utilize the footswitches.



Adding a Modulation Module

This patch adds some modulation to the Filter module with an envelope follower. A simpler version of this patch would use an LFO (low frequency oscillator) patched in the Frequency CV input instead of the envelope follower.

An envelope follower, we are using the Pittsburgh Modular Detect module in this example, outputs a control voltage that is based on the signal level of the incoming audio signal. This creates an auto-wah type effect in our example patch.

This patch uses the basic “Patching a Module” patch but adds a patch cable connecting the output of the envelope follower to the Frequency CV input of the Filter module. The Frequency CV input attenuverter knob of the Filter module is used to set the range and polarity of the expression signal.

This patch does not utilize the expression pedal inputs or footswitches.



Expression Through a Multiple

This patch adds a second effects module and a split expression pedal control signal to the basic “Patching a Module” patch. The multiple section of the Patch Box patch panel is used to split a signal in two. This patch uses the multiple to allow an expression pedal to control two parameters at the same time.

A second effects module is patched between the output of the Filter and the OUT jack of the Patch Box. We have used a Pittsburgh Modular Crush, an analog downsampling, signal crushing module. The EXP1 output is patched into the Multiple. A second patch cable is patched from the Multiple into the Frequency CV input of the Filter. The third output of the Multiple is patched into the Sample Rate CV input of the Crush module.

This patch does not utilize the footswitches.



Modulation Through a Multiple

This patch adds a second effects module and a split LFO (low frequency oscillator) signal to the basic “Patching a Module” patch. This patch uses the multiple to allow an LFO to modulate two parameters at the same time.

Just like the previous example, second effects module is patched between the output of the Filter and the OUT jack of the Patch Box. An LFO triangle waveform output is patched into the Multiple. A second patch cable is patched from the Multiple into the Frequency CV input of the Filter. The third output of the Multiple is patched into the Sample Rate CV input of the Crush module.

This patch does not utilize the expression pedal inputs or footswitches.



Footswitch as On/Off Switch

Starting again with the basic “Patching a Module” patch we are going to add a footswitch controlled modulation source. The footswitch will be used to turn the modulation on and off.

Both switches are patched in exactly the same way. The jacks are arranged in a simple double pole layout. The center jack is the wiper and the connection flips between the left and right jacks. That means when the LED is off, the center jack is connected to the left jack and when the LED is on, the center jack is connected to the right jack.

This patch connects the triangle wave output of an LFO to the right jack of Switch 1. The center jack is patched to the Frequency CV input of the Filter module. That means that when the footswitch LED is lit, the LFO will modulate the Filter and when the footswitch LED is off, the modulation will also be off.

This patch does not utilize the expression pedal inputs.



Footswitch as A/B Switch

Starting with a simple patch that uses the Crush down-sampler module, we are going to add a footswitch to flip between two different modulation sources.

The footswitches can be used to switch between two audio or control voltage sources by patching the audio or control voltage sources into the left and right jacks. The center jack becomes the output.

The footswitches can also be used to route a signal between to destinations. To do this, the input audio or control voltage signal is patched into the center jack and the left and right jacks are used as output jacks.

This patch connects the triangle wave output of LFO 1 to the left jack of Switch 1 and the triangle wave output of LFO 2 to the right jack of switch 1. The center jack is patched to the Mix CV input of the Crush module. That means that when the footswitch LED is lit, the Crush mix will modulate at the speed of LFO 2 and when the the footswitch LED is off, the Crush mix will modulate at the speed of LFO 1.

This patch does not utilize the expression pedal inputs.



Switchable Effects Chaining

This is a big patch with an important feature set. It utilizes both footswitches and the multiple to allow for individual bypass control of two different effects modules. The patch assigns one module to footswitch 1 and a second module to footswitch 2. This is a complex patch but shows the power of a modular effects unit.

The logic of this patch is that the input signal is sent through one of four paths determined by the two footswitches. Both effects modules bypassed. Effect module 1 active and effect module 2 bypassed. Effect module 1 bypassed and effect module 2 active. Both effects modules active.

The preamp input is sent to effect 1 (Filter) and the output of the filter is sent to the on position (right jack) of Switch 1. The output of Switch 1 is sent to the



Warranty

1 Year Limited Warranty:

For a period of one year after the date of original purchase, the instrument and all factory installed parts manufactured by Pittsburgh Modular Synthesizers LLC, are warranted to function properly and be free of defects in materials and workmanship. Should the Patch Box enclosure fail during the warranty period, contact Pittsburgh Modular Synthesizers LLC. We will repair it (or at our option, replace it) at no charge, and pay the cost of shipping it back to you.

The case and all case related hardware are warranted to function properly and be free of defects in materials and workmanship for 1 year.

This warranty is void if in our opinion the instrument has been damaged by accident, mishandled, altered, improperly serviced, or repaired by the customer where such treatment has affected its performance or reliability. This includes but is not limited to damage related to incorrectly attaching power ribbon cables. In the event of such misuse/abuse by the customer, costs for repairs plus two-way shipping costs will be borne by the customer. Instruments found defective should be returned to the factory carefully packed, as the customer will be responsible for freight damage.

Incidental or consequential damages or costs incurred as a result of product malfunction are not the responsibility of Pittsburgh Modular Synthesizers LLC.

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